Maui Island Plan

General Plan 2030

`A `ohe hana nui ke alu `ia.

No task is too big when done together by all.

Prepared By:

County of Maui
Planning Department
Long Range Division

Prepared For:

The People of Maui

Cover Art

Left: 18th Century Hawaiian Kapa; Cook-Foster Collection.
Georg-August University; Göttingen, Germany

Right: Hoku Pa`a: Polaris,the North Star
Traditional Hawaiian Kapa by practitioner Dalani Tanahy; Makaha, Hawaii 2008.
Dyed with `olena, kukui, `uki`uki, alae`a, black walnut

"Hoku Pa'a is a star I see every night above a curve in the mountains of the Makaha Range. I am reminded of its qualities and importance to seafarers who sailed all oceans; steadfast, reliable, immovable, the center of the sky around which all other stars and constellations revolved. This kapa design honors this renowned star."

Maui Island Plan

Island of Maui
General Plan 2030

For information regarding this plan please contact the County of Maui or the Maui County Department of Planning. Copies of this plan are available from the Maui County Department of Planning.

In loving memory, Christopher L. Hart, Robin Foster,
Rae and Carl Lindquist

Published in the United States by
The County of Maui
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Wailuku, Hawaii 96793

The Maui Island Plan was adopted by Ordinance No. 4004 and took effect on December 28, 2012.

LET THERE BE NO SMALL PLAN

Daniel Burnham,
Founding Practitioner, City Beautiful Movement

It is impossible to see the future, but we can envision how we want it to be and we can commit to doing all that is possible to see that our dreams and desires come true. Our Vision is one of hope, based on the values held by those who live on the land – hope that our decisions will keep the land, the people, and our heritage healthy and productive.

Conditions outside our present knowledge may require flexibility in achieving our goals; but as long as we remain guided by the values we hold in common, twenty years from now we will all be able to say, "We have been good stewards; we have been true to Maui."

The Maui Island Plan is the result of five years of listening to the voice of Maui's residents, hearing what is important to each and all of us - what we want and what we need, what we fear and what we dream – and then incorporating that into public policy.

Community involvement was critical to our planning; the process included large public outreach events, planning charrettes, public meetings, workshops, and public hearings. Over the last five years we traveled throughout the island. We listened to the youth with their strong ideals and hope for the future, and we listened to the wisdom and experience of our most senior residents. We listened to the concerns of our working parents and to the needs of our business community and community organizations. We garnered extensive input from our multicultural population.

One particular facet of Maui was prioritized by nearly everyone who participated in our community meetings: the desire to maintain the small towns and open countryside that is such a large part of who and what Maui is, while at the same time providing vibrant urban areas that will provide an equally positive quality of life for those who make their lives in our larger towns.

There is no conflict in these two goals. However, unless we hold these goals in equal esteem, we could sacrifice one goal to the other in the decisions that lie ahead. Our actions for one must always be balanced by our consideration for the other.

This Plan looks forward several generations, its recommendations will transform the way we manage our lands and plan for our communities. Key highlights of the Plan include:

- Adoption of a Directed Growth Plan. Growth areas are established where future growth is desired. This will make development more predictable for everyone, including County service and infrastructure providers. This will help reduce development costs, provide more affordable housing, and lower taxes to the public.

- Protection of Maui's Small Towns and Rural Character. Outside of growth areas development will be limited to preserve our agricultural lands and open space. This will "keep the country - country", a refrain repeated by many citizens.

- Affordable Housing. Housing for our workforce will remain affordable in perpetuity. Housing that is approved as "affordable" will not be converted to free market housing.

- Protection of Watersheds and Coastal Resources. Watershed and coastal zone management will be integrated to protect those areas of the island that contain critical marine resources, including coral reefs.

- Identification of Transit Corridors. Corridors will be protected from future development so that homes and businesses do not have to be condemned to make way for future transit facilities.

- Economic diversification. We will promote emerging industries such as high technology, renewable energy, niche tourism, local agriculture, health care, entertainment, and education. The important visitor industry will still grow, but at a comparatively smaller rate so that our economy will be more diversified.

- Integration of Land Use and Infrastructure Planning. We will implement a framework to ensure that our infrastructure and land use planning functions are integrated, so that infrastructure can be provided more effectively and efficiently. Financing tools will be developed so we can invest in water and wastewater systems, transit, parks, and other public facilities that will serve as a foundation for prosperity.

The steps we take now and in the next twenty years should be considered investments in our future, and in the future of Maui - its land, people, and heritage. We will need the wisdom to carry with us those values, traditions, and lessons from the past to light our path into the future towards the attainment of our Vision and goals. There is a lot to be done in a lot of areas. The responsibility to `ohana, `āina, and being pono calls us to action.

Mohala i ka wai ka maka o ka pua.

Unfolded by the water are the faces of the flowers. Flowers thrive by the water, as people thrive where the living conditions are good. ~Hawaiian `Ōlelo No`eau

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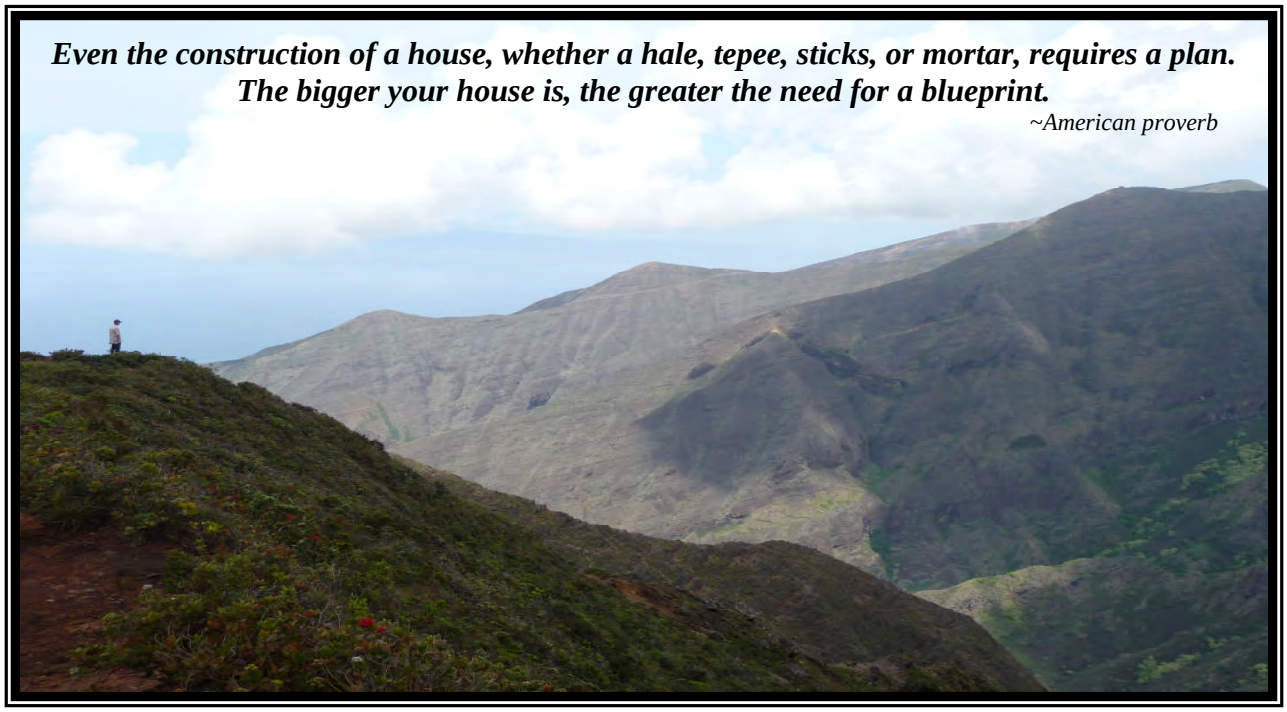
Introduction



View from the top, West Maui Mountains.

The Maui Island Plan is a blueprint that provides direction for future growth, the economy, and social and environmental decisions on the island through 2030. The Maui Island Plan incorporates input from people across the island through a series of community meetings held over several years. The Maui Island Plan is, in essence, the people's plan. The Plan establishes a vision, founded on core values that break down into goals, objectives, policies, and actions. In addition, the Plan incorporates lessons from the past. Key events throughout history have influenced the island's settlement patterns and sense of place. This introduction provides a brief overview of Maui's historical patterns and current conditions. The lessons from the past, combined with a vision for the future, have resulted in the Maui Island Plan.

THE PURPOSE OF THE MAUI ISLAND PLAN

The Maui Island Plan (MIP) accomplishes the following:

- Assesses existing conditions, trends, and issues specific to the island of Maui;
- Provides policy direction for the use and development of land, extension and improvement of transportation services and infrastructure, development of community facilities, expansion of the island's economic base, provision of housing, and protection of natural and cultural resources;
- Establishes policies to manage change and to direct decisions about future land use and development; and
- Provides the foundation to set capital improvement priorities, revise zoning ordinances, and develop other implementation tools.

Specific Outcomes

The MIP looks comprehensively at many factors that influence the physical, social, and economic development of the island. The MIP establishes a Directed Growth Strategy, which identifies areas appropriate for future urbanization and revitalization. The MIP also identifies and addresses key environmental, housing, and economic development issues relevant to Maui's current and future generations.

The MIP will be used by the County Council, the Maui Planning Commission, County staff, and the community as a policy foundation for day-to-day decision making in the following ways:

- Developing, implementing, and applying policies and regulations (e.g., zoning and other ordinances, including Community Plans that describe the kind of development that is allowed);
- Determining the appropriateness of discretionary development proposals; and
- Assigning resources for capital investments and programmatic initiatives.

It is not intended that ministerial permits be reviewed for consistency with all of the MIP goals, objectives, policies, diagrams and maps.

The MIP also communicates preferences to the State of Hawai`i regarding land use, open space, transportation, natural resources, and other issues common to both the County and the State. Just as important, the MIP expresses expectations about future development to residents, property owners, developers, and the business community. It eliminates much of the guesswork from the development approval process and provides clear direction of expectations to the development sector. As a result, the MIP can serve as a catalyst for change by introducing new ideas and development models.

Maui County General Plan

The Maui County General Plan (General Plan) is a term for a series of ordinances that provide direction for future growth and policy creation in the County. The Countywide Policy Plan acts as an overarching values statement, and is an umbrella policy document that provides direction for the MIP and Community Plans.

The Community Plans reflect the unique characteristics of each Community Plan Area and enable residents within those areas to address specific challenges. Figure I-1 illustrates the relationship of the various planning documents that comprise the General Plan.

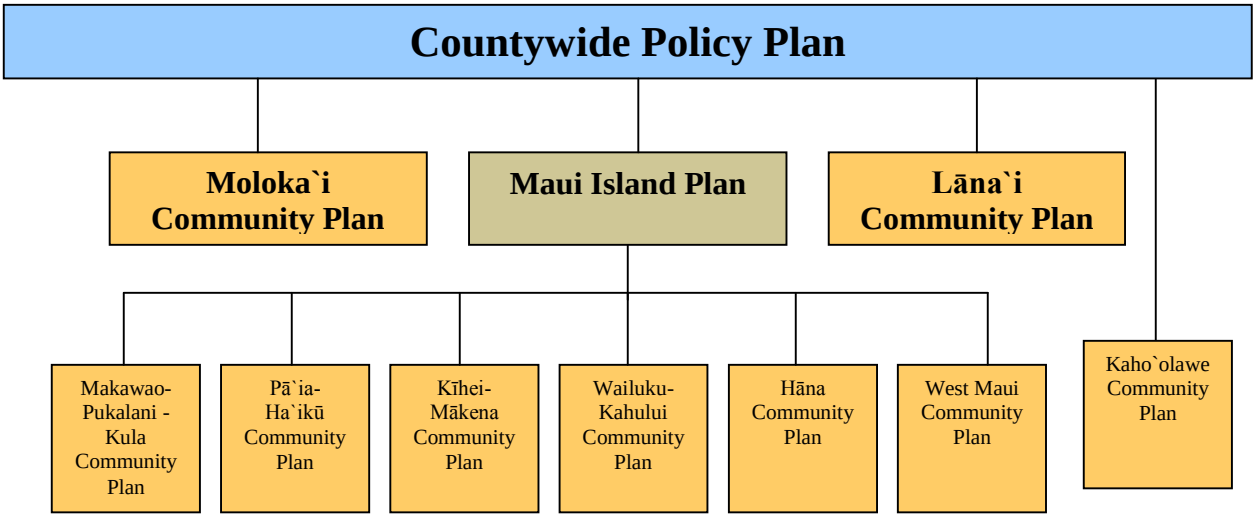


Figure I - 1: General Plan Documents.

Technical Studies

The technical studies developed to support the MIP include the following:

1. Socio-Economic Forecast: The Economic Projections for the Maui County General Plan 2030, June 2006 (Maui County Planning Department);
2. Land Use Forecast, Island of Maui, Maui County General Plan 2030, November 2006 (PlanPacific, Inc.);
3. Scenic Historic Resources Inventory and Mapping Methodology Reports, June 2006 (Chris Hart & Partners, Inc.);
4. WalkStory PlanStory: A Report on the Responses of Participants, December 2006 (Fern Tiger Associates);
5. Maui Island Housing Issue Paper, A Discussion Paper for the Maui County General Plan Update, December 2006 (John M. Knox & Associates, Inc.);
6. Proposed Roadway Development Program, January 2007 (Fehr & Peers/Kaku Associates);
7. Public Facilities Assessment Update, County of Maui, March 9, 2007 (R.M. Towill Corporation);
8. County of Maui Infrastructure Assessment Update, May 2003 (Wilson Okamoto & Associates, Inc.);
9. Telecommunications Assessment, January 2007 (Chris Hart & Partners, Inc.);
10. Agricultural Resources Technical Issue Paper, September 2007 (Chris Hart & Partners, Inc.);
11. Rural Areas Technical Issue Paper, December 2007 (Chris Hart & Partners, Inc.);
12. Heritage Resources Technical Issue Paper, September 2007 (Chris Hart & Partners, Inc.);
13. Economic Development Issue Paper, Island of Maui, Maui County General Plan 2030, October 2007 (PlanPacific, Inc., in association with John M. Knox & Associates, Inc., Tom Dinell, FAICP, and Chris Hart & Partners, Inc.);
14. Infrastructure and Public Facilities Technical Issue Paper, September 2007 (Chris Hart & Partners, Inc.);
15. Directed Growth Strategy—Transfer and Purchase of Development Rights Program Implementation Study, November 2007 (Chris Hart & Partners, Inc.);
16. Maui Island History: Lessons From the Past — A Guide to the Future, September 2006 (Chris Hart & Partners, Inc.);
17. Long-range Capital Improvement Program: Infrastructure Planning and Delivery Challenges, September 2007 (Chris Hart & Partners, Inc.);

18. Directed Growth Plan, Site Evaluation Methodology, September 2007 (Chris Hart & Partners, Inc.);
19. Population and Economic Projections for the State of Hawai`i to 2040, March 2012 (Department of Business, Economic Development and Tourism, State of Hawai`i); and
20. Technical Reference Maps: Natural & Environmental Conditions Map, Cultural Resources Overlay/Scenic Corridor Protection Map, Marine Resource Special Area Management Zone Map, Sensitive Lands Map, Natural Hazards Map, and Agricultural Land Protection Map.

Maui Island Plan Process

Chapter 2.80B, Maui County Code (MCC), was enacted in 2004, and ordinances amending the chapter were enacted in the following two years. Chapter 2.80B revised the process for updating the General Plan. Chapter 2.80B requires that the General Plan identify and describe the major opportunities and challenges facing the County, as well as the social, economic, and environmental impacts of development. In addition, Chapter 2.80B mandates that the General Plan set forth the desired sequence, patterns, and characteristics of future development. Chapter 2.80B also modified the prior General Plan process by requiring that a Countywide Policy Plan be prepared first, followed by a MIP, and then the nine Community Plans.

Chapter 2.80B requires that the Countywide Policy Plan, MIP, and Community Plans be internally consistent, with compatible vision, principles, goals, policies, implementing actions, and land use maps. All agencies are required to comply with the ordinances that comprise the General Plan. All zoning ordinances, subdivision ordinances, and administrative actions by agencies are required to be consistent with the General Plan. Preparation of County budgets and capital improvement programs are required to implement the General Plan to the extent practicable.

Focus Maui Nui, Wailuku.

Public Participation

There have been several formats for public-participation opportunities throughout the General Plan Update process, including Focus Maui Nui, General Plan Update outreach events, General Plan Advisory Committee meetings, and the Maui Planning Commission and County Council review process. These are described on pages 3-4 of the Countywide Policy Plan, adopted by Ordinance No. 3732 (2010).

Plan Format and Organization

The format of the MIP is based on best practices in preparing comprehensive plans.[1] The MIP is divided into chapters addressing the requirements of Chapter 2.80B. Each chapter provides a summary of pertinent background information regarding trends and forecasts and identifies significant regional challenges and opportunities. Each chapter contains a series of goals, objectives, policies, and actions. A goal is articulated as a desired end state, is aspirational, and is framed as a general statement of the desires

[1]Anderson, Larz T. (1995). *Guidelines for Preparing Urban Plans* (APA Planners Press, Chicago).

of the community in addressing a given issue. An objective, oftentimes measurable or quantifiable, serves as a benchmark to monitor the achievement of the goal. Both goals and objectives are intended to be guidelines and should not be construed as regulations. A policy is a specific statement that provides direction to decision makers, and is based on implementing goals and accomplishing objectives. The construction of a policy determines whether it is intended to be a guideline or a regulation. An action is a procedure, a program, or a technique to carry out policies.

Where applicable, maps are included at the end of a chapter. The MIP incorporates diagrams and two types of maps within the plan: background maps and Directed Growth Maps.

Diagrams are a graphical expression of the Plan's policies. Many types of policies lend themselves well to graphical treatment, such as the distribution of land uses, infrastructure, and natural resources. Diagrams are primarily intended to provide useful information and guidance in creating future regulations, management, or facility plans.

Background maps depict existing or projected baseline information (such as environmental conditions, population and employment trend data, and existing infrastructure facilities) and are intended to help the reader understand conditions that may have influenced policy proposals. These maps were largely developed to assist in the Directed Growth Plan as well as to guide the County in identifying and addressing relevant issues. These maps are not intended to be used in any land use permitting, decision making or project review, but rather, are informational in nature. Background maps are not intended to be regulatory.

All of the Directed Growth Maps are regulatory.

Implementation

Implementing the policies and actions established in the MIP will require a coordinated effort from numerous agencies, community groups, and private business. Implementation mechanisms include planning and regulatory approaches, capital improvement programming, special implementation programs, and monitoring and evaluation. Implementing the goals of the MIP will require updating and revising existing planning and regulatory processes as well as establishing new programs and initiatives.

The goals, objectives, policies, and actions in the MIP are consistent with and implement the goals, objectives, policies, and actions of the Countywide Policy Plan.

MAUI ISLAND HISTORY

The MIP looks to the past as a starting point to plan for the future. It is the foundation for preserving our heritage and overcoming challenges, and will ultimately result in a desired future.

Maui's Early Hawaiian Landscape

Prior to Western contact, Hawaiians did not believe in the private ownership of land. A unique system, utilized throughout Hawai`i, divided land into ahupua`a, land divisions running from the mountains to the sea that were administered by each district ali`i. Hawaiian society was separated into distinct classes, from chief to laborer, each with its own defined duties and responsibilities within the ahupua`a.

Chinese laborers loading sugarcane. (n.d.).

In 1786, Captain Jean-Francois de Galaup, Comte de La Perouse was the first outsider to set foot on Maui's shore and interact with the Hawaiians. In the following years, missionary work, the whaling industry, and flourishing trade of diverse goods brought American and European immigrants to the island.

With much of the island remaining arid and inhospitable to human habitation, the towns of Hāna, Makawao, Wailuku, and Lahaina housed the majority of the population. Diversified agriculture rapidly expanded during the 1840s and 1850s to support the transient and resident population.

Having no resistance to introduced Western diseases, Maui's population dropped dramatically following Western discovery and inhabitation. Regardless of the influx of new groups of people, the population steadily decreased. Table I-1 shows the decline in Maui's population from 1831 – 1878.

Table I - 1: Maui's Population 1831 – 1878

Year	Population[2]
1831	35,062
1850	21,047
1860	16,400
1878	12,109

[2] Schmitt, Robert C. (1977). *Historical Statistics of Hawai`i* (University Press of Hawai`i, Honolulu).

The Great Mahele

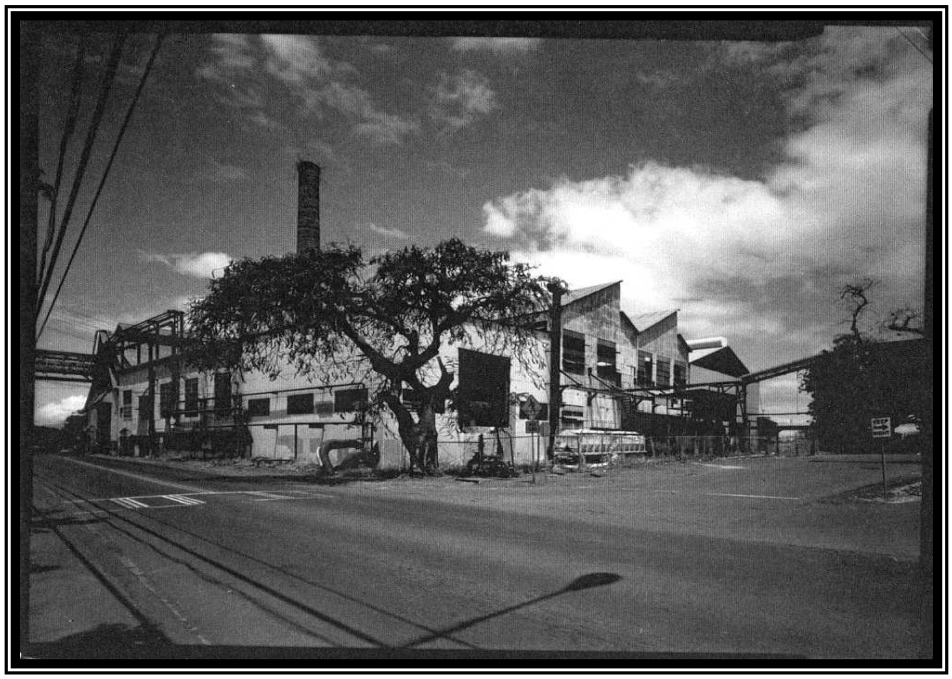
The concept of land ownership was introduced by Westerners. These newcomers recognized a great opportunity in the islands and were becoming increasingly frustrated with the Hawaiian land tenure system. In 1848, Kamehameha III, under pressure from foreigners, set into motion a series of events that altered the distribution of land in Hawai`i.

The Great Mahele, or land division, established a Land Commission and provided the means whereby land claims could be presented and adjudicated by the commission. As part of the Great Mahele, the Kuleana Act of 1850 allowed the Land Commission to award small parcels of land to commoners for subsistence. The King's intent with the Great Mahele and the Kuleana Act was to protect lands from foreign acquisition and to provide Native Hawaiians with the security of land ownership. However, there existed a disconnect between the King's intentions and the actual events that ensued as a result of the Great Mahele.

Living for hundreds of years with the self-sufficient ahupua`a land-tenure system and a communal subsistence economy, Hawaiians, particularly commoners, were unaccustomed to the concept of fee simple land ownership. This unfamiliarity, coupled with numerous legal and logistical constraints, led to foreign acquisition of large amounts of land intended for Native Hawaiians. Many Hawaiian families were required to leave the lands they had cultivated for generations and were forced to move to populated towns such as Wailuku and Lahaina.

Maui Goes for Sugar

Following the events of the Great Mahele, Hawaiian land became widely available for private ownership and capitalist development. Between 1836 and 1861 there was an initial flurry of sugarcane planting and refining throughout Hawai`i. However, lack of capital and an adequate market forced many planters out of business.



Pioneer Mill in 2005 prior to demolition, Lahaina.

In 1850, an indentured labor system was established through the Masters and Servants Act, which supplied plantation workers from foreign markets.[3] From 1860 to 1865, the Hawaiian sugar industry received an additional boost as a result of the American Civil War. During this time, the Louisiana sugar supply ceased, giving Hawai`i a larger share of the market.

In 1876, the Hawaiian Reciprocity Treaty allowed for duty free admission of Hawaiian sugar, resulting in a substantial increase of profits for island growers. With this economic boost, growers immediately began increasing the cultivation of sugarcane. On Maui, acres cultivated in sugarcane expanded from 5,080 in 1867 to 12,000 in 1880, which amounted to an increase of 136 percent.[4]

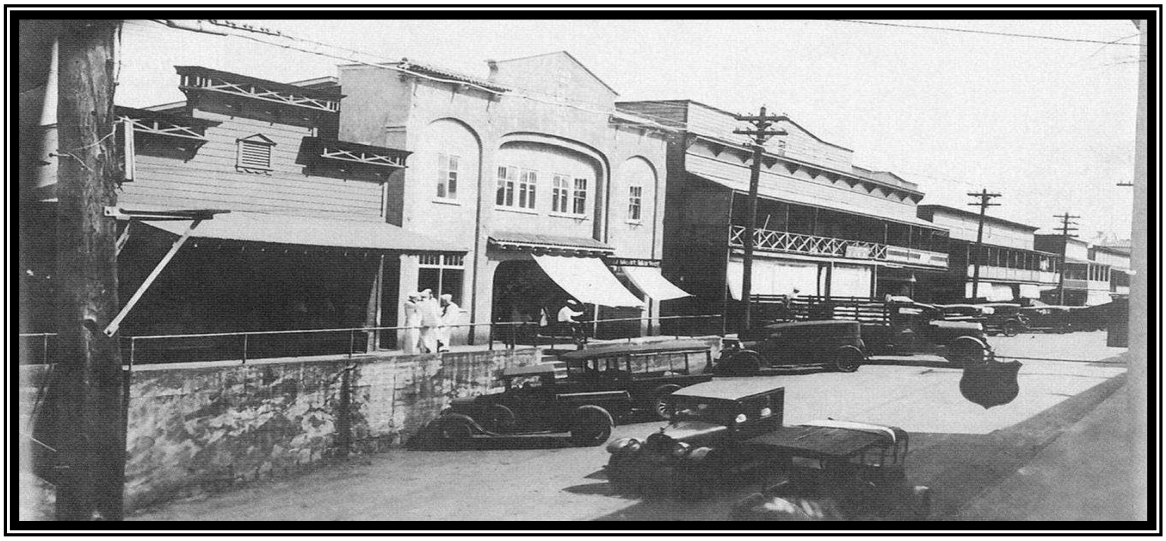
Construction of the Hāmākua irrigation ditch, which delivered water from East Maui's expansive watershed to the arid plains of Central Maui, secured the future of sugarcane cultivation. The development of rail and ocean transportation also greatly influenced the growth of the sugar industry on Maui.

The cultivation of sugarcane has had a long-lasting impact on Maui's landscapes and water supply, and has dramatically influenced the social and cultural development of Maui. With the massive growth of the industry, the need for labor also grew, resulting in the importation of workers from Asia, Europe, South and Central America, and the South Pacific Islands. This growth and importation created incredible ethnic and cultural diversity within the County. In the early 1900s, each of Maui's sugar estates contained multiple plantation camps that housed the immigrant workers. These camps were comprised of housing, schools, stores, churches, recreational facilities, clinics, and neighborhood facilities and services such as police, fire, and community centers. These villages were self-sufficient, and allowed residents to meet normal health and safety needs and enjoy recreational activities within the confines of their community.

[3] Lal, Brij V., Murno, Doug, and Beechert, Edward D. (1993). *Plantation Workers: Resistance and Accommodation (*University of Hawai`i Press, Honolulu).
[4] Lind, Andrew W. (1938). *An Island Community: Ecological Succession in Hawai`i* (Greenwood Press Publishers. New York).

Maui's Golden Pineapple

Pineapple has also played a large role in forming Maui's modern landscape. The pineapple industry began on Maui in 1890 with Dwight D. Baldwin's Ha`ikū Fruit and Packing Company on the northeast side of the island. The Baldwin Packers also cultivated pineapple in the early 1900s in West Maui. The pineapple industry grew steadily, and by 1930, more than 28 percent of Maui's cultivated lands were dedicated to pineapple.[5] In November 2009, Maui Land & Pineapple Company, Inc. announced the company would cease pineapple production. Nonetheless, the cultivation of pineapple persisted in 2010 with the formation of Hali`imaile Pineapple Company, an offshoot of Maui Land & Pineapple Company, Inc., which continues the pineapple legacy of Maui.



Market Street c. 1920, Wailuku.

Cattle Ranching and the Paniolo

Hawai`i has a strong historical connection to cattle ranching. In 1830, King Kamehameha III summoned *vaqueros* from Vera Cruz, Mexico, to teach the Hawaiians how to handle horses and herd cattle. The Hawaiian cowboys, or paniolo, learned herding techniques, and by 1836 bullock hides became a valuable Hawaiian export. As the cattle-ranching industry grew on Maui, multiple ranches dominated the less-fertile upper-elevation lands that were left uncultivated. Cattle ranching eventually grew into Maui's third-largest industry, behind sugar and pineapple. Cattle ranching and the paniolo have had a long-lasting effect on the lifestyle and landscapes of numerous Maui communities.

1942 – 1950: World War II, the Automobile, and the Labor Movement

World War II signified a transition period for Maui. The war brought new immigrants and rapid investment in infrastructure to serve the military. Roads, harbors, and airports were built, dramatically altering the character of Maui and paving the way for future events.

The end of World War II brought about significant change for the sugar and pineapple industries. With rapid mechanization of these industries, rise of unionization, expanding employment opportunities, and growth of private land ownership, plantation camps became a thing of the past. With the camps becoming dilapidated and increasingly expensive to maintain, plantation owners began to look elsewhere for business opportunities.

[5] Lind, Andrew W. (1938). *An Island Community: Ecological Succession in Hawai`i (*Greenwood Press Publishers, New York).

1950 – 1970: New Town Planning and the Emergence of the Visitor Industry

Following World War II, the economy on Maui shifted from sugar and pineapple to a new and promising crop: visitors. With the emergence of new towns, resort-destination areas, and community planning, Maui began a new chapter in its history, which laid the groundwork for present-day economic conditions.

Development of the "Dream City": Kahului in Central Maui

The demand for single-family homes was on the rise because of several factors, including the increasing prosperity of plantation workers, mechanization of the sugar industry, and the closure of plantation camps.

Dream City Plan, 1947.

Hawaiian Commercial & Sugar Company (HC&S) took hold of this market and hired Harland Bartholomew in 1947 to prepare a master plan for a community on the sugarcane fields surrounding Kahului Harbor that would become known as the "Dream City." Beginning in 1950 and continuing to 1963, fee simple house and lot packages were sold at prices ranging from $6,600 to $9,200. Demand for supporting facilities became apparent, prompting HC&S to construct the Kahului Shopping Center in 1951. The contiguous towns of Kahului and Wailuku continued to grow and jointly developed into the civic and population center of the island. In 1962, Community Planning, Inc. prepared the region's first general plan. The plan identified Kahului as the dominant trade and service center, with large modern subdivisions and segregation of land uses, resulting in a "pleasant and appealing community."

Community planning in Central Maui continued in 1972 with the preparation of a second general plan conducted by Eckbo, Dean, Austin & Williams. The 1972 plan came to many of the same conclusions as its predecessor. The plan also warned of the potential negative effects of piecemeal planning, and recommended that the County draft an island-wide general plan. Finally, and most significantly, the plan identified an affordable housing "crisis" and recommended major expansion of residential use in the area

through the implementation of two Project Districts.[6] This plan, its predecessor, and the Dream City development have all shaped the growth and evolution of the area and marked the modern era of population centralization in the Wailuku-Kahului region.

Kahului, 1950

Kahului, 1977.

Rise of Tourism and the Resort-Destination Area

South Maui shoreline, c. 1970.

Maui lost 24 percent of its population from 1940 to 1960.[7] Many residents, particularly younger generations, left Maui in search of employment on O`ahu and the mainland. In 1959, the "Report of Land Use for the Island of Maui" identified two options as potential solutions to reversing the downward population trend. Maui could either expand and diversify its agricultural base, or capture a greater share of Hawai`i's tourism industry. Throughout the previous decades, Maui experienced marginal levels of tourism; however, the lack of visitor facilities prevented the growth of the industry. In 1956, Maui attracted only 5 percent of Hawai`i's visitors and received only 1 percent of their expenditures.[8]

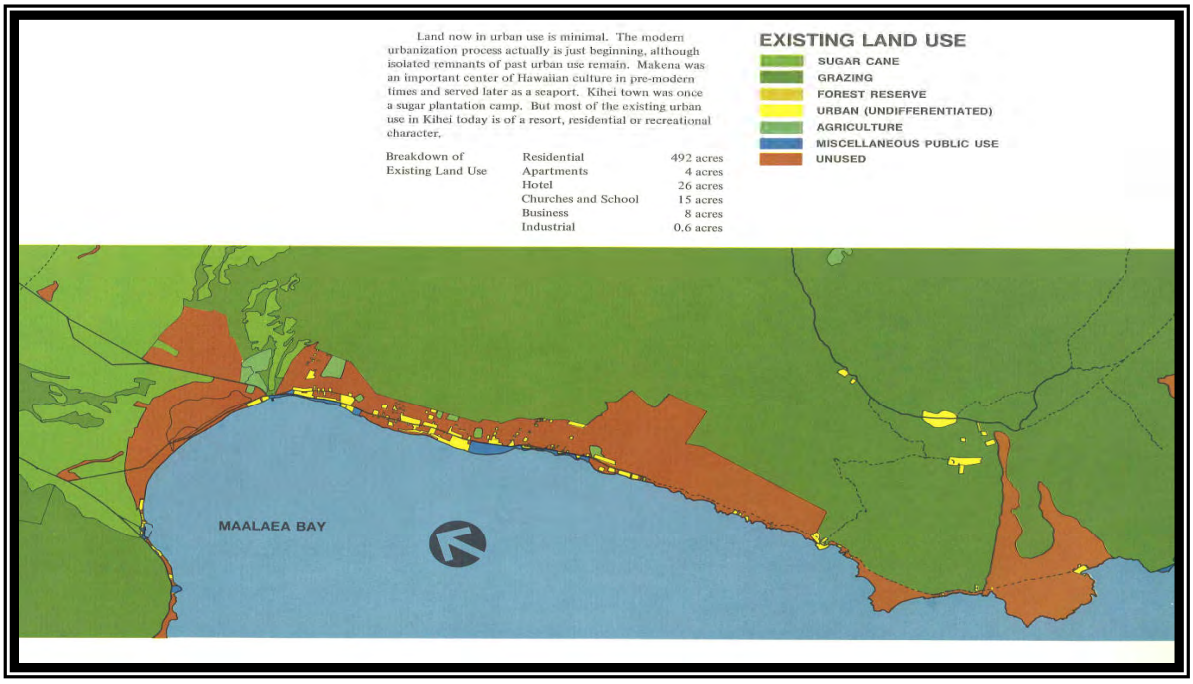
Inspired by O`ahu's success in the tourism industry, local business and political leaders began to plan Maui's tourism future. In 1961, Kā`anapali became the first master-planned resort area in Hawai`i. The resort-destination area trend continued to grow on Maui with the subsequent development of Wailea and Kapalua.

With the birth of a substantial visitor industry, Maui's population and economy began to rebound. Resorts and other visitor services provided employment for Maui's existing residents and attracted new residents. Tourism quickly became the island's strongest industry, and has had a notable impact on Maui's population, culture, economics, infrastructure, natural resources, and land use patterns.

[6] Eckbo, Dean, Austin & Williams (1972). *The Wailuku-Kahului General Plan* (prepared for Planning Commission, County of Maui).
[7] Community Planning, Inc. and R.M. Towill Corporation (1959). *Report of Land Use for the Island of Maui* (prepared for Planning and Traffic Commission, County of Maui).
[8] Id.

Kīhei 701 Plan

With Maui's population and economy growing as a product of the newly established visitor industry, business and political leaders began to look to the sparsely populated and primarily agricultural Kīhei region as the island's next residential, resort, and employment center. In 1970, Maui County planning staff and consultant Noboru Kobayashi jointly prepared the Kīhei Civic Development Plan to provide a long-range plan to guide development of the region through 1990. The plan was partially funded by an urban planning grant from the Federal government under the provisions of Section 701 of the Housing Act of 1954.



Existing Land Use Map, Kīhei Civic Development Plan, 1970.

The so-called Kīhei 701 plan identified the region's expansive white-sand beaches, spectacular views, mild climate, and vast open space as ideal characteristics for fostering a mixed community of residents and visitors along Maui's south shore. With a population of approximately 1,600 in 1970, the region was characterized by diversified agriculture, mauka grazing lands, open space, homestead development, and dirt roads. At the time, only one hotel existed in the region, the Maui Lu, offering 100 visitor units. The plan identified this region as significantly underutilized and introduced a future vision for the area. The plan's vision provided for extensive visitor accommodations and residential units that would transform the region into a massive economic engine.

With the designation of Wailea as a major resort community and other hotel and residential land use designations throughout the region, the Kīhei 701 plan set the stage for massive real estate speculation and development. The plan led to mass purchase and development of land, ushering in the real estate boom on Maui. The Kīhei region experienced rapid growth in the 35 years following the plan. By 2005, the population exceeded 25,000 and the average daily visitor population neared 20,000.[9]

[9] Department of Planning, County of Maui, Hawai`i (2006). *2030 Socio-Economic Forecast.*

1970 – 2000: The Real Estate Boom and Its Impact on the Maui Landscape

The strategic shift from an agricultural-based economy to a tourism-based economy signified the beginning of the next chapter of Maui's diverse history. With the growing number of resorts and increased marketing, Maui's visitor industry grew stronger, and the resident population began to rebound. The visitor industry filled the job gap that the mechanization of the sugar industry had created. The mass departure of residents greatly slowed, and immigration escalated, resulting in a growing demand for housing, particularly projects targeting the off-shore market.

Kapalua Resort in West Maui, 2005.

The visitor industry experienced a significant surge beginning in the late 1970s as a result of off-shore investments. Mainland U.S. and Japanese resort companies viewed Maui's burgeoning visitor industry as a surefire business investment, and began developing large, world-class resorts in Wailea and Kā`anapali. Table I-2 shows the increase in Maui's population from 1960 – 2010.

Table I - 2: Maui's Population 1960 – 2010

Year	Population	% Change
1960	35,717	-
1970	38,691	8
1980	62,823	62
1990	91,361	45
2000	117,644	23
2010	144,444	21

As Maui's population grew, so did the urban footprint on the island's landscape. Settlement patterns expanded rapidly, spreading out from existing population centers. Maui began to experience "planned urban sprawl" as agricultural and rural lands were released in a contiguous manner of urbanization. Central, South, and West Maui have grown significantly in the last three decades with the birth of new subdivisions and visitor accommodations. With the steadily increasing demand for housing, home prices have risen dramatically, out-pricing many local families and creating a pressing need for affordable housing.

Upcountry Maui has also been impacted by the increasing population. The region's cool climate, rural setting, and spectacular views make for a desirable place to live. As a result, the area has experienced growth in the residential market since the 1970s. In particular, the traditionally agricultural Kula area has experienced growth in rural residential development, so-called "gentleman's estates," and real estate speculation. The gradual urbanization of Upcountry has led to multiple challenges, including incompatible land uses, water shortages during periods of prolonged drought, and a loss of the area's traditional rural character.

MAUI TODAY

The island of Maui, also known as "The Valley Isle," contains a unique social, economic, and geographic profile. The island's extraordinary natural beauty has marked it globally as a top vacation destination, as well as a highly desirable place to live. In 2010, Maui's resident population was 144,444. Approximately 2 million visitors vacation on Maui each year, equating to an estimated 46,000 visitors a day.

The island is situated within a volcanic archipelago made up of eight major islands and 124 minor uninhabited islands that stretch in a curved chain for approximately 3,800 miles from the central to the northern Pacific Ocean. The Hawaiian Archipelago stands as earth's most isolated islands, being some 2,400 miles from the nearest continental land mass (North America) and the islands of Polynesia in the South Pacific.

Map I-1 provides an orientation to the island's sense of place through a general display of Maui's topography and towns, in addition to its natural, community, and recreational resources. Collectively, the island is paradise; regionally, it is distinct and unique.

West Maui is a string of coastal communities and mountainous areas. The stretch of coast between Lahaina and Nāpili is dominated by the resort industry due, in part, to its abundant ocean access points that provide numerous recreational opportunities. The northeast portion, stretching from Waihe`e to Honolua Bay, offers a dramatically different setting with its vast open spaces and cliffs, vivid ocean views, and beautiful valleys and streams.

Encompassing the towns of Wailuku and Kahului, the area known as Central Maui has the majority of the island's urban development. The County government civic center, the island's primary airport and sole deep-water harbor, the University of Hawai`i Maui College, the island's primary business district, and vast acres of sugarcane fields all make up the Central Maui area.

Moving eastward, toward Haleakalā, are Upcountry Maui and East Maui. The Upcountry small towns of Makawao, Hāli`imaile, Pukalani, and Kula are characterized by agriculture, ranching, and open space. Makawao, home of the paniolo, has a long tradition of cattle ranching and rodeo. East Maui represents a vast geographic area that is comprised of many small communities, lush natural areas, waterfalls, rugged coastline, small-scale diversified agriculture, and a wealth of Hawaiian history and culture. East Maui remains remote, and is generally accessed by the famous Hāna Highway.

The coastline that stretches from Mā`alaea to Mākena is known as South Maui. Development along this area generally has occurred in a linear pattern between the shoreline and Pi`ilani Highway, forming a continuous urban corridor that attracts a large tourism industry. Coastal amenities are abundant with numerous leeward sandy beaches for snorkeling and leisure.

2000 – 2030: Guiding Maui's Future; Challenges and Opportunities

Maui is blessed by a vibrant host culture, an ethnically diverse population, unique native ecosystems and species, and spectacular scenic beauty. However, a rapidly growing resident and visitor population coupled with the development this growth brings, could jeopardize Maui's unique identity. Strategic steps should be taken to plan for this growth. Residents' quality of life and the vitality of the visitor industry depend on long-range planning that balances growth with community and environmental needs.

Moving forward, it is important to know how far we have come while understanding the direction we are headed. The Plan is a foundation for preserving our heritage and perpetuating our values. The Vision Statement and Core Values serve as the Maui Island Plan's philosophical underpinning, capture the best qualities of Maui today, and provide a path to the future.

VISION STATEMENT AND CORE VALUES

Maui Island Vision

Ua mau ke ea o ka `āina i ka pono
Maui Island will be environmentally, economically, and culturally sustainable with clean, safe, and livable communities and small towns that will protect and perpetuate a pono lifestyle for the future.

Core Values
To achieve our island's vision, we will be guided by the following values:

A. Adopt responsible stewardship principles by applying sound natural resource management practices;

B. Respect and protect our heritage, traditions, and multi-cultural resources;

C. Plan and build communities that include a diversity of housing;

D. Retain and enhance the unique identity and sense of place;

E. Preserve rural and agricultural lands and encourage sustainable agriculture;

F. Secure necessary infrastructure concurrently with future development;

G. Support efforts that contribute to a sustainable and diverse economy for Maui;

H. Create a political climate that seeks and responds to citizen input;

I. Respect and acknowledge the dignity of those who live on Maui;

J. Establish a sustainable transportation system that includes multiple modes, including walking, biking, and mass transit, as well as automobile-based modes; and

K. Recognize and be sensitive to land ownership issues and work towards resolution.

"Registered Historic Parcels" and "Registered Historic Sites" only represent those listed on State or National Registers and included within Maui County's GIS system. Sites shown are not all-inclusive and do not represent all historic sites on Maui. As additional data becomes available it will be integrated into future mapping.

Kahana
Ka'anapali
Lahaina
Olowalu
Wailuku
Kahului
Pa'ia
Ha'iku
Makawao
Pukalani
Keanae
Hana
Kihei
Keokea
Kipahulu
Makena

This map is for informational purposes only and subject to change based on future research and findings.

Character & Context Map

Island of Maui

Background Map

For Informational Purposes Only

Legend

- Primary Road
- Na Ala Hele or Other Trail
- Stream
- Wetland, Pond or Reservoir
- Waterfall
- Registered Historic Site
- Registered Historic Parcel
- Parks

Scenic Corridor
- Exceptional
- High
- Medium

Boating Facility
- Boat Launch Ramp
- Small Boat Harbor

Aquatic Activity
- Ocean Recreation
- Board Surfing
- Body Surfing
- Canoe Paddling
- Snorkling/Diving

Miles
0 1 2 3 4 5 6

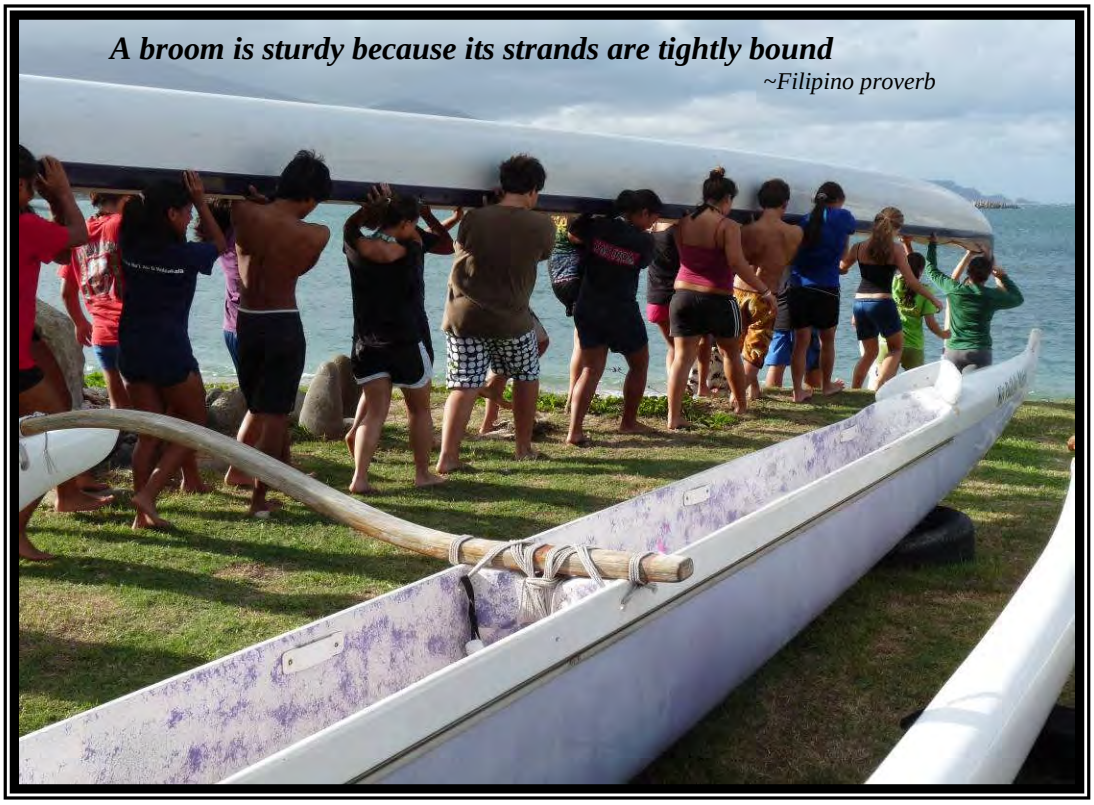
Product Code: M-CET_20120920-a1

This is not a zoning map. Please contact the Planning Department for Zoning confirmation.

Prepared by:
Long Range Planning Division
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Map I-1

Chapter 1: Population



Canoe launch, Kahului.

Population change on the island is inevitable. In-migration and out-migration occur at different rates and for different reasons. Understanding that our overall population will likely follow recent upward trends, it is our responsibility to decide how we would like this growth to manifest itself. Population growth can have positive and negative impacts on the environment, socio-economic and cultural composition of the island, and visitor experience. Visitors and new residents may arrive to Maui with expectations and values that conflict with the local way of life, a lifestyle that has been rooted on Maui for generations.

The policies that are adopted to address the impacts of population change will ultimately define our expectations for the future, and are far more important than the population change itself.

Background Information

The 2030 Socio-Economic Forecast is a planning tool; it identifies future options for the community to consider. The community may want to adopt policies to achieve a specific outcome that differs from the forecasted outcome, and to minimize the undesirable impacts of current trends. The population projections are based on trends and model assumptions that are absent of policy changes or directives. The forecast affects both ongoing planning (project review and approval) and the desired future articulated by Maui's residents and political leaders (General Plan and Community Plans). Because a long-term forecast identifies long-term trends and omits short-term variations, there will be many surprises along the way, even if a forecast turns out to be highly accurate.

The forecast was based on projections developed by the State of Hawai`i Department of Business, Economic Development & Tourism (DBEDT). The forecast allocates expected countywide change to local areas. The DBEDT long-term econometric model draws on historical data over three decades, plus projections from DBEDT and national sources. The DBEDT model (and accordingly, the allocation model) is economically driven: industries that attract capital are taken as crucial to economic growth, which in turn leads to new jobs and increased population.

Historic Population Trends

To put population increase into perspective, it is appropriate to compare Maui Island's population increase to the other major islands in the Hawaiian chain throughout the recent past. It is evident from Table 1-1 (below) that while O`ahu experienced the most dramatic population increase during the 1950s, the other islands, including Maui, were impacted by the steepest increase in population between 1970 and 1990.

Table 1 - 1: State and Island Population 1960 - 2010

Area	1960	1970	1980	1990	2000	2010
State of Hawai`i	632,772	769,913	968,500	1,113,491	1,213,519	1,363,621
Island of O`ahu	500,409	630,528	764,600	838,534	876,156	953,207
Island of Hawai`i	61,332	63,468	92,900	121,572	149,244	185,406
Island of Maui	35,717	38,691	62,823	91,361	117,644	144,444
Island of Kaua`i	27,922	29,524	39,400	51,676	58,568	67,226

United States Census.

According to the 2030 Socio-Economic Forecast, the total population is not expected to increase equally throughout the island; rather, there are specific regions where population growth is more likely to occur at a higher rate than others.

Table 1 - 2: Community Plan Area Population 2000 – 2030

Community Plan Area	2000	2005	2010	2015	2020	2025	2030
West Maui	17,967	19,852	22,156	29,103	31,410	33,743	36,058
Kīhei-Mākena	22,870	25,609	27,244	37,850	40,850	43,885	46,896
Wailuku-Kahului	41,503	46,626	54,433	52,343	56,492	60,689	64,853
Makawao-Pukalani-Kula	21,571	23,176	25,198	23,919	25,815	27,732	29,635
Pā`ia-Ha`ikū	11,866	12,210	13,122	11,332	12,230	13,139	14,040
Hāna	1,867	1,998	2,291	2,541	2,743	2,947	3,149
Total Maui Island	**117,644**	**129,471**	**144,444**	**157,087**	**169,540**	**182,135**	**194,630**

U.S. Census Bureau, 2000; Socio-Economic Forecast, Maui County Department of Planning, 2006, revised 2012.

Demographic Conditions, Trends, and Projections

Some demographic trends embedded in the forecast are consistent with the current projections.

- Between 2010 and 2030, the island's resident population is expected to grow from 144,444 to 194,630, an increase of 35 percent.
- The island's resident population is expected to grow at nearly an identical rate as the *de facto* population.
- The population is aging; the median age increased from 34.1 to 36.2 years between 1990 and 2000.
- Households are becoming smaller over time; Maui's household size is projected to decline from 2.94 persons per household in 2000 to 2.66 persons per household in 2030.

Economic Factors

- Wage and salary jobs are expected to increase by about 1.1 percent annually.
- *Per capita* income will increase very little (in constant dollars).
- Visitor counts will increase by about 1 percent annually.
- Because of high occupancy rates, construction of new units is expected to resume, and the supply of visitor units is expected to grow at 1 percent annually.
- The past rate of growth in resident population, housing, and jobs is higher than the rate of visitor growth. This indicates that Maui's economy has diversified and is less driven by tourism than in the past.

Community Plan Area Findings

To project future employment and housing needs for the island's Community Plan Areas, the forecast model allocated households based on historic trends, availability of entitled lands for development or redevelopment, development constraints, and careful consideration of planned and proposed development projects. The forecast model recognized that relatively isolated areas – such as Hāna – depend much more on the success of one major employer than do others; therefore, an economic downturn can have a devastating impact. Map 1-1 depicts Maui's major employment and population centers. For planning purposes, it is important to provide resident housing near employment.

Community Plan Area	Characteristics
West Maui	In the 1990s, this area saw significant population and job growth. Looking to the future, these trends are projected to continue through 2030. Local development potential to monitor includes timeshare, large master-planned communities, and Hawaiian Homelands. Timeshares and other transient vacation rentals are of particular interest for the impact they may have on island-wide job distribution. Timeshares have higher occupancies than hotels, but employ fewer workers at the lodging site.
Kīhei-Mākena	This area has seen growth in the visitor industry, the technology sector, and expanding residential areas. It has had the smallest average household size, and anecdotally, its workforce is more transient than other areas. The forecast extends all these trends. Based in part on recent development proposals, the forecast shows stronger growth in residential units than in visitor units.

Community Plan Area	Characteristics
Wailuku-Kahului	This area remains the economic and population center of the island. In the 1990s, this area saw significant increases in trade, transportation, communications and utilities, and government jobs. Kahului Harbor is the port through which most cruise ship visitors reach Maui. The 2030 Socio-Economic Forecast suggests the Wailuku-Kahului Community Plan Area will grow faster than other parts of Maui, as former sugar lands are developed into residential subdivisions. Wailuku-Kahului is expected to maintain its status as home to more than a third of Maui's households.
Makawao-Pukalani-Kula	This area saw significant increases in population in the 1980s, but less growth subsequently. New development slowed because of water supply problems. Job growth occurred at a much faster rate, but the forecast calls for economic growth to continue at a slower pace. With only 1 job located in this area for every 2.5 households, most of the area's residents commute outside the area for work. This will continue to be the case; by 2030, the forecast shows only 2.1 local jobs per household .
Pā`ia-Ha`ikū	Since windsurfing became popular in the 1980s, this area has taken on new importance as the home of this sport. In the 1990s, upland regions saw new development of homes on large agricultural lots, with the area population increasing by 52 percent. In light of limited availability of suitable land for new homes, the forecast calls for much slower growth in housing and population.
Hāna	In recent years, this area has seen job losses and a decrease of children and young adults. Slow growth is projected over the planning period, provided the visitor economy remains healthy. Hāna has experienced new population resulting from in-migration.

CHALLENGES AND OPPORTUNITIES

The growth of Maui's resident and visitor population will create both challenges and opportunities. Population growth can exacerbate existing infrastructure-capacity deficiencies, place additional demands on environmental resources, foster shifts in the cultural and ethnic makeup of the population, and change the landscape. In addition, the loss of cultural identity and diversity has created social tensions that have increased over at least the last 20 years. The cultural understanding and sensitivity of new residents to the host culture has been a constant point of discussion throughout the MIP's public-engagement process.

Population Growth

Population growth can also contribute to the health of the community. Population growth is often necessary to maintain a growing economy, an expanding tax base, and employment opportunities. A host of negative social and economic conditions, such as unemployment, crime, family disintegration, and substance abuse, can be found in communities with longstanding population loss. Policies and actions to address population growth on Maui can be found throughout the MIP. Figure 1-1 depicts the projected growth in Maui's resident and *de facto* population to 2030.

Maui's population is aging; and recent data shows that trends related to Maui's aging population will be similar to the trends on the Mainland. Figure 1-2 portrays Maui's age distribution over time. This demographic change has significant impacts to public services as they relate to the elderly, including housing, transportation, health care, and elder care services.

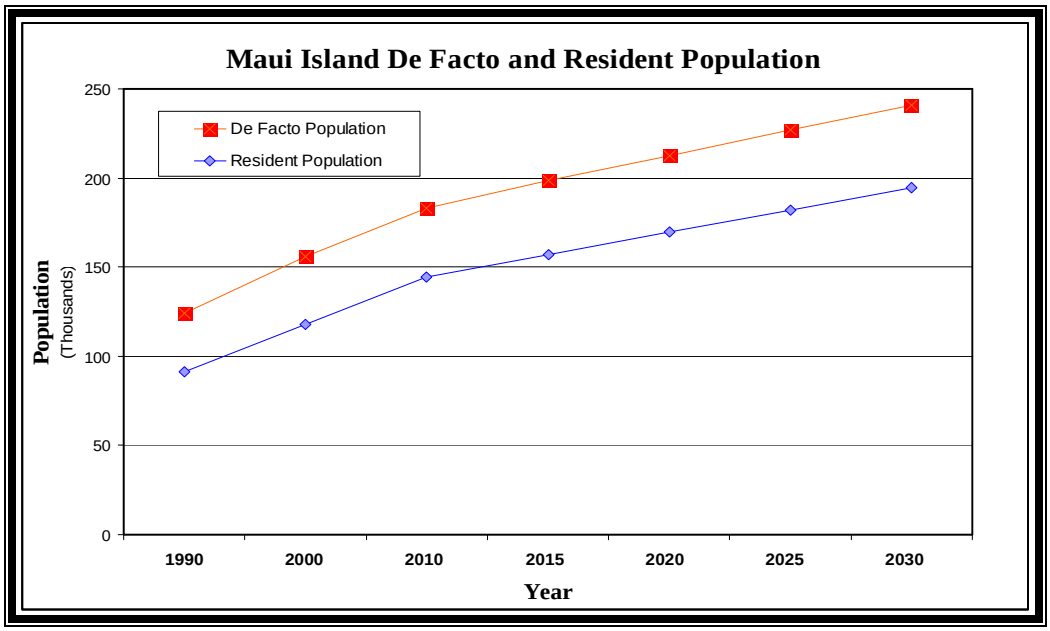


Figure 1 - 1. Maui Island Resident and De Facto Population Projections 1990 – 2030[1]

Aging Population

In addition to the challenge of providing more senior services, the wage-earning population that typically supports children and seniors will be proportionally smaller. Policies and actions to address the aging population can be found in this chapter as well as the Housing, Economic Development, Land Use, and Infrastructure and Public Facilities chapters.

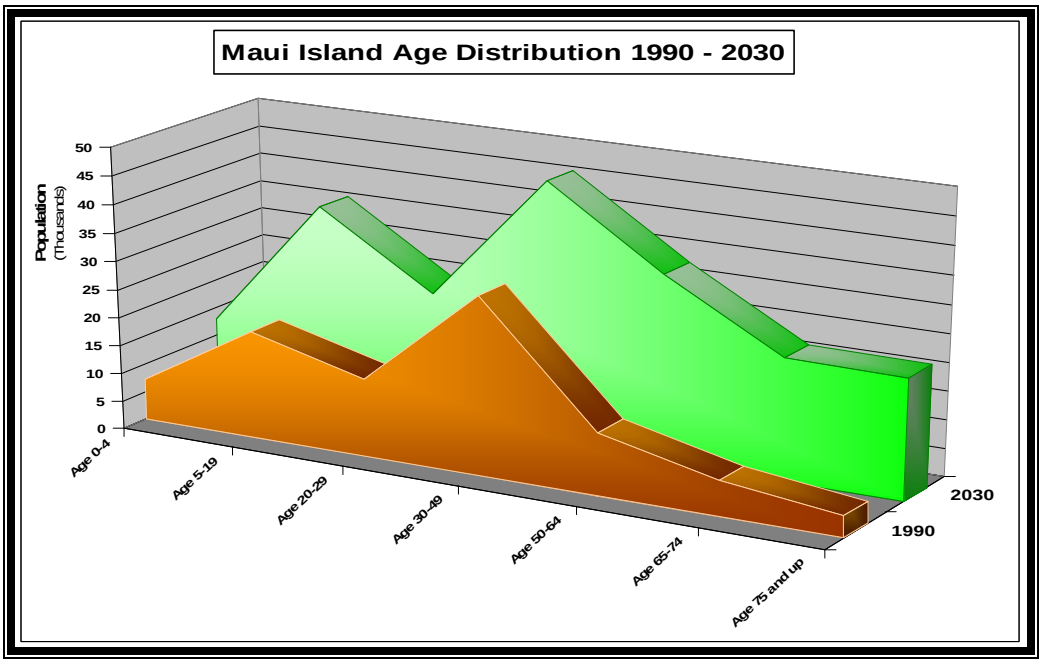


Figure 1 - 2. Maui Island Age Distribution 1990 – 2030.[2]

[1] Department of Business, Economic Development and Tourism, State of Hawai`i (2012). Population and Economic Projections for the State of Hawai`i to 2040 (March 2012).

Figure 1-3 compares the percentage of Mauians born in Hawai`i to the percentage born elsewhere. The percentage of those born in Hawai`i has dropped from 67 percent in 1980 to 53 percent in 2000. The out-migration of island residents is a result of Maui's high cost of housing, limited employment and educational opportunities, and the desire of some Maui residents to experience life outside of Hawai`i. Policies and actions to help provide a choice for island residents to remain on Maui can be found throughout the MIP.

Out-migration of Island Residents

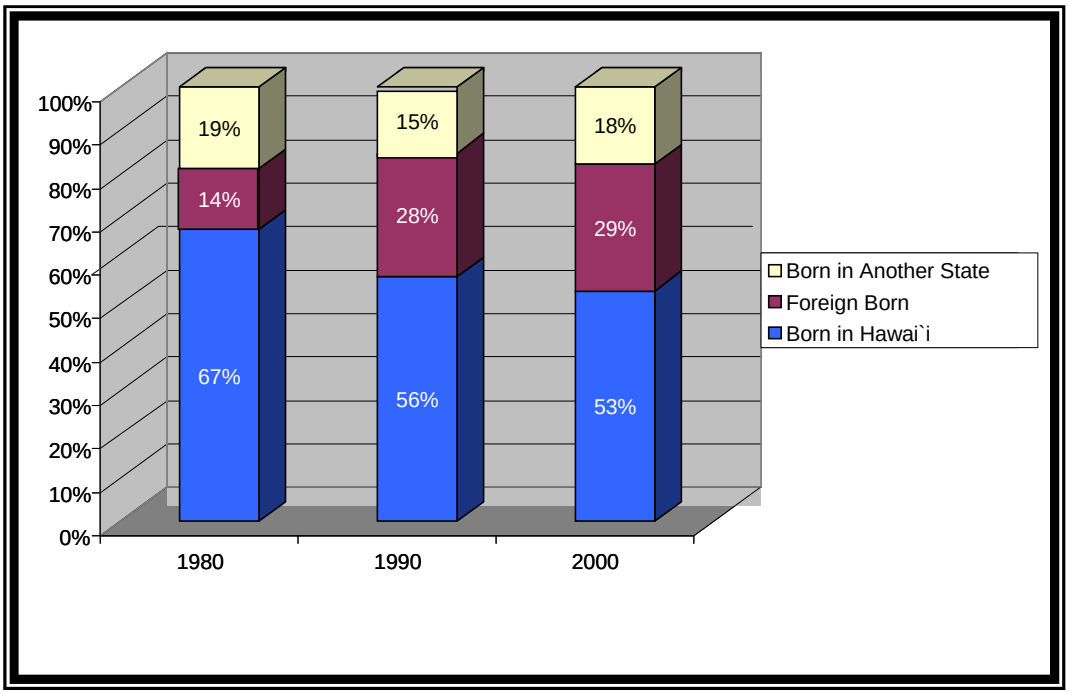


Figure 1 - 3. Maui Island Residents by Place of Birth 1980 – 2000. (Source: United States Census)

Ratio of Visitors to Residents

Figure 1-4 graphically depicts visitor/resident population trends from 1970 to the projection year of 2030. In 1970, the ratio of tourists to residents was approximately 1 to 20. This number has risen dramatically; by 2000, the ratio was approximately 1 to 3.

[2] Department of Business, Economic Development and Tourism, State of Hawai`i (2012). Population and Economic Projections for the State of Hawai`i to 2040 (March 2012)

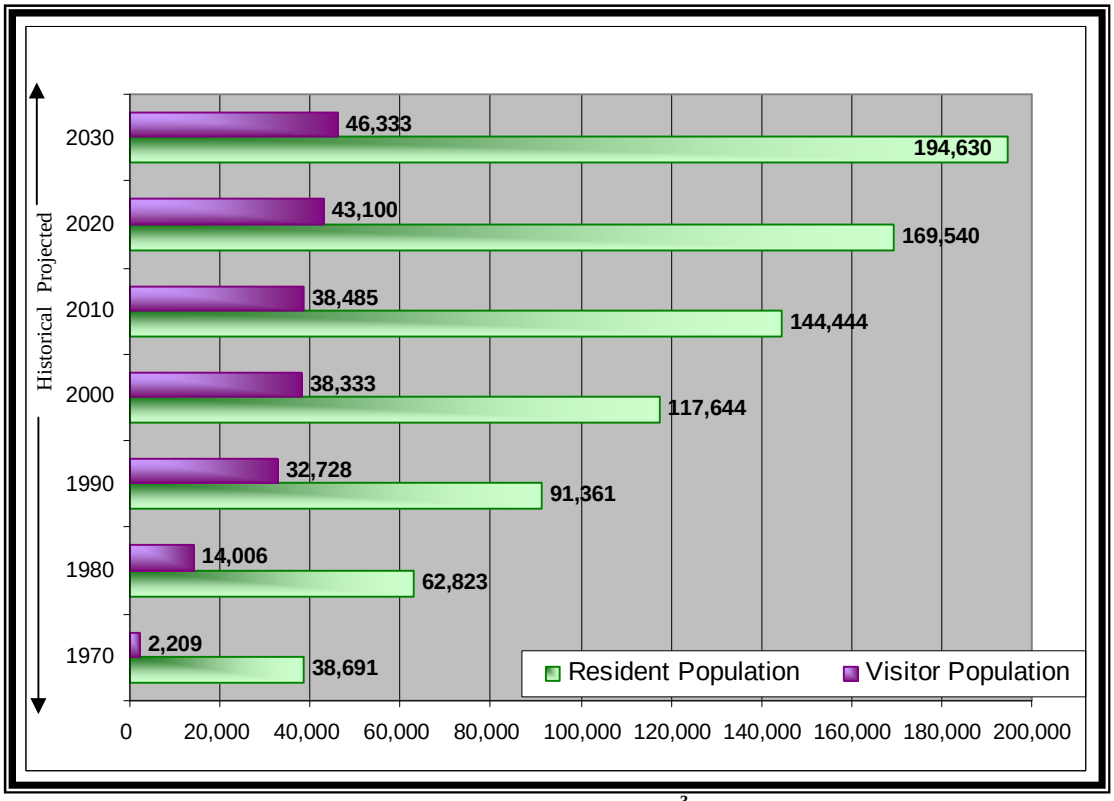


Figure 1 - 4. Maui Island Visitor/Resident Population 1970 – 2030[3].

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

1.1 Maui's people, values, and lifestyles thrive through strong, healthy, and vibrant island communities.

Objective:

1.1.1 Greater retention and return of island residents by providing viable work, education, and lifestyle options.

Policies:

1.1.1.a Expand programs that enable the community to meet the education, employment, housing, and social goals of youth and young adults.

[3] Population and Economic Projections for the State of Hawai`i to 2040 (March 2012).

1.1.1.b Expand housing, transportation, employment, and social opportunities to ensure residents are able to comfortably age within their communities.

1.1.1.c Measure and track resident satisfaction through surveys and community indicators.

1.1.1.d Support funding for transportation, housing, health care, recreation, and social service programs that help those with special needs (including the elderly and disabled).

Implementing Actions:

1.1.1-Action 1 Use an existing agency to facilitate education, employment, housing, social services, and other programs that help retain young adults on Maui.

1.1.1-Action 2 Identify existing and develop new funding sources for youth and family services (e.g., recreation, health care, education, housing, child care, etc.) and integrate such resources to achieve an effective outcome.

1.1.1-Action 3 Develop and regularly conduct a Community Satisfaction Survey to measure residents' quality-of-life, facilitate the development of informed policies/programs, and improve service delivery.

Employment & Population Density Map

Island of Maui

Background Map

For Informational Purposes Only

Legend

- Primary Road
- Stream
- Regional Economic Center
- Community Plan Boundary
- Topography - 100 ft contour

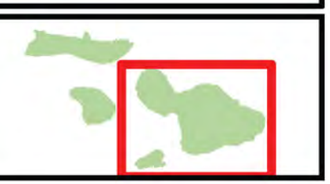
Jobs by Community Plan Areas*

Jobs 2005
Jobs 2030

Population Density

Per Acre by Census Block

- 0.0 - 1
- 1.1 - 5
- 5.1 - 10
- 10.1 - 15
- 15.1 - 20
- 20.1 - 25
- 25.1 - 30
- 30.1 - 50
- 50.1 - 80
- 80.1 - 150



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Prepared by:
Long Range Planning Division
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250 South High Street
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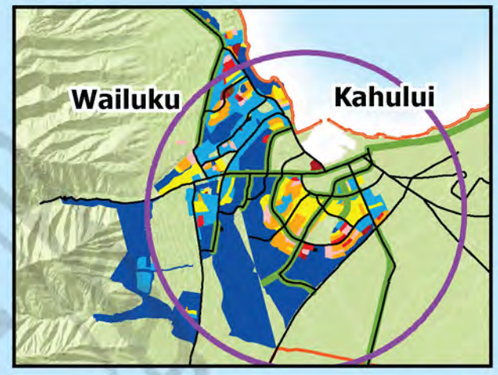
Map 1-1



*Socio Economic Forecast
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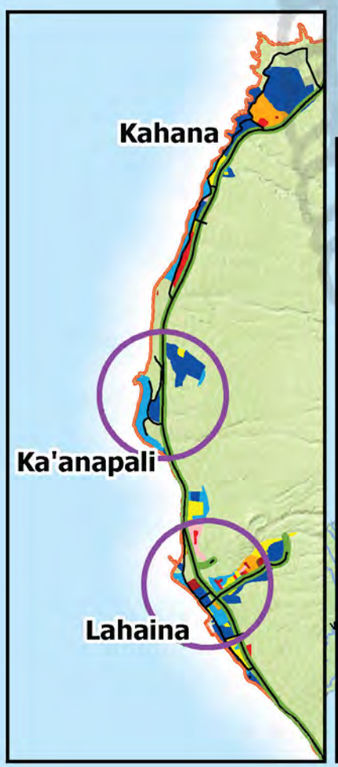
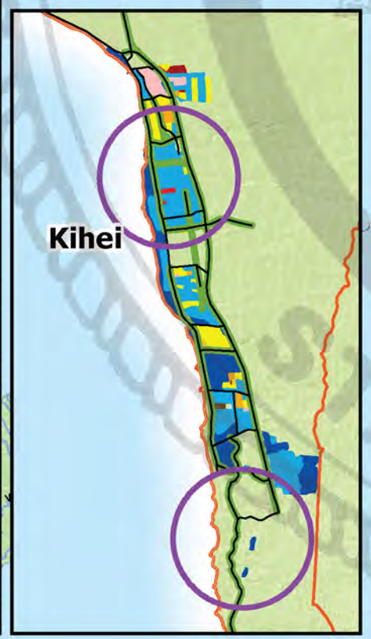
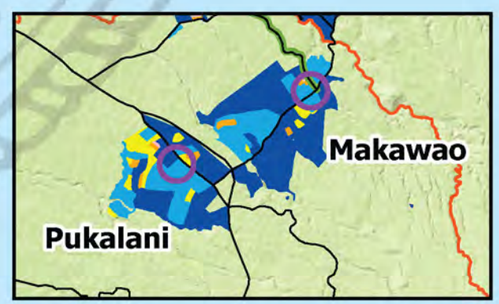
Maui Planning Department
Exhibit R-12







This map is for informational purposes only and subject to change based on future research and findings.

Chapter 2: Heritage Resources

View of Maui from Upper Kula.

Maui's archaeological landscapes, ethnic diversity, historic structures, and rare ecosystems collectively define the island and make it unique. The combination of royal fishponds, burial sites, historic sugar mills, churches, vibrant rainforests, endemic species, and spectacular views tell the tale of a mix of cultures and their relationship with the surrounding natural environment. A tenet of environmental stewardship is sustainability, which refers to the ability of mankind to "meet the needs of the present without compromising the ability of future generations to meet their own needs." Human interactions with the natural elements provide challenges and opportunities for further natural resource protection.

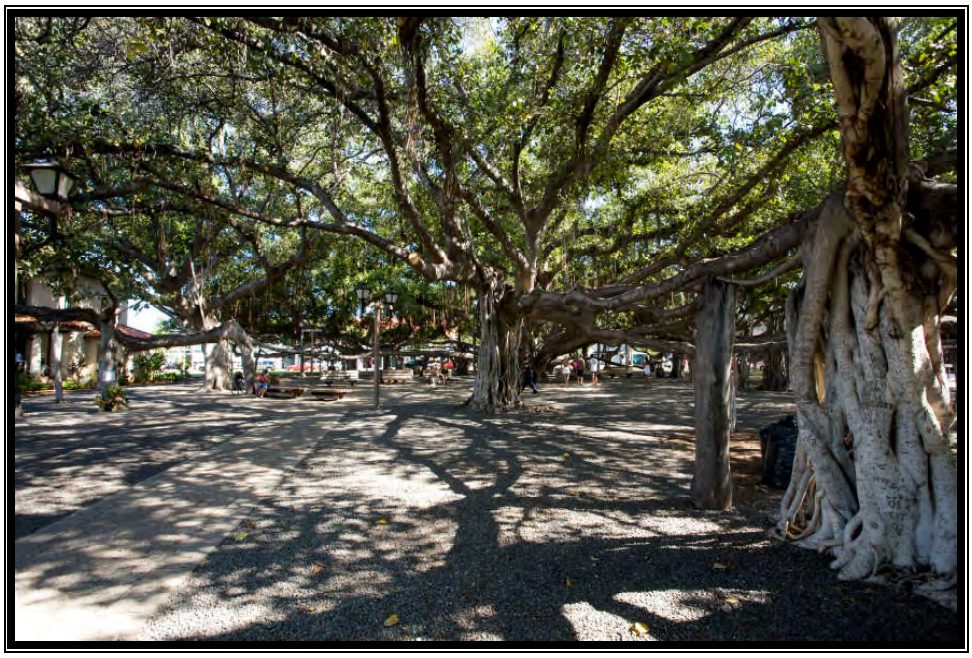
CULTURAL, HISTORIC, AND ARCHAEOLOGICAL RESOURCES

Maui is an island rich in history, culture, and traditions. Beginning with the arrival of voyaging Polynesians, and progressing through time to the modern day, Maui has developed into a diverse community. The island's archaeological artifacts, folklore, historic buildings, landscapes, people, traditions, languages, and lifestyles are all a part of its history. Cultural, historic, and archaeological resources provide us with a connection to the past and a sense of identity and place. They inform us of our history and provide us with an understanding of Maui's people, past and present.

Wo Hing Society Hall, Lahaina.

Background Information

Beginning with the early Hawaiians, Maui has become home to people from across the globe. Each group has made its mark on the island. The early Hawaiians arrived more than a thousand years ago by voyaging canoes from Central Polynesia. They brought with them their language, traditions, and lifestyles. Maui's culture today is rooted in Hawaiian traditions – the Aloha Spirit, the Hawaiian language, hula, surfing, and the beauty and spirit of the land.



Maui's Cultural Resources Provide a Sense of Identity

Banyan Tree Park, Lahaina.

Western explorers arrived in Hawai`i using modern tools of navigation and sailing. They arrived to Hawai`i as sandalwood traders, whalers, and in 1820 as missionaries. Around these economic activities, small towns developed to provide goods and services. American and European institutions, traditions, and culture became rooted in Hawai`i during the rapidly changing period of the 19th century.

With the massive growth of the plantation industry, the need for labor also grew, resulting in the importation of workers from Asia, Europe, South and Central America, and the South Pacific Islands. This influx created incredible ethnic and cultural diversity within the County.

Pu`unēnē.

As a result of Maui's Native Hawaiian history spanning more than a thousand years, and its more recent multi-ethnic history, the island is rich in archaeological and historic sites. The preservation of cultural landscapes encourages the perpetuation of traditional practices. Historic and archaeological resources are also important to Maui's economy. Hawaiian archaeological sites and post-contact historic places provide a visitor experience found nowhere else.

The Countywide Policy Plan, at page 49, establishes the following goal: "Maui County will foster a spirit of pono and protect, perpetuate, and reinvigorate its residents' multi-cultural values and traditions to ensure that current and future generations will enjoy the benefits of their rich island heritage."

Each part of Maui has a mix of cultural resources. Table 2-1 summarizes Maui's resources in the context of the island's six community plan areas.

Table 2 - 1: Maui's Cultural, Historic, and Archaeological Resources by Community Plan Area

Community Plan Area	Cultural, Historic, and Archaeological Resources
Hana	This area is characterized by its vast natural areas, wealth of Hawaiian history, agricultural lands, and rural communities. Hawaiian history and folklore are central to the identity of this area. Many Hawaiian royalty and ali`i originated from this area, including Queen Ka`ahumanu. Hawaiian cultural resources, including lo`i kalo, heiau, burial sites, battle grounds, and ancient trails are abundant in this area. The area remained largely isolated until the completion of the Hana Belt Road in 1926 under the direction of a Chinese county engineer named Paul Low. The area was and remains a taro growing district and had plantations established for the production of rubber and sugar cane. There are Hawaiian, Chinese, Portuguese, Japanese, Filipino, and Euro-American graveyards located in the area.
Wailuku-Kahului	Cultural resources of this area are dominated by the sugarcane industry, though this area is also rich with Hawaiian cultural resources. This area was home to many of Maui's ali`i, including Kahekili, Maui's most powerful chief. `Īao Valley is the site of one of the most famous battles in Hawaiian history, where King Kamehameha I defeated the Maui army in an effort to unite the Hawaiian Islands. The Wailuku Historic District's landmarks, civic center, and commercial buildings along High, Main, Market, Church, and Vineyard Streets stand as unique reminders of the island's cultural identity and history. The Kahului Railroad, the first and last railroad in Hawai'i to begin and end operations, was based at the Port of Kahului. A large taro-producing district was located in nearby Waihe`e in the early 1900s, and was worked by Hawaiians, Chinese, and at least one African-American farmer. There are Hawaiian, Chinese, Portuguese, Japanese, Korean, Filipino, and Euro-American graveyards located in the area.
Makawao-Pukalani-Kula	The history of the Hawaiian cowboy, or paniolo, is prominent in places such as Haleakalā Ranch and `Ulupalakua Ranch. Remnants of Chinese history can also be found in Sun Yat-sen Memorial Park and in this area at the Ket Hing Society of which Sun Yat-sen, his brother, Sun Mei, and their families were members. Hawaiian, Chinese, and Portuguese homesteads are located in the area along with a number of Hawaiian, Chinese, Portuguese, Japanese, Filipino, and Euro-American graveyards.
Kīhei -Mākena	The cultural resources of this area are closely tied to its coastal resources. Fishing villages were prominent in this region and several fishponds still remain along the coast. Within the southwestern end of the Kīhei-Mākena Community Plan Area is a mix of archaeological resources, including Hawaiian burial sites, fishing shrines, heiau, and shelters. Also within this portion of the region is Keone`ō`io, where the French explorer, Jean-Francois de Galaup, Comte de La Perouse, first mapped Maui's South shore and recorded his observations of Hawaiian culture. South Maui also played an important role in the cattle-ranching community during the 1800s and first half of the 1900s.
Pa`ia-Ha`iku	This area's importance in Hawaiian oral history is indicated by the numerous references to landings, battles, and visits conducted here by various ali`i nui. This area was also the location of numerous heiau, reflecting the presence of both locally and regionally powerful chiefs, as well as a sizable population to provide labor for the building of the structures. During much of the 19th and 20th centuries, vibrant plantation towns existed in this area. The sugar and plantation industries and their employees utilized a railroad line that originated in Kahului and terminated in Ha`iku. Remnants of the old railroad track remain in Pa`ia Town, which was once the island's commercial hub. There are several Hawaiian, Chinese, Portuguese, Japanese, Filipino, Euro-American, and African-American graveyards that still exist in the area. The site of the only known turn-of-the-century African-American settlement in Maui County is located at Spreckelsville.

Community Plan Area	Cultural, Historic, and Archaeological Resources
West Maui	As the former capital of Hawai`i, Lahaina was the residence of Hawaiian kings and the location where many key Hawaiian governmental decisions were made during the 19th century. Lahaina's identity as a major seaport made it central to the whaling industry in the Pacific. Lahaina was also home to many influential missionaries who had a profound effect on the culture of the island. The Lahaina Historic Districts I and II, the Lahaina National Historic Landmark District, and Moku`ula signify the importance of this area's rich cultural history. The southern end of the West Maui Community Plan Area, including Launiupoko, Olowalu, and Ukumehame, contains significant remnants of pre-contact Hawai`i such as heiau, agricultural terraces, and petroglyphs. North of Lahaina, toward the wetter end of the area, streams were extensively used for irrigated kalo cultivation by Hawaiians. The sugarcane industry and the pineapple industry also have had a strong presence in this area. Pu`ukoli`i, once the largest sugar plantation camp in West Maui, was located mauka of Kā`anapali, and several Hawaiian, Chinese, Portuguese, Japanese, Korean, Filipino, and Euro-American graveyards still exist in the area.

CHALLENGES AND OPPORTUNITIES

Perpetuation of Cultural Practices and the Hawaiian Language

In recent years, the development of shopping malls, fast-food chain stores, and tract housing have given Maui the visual appearance of many Mainland communities. Maui has also lost several locally owned retail stores and restaurants that catered to the needs of island residents. While State and County programs exist to perpetuate the island's cultural practices and traditions, additional support is needed to make them more effective. Maui's Hawaiian culture, physical beauty, architecture, local cuisine, clothing, music, and customs make the island special and define its "sense of place." By preserving Maui's unique features, we can maintain the health of the visitor industry and economy.

The MIP aims to perpetuate the Hawaiian culture as the basic foundation in the lives of our residents.

Lo`i kalo.

Cultural programs, education, and the local arts need to be widely available to perpetuate the island's unique sense of identity. Educating residents about the value of cultural resources is essential to the preservation of these resources for future generations. Public schools and private organizations, such as the Maui Arts & Cultural Center, provide important venues for such education.

The legal protection of historic and archaeological resources is limited outside of the officially designated historic districts (in Lahaina and Wailuku), formally dedicated historic sites, and the Special Management Area. The many significant sites that exist outside of these areas should be afforded stronger protection.

Protection of Cultural, Historic, and Archaeological, Resources

The National Park Service accepts "Thematic Cultural Resource" nominations for inclusion on the National Register of Historic Places. Cultural resources can be grouped by ethnicity or other themes and publicized through "thematic cultural resource guides." As a valuable resource for the visitor industry, thematic cultural areas and accompanying guides could produce a source of funding for restoration and maintenance of historic sites.

Many cultural areas are made up of a mix of historical sites, archaeological complexes, and natural resources. These elements carry their full cultural significance when linked, protected, and interpreted together as a cultural landscape.

Kalo Kanu o Ka `Āina: A Cultural Landscape Study of Ke`anae and Wailuanui, Island of Maui (1996) makes recommendations for methods to preserve the cultural landscape in portions of the Hana Community Plan Area based on cultural resource inventories, land use management decisions, and actions that protect the community's rural lifestyles and vital natural resources.

Hale Ki`i, Wailuku.

The National Park Service administers the National Heritage Area (NHA) program. NHA designation encourages local residents, government agencies, nonprofit groups and private partners to collaboratively plan and implement programs and projects that "recognize, preserve, and celebrate" the applicable area's physical and cultural landscape. There are currently 49 NHAs, although none can be found in Hawai`i.

The Statewide Historic Preservation Plan for the State of Hawaii (2001) and the Cultural Resources Management Plan for Maui County (1984) provide numerous recommendations that, if implemented, would strengthen cultural resource management.

Geographic Information System technology provides tools to efficiently map the location of cultural sites. The Historic Resources Inventory and Mapping (2006) is one documented inventory of cultural resources. Interviews with knowledgeable cultural practitioners and kupuna across the island are also necessary.

Identifying and protecting historic and archaeological sites on private property can be especially challenging because of the need for support and cooperation from private landowners. Challenges include identifying unknown archaeological sites, encouraging owners to list sites on the State or National Register of Historic Places, and maintaining a database of listed sites.

Ke`anae Congregational Church, Ke`anae.

Island-wide Inventory of Historical Resources

Predictive maps could be developed from a comprehensive resource inventory to forecast undiscovered archaeological sites. In other communities, predictive maps have been used successfully to forecast the location of important archaeological and historical resource sites, thus allowing more effective resource preservation.

The development of incentive programs to encourage landowners to register, maintain, and improve historical and archaeological sites on their property would make voluntary preservation more attractive. Low-interest loans and tax incentives would provide incentives for restoring historic structures.

Maui County has established historic districts within Lahaina and Wailuku (Chapter 19.50, Maui County Code) to provide recognition and protection for historically significant structures. Similarly, establishing archaeological districts should protect areas with strong archaeological significance.

The Countywide Policy Plan, at page 51, establishes the following objective:

"Preserve and restore significant historic architecture, structures, cultural sites, cultural districts, and cultural landscapes."

Ke`anae.

SUMMARY OF CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES ISSUES

While some State and County programs exist to perpetuate island culture and protect historic and archaeological resources, additional support is needed to enable these programs to be effective. The following are a few of the many requirements to meet cultural-resource challenges:

- Preserve and restore Hawaiian cultural practices, places, and language
- Strengthen management programs to better protect historic and archaeological resources
- Develop island-wide inventories of historic and archaeological resources

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

2.1 Our community respects and protects archaeological and cultural resources while perpetuating diverse cultural identities and traditions.

Objective:

2.1.1 An island culture and lifestyle that is healthy and vibrant as measured by the ability of residents to live on Maui, access and enjoy the natural environment, and practice Hawaiian customs and traditions in accordance with Article XII, Section 7, Hawai`i State Constitution, and Section 7-1, Hawai`i Revised Statutes (HRS).

Policies:

2.1.1.a Perpetuate the spirit of aloha and celebrate the host Hawaiian culture and other ethnic cultures.

2.1.1.b Perpetuate a respect for diversity and recognize the broad blending of cultures and ethnicities as vital to the quality of life on Maui.

2.1.1.c Ensure traditional public access routes, including native Hawaiian trails, are maintained for public use.

2.1.1.d Support the education of visitors and new residents about the customs and etiquette of the Hawaiian culture, as well as other cultures.

Implementing Actions:

2.1.1-Action 1 Provide staffing and funding to support cultural resource planning, strengthen enforcement, support cultural programs and educational activities, and utilize the generational knowledge of Native Hawaiian advisory bodies, when appropriate.

2.1.1-Action 2 Establish a program to support the reconstruction, restoration, repair, rebuilding, or preservation of historic sites.

2.1.1-Action 3 Incorporate the following areas of expertise into the Cultural Resources Commission:
(1) Generational knowledge; and
(2) Kupuna with traditional knowledge of land and ocean practices.

2.1.1-Action 4 Develop, expand, and support educational programs, festivals, celebrations, and folklore that foster the spirit of aloha.

Objective:

2.2 A more effective and efficient planning and review process that incorporates the best available cultural resources inventory, protection techniques, and preservation strategies.

Policies:

2.1.2.a Ensure that the island has a comprehensive and up-to-date inventory of historic and archaeological resources, and their cultural significance.

2.1.2.b Require the update of existing planning and regulatory mechanisms to protect the natural, cultural, scenic, and historic resources within designated Heritage Areas (see Cultural Resources Overlay/Scenic Corridor Protection Technical Reference Map).

2.1.2.c Ensure that cultural, historic, and archaeological resources are protected for the benefit of present and future generations.

Implementing Actions:

2.1.2-Action 1 Commission cultural landscape studies of the entire island to assess areas as potential Heritage Areas.

2.1.2-Action 2 Inventory potential Thematic Cultural Resource areas and submit nominations for State and/ or National Register of Historic Places.

2.1.2-Action 3 Prepare every ten years or whenever necessary an update to the Historic and Cultural Resources Plan and Inventory/Mapping Project that documents existing cultural and historic sites.

2.1.2-Action 4 Develop and adopt a Heritage Area Management Program to protect the natural, cultural, scenic, and historic resources to include:

(1) A Heritage Area Plan with protection standards for Heritage Areas identified on the Cultural/ Scenic Resources technical reference map;

(2) A process to require a Cultural Landscape Report for developments within Heritage Areas; and

(3) Consultation with Native Hawaiian advisory bodies, when appropriate.

Objective:

2.3 Enhance the island's historic, archaeological, and cultural resources.

Policies:

2.1.3.a Identify and pursue a listing of the properties and sites on the State and National Register of Historic Places.

2.1.3.b Support the use of easements, dedications, and other mechanisms to acquire, maintain, and protect lands with cultural, archaeological, and historic significance.

2.1.3.c Support regulations to require developers, when appropriate, to prepare an Archaeological Inventory Survey, Cultural Impact Assessment, and Ethnographic Inventories that are reviewed and commented upon by the Office of Hawaiian Affairs, Native Hawaiian advisory bodies, the State Historic Preservation Division (SHPD), and the Office of Environmental Quality Control, and systematically comply with the steps listed in SHPD's administrative rules, including consultation and monitoring during construction phases of projects.

2.1.3.d Promote the rehabilitation and adaptive reuse of historic sites, buildings, and structures.

2.1.3.e Encourage property owners to register historic and archaeological sites on the State and National Register.

2.1.3.f Support opportunities for public involvement with the intent to facilitate the protection and restoration of historic and archeological sites, including consultation with stakeholders.

2.1.3.g Encourage the resolution of land title questions relating to Land Commission Awards and Royal patents.

2.1.3.h Ensure compliance with historic preservation laws, and discourage demolition of properties that are determined to be eligible for listing on the National or State Register of Historic Places.

Implementing Actions:

2.1.3-Action 1 Develop a comprehensive program for protection of cultural, historic and archaeological sites through the acquisition of easements, use of Transfer of Development Rights/Purchase of Development Rights, and other protective mechanisms.

2.1.3-Action 2 Amend regulations to provide additional protection of lands that are important for traditional native Hawaiian uses including subsistence food gathering, traditional access, agriculture, and religious uses.

2.1.3-Action 3 Establish additional Historic and Archaeological Districts and ensure that land use regulations are implemented to ensure their protection.

2.1.3-Action 4 Develop a program to identify and list Historic Places on the State and National Historic Register.

Mā`alaea Bay.

SHORELINE, REEFS, AND NEARSHORE WATERS

Maui's shoreline is a complex system of wetlands, gullies, dunes, beaches, lava fields, and hardpan substrate. Maui's coast serves as habitat for indigenous plants and animals. The health of the shoreline and beach areas is a key factor in sustaining sand resources, coral reefs, and marine wildlife. These areas serve as ecological, social, and economic resources. Various Federal, State, and County laws exist to conserve coastal resources while balancing development demands. Even with the existing regulatory framework, further management is necessary to balance rapid growth with shoreline protection.

Recreational public access point, Puamana Beach Park.

Access to shoreline and beach areas is essential for a range of recreational activities; surfing, swimming, fishing, diving, and canoeing are part of Maui's lifestyle. Many of Maui's most spectacular views are along the island's coastline. Coastal-land preservation protects cultural and historic resources, including traditional fishponds, heiau, and burial sites. A comprehensive network of State and County laws exist to preserve and enhance shoreline and coastal waters. While there are many layers of regulations, the jurisdictional boundaries and inherently complex nature of the hydrologic cycle present a challenge to effective coastal-resource protection. The Countywide Policy Plan, at page 47, establishes the following policy: "Protect and restore nearshore reef environments and water quality." The corresponding implementing action is: "Develop regulations to minimize runoff of pollutants into nearshore waters and reduce nonpoint and point source pollution."

CHALLENGES AND OPPORTUNITIES

Lack of an Integrated Coastal Zone Management Program

Maui's beaches, nearshore waters, and reef ecosystems cannot be managed or regulated independently of one another. Integrated Coastal Zone Management (ICZM) provides a more holistic approach to beach management. ICZM requires a broader effort that crosses political and geographic boundaries in an effort to achieve sustainability.

ICZM uses the informed participation and cooperation of all stakeholders to assess the societal goals in a given coastal area and to take actions towards meeting those objectives. ICZM seeks over the long term to balance environmental, economic, social, cultural, and recreational objectives, all within the limits set by natural dynamics. Integration of all relevant policy areas and levels of administration is required.

The Beach Management Plan for Maui (2006), prepared by the University of Hawai`i Sea Grant Extension Service, sets forth detailed objectives and recommendations to promote preservation and sustainable development of the coastline. Many of the plan's recommendations may be implemented through changes to land use policies, rules and regulations, and the establishment of new programs and partnerships.

Deteriorating Reef Health and Fish Stock; Compromised Ecosystems

Reef decline on Maui ranks among the fastest in the world. Several sites, both protected and developed, have seen coral communities and reliant organisms nearly disappear in approximately 20 years.[1]

A majority of the human population lives and plays along the shoreline. Additional tourism and a growing resident population have increased development along the shoreline, which is a contributing factor in nearshore water quality. Coral ecosystems have not evolved to allow reef communities to recover from the types of disturbance caused by such development.[2]

Two stressors that can be addressed immediately are: (1) overfishing, which reduces the ability of the wider reef ecosystem to oppose replacement of coral and other reef building species by algae; and (2) deteriorating water quality caused by increased inorganic nutrients. These problems can be attributed to coastal urbanization from an ever-increasing population of residents and tourists and from the groundwater influxes of nutrients into Maui's nearshore waters.[3]

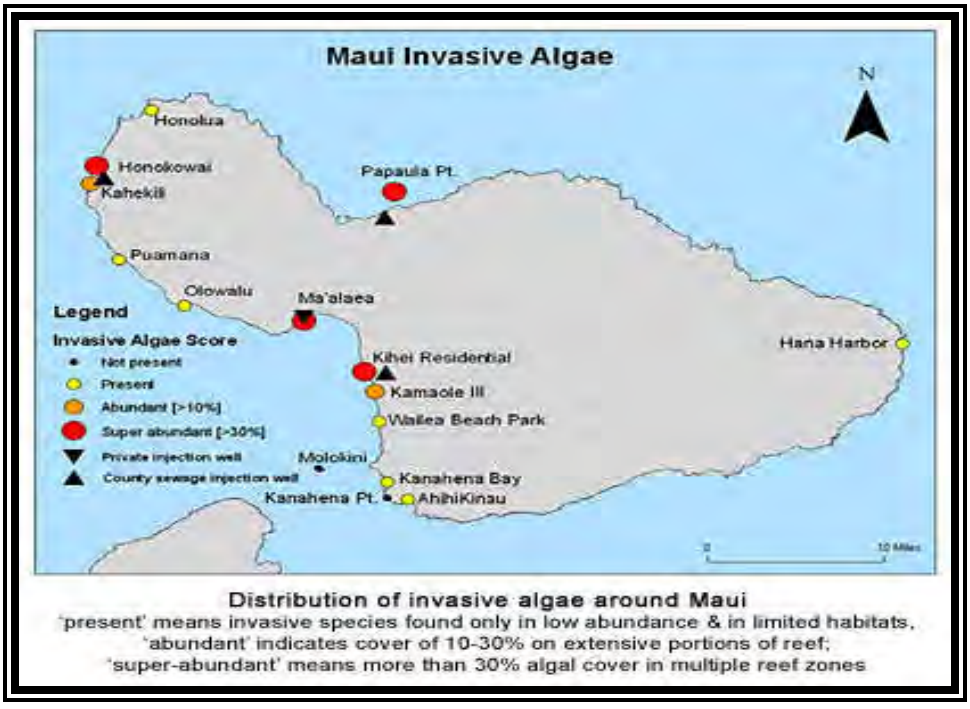


Figure 2 -1. Distribution of invasive algae.

[1] Vermeij, M.J.A. (2008). *Coral Reefs of Maui* (University of Hawai`i Press, Honolulu).
[2] Id.
[3] Id.

Scientists have been studying the various types and locations of algal blooms. Large-scale macroalgal blooms have been documented on the island for several decades. The most common blooms are associated with the more heavily populated areas of Kīhei, Lahaina, and Kahului. The input of nitrogen and phosphorus from land-based sources such as agricultural fertilizers, sewage, and stream runoff may accelerate algal growth rates. Sewage-injection wells, defunct septic tanks, and channelized stream runoff may also contribute to the algal problem. Not only does this smother coral and destroy delicate ecosystems, but it can result in a detrimental effect on the local economy, resident lifestyles, and Native Hawaiian cultural practices. Blooms in North Kīhei have been shown to cost the County economy as a result of lost revenue and in the costs associated with removing algae from the beaches.[4]

Macroalgae smothering reef, Mā`alaea.

Once the decline starts, there is little that can be done to stop it. Prevention, rather than restoration, will be a more prudent management option.

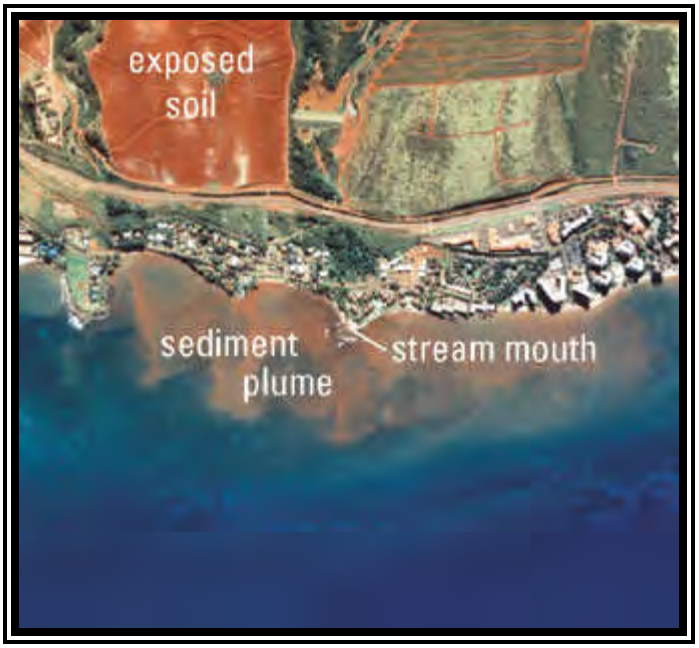
There could be success in using small-scale kapu management programs. One consideration would be an experimental limitation on the take of herbivores (large urchins, the majority of surgeonfish, parrotfish, and chub). The Division of Aquatic Resources, of the State Department of Land and Natural Resources, is experimentally introducing such programs to limit invasive algae, restore the reefs, and replenish the fish stocks.[5] Another implementation measure may come in the form of a "resting" period for certain reefs where tour-boat mooring and snorkeling is popular. There may also be noticeable success in increasing the number of Marine Managed Areas (MMA) on Maui. For instance, the Honolua-Mokulē`ia Bay Marine Life Conservation District has been protected since 1978, and recent surveys have shown success in the form of higher fish biomass, more large-sized fishes, and a greater number of species.[6]

[4] Vermeij, M.J.A. (2008). *Coral Reefs of Maui* (University of Hawai`i Press, Honolulu).
[5] State of Hawai`i Division of Aquatic Resources, Department of Land and Natural Resources (2007). *Slippery Slope to Slime.*

MMAs can be accomplished in a variety of ways with different definitions of what is allowable. Each coastal community should be managed and protected with respect to its specific needs.

Poor Water Quality Because of Upland Activities

Nonpoint source (NPS) pollution is a major threat to Maui's nearshore coastal ecosystems. Urban development, agriculture, and degraded watersheds are significant contributors to such pollution. Urban development changes the natural hydrology of an area through site clearing, grading, impervious surfaces, and unnatural landscapes. Such activities decrease the ability of water to infiltrate the soil surface, which increases runoff volumes. Increased runoff produces erosion, which in association with urban activities, results in the discharge of sediment and pollutant loadings to surface and coastal waters.



Agricultural runoff, West Maui.

Agricultural activities also generate a tremendous amount of NPS pollution. Active agriculture requires regular disturbances to the land and the use of fertilizers and pesticides to cultivate crops. Likewise, golf courses and landscape planting, especially along the developed shoreline, generate NPS pollution from the application of fertilizers and pesticides.

The State of Hawai`i's Coastal Nonpoint Pollution Control Program Management Plan (1996) and Implementation Plan for Polluted Runoff Control (2000) (cumulatively, the Nonpoint Pollution Plans) provide a comprehensive statewide strategy to prevent and reduce polluted runoff in agriculture, forestry, urbanization, marinas, recreational boating, hydromodifications, and wetland and riparian areas.

[6] Vermeij, M.J.A. (2008). *Coral Reefs of Maui* (University of Hawai`i Press, Honolulu).

The goal of the Nonpoint Pollution Plans is to protect coastal waters from polluted runoff. The County of Maui will be a key partner and advocate with the State in effectuating these plans.

The Nonpoint Pollution Plans recommend the required reduction of post-development loadings of pollutants known as total suspended solids (TSS) to levels similar to predevelopment levels. This can be achieved through the incorporation of various structural and non-structural enhancements. Reduction of TSS to predevelopment levels should be required of all new subdivisions to protect nearshore water quality.

Sandbags and seawalls, West Maui.

The County's grading ordinance (Chapter 20.08, MCC) generally requires an erosion control plan, specifying best management practices (BMP), when a parcel exceeding one acre (43,560 square feet) is proposed for grading. The Nonpoint Pollution Plans recommend that an erosion control plan be required when the area of grading exceeds 5,000 square feet. Establishing such a requirement could significantly reduce the impact of grading activities on coastal water quality. In addition, monitoring of an erosion control plan and the imposition of stiff penalties for non-compliance are necessary to ensure that BMPs are properly implemented.

As humans have constructed their houses on the shoreline, they have had to adapt to natural environmental processes that may alter or damage their structures. Alterations to the shoreline, such as hardening and excessive extraction of sand from nearby dunes, can pose a threat to those very beaches and dunes. When natural sand-transport processes are interrupted through human actions, such as the construction of seawalls and revetments, it can deprive adjacent beaches of the sand necessary to compensate for erosion arising from storm surge, sea-level rise, and wave action.

Coastal erosion is a natural process, whereby the width of the beach is maintained by sand resources held in dunes, but coastal land is lost. In contrast, beach erosion is the loss of beach width arising from erosion and the impoundment of sand behind seawalls. While shoreline hardening is appropriate in some circumstances, the loss of Maui's beaches is often accelerated when private landowners attempt to protect their oceanfront property by armoring the shoreline.

Decreased sand and beach, Kā`anapali.

The Hawai`i Coastal Hazard Mitigation Guidebook (2005) serves as a precautionary tool for coastal development and planning throughout the State. Recognizing that policies for coastal-hazard assessment and shoreline setbacks are not uniform, the guidebook fills in critical gaps related to hazard zones, erosion trends, storm events, and safety-buffer design. The guidebook recommends erosion-rate shoreline setbacks based on the size, type, and lifespan of structures. In contrast to Maui's use of a 50-year multiplier for construction setbacks based on annual erosion rates, the guidebook recommends multipliers of 70 and 100 years, dependent on structure specifics.

Maui's pristine beaches and clear, clean waters are key elements in tourism and the public's recreational opportunities. Therefore, the regulation of shoreline development, including severe restrictions on shoreline hardening, is of critical economic, environmental, and social importance.

A surfer at Puamana Beach Park, Lahaina.

Limited Public Beach Access and Facilities

With Maui's growing population of visitors and residents, there is an increasing demand to develop along the shoreline. Many privately owned, undeveloped shoreline parcels that have traditionally been utilized by the public for recreational purposes and cultural practices are now being developed. Development of these parcels restricts the public's opportunity to utilize these coastal lands.

The MIP provides numerous policy recommendations for implementing more effective beach management practices.

SUMMARY OF SHORELINE, REEFS, AND NEARSHORE WATERS ISSUES

Maui's comprehensive coastal zone management and regulatory framework is designed to protect the shoreline and abutting waters. However, human activities contributing to NPS pollution, shoreline hardening, increased development, and lack of beach access are among the major threats to the integrity and the public's use of the island's beaches and coastal waters. With the dynamic nature of Maui's coastal areas, the County will continue to face challenges in its resource management programs. A few shoreline protection issues include:

- Lack of an ICZM program
- Deteriorating reef health and fish stocks and compromised marine ecosystems
- Poor water quality arising from upland activities
- Limited public beach access and facilities

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

2.2 An intact, ecologically functional system of reef, shoreline, and nearshore waters that are protected in perpetuity.

Objective:

2.2.1 A more comprehensive and community-based ICZM program.

Policies:

2.2.1.a Encourage a management system that protects and temporarily rests the reef ecosystems from overuse.

2.2.1.b Support the establishment of additional MMAs and reef replenishment areas.

2.2.1.c Work with appropriate agencies and community members to protect any special managed conservation areas from overuse and ensure that surrounding land uses do not contribute to the degradation of the natural resources, such as `Ahihi-Kina`u Natural Area Reserve, Honolua-Mokulē`ia Bay Marine Life Conservation District, and Mākena State Park.

2.2.1.d Incorporate the following into the MIP, where consistent with the MIP:
(1) Beach Management Plan for Maui;

(2) Coastal Nonpoint Pollution Control Program Management Plan;
(3) Implementation Plan for Polluted Runoff Control; and
(4) Ocean Resource Management Plan.

2.2.1.e Support greater coordination among governmental agencies involved with the protection of the island's marine resources.

Implementing Actions:

2.2.1-Action 1 Seek funding and work with other agencies and organizations to establish and prioritize MMAs around Maui's coastline.

2.2.1-Action 2 Establish an advisory committee to advocate the conservation and management of coastal resources, including members with generational knowledge; kupuna with traditional and/or area knowledge; and those possessing traditional knowledge of land or ocean practices.

Objective:

2.2.2 Improved reef health, coastal water quality, and marine life.

Policies:

2.2.2.a Create additional mechanisms where needed to contain and control runoff and pollution.

2.2.2.b Allow extraction of high quality, Class A, low silt sands only when they will be used to protect or restore Maui's shorelines and beaches.

2.2.2.c Carefully manage beach nourishment activities to protect the coastal and marine ecosystem.

2.2.2.d Require, where appropriate, a buffer between landscaped areas and the shoreline, gulches, and streams to reduce the runoff of fertilizers, pesticides, herbicides, and other pollutants into coastal waters.

2.2.2.e Strictly regulate shoreline armoring in accordance with adopted Shoreline Rules, with an intent to protect the coastal and marine ecosystem.

2.2.2.f Support greater protection of Keālia Pond National Wildlife Refuge through the following:
(1) Enhancement of marine ecosystems;
(2) Beach and sand dune restoration; and
(3) Expansion of habitat for Maui's threatened or endangered sea turtles, birds, and other species.

2.2.2.g Support the development of regulations to prevent the excessive depletion of fish stocks due to non-sustainable practices and gear such as SCUBA spear-fishing and lay nets, within the context of nearshore ecosystems.

2.2.2.h Encourage the State to conduct a regular census of fish populations and monitor coral health.

2.2.2.i Encourage the State to significantly increase the number of park rangers, enforcement officers, and marine biologists to protect coastal resources.

2.2.2.j Encourage the State to prohibit the collection and exportation of fish, coral, algae, and other marine species for the ornamental and aquarium trade.

Implementing Actions:

2.2.2-Action 1 Adopt coastal landscaping provisions that include standards such as setbacks, buffers, and other measures that promote the use of native plants and xeriscaping.

2.2.2-Action 2 Develop a master plan and feasibility study for the preservation and enhancement of the Ma`alaea Beach recreation area and Keālia Pond National Wildlife Refuge to include the possible mauka realignment of North Kīhei Road.

2.2.2-Action 3 Work with appropriate agencies, landowners, and community groups to identify Maui's Hawaiian fishponds and develop a management plan for their protection, repair, restoration, and use.

2.2.2-Action 4 Implement a Reef Protection Restoration Plan.

Objective:

2.2.3 Water quality that meets or exceeds State Clean Water Act standards.

Policies:

2.2.3.a Reduce the amount of impervious surface and devise site plan standards that aim to minimize storm runoff and NPS pollution.

2.2.3.b Support the revision of existing regulations to require an Erosion and Sedimentation Control Plan (ESCP) for development activities that may pose a threat to water quality.

2.2.3.c Require an on-site monitoring program, where applicable, when grading may pose a threat to water quality or when recommended in the ESCP.

2.2.3.d Avoid development actions that impair Maui's reef systems and remove identified stressors.

2.2.3.e Phase out cesspools and restrict the use of septic systems in ecologically sensitive coastal areas by converting to environmentally-friendly alternative sewage treatment systems, and connecting to central sewerage systems when and where feasible.

2.2.3.f Prohibit the development of new wastewater injection wells, except when unavoidable for public health and safety purposes.

2.2.3.g Ensure that the County upholds its affirmative duty under the Clean Water Act by monitoring and reducing point and NPS pollution to help safeguard coastal waters.

Implementing Actions:

2.2.3-Action 1 Transition from the use of wastewater injection wells to appropriate, environmentally sound methods of wastewater disposal, and promote the beneficial reuse of wastewater effluent.

2.2.3-Action 2 Revise regulations:

(1) Require the approval of an ESCP for development activities that may pose a threat to water quality.

(2) Require an on-site monitoring program, where applicable, when grading may pose a threat to water quality or when recommended in the ESCP.

(3) Devise site plan standards using innovative tools.

(4) Control the pollutant load by imposing standards that are more restrictive than the State water quality control standards.

Objective:

2.2.4 Acquire additional shoreline lands and shoreline access rights.

Policies:

2.2.4.a Promote the use of conservation easements, land trusts, transfer and purchase of development rights, and mitigation banking.

2.2.4.b Require the dedication of public beach and rocky shoreline access ways to and along the shoreline where it serves a practical public interest as a condition of development or subdivision approval; future subdivisions and developments shall be consistent with and effectuate, to the extent practicable, the *Shoreline Access Inventory Update - Final Report* (March 2005), and its updates.

2.2.4.c Incorporate the *Shoreline Access Inventory Update - Final Report* (March 2005), and its regular updates, into this plan.

2.2.4.d Identify access points while further acquiring key shoreline parcels and easement rights to enhance and protect beach access and shoreline recreation.

Implementing Actions:

2.2.4-Action 1 Revise subdivision and development regulations to:

(1) Increase linear frequency for public access to and along the shoreline; and

(2) Require access to and along the shoreline as a condition of subdivision, land use entitlement, and/or discretionary development approval.

2.2.4-Action 2 Prioritize the acquisition of shoreline parcels in accordance with the recommendations of the Shoreline Access Inventory Update – Final Report (March 2005), and other plans funded by the Coastal Zone Management Program.

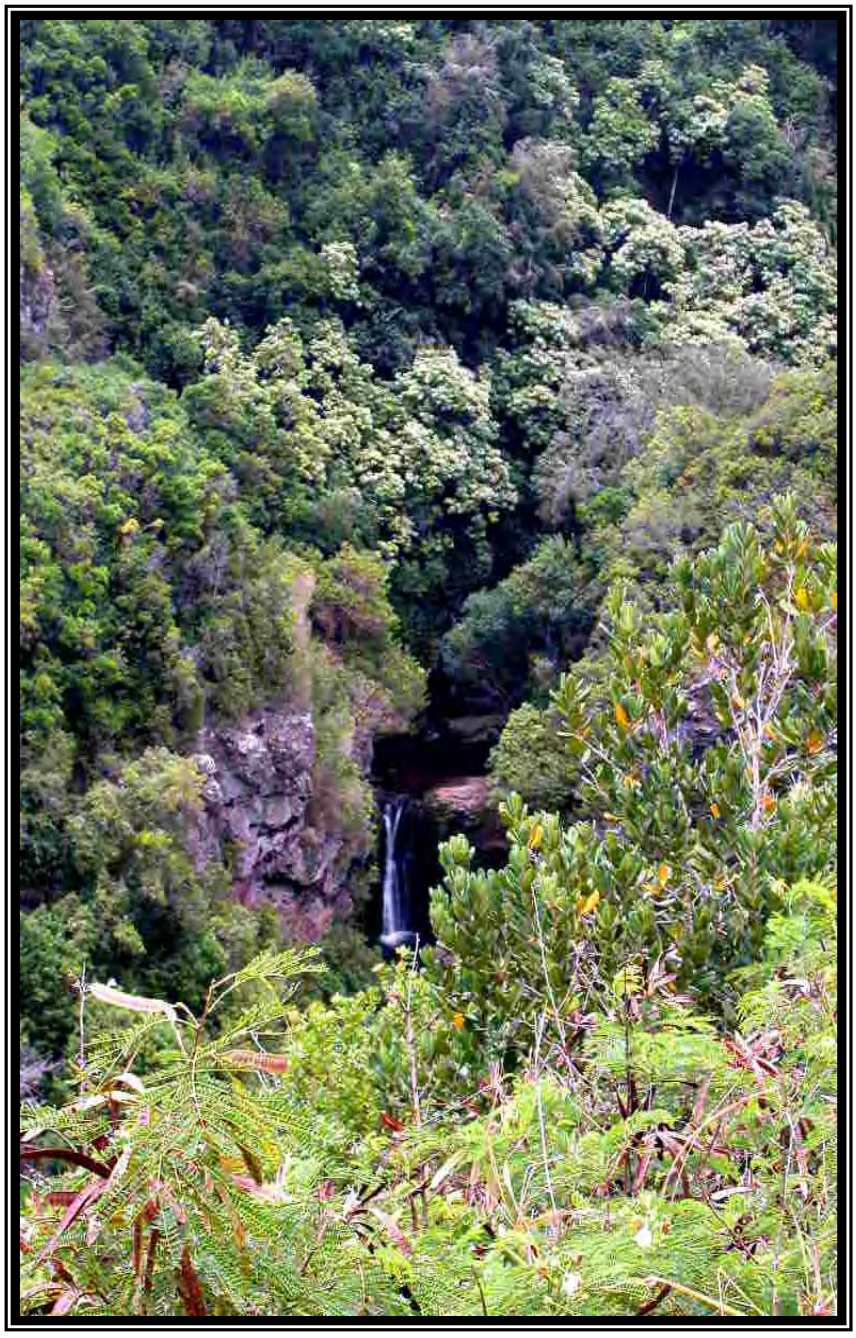
2.2.4-Action 3 Implement the Pali to Puamana Plan to facilitate the restoration of shoreline and coastal resources along the eight-mile stretch of seashore from Ukumehame to Puamana.

2.2.4-Action 4 Acquire development rights for the lands adjoining Ho`okipa Beach Park, to enhance coastal zone management.

2.2.4-Action 5 Acquire coastal lands between the Central Maui Wastewater Reclamation Facility and Pā`ia Town in accordance with the recommendations of the Northshore Greenway Master Plan.

2.2.4-Action 6 Develop and adopt funding mechanisms to finance the acquisition of additional shoreline lands in South and West Maui, and other areas as they urbanize.

WATERSHEDS, STREAMS, AND WETLANDS



One of the many waterfalls in East Maui.

Traditional Hawaiian management models recognized the key importance of fresh water and the opportunities to manage water resources in a basin-wide context called the ahupua`a. Beginning at the top of the mountains, the ahupua`a follows the ridgeline, down enclosing valleys and their resources, and extends out to the nearshore coral reefs and sea. This is what we typically refer to as a watershed. Within the ahupua`a, traditional conservation and management practices were based on indigenous knowledge, with a respect for the land and water.

Maui's Critical Watersheds and Streams

Maui consists of two large-scale watersheds: West Maui and East Maui. One portion of the East Maui watershed is one of the wettest areas in the State, receiving up to 400 inches of rainfall per year. Maui's watersheds are a mix of streams, gulches, aquifers, and rivers varying in size, flow, and connectivity. Maui's watersheds and corresponding major streams are outlined in Table 2-2.

Table 2 – 2: Maui's Major Streams

East Maui Watershed	West Maui Watershed
• Waikamoi Stream • Kailua Stream • Hanawī Stream • `Ohe`o Gulch • Makapipi Stream • Palikea Stream	• `Īao Stream • Waiehu Stream • Waihe`e River • Waikapū Stream • Honokōhau Stream

CHALLENGES AND OPPORTUNITIES

Integrated Watershed Management

Maui's nearshore waters and marine life are dependent on functioning watersheds. Without healthy watersheds as a buffer, soil and sediment can erode and flow into nearshore reefs and ocean waters, smothering coral reef colonies. Such runoff can also cause the temperature of the water column to rise, in turn degrading the habitat and marine-life spawning areas.

The East Maui Watershed Partnership, West Maui Mountains Watershed Partnership, and the Leeward Haleakalā Watershed Restoration Partnership are existing watershed-based partnerships that coordinate the efforts of various government agencies, private businesses, and conservation organizations. These partnerships develop long-term resource inventories and management plans for their respective watersheds. The County of Maui, as a member of these partnerships, should continue to support their efforts and utilize the valuable inventories and plans they develop.

Point and NPS Pollution

Polluted runoff from urban and agricultural activities, commonly referred to as NPS pollution, degrades water quality. Such pollution and erosion impacts plants, animals, and human users of a watershed from upper elevations down to coastal lands and nearshore waters.

To mitigate NPS pollution from agricultural operations, the County should actively partner with the State to implement the Department of Health's Pollution Prevention Plan, which provides incentives to farmers who prepare plans to address such issues as erosion control, nutrient and pesticide management, runoff from confined animal facilities, grazing management, and irrigation.

Aquatic habitats ecologically link together most of the terrestrial habitats. The flow of water from mountaintops transports nutrients, organic matter (energy), and water down through the various forested habitats into estuaries and wetlands at low elevations and then finally into the sea. This organic energy from dead plants and animals fertilizes the growth of plants and animals in lower-elevation habitats; the streams and groundwater flow provide water for plants and animals throughout the ecosystem. Many native freshwater aquatic animals migrate between the ocean, estuaries, and upper reaches of streams as part of their life cycle, as noted in Hawai'i's Comprehensive Wildlife Conservation Strategy (2005) (Wildlife Study).[7]

Ginger-dominated forest, Waikamoi Preserve.

Loss of Riparian Biodiversity

Land conversion of Upcountry forested lots for residential uses removes trees and vegetation, which increases erosion and stormwater runoff. Mature trees are often removed to enhance vistas from a parcel and to make grading and utility installation easier. Yet, when trees are removed, erosion is increased, and sediment and stones flow into headland streams. The reduction or increase of vegetation at higher elevations can significantly impact the amount of available fresh groundwater. When fog is able to condense on trees and other vegetation, it can increase total annual precipitation by as much as 30 percent.[8]

Invasive species threaten the health of Maui's watersheds. Non-native species may out-compete native species or may directly harm native species through predation or infection. Miconia, a fast-growing, weedy tree from South and Central America, has caused serious damage on Maui by destabilizing watersheds and inducing landslides.

[7] Department of Land and Natural Resources (2005). *Hawai`i's Comprehensive Wildlife Conservation Strategy*.
[8] Meher-Homji, V.M. (1991). *Climatic Change*; *Probable Impact of Deforestation on Hydrological Processes* (Stanford University, Palo Alto).

Feral ungulates, or wild hooved animals, such as boars, goats, axis deer, and mouflon, can drastically alter watersheds by eating understory plants down to their roots, leaving barren land susceptible to erosion.

Maui's watersheds are threatened by unregulated land conversion. These key threats are negatively impacting the health of the island's watersheds. The incidence of increased population and subsequent demand for residential land will prompt the need for long-range planning and vigilant management to ensure the health of watersheds and streams for future generations.

Inappropriate Development

The implementation of an island-wide directed-growth strategy that channels growth to areas suitable for urban development provides one mechanism to protect the natural integrity of Maui's critical watersheds. Overall, development within Maui's critical watersheds will be discouraged. When development or subdivision of land does occur on agricultural lands or within the State Conservation District, the County or State should require documentation that development of areas susceptible to high erosion and sediment loss will be avoided.

To further protect the resource, conservation subdivision design (CSD) plans and the incorporation of low-impact development (LID) techniques should be considered. This could be accomplished through the establishment of an overlay district applied to Maui's critical watershed areas. CSD plans and LID techniques include the following: clustering development; utilizing innovative stormwater- and wastewater-management techniques such as rain gardens, vegetated swales, and neighborhood-scale wastewater-disposal systems; avoiding sensitive environmental features; buffering streams from development; limiting impervious surfaces; reducing driveway and roadway widths; and minimizing lawn coverage and tree removal.

East Maui Irrigation Company ditch next to Hāna Highway.

Diversion and Damming

A stream's natural flow can be altered through diversion and damming, affecting the overall watershed by compromising the vitality of its flora and fauna. Many of Maui's streams are diverted for agricultural irrigation and domestic use. According to the Wildlife Study, Maui has the highest number of diverted streams in the State. Diversion results in reduced stream flow and a rise in water temperature, thus negatively affecting many aquatic species.

With the high number of diverted streams on Maui, it is necessary to take proactive steps to protect endemic aquatic species and their spawning grounds. The County should work with State agencies to "protect baseline stream flows for perennial streams, and support policies that ensure adequate stream flow to support Native Hawaiian aquatic species, traditional kalo cultivation, and self-sustaining ahupua`a", consistent with the policy established at page 46 of the Countywide Policy Plan.

SUMMARY OF WATERSHEDS, STREAMS, AND WETLANDS ISSUES

Many of Maui's streams and watersheds are privately controlled, while water resources are held in public trust for the people. Some of the major watershed, stream, and wetland issues facing Maui include:

- Absence of a comprehensive and integrated approach to watershed management
- Watershed pollution from point and nonpoint sources
- Loss of riparian biodiversity
- Inappropriate development near and around sensitive habitats that support native, endangered, and endemic species habitat
- Stream diversion, damming, and alteration resulting in a disruption of the hydrologic cycle

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

2.3 Healthy watersheds, streams, and riparian environments.

Objective:

2.3.1 Greater protection and enhancement of watersheds, streams, and riparian environments.

Policies:

2.3.1.a All present and future watershed management plans shall incorporate concepts of ahupua`a management based on the interconnectedness of upland and coastal ecosystems/species.

2.3.1.b Continue to support and be an active member of watershed partnerships.

2.3.1.c Support the establishment of regional water trusts, composed of public and private members, to manage water resources.

2.3.1.d Support regulations to require developments to utilize ahupua`a management practices.

2.3.1.e Work with private and non-profit entities to educate the public about the connection between upland activities within the watershed and the impacts on nearshore ecosystems and coral reefs.

2.3.1.f Provide adequate funding and staff to develop and implement watershed protection plans and policies, including acquisition and management of watershed resources and land.

2.3.1.g Encourage the State to mandate instream assessment to provide adequate water for native species.

2.3.1.h Maui will protect all watersheds and streams in a manner that guarantees a healthy, sustainable riparian environment.

Implementing Actions:

2.3.1-Action 1 Develop, regularly update, and adopt watershed management plans for regions of the island not covered by existing plans.

2.3.1-Action 2 Work with the State and Federal government to ensure instream assessment to assure the reproductive system/cycle for Native species and for other purposes.

Objective:

2.3.2 Decreased NPS and point source pollution.

Policies:

2.3.2.a Enforce water pollution related standards and codes.

2.3.2.b Support the use of LID Techniques such as those described in the State of Hawai`i LID Practitioner's Guide (June 2006), as amended.

2.3.2.c Encourage farmers and ranchers to use agricultural BMPs to address NPS pollution.

Implementing Actions:

2.3.2-Action 1 Adopt standards to reduce the amount of nutrients that enter watersheds, and encourage the reduction of landscape fertilizers and pesticides.

2.3.2-Action 2 Develop updated grading BMPs that are appropriate for Maui.

2.3.2-Action 3 Implement the Pollution Prevention Plan (PPP) program, which provides incentives for agricultural operations to prevent runoff and nonpoint source pollution.

Objective:

2.3.3 Preserve existing wetlands and improve and restore degraded wetlands.

Policies:

2.3.3.a Prohibit the destruction and degradation of existing upland, mid-elevation, and coastal wetlands.

2.3.3.b Support and fund wetland protection and improvement, and restoration of degraded wetlands.

2.3.3.c Where applicable, require developers to provide a wetland protection buffer and/or other protective measures around and between development and wetland resources.

Implementing Actions:

2.3.3-Action 1 Develop standards for appropriate buffers and/or other protective measures for development near or around wetlands.

2.3.3-Action 2 Enact ordinances to ensure no net loss of wetlands.

2.3.3-Action 3 Enforce no net loss of wetlands and improve degraded wetlands.

2.3.3-Action 4 Assist in the preservation and enhancement of Keālia and Kanahā-Mauoni Ponds; Lā'ie, Kalepolepo, Nu'u, Ukumehame, Olowalu, Launiupoko, and Mākena wetlands; and other wetland areas.

Objective:

2.3.4 Greater preservation of native flora and fauna biodiversity to protect native species.

Policies:

2.3.4.a Work with appropriate agencies to eliminate feral ungulate populations and invasive species.

2.3.4.b Encourage the State to provide adequate funding to preserve biodiversity, protect native species, and contain or eliminate invasive species.

2.3.4.c Support the work of conservation groups and organizations that protect, reestablish, manage, and nurture sensitive ecological areas and threatened indigenous ecosystems.

Implementing Actions:

2.3.4-Action 1 Develop tree protection regulations that restrict the removal of vegetation outside of identified building envelopes/protected areas.

2.3.4-Action 2 Develop strategic partnerships with conservation groups and organizations to maximize Federal, State, County, and private funding; and increase cooperation to achieve conservation goals.

Objective:

2.3.5 Limited development in critical watershed areas.

Policies:

2.3.5.a Discourage development and subdivision of land within critical watersheds and in areas susceptible to high erosion and sediment loss.

2.3.5.b Designate critical watershed areas as conservation lands.

2.3.5.c Strongly encourage new subdivisions and developments that are proximate to environmentally sensitive watershed resources to prepare and implement CSD plans.

Implementing Actions:

2.3.5-Action 1 Develop tools, such as CSD plans, to protect watershed resources and sensitive habitats.

2.3.5-Action 2 Identify and map critical watersheds, sensitive habitats, and those areas susceptible to high erosion and sediment loss.

Objective:

2.3.6 Enhance the vitality and functioning of streams, while balancing the multiple needs of the community.

Policies:

2.3.6.a Protect and enhance natural streambeds and discourage stream alteration.

2.3.6.b Work with appropriate agencies to establish minimum stream flow levels and ensure adequate stream flow to sustain riparian ecosystems, traditional kalo cultivation, and self-sustaining ahupua`a.

2.3.6.c Respect and participate in the resolution of native Hawaiian residual land and water rights issues (kuleana lands, ceded lands, and historic agricultural and gathering rights).

2.3.6.d Ensure that stream flows implement laws and policies found in the State Constitution and Water Code.

2.3.6.e Work with appropriate agencies and stakeholders to establish minimum stream flow levels, promote actions to support riparian habitat and the use of available lo`i, and maintain adequate flows for the production of healthy kalo crops.

Implementing Actions:

2.3.6-Action 1 Compile and update data on the needs of the multiple users of water.

WILDLIFE AND NATURAL AREAS

Many of Maui's natural areas and wildlife are in designated State and National Parks, nature preserves, forest reserves, natural area reserves, and private lands. These lands contribute to the quality of life on Maui, attract visitors, provide habitat for native species, and are inextricably tied to the Hawaiian culture.

Waterfall in Kīpahulu.

Maui's natural areas and wildlife are key components of the island's identity. As the island experiences an increase in population and subsequent demand for development, Maui's natural areas and wildlife will experience increased challenges, requiring strong management and protection.

`Ōhi`a forest, Waikamoi Preserve.

CHALLENGES AND OPPORTUNITIES

Maui's natural areas and undeveloped open space provide wildlife plant and animal habitat for many of Hawai`i's native and endangered species. Furthermore, these areas are resources for the island's residents and visitors. Many wildlife and natural areas contain rainforests and dryland forests and other disappearing Hawaiian ecosystems that are critical for the survival of many native species.

Lack of Integrated Environmental Resource Planning and Management

Native wildlife is important to residents. According to the Wildlife Values in the West (2005) survey, a large majority of Hawai`i's residents (71.4 percent) strongly agree that it is important to take steps to prevent the extinction of endangered species. Wildlife-viewing opportunities are worth hundreds of millions of dollars to the State's tourism industry, according to the United States Department of Interior.

The Countywide Policy Plan, at page 46, establishes the following policies:

"Preserve and reestablish indigenous and endemic species' habitats and their connectivity."

"Expand coordination with the State and nonprofit agencies and their volunteers to reduce invasive species, replant indigenous species, and identify critical habitat."

A strong foundation of programs and partnerships to protect endangered species is in place. The State and Federal government have the primary responsibility for managing endangered species; however, the County should continue to play a key supportive role through its land use planning and regulatory responsibilities.

Loss of Natural Areas and Wildlife Habitat

With Maui's continually growing population, previously undeveloped areas are experiencing increased development pressure, particularly in the State Agricultural District. Many agriculturally designated lands are home to threatened and endangered species that could be harmed by development. The County can ensure greater protection of flora and fauna resources by requiring assessments for development in areas with medium, high, and very high concentrations of threatened and endangered species.

Cyanea mceldowneyi, endemic to East Maui.

The Natural Area Partnership Program (NAPP) was created within the Division of Forestry and Wildlife, State Department of Land and Natural Resources, to protect privately owned lands with intact Native Hawaiian ecosystems and essential habitat for endangered species. The program provides private landowners with assistance to protect land in perpetuity through transfer of fee title or a conservation easement to the State or a cooperating entity.

Programs such as NAPP are vital to the preservation of natural areas; however, they rely on private landowners to voluntarily initiate the partnership. An inventory and evaluation of NAPP-eligible lands could be conducted to identify lands that add to contiguous native ecosystems and provide vital habitat for native species. For lands identified as possessing these characteristics, proactive steps could be taken to encourage property owners to protect the land.

To fund the acquisition of important natural areas, the County may apply for grants from the Land Conservation Fund, pursuant to Section 173A-5, Hawai`i Revised Statutes, to obtain funding for the acquisition of land and easements for watershed protection, parks, coastal areas, scenic resources, and other natural areas.

Greensword found only in the West Maui Mountains.

Maui is biologically diverse and characterized by high levels of endemism (species unique to the island) in animals and plants, with more than 10,000 species found nowhere else on Earth. Rates of endemism are typically 99 percent to 100 percent for terrestrial insects, spiders, and land snails; 90 percent for plants; more than 80 percent for breeding birds; and 15 percent to 20 percent for aquatic fauna.[9]

`Ama`u fern.

The longevity of a species is directly related to the health of its habitat. In addition to the individual species, the native habitats can be considered endangered because of habitat fragmentation. Vast expanses of Maui's native habitats have already been lost; therefore, preservation of remaining habitat is vital to the survival of many species.

Historically, activities such as logging, agriculture, grazing, military use, fire, and urban, rural, and residential development have claimed more than half of Hawai`i's native habitats. At low elevations, where development pressures are highest, less than 10 percent of native vegetation remains, according to the Wildlife Study.[10] Native flora is in need of conservation; more than 250 species are federally listed as threatened or endangered.

[9] Department of Land and Natural Resources (2005). *Hawai`i's Comprehensive Wildlife Strategy*.
[10] Id

Horizon across from Keālia Pond.

The upper elevations of West Maui and Haleakalā provide vital habitat for endangered and endemic plants and animals. With the threat of habitat destruction and invasive species in the lower elevations of the island, many native species have been forced to adapt to higher elevation. East Maui, in particular, has been identified as containing some of the last remaining intact Native Hawaiian ecosystems in the State. The Waikamoi Preserve, within East Maui, protects hundreds of native species. The koa-`ōhi`a forest within the preserve provides a sanctuary for many endangered plants and animals. State and Federal lands, such as State Forest Reserves and Haleakalā National Park, also provide habitat for many endangered species and protect sensitive habitat.

Kanahā Pond Wildlife Sanctuary in Kahului provides vital habitat for native waterbirds. Keālia Pond National Wildlife Refuge, on Maui's south shore, provides critical habitat for many endangered bird species. The refuge protects some of the last remaining native wetland habitat in the State.

Hawai`i presents both an opportunity and challenge for conservation. While the threats to Hawai`i's native species persist, recent years have seen greater awareness of the need to take action to conserve biodiversity, more assertive political will to take steps to address the problems, and wider community involvement in projects.[11]

Introduction of Invasive Species

Maui's native species and their habitats are also important cultural resources for Native Hawaiians. Historically, feathers from forest birds were used to make elaborate capes, lei, and helmets for the ali`i. In present-day Hawai`i, the link between Native Hawaiian culture and native species has not been lost, as seen in the continuation of traditional practices such as gathering of native plants for hula, medicinal uses, carving, weaving, and ceremonies.

The greatest threat to native and endemic species of Hawai`i is invasive species. Because of their evolutionary history, Hawai`i's native plants and animals are particularly susceptible to the threats posed by the introduction and spread of invasive species and pathogens. The introduction of invasive species causes environmental and economic harm. Non-native species may out-compete native species or may directly

[11] Department of Land and Natural Resources (2005). *Hawai`i's Comprehensive Wildlife Strategy*.

harm native species through predation or infection. Non-native species may also threaten native species through interbreeding and hybridization, leading to the loss of the native species as a unique species. The Wildlife Study estimated that more than 6,000 introduced terrestrial and aquatic species were established and that approximately 26 percent to 30 percent of species in Hawai`i are non-native.[12] While many introductions do not pose a threat to native habitats, approximately 10 percent of the established non-native species are highly invasive or pose significant threats to Hawai`i's ecosystems.

No other state has experienced a similar invasion of non-native competitors, predators, habitat-modifiers, vectors of infectious disease, and pathogens, according to the Wildlife Study.[13] Over a nine-month period, the State Department of Agriculture discovered more than 100 alien species entering the island via air cargo, as reported in the Kahului Airport Pest Risk Assessment (2002).

Feral ungulates pose a major threat to native plants by consuming and trampling native understory plants. In turn, this has created conditions favoring non-native plant infestation and establishment, preventing the establishment of ground-rooting native plants, and disrupting soil-nutrient cycling.

Actions that will assist conservation efforts include the protection of existing native habitats from feral animals, invasive plant control and eradication, monitoring of populations, and additional research on methods to address the role of invertebrates and disease. Furthermore, education and outreach efforts will teach residents and visitors about invasive species, how to avoid introduction, and how to eradicate those that are already a nuisance.

SUMMARY OF WILDLIFE AND NATURAL AREAS ISSUES

Maui's wildlife and natural area resources are key components of the island's identity. Interconnected natural landscapes that provide habitat for native and endangered species can be affected and degraded by a few activities that reduce their habitat value. Major issues affecting Maui's wildlife and natural areas include:

- Lack of integrated environmental resource planning and management
- Loss of natural areas and wildlife habitat
- Introduction of invasive species

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

2.4 Maui's natural areas and indigenous flora and fauna will be protected.

[12] Department of Land and Natural Resources (2005). *Hawai`i's Comprehensive Wildlife Strategy*.
[13] Id.

Objective:

2.4.1 A comprehensive management strategy that includes further identification, protection, and restoration of indigenous wildlife habitats.

Policies:

2.4.1.a Identify and inventory the following:
(1) Natural, recreational, and open space resources;
(2) Flora and fauna with medium, high, and very high concentrations of threatened or endangered species; and
(3) Location and extent of invasive species.

2.4.1.b Require flora and fauna assessment and protection plans for development in areas with concentrations of indigenous flora and fauna; development shall comply with the assessment and protection plan and shall use the avoidance, minimization, and mitigation approach respectively, with an emphasis on avoidance.

2.4.1.c Support the implementation of Hawai`i's Comprehensive Wildlife Conservation Strategy (October 2005).

Implementing Actions:

2.4.1-Action 1 Develop, and regularly update, an island-wide Environmental Resources Sites' database to serve as a basis for decision making to include the following: natural preserves; watersheds; wetlands; streams; dryland forests; critical habitat areas; natural barrier resources; and other sensitive landforms and features on an Environmental Resources Map.

2.4.1-Action 2 Prepare the following, in coordination with the State and resource partnerships:
(1) An inventory of key habitats that lack regulatory protections; and
(2) An inventory of NAPP-eligible lands.

2.4.1-Action 3 Increase wildlife and natural area planning expertise throughout the County government.

2.4.1-Action 4 Amend existing regulations to require flora and fauna assessments and protection plans for development in areas with identified concentrations of indigenous flora and fauna.

Objective:

2.4.2 A decrease in invasive species through programs and partnerships that eradicate undesirable species and protect native habitat.

Policies:

2.4.2.a Prevent the introduction of invasive species at all of Maui's airports and harbors.

2.4.2.b Encourage the State to increase funding in support of invasive species interception, control, and eradication.

2.4.2.c Encourage the State to develop programs that allow students to participate in invasive species eradication projects.

Implementing Actions:

2.4.2-Action 1 Work with Federal and State agencies to develop and implement procedures for the inspection of incoming cargo, passenger baggage, and vehicles for invasive species and prohibited plants and animals.

2.4.2-Action 2 Pursue Federal and other dedicated funding for invasive species intervention at harbors and airports.

2.4.2-Action 3 Pursue Federal and other funding for public/private partnerships to develop and implement environmental protection programs.

Objective:

2.4.3 Greater protection of sensitive lands, indigenous habitat, and native flora and fauna.

Policies:

2.4.3.a Secure an interconnected network of sensitive lands, greenways, watercourses, and habitats.

2.4.3.b Protect Maui's sensitive lands (see Sensitive Lands on Protected Areas Diagrams).

2.4.3.c Promote innovative environmental-planning methods and site-planning standards that preserve and re-establish indigenous flora and fauna habitat, to preserve and restore connected habitat corridors and open space.

2.4.3.d Utilize protection tools such as conservation easements, land trusts, land banks, Purchase of Developments Rights (PDRs), Transfer of Development Rights (TDRs), and other stewardship tools to acquire natural areas.

2.4.3.e Encourage discussions with communities to designate heritage areas that protect recreational and cultural lifestyles and resources.

2.4.3.f Support the expansion of Haleakalā National Park, and the creation of new national parks, where appropriate and supported by local communities.

2.4.3.g Encourage reforestation efforts that increase native species' habitat.

2.4.3.h Utilize the Natural Area Partnership Program (NAPP) and other programs to protect natural lands.

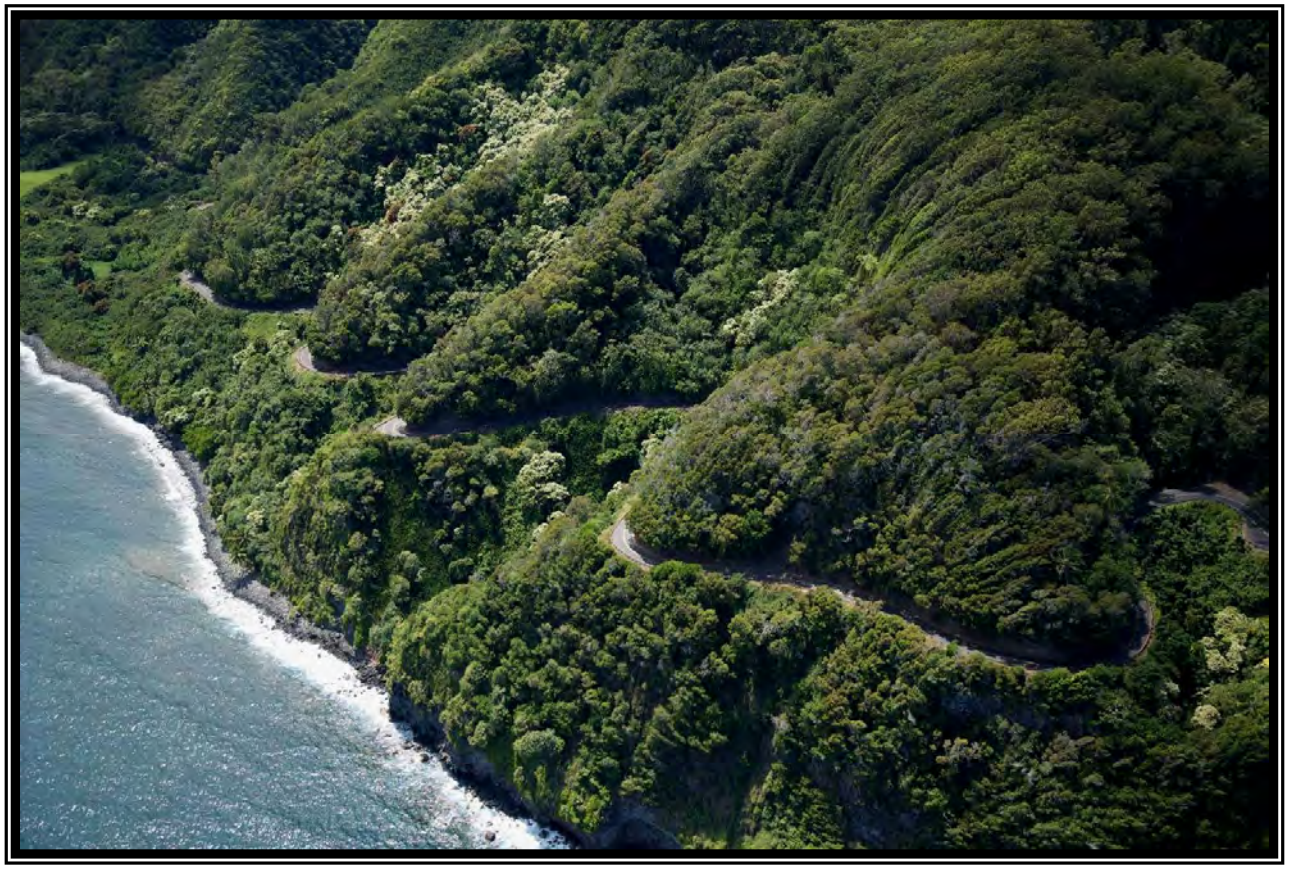
2.4.3.i Support increased dedicated funding for the acquisition, protection, restoration, or preservation of important natural areas or open space through the following: grants from the Land and Water Conservation Fund; dedicated funding from real property taxes or other appropriate revenues; bond issues; real estate transfer tax; revenues from the

Transient Accommodations Tax; development mitigation fees; and other appropriate funding sources.

Implementing Actions:

2.4.3-Action 1 Develop management plans for the reforestation of native species' habitats and institute rest periods for designated areas threatened by overuse.

2.4.3-Action 2 Develop an inventory of lands, and prioritize urban and rural wilderness areas that are threatened by human impacts and are strong candidates for preservation.



Aerial view of the Hāna Highway.

SCENIC RESOURCES

Maui's shoreline, tropical rainforests, rugged valleys, vast open spaces, historic towns, pastoral landscapes, and panoramic Pacific Ocean views are all a part of the island's scenic resources. In the past few decades, the island has experienced rapid growth of the visitor industry, as well as an increase in population, which have dramatically impacted the island's scenic corridors and view planes. The current network of laws established to protect scenic resources is focused on coastal lands. Areas outside of coastal lands also possess significant scenic resources that could benefit from regulatory controls and preservation strategies.

Scenic views are public resources; they contribute to residents' everyday quality of life. The island's dramatic viewsheds and scenic horizon are part of what makes Maui a desirable place to live. There are many kinds of scenic resources and various ways to appreciate them on a daily basis. There are some views that possess notably higher significant scenic-resource value than others. State and County roadways, such as Haleakalā Highway, Honoapi`ilani Highway, Hāna Highway, Kula Highway, and Kahekili Highway, provide ocean, mountain, agricultural, and island-wide views. Roadways on Haleakalā, especially at upper elevations, offer expansive views of Central and West Maui, the islands of Moloka`i, Lāna`i, and Kaho`olawe, and the peaks of Mauna Loa and Mauna Kea on the Island of Hawai`i. Coastal roadways also provide significant views of neighboring islands, slopes of Haleakalā, and rugged valleys of the West Maui Mountains. The East Maui portion of the Hāna Highway is famous for its legendary cliff, ocean, rainforest, waterfall, and valley views.

CHALLENGES AND OPPORTUNITIES

Scenic views are closely tied to residents' quality of life and the island's sense of place. Maui possesses unique, rare, and significant views, many of which have no equal. Many views and landscapes are closely tied to Hawaiian culture, folklore, and history.

Degradation of Scenic Resources

Maui's spectacular views are a driving force behind the island's thriving visitor industry. Thus, scenic-resource preservation is an important part of protecting the health of Maui's economy.

Within highly urbanized corridors, there are exceptional and important views. These views are especially important because they provide visual relief and enhance the quality of the built environment, thereby making urban areas more livable.

The Scenic Resources Inventory and Mapping Project (2006) identifies and maps the island's scenic-resource corridors. Each roadway corridor is rated exceptional, high, medium, or low based on its overall resource value. Roadway corridors with exceptional or high scenic-resource values typically contain dramatic and diverse resource values throughout the corridor. These corridors are typically in a natural condition and remain undeveloped.

Kekaulike Highway.

Limited Access to Scenic Resources

While roadways offer vast opportunities for residents and visitors to enjoy Maui's beautiful views, other areas also contribute significantly to the island's scenic resources. Areas such as beaches and trails provide access to scenic views, some of which may not be visible from roadways.

Inappropriate Building and Landscape Design

Lands rich in scenic-resource value are often the same lands that are in high demand for recreational, resort, and residential uses. Over the past two decades, growth and development have caused some visual clutter along State and County roadways, obstructed ocean views, and produced urban and rural sprawl conditions on agricultural lands that once separated distinct country-town communities. While the visual impact of some developments may seem minimal, the cumulative impact is significant. Inappropriate architectural, site, and landscape design, as well as the massing of many coastal structures, can dramatically hamper scenic resources. Furthermore, utility poles can diminish the quality of views from many State and County roadways and create visual clutter.

Subdivision and development of Maui's agricultural and rural lands have resulted in landscapes marked by the proliferation of dwelling units that threaten visual resources.

The establishment of a Scenic Roadway Corridor Overlay District would establish special controls along scenic roadway corridors to prevent or mitigate the impact of development on scenic resources. An important component of the overlay district would be the establishment of design guidelines and a view-corridor management plan. Techniques such as development clustering, greenbelts and open-space buffers, site-plan configuration to protect view planes, building design and height limitations, setbacks from public roadways, landscaping, and other means would be incorporated into the guidelines. Any new subdivision or construction of a building that exceeds a specified height threshold and is within a Scenic Roadway Corridor viewshed would be subject to an assessment of the project's visual impact and compliance with the design guidelines.

The management plan would identify right-of-way improvements, utility controls, roadside maintenance activities, signage, potential new vehicular turn-offs, and land-acquisition opportunities that would protect the integrity of scenic resources.

The County could use the management plan and design guidelines to review site designs, development applications, and capital improvement programs to ensure that Maui's scenic roadways and resources are protected.

Pi`ilani Highway.

Loss of Agricultural and Open Lands to Development

In recent years, thousands of acres of former sugar land in the Pā`ia-Ha`ikū Community Plan Area and the West Maui Community Plan Area have been

impacted by development.

The Countywide Policy Plan, at page 74, establishes the following objective: "Improve land use management and implement a directed-growth strategy." An island-wide directed-growth strategy can help protect Maui's scenic resources. A directed-growth strategy can utilize principles such as open-space preservation, agricultural land protection, green belts, and a compact settlement form that will help to minimize the encroachment of urban development into rural areas.

SUMMARY OF SCENIC RESOURCES ISSUES

- Loss or degradation of scenic resources that are a part of the island's shared quality of life
- Access to scenic resources
- Inappropriate building massing, architecture, siting, and landscape design
- Loss of agricultural and open lands to development

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

2.5 Maui will continue to be a beautiful island steeped in coastal, mountain, open space, and historically significant views that are preserved to enrich the residents' quality of life, attract visitors, provide a connection to the past, and promote a sense of place.

Objective:

2.5.1 A greater level of protection for scenic resources.

Policies:

2.5.1.a Protect views to include, but not be limited to, Haleakalā, `Īao Valley, the Mauna Kahalawai (West Maui Mountains), Pu`u Ō`la`i, Kaho`olawe, Molokini, Moloka`i, and Lāna`i, Mauna Kea, Mauna Loa, sea stacks, the Pacific Ocean, and significant water features, ridgelines, and landforms.

2.5.1.b Identify, preserve, and provide ongoing management of important scenic vistas and open space resources, including mauka-to-makai and makai-to-mauka view planes.

2.5.1.c Protect "night sky" resources by encouraging the implementation of ambient light ordinances and encouraging conversion of all sources that create excessive light pollution, affecting our ability to view the stars.

2.5.1.d Protect ridgelines from development where practicable to facilitate the protection of public views.

2.5.1.e Protect scenic resources along Maui's scenic roadway corridors.

Implementing Actions:

2.5.1-Action 1 Adopt a Scenic Roadway Corridor Overlay District to establish special controls to mitigate the impact of development on scenic resources.

2.5.1-Action 2 Establish a Scenic Roadway Corridor Management Plan and Design Guidelines to guide the development within the Overlay District.

2.5.1-Action 3 Adopt a management plan that identifies right-of-way improvements, utility controls, roadside maintenance activities, signage, potential new vehicular turnoffs, and land acquisition opportunities that would protect the resource.

2.5.1-Action 4 Establish design guidelines that integrate techniques such as development clustering, greenbelts, and open space buffers, site plan configuration to protect view planes, building design and height limitations, setbacks from public roadways, landscaping, and other techniques.

2.5.1-Action 5 Create thresholds for new subdivision of land or building permit which is within a Scenic Roadway Corridor viewshed (as mapped by the County) to make them subject to assessment of the projects visual impact and compliance with the design guidelines.

2.5.1-Action 6 The County shall use the management plan and design guidelines to review site designs, development applications, and capital improvement programs to ensure that they do not degrade Maui's scenic roadways and resources.

2.5.1-Action 7 Develop and adopt standards to protect ridgelines, slopes, and view planes from development.

2.5.1-Action 8 Develop and adopt regulations to protect night-sky resources from encroachment by the built environment, and limit night-light emissions and light-intensity levels.

Objective:

2.5.2 Reduce impacts of development projects and public-utility improvements on scenic resources.

Policies:

2.5.2.a Enforce the policies and guidelines of the SMA regarding the protection of views.

2.5.2.b Require any new subdivision of land, development, or redevelopment adjacent to a "high" or "exceptional" scenic corridor to submit an impact assessment of the project's scenic impacts; this assessment shall use the avoidance, minimization, and mitigation steps respectively, with an emphasis on avoidance.

2.5.2.c Require appropriate building setbacks and limits on wall heights to protect views along scenic corridors.

2.5.2.d Encourage the State of Hawai`i Board of Land and Natural Resources to deny any development within the State Conservation District that interferes with a scenic landscape or disrupts important open space resources.

2.5.2.e Require Urban Design and Review Board (UDRB) review and approval of utility poles, facilities, and other visible infrastructure improvements along scenic corridors.

2.5.2.f Ensure little or no effect on scenic resources from utility improvements, primarily power poles.

2.5.2.g Protect scenic vistas from intrusion by power poles.

Implementing Actions:

2.5.2-Action 1 Develop, adopt, and implement a Scenic Resources Management Plan and design guidelines.

2.5.2-Action 2 Develop and adopt an ordinance that requires Scenic Resource Impact Assessments for projects that may have potential impact on scenic resources.

2.5.2-Action 3 Develop and adopt standards and processes to:

(1) Ensure that the location and design of utility poles, facilities, and infrastructure do not degrade scenic resources;
(2) Require utilities to be placed underground, whenever feasible; and
(3) Require UDRB to review and approve the installation of utilities along scenic corridors.

Objective:

2.5.3 Greater protection of and access to scenic vistas, access points, and scenic lookout points.

Policies:

2.5.3.a Protect, enhance, and acquire access to Maui's scenic vistas and resources.

Implementing Actions:

2.5.3-Action 1 Revise land use regulations to:

(1) Require access, where appropriate, to scenic vistas and resources, provided such access is culturally acceptable;
(2) Limit the height of walls; and
(3) Require appropriate setbacks and site design along scenic corridors.

2.5.3-Action 2 Develop additional Scenic Lookout points.

Chapter 3: Natural Hazards

A wildfire burns across the pali, Mā`alaea.

Maui's pristine waters, lush mountainsides, dry brushland, and dormant volcano offer an awe-inspiring variety of landscapes to explore. The different extremes in climate and terrain can come with a price: the potential for numerous natural hazards that could affect any part of the island. Chronic hazards, such as coastal erosion, flooding, and vog (volcanic smog), may persist or recur over long periods of time. Tsunamis, hurricanes, wildfires, and earthquakes vary in frequency and intensity and are difficult to predict. With the impacts of climate change superimposed on Hawai`i's existing risk from these hazards, communities may be exposed to more severe and frequent hazards, increasing risk; and potentially affecting our economy and eroding the quality of life.

Background Information

Natural hazards must be considered when planning for the future. Maui's shorelines, beaches, and near shore coastal waters are highly susceptible to damage from coastal hazards such as tsunamis, storm surge, and erosion. Inland areas can sustain wind damage, flooding, fires, and drought. These dangers pose a significant threat to life and property.

The University of Hawai`i, the National Oceanic and Atmospheric Administration, and others are working to model the likely impact of a typical tsunami event on the island of Maui. There are several densely populated areas near the coastline and/or in low-lying areas that are vulnerable to tsunami damage.

These same areas are also in danger of periodic hazards such as high surf and storm surge. During the time horizon of the MIP, it will be important to understand how sea-level rise and shoreline changes may affect low-lying areas.

Mitigation, risk, and vulnerability should be addressed for the hazards listed in Table 3-1 when planning for the long term.

Table 3 – 1: Maui's potential natural hazards

Hazards	Overview
Tsunami	Locally generated or Pacific-wide seismic waves (tsunamis) threaten Pacific island coastal communities. Due to increased coastline development, thousands of residents and tourists can be affected by a tsunami. In Hawai`i, tsunamis have accounted for more lost lives than the total of all other local disasters. In the 20th century, an estimated 221 people have been killed by tsunamis. Historically, Maui has experienced tsunami wave heights as high as 33 feet.
Earthquake/ Seismic Hazards	Landslides, ground cracks, rockfalls, and tsunamis are all hazards resulting from earthquakes. Engineers, seismologists, architects, and planners have carefully evaluated seismic hazards related to building construction. They have devised a system of classifying seismic hazards based on the expected strength of ground shaking and the probability of the shaking actually occurring within a specified time. The results are included in the Uniform Building Code (UBC) under the seismic provisions.
Volcanic Activity	The East Maui volcano (Haleakalā) has witnessed at least ten eruptions in the past 1,000 years; numerous eruptions have occurred in the past 10,000 years. Thus, East Maui's long eruptive history and recent activity indicate that the volcano will erupt in the future. Although Haleakalā is in the last stage of Hawaiian volcanic cycle, the eruption recurrence rate is estimated to be about 200-600 years. Lava flow, tephra (airborne lava fragments), volcanic gases, and ground cracks may follow another eruption.
Tropical Cyclones	"Tropical Cyclone" is a general term that can describe tropical depressions, tropical storms, and hurricanes. The systems are classified according to maximum sustained wind speeds. These storms generally affect Maui from June through November. In addition to high wind damage, tropical cyclones impart riverine (non-coastal) flooding, freshwater coastal flooding, high surf damage, highly destructive storm surge, and severe flooding in low-elevation areas with insufficient drainage. Maui's unique topography concentrates torrential rains on mountain slopes, resulting in destructive flash floods and landslides. Even a relatively weak tropical system can have the potential to result in considerable property damage and loss of life. Major tropical cyclones on average occur once every 10 years.

Hazards	Overview
Severe Storms and Flooding	Major floods from severe storms typically occur during the winter season (October through April) and account for 84 percent of the floods in the islands.[1] Kona storms are typically the most destructive storms in Hawai`i, based on frequency. Storm intensities may include wind speeds up to 60 miles per hour with flooding rains and snow storms on Haleakalā. Kona low pressure systems are relatively long-lived storms, often affecting Hawai`i for a week or more, and have been historically responsible for a great deal of damage.
Drought	Long periods without rain are not uncommon in parts of the Pacific. The implications of a drought are varied and can be dramatic. Reduced crop yields, livestock losses, reservoir depletion, and impacts to long-term watershed and aquifer health can have cumulative impacts on agricultural activity. Disputes may arise over water rights; water quality itself may decline due to higher chloride concentrations, pH, and higher temperatures.
Fires	Put simply, "wildfire" is the term applied to any unwanted and unplanned fire burning in forest, shrub, or grass. According to the U.S. Department of Forestry and Wildlife, in Maui County there were 1,291 brush fires between 1972-1999, which burned 64,248 acres and impacted 43 structures. Unlike the mainland United States, Hawai`i's ecosystems are not adaptive to wildfire. Past wildfires in Hawai`i have destroyed the last known species of certain native plants. According to local biologists, many other native plants are only a wildfire away from extinction. Wildfires also cause soil erosion, which then leads to soil runoff into the ocean, killing marine life that local populations rely on for food and cultural practices. Soil erosion and soil damage from wildfire also impact the health of Hawai`i's watersheds. When the watersheds are impacted by wildfire, soil runoff can contaminate these water sources, making them unfit for drinking.
Sea Level Rise	The University of Hawai`i Coastal Geology Center has predicted that the sea level will rise in the coming decades. This would impact all coastlines, and would most severely affect Maui's developed, low-lying communities: Mā`alaea, North Kīhei, Lahaina, Kā`anapali, and Kahului. Prudent land use planning will consider possible sea-level rise as a variable in the future.
High Wind	High winds can cause heavy damage to public buildings and homes. Construction standards, building materials, and building location determine whether a structure will endure. These winds can be the result of tropical systems, frontal systems, or Kona low pressure systems. Depending on the wind direction and speed, a Venturi effect may take place in mountainous terrain on Maui, oftentimes amplifying localized wind speeds.
Landslides	This general term covers debris flows, rockfalls, and a variety of other slope failures. Landslides are commonly related to tropical cyclone events, heavy rain on saturated ground, or earthquakes. Debris flows, sometimes referred to as mudslides, mudflows, or debris avalanches, are common types of fast-moving landslides and occur in a variety of environments. According to the City and County of Honolulu's Civil Defense Agency, the most hazardous areas are canyon bottoms, stream channels, areas near the outlets of canyons, and slopes excavated for buildings and roads.

[1] State of Hawai`i (2007). *Hazard Mitigation Plan*.

Aerial view of the destruction caused by a Kona storm, Kula.

Property damage resulting from natural hazards has become exceedingly costly for both the disaster victims and the American taxpayer. According to the Maui County Multi-Hazard Mitigation Plan (HMP), from 1989 to 1993, the average annual loss from natural disasters was $3.3 billion nationally. Over 6,000 people have been killed and 50,000 injured from natural disasters in the past 25 years (FEMA, 1998). Nationally, extreme weather caused approximately $23.9 billion in combined property and crop damages in 2011, more than double the $9.9 billion in 2010. Property damages were estimated at $20.9 billion, almost triple the 2010 total of $7 billion and 2009 total of $6.8 billion. As in 2010, flooding was a major culprit, accounting for more than $9 billion in losses. Weather-related deaths also more than doubled in 2011, reaching 1,091 victims, up from 490 in 2010. According to the National Weather Service, this number is well above the 10-year average (2002-2011) of 641.

The HMP identifies hazards and risks posed by natural disasters, and provides an action plan to reduce loss if such disasters occur. FEMA requires that this plan be updated every five years. The MIP advocates for the implementation and updating of the HMP.

CHALLENGES AND OPPORTUNITIES

Fragmented Agency Coordination

Although the Maui County Civil Defense Agency is responsible for HMP implementation, the agency cannot be successful in its mission without the cooperative efforts of many County, State, and Federal agencies. To be prepared for any hazard event, all relevant agencies have to be communicative and coordinated; this will help to ensure community resilience before, during, and after a hazard event.

In the context of social and physical systems, resilience can be described as a way to cope with uncertainty or risk. Natural hazards, such as earthquakes, severe storms, or shoreline erosion, pose a variety of risks to communities that cannot be fully described or predicted. Communities manage these risks by building the capacity to avoid or minimize the impacts of hazards, and rebound quickly from disasters.

Guiding Principles for Resilient Communities

Various communities in Hawai`i have defined six principles to plan for resilience. These principles, adapted from the Hawai`i Coastal Zone Management Program (2007), include:

- **Community-based:** engage communities in planning and implementation.
- **Place-based:** consider unique characteristics (natural resources, weather, and demographics) of each place.
- **Ecosystem-based:** recognize connections between land and sea and other components of the ecosystem.
- **Culture-based:** honor the host culture and values.
- **Risk-based:** incorporate hazard risk knowledge in all elements of planning.
- **Collaborative:** promote collaboration between stakeholders at all stages of the planning process.

Guiding principles can be applied in all stages of the planning cycle. Specific steps to plan for resilience in a community:

- **Step 1**: Characterize hazard risk
- **Step 2**: Define resilience goals and status
- **Step 3**: Develop actions and partnerships

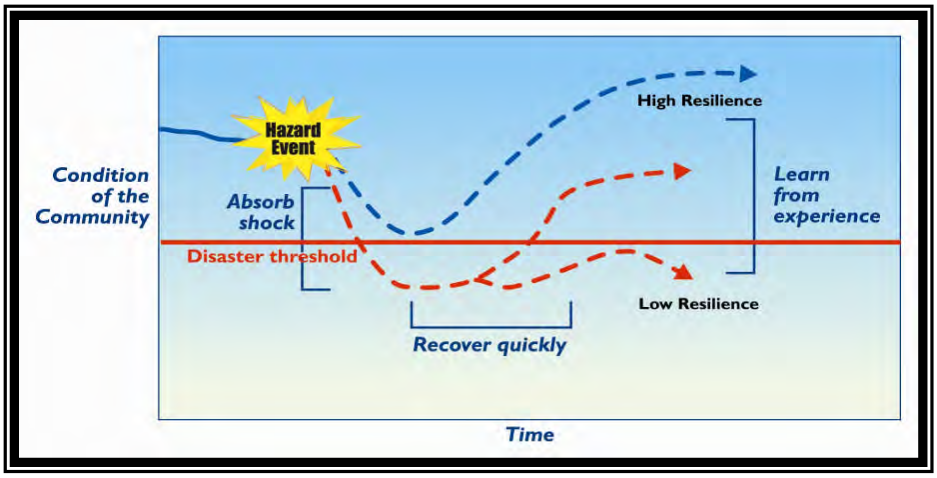


Figure 3 - 1: Goals of resilient communities (U.S. Indian Ocean Tsunami Warning System Program).

Hazard mitigation is action taken to permanently reduce or eliminate long-term risk to people and their property from the effects of natural hazards.

The purpose of multi-hazard mitigation is two-fold: 1) protect people and structures from harm and destruction; and 2) minimize the costs of disaster response and recovery. Hazard mitigation planning is the process that analyzes a community's risk from natural hazards, coordinates available resources, and implements actions to reduce risks.

In 1995, FEMA introduced a National Mitigation Strategy to ensure the national focus on mitigation. The National Strategy promotes the partnership of government and the private sector to "build" safer communities. Hazard mitigation encourages all Americans to identify hazards that may affect them or their communities to take action to reduce risks. Mitigation actions help safeguard personal and public safety. Retrofitting bridges, for example, can help keep them from being washed out, which means they will be available to fire trucks and ambulances in the event of a storm. Installing hurricane clips and fasteners can reduce personal and real property losses for individuals and reduce the need for public assistance in the event of a hurricane. Increasing coastal setbacks reduces the risk of deaths and property losses from tsunamis, storm surge, and sea-level rise.

Limited Routes For Safe Evacuation

In several areas of the island there is only one access to get into or out of a region. For years this has been a problem for Lahaina travelers when there is a wildfire or a rockslide, and this limitation could be disastrous if a tsunami impacted the south- and/or west-facing shores. Likewise, Hāna and East Maui are prone to being cut off from the rest of the island in the event of earthquakes or rockslides.

Property owners, businesses, service providers, and government have a tendency to delay the preparation for natural dangers until there is a crisis. This lack of preparation puts both life and property at risk.

Warning sign posted after 2006 earthquake, Kīpahulu.

Improved Public Outreach and Education

Increasing awareness through public forums that educate communities about natural hazards will empower the public with solutions that will enable the entire community to work together when a crisis strikes. School programs can also be implemented to teach children how they can respond to an emergency situation.

Another important benefit of hazard mitigation and education is that public investment in disaster preventative measures can significantly reduce the impact of disasters in the future, including the cost of post-disaster cleanup.

SUMMARY OF NATURAL HAZARDS ISSUES

- Fragmented agency coordination
- Lack of plans to protect life and property
- Limited routes for safe evacuation
- Need to improve public outreach and education
- Development and/or redevelopment located in hazardous areas

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

3.1 Maui will be disaster resilient.

Objective:

3.1.1 Increased inter-agency coordination.

Policies:

3.1.1.a Reinforce the island's preparedness capacity by:
(1) Applying the latest data-gathering techniques/technology;
(2) Pursuing funding opportunities;
(3) Improving monitoring and advance warning systems;
(4) Fostering public awareness; and
(5) Working with external agencies to coordinate disaster mitigation and response.

Implementing Actions:

3.1.1-Action 1 Consolidate and update the geographic information systems (GIS) hazards data bank in the Maui County Emergency Operations Center. Allow for the use of outside data to be included in the data bank.

3.1.1-Action 2 Acquire the latest GIS technology in hazard, risk, and vulnerability assessments.

3.1.1-Action 3 Establish a standing County Hazard Mitigation Committee, comprised of representatives from all levels of government and the private sector.

Objective:

3.1.2 Greater protection of life and property.

Policies:

3.1.2.a Identify critical infrastructure, lifelines, roads, and populations that are vulnerable to coastal hazards, and encourage strategic retreat and relocation to safer areas.

3.1.2.b Consider the location of dams, reservoirs, holding ponds, and other water-containing entities that are upstream of inhabited areas to anticipate, avoid, and mitigate inundation risks, and discourage new development in areas where possible inundation hazards may exist.

3.1.2.c Strengthen current development standards to minimize destruction of land and property.

3.1.2.d Encourage the use of construction techniques that reduce the potential for damage from natural hazards.

3.1.2.e Increase the County's resilience to drought.

3.1.2.f Increase food and energy security through local production and storage.

Implementing Actions:

3.1.2-Action 1 Develop an Emergency Management Center in Central Maui.

3.1.2-Action 2 Implement the HMP, and subsequent updates, to the extent it is consistent with MIP.

3.1.2-Action 3 Develop a Post-Disaster Recovery and Reconstruction Plan that will ensure Maui's resilience to coastal hazards.

3.1.2-Action 4 Develop plans and/or incentives to do the following:

(1) Encourage rebuilding inland as an alternative to shoreline hardening;
(2) Streamline the reconstruction of structures that are moved substantially inland;
(3) Encourage the relocation of existing structures so they are away from shoreline areas; and
(4) Encourage the relocation of vulnerable coastal roads that are susceptible to destruction from natural hazards, such as a portion of North Kihei Road and the Pali to Puamana realignment.

3.1.2-Action 5 Periodically update the shoreline rules to enable the Maui Planning Commission to provide safe setbacks from the shorelines and incorporate best management practices.

3.1.2-Action 6 Use and update the Federal Emergency Management Agency-Digital Flood Insurance Rate Maps (DFIRM) in the permitting process to minimize development in flood-prone areas.

3.1.2-Action 7 Following each coastal erosion disaster, identify and document the new shoreline position to be used for reviewing future development.

3.1.2-Action 8 Following each natural disaster, gather data to plan for future disaster events.

3.1.2-Action 9 Update coastal-planning requirements to factor in incremental effects of rising sea levels.

3.1.2-Action 10 Increase water storage and development of additional capacity in Upcountry Maui and other areas susceptible to drought and encourage efficiency in conservation programs.

Objective:

3.1.3 A more coordinated emergency response system that includes clearly defined and mapped evacuation routes.

Policies:

3.1.3.a Identify and expand shelter facilities and evacuation routes away from areas susceptible to natural hazards.

Implementing Actions:

3.1.3-Action 1 Develop an island-wide evacuation routes plan.

3.1.3-Action 2 Identify and develop required shelter capacity.

3.1.3-Action 3 Plan for opening and staffing the shelters to ensure that the facilities are made available at the time of evacuation orders.

Objective:

3.1.4 A more educated and involved public that is aware of and prepared for natural hazards.

Policies:

3.1.4.a Promote public education and involvement related to natural hazards awareness and preparedness.

3.1.4.b Coordinate a multi-agency effort to establish and promote a comprehensive public education program that will focus on practical approaches to preparedness, damage prevention, and hazard mitigation.

Implementing Actions:

3.1.4-Action 1 Develop regularly scheduled mitigation training for public and private emergency responders and establish volunteer groups to elevate public awareness of emergency procedures.

Chapter 4: Economic Development

Aia a kau ka i`a i ka wa`a, mana`o ke ola.
One can think of life after the fish is in the canoe. ~Hawaiian `Ōlelo No`eau

Farmers' market, Kahului.

Maui was the first of the neighbor islands to attract large-scale resort development as the islands transitioned from a plantation-based economy to one based on tourism. Maui's economy has thrived on tourism and it continues as Maui's primary engine. Any economy, however, needs to diversify in order to flourish as times and markets change. Moving forward, Maui must make a fundamental shift to an economy driven by innovation and the creative capacity of its residents. Maui can secure the economic well-being of its residents while protecting the island's scenic beauty, pristine environment, and cultural heritage that residents and visitors cherish.

Background Information

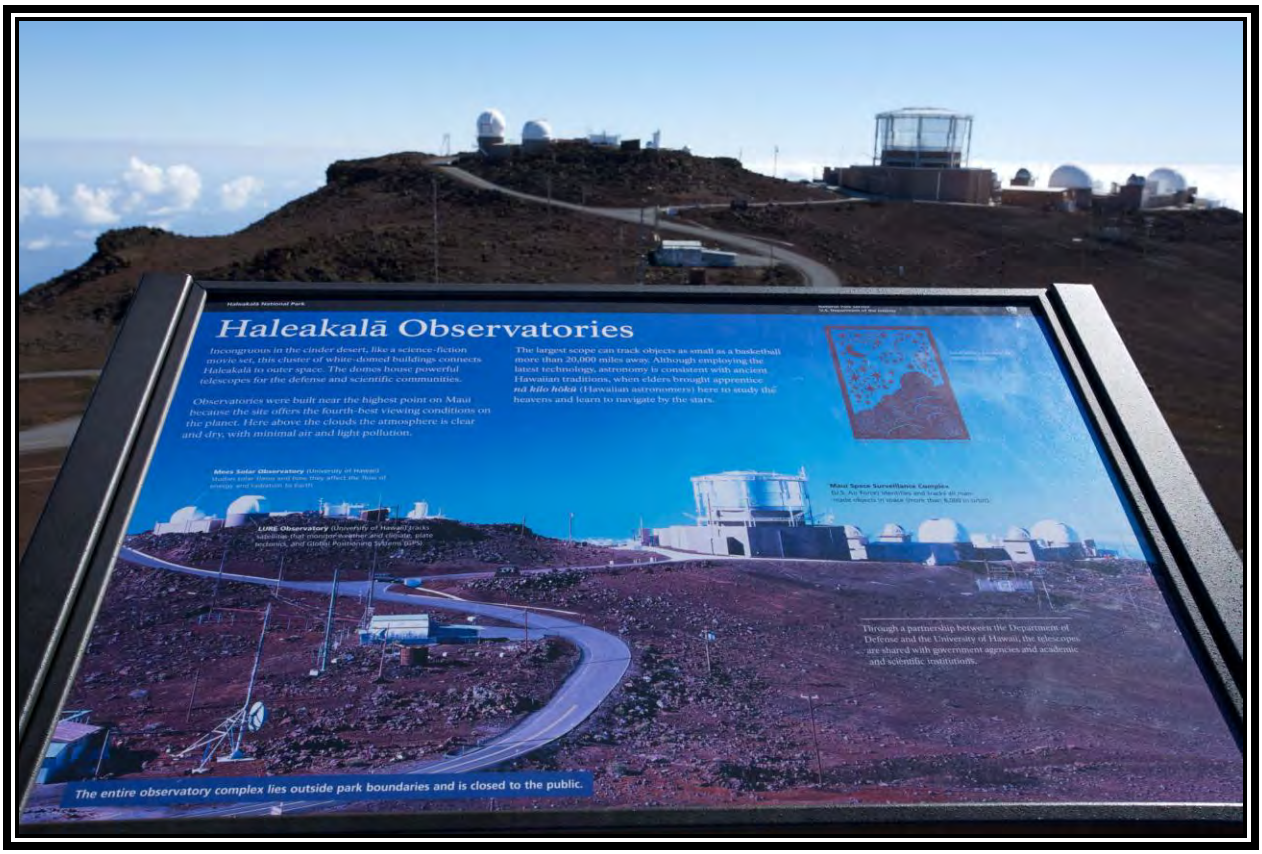
Maui continues to dominate the neighbor-island tourism market and has consistently led the other counties in the rate of job growth and per-capita income. Today, the County has approximately 4,700 business establishments, which, when combined with Federal, State, and County jobs, provides about 71,600 wage and salary jobs.[1] According to the 2004 *Maui County Comprehensive Economic Development Strategy* (CEDS), 88 percent of Maui firms employ fewer than 20 people. The State Department of Business, Economic Development, and Tourism (DBEDT) estimates that the County has an additional 19,000 self-employed jobs, which include small business owners.[2] With the exception of the economic downturn in the early 1990s, the unemployment rate for Maui County has closely tracked the statewide average.

It is now acknowledged that the health of the island's economy is directly tied to the health of the island's natural environment. The 2010 CEDS cited widespread community and political support for economic diversification, renewable energy, and environmental protection.[3] Maui's numerous natural and cultural sites and qualities, as well as the cultural diversity of Maui's people, are critical resources to be protected. Participants in this and past planning processes have repeatedly recognized the island's scenic beauty, pristine environment, cultural heritage, and historic sites as assets that require thoughtful stewardship. Economic development must therefore strike a delicate balance between growth and protection of these treasured resources.

This chapter incorporates data from a number of studies, technical papers, and community efforts. These papers and efforts provide background information and statistics regarding economic issues facing Maui. The following studies and reports are available at the Maui County Planning Department's Long Range Planning Division:

1. Economic Development Issue Paper, Island of Maui, Maui County General Plan 2030, October 2007 (PlanPacific, Inc., in association with John M. Knox & Associates, Inc., Tom Dinell, FAICP, and Chris Hart & Partners, Inc.);
2. Agricultural Resources Technical Issue Paper, September 2007 (Chris Hart & Partners, Inc.);
3. Maui Economic Development Board, Inc., County of Maui Comprehensive Economic Development Strategy. October 2004;
4. Maui Economic Development Board, Inc., County of Maui Comprehensive Economic Development Strategy, October 2010;
5. Hawai`i Tourism Authority, Maui County Tourism Strategic Plan: 2006-2015;
6. Maui Farm Bureau, with the Office of Economic Development, Maui Agricultural Development Plan, August 2008;
7. Report to the Twenty-Fourth Legislature, State of Hawai`i, 2008, Pursuant to Section 2 of Act 219 Session Laws of Hawai`i 2007, Requiring a Report by the Maui Health Initiative Task Force; and
8. Superintendent's 19th Annual Report on Hawai`i Public Education, December 2008.

[1] PlanPacific, Inc. (October 2007). *Economic Development Issue Paper, Island of Maui, Maui County General Plan 2030.*
[2] Includes both full- and part-time jobs. An individual may hold two jobs or more, as a wage and salary employee and/or as a self-employed person.
[3] Maui Economic Development Board, Inc. (October 2010). *County of Maui Comprehensive Economic Development Strategy.*



Haleakalā Observatories, Haleakalā Crater.

ECONOMIC DIVERSIFICATION

Diversifying Maui's economy has been a key, longstanding County goal. A move toward a more diversified economy will create more resilience and reduce Maui's reliance on tourism and its consequent vulnerability to fuel costs and external economic conditions. Diversification may also reduce the island's dependence on construction for the visitor and off-island housing markets, thereby reducing demand on the island's natural resources. Economic diversification will provide a broader spectrum of job opportunities, including high-skill and higher-paying jobs, thereby increasing jobs that pay a living wage.

In addition to attracting high-technology industries and supporting the expansion of agriculture, recent diversification efforts have focused on potential growth sectors such as local agriculture, sports and recreation, education, health care, film and entertainment, and energy production using renewable resources.

Comprehensive planning for economic development in Maui County has been led by a strong collaboration between the County government and the Maui Economic Development Board, Inc. (MEDB). Current policy recommendations are stated in the 2010 CEDS, which MEDB prepared for the Office of Economic Development. The CEDS drew upon focus group meetings, as well as two prior efforts that incorporated extensive community participation: the Focus Maui Nui project and the 2004 Mayor's Economic Summit.

CHALLENGES AND OPPORTUNITIES

The island of Maui, like the County as a whole, faces two fundamental challenges in economic development: (1) diversification; and (2) increasing the number and proportion of living wage jobs. There is a subset of more specific challenges, such as the high cost of housing and the need to strengthen public education. These challenges are described in the 2010 CEDS and are summarized below.

Improve the Island's Business Climate

- **Affordable Housing.** Substantially increased housing costs since 2001 have negatively impacted the quality of life for residents and pose a barrier to attracting and retaining skilled workers in fields from high technology to agriculture.
- **Education and Workforce Development.** The 2010 CEDS focused on the need to train Maui's residents to qualify for high-skill jobs and the related need to improve the public education system.
- **Infrastructure Development.** The 2010 CEDS cited water, road, and air transportation systems as particular areas of concern in the 2010 CEDS planning process. More recently, the capacity of Kahului Harbor has emerged as a major concern.
- **Business Climate.** Maui struggles with an unpredictable business environment. The cost of land, labor, and shipping are high compared to many of the island's mainland and overseas competitors. Maui also has regulations that are intended to protect the island's cultural and natural resources, but these regulations increase business costs. Streamlining government permitting requirements for projects in targeted industries will support new opportunities and make development decisions more predictable, cost effective, and feasible.

Limited Economic Diversification

The *Maui County Tourism Strategic Plan: 2006-2015* (Maui County TSP) states that, among the four counties, Maui is the most reliant on tourism. Of Maui County's Gross County Product, 39 percent is attributed to tourism, versus a range of 19 to 29 percent for the other counties.[4] A large proportion of jobs in Maui County are low-wage jobs, many of them tourism-related. Most households are supported by individuals with two or more jobs.

The importance of the visitor industry to the island's economy is illustrated by the

[4] Hawai`i Tourism Authority (2006). *Maui County Tourism Strategic Plan: 2006-2015*.

proportion of jobs by industry. In Maui County, according to data provided by the Hawai`i Department of labor and Industrial Relations (2007), the accommodations and food services industry accounts for the largest proportion of jobs – 29 percent of all wage and salary jobs. This is nearly double the statewide proportion of 15 percent. Retail trade, also driven substantially by tourism, is second at 13 percent of all wage and salary jobs.

The Maui Island Plan recommends a shift in thinking about economic success. It suggests that we no longer measure economic vitality solely by statistics such as the number of building permits issued or growth in tax revenue, but by much more balanced sustainability indicators. In the community workshops discussing the General Plan update, residents stressed a desire to keep economic priorities in balance with the environment and community.

The *Hawai`i 2050 Sustainability Plan* focuses on the triple bottom line approach. The Plan notes that the goals of economic prosperity, social and community well-being, and environmental stewardship should be considered equally important and interdependent.

Increase Sustainability

Diversified agriculture and knowledge- and innovation-based industries such as high technology, film and digital media, health care, and biotechnology are promising industries that can provide a foundation for building a sustainable economy. While the private and public sectors have made great strides and investments in these areas, it is vital to sustain and increase these efforts if we are to fundamentally transform our economy.

A diversified economy would still provide for growth of the tourism sector, but the other sectors would grow at a higher rate.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

4.1 Maui will have a balanced economy composed of a variety of industries that offer employment opportunities and well-paying jobs and a business environment that is sensitive to resident needs and the island's unique natural and cultural resources.

Objective:

4.1.1 A more diversified economy.

Policies:

4.1.1.a Encourage an economy that is driven by innovation, research and development, and human resource development, including but not limited to, increasing technology- and knowledge-based sectors to be a major component in Maui County's economic base.

4.1.1.b Support the creation of new jobs and industries that provide a living wage.

4.1.1.c Facilitate and expedite permits and approvals.

4.1.1.d Develop linkages and partnerships among international research and development activities and Maui businesses.

Objective:

4.1.2 Increase activities that support principles of sustainability.

Policies:

4.1.2.a Support industries that are sustainable, and culturally and environmentally sensitive.

4.1.2.b Encourage and support local businesses.

4.1.2.c Substitute imports with locally-produced services and products where practicable.

4.1.2.d Support the development of economic development clusters in targeted industry sectors.

4.1.2.e Encourage all businesses to save energy, water, and other resources.

Implementing Actions:

4.1.2-Action 1 Regularly study market trends with the intent to attract new industries that are environmentally/culturally appropriate for Maui.

4.1.2-Action 2 Develop programs that brand all locally produced services and products or devise other measures to achieve import substitution.

4.1.2-Action 3 Create a database of imports suitable for substitution by locally produced services and products and annually report on progress made towards import substitution.

Objective:

4.1.3 Improve the island's business climate.

Policies:

4.1.3.a Upgrade, maintain the quality of, and improve access to telecommunications infrastructure.

4.1.3.b Ensure an adequate supply of affordable workforce housing.

4.1.3.c Develop neighborhoods and communities that are attractive to the workforce of a diversified economy.

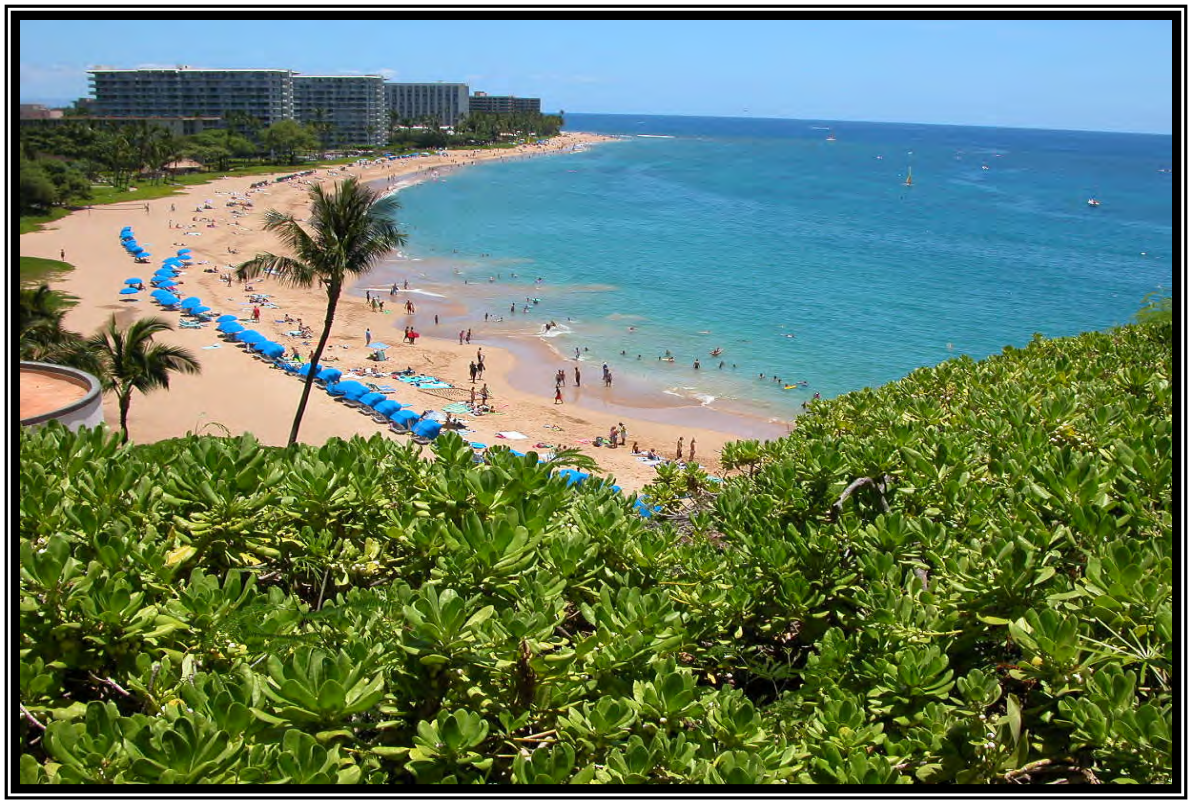
4.1.3.d Encourage, nurture, and reward entrepreneurship and innovation.

4.1.3.e Encourage employers to establish incentive programs. Support flexibility in workforce policies compatible with business and quality of life goals.

4.1.3.f Assist community development organizations with revitalization and development of neighborhoods and communities that are attractive to the workforce of a diversified economy.

Implementing Action:

4.1.3-Action 1 Develop and implement innovative land use tools, public/private transportation incentives, and flexible business practices to reduce travel costs and job trips.



Kā`anapali Beach.

TOURISM

The visitor industry serves as Maui County's economic engine, generating more than 80 percent of the County's economic activity. Tourism also provides 75 percent of all private sector jobs on Maui and contributes approximately 40 percent of real property tax collections. The $3 billion in annual visitor spending significantly boosts nearly all sectors of Maui County's economy. The leisure and hospitality sector is comprised of accommodations, arts and entertainment, and food service industries. Indirectly, the sector generates considerable activity and employment in other industries such as small businesses, agriculture, retail, health services, commerce, construction, and real estate. The Maui County TSP states

that Maui's economy is the most reliant on tourism among the four counties. Therefore, significant care must be taken to nurture a healthy and vibrant visitor industry.

The Hawai`i Tourism Authority (HTA) is the lead agency and advocate for Hawai`i's tourism industry. Funded through the Transient Accommodations Tax (TAT), the HTA oversees marketing Hawai`i as a visitor destination, invests in "product development," and carries out research and planning. In marketing, HTA funds the Hawai`i Convention and Visitors Bureau and the Maui Visitors Bureau, as well as other agencies to promote Hawai`i in international markets.

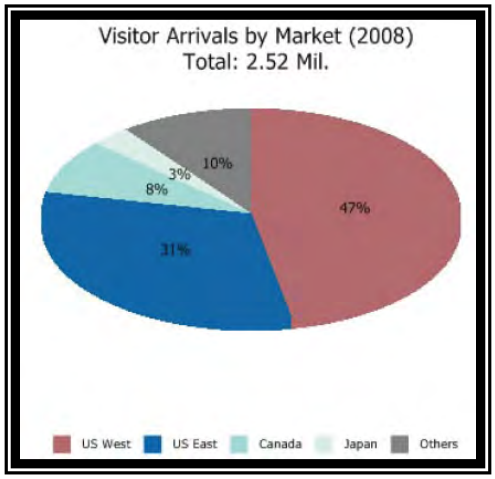


Figure 4 - 1. Visitor Arrivals by Market.
Source: UHERO Economic Information Service.

The County has a more limited role in tourism planning. It receives a portion of the TAT from the State, which currently accounts for approximately 7 percent of its General Fund revenues and is the County's second largest source of revenue. The County's principal role involves regulation of land uses, including visitor units and related recreational real estate, in addition to commercial attractions. It is envisioned that Maui will play a more active role in tourism planning through the County's Office of Economic Development and other agencies that play a supporting role in job creation and economic growth.

The Maui County TSP is one of four county-level Strategic Tourism Plans prepared under the auspices of the HTA. The County plans are intended to provide specific guidance, and build on the themes and policies set forth in the statewide Hawai`i Tourism Strategic Plan. In the plan, the "Maui County Tourism Goal" is stated as follows:

> ***To strategically manage tourism on Maui, Moloka`i, and Lāna`i in a sustainable manner that promotes economic well-being, quality of life for residents, preservation of natural and cultural resources, and quality experiences for visitors.***

CHALLENGES AND OPPORTUNITIES

Maui is one of the most desired visitor destinations in the world. However, tourism is highly dependent on the subjective and variable interests of global markets. Maintaining the strength of the visitor industry by keeping Maui a desirable destination for visitors, and home for residents, will be a critical challenge.

Attract Higher-Spending Visitors and Promote Diversification

The goal of the visitor industry should be to continue to promote visitor revenue and attract higher-spending visitors that address and complement the needs and goals of the local communities.

The relationship between the number of residents and visitors on the island at any given time cannot be overlooked as an important public policy discussion point. Resort communities all around the world that are dependent on tourism have grappled with the "golden goose" debate, whereby the tourism experience may be compromised by the very nature of the area's popularity.

The visitor industry continues to provide opportunities for small, locally-owned businesses to provide goods and services to the industry. The visitor sector supports both the State and Maui County Tourism Strategic Plans that place significant emphasis on attracting higher-spending visitors. The visitor industry continues to market to a well-balanced and diversified visitor demographic. A diversity of visitors

will provide new market opportunities and help the industry recover from downturns.

A cruise ship docked in the harbor, Kahului.

Manage the Expansion of Visitor Units

Promoting cross-related enterprises in the arts and entertainment, sports and recreation, and education sectors can strengthen small, locally-owned businesses. Particular opportunities lie in agri-tourism, eco-tourism, educational tourism, heritage tourism, voluntourism, and health and wellness tourism. Developing strategies to reduce the leakage of the expended tourist dollar out of Maui is an important way to increase the economic benefit of tourism for Maui.

To protect the quality of Maui's visitor industry, and the island lifestyle, the County must carefully manage and control any future expansion of visitor units on Maui island.

Maui's visitor industry is diversifying from one dominated by hotels to one with a mix of visitor unit types.

Alternative forms of tourism, such as timeshare, resort condos, second homes, cruise ships, vacation rental homes, bed and breakfasts (B&Bs), and other types of visitor accommodations, have social, fiscal, and economic implications that need to be understood, monitored, and managed.

The conversion of housing from long-term residential use to transient-vacation-rental use raises a number of potential issues including, loss of community due to the transient nature of neighborhoods, disruptions such as overflow parking or partying, purported avoidance of the TAT by some operators, loss of residential housing stock to visitor use, and higher residential property taxes.

Concerns have also been raised about the gentrification of Maui neighborhoods, the proliferation of gated communities, and the allocation of scarce resources, such as water, to developments targeted to offshore buyers.

However, alternative tourism accommodations also diversify Maui's visitor accommodations portfolio, and provide an alternative to the large-scale, coastal resort experience. These accommodations generate more economic activity per dollar spent, provide opportunities for small business creation and entrepreneurship, and provide accommodation opportunities for Maui residents and visiting family members.

The identified need for additional visitor facilities in the late 1950s gave birth to the concept of the resort destination area, and in 1961 Kā`anapali became the first planned resort destination area in the State. The resort destination area trend continued to grow on Maui with the subsequent development of Wailea and Kapalua.[4] Per previous General Plans, it has been County policy to limit large-scale resort development to the defined resort destination areas of Wailea, Mākena, Kapalua, and Kā`anapali. The tremendous contribution that tourism makes to our economy must be acknowledged with careful management and diversification so that the tourism sector will continue to grow in a manner that addresses the issues that have been raised.

The visitor industry continues to provide Maui residents with many economic opportunities. The industry generates the most tax revenue and employs more residents than any other industry. Many Maui residents benefit from the industry.

Over the years, it has been County policy to maximize the economic benefit**s** of the visitor industry by attracting higher-spending visitors rather than maximizing the number of visitors to the island. This policy ensures a rich visitor experience while protecting the island's natural beauty, culture, island lifestyles, and aloha spirit.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

4.2 A healthy visitor industry that provides economic well-being with stable and diverse employment opportunities.

Objective:

4.2.1 Increase the economic contribution of the visitor industry to the island's environmental well-being for the island's residents' quality of life.

Policies:

4.2.1.a Engage the visitor industry in the growth of emerging sectors where practicable.

4.2.1.b Support the implementation of the Maui County TSP, when consistent with the MIP.

[4] Chris Hart & Partners (September 2006). *General Plan 2030, Maui Island Plan, Maui Island History: Lessons from the Past – A Guide to the Future.*

4.2.1.c Focus economic growth in the visitor industry through enhanced visitor experiences and an emphasis on attracting higher-spending.

4.2.1.d Provide a rich visitor experience, while protecting the island's natural beauty, culture, lifestyles, and aloha spirit.

4.2.1.e Diversify the tourism industry by supporting appropriate niche activities such as ecotourism, cultural tourism, voluntourism, ag-tourism, health and wellness tourism, educational tourism, medical tourism, and other viable tourism-related businesses in appropriate locations.

4.2.1.f Recognize the important economic contributions that the visitor industry makes and support a healthy and vibrant visitor industry.

4.2.1.g Support the increased availability of kama`āina discount programs.

Implementing Actions:

4.2.1-Action 1 Conduct and regularly update an impact assessment (social, economic, and environmental) of the costs and benefits of mega-resort, timeshare, vacation rental, and other types of visitor accommodations.

4.2.1-Action 2 Seek additional revenues to offset the potential loss of HTA funds that will help support niche activities.

4.2.1-Action 3 Develop a yearly performance report to the Maui County Council that describes the returns resulting from expenditures of public funds/grants that are awarded for the visitor industry.

Objective:

4.2.2 Comprehensively manage future visitor-unit expansion.

Policies:

4.2.2.a Mitigate the impact of tourism on the host culture, natural environment, and resident lifestyles.

4.2.2.b Allow, where permitted by the community plan, the development of business hotels and small, sensitively-designed inns.

4.2.2.c Manage impacts from transient vacation rentals, hotels, bed and breakfast units, timeshares, and resort condominiums on residential communities, public infrastructure, and community facilities.

4.2.2.d Discourage supplanting of existing island housing to visitor accommodations that may have a negative impact on long-term rental housing, price of housing, and price of land.

4.2.2.e Allow the designation of retreat/mini-conference centers in appropriate locations through the community plan process.

4.2.2.f Community plans should consider establishing standards such as limits on building size, room count, and the number of inns, if any, that will be allowed in small towns.

Implementing Actions:

4.2.2-Action 1 Manage transient vacation rentals through permitting in accordance with adopted regulations and community plan policies.

4.2.2-Action 2 Work cooperatively to establish a comprehensive set of resource management standards, including protection of Native Hawaiian rights and certification programs for ecotourism.

4.2.2-Action 3 Develop programs and/or regulations to:

(1) Allow for the development of small, locally-owned inns and B&Bs in the commercial cores of Maui's country towns and business districts if permitted, and as defined in the community plans;

(2) Cap the number and type of visitor accommodations that can be permitted; and

(3) Manage the number and type of visitor accommodations that can be permitted.

4.2.2-Action 4 Develop design guidelines for small, locally-owned inns, retreat centers, and like-kind accommodations.

Objective:

4.2.3 Maximize residents' benefits from the visitor industry.

Policies:

4.2.3.a Promote a desirable island population by striving to not exceed an island-wide visitor population of roughly 33 percent of the resident population.

4.2.3.b Use the required General Plan Annual Status Report to monitor trends related to residents and visitors.

Fresh produce. Kula.

AGRICULTURE

Agriculture on Maui consists of large, land-extensive activities (plantation crops and cattle-grazing) and labor-intensive small farming. Agricultural enterprises range from subsistence farming to corporate-owned plantations. Products include plant crops, livestock products, and aquaculture. In terms of acreage, sugar and pineapple continue to be Maui's leading crops. In terms of value, seed corn is the leading crop. One sugar plantation remains in the State, Hawaiian Commercial & Sugar Company (HC&S). Currently, wage and salary jobs in agriculture have declined as plantations have closed or become more efficient.

In 1984, the County had 3,700 agricultural jobs. By 2005, the number of wage and salary jobs in agriculture dropped to 1,600, only 2.3 percent of all Maui County jobs.[5] By 2009, they dropped to 2.2 percent of all Maui County jobs.

Planning for agriculture generally focuses on a specific issue, crop, or project. Between 2002 and 2003, the Maui County Farm Bureau, Inc. (Farm Bureau) engaged in a strategic planning process with support from the Mayor's Office of Economic Development. This resulted in the preparation of the *Maui Agricultural Strategic Plan* (2003). The Strategic Plan sets forth a vision and a set of initiatives, as well as more detailed implementation steps. In July 2009, the Farm Bureau, in cooperation with the Office of Economic Development, produced the *Maui Agricultural Development Plan*.

CHALLENGES AND OPPORTUNITIES

Achieving Food and Energy Self-Sufficiency

Each agricultural industry confronts its own unique challenges and opportunities that fluctuate with market and biological influences. Most of the challenges and opportunities discussed pertain to small farms. Large corporate landowner/ agricultural producers such as HC&S confront different sets of challenges and opportunities.

Workers harvest cabbage, Kula.

Increasing local consumption of Maui agricultural goods is a long-term opportunity for stabilizing and expanding agriculture. Besides economic benefits to farmers, substituting locally-produced food for imports could allow Maui to become more self-sufficient. Success will involve a commitment by Maui residents, businesses, and institutions to buy locally-produced food; grocers to contract with local farmers; and government to provide land, water, and tax incentives to support critical industries and crops.

It is estimated that 85-90 percent of food consumed in Hawai`i is imported.[6] The globalization of food production and processing poses a challenge to exports and imports. Plantation agriculture and the export of sugar and pineapple have declined because crops can be grown and food products can be processed at lower cost overseas.

[5] State of Hawai'i, Department of Business, Economic Development and Tourism (various years). *State of Hawai'i Databook.*
[6] State of Hawai`i, Department of Agriculture (December 2008). *Food Self-Sufficiency in Hawai`i.*

There are many opportunities for Maui's farmers and food manufacturers to expand their sales of natural and organic foods. Supporting the establishment of farmers markets, pick-your-own farms, community gardens, and other community-supported agricultural programs will provide alternative market channels to expand sales of locally grown and manufactured organic products.

Increase Agriculture's Role in the Island Economy

Growing crops that can be processed to generate electrical power or to make fuel will provide agricultural jobs, utilize agricultural lands, and make Maui more energy self-reliant.

Locally grown cabbage, Kula.

The economic feasibility of energy crops for biofuels depends largely on factors in the sugar and oil markets, and alternative uses for land. Only land zoned for agriculture is likely to be available for energy crops. Market forces appear to be working in favor of biofuel development on Maui. Potential synergies and trade-offs between dedicating land to biofuel crops for automotive fuels versus utility-scale power generation should be further examined. Potential areas identified for biomass energy crop production include former Lahaina plantation land; HC&S land in Pā`ia; and HC&S land in Pu`unēnē. Potential also exists on Upcountry ranch lands.

If agriculture on Maui is to be economically viable, the State and County will need to ensure that farmers have access to sufficient supplies of affordable water. Water rates must be implemented that encourage conservation and provide affordable water to farmers. The community will need to invest in the maintenance and construction of water system infrastructure including storage, transmission, and treatment.

The availability of transportation to markets outside of and on Maui affects the economic viability of many agricultural enterprises. Some industries, such as cut flowers, rely heavily on airline shipping to the mainland. Fruit and vegetable farmers ship to Oahu by way of the inter-island barge. Transportation costs can be a significant part of the farmer's overall cost of doing business.

The issues of pest control and invasive species pose different problems for exporters of Hawai`i products and for importers of food and agricultural materials. Exporters face rigorous controls to prevent the spread of pests and alien species to mainland and export markets. These controls can increase the cost of Maui products and halt their export altogether. The introduction of pests and alien species is also a threat to Maui agriculture. Unless agricultural inspection services are sufficiently funded and implemented, enlarging transportation facilities and adding direct connections from foreign and domestic ports can increase Maui's vulnerability to pests and alien species.

HC&S, a subsidiary of Alexander & Baldwin, Inc., is Maui's largest agricultural business with over 900 employees. HC&S grows sugarcane on 37,000 acres of land in Central and East Maui, and utilizes and maintains the State's most extensive surface water system. HC&S plans to continue to grow sugarcane and seeks to increase profitability by developing value added products such as its Maui Brand Natural Cane Sugar. HC&S has also expressed an interest in expanding biofuel production to meet Maui's demand for renewable energy.

Expand Diversified Agriculture Production

For agriculture to flourish in Central Maui, reliable and affordable supplies of water will need to be made available to the region. Without an adequate supply of affordable water, farmers may be reluctant to invest capital in agricultural production.

Processing facilities are needed to prepare export crops for shipping and to enable small businesses to make value-added products. With aid from the County, the Maui Flower Growers Association has considered the development of a facility for de-infestation of tropical flowers and other commodities. The cultivation of kalo and other principal and traditional Hawaiian foods is increasingly supported and is linked closely to self-sufficient stewardship of natural resources through hard work. Even with the right crops and ample land and water, agriculture will not expand without attracting additional farmer-entrepreneurs and laborers. Today's farm operators are aging, and their children are typically choosing other occupations. The high cost of farm labor presents a challenge towards providing affordable locally-grown food. Training and education can improve the number of men and women prepared to run farming operations. The Maui Agricultural Strategic Plan calls for more educational programs for farmers in subjects such as record-keeping, marketing, and business planning. The 2010 CEDS recommends expanding the agricultural education in Maui's schools (K-12 and beyond) to attract young people to the agriculture sector and to improve farm succession planning.

Researchers at the University of Hawai`i have identified several "star" industries, including aquaculture, herbs, seed crops, vegetables and melons, floriculture, and nursery products. Maui County has seen growth in these crops – particularly in vegetables and fruit and floriculture/nursery products.

Maui's share of diversified crop production, especially in the area of vegetables and fruits, has declined with increasing competition from mainland and Oahu producers and because of high shipping costs. Since the closing of Haleakalā Dairy, Maui no longer has a major producer of fresh milk and dairy products.

The quality of Maui's agricultural lands and favorable climate provide the island with an intrinsic competitive advantage that offsets, to some extent, the high cost of production. Maui is in a relatively good position to participate in the expansion of the production of seed crops worldwide.

Agricultural tourism is a growing sector, with on-farm sales, recreational activities, and other retail sales providing the largest amounts of revenue. An example is Haleakalā Ranch, which offers horseback riding, all-terrain vehicle riding, and zip-line activities. Streamlining zoning and permitting for ag-tourism businesses that supplement the income of farming activities could be one way to encourage the growth of this sector.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

4.3 Maui will have a diversified agricultural industry contributing to greater economic, food, and energy security and prosperity.

Objective:

4.3.1 Strive for at least 85 percent of locally-consumed fruits and vegetables and 30 percent of all other locally-consumed foods to be grown in-State.

Policies:

4.3.1.a Strive to substitute food/agricultural product imports with a reliable supply of locally-produced food and agricultural products.

4.3.1.b Facilitate and support the direct marketing/sale of the island's agricultural products to local consumers, through farmers markets and similar venues.

4.3.1.c Encourage growing a diverse variety of crops and livestock to ensure the stewardship of our land while safeguarding consumer safety.

4.3.1.d Work with the State to regulate and monitor genetically-modified-organism (GMO) crops to ensure the safety of all crops and label all GMO products.

Implementing Actions:

4.3.1-Action 1 Encourage the development of community gardens, including gardens on greenbelts that separate communities.

4.3.1-Action 2 Establish benchmarks to monitor progress towards achieving island-wide food self-sufficiency.

4.3.1-Action 3 Propose revisions to the zoning ordinance to allow the direct marketing of the island's agricultural products through farmers markets, "pick-your-own" farms, farm stands, and similar venues.

Objective:

4.3.2 Maintain or increase agriculture's share of the total island economy.

Policies:

4.3.2.a Encourage the export of the island's agricultural products to offshore markets.

4.3.2.b Support infrastructure investments at harbors, such as ferry service, airports, and other facilities for the rapid and cost-effective export of island-grown products.

4.3.2.c Encourage the continued viability of sugar cane production, or other agricultural crops, in central Maui and all of Maui Island.

4.3.2.d Work with the State to reduce excise taxes for commercial agricultural products produced within the State.

4.3.2.e Coordinate with appropriate State and Federal Departments and agencies, private shipping companies, and farmers associations to assist in the rapid and cost-effective export of Maui's agricultural products to off-island markets.

Implementing Actions:

4.3.2-Action 1 Bi-annually update the Maui Agricultural Development Plan to provide strategic direction for the expansion of agriculture on Maui and to determine ongoing direct and indirect benefits of agriculture on Maui.

4.3.2-Action 2 Increase staffing within the Office of Economic Development to promote agricultural development, as financially feasible.

Objective:

4.3.3 Expand diversified agriculture production at an average annual rate of 4 percent.

Policies:

4.3.3.a Promote the development of locally-grown and ecologically-sound biofuels, aquaculture, and forest products.

4.3.3.b Support the development of farming associations/cooperatives.

4.3.3.c Work with educational institutions and appropriate agencies to provide education and training for farm owners and entrepreneurs.

Implementing Actions:

4.3.3-Action 1 Implement the Maui Agricultural Development Plan (July 2009) and its updates, when consistent with the MIP.

4.3.3-Action 2 Develop a program to expand the seed crop industry consistent with safe GMO practices.

Kaheawa Wind Farm, Mā`alaea.

EMERGING SECTORS

Our national economy is moving from a post-industrial economy to one that is based on innovation and knowledge. Maui's geographic isolation presents challenges to almost any business trying to become established on the island. The isolation factor often increases costs and can be a barrier to obtaining necessary financing, business supplies, and equipment. On the other hand, Maui is in a highly strategic location between the mainland U.S. and Asia, creating a natural gateway between these two high technology markets. Another competitive advantage of Maui's mid-Pacific location is the flexibility provided by Hawai`i's time zone, which allows Maui companies to conduct business with Asia and the U.S. East Coast in the same business day.

In 2005, Maui's technology industry earned an estimated $145 million.[7] In recent years, high technology's contribution to the island's economy has increased, and the average wage for jobs in the technology sector surpassed Maui's living wage standard.[8] Wages within the technology industry are highly competitive with other industries, providing Maui's workforce with new opportunities for highly skilled and well-paid employment. The average salary per year paid to high technology workers in 2005 was $60,000 to $70,000.[9] Statewide, wages in the technology sector in 2005 were 66 percent above the average for the private sector as a whole.[10]

Employment in Maui's technology sector grew almost 20 percent between 2002 and 2007 (an annual rate of 3.7 percent), outperforming the statewide (and national) average. By 2007, an estimated 163 technology companies were operating on Maui, with a total workforce of 1,886, or almost 2 percent of the total workforce. The average technology company on Maui has 12 workers. Many of the sector's jobs are concentrated in the information, communications, and defense/aerospace markets. Environmental sciences, agricultural biotech, ocean science, and renewable energy are additional sectors that have shown significant growth potential. Since the birth of Maui's high technology sector in the early 1980s, total employment, annual earnings, and average employee wages have all increased.

The success of the high technology industry depends on the presence of several key factors. In mainland regions such as Silicon Valley, Research Triangle, and Route 128, where high technology has been extremely successful, the following key factors are present and provide essential support for the industry:

- High quality of life;
- Intellectual infrastructure such as universities and public or private research laboratories that generate new knowledge and technologies;
- Mechanisms for transferring knowledge between companies;
- Physical infrastructure such as high quality telecommunication systems;
- Highly skilled technical workforce;
- Sources of risk capital; and
- Entrepreneurial culture.[11]

CHALLENGES AND OPPORTUNITIES

High Technology and Knowledge Based Sectors

High technology is a driving force in the global economy. Thus it is important for Maui to support and expand its technology sector to be globally competitive and maintain a strong economic base. The technology sector includes a wide range of employment opportunities and requires a workforce with an array of skill sets. Clusters of niche technology industries allow related companies to draw productive advantage from their mutual proximity and connections. Maui has the opportunity to support the growth and development of clusters around key technology niches such as biotechnology, astronomy, space surveillance, ocean sciences, and disaster mitigation. Due to Maui's year-round growing season, biotechnology has the potential of becoming a big player in the island's high technology industry.

[7] Maui Economic Development Board, Inc. (July 1, 2004 – June 30, 2005). *Annual Report on Operations*.
[8] Office of Economic Development, County of Maui (October 2010). *County of Maui Comprehensive Economic Development Strategy*.
[9] Maui Economic Development Board, Inc. (July 1, 2004 – June 30, 2005). *Annual Report on Operations*.
[10] Department of Business Economic Development and Tourism (October 2006). *DBEDT e-Reports; Hawai`i's Technology Sector: 2001 – 2005*.
[11] U.S. Department of Commerce, Economic Development Administration (August 2006). *A Resource Guide for Technology-based Economic Development.*

Additionally, with Haleakalā's elevation and high quality visibility, space surveillance is another industry niche with considerable growth potential. Growth of this industry niche also depends on continuing cooperation with the University of Hawai`i Astronomy Program. While it is unlikely that high technology will become a dominant industry on Maui in the near future, the industry will continue to be a growing economic sector which is vital to the diversification of the island's economy and the provision of quality employment and education opportunities for residents.

An example of research potential, Kula.

Access to high technology infrastructure such as advanced telecommunications systems and affordable high speed internet connections is imperative to facilitate the growth of the technology industry. Maui is highly equipped in this aspect with a diversified network of trans-Pacific high-bandwidth telecommunications and a sophisticated satellite communications system. Maui must overcome the following challenges to succeed in the high technology and innovation sector:

- **Shortcomings of (K-12) Public Education.** The State will need to significantly increase its investment in the State's public school system if Hawai`i's students are to have a strong educational foundation that will allow them to compete for high technology jobs on Maui.
- **Lack of Postgraduate Education.** Studies have demonstrated that research and development institutions, including research universities, play a major role in supporting and enhancing a robust technology-oriented private sector.[12] Maui's lack of postgraduate educational opportunities in math, science, engineering, and technology present a significant challenge to advancing the high technology industry. Opportunities exist to partner with leading research universities to establish satellite campuses on Maui oriented around Maui's emerging sectors.
- **High Cost of Living.** Maui's high cost of living and shortage of affordable housing create barriers to attracting and retaining the skilled workforce needed by many high technology industries.

[12] U.S. Department of Commerce, Economic Development Administration (August 2006). *A Resource Guide for Technology-based Economic Development.*

Media and Sports & Recreation

Maui County established the Maui County Film Office in 1994, under the auspices of the Office of the Mayor in the Office of Economic Development. The Office's mission statement was as follows: "To market and highlight the positive reasons Maui should be considered as a prime location for film, television, stills, documentaries, reality television, commercials and multi-media productions. The promotion of our island further showcases its beauty and venues available to produce quality programming."

Pacific Biodiesel, Kahului.

Often, many of Maui's signature sporting events are funded with a combination of private, state, and county dollars – and are broadcast to a national audience. Most of these events showcase our islands in the process. Many of the sporting events held in the County require assistance from the Department of Parks and Recreation and also receive promotional support from the Maui Visitors Bureau via County funding.

On January 31, 2008, Governor Lingle signed a Memorandum of Understanding with the U.S. Department of Energy for the Hawai`i-DOE Clean Energy Initiative.

The goal of the initiative is to decrease energy demand and accelerate the use of renewable, indigenous energy resources so the State will meet 70 percent of its energy demand through clean, renewable energy sources by 2030.

Renewable Energy Development and Use

Renewable energy can grow new local industries, provide jobs and income for the people of Maui County, and protect the environment, which is also the basis of Maui's economy. According to the U.S. Department of Energy, "renewable" energy sources include biomass, hydroelectric, geothermal, solar, wind, ocean thermal, wave action, and tidal action. Renewable energy development will be critical to help the State of Hawai`i and Maui County reduce energy costs, avoid the negative economic effects of volatile oil prices, reduce overdependence on oil, and increase energy security by reducing imports.

Several studies from across the country suggest that renewable energy is a significant potential source of employment in a wide range of sectors including agriculture, engineering, manufacturing, chemistry, construction, information technology, communications, sales/marketing, and business services.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

4.4 A diverse array of emerging economic sectors.

Objective:

4.4.1 Support increased investment and expanded activity in emerging industries.

Policies:

4.4.1.a Support the development of and access to state-of-the-art voice, video, and data telecommunications systems and high-speed Internet.

4.4.1.b Attract and assist industries to compete in high technology activities such as those related to renewable energy, green technologies, diversified agriculture, ocean sciences, health sciences, space technologies, and other knowledge-based industries.

4.4.1.c Support new industries that are environmentally and culturally sensitive such as health and wellness, sports and outdoor activities, cultural activities, the arts, film-making, entertainment, and digital media.

4.4.1.d Support a sustainable, culturally sensitive, astronomy industry.

4.4.1.e Support the continued development of the Maui Research and Technology Park in Kihei, as a center for research and development, education, and diversified economic development, as provided by the Maui County Code.

4.4.1.f Work with appropriate organizations to support the development of high technology clusters around renewable energy, diversified agriculture, ocean sciences, health sciences, and other knowledge-based industries.

Implementing Actions:

4.4.1-Action 1 Develop streamlined permitting procedures for emerging industries.

4.4.1-Action 2 Prepare a list of environmentally and culturally sensitive and appropriate industries that would potentially benefit Maui as listed in the updated CEDS report.

Objective:

4.4.2 Increase the development of renewable energy technologies that are supported by the local community.

Policies:

4.4.2.a Support the expansion of the renewable energy sector and the use of solar, wind, wave, and biofuel technologies.

4.4.2.b Provide incentives to encourage renewable energy development, the use of green energy technologies, and energy conservation.

4.4.2.c Ensure an adequate supply of land and facilitate permitting to meet the needs for renewable energy technologies such as solar, wind, wave, biofuel, and other technologies, provided that environmental, view plane, and cultural impacts are addressed.

4.4.2.d Support the Maui County Energy Alliance Plan where consistent with the MIP.

Implementing Actions:

4.4.2-Action 1 Publicize renewable energy production opportunities to potential investors.

4.4.2-Action 2 Support the implementation of a wheeling tariff.

4.4.2-Action 3 Develop plans, programs, and incentives to:
(1) Attract/strengthen/retain renewable energy businesses; and
(2) Assist businesses and homeowners to obtain/install/use solar, wind, and other forms of renewable energy facilities.

4.4.2-Action 4 Implement the goals and objectives of the Maui County Energy Alliance Plan where consistent with the MIP and financially feasible.

Ching Store, Kēōkea.

SMALL BUSINESS DEVELOPMENT

Small businesses are the backbone of Maui County's economy. According to the 2004 CEDS, 88 percent of Maui firms employ fewer than 20 people. The State DBEDT estimates that the County has an additional 15,000 self-employed jobs that are not included in the official labor force data.[13] Small businesses with an average of 12 employees each account for about 3,500 business establishments on Maui. Supporting efforts to increase the local production and consumption of goods and services can significantly strengthen the economy as money recycles within the community instead of leaking out of the community to off-island interests. Aligning small businesses with County economic goals and assisting small and micro businesses with access to financial markets is one important component of economic diversification.

[13] DBEDT (2009). Includes both full- and part-time jobs. An individual may hold two jobs or more, as a wage and salary employee and/or as a self-employed person.

The County partners with many organizations and committees that support small business efforts, including the MEDB; the Made in Maui Trade Council of the Maui Chamber of Commerce; the Workforce Development Council; the Maui County Workforce Investment Board; the Tri-Isle Resource Conservation and Development Council, Inc.; the Maui Rural Development Project; the Moloka`i Chamber of Commerce; the Moloka`i Enterprise Community; the Maui Economic Opportunity (MEO) Business Development Corporation; and Lōkahi Pacific.

There are about 71,600 wage and salary jobs on Maui.[14] To maintain a growing and healthy economy, Maui will have to substantially increase its rate of new business formation over the next 10 years. According to the Maui Chamber of Commerce, Maui needs up to 10,000 new jobs in businesses that are not dependent on tourism.[15] Most new businesses are small businesses, and small businesses create the majority of new jobs. However, according to the Maui Chamber of Commerce, approximately 80 percent of new businesses fail within the first 5 years of operation.[16]

CHALLENGES AND OPPORTUNITIES

National Economic Cycles

The success of small firms depends on multiple factors, including access to financial markets, a talented employment pool, efficient delivery and transportation systems, and effective marketing options. Maui's small businesses are highly vulnerable to national economic trends and business and tourism cycles. Retailing, accommodations, and service sectors are dependent on a vibrant visitor industry.

High Start-up and Operating Costs

Hawai`i has consistently received poor ratings as a place to conduct business. According to Chief Executive Magazine's 2009 survey of the best states in which to do business, Hawai`i ranked 41st of 50 states. Hawai`i is a very difficult place to do business due to its geographic isolation, high cost of living, and the high cost of doing business.

Calasa Service Station, Kula.

[14] PlanPacific Inc. (October 2007). *Economic Development Issue Paper, Island of Maui, Maui County General Plan 2030.*
[15] Maui Chamber of Commerce (October 2009). *The Maui Website, Maui Chamber of Commerce.*
[16] Id.

The cost of worker's compensation is a primary concern of Hawai`i employers, where small employers account for over 90 percent of employer firms.[17] In a 2007 national study by the State of Oregon, Hawai`i was ranked 3rd highest in the nation in terms of the dollars Hawai`i employers pay for worker's compensation for every $100 of payroll.[18]

Another significant challenge is the cost of health care. A 2008 study estimates that by 2016 the average cost of family employer-sponsored health insurance will top $16,679, an increase of 77 percent from 2006 premium costs.[19] In Hawai`i, this would mean that family health insurance would consume 22.7 percent of the projected Hawai`i median family income. It is estimated that small businesses pay health care premiums that are 18 percent greater than larger companies.[20]

Niche Opportunities

Several sectors have demonstrated recent strong performance such as the renewable energy sector, health and wellness industries, and to a limited degree, diversified agriculture. Maui's wealth of natural resources, ideal environmental attributes, and year-round growing season provide natural advantages for these industry niches.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

4.5 Small businesses will play a key role in Maui's economy.

Objective:

4.5.1 Increase the number of and revenue generated by small businesses and decrease the percentage of small business failures.

Policies:

4.5.1.a Provide incentives and support for small businesses and entrepreneurs that incorporate sustainable technologies and practices into their operations, utilize local materials, or produce and sell locally-made goods or services.

4.5.1.b Assist traditional "mom and pop" business establishments.

4.5.1.c Reduce barriers to small business development.

4.5.1.d Require, where feasible, the government procurement of goods and services from locally-owned, small businesses.

4.5.1.e Support community markets and venues that sell locally-made produce, goods, and services.

[17] State of Hawaii Legislature (January 2007). *State of Hawaii Workers' Compensation System Informational Briefing prepared for the House Committee on Labor and Public Employment.*
[18] Oregon Department of Consumer & Business Services (January 2007). *Oregon Workers' Compensation Premium Rate Ranking: Calendar Year 2006.*
[19] New America Foundation (June 2009). *The State of State Health website.*
[20] Democratic Policy Committee Special Report (June 2009). *Health Care Costs in Hawaii.*

Implementing Actions:

4.5.1-Action 1 Develop and market an online directory of local small businesses and their products/services.

4.5.1-Action 2 Provide business assistance, workshops, and marketing programs to small businesses to establish and enhance their viability.

4.5.1-Action 3 Review and revise regulations and procedures to improve Maui's small-business climate.

4.5.1-Action 4 Develop a program and revise procedures to facilitate government procurement of goods and services from local businesses.

4.5.1-Action 5 Develop and enhance programs that help locally-operated small businesses to market and provide goods and services to visitors and the visitor industry.

4.5.1-Action 6 Adopt the UBC's Uniform Code for Building Conservation to reduce the cost of rehabilitating older structures for commercial and other uses.

4.5.1-Action 7 Continue to work with small businesses and direct them to organizations that provide loans.

Maui Memorial Medical Center, Wailuku.

HEALTH CARE SECTOR

Obtaining quality health care is an essential part of every resident's life and will continue to grow in importance as Maui's population ages. The traditional and alternative medicine sectors are identified as growth sectors, and opportunities exist to create a robust niche industry that can provide viable employment. To build a solid foundation for the provision of quality health care services, including mental health and substance abuse services, and realize the economic potential of these sectors, Maui needs to develop and provide access to a comprehensive and integrated spectrum of health care services and improve the quality of medical facilities. In 2007, the Maui Health Initiative Task Force developed a strategic health care plan that aimed to address Hawai`i's severe shortage of health care workers, particularly on neighbor islands. The measure called for the State Department of Health to develop a system to assess and address health care staffing needs statewide.

The task force addressed four major areas of health care in Maui County: acute, primary, and emergency health care services; home- and community-based services; disaster preparedness; and remote rural area health care needs. The task force identified a number of priorities, objectives, and actions aimed at improving health care services. This effort forms the basis of many of the policies in this plan.

CHALLENGES AND OPPORTUNITIES

Expand Economic Benefits in Health Care

Health care and closely related fields have shown above average job growth in recent years, and this trend is expected to continue as Maui's population continues to grow and age. It is forecasted that the percentage of the island's population 60 years of age and older will increase from 15 percent in year 2000 to 25 percent in year 2030.[21] Thus, significant investment will be necessary to address the health care needs of a larger and older population.

Health Care Workforce Shortages

Developing and maintaining an adequate supply of highly skilled health care professionals will be a critical factor in realizing the economic potential of the health care sector. At present, Maui is facing a shortage of health care workers that is driven by factors such as low reimbursement rates, high cost of housing and living, the perceived limitations of rural community life, facilities in need of upgrades, and access to quality education.[22] It is estimated that an additional 7,500 nurses will be needed within the next 10 years to replace nurse retirees.[23]

Maui Memorial Medical Center Emergency Entrance, Wailuku.

Investment in and Greater Autonomy for Maui Memorial Medical Center

Investment in the health care sector would benefit Maui by increasing the number of jobs available in a number of health-related fields; providing job-oriented educational opportunities; and improving access to health care programs and services.

[21] County of Maui, Department of Planning (June 2006). *Socio-Economic Forecast: The Economic Projections for the Maui County General Plan 2030.*

[22] State of Hawaii Legislature, Maui Health Initiative Task Force (2008). *Report to the Twenty-Fourth Legislature, Pursuant to Section 2 of Act 219 Session Laws of Hawaii 2007 Requiring a Report.*

[23] Id.

Expand Alternative Health Care

Maui Memorial Medical Center (MMMC) is the only regional hospital on the island, with 1,000 employees and 200 attending physicians. Plans are also being discussed to include West and/or South Maui facilities that would assist those particular communities with not only specialties, but also urgent care. Partnerships with other counties may also be considered.

The health and wellness services sector has emerged as a popular industry with a significant number of private alternative medical practitioners serving the visitor and resident populations throughout all regions of the island. There is a demonstrated interest in health and wellness tourism on Maui. There are a number of natural advantages that Maui offers to the health and wellness sector. Many seek out alternative medical treatments on Maui for the natural and healing environment the island offers.

Kaunoa seniors exercising, Spreckelsville.

There is a growing awareness that mental and emotional health problems are associated with staggering social and economic costs that create a heavy burden for the workplace. Productivity can be affected if workers who are employed are not able to work at their full capacity because of a disability or underemployment. This underscores the need for strategies that may allow workers to become more healthy and productive, but also ensure that there are opportunities for employment. The annual burden of mental disorders is primarily associated with costs arising from unemployment, decreased productivity, and disability. [24]

Mental Health and Substance Abuse

Substance abuse is a costly health problem in Maui County that impacts the community on multiple levels. In addition to the breadth of destructive public health and safety implications of drug abuse and addiction, substance-abuse effects include family disintegration, loss of employment, failure in school, domestic violence, and child abuse. Effective prevention programs demonstrate a delay in the

[24] Schultz, Izabela and Rogers, E. Sally (2011). *Work Accommodation and Retention in Mental Health (*Springer Science+Business Media, LLC., New York*)*.

onset of substance abuse, and a reduction in subsequent problems later in life.[25]

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

4.6 Maui will have a health care industry and options that broaden career opportunities that are reliable, efficient, and provide social well-being.

Objective:

4.6.1 Expand the economic benefits of the health care sector.

Policies:

4.6.1.a Encourage expanded services at MMMC and at other medical facilities.

4.6.1.b Support expansion of federally qualified health centers with the direct involvement of the residents of the communities served.

4.6.1.c Support the use of multimedia as a means to provide healthcare information.

4.6.1.d Encourage digitalization of all diagnostic equipment at all facilities on Maui to enable sharing of data and more efficient use of limited provider workforce, consistent with data protection and patient privacy.

4.6.1.e Support the expansion of telemedicine.

4.6.1.f Encourage expansion and improved access to emergency care in all communities.

Objective:

4.6.2 Be more efficient in the delivery of health care services and in minimizing health care costs.

Policies:

4.6.2.a Support expansion of health care providers and facilities to improve access to quality care throughout the island.

4.6.2.b Encourage the expansion of veteran health care services.

4.6.2.c Allow home-based out-patient medical care that does not interfere with surrounding neighborhoods.

[25] U.S. Department of Health and Human Services (2008). *Substance Abuse Prevention Dollars and Cents: A Cost-Benefit Analysis.*

Objective:

4.6.3 Expand Maui's alternative health care services, including spiritual practices.

Policies:

4.6.3.a Support efforts to promote alternative medicine.

4.6.3.b Allow small-scale home-alternative medicine businesses such as massage, chiropractic care, traditional Hawaiian healing, and acupuncture that do not interfere with surrounding neighborhoods.

Implementing Action:

4.6.3-Action 1 Support the alternative health practices industry as well as local entrepreneurs who offer related services.

Pā`ia School, Pā`ia.

EDUCATION AND WORKFORCE DEVELOPMENT

Maui County has recognized the need to improve educational infrastructure and develop the local workforce as a basic building block for creating a vibrant local economy. Intellectual resources help provide the climate necessary for research and innovation. Investing in human resources can tie together the innate abilities, talents, knowledge, skills, and experience of the workforce to make it economically productive. Human capital can be increased by investing in health care, education, and job training. Communities that improve educational infrastructure and create telecommunications infrastructure linkages between industry and education have demonstrated above average economic performance.

Maui needs to continue to encourage the State to strengthen public education in a variety of ways. In 2007 as part of the *Hawai`i Public Education Poll*, 600 residents across the state were surveyed over the telephone about Hawai`i's public schools. As expected, the highest educational priority was communication skills followed closely by reading and math skills.[26] Historically, Hawai`i's student proficiency rates in reading and math have been low; however, since 2003, they have been improving.[27]

As part of the effort to increase educational options, Act 272 was passed in 1994 authorizing Hawai`i's first 25 charter schools. This law created an opportunity for existing State Department of Education (DOE) schools to convert to "student centered" schools. In 1999, the Hawai`i legislature again amended the law through Act 62 to allow new start-up charter schools, and changed their designation from "student-centered" to "New Century" schools. Act 130 was passed in June of 2012 and established a new charter school law. The law provides an accountability system for charter schools, with performance measures in academics and operations. Hawai`i public charter schools reported an enrollment record in September 2012 of more than 10,000 Kindergarten through Grade 12 students enrolled in classes after summer break. The projected enrollment of 10,097 represents a milestone for Hawai`i's charter movement, which served just 1,341 students in 2000. The Kīhei Public Charter school serves grades K-12 in South Maui.

Additionally, the DOE funds Hawaiian language immersion classes. Hawai'i is the only state in the United States that has two official state languages, with Hawaiian designated a native language. In 1987, in light of the Hawai'i State Constitution mandate to promote the study of Hawaiian culture, language, and history, the DOE established the Hawaiian Language Immersion Program, *Ka Papahana Kaiapuni Hawai'i.*

The DOE also surveyed island residents to elicit concerns about the public school system as a means to identify priorities for their budget. The DOE received over 2,000 responses. The public was most concerned about the availability of programs and courses offered; achieving smaller class sizes; the availability of classroom supplies and textbooks; teacher quality; and personnel, resources, and services to improve student performance.[28] The responses helped the DOE identify the following three strategic goals for the years 2008-2011:

1. Improve student achievement through standards-based education;
2. Provide comprehensive support for all students; and
3. Continuously improve the performance and quality of instruction, teacher personnel, and develop clear communication with stakeholders groups.[29]

Hawai`i's public education system, unlike the other 49 states, receives its funding predominantly from State and Federal sources. Hawai`i's public school system is the only one in the nation not dependent on local property taxes as a major source of revenue.[30]

[26] Department of Education, State of Hawai`i (December 2008). *Superintendent's 19th Annual Report on Hawai`i Public Education.*
[27] Department of Education, State of Hawai`i (2008). *School Enrollments 2008.*
[28] Department of Education, State of Hawai`i (December 2008). *Superintendent's 19th Annual Report on Hawai`i Public Education.*
[29] Id.
[30] Id.

CHALLENGES AND OPPORTUNITIES

Renewal of Public (K-12) Education

Hawai`i has ranked low in comparison to national averages in both student math and reading proficiency. In its 2008 report card on public education, Education Week magazine gave Hawai`i a "D" grade in K-12 achievement. According to data from the *College Board*, in 2009, Hawai`i ranked 48 out of 50 states on Scholastic Aptitude Test (SAT) scores. However, Hawai`i has seen some progress since 2003 as the percent of students scoring proficient or above has increased in both reading and math, with about one-half of Hawai`i's schools showing growth in both reading and math over the last 3 years.[31]

Hawai`i has also shown improved student performance results in relation to targets set locally under the *No Child Left Behind Act of 2001*. Schools have raised both their reading and math proficiency rates by 20 or more percentage points during the last 3 years, and 86 schools have raised either their reading or math proficiency rate by 20 or more percentage points in the same period of time. Recent increases are a result of improvements in student achievement as well as implementation of a new State assessment.[32] This progress suggests teaching practices designed to improve performance in targeted areas have been successful and should continue.

Maui will need to overcome the following challenges to develop and maintain a vibrant public education system that will provide a pool of talented employees to meet the island's economic development goals:

- ***Lack of Resources.*** Figure 4-2 compares Hawai`i's percentage of State and local expenditures in support of public education with 4 comparable states and the national average. Hawai`i's per capita percentage of State and local expenditures for public education declined slightly, from 19.3 percent in the 2003-2004 period, to 18.5 percent in the 2004-2005 period. Similar declines were seen in the other 4 states. Hawai`i's expenditures per pupil continue to rank below the other 4 states, and it is well below the national average.

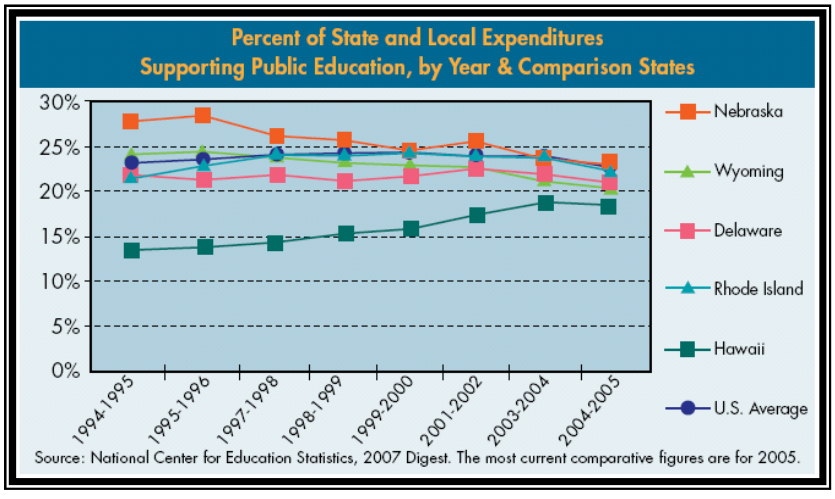


Figure 4 - 2. Comparison of State and Local Expenditures for Public Education.

[31] Department of Education, State of Hawai`i (December 2008). *Superintendent's 19th Annual Report on Hawai`i Public Education.*
[32] Id.

According to the U.S. Census Bureau, in 2004 and 2005, Hawai`i ranked second to last and last, respectively, in the proportion it spends on education.

In 2004-2005, the State of Hawai`i ranked 23rd in its total expenditures per pupil as compared to other states. In reviewing the data, if the State increased funding for public education by approximately 25 percent, Hawai`i would be among the top ten states nationally for its investment in K-12 public education.

- ***High Percentage of Special Needs Students.*** Students with special needs have constituted a majority of those enrolled in Hawai`i public schools. Special needs students include English language learners, the economically disadvantaged, and students in special education. In 2008, 51 percent of Hawai`i's students had special needs. The challenge and cost of educating special needs students have become state and national issues.[33]
- ***Homelessness and/or Family Crisis.*** Identifying and providing support services for students who are homeless continues to be a priority under the McKinney-Vento Homeless Education Assistance Improvement Act of 2001 (McKinney-Vento Act). The DOE's current economic forecasts for Hawai`i suggest that the number of students who are homeless across the state is likely to increase. Families experiencing homelessness – whether for the first time or chronically – face obstacles that affect students' ability to focus on academics.[34]
- ***Quality of Instruction.*** Respondents to a 2008 State survey done to gauge community concerns about education indicate that improving the quality of instruction in Maui's schools is a high priority.[35] Programs designed to improve learning approaches and measure effectiveness of teaching practices should be developed. According to the DOE's Office of Human Resources, the percentages of teachers with advanced degrees (30 percent) and fully licensed teachers (86 percent) have increased gradually over the past 4 years. The County of Maui encourages the State to foster improved working conditions for teachers, opportunities for career development, and enhanced compensation packages to retain qualified faculty.
- ***Bureaucracy/Lack of Accountability.*** Hawai`i has the country's only State-run K-12 public education system. As a result, administrative functions are highly centralized. Administrative tasks such as procurement of supplies, facility repair and maintenance, and teacher training and recruitment can be hampered by complex procedural requirements that may not reflect the needs of the State's varying school complexes.

  The responsibility for financing, managing, and planning the public school system is split among the State legislature, Governor's office, DOE, and the State Board of Education (BOE). The nature of school governance has complicated school reform and clouded accountability for the performance of the public school system.

[33] Id.
[34] Id.
[35] Id.

Expand Opportunities for Vocational and Higher Education

Providing support for the expansion of University of Hawai`i Maui College (UHMC), the University of Hawai`i Center-Maui, and other schools of higher education and vocational training has been an important and longstanding policy of academia, government, and Maui's business community. UHMC's potential to be a greater economic driver in the community is significant, and providing expanded degree programs can greatly contribute to the County's welfare.

In the long term, UHMC's master plan anticipates future expansion of facilities and programs. This expansion could provide for additional classroom space to accommodate as many as 5,000 full-time equivalent students. As such, State and County officials will need to work together to identify appropriate locations for the school's expansion or accommodate an increase in density at the existing campus. Investing in telecommunications infrastructure and distance learning modes will also become an increasingly important building block for economic development.

There have been dramatic increases in the number of students earning distance learning degrees, and this trend is expected to continue as residents find educational resources limited on-island and commuting by air to off-island educational centers cost prohibitive.

The Maui County Workforce Investment Board (MCWIB) has played an important role in preparing our workforce for the diverse challenges that lie ahead. The MCWIB operates under Maui Economic Opportunity, Inc (MEO). The MCWIB's vision is to have a globally competitive and proficient workforce, which aims to uphold a diverse and prosperous economy while preserving the quality of life in Maui County.

Increase STEM Jobs

In preparing the workforce for successful careers in 21st century businesses, S.T.E.M. (science, technology, engineering, and mathematics) programs are provided by many of Maui's high schools as well as UHMC. Workforce development programs are also offered on a noncredit basis. Maui's workforce also has access to such centers of technological excellence as Chaminade University, the University of Hawai`i (UH), the UH College of Engineering, and the UH Computer Science Department.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

4.7 Maui will have effective education and workforce development programs and initiatives that are aligned with economic development goals.

Objective:

4.7.1 Improve preschool and K-12 education to allow our youth to develop the skills needed to successfully navigate the 21st century.

Policies:

4.7.1.a Encourage the State to implement programs such as:

(1) Universally available preschool for children between the ages of one and five;

(2) Mandatory kindergarten;

(3) Mandatory K-5th grade classroom size limits of 1 teacher to 20 students;
(4) Mandatory nutrition programs; and
(5) Mandatory Native Hawaiian programs at all grade levels.

4.7.1.b Encourage the DOE to extend the school day by at least an hour.

4.7.1.c Encourage the State to increase funding for public education so that Hawai`i is among the top 10 states nationally as measured by investment per pupil.

4.7.1.d Encourage the State to ensure teacher certifications relate to effective delivery and improved student performances, and develop an industry experience/equivalency certification to assure our DOE students have access to career technical education and training.

4.7.1.e Encourage the UHMC to provide dormitory space for high school students.

4.7.1.f Encourage the development and implementation of curriculum on native Hawaiian history, culture, and practices, in consultation with native Hawaiian groups and associations.

Objective:

4.7.2 Encourage an increase in the number of certificate recipients and associate, bachelors, and graduate degrees conferred.

Policies:

4.7.2.a Encourage the State to increase the number of articulation agreements between the UHMC and four-year universities, particularly the University of Hawai`i at Manoa.

4.7.2.b Encourage the State to expand accredited 2-year, 4-year, and graduate programs through the UHMC.

4.7.2.c Encourage the education and training of our residents to meet the needs of a diversified economy.

4.7.2.d Support education and training programs such as student internships, vocational training, and career development opportunities to ensure a highly skilled workforce.

4.7.2.e Work with educational institutions to improve and expand access to education and training through multiple modes, including distance learning.

Implementing Actions:

4.7.2-Action 1 Consider a labor force capacity study to project the future supply and demand for knowledge-based workers to serve Maui's technology-related needs.

4.7.2-Action 2 Partner with the State and other entities toward the development of a County database of health care resources such as workforce, area shortages, and present and future needs, up to and including a plan to address such needs.

4.7.2-Action 3 Work with the UHMC, trade unions, and other entities to develop curriculum and certification programs relating to design, installation, and operation/maintenance of renewable energy systems.

4.7.2-Action 4 Work with appropriate institutions and trade unions to develop and implement a certification program on current or emerging building code and land use regulations and consider conducting a County training program on same.

Objective:

4.7.3 Strive to ensure that more of Maui's jobs are developed in STEM-related sectors by 2030.

Policies:

4.7.3.a Support the development of STEM-related certificates and degrees at the two- and four-year levels.

4.7.3.b Support the education initiatives of the Maui Agricultural Development Plan.

4.7.3.c Expand and seek funding for internships, mentoring, job shadowing, etc. to foster interest in health and green workforce careers.

4.7.3.d Work with MEDB, UHMC, and other similar organizations to expand internship/education programs to support STEM careers.

4.7.3.e Continue to partner with the MEDB and other similar organizations to recruit, assist, and retain emerging industries, research and development activities, and educational/workforce opportunities.

Chapter 5: Housing

Traditional neighborhood, Wailuku.

Housing is one of our most basic human needs. It is one of the fundamental building blocks in our communities and it is where our families gather and find shelter. All segments of our island have particular needs, whether it is the first home or apartment for young adults, or to accommodate the specified needs that come with age. Housing is not always treated as a human right. When adequate or appropriate housing is unattainable to a large portion of the population, it negatively impacts the entire community and decreases overall quality of life. We can do many things to promote an adequate and permanent supply of affordable for-sale and rental housing to meet resident needs. To meet our island's housing needs, we must rethink Maui's paradigm. Due to numerous factors, Maui's housing prices have escalated dramatically in the last decade. With some of the highest housing prices in the nation, many Maui residents are struggling to afford housing on the island.

Background Information

The Housing chapter refers to, and is based on, the following studies and reports created specifically for the MIP:

1. Socio-Economic Forecast: The Economic Projections for the Maui County General Plan 2030, June 2006;
2. Land Use Forecast, November 2006; and
3. Maui Island Housing Issue Paper, December 2006.

The Maui housing market has been volatile in recent years, as illustrated in Figure 5-1.[1] There were significant variations in the price of new and existing single-family homes and condominiums on Maui between 1979 and 1999, but nothing like the swings that occurred after 1999. More recently, the real estate market on Maui has tended to stabilize but housing prices still remain significantly higher than housing prices in the 1990s.

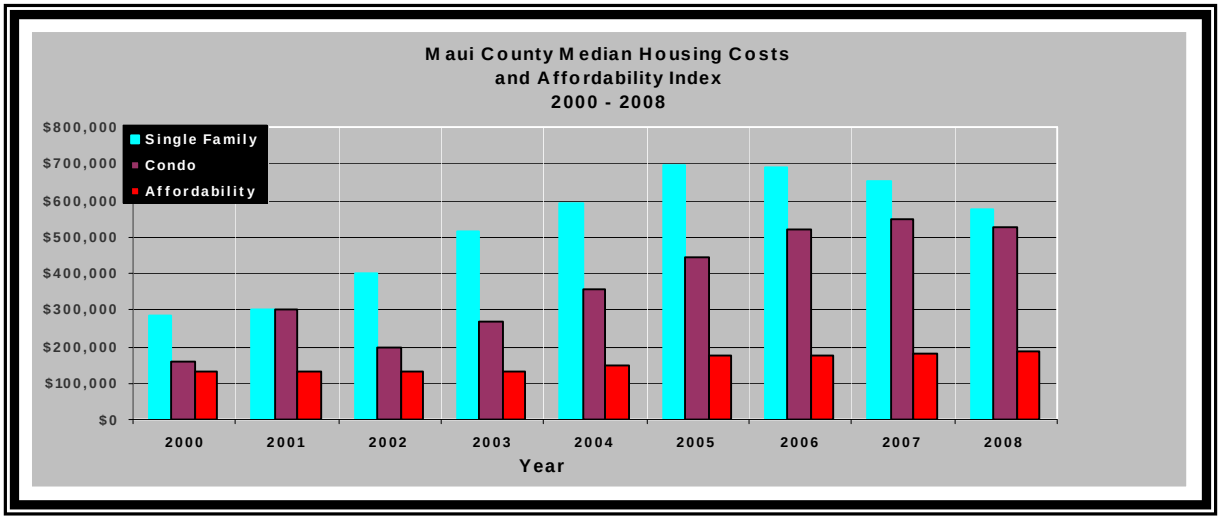


Figure 5 - 1. Maui Median Home Prices, Current Dollars.

Maui residents, by almost any measure, face a critical housing situation:

- They spend a higher percentage of their income on housing than almost anyone else in the United States;
- The cost of housing on Maui makes home ownership very unaffordable, as compared to the national average;
- The median price for single-family homes and condos, whether new or existing units, has been exceedingly above what people can afford, in recent years; and
- The home ownership rate for Maui is significantly lower than for the rest of the United States.

The dynamics of housing production and pricing are extremely complex. Many key drivers are far beyond the control of local government, including:

[1] (1) Median Single-Family and Condominium sales data from the Maui Board of Realtors, 2009; (2) Housing Affordability Index based on a two-wage household (Maui County Databook, 2000 - 2008) each earning the average wage and applying common loan eligibility standards.

- National and international economic cycles;
- Federal Housing policies such as the reduced federal income tax for the well-to-do and mortgage interest deductions on second homes;
- Low interest rates that contribute to rising prices;
- Consumers' willingness to accept higher levels of household debt through "creative financing" mechanisms;
- Overall cost of construction;
- Offshore demand;
- High levels of speculation in some economic cycles; and
- The geographic and land constraints inherent with an island environment.[2]

These points suggest that relatively high prices are longstanding and will probably continue to be high as long as the State and Maui remain desirable and accessible to large offshore markets.

Maui County relies primarily on inclusionary zoning to increase the supply of affordable housing. Simply put, inclusionary zoning requires a developer of new housing to build a specified number of affordable dwelling units.

There is no one policy that by itself can lead to an adequate supply of affordable housing. Policies that may work well during times of economic growth may not be well suited to periods of financial downturn. Strategies that are focused on local residential use may not function well unless the vacation home and transient vacation rental markets are taken into consideration. Programs that are ideal when applied to large developments may be counterproductive when imposed on homeowners or small-scale builders.

CHALLENGES AND OPPORTUNITIES

Need for Improved Economic Housing Cycle Monitoring

There are some significant gaps in data currently available to county planners addressing affordable housing issues, especially as it relates to the interrelation between housing production and the economic cycle. Furthermore, the current reporting system needs to distinguish between housing used for the tourism and second-home markets and housing used by Maui residents. In addition, data on new housing sales are not as readily available as resale data. There is also a need for data exploring the use of offshore investment homes that remain unoccupied.[3]

A reduction in the supply of housing available for long-term residential use occurs when any owner – offshore or local – converts residential housing stock into non-residential uses. Non-residential uses can include vacation homes or transient vacation rentals (TVRs). The supply problem is compounded because many TVRs are also part-time vacation homes, with owners defraying mortgage costs by TVR use, thereby driving up housing costs.[4]

Competition From the "Offshore

The presence of affluent, non-resident buyers influences the housing market in several ways, all of which put upward pressure on prices. First, non-residents seeking a second home can typically outbid residents for houses and apartments being resold. Second, in a

[2] Knox, John M. and Tom Dinell (December 2006). *Maui Island Housing Issue Paper: A Discussion Paper for the Maui County General Plan Update, Summary of Recommendations.*
[3] Id.
[4] Id.

Market"

strong market, developing higher-priced units generally produces greater profit per unit. Therefore, a relatively large proportion of new residential units and lots are being developed for upper-end buyers. Finally, when the building industry is focused on the upper-end market there are fewer resources for affordable housing.

Property taxation may be one tool to mitigate the impact of non-resident demand on Maui's housing prices. Property tax rates in Maui County and throughout the State are low compared to rates and supplementary fees charged by mainland municipalities, school districts, and public facility districts. Relatively low property taxes for single-family and multifamily residences make Maui properties more attractive to the offshore buyer. Property taxes can be made more progressive by increasing property tax rates and simultaneously increasing the home exemption to neutralize the rise in the tax for resident property owners and including a similar offset for owners of rental properties leasing to residents.[5]

Sand Hills, Wailuku.

Maintaining the Stock of Affordable Housing

The conveyance tax can also be used to fund the development of affordable housing. Through the enactment of State enabling legislation, Maui County could impose a surcharge on the conveyance tax with the proceeds to be deposited in the County's Affordable Housing Fund. Such legislation could permit the County to utilize a graduated scale so that the sellers of multi-million dollar homes pay a higher percentage surcharge than do those conveying more modest or affordable dwellings.

A great deal of affordable housing has been built in Hawai`i over the years. Much of it has slipped back into the market housing stock in relatively short periods of time, as the original buyers resell at market prices. Preserving affordable housing in perpetuity will be extremely important to help increase and maintain the supply of affordable housing units and reduce housing prices for Maui residents.

Compact, Mixed-

At the island and regional scale, increasing the density of housing is a more efficient use of land. It also saves on linear miles of roads, water lines, and other utilities that need to be

[5] Ibid., II-18.

Income Communities with Expanded Housing Choices

built and maintained. Increasing the density of housing also preserves more land for agriculture and open space. At the project scale, increased density can reduce land and building costs and thereby result in more affordable sale and rental prices. There are two general ways to increase density: (1) to develop a multifamily housing type rather than a single-family housing type; and (2) to increase the number of units per acre in either category.[6]

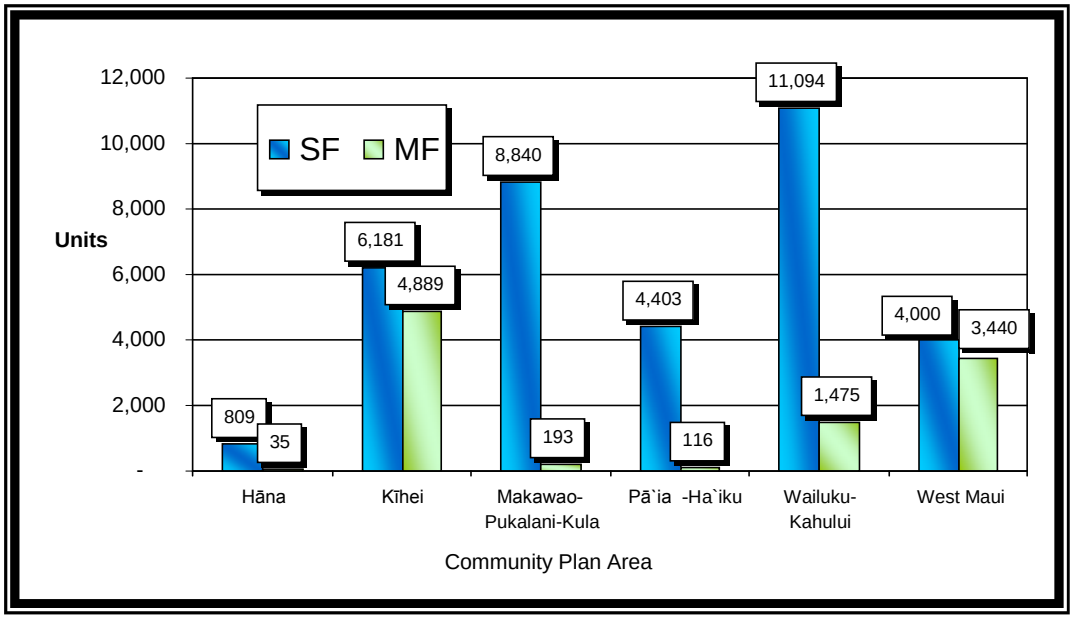


Figure 5 – 2. 2005 Single-Family and Multifamily Dwelling Units by Maui Island Community Plan Area. *Source: Existing Land Use Database, 2005.*

In 2005, single-family dwellings comprised 78 percent of the total housing stock on Maui.[7] Multifamily dwellings are typically less expensive than single-family dwellings and are often attractive to seniors and young adults. The limited supply of multifamily units has constrained consumer choice and exacerbated housing prices. Figure 5-2 illustrates the mix of single-family and multifamily dwellings in Maui's community plan areas. The Makawao-Pukalani-Kula, Pā`ia-Ha`ikū, and Wailuku-Kahului community plan areas offer limited multifamily housing opportunities.

Accessory or `ohana dwellings can also play a significant role in increasing the affordable housing stock on Maui, whether such units are used to house family or become long-term rental units.

The dangers of concentrating people with few economic resources and limited educational skills in a single project are well known. The placement of rental housing projects in the same areas as for-sale housing provides for more diverse communities. The desired outcome is mixed income communities, which in turn contribute to the social well-being of the larger community.

With the number of people over age 65 growing in the coming decades, there is a need

[6] PlanPacific, Inc. (November 2006). *Land Use Forecast, Island of Maui, Maui County General Plan 2030, Technical Resource Study.*
[7] Id.

Housing for Seniors and Those with Special Needs

to work with the State, Federal government, community groups, landowners and others to find ways to provide affordable housing to senior citizens and those with special needs.

Hawai`i is the only state in the nation to have both State and County level zoning. Developers understand that it takes years to get all the necessary permits for a major project and that it will involve multiple jurisdictions. Getting through the regulatory process takes time and money. County policy can state that projects that provide for a specified percentage of affordable for-sale or rental housing units shall be fast tracked.

Reduce Developers' Cost to Build Affordable Housing

Lack of adequate infrastructure is frequently an impediment to the development of affordable housing. The County can play a proactive role in resolving infrastructure bottlenecks by working with developers to coordinate the planning and development of infrastructure within the Urban Growth Boundaries. The County can also adopt minimum and desirable infrastructure level-of-service standards so that the development process is more predictable and transparent.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

5.1 Maui will have safe, decent, appropriate, and affordable housing for all residents developed in a way that contributes to strong neighborhoods and a thriving island community.

Objective:

5.1.1 More livable communities that provide for a mix of housing types, land uses, income levels, and age.

Policies:

5.1.1.a Promote livable communities (compact/walkable/bikeable, access to transit) that provide for a mix of housing types and land uses, including parks, open space, and recreational areas.

5.1.1.b Promote planning approaches that provide a mix of multifamily and single-family housing units to expand housing choices.

5.1.1.c Discourage gated communities.

5.1.1.d Provide incentives for the rehabilitation or adaptive reuse of historic structures to facilitate more housing choices.

5.1.1.e Use planning and regulatory approaches to provide higher housing densities.

Implementing Actions:

5.1.1-Action 1 Amend development codes to facilitate different types of housing, including mixed use, mixed housing types, clustering, and conservation subdivisions.

5.1.1-Action 2 Do a study to determine optimum permit processing times on affordable housing development approvals while ensuring that community and environmental standards are addressed.

5.1.1-Action 3 Establish the rules and mechanisms to establish a Maui "master list" of affordable housing projects and land entitled for affordable housing so that residents will be able to obtain an affordable unit in a fair and expeditious manner.

5.1.1-Action 4 Study successful models of affordable housing projects/units and adopt appropriate minimum design standards that satisfy the needs of Maui's residents.

5.1.1-Action 5 Amend zoning and historic preservation ordinances/rules to support adaptive reuse opportunities.

5.1.1-Action 6 Develop incentives to promote projects that achieve the Leadership in Energy and Environmental Design (LEED) Silver or Gold certification.

Objective:

5.1.2 Better monitoring, evaluation, and refinement of affordable housing policy in conjunction with the economic cycle.

Policies:

5.1.2.a Improve data on resident and nonresident housing.

5.1.2.b Utilize the following approaches to promote resident housing and to minimize off-shore market impacts:

(1) Ensure that the future housing stock is composed of a mix of housing types (multifamily, small lots, ohana units, co-housing, cottage houses, etc.);

(2) Encourage new housing in proximity to jobs and services, in places that are conducive/affordable to island residents; and

(3) Explore taxation alternatives and building fee structures.

Implementing Actions:

5.1.2-Action 1 Develop appropriate incentives to encourage the production of required affordable housing during the different stages of an economic cycle.

5.1.2-Action 2 Develop and maintain a reporting system/database and related maps for the following:

(1) Existing/newly constructed housing units that are affordable to very low-, low-, and moderate-income households;

(2) The location and quantity of housing that is used by visitors/second home; and

(3) Property tax information, including property land use designations, tax rates, acquisition price, and market value assessments.

5.1.2-Action 3 Explore the benefits and costs of revising the County's property tax rates to make them more responsive to the needs of the citizens in the area of affordable housing.

5.1.2-Action 4 Develop incentives for locating new workforce housing in proximity to jobs and services.

Objective:

5.1.3 Provide affordable housing, rental or in fee, to the broad spectrum of our island community.

Policies:

5.1.3.a Consider regulations that can help keep affordable housing available at affordable rents.

5.1.3.b Seek to have ownership of affordable for-sale and rental housing vested in a non-profit community land trust, or other qualified housing provider, committed to keeping such housing affordable in perpetuity.

5.1.3.c Facilitate the use of public lands in urban areas that are suitable for affordable housing.

5.1.3.d Develop or support partnerships and initiatives that provide housing-related education/outreach.

5.1.3.e Support the continuing efforts of the County and its community partners to:

(1) Disseminate information on different housing/financial assistance programs (loans, grants, etc.) including information on housing rehabilitation/restoration/adaptive reuse;

(2) Provide housing-related counseling including budget, credit, and financial planning assistance; and

(3) Create and maintain a comprehensive/master list of available affordable housing to help residents secure a unit that satisfies their need.

Implementing Actions:

5.1.3-Action 1 Consider the following actions in housing-related code amendments:

(1) Give a higher priority to the construction of actual units and a lower priority to the provision of land, over the current alternative in-lieu fee payment;

(2) Require recordation of a covenant to ensure that the required affordable units in a project remain affordable for perpetuity;

(3) Consider that affordable houses be developed and available concurrently with market units;

(4) Encourage the development of affordable "for-sale" and rental housing through incentives;

(5) Consider a rent stabilization program to ensure that rental housing remains affordable;

(6) For the sale prices of required affordable housing units, evenly distribute prices over the range of the subject income category; and

(7) Expedite permitting for affordable housing projects approved pursuant to the residential workforce housing ordinance.

5.1.3-Action 2 Support/help in the creation of Community Development Corporations to facilitate the development and maintenance of affordable housing.

5.1.3-Action 3 Enhance our existing affordable housing financing program to include the following elements:

(1) An affordable housing assessment on commercial and residential properties.

(2) A real estate transfer tax imposed on visitor units, TVRs, and residential housing that is not affordable for residents with household incomes of up to 200 percent of the island median household income.

5.1.3-Action 4 Explore flexible funding for the affordable housing fund/program based on County tax revenues.

5.1.3-Action 5 Actively pursue appropriate Federal, State, County, and private grants/subsidies to facilitate affordable housing projects.

Objective:

5.1.4 Provide infrastructure in a more timely manner to support the development of affordable housing.

Policies:

5.1.4.a Prioritize the development of infrastructure that supports the development of affordable housing.

5.1.4.b Utilize appropriate financing approaches and assistance tools to encourage the development of infrastructure and public facilities.

5.1.4.c Tailor infrastructure requirements to correspond with appropriate level-of-service standards to help control housing costs and to maintain safety.

Implementing Actions:

5.1.4-Action 1 Prioritize Capital Improvement Projects that commit to building appropriately planned affordable housing-related projects.

Objective:

5.1.5 A wider range of affordable housing options and programs for those with special needs.

Policies:

5.1.5.a Ensure that residents with special needs have access to appropriate housing.

5.1.5.b Encourage housing to be built or rehabilitated to allow the elderly and those with special needs to live in their homes.

5.1.5.c Ensure and facilitate programs to assist those with special needs from becoming homeless.

5.1.5.d Promote programs that stimulate the production of sustainable homeless shelters and alternative housing technologies.

5.1.5.e Support programs that offer home modification counseling on low-interest retrofit loans and grants to those with special needs.

Implementing Actions:

5.1.5-Action 1 Develop financing mechanisms to assist low-income elders and other high-risk/disadvantaged patients who need residential and institutional health care to remain in affordable housing that is part of a community development project.

5.1.5-Action 2 Create or assist in creating programs that provide affordable housing to seniors, the disabled, and those returning from mental health institutions, correctional institutions, and drug rehabilitation.

5.1.5-Action 3 Help in securing/leveraging federal grants, low income housing tax credits, and other resources that support affordable housing for special needs populations.

5.1.5-Action 4 Develop and maintain indicators to monitor homelessness.

5.1.5-Action 5 Partner with the private sector/nonprofit organizations to develop and maintain an adequate supply of emergency shelters and transitional housing.

5.1.5-Action 6 Amend the Zoning/Subdivision Codes to streamline and facilitate the development of elder care/assisted living facilities, as well as housing/facilities that are Americans with Disabilities Act-compliant.

5.1.5-Action 7 Waive County review fees to modify dwelling units to accommodate the needs of people with disabilities (reasonable accommodation).

5.1.5-Action 8 Explore the adoption of an aging-in-place ordinance.

Objective:

5.1.6 Reduce the cost to developers of providing housing that is affordable to families with household incomes 160 percent and below of annual median income.

Policies:

5.1.6.a Support fast-track processing procedures for the following housing-related entitlements: affordable housing projects/units; indigenous Hawaiian housing/units; and special-needs housing units (seniors, disabled, homeless, etc.).

5.1.6.b Require the construction of affordable for-sale and rental housing units as part of the construction of new housing developments.

5.1.6.c Offer extra incentives in boom periods and withdraw incentives during slack periods.

Implementing Actions:

5.1.6-Action 1 Develop a comprehensive, flexible system of incentives to develop affordable housing, including:

(1) Reduction or waiver of impact, assessment, and permit fees;
(2) Density bonuses;
(3) Exemptions from subdivision and zoning standards;
(4) Building code modifications while maintaining health and safety; and
(5) Possible use of publicly owned lands.

5.1.6-Action 2 Streamline the permitting process as follows:

(1) Within one year of this plan's adoption, adopt new administrative rules that streamline and clarify the permitting process;
(2) Consider using outside consultants (third-party review);
(3) Implement a one-stop permitting process; and
(4) Adopt a set of standards so permitting is administrative and as ministerial as possible.

Objective:

5.1.7 Increased preservation and promotion of indigenous Hawaiian housing and architecture.

Policies:

5.1.7.a Preserve, promote, and give priority to Hawaiian housing/architecture forms to preserve Hawaiian culture.

5.1.7.b Provide for indigenous architecture as an allowable structure for native Hawaiian uses to include hula and lā`au lapa`au.

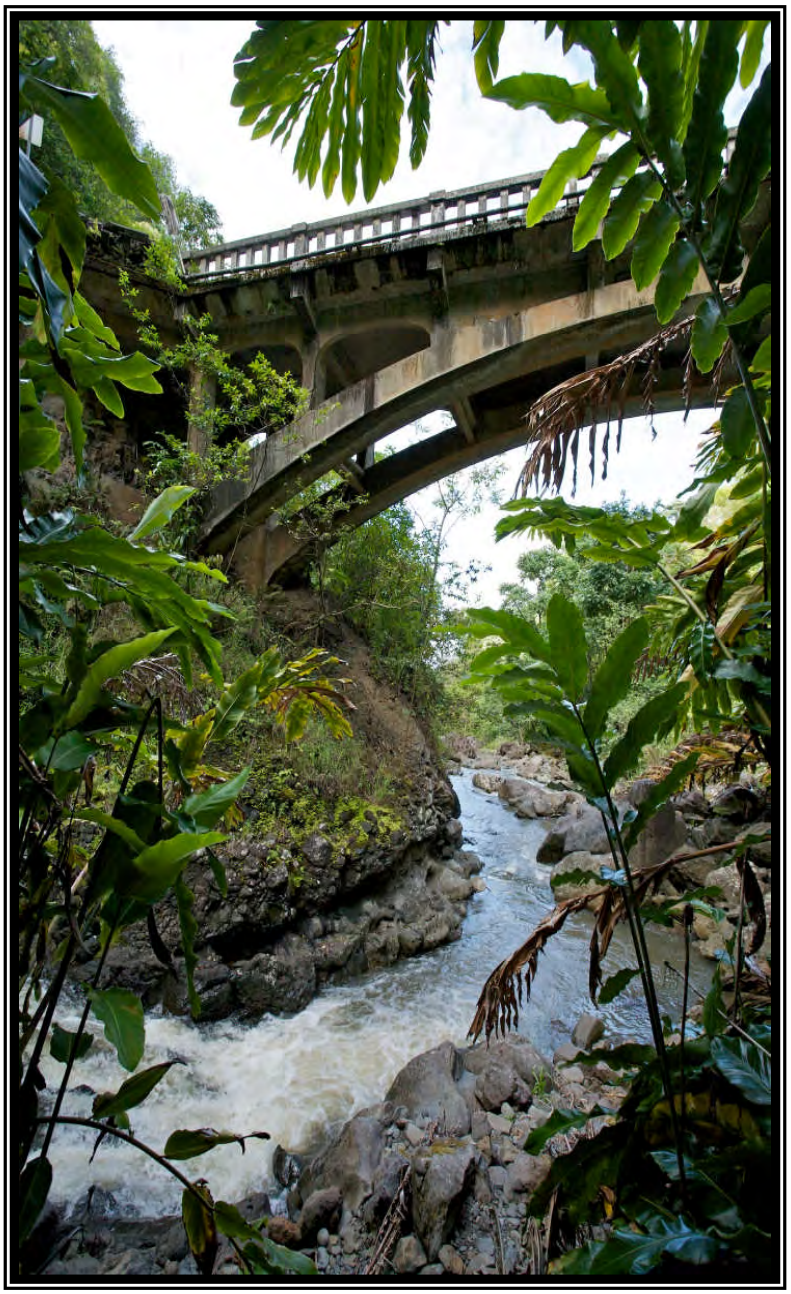
Implementing Actions:

5.1.7-Action 1 Revise regulations to allow for indigenous Hawaiian architectural practices, styles, customs, techniques, and materials, in accordance with Section 46-1.55, Hawai`i Revised Statutes.

5.1.7-Action 2 Encourage the use of alternative building materials (e.g., bamboo).

Chapter 6: Infrastructure and Public Facilities

A society grows great when old men plant trees whose shade they know they shall never sit in.
~Greek Proverb



A historic bridge on Hāna Highway, East Maui.

The island of Maui carries the marks of those who came before us. The foresight of our forbearers – the time, the energy and the resources they expended to make their vision of the future a reality – is evident all around us. Their vision can be seen in every rock wall, fishpond, and irrigation ditch; and in every park, highway, plane that lands, or ship that docks. Every time we draw a drink of water, switch on a light, or bring our children to school, we reap the benefits of our grandparents' sacrifices. They built a foundation that we have come to take for granted. That foundation, Maui's infrastructure, now shows the wear of the years between our grandparents' investment and our own generation.

The island's infrastructure systems are vital to our community, economic prosperity, and quality of life. They are also expensive to construct, maintain and replace. However, for Maui to be prosperous in the future we must now make the same sacrifice our grandparents made. We must aim to share their foresight and be willing to make the investments needed to provide a stable future for our children and grandchildren.

This chapter will examine the following infrastructure and public facility systems: Solid Waste, Wastewater, Water, Transportation, Transit, Parks, Public Facilities, Schools and Libraries, Health Care, Energy, and Harbors and Airports.

Background Information

The information presented in this chapter of the MIP draws from numerous plans, technical studies, and issue papers.

1. Infrastructure and Public Facilities Technical Issue Paper, Chris Hart & Partners, Inc., September 2007;
2. Long-range Capital Improvement Program-Infrastructure Planning and Delivery Challenges, Chris Hart & Partners, Inc., September 2007;
3. Long-range Capital Improvement Programming-Infrastructure and Public Facility System Funding Sources and "Order of Magnitude" CIP Costs, Technical Memorandum, Chris Hart & Partners, Inc., September 2007;
4. Infrastructure Assessment Update, County of Maui Planning Department, Long Range Division, September 2007;
5. Proposed Roadway Development Program, Fehr & Peers Kaku Associates, January 2007;
6. Integrated Solid Waste Management Plan, Maui County Department of Environmental Management, Solid Waste Division, February 2009;
7. Water Use and Development Plan, Maui County Department of Water Supply, Water Resources and Planning Division, Draft, May 2007;
8. County of Maui Short Range Transit Plan, Final Report, January 2005;
9. Public Facilities Assessment Update, County of Maui Planning Department, Long Range Division, prepared by R. M. Towill Corporation, March 2007;
10. Preliminary Report to the Twenty-Fourth Legislature, Department of Health & Department of Human Services, State of Hawai`i, 2007 and 2008;
11. Hawai`i Health Performance Plan, State Health Planning and Development Agency, Hawai`i, 1999-2004;
12. 2005-2025 Maui Bed Needs Study, Final Report, collaborative efforts by the State Health Planning and Development Agency/Memorial Medical Center/Malulani Health Systems, Inc./Kaiser Permanente/the Maui Mayor's office, prepared by Hawai`i Health Information Corporation, August 2004; and
13. Bike Plan Hawai`i, A State of Hawai`i Master Plan, Highways Division, Department of Transportation, State of Hawai`i, September 2003.

A Central Maui Landfill employee directs traffic, Pu`unēnē.

SOLID WASTE

According to the U.S. Environmental Protection Agency (EPA), the United States has witnessed a steady rise in total tons of waste generated and pounds generated per person. Management of this waste will increasingly rely on a sophisticated array of strategies. However, landfill disposal remains the most common method of dealing with waste both on the mainland and in Maui County. Maui's waste management strategies include landfill disposal, source reduction, recycling, and composting. Source reduction and waste diversion will continue to contribute to solid waste management on the island. The use of alternative technologies for converting waste to energy can contribute to extending the life of the landfill.

The County of Maui Department of Environmental Management's Solid Waste Division is responsible for the planning, operation, and maintenance of the County's landfills. The Central Maui Landfill is located off Pūlehu Road. It is owned and operated by the County and accepts all types of municipal waste, except for regulated hazardous wastes and commercial construction/demolition debris. In 2009 the Department of Environmental Management's Solid Waste Division updated its county-wide Integrated Solid Waste Management Plan (ISWMP). The ISWMP provides a comprehensive blueprint for the planning and expansion of the County's solid waste management system. The updated ISWMP addresses several issues including the finite capacity of the County's landfills, the growing waste stream, the rising cost of energy, and the desire to provide more and better services to Maui's residents. The island's landfill facililities on Maui include:

1. The Hāna Landfill serves the Hāna community plan area and has a total area of approximately 35 acres and accepts residential, commercial and green waste.
2. The Olowalu Convenience Center located adjacent to the former Olowalu landfill, accommodates self-haul residential waste from residents of Lahaina for transfer to the Central Maui landfill. The site also includes a limited recycling drop station.
3. The Maui Demolition and Construction Landfill is a privately owned and operated facility that accommodates the island's construction waste.

Maui County Landfill, Pu`unēnē.

CHALLENGES AND OPPORTUNITIES

Limited Landfill Capacity

Most of the island's waste goes to the Central Maui Landfill. The Central Maui Landfill accepts about 500 tons per day of waste on average, although with the recent economy this tonnage is less. If nothing is done to divert waste from this landfill through increased recycling and WasteTEC (waste to energy), the landfill capacity will be reached by 2026. Efforts to increase diversion as recommended by the ISWMP could increase landfill capacity until 2042.

Based on the ISWMP, Hāna Landfill is expected to accommodate the needs of its community through the planning period as its projected capacity will be reached by 2096.

Source Reduction and Recycling

The National Recycling Coalition (NRC) and the Environmental Defense Fund (EDF) view source reduction as a viable means to reduce municipal solid waste. Recently, the NRC broadened its mission statement to include source reduction. It states: "ton for ton, source reduction is more valuable to society than recycling." The EDF has stated that eliminating excessive layers of packaging is one of the most obvious and important

Recycling containers at Pa`uwela Recycling Center, Ha`ikū

forms of source reduction, and that source reduction has the potential to alleviate natural resource depletion.

In recent years, the County has diverted around 30 percent of its waste to recycling, composting, and other uses; this doesn't meet the State's goal of 50 percent diversion by 2000. The ISWMP sets forth an implementation plan that aims to attain an 83 percent waste diversion by the year 2040. To achieve this, the County is moving towards full automation of its trash collection (where feasible) and curbside recycling. Implementation of curbside recycling will require the acquisition and development of property to support a materials recovery facility (MRF).

The ISWMP explores options for waste-to-energy for Maui that would divert waste from landfills and convert the waste stream to a beneficial project such as electricity. The County's waste stream projected to the year 2030 could sustain such a facility and a 54 percent recycling rate. Currently the recyling rate is about 30 percent. The recycling program, gas to energy program, waste-to-energy and waste diversion programs will need to be coordinated and integrated in the overall management of our solid waste stream to extend the capacity of our landfills.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

6.1 Maui will have implemented the ISWMP thereby diverting waste from its landfills, extending their capacities.

Objective:

6.1.1 Meet our future solid waste needs with a more comprehensive planning and management strategy.

Policies:

6.1.1.a Update and publicize the ISWMP every ten years.

6.1.1.b Strengthen inter-agency coordination including Planning and Environmental Management departments.

6.1.1.c Divert waste from the landfills and educate the public about the recommendations of the ISWMP.

6.1.1.d Minimize future active, unlined landfill cells to the extent feasible.

Implementing Actions:

6.1.1-Action 1 Implement the ISWMP through programs/improvements/upgrades of the solid waste management system and the Capital Improvement Project (CIP) budget in a timely manner.

6.1.1-Action 2 Regularly update waste generation, reuse, recycling, and disposal data for monitoring and implementation purposes.

6.1.1-Action 3 Educate the public about the importance and cost savings of solid waste reduction.

Objective:

6.1.2 Divert at least 60 percent of solid waste from the island's landfills.

Policies:

6.1.2.a Require residents and commercial enterprises that generate waste to pay a fair proportion of disposal costs.

6.1.2.b Encourage environmentally safe waste-to-energy solutions.

6.1.2.c Facilitate the reduction of solid waste generated by packaging, food service products, construction waste, etc.

6.1.2.d Educate residents and visitors about the impacts of and methods to reduce, reuse, and recycle.

6.1.2.e Discourage the disposal of landfill leachate by diversion to wastewater treatment plants, where practicable.

Implementing Actions:

6.1.2-Action 1 Implement a comprehensive, curbside recycling program.

6.1.2-Action 2 Develop regulations, programs, funding opportunities, and/or incentives to:

(1) Increase recycling of used appliances/furniture/electrical/components/clothing/other household items and recyclable materials;

(2) Increase the number of composting centers;

(3) Reduce solid wastes generated by packaging, food service products, home construction waste, etc.;

(4) Construct materials recovery facilities (MRFs) including a facility in Central Maui, in accordance with the ISWMP, and investigate a cost-recovery fee to meet funding needs; and

(5) Discourage slow degradable materials, e.g., Styrofoam.

6.1.2-Action 3 Develop public outreach/education/incentive programs to increase awareness to reduce, reuse, and recycle.

6.1.2-Action 4 Prepare a study to assess the feasibility of a future waste to energy program.

6.1.2-Action 5 Identify and develop a recycling/redemption facility at an appropriate location in West Maui.

Central Maui Wastewater Reclamation Facility, Kanahā.

WASTEWATER

The Maui County Code defines wastewater as "water-carried wastes from dwellings, commercial establishments, institutions and industrial plants, and may include groundwater, surface water and storm water not intentionally admitted." Management of wastewater is important because it helps guard the water supply from becoming contaminated, protects the public health and environment, and aids in water conservation by allowing reclaimed water to be used for nonpotable water purposes. Proper disposal of the millions of gallons of wastewater produced on Maui protects the drinking water supply, coastal water quality, and other important environmental resources.

The Maui County Department of Environmental Management, Wastewater Reclamation Division (WWRD), is responsible for the development, operation, and maintenance of the municipal wastewater system. The Division operates three principal wastewater management and reclamation systems: Wailuku-Kahului, Kīhei, and Lahaina. Table 6-1 lists the areas which are supplied by each wastewater system.

Table 6 - 1: Maui's Wastewater Systems

System	Towns Serviced
Wailuku-Kahului	Wailuku, Kahului, Kū`au, Pā`ia, Spreckelsville, Waikapū, Waiehu
Kīhei	Kīhei, Wailea
Lahaina	West Maui, from Kapalua to Puamana
Hāli`imaile	Hāli`imaile Town

The service areas of the three wastewater management systems correspond generally to Maui's Community Plan areas. The Makawao-Pukalani-Kula Community Plan area is served by individual cesspools and septic tanks, with the exception of a portion of Pukalani, which is served by a privately-owned wastewater reclamation facility. Hāli`imaile is unique as it is the only Upcountry subdivision that is served by a County collection system (and private treatment pond). Mākena has a private treatment plant. The Hāna Community Plan area is served by individual cesspools and septic tanks.

Existing Plans and Programs

Maui's wastewater systems were assessed in the *County of Maui Infrastructure Assessment Update* (Wilson Okamoto, 2003). Wastewater system monitoring is an ongoing task for the WWRD. Much of the assessment and planning for different parts of the system, such as pumps and plants, is updated as frequently as every quarter. The Wastewater Division is utilizing a hydraulic model to analyze areas of the system that will require upgrades due to current use or further development. Major expansions and capital improvements are guided by the Division's facility plans; projects are then incorporated into its annual capital budgeting process.

Regional Analysis

The regional analysis provides an overview of each wastewater system's existing 2005 demand, projected 2030 demand, projected surpluses, shortages, and major capital improvement project investments. Wastewater demand is expressed as millions of gallons per day (mgd).

Wailuku-Kahului Wastewater System

The Wailuku-Kahului wastewater system is the largest and oldest of Maui's wastewater collection systems. The treatment facility currently has a design capacity of 7.9 mgd. Based on population growth to 2030, the capacity of the treatment facility will not be reached by the end of the planning horizon.

In August 2005, the County completed a study to address shoreline erosion and tsunami hazards at the Central Maui Wastewater Reclamation Facility. The study evaluated 11 treatment and disposal alternatives that ranged from maintaining the facility at its current location with fortification to withstand

shoreline erosion and tsunami hazards, to relocating the facility to an alternative inland location. Cost estimates associated with these alternatives ranged from $30 million to $400 million, respectively. Based on the conclusion of this study, the Maui County Council adopted a resolution to maintain the existing facility at its present location with appropriate fortification to withstand shoreline erosion and tsunami hazards.

Kīhei Wastewater System

The Kīhei wastewater system was built in 1975 and has a design capacity of 8.0 mgd. In 2005, wastewater flows to the facility averaged 5.0 mgd. Based on projected population growth between 2005 and 2030, the capacity of the treatment facility will be sufficient to meet projected demand over the period.

Approximately 1 mgd of final effluent is currently treated as reclaimed water for irrigation. According to WWRD, there are no near-term concerns with the capacity of the Kīhei Wastewater Reclamation Facility. Larger projected developments like Mākena and Wailea 670 have indicated they will use their own private treatment plants, not placing additional demands on the County system. However, should they connect to the County system then they will have a long-term impact on plant capacity.

Lahaina Wastewater System

The original Lahaina Wastewater Reclamation Facility was constructed in 1975 and has undergone several modifications and additions since that time. It currently has a capacity of up to 9.0 mgd. In 2005, wastewater flows to the Lahaina facility averaged 5 mgd. If regulatory constraints and requirements remain unchanged, adequate treatment capacity should be available to serve the projected population growth through the 2030 planning horizon. In addition to wastewater treatment, the facility supplies about 1.0 to 1.4 mgd of reclaimed water for nearby customers.

Makawao-Pukalani-Kula Community Plan Area

The majority of the Makawao-Pukalani-Kula Community Plan area is served by individual cesspools and septic tanks. Hāli`imaile is the only subdivision that is served by a County collection system. It is expected that new developments in the Upcountry area, aside from those in Hāli`imaile, will all be served by septic systems as required by the State Department of Health. Any new development in Hāli`imaile is required by the Department of Environmental Management to obtain a letter from Maui Land and Pineapple Company accepting the added flow to their treatment facility before the County will issue approval for the connection. Otherwise, the project will be required to build its own package wastewater treatment plant.

CHALLENGES AND OPPORTUNITIES

Need for Additional Funding to Maintain Aging Facilities

County operated wastewater treatment facilities and collection systems are aging, and will require increased maintenance during this planning horizon.

County, State, and Federal requirements prescribe the operation of treatment facilities and the quality of treated wastewater. To date, the County meets the requirements of all jurisdictions. Maintaining this level of quality will require thoughtful planning by the Department of Environmental Management, Wastewater Division.

To meet the projected demand, sufficient funding is needed for the upgrade and maintenance of the island's wastewater facilities.

Wastewater Reuse

Each year, the County treats approximately 17 mgd of wastewater. This is an amount that is nearly equivalent to the sustainable yield of the `Īao Aquifer. Once wastewater is properly treated, it is possible for the nonpotable water to be stored and transported for landscaping, fighting fires, and agricultural irrigation. An excess of approximately 11.4 mgd of reclaimed water is produced at treatment facilities. But, without sufficient storage and distribution capability to make use of all of it, the excess is sent down injection wells. Reuse of wastewater is an electricity dependent process. The increased reuse of wastewater will increase electrical usage and costs.

Injection Wells

The County manages fifteen injection wells on Maui: eight in Kahului, four in Lahaina, and three in Kīhei. In addition to the publicly maintained wells, there are numerous privately-owned and operated injection wells in the County. Many privately-owned condominiums and businesses in areas that were built outside of existing County sewer service have their own injection well(s).

There has been a growing public concern that wastewater may be leaching from injection wells into the ocean. Some alternatives are to upgrade the wastewater reclamation reuse systems, improve the current level of water treatment, or to phase out injection wells entirely. All of these alternatives will require a significant financial investment to implement.

Private Wastewater Treatment Plants

Private wastewater treatment plants present an alternative to centralized plants when new developments are built beyond the service area boundaries. However, it is important to understand that the County land use policies and directed growth strategies are critical to direct future growth and development to the most appropriate locations and communities. The permitting and use of private plants are appropriate only when they implement the County land use policies and directed growth strategies. These privately-owned and operated facilities can treat wastewater to a level of quality that meets Federal, State, and County requirements. The primary issues associated with these plants are the high up-front cost and ongoing operation costs that these facilities place on individual communities. Also, a related issue that must be addressed is the need to secure financial assurance to ensure an uninterrupted operation (in case of bankruptcy or any default on financial obligation by the private operation).

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

6.2 Maui will have wastewater systems that comply with or exceed State and Federal regulations; meet levels-of-service needs; provide adequate capacity to accommodate projected demand; ensure efficient, effective, and environmentally sensitive operation; and maximize wastewater reuse where feasible.

Objective:

6.2.1 A wastewater planning program capable of efficiently providing timely and adequate capacity to service projected demand where economically feasible and practicable.

Policies:

6.2.1.a Encourage the use of renewable energy in support of wastewater treatment facilities.

6.2.1.b Focus the expansion of wastewater systems to accommodate planned growth consistent with the MIP Directed Growth Strategy.

6.2.1.c Establish new wastewater treatment plant(s) outside the tsunami zone.

Objective:

6.2.2 Adequate levels of wastewater service with minimal environmental impacts.

Policies:

6.2.2.a Meet or exceed all State and Federal standards regulating wastewater disposal or reuse.

6.2.2.b Encourage tertiary treatment for all municipal wastewater that is disposed through deep injection wells. Phase out all municipal and private injection wells in coordination with water reuse programs, where feasible, by 2020.

6.2.2.c Improve and upgrade the County's existing wastewater collection, treatment, and reuse facilities consistent with current and future plans and the County's CIP.

6.2.2.d Maintain an ongoing sewer inspection program for public and private multi-user systems to identify potential problems and forecast each system's residual life.

6.2.2.e Require all new developments to fund system improvements in proportion to the development impact and in accordance with the County's wastewater functional plan.

6.2.2.f Require appropriate funding mechanisms, such as a sinking fund, to adequately maintain or replace aging water-system components.

6.2.2.g Strongly encourage the phase out of cesspools.

Implementing Actions:

6.2.2-Action 1 Implement the following to ensure effective, safe multi-user wastewater treatment systems:

(1) Amend County regulations and plans to ensure adequate operating procedures, treatment standards, and monitoring programs;

(2) Establish treatment and capacity requirements suitable for the required level of service/use; and

(3) Require private treatment facilities or public-private funded facilities to provide financial assurance, including bonds, for the following:

a. Repair, removal, or replacement of any system components reaching the end of intended service life; and

b. Enforcement of other needed corrective action(s) or guaranteeing uninterrupted operation in case of bankruptcy, abandonment, or any other default on financial obligation.

6.2.2-Action 2 Work with the State toward the phase out of cesspools.

6.2.2-Action 3 Conduct and implement technical studies to identify appropriate level of service and potential funding mechanisms to augment the funding available for ongoing upgrade/maintenance of the wastewater system.

Objective:

6.2.3 Increase the reuse of wastewater.

Policies:

6.2.3.a Strengthen coordination between the Department of Water Supply (DWS) and the WWRD to promote reuse/recycling of wastewater.

6.2.3.b Expand the reuse of wastewater from the Central Maui, Kīhei, Lahaina, and other wastewater systems.

Implementing Actions:

6.2.3-Action 1 Identify potential new users of treated effluent and implement the necessary improvements to supply this water through the County CIP.

6.2.3-Action 2 Amend County regulations to allow for the use of grey water for approved purposes.

6.2.3-Action 3 Create education, marketing, and incentive programs that promote the reuse/recycling of wastewater.

When you are thirsty, it is too late to think about digging a well.
~Japanese Proverb

East Maui Irrigation Ditch.

WATER

As the most isolated archipelago on earth, the provision of clean and reliable sources of fresh water - vital for survival - must come from our own endeavors. Natural reservoirs of water are available to meet future demand if we, as a community, are willing to invest in the stewardship and storage of this critical resource. Balanced stewardship - respectful of the varied needs of the land, people, and future - will require much in terms of capital and human resources. To meet our water needs we will need to be creative, adapt to changing situations, develop innovative solutions to conflicting needs, and commit to our island society as a whole.

Looking forward, water will continue to be of paramount importance to Maui's urban, agricultural, rural, industrial, commercial, and native Hawaiian users, as well as sensitive biological and ecological systems. Land use decisions must be closely tied to water availability.

Maui has two primary forested mauka watersheds: East and West Maui. The West Maui watershed is composed of the mountain ridges, valleys, streams, and aquifers stretching from the top of Pu`u Kukui down to the sea. The East Maui watershed begins at the summit of Haleakalā; it is the island's largest water producer. Sources of water on Maui consist of streams (surface water) and aquifers (groundwater). Maui's perennial streams are predominantly on the windward slopes of the island's watersheds. Streams are also influenced by periods of prolonged drought, resulting in minimal flow or a dry stream bed. As a result of high precipitation and geology, Maui possesses vast underground reservoirs of freshwater. Rainwater seeps through the highly permeable basalt of the volcanoes and is stored in aquifers, floating on the underlying saltwater. The majority of the water supplied to the island comes from groundwater. Groundwater is generally more reliable and less expensive to treat than surface water.

Water Systems

The DWS is responsible for the development, operation, maintenance and protection of the municipal water system and supply. On the island of Maui, DWS manages nine public water systems as defined by the State Department of Health under the State Drinking Water Act, in four districts: Central Maui, West Maui, Upcountry, and Hāna.

The mission of DWS is to "provide clean water efficiently." One method is by enforcing system standards. System standards are set statewide and are based on national utility standards; however, there is currently no approved County policy regarding water system standards. The standards vary by source (ground and surface); they take into account various factors such as redundancy, aquifer sustainable yield, peak demand, drought, and equipment malfunctions.

Table 6 - 2: Water Districts on Maui

District	County Water Systems	Areas Supplied
Central Maui	**Drinking Water:** (Central Public Water System (PWS))(aka Wailuku) **Irrigation:** Wastewater Reclamation Division	Wailuku, Waikapū , Waihe`e, Waiehu, Kahului, Pu`unēnē across the isthmus, Spreckelsville, Pā`ia, Kū`au to the north, Mā`alaea, Kīhei, Wailea, and Mākena to the South
West Maui	**Drinking Water:** Lahaina PWS, Honokōhau PWS **Irrigation:** Wastewater Reclamation Division	Lahaina, Honokowai, `Alaeloa-Kahana, Nāpili, Honokōhau, and spans Kā`anapali region
Upcountry	**Drinking Water:** Makawao PWS, Lower Kula PWS, and Upper Kula PWS **County Irrigation:** Kula Agricultural Park **State / County System – Irrigation:** Upcountry Dual System	Ha`ikū, Hāli`imaile, Makawao, Pukalani, Kula, `Ulupalakua, and Kanaio
East Maui	**Drinking Water:** Ke`anae , Nāhiku, Hāna **County / Private Shared – NonPotable** Kaupō / Kaupō Ranch	Ke`anae, Nāhiku, Hāna, Hāmoa, Koali, and Kaupō

Regulatory Controls

In addition to the DWS, the Board of Water Supply (BWS) and the Maui County Council are responsible for decisions regarding fresh water on the island. The BWS is obligated to review DWS's request for an annual appropriation for operations and capital improvements, and to recommend the establishment or adjustment of water rates and charges. The Maui County Council has the duty to review matters related to DWS and the State Commission on Water Resource Management (CWRM), as well as matters related to compliance with safe drinking water rules and regulations.

Maui's water sources, ground and surface, must meet Federal Safe Drinking Water Act (SDWA) quality standards. Regulation of the SDWA is administered by the EPA through the State Department of Health (DOH). The CWRM also has regulatory control over Maui's water resources. CWRM, through administration of the State Water Code, Chapter 174, Hawai`i Revised Statutes, is obligated to set policies, protect resources, define uses, establish priorities while assuring rights and uses, and establish regulatory procedures. Within designated Water Management Areas, CWRM possesses regulatory control over water withdrawals through a water use-permit process. The permit process is designed to provide better protection of freshwater resources. Only one groundwater management area has been designated by CWRM on the island: the `Īao Aquifer system. In addition, the surface water area of Na Wai `Ehā has been designated.

Existing Plans and Programs

The Water Use and Development Plan (WUDP) is the primary long-range plan of DWS. The WUDP serves as a long range guide for water resource management for the County. The WUDP is intended to identify system needs consistent with the General Plan, identify water issues, challenges and opportunities, and, with Maui County Council approval, to set forth County policy with regard to such issues, including allocation of water to land uses. Such policies are intended to be considered by the State in making its decisions regarding new pumping permits, stream withdrawals, and other matters. The WUDP must be updated on a regular basis to ensure consistency with the General Plan, and to address significant changes to water status, policies, or issues that may need to be addressed. An update of the WUDP for Maui is in progress. The BWS holds a public hearing and submits findings and recommendations to the DWS. The DWS then transmits the WUDP to the Maui County Council for review and approval. The WUDP must also be adopted by the CWRM.

Regional Analysis

Each of Maui's four water systems possesses unique challenges, constraints, and opportunities. The following regional analysis provides an overview of each system's status, sources, and projected 2030 demand[5]. Since the WUDP is currently undergoing a comprehensive update, the regional analysis is based on the best available information. This analysis uses the following documents as the primary source of information: *County of Maui Infrastructure Assessment Update* (May 2003), prepared by Wilson Okamoto & Associates, Inc.; DWS Availability Worksheets; and Maui County Water Use and Development Plan (May 2007 Draft), prepared by Ha`ikū Design and Analysis.

[5] Water demand is expressed as million gallons per day (mgd) and existing demand refers to 2005. When referring to an aquifer's sustainable yield, the given calculation represents the estimated maximum amount of groundwater that can be withdrawn without damaging the aquifer's ability to replenish itself.

Central Maui Water System

Approximately 75 percent of the water supplied by the Central Maui system is withdrawn from the `Īao Aquifer in the vicinity of `Īao and Waiehu Streams. The remaining 25 percent is supplied primarily by the Waihe`e Aquifer with a small portion coming from surface-water sources. In practical terms, the available supply of water for the Central Maui system is estimated at 26 mgd. The average daily demand on the Central Maui system for 2005 was 21.39 mgd. Current projections indicate that demand will outpace current supply prior to 2020. Total projected 2030 demand on the Central Maui system is estimated at 34.11 mgd, which exceeds the current 26 mgd supply of the system by 8.11 mgd. Development of additional sources is crucial for the Central Maui system.

West Maui Water System

The West Maui system receives water from ground and surface sources. Total available water supply for the West Maui water system is 8 mgd. Current demand on the system is 5.17 mgd. Projected demand for 2030 is estimated to be 6.56 mgd.

Upcountry Water System

The Upcountry system is supplied primarily by surface-water sources; however, groundwater sources are available to service the Upcountry system during periods of drought. The Upcountry system is one of the more complex DWS systems for several reasons. The system is composed of four interconnected sub-systems, as well as a range of source- and service-area elevations. The system is almost completely reliant on surface water, making it vulnerable to drought conditions. The system is supplemented by pumping groundwater during drought periods; however, this activity is extremely expensive due to the high energy costs of pumping water to the service-area elevation. Voluntary and mandatory water-use restrictions are imposed on residential and agricultural users of the system during dry periods. These restrictions often negatively impact the productivity of Upcountry farmers.

Hāna Water System

The Hāna system currently receives all of its water from ground sources consisting of two wells. Total available supply for the Hāna system is approximately 0.487 mgd. Two private water systems, Hāna Water Resources and Hāna Water Company, exist in the area. In 2005, the system average daily demand was 0.195 mgd. Projected demand for 2030 is estimated at 0.215 mgd.

The Ke`anae system is served by the Ke`anae Well, and back-up well (Ke`anae Well 2). Current demand is approximately 100,000 gallons per day. Nāhiku is served by the Nāhiku Tunnel which has about 20,000 gallons per day of available capacity. Current demand from the Nāhiku Tunnel is approximately 15,000 gallons per day.

Table 6-3 identifies long-range water source development opportunities for each DWS water system. These are included in the DWS long-range capital project database and evaluated in the WUDP. All of the strategies represent a series of projects that come on as indicated by demand growth, sufficient to supply enough water for forecasted growth in the region. In West Maui and East Maui, resource options have not been combined into "strategies" by the County's Water Advisory Committees. However, new-source options under consideration include those listed.

Table 6 – 3 Long-Range Water Source Development Opportunities:

Resource Strategy or Resource Option	Notes
CENTRAL MAUI	
All Strategies Assumed to Include: Conservation Resource Protection Maui Lani Wells Kupa`a Well Shaft 33 Replacement Waikapū Wells	
Strategy Options:	
Northward Basal Groundwater Development	Development of a series of basal wells in the northern half of the Waihe`e aquifer, and Kahakuloa aquifer.
Eastward Basal Groundwater Development	Development of a series of basal wells in the Ha`ikū, Honopou and or Waikamoi aquifers.
Na Wai `Ehā Surface Water Treatment	Use of water from the Waihe`e ditch system. Na Wai `Eha, or the four great waters, including the `Īao, Waihe`e, Waikapū, and Waiehu Streams. The Waihe`e Ditch System was constructed by Hawaiian Commercial and Sugar Company and Wailuku Sugar in the early 1900s to supply water for sugarcane irrigation from these four streams. The system contains 12 miles of ditches and tunnels stretching from Waihe`e to Waikapū .
Desalinization of Brackish Groundwater	Several sites and configurations have been evaluated
Maximization of Water Conservation and Reclaimed Water Use	A certain amount of conservation is targeted in all final strategies. This option envisions maximal conservation through a major early investment as well as use of reclaimed water and possible construction of an additional reclaimed water line.
UPCOUNTRY MAUI	
All strategies are assumed to include: Conservation Watershed Protection Po`okela Well Olinda WTP Upgrade Kamole WTP Upgrade Phase 6 and 10 Booster Pump Upgrades Flume Rehabilitation Other Efficiency Measures	
Strategy Options:	
Incremental Basal Well Development	Various locations, elevations, and booster pump configurations are considered.
Expansion of Raw Water Storage Capacity	Construction of one or more additional large raw water storage reservoirs to supplement effective reliable yields from the Upcountry system.
"Drought Proof" Full Basal Backup	Construction of sufficient wells to provide service to Upcountry customers even during an extreme drought. This strategy is evaluated at different levels of uninterrupted reliability.

Resource Strategy or Resource Option	Notes
Expanded Capacity at the Kamole Water Treatment Plant.	This strategy reviews the benefits of an increase of Kamole Water Treatment Plant capacity, particularly of drought-period capacity, in relation to system-operation costs.
Limited Growth with Extensive Conservation Measures	This strategy examined means and impacts of limiting demands on the Upcountry system. Conservation measures and redistribution of growth scenarios were considered. While redistribution of growth would be the purview of land use planning agencies, it was seen as potentially valuable information for land use decision makers.
WEST MAUI	
All strategies are assumed to include: Conservation Resource Protection Other Efficiency Measures	
Strategy Options:	
New Basal Wells	Drill new basal wells to supply additional water to DWS West Maui systems. Various sites have been identified.
Additional Use of Surface Water	Increase use of the Māhinahina Treatment Plant.
Renovation of Existing Unused Sources	Examine the feasibility of adapting and utilizing, or drilling into the same location as, some historical sources.
Desalinization	Desalinization of brackish water.
Increased Use of Reclaimed Water	Examine the feasibility of expanding reclaimed water use.
Improved Interconnection Between West Maui Systems	This would enable one end of the system to more readily and effectively back up the other, thereby making more effective use of existing sources.
EAST MAUI	
All strategies are assumed to include: Conservation & Other Efficiency Measures Resource Protection Ke`anae Backup Well Hāmoa Well 2 Wākiu Backup Well	
Strategy Options:	
New Basal Well(s)	
System Improvements	Improved connections within systems, water loss reduction.
Increased Use of Tunnel (Nāhiku)	

Conservation and Energy Efficiency

In addition to the potential future sources discussed in the regional analysis section, several conservation and energy efficiency options exist to ensure a reliable and clean supply of water for all four regional systems.

Demand Side Management Programs: Demand-side management (DSM) describes actions that DWS can take to influence how customers utilize County water. Examples of DSM programs include: incentives for installing efficient appliances and low-flow water fixtures and toilets, the implementation of landscaping ordinances that require drip irrigation and drought tolerant plants, and water-rate design and pricing policies that increase water rates as consumption increases.

Supply-Side Leak Reduction: Supply-side leak reduction involves continually inspecting transmission lines and distribution pipes for leaks and breaks. This practice reduces the loss of ground and surface water due to infrastructure deficiency.

Stream and Watershed Restoration and Protection Measures: Protecting and restoring watersheds and streams is a key element of ensuring a reliable source of fresh water for current and future generations. Options include requiring minimum streamflows, restoring stream channels, supporting watershed protection partnerships and programs, and acquiring Maui's key watersheds.

CHALLENGES AND OPPORTUNITIES

Comprehensive Water Resources Planning and System Control

Water-resource planning is critical to ensure public health, economic development, and environmental protection. This involves continual assessment of the current and future adequacy of water supplies in a holistic way, including the establishment of appropriate principles and standards. The process looks ahead to what the subject area would be like, how much water would be needed, where such water would come from, and what the water quality should be. Equally important is determining the capital improvements that would be required to treat and deliver the needed water, and the best ways to pay for these improvements. With regard to system control, the County controls a relatively small percentage of the water on the island.

DWS Budget Constraints

The DWS is currently facing a major financial deficit. The Department's current budget is not able to cover costs for long overdue replacements and repairs for all water systems. Many systems need to be updated to ensure a reliable supply of water for users.

Stream Protection and Instream Flow Standards

Section 174C-3, Hawai`i Revised Statutes (HRS), defines instream use as "beneficial uses of stream water for significant purposes which are located in the stream and which are achieved by leaving the water in the stream". The CWRM's mandate is to establish instream flow standards that will protect instream uses while allowing for reasonable and beneficial offstream use. Interim instream flow standards (IIFS) were adopted for both East and West Maui in 1988 (Sections 13-169-44 and 48, Hawai`i Administrative Rules). However, the IIFS are not based on scientific information; rather, they simply continue the "status quo" by setting the standard at the amount of water that was flowing in each stream on the date of adoption. CWRM is currently drafting an Instream Flow Program Implementation Plan which will, among other actions, develop a standardized IIFS methodology and set scientifically-based IIFS statewide. These standards will influence DWS's long-range planning for surface-water resources, both instream and offstream.

Native Hawaiian Water Rights

Water rights for native Hawaiians are protected by Section 174C-101, HRS. These water rights include current and future water use for Hawaiian Homelands, domestic water use for kuleana lands, and traditional and customary rights. The ahupua`a systems that exist should be maintained and enhanced.

Energy Production and Efficiency Measures

Since energy use is a substantial component of DWS costs, increasing energy efficiency is a key element of reducing long-term water service costs. Multiple energy production and efficiency options exist, including hydroelectric generation, wind power for water pumping, and system operation efficiency improvements.

Wastewater Reuse

Wastewater reuse involves the treatment and reuse of wastewater for agricultural, golf course, landscape, and other irrigation needs. Reuse of wastewater extends the life of used water and conserves freshwater sources. The feasibility of treating and utilizing wastewater depends on many factors; the location of the wastewater facility and the proposed service area are key considerations for wastewater reuse.

Private Water Systems

Private water systems present an alternative to public water systems when new developments are built beyond water service areas. However, water source development should implement, rather than undermine, County land use policies and directed growth strategies that seek to direct future growth to the most appropriate locations and communities. The permitting and use of private multi-user water systems are appropriate only when they implement County land use policies and directed growth strategies.

The DWS has concerns about the growing number of private wells on the island for several reasons:

- Each well is a potential conduit for contamination to the aquifer. Over the years, wear, damage, improper maintenance, or inadequate wellhead protection can lead to the potential for nondesirable substances to enter the aquifer through well bores, flawed or damaged casings, or abandoned wells that have not been properly sealed. There are already many wells on the island that can no longer be located. Each one of these represents a potential risk of such contamination to the aquifer. The more wells that are approved, the more this risk is multiplied.
- Private parties or their successors may lack long-term funds to ensure proper well maintenance, and may abandon wells without proper sealing. To avoid contamination and degradation of water quality, and to ensure long-term reliable water supply, wells must be properly operated, maintained, and sealed. Financial assurance is needed to ensure an uninterrupted operation (in case of bankruptcy or any default on financial obligation by the private operation).
- It is important that the impact of private water systems on surface and groundwater sources be carefully managed and monitored to ensure the long-term sustainability of the island's water resources. A majority of private wells in the State either do not report pumpage at all, or report infrequently. Though the individual impacts of such wells are generally minor, their cumulative impacts may not be. This makes it difficult for the agencies tasked with resource monitoring to accurately gauge aquifer status. Increasing the number of small private wells may exacerbate the problem.
- Some private systems are placed in such a way that they compete with DWS for resources that would otherwise have served the community at large. Because DWS is subject to more extensive public process, budgetary review, and environmental review than private developers, DWS can lose opportunities to develop intended wells as private developers install them. At times this creates opportunities for partnership. At other times, the

County loses opportunities to provide water that would meet the needs of the broader community.

Agricultural Water Use

The State Water Code identifies agriculture as a valid and protected use of water. Agriculture is important to Maui's economy, lifestyle, history, and quality of life. Large agricultural operations, namely sugarcane and pineapple, have dedicated water sources as a result of their establishment and development of these sources over a century ago. While large-scale agriculture has privately-owned water sources, diversified agricultural operations rely predominantly on DWS systems to supply water for irrigation. The majority of diversified agriculture is located Upcountry and utilizes the same County water supplied throughout the region for domestic purposes.

The State Water Code mandates balancing water uses (including domestic, commercial, Hawaiian water rights, instream flow, and agriculture) to obtain maximum beneficial use of State waters and best serve the public good. However, complex challenges for both large-scale and diversified agriculture currently exist regarding water supply in the future. These are mainly focused on the competing interests or conditions, including the current high demand for water from all types of users, the potential establishment of IIFS, and the growing concern over native Hawaiian water rights.

Since Upcountry farmers rely predominantly on County water, mandatory water-use restrictions implemented during severe drought conditions can have negative consequences for them. Additionally, since County water is treated for domestic use, farmers are paying high water rates for a use which does not necessarily require treatment. DWS, in conjunction with State and Federal agencies, is currently implementing a project (Upcountry Dual Water System) to supply Kula farmers with less expensive untreated surface water. While completion of this project will provide a more affordable source of water for crop irrigation, the use of untreated water gives rise to other potential future issues: competition for the water to treat and meet potable water demands, and the risk that some grocery stores may ban any produce irrigated with untreated water.

With the recent downsizing of Maui's sugar and pineapple industries along with uncertainty about the outcome of the CWRM's decision on IIFS, there are questions about the availability of a long-term source of water to support agriculture in Central Maui. Competition for unused diverted water is likely to arise, as demonstrated in the Waiāhole Water Case on Oahu, requiring tough decisions to ensure the equitable distribution of such water. Additionally, this uncertainty has the potential for negatively affecting future agriculture due to the requirement of many lending institutions to demonstrate long-term access to water to secure loans.

Potential Opportunities

Other opportunities exist to meet Maui's water needs.

- **Reclaimed Water Use:** While some agricultural operations utilize reclaimed water for irrigation, the potential exists to increase this usage where feasible. Utilizing reclaimed water conserves new water sources while extending the life of used water.
- **Desalination:** Desalination is the process of removing salt and excess minerals from sea water so that it is suitable for human consumption or irrigation. Desalination is becoming more cost effective for communities

where fresh water has become scarce. The desalination of large quantities of water can require large amounts of energy. In addition, it can be expensive to build the transmission infrastructure that may be required to transport the water from the desalination facility to consumers. There are a number of environmental constraints associated with desalination: the impact on marine life due to open ocean intakes; the impact on energy consumption; and the disposal of effluent wastewater generated through the desalination process. Many of these issues may be addressed as desalination technologies continue to improve.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

6.3 Maui will have an environmentally sustainable, reliable, safe, and efficient water system.

Objective:

6.3.1 More comprehensive approach to water resources planning to effectively protect, recharge, and manage water resources including watersheds, groundwater, streams, and aquifers.

Policies:

6.3.1.a Ensure that DWS actions reflect its public trust responsibilities toward water.

6.3.1.b Ensure the WUDP implements the State Water Code and MIP's goals, objectives, and policies.

6.3.1.c Regularly update the WUDP, to maintain compliance with the General Plan.

6.3.1.d Ensure that the County's CIP for water-source development is consistent with the WUDP and the MIP.

6.3.1.e Where desirable, retain and expand public ownership and management of watersheds and fresh-water systems.

6.3.1.f Encourage and improve data exchange and coordination among Federal, State, County, and private land use planning and water resource management agencies.

Implementing Actions:

6.3.1-Action 1 Implement the WUDP.

6.3.1-Action 2 Develop site selection studies for water storage and supply facilities for each community plan area.

6.3.1-Action 3 Prepare and implement a plan to identify and prioritize infrastructure requirements needed to accommodate nonpotable water for irrigation.

6.3.1-Action 4 Work with the State to set standards for the amount of water withdrawn from aquifers and other groundwater sources to ensure the long-term health and sustainability of the resource.

6.3.1-Action 5 Produce an annual evaluation of the state of available water resources on the island.

Objective:

6.3.2 Increase the efficiency and capacity of the water systems in striving to meet the needs and balance the island's water needs.

Policies:

6.3.2.a Ensure the efficiency of all water system elements including well and stream intakes, water catchment, transmission lines, reservoirs, and all other system infrastructure.

6.3.2.b Encourage increased education about and use of private catchment systems where practicable for nonpotable uses.

6.3.2.c Maximize the efficient use of reclaimed wastewater to serve nonpotable needs.

6.3.2.d Work with appropriate State and County agencies to achieve a balance in resolving the needs of water users in keeping with the water allocation priorities of the MIP.

6.3.2.e Ensure water conservation through education, incentives, and regulations.

6.3.2.f Acquire and develop additional sources of potable water.

Implementing Actions:

6.3.2-Action 1. Develop programs to increase the efficiency of all water system elements.

6.3.2-Action 2. Develop, adopt, and implement water source development siting standards that implement the MIP Directed Growth Plan and the WUDP, and protect water quality for existing and future consumers.

6.3.2-Action 3. Revise County regulations to require high-efficiency, low-flow plumbing fixtures in all new construction.

6.3.2-Action 4. Pursue development of additional potable water sources to keep pace with the County's needs.

6.3.2-Action 5. Identify and develop renewable energy systems to serve the DWS.

6.3.2-Action 6. Develop a water rate structure that encourages conservation and discourages the excessive use of water.

6.3.2-Action 7. Develop a comprehensive water conservation ordinance to include xeriscaping regulations to promote water conservation.

6.3.2-Action 8. Update DWS reliability and drought standards, and continue to evaluate as needed in light of updated regulation and rainfall and flow data.

Objective:

6.3.3 Improve water quality and the monitoring of public and private water systems.

Policy:

6.3.3.a Protect and maintain water delivery systems.

Implementing Actions:

6.3.3-Action 1 Ensure water quality and quantity report results are provided in a timely manner to consumers when water quality or quantity falls below standards.

6.3.3-Action 2 Complete and implement DWS wellhead-protection program to protect the water quality of public and private wells.

Hāna Highway is a major roadway infrastructure and gateway to central Maui.

TRANSPORTATION

Streets and highways are currently the primary infrastructure supporting Maui's transportation system and play a major role in shaping settlement patterns. The quality of the roadway system affects various modes of travel including automobile, transit, bicycle, and pedestrian. The condition of Maui's roadway system also impacts the safety of all roadway users, the movement of goods and products, efficiency of emergency public services, and quality of life. This system experiences increasing demand associated with island growth and development. A key outcome, therefore, is to maintain, improve, and expand where necessary the existing roadway system, and expand multimodal transportation to improve traffic flow, safety, and efficiency.

Maui's road network is comprised of both State and County roadways that provide connections between the island's major urban centers and circulation within communities. Major highway systems on the island include Honoapi`ilani and Kūihelani Highways, which connect Central and West Maui; Mokulele and Pi`ilani Highways, which connect Central and South Maui; Hāna Highway, which connects Central and East Maui; and Haleakalā and Kula Highways, which connect Central and Upcountry Maui.

According to the State Department of Transportation (DOT), the average daily traffic volumes indicate that Maui's most heavily-traveled roadways during the day are Honoapi`ilani Highway, Ka`ahumanu Avenue, and Hāna Highway.

Existing Plans and Programs

The DOT has jurisdiction over State roadways while the County of Maui, Department of Public Works, Highways Division, has jurisdiction over County roadways. The primary program governing improvements to Maui's roadway network is the Hawai`i Statewide Transportation Improvement Program (STIP). The STIP provides a multi-year listing of State and County projects and identifies those projects slated for Federal funding. It is a multimodal transportation improvement program that is developed utilizing existing transportation plans. The STIP delineates funding categories including the Federal and local share of funding required for each project.

Maui's roadway network was assessed in the *Proposed Roadway Development Program*, Fehr & Peers and Kaku Associates, (2007). The purpose of this study was to provide a current and future (2030) capacity assessment of Maui's roadway network pursuant to proposed land use and development trends. This study was used as the primary source of information for this Transportation Section. See Diagram 6-2 for a depiction of existing and conceptual transportation options.

Table 6 - 4: Proposed Highway Improvements

Up-Country - Kīhei Corridor	
Honoapi`ilani Realignment-aka Lahaina By-Pass	Wai`ale/Kūihelani Hwy Connector
Phase A Keawe St. to Lahainaluna Road	Lono Ave extension to Kūihelani Hwy
Phase B Lahainaluna Road to Launiupoko	`Imi Kālā /Pihana extension (bridge)
Phase C Keawe St. to Honokowai	`Imi Kālā /Wai`ale -Mill St, extension
Pali to Puamana Parkway-aka Honoapi`ilani Realignment	Paniolo Connector (Haleakalā Hwy - Baldwin Ave)
Mā`alaea to Ukumehame	
Keawe St. Extension	Kahekili Hwy widening
Mill Street Extension (Aholo St. to Keawe)	Maui Lani Parkway
Pā`ia By-Pass	Kuikahi Drive Extension
Kīhei North-South Collector Road	Kehalani Collector Road
Kīhei Mauka By-Pass	Kehalani Loop Road
Wai`ale Extension	
Kahului Airport	

CHALLENGES AND OPPORTUNITIES

Although the implementation of proposed roadway improvements will certainly help Maui's roadway network, traffic congestion will remain an important quality-of-life issue. The expansion of the roadway network should not be considered the only solution for addressing transportation and mobility on the island. The following issues present some essential factors in planning for an effective transportation and mobility system on Maui.

Integration of Transportation and Land Use Planning

Research by the National Transportation Research Board, the EPA, as well as numerous Professional and peer–reviewed academic studies shows the creation of more compact communities reduces dependence on automobile travel – i.e. on vehicle miles traveled (VMT). Research suggests that increasing residential density can reduce household VMT by about 10 percent, and perhaps by as much as 25 percent when combined with higher employment concentrations, public transit improvements, mixed uses, and other demand management measures.[2] Furthermore, more compact mixed-use developments can help produce reductions in CO2 emissions as well as energy consumption, both directly and indirectly. These reductions can mean improvements to air quality, healthier conditions for human beings and the surrounding natural environment.

Land use patterns have a significant effect on the costs of providing public infrastructure and services such as roads, water, solid waste collection, wastewater treatment, and school facilities. Numerous studies have demonstrated that the cost of providing public infrastructure and services tends to increase with low density and dispersed development, and can be reduced with higher density and compact development within or proximate to existing urban areas. A study by the Urban Land Institute in 1989, *The Costs of Alternative Development Patterns* by James Frank, demonstrated that the municipal capital costs per housing unit increased not only with lower density development, but also with the distance from urban employment and service centers. In Colorado, William Coyne found that "dispersed rural residential development costs county governments and schools $1.65 in service expenditures for every dollar of tax revenue generated."[3]

Integrating land use and transportation planning to create denser and more compact communities that are located closer to employment centers can have not only economic but also social and environmental benefits. Todd Litman of the Victoria Transport Policy Institute developed a summary of smart-growth benefits which are depicted in Table 6-5.[4]

Table 6 - 5: Smart Growth Benefits

Economic	Social	Environmental
Reduced development costs	Improved transit options and personal mobility	Greenspace and habitat preservation
Reduced public service costs	Improved housing options	Reduced air pollution
Reduced transportation costs	Community cohesion	Increased energy efficiency
More efficient transportation	Preserves unique cultural resources	Reduced 'heat island' effect
Supports industries that depend on 'high quality' environments (tourism, farming, etc.)	Increased physical health and exercise	

Many communities have been working on ways to create more livable and healthier communities by integrating land use and transportation planning and development. Compact smart-growth communities, the implementation of "complete streets" policies, and transit-oriented development projects can be found throughout the

[2] National Research Council of the National Academies (2009). *Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy use and CO2 Emissions.* (Transportation Research Board, Washington, D.C.).
[3] Coyne, William (December 2003). *The Fiscal Cost of Sprawl: How Sprawl Contributes to Local Governments' Budget Woes.* (Environment Colorado Research & Policy Center, Denver).
[4] Litman, Todd (2002). *Evaluating Transportation Land Use Impacts* (Victoria Transport Policy Institute, Victoria).

United States.

Expansion of the Multi-Modal Transportation Network

Mobility issues on Maui can be addressed by expanding transportation alternatives, including public transit, paratransit, human services transportation, biking, and pedestrian movement. The State's policy, as embodied in Act 54 (2009), favors complete streets – i.e., to reasonably accommodate convenient access and mobility for all users of the public highway, including pedestrians, bicyclists, transit users, motorists, and persons of all ages and abilities. A balanced multimodal transportation network provides mobility choices and contributes to an efficient network that meets varied needs of all uses, including those with mobility challenges. For environmental and sustainability reasons, a greater percentage of future transportation investment must shift away from the construction of additional roads and move towards the expansion of a public multimodal transportation network.

Transportation Demand and System Management

Transportation Demand Management (TDM) involves the implementation of plans or programs aimed at reducing the use of single-occupant vehicles. TDM strategies are primarily aimed at influencing the travel trends and options of weekday commuters. These strategies include supporting alternative travel modes and altering the time and amount of travel through programs and amenities such as guaranteed ride home programs, bicycle lockers, commuter benefits, telework, and alternative work schedules. Roadway and congestion pricing have also become increasingly common TDM and infrastructure financing strategies.

Transportation System Management (TSM) strategies increase the efficiency and effectiveness of existing and future roadway systems, without widening streets, through innovative technologies and effective prioritization of resource use. Strategies may include the use of intelligent transportation system (ITS-adaptive "Real-Time" Traffic Operations using: cameras and a centralized traffic management center to control traffic and incidents as they occur; changeable message signs along major roads to advise drivers of road problems). TSM strategies may also apply intersection modifications at signalized and nonsignalized intersections, restriping travel lanes, one-way couplets, installing pavement markers, and relocating transit stops. Such modifications in traffic operations are designed to increase the operational efficiency, safety, and capacity of the existing roadway system without corridor-wide street widening.

Funding Road Improvements

Transportation networks are inherently expensive to construct and maintain. Maui's roadways are primarily financed through Federal and County programs. In recent years, however, Federal funding has declined, resulting in increased pressure on the County to finance needed roadway network improvements. As Federal funding continues to wane, the County will need to explore alternative financing mechanisms to address transportation needs.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

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

Objective:

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

Policies:

6.4.1.a Plan for an integrated multi-modal transportation system comprised of public transit, bicycle, pedestrian, automobile, and other transportation modes.

6.4.1.b Refocus transportation investment from the construction of additional roadways only for the automobile to the expansion of a multimodal transportation system.

6.4.1.c Encourage the use of "complete streets" design methods.

6.4.1.d Encourage employers to implement TDM strategies.

Implementing Actions:

6.4.1-Action 1 Explore the benefits and costs of establishing a Metropolitan Planning Organization to serve Maui's transportation needs.

6.4.1-Action 2 Develop and implement in a timely manner appropriate Transportation System Management(TSM) and Transportation Demand Management (TDM) programs in accordance with a Comprehensive Long Range Multimodal Plan.

6.4.1-Action 3 Study the feasibility of High Occupancy Vehicle (HOV) lanes within or adjacent to major arterials.

6.4.1-Action 4 Optimize traffic signal timing and coordination to reduce travel time and delay.

6.4.1-Action 5 Establish additional park-n-ride facilities in key locations.

Objective:

6.4.2 Safe, interconnected transit, roadway, bicycle, equestrian, and pedestrian network.

Policies:

6.4.2.a Ensure transit-, roadway-, and pedestrian-facilities design and level-of-service standards respect the unique character of our communities.

6.4.2.b Prioritize transportation improvements list to cost-effectively meet existing and future needs consistent with the MIP.

6.4.2.c Require new development, where appropriate, to integrate sidewalks, pathways, bikeways, and transit infrastructure into new commercial and residential projects while enhancing community character.

6.4.2.d Identify and improve hazardous and substandard sections of roadways, drainage infrastructure, and bridges, provided that the historical integrity of the roads and bridges are protected.

6.4.2.e Consider identification, acquisition where appropriate, and utilization of abandoned right-of-ways for bikeways, pedestrian pathways, and open-space networks.

6.4.2.f Support the implementation of the *Central Maui Pedestrian & Bicycle Master Plan* (March 2012), when consistent with the MIP.

Implementing Actions:

6.4.2-Action 1 Revise the subdivision ordinance to require developers, where appropriate, to integrate sidewalks, pathways, bikeways, and transit infrastructure into new commercial and residential projects, while enhancing community character.

6.4.2-Action 2 Implement the Upcountry Greenway Master Plan (2004), and other approved greenway plans, consistent with the MIP, and County and State transportation plans.

6.4.2-Action 3 Develop and adopt regulations to require developments to dedicate right-of-way consistent with State and County transportation plans prior to or as the phases of the developments become operational.

6.4.2-Action 4 Implement pedestrian and bikeway plans.

Objective:

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

Policies:

6.4.3.a Ensure that the roadway and transit alignments respect the natural environment and scenic views.

6.4.3.b Ensure that roadways and transit systems in rural areas and small towns enhance community character.

6.4.3.c Design all transit systems to respect visual corridors and Maui's character.

Implementing Actions:

6.4.3-Action 1 Adopt and amend County regulations to incorporate design standards for roadways, transit, and pedestrian facilities that ensure protection of the natural environment and each community's sense of place.

6.4.3-Action 2 Develop, adopt, and regularly update the mapping of Scenic Corridor Protection standards that implement the recommendations of the Scenic Roadway Corridors Management Plan and Design Guidelines.

6.4.3-Action 3 Urge the State to relocate Honoapi`ilani Highway mauka between the Pali and Puamana, and develop a network of parks and open space on the makai side of the highway, in accordance with the Pali to Puamana Master Plan.

Maui Bus use has grown and continues to see support, Kahului.

TRANSIT

Transit is the newest component of Maui's public infrastructure system. Public transit has increased in importance on Maui in the last 15 years as traffic congestion has stimulated the need for alternative modes of transportation. Public transit was initiated on Maui in 1992 with two fixed routes servicing Central Maui, operated by Maui Economic Opportunity, Inc. (MEO). The current public transit system, which began as the Maui Bus in July of 2006, includes fixed-route, paratransit, and commuter programs. Also, human services transportation, under the County of Maui Department of Transportation (MDOT), includes rural shuttles, dialysis transportation, and a variety of social services transportation programs. Transit services are now integrated to provide for the combined needs of the general population as well as the needs for individuals who are mobility challenged.

Public transit continues to expand in response to the changing transportation needs of the community. MDOT has taken an adaptive management approach to establishing public transit and has initiated positive steps towards addressing roadway congestion and mobility issues on the island. MDOT transit ridership statistics indicate that ridership is steadily increasing; this trend is expected to continue. While ridership was approximately 33,000 passenger boardings during the month of July 2006, ridership has increased to 225,954 passenger boardings in the month of August 2011.

Existing Plans and Programs

MDOT is currently operating the transit program on the basis of MDOT's operations taking into consideration the *County of Maui Short Range Transit Plan* (2006-2010) (SRTP), prepared by Urbitran Associates, Inc.; the *Maui County Bus Stop Planning and Design Services*, prepared by the KFH Group; and Focus Maui Nui's goals and objectives. The SRTP contains planning, policy, and financial components that provide direction for implementing Maui's public transportation system. Federal policy, updated State Department of Transportation plans, and updated SRTP plans provide the basis for MDOT's transit policy throughout Maui.

Regional Analysis

Long-range planning for Maui's transit needs requires an analysis of current and forecasted island population distribution, as well as identification of transit-dependent populations, employment centers, and major trip generators. Central, South, and West Maui will continue to demand more transit service based on their current and projected population and employment trends. Upcountry, although not a major employment center, possesses characteristics which make it an integral element of future island-wide transit planning. East Maui, being isolated and presenting unique transportation challenges, is currently being served by the human services component of the transportation system.

CHALLENGES AND OPPORTUNITIES

Accommodating Current and Future Transit Needs

To accommodate Maui's needs, long-range transit planning must be integrated with land use decisions. The location of future transit operations is directly dependent on future development patterns. Major land use decisions must consider the potential implications for the mobility of residents, visitors, and individuals who are mobility challenged and plan for the beneficial integration of transit.

To encourage inter-modal transit, coordination must be achieved among bus service, rail, or other future transit modes, park-and-ride facilities, bike routes, and pedestrian paths. This should be accomplished while considering the special needs of each region on the island.

Since the visitor industry is a major contributor to Maui's roadway congestion, the industry must also be a significant player in the formulation of transportation solutions.

Public Private Partnerships

Many entities in the private sector benefit from the County transit services as alternative modes of transportation for customers and employees. The County should continue to partner with the private sector to support mass transit within the community and welcomes volunteers who will assist the MDOT in implementing infrastructure according to government standards. The private sector's involvement can vary from subsidizing commuter bus passes to the dedication of land for transit purposes. The funding of public transit programs and facilities continues to be an ongoing challenge. Reliable mechanisms for transit programs

such as dedicated funding sources should be obtained to ensure that transit remains a viable transportation option for an increasing number of residents and visitors throughout the island.

Transit Supportive Roadway Infrastructure

Providing adequate transit supportive roadway infrastructure is vital to the efficient operation of a transit service. Bus pullouts, waiting benches/shelters, and signs are key roadway infrastructure items that are needed to support transit. While retroactively adding this infrastructure to existing roadways is important, ensuring that new roadways and subdivisions adequately accommodate transit is also a vital step.

Main Public Transit Facility

A key element of a successful public transit system is the presence of a main transit facility and connecting transit hubs. The County is currently utilizing the Queen Ka`ahumanu Shopping Center as a key transit hub. MDOT has entered into a license agreement to occupy its current premises at the Queen Ka`ahumanu Shopping Center, until the year 2020 and has implemented hub improvements. As Maui's ridership and system needs grow, the County should conduct a study to identify additional transit infrastructure needs.

Transportation Corridors

It is essential for Maui's future transportation system to identify multimodal corridors that include transit and other alternative modes of transportation (e.g., rail, bikes, etc.). The County should conduct a study to identify future locations for transit corridors and stations, as well as take action to protect and preserve lands necessary for these facilities for future County use.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

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

Objective:

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

Policies:

6.5.1.a Maximize access to public transit in town centers, commercial districts, and employment centers.

6.5.1.b Expand regional and inter-regional transit services, where appropriate, in heavily traveled corridors and within communities.

6.5.1.c Increase the frequency of current service, add additional bus routes as demand requires, and transition to nonpolluting transit vehicles, as funding permits.

6.5.1.d Provide adequate transit infrastructure (e.g., bus pullouts, waiting benches and shelters, signs) along existing and future transit right-of-ways.

6.5.1.e Require new development where appropriate, to provide right-of-ways (ROWs) to accommodate transit circulation and support facilities.

6.5.1.f Identify, protect, and preserve, or acquire corridors for future inter-community transit use, including but not limited to, rail and also multimodal use corridors.

6.5.1.g Establish transit corridors by planning for and securing right-of-way when appropriate for alternative modes of transportation (such as rail and water ferry service).

6.5.1.h Pursue improvements and upgrades to the existing transit system consistent with updated MDOT planning studies/transit plans (within the framework of comprehensive island-wide multimodal transportation plans).

6.5.1.i Increase inter-agency coordination between the Department of Planning, State Department of Transportation, County Department of Public Works, and other applicable agencies.

Implementing Actions:

6.5.1-Action 1 Amend the County subdivision and development regulations to require, where appropriate, transit-supportive roadway infrastructure.

6.5.1-Action 2 Develop and adopt an ordinance to require developments, if appropriate, to provide private shuttle services connecting to public transit or appropriate impact fees for transportation improvements.

6.5.1-Action 3 Prepare a study to:
(1) Prioritize transit corridors and stations;
(2) Develop an implementation program to preserve sites and ROWs for necessary facilities; and
(3) Identify alternative funding approaches including public-private partnerships.

6.5.1-Action 4 Regularly conduct transit system needs-assessment surveys to ensure community satisfaction, and provide opportunities for transit-system users to make suggestions on ways to improve services.

6.5.1-Action 5 Work with rental car agencies to consider expansion of their agencies into high population areas such as West and South Maui.

6.5.1-Action 6 Designate, map, and preserve, or develop corridors to support mass-transit solutions.

Objective:

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

Policies:

6.5.2.a Support alternative methods and sources of funding transportation improvements (including impact fees, higher taxes, fare adjustments, dedicated sources of funding, and assessments).

6.5.2.b Collaborate with public-private entities or nonprofit organizations to reduce public transit operational expenses.

6.5.2.c Coordinate with appropriate Federal, State, and County agencies to fund transportation projects in areas where growth is anticipated.

Implementing Actions:

6.5.2-Action 1 Conduct and implement technical studies to identify potential funding for ongoing maintenance and upgrades of transportation systems (transportation impact fees, community facilities districts, etc.).

6.5.2-Action 2 Establish alternative financing programs such as transportation impact fees, community facilities districts, transfer of development rights, or dedicated sources of funding.

An example of active recreation in Eddie Tam Complex, Makawao.

PARKS

As the island's population continues to grow, local actions to designate and protect parks and open space will play a key role in ensuring a high quality of life for Maui's residents. Therefore, it is important to plan for growth so these qualities are not lost. Maui's developed parks and system of open spaces include lands utilized for both active and passive recreation purposes. These developed parks provide athletic fields, tot lots, tennis courts, gymnasiums, and a variety of other facilities for daily use by island residents. The facilities are dispersed throughout the community at a scale that ranges from small one-acre mini-parks to large regional parks of 100 acres or more.

Maui's system of open space resources includes natural areas, productive agricultural lands, gulches, wetlands, and waterways. These lands are often used for hiking, horseback riding, off-roading, mountain biking, fishing, hunting, camping, and other recreation uses. In addition to recreation, open lands serve the following important functions:

- Preserve important natural resources and critical habitats;
- Preserve lands for agriculture and forestry;
- Protect important views;
- Protect significant cultural and historic sites;
- Enhance the aesthetic quality of the built urban environment; and
- Contain urban sprawl.

To maintain a high degree of community livability, it is necessary to have a combination of adequate supply and distribution of open space resources.

Maui County Park System

The County of Maui Department of Parks and Recreation is responsible for the development, operation, and maintenance of County park facilities. The State Department of Land and Natural Resources (DLNR) has jurisdiction over State Beach Parks, Natural Area Reserves, and other managed lands. The National Park Service manages Haleakalā National Park.

As of March 2007, the County's parks included a total of 770 acres of sub-regional parks (15- to 20-acres in size) and 334 acres of regional parks (40- to 150-acres in size). The *Public Facilities Assessment Update* (2007) finds that the island has a considerable deficit of park space in all of its community plan areas. This conclusion was based on a standard of 10 acres per 1,000 of *de facto* population for sub-regional parks and 15 acres per 1,000 of *de facto* population for regional parks. It should also be noted that these findings were based on County parks only and thus excluded State, private, and Federal park lands.

Existing Plans and Programs

The Maui County Department of Parks and Recreation does not have a park and recreation facilities plan. This task has historically been done on an intermittent basis for a specific area when funding has been available. The *South Maui Parks and Open Space Master Plan* (October, 2003), the *Pali to Puamana Parkway Master Plan* (February, 2005) and the *Shoreline Access Inventory Update* (March, 2005) are examples of these types of studies. The Department typically conducts facility planning on the basis of its six-year capital program budget, which is updated on an annual basis.

An ongoing program of long-range park lands and facilities planning would help the Department serve the recreational needs of the island's rapidly growing population. A better understanding of the community's recreation goals and a set of criteria based on the community's desires will help identify adequate levels of staff and funding.

Level-of-Service (LOS) Standards

The National Recreation and Parks Association (NRPA) published updated guidelines in 1996 entitled "Park, Recreation, Open Space, and Greenway Guidelines". These revised guidelines encourage communities to develop their own LOS standards that are based on local goals, priorities, and conditions. The NRPA suggests and provides approaches for inventorying existing park areas and facilities; and

assessing the adequacy of current standards through visitor surveys, resident questionnaires, and field observation of participation rates. Because of Maui's unique position as an ocean-oriented visitor destination, an individualized LOS study that recognizes the island's assets, conditions, and resources may result in standards that more accurately reflect the island's park land and facility needs.

Wailuku-Kahului Parks

The Wailuku-Kahului Community Plan area contains more parks *per capita* than any other community plan area on the island. Since many of the community's parks provide region-wide facilities, they are used by residents of other communities. This area has approximately 186 acres of sub-regional park land and 377 acres of regional parks. Based on current *de facto* population, the area is already deficient in sub-regional park lands by approximately 477 acres. Future projections to 2030 indicate that this deficit will increase to 541 acres.

Kīhei-Mākena Parks

The Kīhei-Mākena Community Plan area contains mostly beach parks. This area currently has 114 acres of sub-regional park land. Based on current *de facto* population, the area is already deficient in sub-regional park lands by approximately 336 acres. Future projections to 2030 indicate this deficit will increase to 605 acres.

West Maui Parks

The West Maui Community Plan area contains many beach parks. The area currently has 125 acres of sub-regional parks which are primarily neighborhood parks. Based on current *de facto* population, the area is already deficient in sub-regional park lands by approximately 322 acres. Future projections to 2030 indicate this deficit will increase to 497 acres.

Makawao-Pukalani-Kula Parks

The Makawao-Pukalani-Kula Community Plan area currently has 118 acres of sub-regional parks land. Based on current *de facto* population, the area is already deficient in sub-regional park lands by approximately 114 acres. Future projections to 2030 indicate that this deficit will increase to 191 acres. A major limitation with this area is its widely dispersed population centers. Consequently, an option that could be considered is locating some of the smaller parks within future designated residential areas and placing larger parks near the center of major residential areas such as Makawao and Pukalani.

Pā`ia-Ha`ikū Parks

The Pā`ia-Ha`ikū Community Plan area has approximately 110 acres of sub-regional park land. Based on current *de facto* population, the area has a deficit of 13 acres in sub-regional park lands. Future projections to 2030 indicate that this deficit will increase to 30 acres.

Hāna Parks

The Hāna Community Plan area has a well-developed park system; it experiences, by far, the smallest deficit of park space of any of Maui's community plan areas. The area will require an additional 7 acres of park space to support the *de facto* population by 2030.

Other Park Facilities

The Public Facilities Assessment Update (2007) (PFAU) also identified the need for other park facilities such as tennis courts, sports courts, sports fields, gyms, and community centers. The PFAU concluded that every community plan area would need these park facilities to accommodate growth to 2030.

Along with infrastructure systems, the above mentioned park facilities are also important elements of building and supporting healthy communities. These facilities and the services they provide support social and economic activities and play a key role in our everyday lives.

CHALLENGES AND OPPORTUNITIES

Long-Term Planning and Adequate Facilities Maintenance

Conducting long-range park land and facility planning will help to ensure that park land and facilities keep pace with population growth. The program must have the capacity to continually monitor the island's recreational needs, including persons with disabilities, and respond to changing circumstances through the timely acquisition of needed land and the development of required facilities.

A primary goal should be the preparation of a parks and recreation functional plan. Elements that should be addressed in the plan include the following: summary of existing conditions; parks and recreation level-of-service standards; Americans with Disabilities Act (ADA) compliance; demand and needs assessment; community vision, goals, objectives, policies, and actions; opportunities; long-term, island-wide master plan reflecting the vision; prioritization of land area and facility needs; potential funding sources; and implementation schedule.

To keep pace with population growth and the needs of different areas of the island, a proactive maintenance program should be employed and supported by adequate funding.

Acquisitions of Suitable Park Sites

The scarcity and cost of suitable park land necessitate that appropriate park sites be identified early in the planning process to allow sufficient time to acquire sites with favorable topography, access to infrastructure, and locations that could serve the dual purpose of meeting a community's recreational needs while serving as visual relief and open space between and within communities.

Network of Parks and Recreational Areas

The long-term functional plan should provide residents and visitors with opportunities to access and enjoy an interconnected network of greenways, trails, bikeways, and pedestrian-oriented streets. This network should link residential communities and visitor accommodations with existing and future park sites, the ocean, and different open-space resources.

Shoreline Access and the Carrying Capacity of Beach Parks

Being an ocean-oriented community with considerable population growth, Maui's existing beach parks are increasingly crowded. Therefore, access to the shoreline should be protected and enhanced. To maintain a high quality-of-life for island residents, the County will need to provide and maintain beach-access points and beach parks in each region of the island.

The *Pali to Puamana Parkway Master Plan* proposes the creation of an undeveloped 8-mile stretch of shoreline for recreation use through the realignment of Honoapi`ilani Highway. This will provide a significant opportunity for Maui to expand its inventory of shoreline lands. In addition, the *Shoreline Access Inventory Update – Final Report* (2005) identifies specific parcels the County could acquire to enhance beach access on Maui.

Availability and Access to Active and Passive Recreation

In recent years, parks investment has generally been focused around active recreation parks. As the island urbanizes, it will be just as important to protect and create open spaces and passive recreation opportunities within urban areas and throughout the island.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

6.6 Maui will have a diverse range of active and passive recreational parks, wilderness areas, and other natural-resource areas linked, where feasible, by a network of greenways, bikeways, pathways, and roads that are accessible to all.

Objective:

6.6.1 More effective, long-range planning of parks and recreation programs able to meet community needs.

Policies:

6.6.1.a Support, consistent with the MIP, the implementation of open-space and recreational plans, such as the *Pali to Puamana Parkway Master Plan* and the *Upcountry Greenways Master Plan*.

6.6.1.b Utilize the ahupua`a approach by integrating mauka-to-makai natural landscapes into an island-wide parks and recreation functional plan.

6.6.1.c Provide a balanced mix of passive and active parks, including neighborhood, community, and regional parks, in each community plan area.

6.6.1.d Support the expansion of Haleakala National Park, where supported by affected communities.

6.6.1.e Support lo`i and dryland taro restoration in County, State, and Federal parks.

6.6.1.f Encourage private landowners to dedicate land to Federal, State, or County governments, or nonprofit land trusts, for parks and open-space protection consistent with the MIP.

6.6.1.g Strengthen inter-agency coordination including State and County departments, such as resolving joint use of facilities and properties.

6.6.1.h Work with the State to prepare and implement a master management plan for `Āhihi-Kīna`u and La Perouse-Keone`ō`io Bay to Kanaloa Point region.

Implementing Actions:

6.6.1-Action 1 Identify government ROWs to determine if they can be incorporated into an island-wide parks and recreation functional plan.

6.6.1-Action 2 Identify community partners for the maintenance and ownership of community park facilities.

6.6.1-Action 3 Develop, adopt and regularly update an island-wide parks and recreation functional plan that incorporates facilities, programs, and a financial component.

6.6.1-Action 4 Institute regularly-held, inter-agency coordination meetings to facilitate the implementation of the functional plan.

Objective:

6.6.2 Achieve parks and recreation opportunities to meet the diverse needs of our community.

Policies:

6.6.2.a Establish appropriate level-of-service standards at the neighborhood, community, and regional levels.

6.6.2.b Identify and acquire parks and recreational facilities that address existing park inadequacies and complement and enhance neighborhoods, communities, and natural-land features.

6.6.2.c Design park facilities to preserve and enhance natural site characteristics, maximize views, protect environmental and cultural sites, and minimize water demands.

6.6.2.d Acquire lands along the shoreline, between coastal roadways and the ocean.

6.6.2.e Encourage the development of regional parks, district parks, and greenways in a manner that helps to contain sprawl, provide separation between distinct communities, or offer open space within urban communities.

6.6.2.f Require large master-planned communities that incorporate a mixture of park facilities pursuant to parks standards and functional plans.

6.6.2.g Support appropriate areas for cultural parks (e.g., Kepaniwai) in each community plan area.

6.6.2.h Incorporate community input to determine the appropriate location, design, and long-term stewardship of parks and recreation facilities.

6.6.2.i Manage commercial activities at public parks to minimize impacts to residents.

6.6.2.j Support public-private partnerships to implement the acquisition and development of parks when consistent with the General Plan.

6.6.2.k Support a coordinated program to improve, operate, and maintain joint-use facilities and grounds.

Implementing Actions:

6.6.2-Action 1 Develop and adopt LOS and design standards for parks and recreational facilities.

6.6.2-Action 2 Identify and acquire appropriate park sites in accordance with a parks and recreation functional plan.

6.6.2-Action 3 Implement parks and recreational plans, consistent with the MIP, including the North Shore Bikeway Master Plan; Upcountry Greenway Master Plan; South Maui Community Park and Open Space Master Plan; Pali to Puamana Parkway Master Plan; Shoreline Access and Inventory Update-Final Report; South Maui Heritage Corridor; and North Shore Corridor Report.

6.6.2-Action 4 Develop a regional park and fairground in Central Maui, and regional parks in South and West Maui.

6.6.2-Action 5 Amend County zoning and subdivision ordinances to require development to incorporate a mixture of park facilities into large master-planned communities.

6.6.2-Action 6 Develop additional historical and cultural parks.

6.6.2-Action 7 Establish community-based advisory boards where necessary to help prioritize the purchase of park and recreational lands and facilities.

Objective:

6.6.3 An expanded network of greenways, trails, pathways, and bikeways.

Policies:

6.6.3.a Link existing and future park sites, natural areas, the shoreline, and residential areas with a network of bikeways, pedestrian paths, trails, and greenways.

6.6.3.b Support the implementation of plans and programs that facilitate pedestrian mobility and access to active and passive recreation areas and sites.

6.6.3.c Collaborate with the State and private land owners to ensure perpetual access and proper stewardship of traditional trails and access systems.

6.6.3.d Facilitate the development of well-managed noncommercial campgrounds throughout the island.

6.6.3.e Consider requiring commercial bike rental businesses to provide funding that supports a mauka-to-makai Haleakalā bikeway improvement program.

6.6.3.f Ensure ADA compliance and seek opportunities to make all parks and recreational facilities accessible to people with disabilities.

Implementing Actions:

6.6.3-Action 1 Amend development regulations to ensure the construction of adequate parking with pathways near shoreline access points.

6.6.3-Action 2 Amend the Maui County Code to provide better access and proper stewardship of traditional trails and access systems.

6.6.3-Action 3 Develop an educational program for private land owners and the general public to ensure proper stewardship of the islands' trail and access systems.

6.6.3-Action 4 Develop public campgrounds in suitable locations throughout the island.

6.6.3-Action 5 Create opportunities to utilize portions of public parks for community gardens.

The renovated Kalana Pāku`i Building, Wailuku.

PUBLIC FACILITIES

Along with infrastructure systems, public facilities are important elements of building and supporting healthy communities. Services provided by these facilities play a key role in our everyday lives; by supporting essential social and economic activities. The following analysis examines public facilities from a regional perspective; it identifies the current setting and projected 2030 demand. Public facilities assessed include fire control, police, and government offices and parking. The Public Facilities Assessment Update (2007), prepared by R.M. Towill Corporation, provides the primary source of information for this section.

Fire Control

Maui's Fire control is administered by the Maui County Department of Fire and Public Safety (FPS). The mission of the FPS's is to "protect and preserve life, environment, and property." Adequate fire control coverage is determined by several factors such as the distance from a fire station, the value of property, and the population of an area. On Maui, nearly all commercial and residential districts are within a five road-mile coverage radius of a fire station. However, there are rural and agricultural areas outside of this coverage radius. Three fire stations exist in the Wailuku-Kahului community plan area, two in West Maui, two in South Maui, two in the Makawao-Pukalani-Kula community plan area, one in the Pā`ia-Ha`ikū community plan area, and one in the Hāna community plan area. As the island continues to grow, additional stations will be needed. FPS is currently planning to develop a new station in Ha`ikū. Fire stations in Waikapū, North Kīhei, and West Maui will need to be constructed to accommodate future population growth in these areas.

Police

Police services are administered by the Maui County Police Department (MPD). The mission of the MPD is to "serve the community in a manner that epitomizes those ideals woven into the fabric of the Constitution of the United States and the spirit of aloha. We will serve to enhance the quality of life in cooperation with all of those who share these beautiful islands in making this a better place to live."

A police force's effectiveness is a function of the number of police officers, the areas that they can cover, resources available to the police department, the speed at which they can respond to emergencies, and the frequency of calls distributed within an area. Maui County has a lower incident of crime per capita of de facto population compared to State averages.

Three police stations exist on the island; they are located in Wailuku, Lahaina, and Hāna. A number of sub-stations also exist around the island with none that can process and temporarily hold arrestees. MPD will need to expand and or replace its facilities as population increases. The exception is the Hāna station, which is projected to have adequate capacity to 2030. The Department is currently focusing its attentions on building a County-owned permanent station in Kīhei.

Government Offices and Parking

The Wailuku Civic Center District was established in 1905 when the Territorial Legislature designated Wailuku Town as the County's seat of government. The Civic Center encompasses State, Federal, and County-owned parcels and buildings. The Civic Center is a place of great importance and symbolism. It is a place where key decisions are made, people work, and numerous government services are provided.

The primary source of information for the following analysis is the *Wailuku Municipal Service Center Master Plan Report* (2004). Existing County offices include the Kalana O Maui building, County Courthouse, and the Kalana O Pāku`i building. Construction dates for these buildings range from 1907 for the County Courthouse to 1970 for the Kalana O Maui building. The construction of the Kalana O Maui building represents the last significant contribution of County-owned office space to service County employees. Maui's resident population and County government employment have both grown significantly since 1970. However, the supply of office space and parking has not kept pace with the growing demand.

As Maui's resident population and County government employees grow into 2030, office space and parking stalls will need to be added to accommodate this growth. Several options exist to address County

government needs, including revitalization of the Civic Center District to provide additional municipal office space and parking.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

6.7 Maui will have adequate public facilities that meet the diverse needs of residents.

Objective:

6.7.1 More effective planning for public facilities to meet community needs.

Policies:

6.7.1.a Ensure the development and update of island-wide public facilities functional plans that incorporate prioritized facilities, programs, and a financial component.

6.7.1.b Establish appropriate level-of-service standards for public facilities provided by the County.

6.7.1.c Pursue improvements and upgrades of County public facilities consistent with the public facilities functional plan.

6.7.1.d Recognize Wailuku Town as Maui's Civic Center and support the revitalization of the Civic Center District by consolidating government office spaces, enhancing landscape beautification, and providing adequate public parking.

6.7.1.e Support, with community input, the relocation of the Maui Community Correctional Center from Wailuku to an appropriate location in Pu`unēnē.

6.7.1.f Adequately plan and fund public safety facilities (fire, police, ambulance, civil defense) to meet community needs.

6.7.1.g Increase joint facilities utilization and program coordination between State and County agencies such as baseyards, communication centers, recreational facilities, etc., where feasible.

6.7.1.h Focus future expenditures for additional government office space, parking, and related facilities in Wailuku's Civic Center District.

6.7.1.i Encourage continuous and safe walkways for children within one mile of each school.

6.7.1.j Encourage public-private partnerships to identify and resolve public facility plan shortcomings when consistent with the General Plan.

6.7.1.k Incorporate community/area residents' input to determine the appropriate location and design of public facilities.

Implementing Action:

6.7.1-Action 1 Establish an archive center to preserve both digital and hardcopy documents that are important to Maui's planning process.

If you are planning for a year, sow rice; if you are planning for a decade, plant trees; if you are planning for a lifetime, educate people.

~Chinese Proverb

`Īao Intermediate School, Wailuku.

SCHOOLS AND LIBRARIES

In this increasingly complex world and its emerging industries, educational institutions and libraries are critical elements in ensuring a healthy and prosperous community. A broad set of skills and aptitudes is required if our nation, our State, and our island are to remain globally competitive, with a diverse economy that will sustain our way of life. Research indicates that investments in school infrastructure correlate with significant increases in student learning. Our schools and libraries foster the development of Maui's children, promote life-long learning and responsible citizenship, shape future employment opportunities, and influence the island's growth and development. While public education is a State responsibility, Maui County encourages all educational institutions including the State to continually invest in our residents' future.

Our children have a right to an inheritance – capital investments made in our physical, social, and human resources – sufficient to ensure they will have a quality of life no less satisfying than the quality of life enjoyed by our generation. Our grandparents labored to open pathways of success for us; we can do no less for our keiki.

The Hawai`i school system is a statewide system that manages all public schools in the State, making it approximately the 10th largest school system in the nation. The County does not have any jurisdiction over the public school system; however, coordination between the State and County is necessary for planning future school locations and acquiring adequate land. The State's public school system is managed by the Department of Education (DOE) with oversight provided by the Board of Education (BOE), Governor's office, and the Hawai`i State Legislature.

The Hawai`i public school system includes elementary, intermediate, and high schools. Maui has a total of 24 public schools. Maui also has several charter and private schools. Table 6-6 provides a breakdown of the three school types, approximate student age by grade, and the number of schools on the island.

Table 6 - 6: Maui's Public Schools

School Type	DOE Grades	Student Age (Approx.)	Number on Maui [5]
Elementary School	K-5	5-10	15
Intermediate (middle) School	6-8	11-13	6
High School	9-12	14-17	5

For each school type, the BOE sets benchmarks for school size. Benchmark capacities are based on BOE policy, which calls for the design of schools as small communities of learners. Specific BOE enrollment design guidelines by school type are outlined in Table 6-7.

Table 6 - 7: BOE Enrollment Design Guidelines

School Type	Grade Level Served	Building Design Capacity
Elementary School	K-5	400 - 750 Students
Intermediate (middle) School	6-8	500 – 1,000 Students
High School	9-12	800 – 1,600 Students

Existing Plans and Programs

Plans for the public school system are prepared in accordance with Chapter 226, (HRS). The *State Education Functional Plan*, adopted by the State Legislature in 1985, charts education directions intended to improve educational quality in Hawai`i. The State Education Plan serves as a technical reference document to support the functional plan. In addition, schools are organized around complexes that include a High School and the Elementary and Intermediate Schools that feed into the High School. Each school complex has its own facility master plan.

[5] Hāna High/Elementary counted once for each school type.

Library Facilities

Libraries are an important community resource for residents of all ages. The Hawai`i State Public Library System (HSPLS) is under the direct control of the BOE. Hawai`i's libraries are funded through and receive approximately 1 percent of the DOE's budget.

Library facilities were assessed on a measure of 0.6 gross square feet per capita and a ten road-mile service area radius. Six libraries exist on the island: Wailuku, Kahului, Makawao, Lahaina, Kīhei, and Hāna. HSPLS will need to expand and/or replace its facilities in all areas. The exception is Hāna, which is projected to have adequate capacity to 2030. The Pā`ia-Ha`ikū community plan region does not have a library of its own; given the current and projected population of this community, a new library would be warranted in this area by 2030.

CHALLENGES AND OPPORTUNITIES

Meeting Capacity Deficits and Providing Smaller, Learning Centered Schools

As the County grows and expands its urban growth areas to accommodate newly developing neighborhoods, existing schools will need to be expanded or new schools built to meet the increasing enrollment. This conclusion is based on the *County of Maui Public Facilities Assessment Update* (2007) and enrollment projections provided by the DOE (available through the 2014-2015 school year). Issues related to school capacity exist at Maui High School, `Īao Intermediate School, Maui Waena Intermediate School, Waihe`e Elementary School, Lahaina Intermediate School, and Lahainaluna High School. Maui High School's capacity issue is being addressed through the proposed new high school in South Maui. Several schools exceed the BOE's enrollment design guidelines, and many schools rely on portable classrooms to meet capacity needs. New intermediate and elementary schools will be needed during the 2030 planning horizon in the Central and West Maui.

Coordinating Land Use and School Facility Planning

As previously mentioned, the County does not have jurisdiction over the public school system. Therefore, cooperation with the State becomes increasingly important since the placement and design of facilities can help strengthen communities by providing a center for community activities that extend beyond the school day. Joint use of school facilities can result in a more efficient use of scarce public resources and provide neighborhood amenities; examples include shared use of playing fields, auditoriums that double as community theaters, and other community services incorporated into schools. However, the DOE's primary responsibility is to ensure that the State's K-12 educational facilities are available first and foremost for providing education and a safe environment for public school students.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

6.8 Maui will have school and library facilities that meet residents' needs and goals.

Objective:

6.8.1 Assist in providing appropriate school and library facilities in a timely manner and in strategic locations.

Policies:

6.8.1.a Work in partnership with all educational institutions to meet current and future needs including appropriate location, timing, and design of future facilities.

6.8.1.b Allow for the expansion and intensification of uses at the UHMC including satellite campuses operating in remote areas.

6.8.1.c Encourage the DOE to build and maintain smaller, community-oriented schools.

6.8.1.d Encourage better cooperation by the State and County for use of State and County facilities.

6.8.1.e Encourage the State to upgrade, modernize, and expand school facilities, including those in remote communities.

6.8.1.f Work with the State to develop a master plan for the expansion of UHMC in accordance with the MIP.

6.8.1.g Support partnerships (public/private/nonprofit) to build and staff new schools and improve existing facilities.

6.8.1.h Work with the BOE HSPLS to provide centralized library services (including telecommunications) to all areas of Maui.

6.8.1.i Work with the State to expedite planning and construction of Kīhei High School, including the integration of the high school with the Maui Research and Technology Park.

6.8.1.j Work with the State to identify intermediate school sites in Central Maui and other areas where needed.

Objective:

6.8.2 Provide a more expansive network of safe and convenient pedestrian-friendly streets, trails, pathways, and bikeways between neighborhoods and schools where appropriate.

Policies:

6.8.2.a Encourage the State to build new school facilities in appropriate locations that minimize time and distance for students to travel to and from school.

6.8.2.b Encourage the State to implement the Safe Routes to School initiative with funding commitments to help the County plan and fund projects that ensure safe access routes to school.

Implementing Actions:

6.8.2-Action 1 Conduct an inventory to determine safety obstacles along school access routes and work with the State to address safety concerns for students who are unable to utilize school bus transport.

6.8.2-Action 2 Work with the State to coordinate the siting and development of future school facilities, bikeways, pedestrian paths, and greenways to encourage mobility.

6.8.2-Action 3 Amend County zoning and subdivision regulations to require development within the vicinity of schools, libraries, community centers, and other public facilities to provide bike-and pedestrian-friendly infrastructure and traffic calming features.

Maui Memorial Medical Center, Wailuku.

HEALTH CARE

The Hawai`i Department of Health is the agency in charge of health care systems throughout all localities within the state. Hawai`i's current health care system and its overall health status are the legacies from the State's history as a kingdom, a republic, and a territory. The kingdom provided medical care to the population through the kauka (doctor) who were supported by the early ali`i (chiefs). With the establishment of the plantations beginning in 1835, came a highly paternalistic model that guaranteed access to medical care through a system of salaried or contract physicians and plantation-owned hospitals. Although some of the plantation hospitals eventually closed, others became private or County hospitals. The latter became the basis for what is today a system of hospitals on most of the neighbor islands that has been State-operated by the Department of Health.

In 1967, an executive order established the State Comprehensive Health Planning Office. In 1974, through Chapter 323, Part III, HRS, the agency was formalized and renamed the State Health Planning and Development Agency (SHPDA). This legislation also established the Statewide Health Coordinating Council (SHCC) and the Subarea Health Planning Councils to provide a permanent vehicle for citizen input into the health planning process; this ensures the State's health services plans will be based on informed decision making.

Health Status

Hawai`i's resident population enjoys a life expectancy that exceeds that of the mainland U.S. (78.8 years versus 76.1 for all races and both sexes). The resident population has the lowest age-adjusted overall death rate in the country, and is the fifth lowest in infant mortality. The State has been ranked fourth in the nation for overall health rankings.

Existing Plans and Programs

The principal planning product of the SHPDA and its citizen advisory bodies is the State Health Services and Facilities Plan (HSFP). In 1996, the SHPDA and SHCC began a full-scale revision of the HSFP. The Plan was reformatted and redirected to become a strategic document that emphasized improvement of health status and the importance of access, quality, cost effectiveness, and equity as criteria for decision making. The HSFP is now more commonly known as the "Hawai`i Health Performance Plan."

In 2007, the Maui Health Initiative Task Force was established by Act 219 by the Session Laws of Hawai`i. The task force was charged with determining current and future health care needs; developing an integrated plan for health care; and proposing an appropriate role for facilities in Maui County. The task force produced its final report in four months including a set of priorities to provide a high quality of health care throughout Maui. The report's priorities are as follows: 1) Extend emergency care and medical transportation systems; 2) Expand and modernize facilities; 3) Add home and community-based services; 4) Boost reimbursements; 5) Recruit and maintain the workforce; 6) Enhance mental health services; 7) Improve access to dental care; 8) Upgrade obstetric care and establish a neonatal resuscitation team; 9) Promote healthy living and disease prevention; 10) Improve pharmacy services; 11) Update technology; and 12) Prepare for disasters.

The 2005-2025 Maui Bed Needs Study was the product of a collaborative work of the SHPDA; MMMC; Malulani Health Systems, Inc., Kaiser Permanente; and the County's Mayor's office. This study builds upon an understanding of patterns of hospitalization on Maui, in the State as a whole, and across the country; driving forces in healthcare; and the characteristics of Maui's population and its future projection.

To estimate current and future needs, the study includes two sets of calculations that were performed on each bed projection model. The first set assumed that there would be no wait list patients in acute care beds. The second set assumed that the problem of wait list patients in acute care beds would not be resolved and that this patient population would continue to grow. A simplified version of the results is presented in Table 6-8.

Table 6 - 8: Maui's Bed Needs, 2005-2025

Needs if 12% of Maui Residents Continue to be Hospitalized on Oahu	2005	2010	2015	2020	2025
High Estimate to Meet Acute Care Needs Only	189	214	242	272	305
High Estimate to Meet Wait List Needs Only	48	55	65	73	85
Total Beds Needed to Match High Estimates	**237**	**269**	**307**	**345**	**390**
Beds to be Added Beyond Current 196 at MMMC					
To Meet High Estimate Acute Care Needs	-7	18	46	76	109
To Meet High Estimate Wait List Needs	48	55	65	73	85
Total Beds to be Added to Meet High Estimates	**41**	**73**	**111**	**149**	**194**
OR					
Revised Needs if Maui Residents No Longer Go to Oahu for Hospitalization					
Additional Beds Required	25	29	33	37	42
Revised Total Beds Needed	**262**	**298**	**340**	**382**	**432**
Revised Total Additional Beds Needed	**66**	**102**	**144**	**186**	**236**

Note: The High Estimate is the Current Use Model estimate assuming an occupancy rate of 75% plus 5%. Refer to Table 14 on page 55 for details.

The Study showed that in 2002, Maui's licensed bed supply was 1.5 beds per 1,000 population. Bed projections, which include wait-list patients, start at 1.5 beds per 1,000 and reach 1.8 beds by 2025. Projections, which exclude wait-list patients, range from 1.3 beds per 1,000 in 2005 to 1.5 beds per 1,000 in 2025.

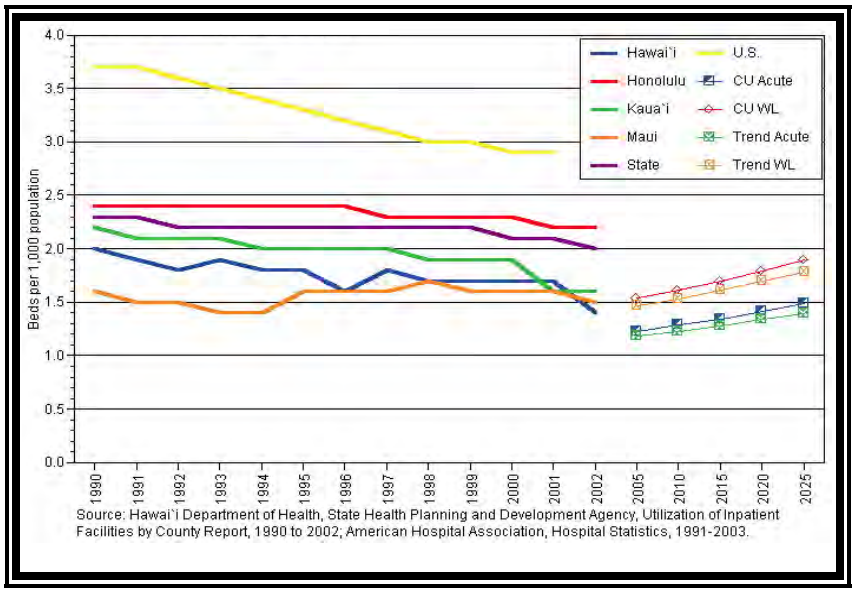


Figure 6 - 1: Beds per 1,000 Population-Hawai`i Counties & U.S.

CHALLENGES AND OPPORTUNITIES

Aging Population

Because Maui's population is aging and seniors are relocating from other areas of the country to retire in Hawai'i, there will be a need for additional services, including respite. Veterans predictably have a need for mental health services and many veterans do not seek help. Substance abuse produces a generation of people with mental incapacities in need of mental health care services; this need does exist on Maui.

On Maui, access to dental care is extremely limited for the elderly, the indigent, Native Hawaiians, and those with Medicaid. In addition, many of the island's

Chronic Illness, Especially Among Native Hawaiians

children lack adequate dental insurance, and the lack of fluoride in the island's water has contributed to significant tooth decay among Maui's children. The life expectancy of Native Hawaiians is significantly less than that of other populations. 18 percent of Native Hawaiians die before reaching age 45, 2.5 times higher than the death rate of other ethnic groups. Native Hawaiians experience higher death rates than the general population from cancer (50 percent higher), diabetes (119 percent higher), heart disease (86 percent higher), kidney-related complications (140 percent) and cerebrovascular disease (64 percent higher-brain dysfunctions related to disease of blood vessels supplying the brain).

Disease Prevention and Integrated Health Care Delivery

The challenges facing the island's health care system are the reformation of the medical care delivery system and the design of a health system to reflect the unique circumstances facing health care on Maui. The basic premise upon which a redesigned system rests is that it is better to prevent a disease than to treat it. The best approach to improve the health status is to make an integrated delivery system available to all populations where they live, work, study, and engage in other life activities. This system should include primary care, health education, lifestyling, etc. Partnerships between health care providers, health care consumers, and the community becomes the desired operational strategy.

The need for a medical cure that dominated earlier health care thinking is growing less important than the need for total health care, including a focus on education and prevention.

There is a renewed emphasis throughout the country on educating citizens to make healthy lifestyle choices to reduce the prevalence of chronic disease. This shift carries an obligation to make full information available so patients can make informed lifestyle and health care choices.

Emergency Services & Overall Health Care Infrastructure

The need for improved emergency care and transport is most evident in West Maui where there are no emergency care facilities despite the presence of a significant number of residents and tourists. MMMC's Emergency Department has been targeted for upgrading and expansion; the intent is to provide additional capacity and enable better triage of patients in need of emergency room services. However, this facility (while centrally located) remains remote from other areas of the island.

According to the *Maui Bed Needs Study*, Maui needs additional acute-care beds and services. As demographic data show, Maui's elderly population will grow significantly over the next 20 years. Long-term care beds will be needed near population centers to meet future demand. The need for long-term care beds is particularly acute in West Maui. Medical facilities need to be continuously modernized to keep up with technology. Modernization includes continuous updating of technology and systems, and replacing of outmoded facilities and infrastructure.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

6.9 All of Maui residents will have the best possible health care to include healthy living, disease prevention, as well as acute and long-term care.

Objective:

6.9.1 Greater autonomy to the Maui region in their efforts to improve medical care on the island.

Policies:

6.9.1.a Encourage the State to give greater autonomy to the Maui region in their efforts to improve medical care on the island.

6.9.1.b Support innovative financial solutions, such as capital partnerships, joint ventures, and consolidations for MMMC and other health institutions.

6.9.1.c Support MMMC as a major core medical center that provides a greater range of services.

6.9.1.d Support the immediate development of a critical access hospital in West Maui.

6.9.1.e Support the expansion of regional critical-access facilities, where allowed by Federal regulations.

6.9.1.f Improve medical service to remote and outlying regions.

6.9.1.g Support transportation services for dialysis patients and community dialysis programs.

6.9.1.h Work with the State to determine the feasibility of appropriate medical facilities in South Maui and Hāna, including the possible reestablishment of a small community hospital in Hāna, the establishment of a hospital in South Maui, and assist the State in securing funding to meet Maui's health care needs.

Implementing Action:

6.9.1-Action 1 Work with Federal and State legislators to enact legislation and secure funding to meet Maui's health care needs.

Objective:

6.9.2 An expansion of long-term care facilities and long-term care alternatives to meet the needs of our aging population.

Policies:

6.9.2.a Support efforts to increase Maui's long-term care bed capacity to cover current and future needs, close to large population centers.

6.9.2.b Recognize that facilities for low-income elders who need long-term care are a needed form of affordable and subsidized housing.

6.9.2.c Evaluate the needs of the long-term disabled and provide planning support for their care, if there is a need for long-term care facilities.

6.9.2.d Consider long-term care facilities as a major potential employment base and encourage the recruitment and training of potential employees.

Implementing Actions:

6.9.2-Action 1 Work with the State to secure the construction of long-term care facilities (particularly in South and West Maui), expand and modernize Kula hospital without jeopardizing its status as a registered historic structure, and establish geriatric training programs.

6.9.2-Action 2 Monitor current and future long-term care bed needs and ensure that such needs are met consistently with the Maui Bed Needs Study.

Objective:

6.9.3 More support to home-care and community-based programs so they become alternatives to traditional nursing homes.

Policies:

6.9.3.a Support the establishment of a program to assist the elderly and people with disabilities to remain in their homes or in a home-like setting.

6.9.3.b Support the establishment of senior and adult-day-care centers and senior housing.

6.9.3.c Continue to support existing senior centers (e.g. Kaunoa), and establish new senior centers that will provide day-care sites and programs for the disabled and elderly.

6.9.3.d Support funding alternatives for community-based services that assist home-care efforts.

6.9.3.e Encourage the State to adopt the recommendations contained within the Legislative Reference Bureau's report entitled "Gimme a Break: Respite Care Services in Other States," (December 2007) where appropriate, feasible, and consistent with the MIP.

Implementing Actions:

6.9.3-Action 1 Gradually expand the "Aging-in-Place" education program for home builders and homeowners.

6.9.3-Action 2 Expand the responsibilities of the Department of Housing and Human Concerns to include providing support for the following community-based services:

(1) The Hāna "Aging-in-Place Retrofit Project";
(2) Transportation services for seniors and persons with disabilities; and
(3) Home-delivered meals programs, like Meals on Wheels, to underserved communities.

6.9.3-Action 3 Expand programs that utilize able-bodied seniors to voluntarily assist other seniors and disabled who are homebound.

Objective:

6.9.4 Improved preventative medicine and primary health care.

Policies:

6.9.4.a Develop and utilize health-status benchmarks to measure prevention and primary health care service delivery.

6.9.4.b Support programs that provide family planning assistance.

Implementing Action:

6.9.4-Action 1 Offer culturally-sensitive programs to address healthy lifestyles, mental health, dental health, substance abuse, and chronic/life-threatening diseases.

Kaheawa Wind Farm, Mā`alaea.

ENERGY

Hawai`i's citizens pay the nation's highest energy costs. In 2005, Hawai`i relied on imported fossil fuels (petroleum and coal) for 94.5 percent of its primary energy needs, at a cost of $4.62 billion, making Hawai`i the most oil-dependent state. Renewable energy development will be critical in helping Maui stabilize energy costs, avoid the negative economic effects of volatile oil prices, reduce overdependence imported on oil, and increase energy security by reducing imports.

Less than 7 percent of Hawai`i's energy is provided by renewable sources (DBEDT, 2006). Oil was used to produce 80 percent of electricity sold by the State's utilities in 2005. The remaining electricity generation was supplied by coal (13.9 percent), municipal solid waste (2.6 percent), geothermal (2 percent), hydroelectricity (0.7 percent), bagasse or sugarcane waste (0.6 percent), wind (0.1 percent), and a very small amount from solar photovoltaic.[6] According to the U.S. Department of Energy, renewable energy sources include biomass, hydroelectric, geothermal, solar, wind, ocean thermal, and wave or tidal actions. Renewable energy can grow new local industries, provide jobs and income for the people of Maui County, and protect the environment.

Growth Trends

Maui's electricity from renewable energy is provided by solar, wind, hydroelectric, and biomass.[7] The 30-megawatt Kaheawa Wind Power Project began producing power in June, 2006. A 21-megawatt expansion is underway; Sempra Energy announced plans to build the 21-megawatt Auwahi Wind Project at `Ulupalakua Ranch. The Hawaiian Commercial & Sugar Company's (HC&S) facility in Pu`unēnē sells an average of 40 percent of its total electricity production to Maui Electric (MECO) and provides 6 percent of Maui's electrical power.

Hydropower is considered an intermittent energy resource because Maui's stream flows vary seasonally.[8] Several small-scale hydroelectric facilities operate on the island, providing approximately 6 megawatts of electricity.

Pumped-storage hydroelectric generation is a promising technology to allow for storage of renewable energy so that it can be used as needed. Saltwater-pumped storage is in use on the island of Okinawa, Japan, and MECO and the County are looking at this option.

The use of residential and commercial solar water heating and photovoltaic (PV) installations is widespread. Hawai`i is known to have more solar water heaters per capita than any other state. Grid-tied residential and commercial PV installations are considered to be competitive with conventional utility power in Hawai`i.

Geothermal energy has potential for future development in Maui and could contribute substantially to stabilizing electricity prices and to contribute to energy independence for the island. There are lands on Maui currently designated as a Geothermal Resource Area by the Board of Land and Natural Resources, a designation necessary for the potential development of geothermal resources for alternative energy production. Interest in geothermal resource development on Maui exists and may be developed to assist in reaching Maui County's goal for 70 percent clean, renewable energy resource by 2030.

CHALLENGES AND OPPORTUNITIES

Biomass Energy

The economic feasibility of energy crops for biofuels depends largely on factors in the sugar, pineapple, and oil markets, as well as alternative uses for land and water. Only land zoned for agriculture is likely to be available for energy crops. Market forces appear to be working in favor of biofuel development on Maui. Potential synergies and trade-offs between dedicating land to biofuel crops, for automotive fuels, versus utility-scale power generation should be further examined. Potential areas identified for biomass energy crop production include former fallow

[6] State of Hawai`i DBEDT (January 2006). *Photovoltaic Electricity in Hawai`i.*
[7] State of Hawai`i DBEDT (December 2006). *A Catalog of Potential Sites for Renewable Energy in Hawai`i.*
[8] Id.

agricultural land in West Maui, and HC&S land in Central Maui.

MSW is not considered a purely renewable energy resource, since it includes non-renewable materials such as tires and plastics. MSW power generation may merit some consideration given scarce landfill space on the island. [9]

Geothermal, Hydroelectric and Ocean Energy

Geothermal, hydroelectric, ocean thermal and wave energy technologies are alternative energy sources being considered for Maui, along with additional wind, solar, and biofuel energy. Of these technologies, geothermal and hydroelectric are currently economically viable and thus, their development on Maui can be considered more likely in the near term. Ocean thermal and wave energy in particular are emerging technologies that may present economic opportunities for Maui from a research and development perspective; however, these technologies appear to have limited applications for near-term use for utility power generation. [10]

Solar Energy

Distributed solar energy projects such as solar water heating, PV lighting, building-integrated PV, and PV rooftop systems integrate easily with other land uses and developments. DBEDT lists Kahului Airport as a potential area for utility-scale solar development due to availability of open land, proximity to transmission lines, and lack of zoning conflicts.[11] However, the reflection from solar equipment and its potential to interfere with nearby airfield activities must be considered. The Kīhei area and the former Pu`unēnē airport site are also potential areas for utility-scale solar development.

Solar projects may be allowed in the County's Rural zoning district and in portions of the County's agricultural zoning district. Due to the need for significant land area for commercial-grade solar power facilities, utility-scale solar energy may be incompatible with active agricultural uses. [12]

Wind

Maui has significant potential for wind energy development. View impacts and physical access present challenges to wind energy development on Maui, since many viable sites lie on high ridges. Wind energy may encounter fewer land use and zoning barriers than other types of renewable energy development. Zoning ordinances allow for wind energy development in State and County agricultural districts. Barring conflicting land uses, wind energy is likely to be allowable in rural districts. [13]

Increased Level of Service

Increased water and wastewater treatment requires additional energy. The public should consider long-term energy requirements as part of a comprehensive analysis of the costs and benefits of improvements to services.

Stable Energy Grid

Maintaining a stable energy grid requires regulation and management of energy generation and distribution resources to enable diverse, distributed suppliers to generate energy in a way that optimizes available supplies while maintaining reliable electric service. Multiple factors are involved with maintaining a stable energy grid including improving energy generation, transmission and distribution infrastructure, providing more options for suppliers and end-users to regulate energy generation and consumption, and creating viable means for new energy suppliers to feed into the grid.

[9] State of Hawai`i DBEDT (December 2006). *A Catalog of Potential Sites for Renewable Energy in Hawai`i.*
[10] Id.
[11] Id.
[12] State of Hawai`i DBEDT (January 2006). *Photovoltaic Electricity in Hawai`i.*
[13] State of Hawai`i DBEDT (December 2006). *A Catalog of Potential Sites for Renewable Energy in Hawai`i.*

Opportunities

New energy markets can be developed to support suppliers of new, nonutility renewable energy provided a stable energy grid can be maintained. Options and standards for how energy is supplied and used by end-users and the suppliers of energy need to be developed to diversify the traditional and evolving energy sector.

Several studies from across the country suggest that renewable energy is a significant potential source of employment for Maui workers in a wide range of sectors, including agriculture, engineering, manufacturing, chemistry, information technology, communications, sales and marketing, and business services. The following is a brief summary of a few of these studies:

- A 2002 report funded by CALPIRG Charitable Trust suggests that building 5,900 megawatts of renewable-energy capacity could create the equivalent of 28,000 year-long construction jobs and 3,000 permanent operations and maintenance jobs.[14]

- A 2004 study (Renewable Energy Today) by economic consulting firm Black & Veatch found that adopting a renewable portfolio standard would cost the State of Pennsylvania $1.23 billion more over twenty years than using conventional fuels, but would generate $10.1 billion more in gross state output, $2.8 billion more in earnings, and tens of thousands of additional jobs.

- A 2007 survey by Massachusetts Technology Collaborative found that renewable energy industries accounted for over 14,000 jobs in that state. Job growth in renewable energy was three times as fast as major industries such as financial services, defense contracting, software, communications, and healthcare.[15]

- A 2007 study by the University of New Hampshire (Alternative Energy Press) concluded that adopting a renewable energy portfolio of 20 percent would create thousands of jobs with wages far higher than the state average, generate over $1 million in additional revenue, and provide opportunities to develop new local businesses.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

6.10 Maui will meet its energy needs through local sources of clean, renewable energy, and through conservation.

Objective:

6.10.1 Reduce fossil fuel consumption. Using the 2005 electricity consumption as a baseline, reduce by 15 percent in 2015; 20 percent by 2020; and 30 percent by 2030.

[14] Heavner, Brad and Churchill, Susannah (June 2002). *Renewables Work: Job Growth from Renewable Energy Development in California.* (CALPIRG Charitable Trust, Sacramento).

[15] Howe, Peter J. (August 2007). *'Clean energy' industry shows fast job growth*. (Boston Globe, Boston).

Policies:

6.10.1.a Support energy efficient systems, processes, and methods in public and private operations, buildings, and facilities.

6.10.1.b Support the Maui Solar Rooftop initiative.

6.10.1.c Support Hawai`i Energy and other Public Utility Commission (PUC) approved energy efficiency programs.

Implementing Actions:

6.10.1-Action 1 Work with the Energy Management Program to:

(1) Audit County facilities, operations, and equipment;
(2) Develop programs and projects to achieve greater energy efficiency and reduction in fossil fuel use;
(3) Develop and maintain data and reports on island energy consumption;
(4) Phase out inefficient fossil-fueled vehicles; and
(5) Assist homeowners and businesses in reducing fossil fuel consumption.

Objective:

6.10.2 Increase the minimum percentage of electricity obtained from clean, renewable energy sources. By 2015, more than 15 percent of Maui's electricity will be produced from locally-produced, clean, renewable energy sources, 25 percent by 2020, and 40 percent by 2030.

Policies:

6.10.2.a Evaluate available renewable energy resource sites and applicable technologies.

6.10.2.b Encourage the installation of renewable energy systems, where appropriate.

6.10.2.c Support the establishment of new renewable energy facilities at appropriate locations provided that environmental, view plane, and cultural impacts are addressed.

6.10.2.d Encourage all new County facilities completed after January 1, 2015, to produce at least 15 percent of their projected electricity needs with onsite renewable energy.

Objective:

6.10.3 Increased use of clean, renewable energy.

Policies:

6.10.3.a Support efforts in the PUC to upgrade Maui's power grid to integrate renewable energy from multiple sources and wheeling of electricity.

6.10.3.b Encourage the PUC to work with the County to implement and expedite community supported renewable energy projects.

6.10.3.c Encourage efforts to produce more renewable energy using distributed generation.

6.10.3.d Encourage import substitution by MECO and the broader community to become more self-sufficient in energy production.

6.10.3.e Educate the public on the economic and environmental benefits from the increased use of renewable energy.

6.10.3.f Encourage support from the Federal government, State, and the private sector for Maui's renewable energy objectives.

6.10.3.g Encourage incentives to support the development and use of renewable energy.

Implementing Actions:

6.10.3-Action 1 Install and maintain back-up power systems at County facilities for critical public health and safety purposes.

6.10.3-Action 2 Establish incentives or exemptions for renewable energy production facilities except for public utility companies.

Objective:

6.10.4 More efficient distribution of power throughout the island while preserving island beauty.

Implementing Actions:

6.10.4-Action 1 Avoid the use of power poles where possible for new construction.

6.10.4-Action 2 Underground existing power transmission and distribution systems wherever possible or feasible when upgrades or new systems are needed.

6.10.4-Action 3 Strongly encourage the State PUC to initiate a new Integrated Resource Plan process.

Historic Lahaina harbor (left) and Kahului airport (right).

HARBORS AND AIRPORTS

As a remote island state, Hawai`i is dependent on ocean transportation for supply of essential commodities. Hawai`i imports approximately 80 percent of its food and merchandise; nearly all of these imports, including food, clothing, building materials, cars, and fuel, enter the State through the commercial harbor system. Commercial harbors also provide the primary means of exporting local products such as sugar, molasses, pineapple, livestock, and diversified agricultural products. Maui's commercial harbor is vital to the island's economy because of the support it provides for Maui's major industries. Although the number of jobs provided by the harbor industry is also important to Maui's economy, the port system is most importantly the island's primary infrastructure, sustaining our modern lifestyle. Harbors can also be used as an economic development tool by strategically locating certain industry sectors within close proximity to harbors; and creating gathering areas for recreation and entertainment that benefit from the activity and atmosphere of a harbor area.

Maui has three harbor facilities: Kahului Commercial Harbor, Lahaina Harbor, and Mā`alaea Harbor. Kahului Commercial Harbor is Maui's primary harbor and is the focus of the remainder of the Commercial Harbors discussion.

Kahului Commercial Harbor

Kahului Harbor.

Kahului Commercial Harbor serves as Maui's lifeline to the rest of the world. Most imported and exported goods travel through Kahului Harbor. All business activities on the island are either directly or indirectly dependent on operations at Kahului Harbor. The harbor is the third busiest harbor in the State in terms of traffic and the busiest of all neighbor island harbors with inbound vessel arrivals reaching 1,426 in 2006.[16]

Primary harbor activities include overseas container cargo, inter-island cargo, and passenger cruise ships. Kahului Harbor provides vital industry support services to key economic sectors including retail, tourism, construction, and agriculture. Maintaining efficient and timely operations at Kahului Harbor is essential for supporting Maui's economy. In 2006, the State DOT Harbors Division developed the *Kahului Commercial Harbor 2025 Master Plan.* This Plan provides a general, long-range guide for commercial harbor development.

The Master Plan finds that Kahului Commercial Harbor's limited berths and maritime lands are inadequate to accommodate the projected volume of vessel dockings and cargo being shipped through its terminals. To address the shortfall, major facility improvement to 2025 include:

- New piers;
- Berthing improvements;
- Develop a cruise ship terminal at Pier 5; and
- The acquisition of lands adjacent to the harbor for future harbor development.

The overall goal of the above improvements is to ensure efficiency of harbor operations and safety of passengers disembarking and boarding ships.

Aerial view of Kahului Harbor, Kahului.

Container Yard: The open-yard, container storage locations at all container terminals designated by the carrier in the port.

Berth: The water area at the waterfront edge of a wharf, reserved for a vessel, including wharf accessories such as bollards.

[16] County of Maui (2006). *Maui County Data Book 2006.*

CHALLENGES AND OPPORTUNITIES

Need for Expanded Facilities

Forecasted demand for port lands required by the year 2025 is considerably greater than the land currently available for harbor operations in Kahului. Expansion of the harbor's maritime lands is restricted by existing commercial and industrial operations surrounding the harbor. The Harbors Division is working with Alexander & Baldwin Properties, Inc. to identify possible expansion opportunities to resolve the shortage of cargo acreage. The growth of the cruise ship industry is constrained by limited berthing space. To support this form of tourism, additional harbor capacity will be required for both cruise ships and ferries at the Kahului and Lahaina harbors.

Critical Need for Alternative Harbor

Maui only has one commercial harbor that can accommodate large cargo vessels (unlike O`ahu, Hawai`i, and Kauai). In the event of a natural disaster, Maui would be left with no facility for ocean transport. The lack of an alternate harbor is a serious economic and safety issue that could have devastating consequences. Several studies have been conducted to assess the feasibility of developing contingency commercial harbor facilities on Maui; however, no potential locations have been identified. The primary function of the port system should be the movement of cargo. To enhance this system, it is important that land use planning for the area near harbors considers the allocation of sufficient land for industrial and high technology businesses; these businesses often benefit from close proximity to harbor infrastructure.

Adequate Land Supply

Harbor Front Revitalization

Harbor areas can also provide a great atmosphere for outdoor recreation and entertainment activities. Creating gathering areas for recreation and entertainment near harbor districts has proven to be a successful economic development tool for many port cities such as San Francisco and Seattle. The County should develop a master plan analyzing the potential for harbor front revitalization incorporating the potential for increased recreation and entertainment as one component of the plan.

Airports - Existing Setting

Air transportation is critical to Maui's economy and way of life. Each day, thousands of Hawai`i residents travel through Maui's airports to conduct business, visit relatives, shop, and vacation. Maui's leading industry, tourism, and nearly all the other island's economic activities rely on an efficient, dependable, and affordable air transportation system.

Three airports exist on Maui: Kahului, Kapalua, and Hāna. Kahului Airport is the second busiest airport in the State with 6,514,814 passengers in 2007[17]. Kahului Airport is classified as a "Commercial Service-Primary Airport" by the Federal Aviation Administration; it services both transoceanic flights from the North American mainland and inter-island flights.

In addition to providing passenger service, Kahului Airport en-planes and de-planes thousands of tons of cargo and mail each year.

[17] County of Maui (2008). *Maui County Data Book 2008*.

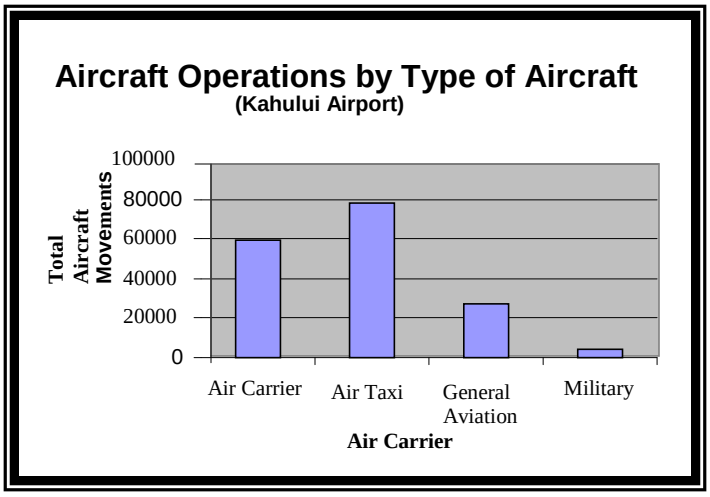


Figure 6 - 2: Aircraft Operations by Type of Aircraft (Kahului Airport).

The airport system is a vital element of Maui's economy through direct employment created at airport facilities and affiliated businesses. *The Hawai`i Tourism Strategic Plan (2005–2015)* and final report of the Economic Momentum Commission recommend significant and immediate upgrades to Kahului Airport. The State Department of Transportation, Airports Division, is responsible for managing State airports. The Department, together with the Airlines Committee of Hawai`i, prepared an *Airport Modernization Plan* in March 2006. This Plan's goals are two-fold:

- Create a world class airport transportation system that meets the needs of State residents and visitors today and into the future.
- Create efficiencies and effectiveness in operations and increase levels of satisfaction for State residents and visitors.

The Plan proposes short- and long-term projects at Kahului Airport designed to enhance existing facilities, as well as adequately accommodate current and projected demand.

Kahului Airport's main runway.

CHALLENGES AND OPPORTUNITIES

Airport Improvements

Current Kahului Airport facilities can accommodate a limited number of wide-bodied aircraft; however, accommodating current and projected demand will require both modifications of existing gates and increasing the number of gates. Other long-term projects include lengthening of runways, increasing fuel storage capacity, expanding holding room capacity, increasing the number of on-site parking stalls, and constructing a new airport access road.

Prior efforts to expand Kahului Airport to an international airport status have been met with considerable public opposition. Project opponents have expressed concern over the introduction of alien species and the project's growth inducing impacts. Future airport expansion will need to be done in a manner that is consistent with Maui's land use, environmental, and economic development objectives.

Improvements to Kahului Airport can strengthen local business, enhance the quality of life, and strengthen the tourism industry when done in a manner that the community supports.

Airport facilities have become significant generators of employment at and around them. Different activities can prosper by being proximate to airport infrastructure, including business parks, industrial parks, warehousing and freight forwarding facilities, wholesale merchandising, information and telecommunication parks, hotel and entertainment centers, and mixed-use development. The County should develop a master plan to identify suitable land uses, urban design character, and supporting infrastructure for lands proximate to Kahului Airport. Such a plan would need to be sensitive to the visual character and rural ambiance of Maui.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

6.11 Maui will have harbors and airports that will efficiently, dependably, and safely facilitate the movement of passengers and cargo.

Objective:

6.11.1 Upgraded harbor facilities to handle larger volumes of freight and passengers and additional small boat harbors.

Policies:

6.11.1.a Support the expansion and upgrade of Kahului Harbor through the following, provided that any expansion is respectful of cultural practices and existing recreational uses and supports improved water quality:

(1) Accommodate increasing volumes of cargo;
(2) Provide deeper pier depths and greater fuel-receiving and storing capacities; and
(3) Ensure safe and efficient work areas, including separating passenger operations from fuel and cargo operations.

6.11.1.b Work with public and private entities to provide adequate pier slips, utilities, repair facilities, and waste-disposal capabilities.

6.11.1.c Encourage the State to safely separate passenger (cruise and ferry) operations from hazardous bulk fuels and heavy cargo transporting operations, while not decreasing harbor's capacity to safely support various recreational uses.

6.11.1.d Encourage the State to develop cargo inspecting sites and facilities for efficient cargo and container processing and transportation and to prevent alien species entry.

6.11.1.e Support a State and County task force to study the feasibility of a second commercial harbor on Maui.

Implementing Actions:

6.11.1-Action 1 Update/amend the Wailuku-Kahului Community Plan to accommodate planned harbor improvements and any compatible land uses considering seal level rise.

6.11.1-Action 2 Study the feasibility of developing a Harbor Front District for Kahului Harbor that incorporates the planned harbor improvements and defines appropriate mixes of uses including entertainment and recreation where appropriate.

Objective:

6.11.2 Establish more economically thriving and environmentally sensitive small boat harbors accommodating resident and business activity, including fishing, recreation, and tour boats.

Policy:

6.11.2.a Provide for needed shore-side facilities and capabilities to support small boat harbor users (e.g. repair facilities, parking, cold storage, and mass-transit connections).

Implementing Actions:

6.11.2-Action 1 Provide boat owners with adequate pier slips, utilities, repair facilities, waste-disposal capabilities, and yacht berthing/launch/recovery services.

6.11.2-Action 2 Develop plans and funding mechanisms to stimulate shore-side improvements to small boat harbors.

6.11.2-Action 3 Broaden cooperation with State, County, and private entities to regularly report progress on projects and implementing initiatives.

Objective:

6.11.3 Upgraded airport facilities and navigation aids to serve the needs of passengers, freight movements, and general aviation.

Policies:

6.11.3.a Protect the island's airports from encroaching urbanization that may negatively impact the airport operations.

6.11.3.b Support State efforts to improve Kahului Airport operations to better serve passenger and cargo needs.

6.11.3.c Support State efforts to identify sites and plan to relocate and accommodate small and rotary wing aircraft.

6.11.3.d Encourage the State to improve airport safety including lighting, fuel transmission, fuel safety, etc.

6.11.3.e Consider expansion of rental car facilities in West and South Maui.

6.11.3.f Consider expansion of mass transit (bus, fixed-rail, shuttle, and taxis, bicycle, and pedestrian facilities) to and from Kahului Airport and not limited to passenger movements (allowing for luggage and cargo).

6.11.3.g Encourage the State to maintain airport capacity and to encourage more responsive air services to Hāna and Kapalua.

Implementing Actions:

6.11.3-Action 1 Work with the State and Kahului Airport users to:

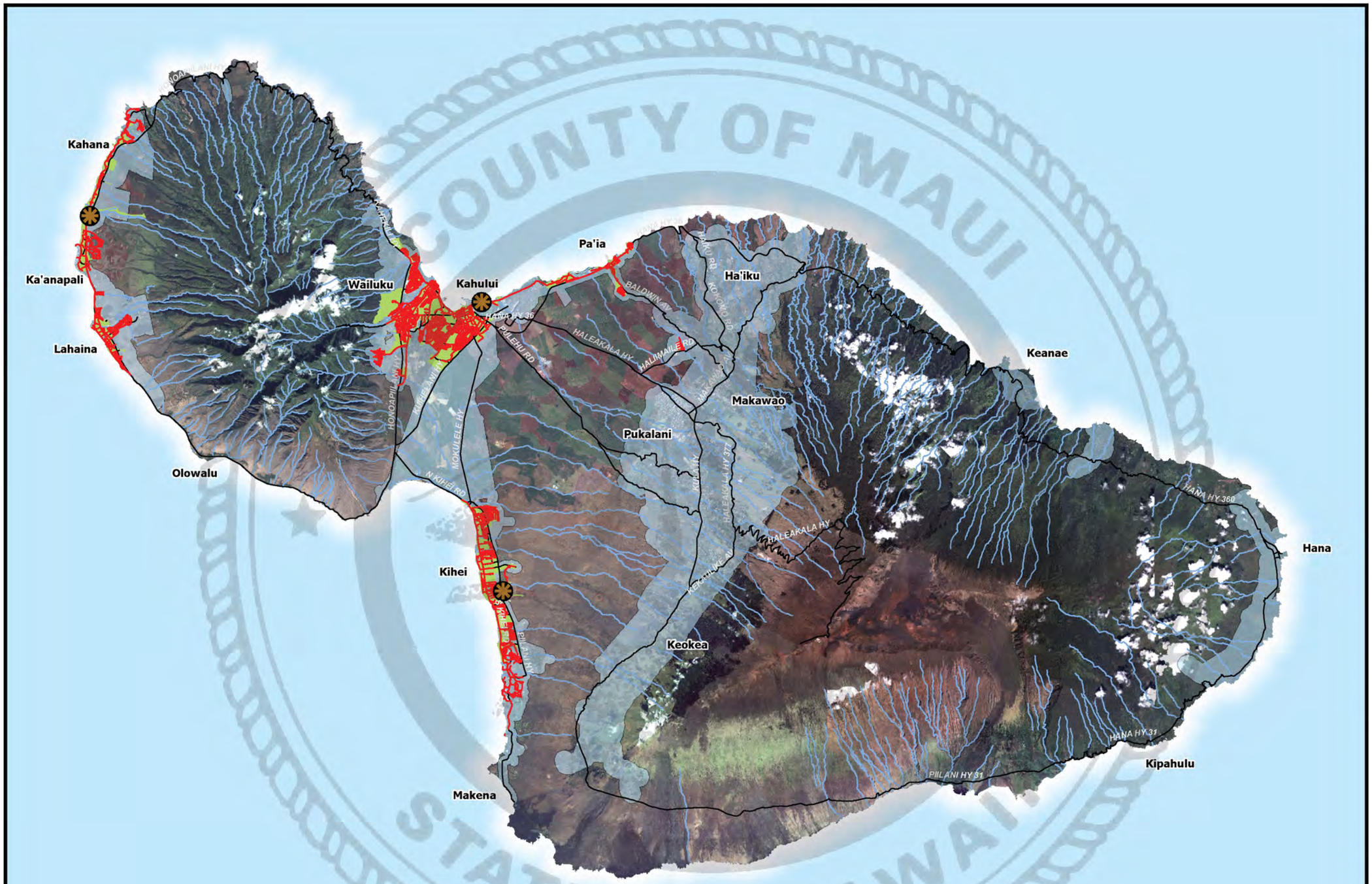
(1) Safely accommodate more efficient airplanes;
(2) Increase infrastructure investments and improve operating procedures;
(3) Implement more efficient and reliable screening/inspecting of passengers, luggage, and cargo;
(4) Identify and construct airport sites and hangars for small and rotary wing aircraft;
(5) Accommodate mass transit, busses, shuttles, and taxis; and
(6) Beautify the airport grounds and access roads.

6.11.3-Action 2 Develop a plan to minimize safety hazards during the transport of aviation fuel from Kahului Harbor to Kahului Airport.

6.11.3-Action 3 Study the feasibility of developing an Airport District for Kahului Airport that intentionally agglomerates uses that support the airport such as a business hotel(s), gas stations, parcel delivery services and freight forwarding.

6.11.3-Action 4 Preserve land around the airport for future expansion.

6.11.3-Action 5 Develop a corridor study and sub-area plan for land uses around the airport and along the airport connector road.



This map is for informational purposes only and subject to change based on future research and findings.

Water & Sewerage Service Areas Map

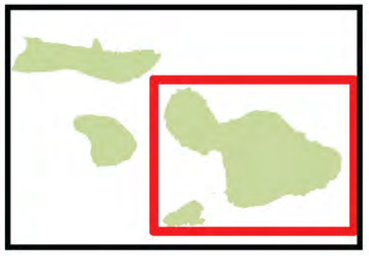
Island of Maui

Background Map

For Informational Purposes Only

Legend

- Primary Road
- Stream
- Maui County Department of Water Supply Service Area
- Wastewater Service Area
- Public Utility Sewerline
- Wastewater Treatment Plant



Miles

0 1 2 3 4 5 6

Product Code: M-CET_20120920-h1

This is not a zoning map. Please contact the Planning Department for Zoning confirmation.

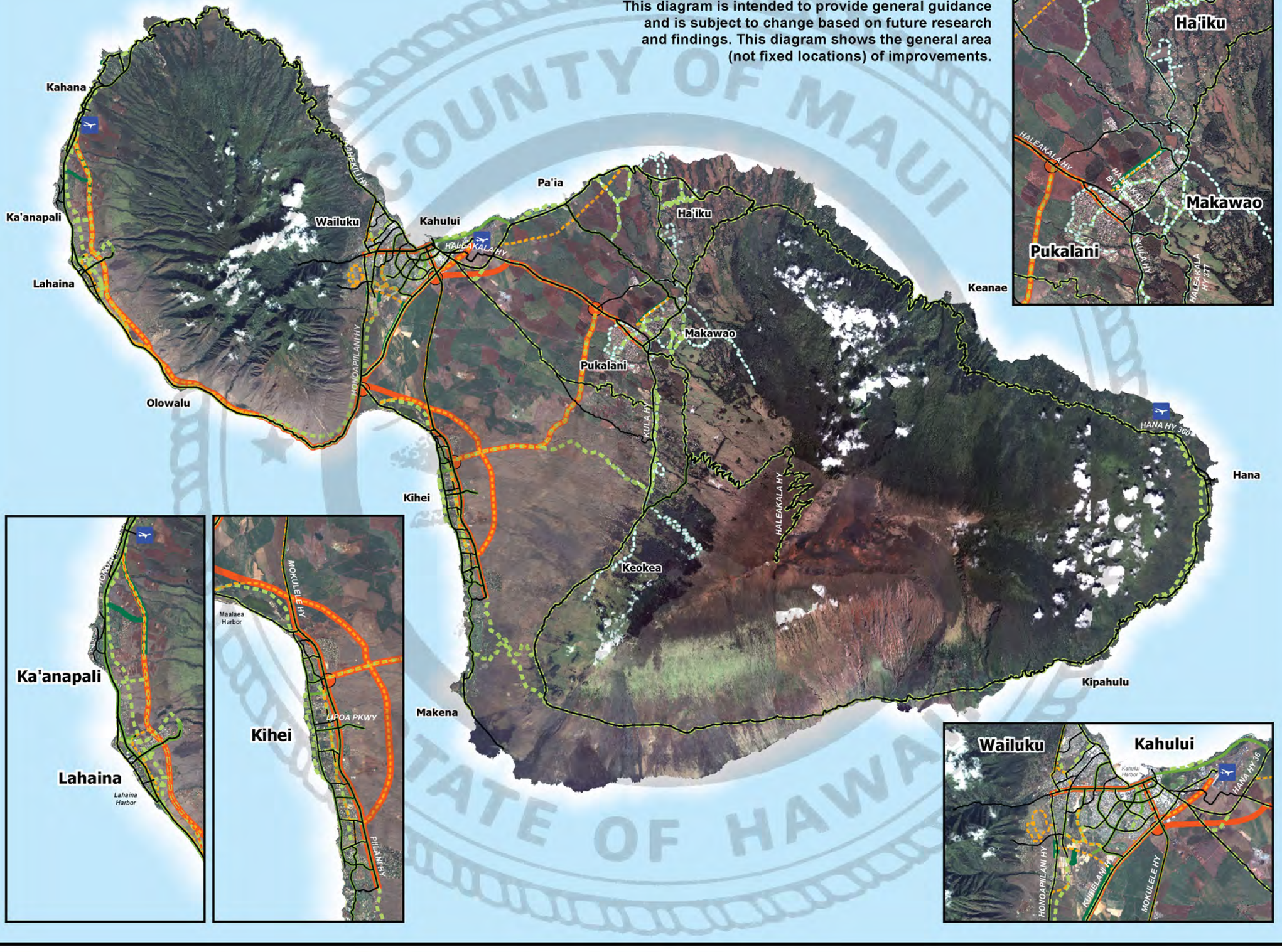
Prepared by:
Long Range Planning Division
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Map 6-1

Regional Transportation Network

Island of Maui

This diagram is intended to provide general guidance and is subject to change based on future research and findings. This diagram shows the general area (not fixed locations) of improvements.



Legend

- Primary Road
- Secondary Road
- Bike Path
- Airport

Proposed

- Conceptual Transit Station
- Conceptual Transit Corridor
- Lahaina Bypass
- Road or Highway
- Bike Path
- Upcountry Greenways Plan
- Maui Island Plan Greenways

Miles
0 1 2 3 4 5 6

Product Code: M-CET_20120920-m1

This is not a zoning map. Please contact the Planning Department for Zoning confirmation.

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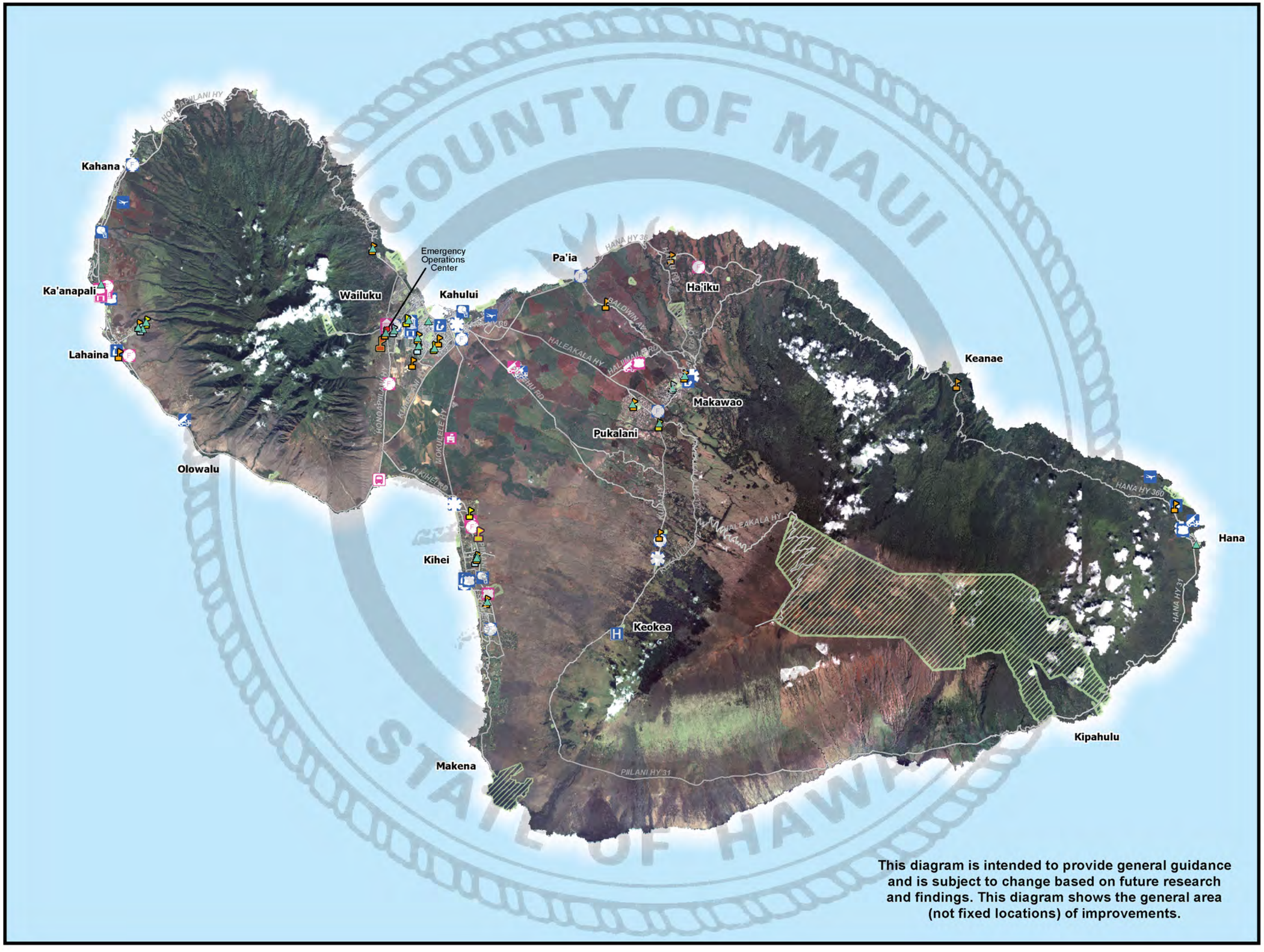
Diagram 6-1

Public Facility/Infrastructure Improvements

Island of Maui



This diagram is intended to provide general guidance and is subject to change based on future research and findings. This diagram shows the general area (not fixed locations) of improvements.

Legend

- Primary Road
- Parks & Public Access
- Emergency Shelter

Existing Public Schools

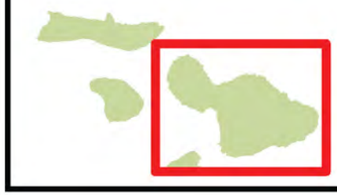
- High School
- Intermediate School
- Elementary School

Proposed Public Schools

- Elementary School
- High School

Public Facilities / Infrastructure

EXISTING		PROPOSED
	Airport	
	Ambulance Station	
	Fire Station	
	Police Station	
	Hospital	
	Government Office	
	Solid Waste Facility	
	Waste Water Treatment Plant	
	Transit Center	
	Public Library	
	Jail	



Miles 0 1 2 3 4 5 6

Product Code: M-CET_20120920-f1

This is not a zoning map. Please contact the Planning Department for Zoning confirmation.

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Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Diagram 6-2

Chapter 7: Land Use

Our place under the sun is brief. Our actions will leave an indelible print on the face of the land. Our obligation spans across the history and future of Maui, to those who came before and those yet to come. We must remember we speak for them, as well as for ourselves, to respect their dreams and their rights as well as our own.

West Maui Mountains and `Īao Valley.

The purpose of the land use chapter is three-fold: to provide an overview of Maui's past and current land use patterns; to explore future land use challenges and opportunities; and to provide policy direction that will enhance Maui's agricultural lands and protect the rural character and scenic beauty of the countryside. Agricultural lands are a necessary link to self-sufficiency and a diverse economy. In addition, the agricultural landscape contributes to our sense of place and is a part of our island heritage. The island's small towns are a treasure to be protected. Residents also desire clean, safe, and livable urban environments that provide a high quality of life.

Central Maui Sugarcane Fields. Pu`unēnē.

AGRICULTURAL LANDS

Agriculture is deeply rooted in Maui's history and will continue to be an important industry from an economic, social, and environmental perspective. Traditional Hawaiian ahupua`a land divisions had a complete ecological system that included agriculture as a basic component. With the arrival of American and European immigrants in the eighteenth century came a new era of Hawaiian agriculture: sugarcane and pineapple. These industries drove Maui's economy for over 90 years, having long-lasting impacts on the island's people, land, and water. Within the past two decades, Maui has experienced a decline in sugarcane and pineapple production, and an increase in the cultivation and sale of diversified crops. Although Maui's agriculture has evolved over the years, its importance remains constant.

Background Information

This chapter of the MIP draws on a series of technical papers that provide background information and policy direction for the future. The following studies and reports are available at the Maui County Planning Department's Long Range Planning Division:

1. Agricultural Resources Technical Issue Paper, September 2007 (Chris Hart & Partners, Inc.);
2. Rural Areas Technical Issue Paper, December 2007 (Chris Hart & Partners, Inc.);
3. Directed Growth Strategy—Transfer and Purchase of Development Rights Program Implementation Study, November 2007 (Chris Hart & Partners, Inc.);
4. Land Use Forecast, Island of Maui, Maui County General Plan 2030, November 2006 (PlanPacific, Inc.); and
5. Economic Development Issue Paper, PlanPacific, Inc., in association with John M. Knox & Associates, Inc., Tom Dinell, FAICP, and Chris Hart & Partners, Inc., October 2007.

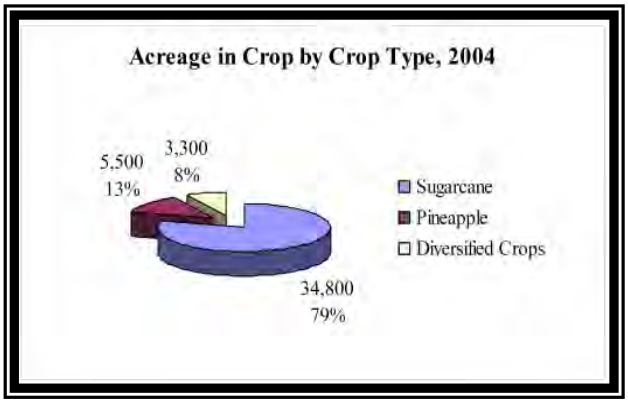


Figure 7-1. Acreage in Crop by Crop Type, 2004.

Vital Component of Economy

Agriculture creates a diversity of jobs, generates tax revenues, and produces a variety of crops for different local and export markets. While agriculture ranks behind tourism and retail business in terms of market value, its contributions to the economy are significant. In 2007, the total value of crop sales in Maui County approached $139 million and the agricultural industry provided 1,700 jobs.[1] Agriculture also benefits Maui's tourism industry by providing green landscapes and enhancing the island's sense of place.

Food and Energy Security

Although Maui has an ideal climate and location for crop production, according to the Hawai`i Business Magazine (April 2005) nearly 90 percent of our State's food is imported. Diversified local food production can help buffer our food supplies by reducing our dependency on imported foods. Moreover, local agriculture can deliver fresher, and more flavorful and nutritious alternatives when compared to many mainland and foreign agricultural products. Energy crops are an emerging agricultural industry that has the potential to significantly increase Maui's energy security and the demand for agricultural land.

Stewardship of Land and Water

Unlike urban development, agriculture protects land use options for future generations. In addition, agriculture gives residents a connection to the land and promotes the stewardship of natural resources.

Open Space Implications

A desirable attribute of agricultural land, whether in active production or not, is that it is considered to be open space, often green and scenic. It thus plays an important role in Maui's beautiful landscape. In 2006, Maui County had over 244,000 acres of land designated for agricultural use within the State Land Use District.[2]

[1] Department of Agriculture (2008). *Statistics of Hawai`i Agriculture.*
[2] State of Hawai`i DBEDT (2008). *The State of Hawai`i Data Book, 2008.*

CHALLENGES AND OPPORTUNITIES

The State and County have enacted zoning laws to protect agricultural resources and promote agricultural activities; nevertheless, there remain numerous challenges within the industry.

Challenges in Agricultural Lands

When additional Urban District lands are needed to accommodate growth, it is almost inevitable that agriculturally zoned land will be converted. It is the "default" zoning or district on the island, and it most often borders our urbanized areas. While providing housing and jobs is desirable and necessary to meet the needs of our residents, there is also a corresponding loss of agricultural land.

Urbanization is not the only factor contributing to the loss of viable agricultural land. Commercial farming is a business venture where the ability to make a profit is a necessity. If the business is not profitable, it will stop operating and the assets will be used differently. Residential development and other factors within the agricultural district contribute to the loss of agricultural land productivity and profitability:

- **Diminished Production Capacity.** Fragmentation of agricultural parcels affects the agricultural production capacity of the land. Noncontiguous and fragmented agricultural parcels offer less economy-of-scale for production and marketing and make it more difficult to justify the cost of agricultural investment. When roads, waterlines, and other infrastructure are introduced into an agricultural area, the expansion of this infrastructure to support more development is likely. Once fragmentation begins, it leads the way to further development of agricultural land.
- **Higher Land Costs to Farmers.** Non-agricultural land uses are viewed by many to be a more profitable investment than agricultural land uses. This perception, coupled with expanding infrastructure, lead to elevated land costs. Those who may consider starting a farming business or expanding their current operation are often unable to afford these higher land costs, thus stifling the viability of agriculture and leaving the land available for urban or rural development.
- **Conflicts with Non-agricultural Land Uses.** Agricultural activities often create noise, odors, dust, and other byproducts that residential neighbors view as nuisances. With encroachment of rural and urban uses adjacent to agricultural land uses, farmers who have operated their farms for decades with few nearby neighbors suddenly find themselves in conflict with new homeowners. This situation may result in higher operating costs for farmers and a higher incidence of further land conversion.
- **Social Changes**. Small farms have traditionally been passed from one generation to the next. As social mores change, commercial farming may be considered by some to be a difficult occupation with an undesirable lifestyle. Where families no longer wish to pursue farming, land may be subdivided and sold.
- **Affordable housing**. Some small farmers desire to pass land on to their children by subdividing and thus providing them with an affordable opportunity for housing. While this directly benefits family members,

fragmenting the original property can result in loss of agricultural productivity as described above. It is more difficult to have a viable farm on a small property than it is on a larger one.

- **Water**. A reliable and inexpensive source of water is particularly important to keep agricultural lands in production. Without it, farmers cannot predictably plant and harvest, and the land may be good for other uses. Other land uses also compete for available source, including urban, cultural, and conservation uses; and new source development has not kept pace with this demand. Finally, where water is available it is often expensive, as it is treated to potable standards.

Agricultural land management can be enhanced through a directed growth strategy that identifies areas appropriate for development, utilizing tools for agricultural protection such as zoning, transfer and purchase of development rights (TDR/PDR), and Conservation Subdivision Design (CSD).

The Agricultural Zoning District (Chapter 19.30A, MCC) requires a distribution of minimum lot sizes that range from two to forty acres for new subdivisions. The required distribution provides a greater diversity of lot sizes, and has decreased fragmentation of agricultural lands. The Agricultural District Ordinance could be reviewed and revised to further decrease fragmentation by considering such tools as decreasing the number of 2-acre lots, or clustering of the 2-acre lots into smaller parcels, or developing CSD provisions as described below.

Many communities have established TDR programs to protect important agricultural lands and direct development to areas suitable for development.

An Agricultural Land Protection Toolbox

> *TDR programs allow landowners to sever the building rights from a particular piece of property and sell them…TDR programs strive for two main goals. First, communities can use TDR programs to preserve open space, agriculture, historic buildings or housing. And TDR programs make such preservation more equitable and politically palatable by compensating landowners who lose the right to develop their property.*[2]

[2] Hanley-Forde, George Homsy, Katherine Lieberknecht, and Remington Stone (2011). *Transfer of Development Rights Programs*. p. 2.

The Farm and Ranch Lands Protection Program, or 2002 Farm Bill, is administered by the Natural Resources Conservation Service, U.S. Department of Agriculture, to help farmers and ranchers keep their land in agriculture through the purchase of conservation easements. Grants from this federal program can be used in conjunction with State Legacy Land Conservation Program grants, or other land preservation funds, to permanently protect agricultural land.

CSD requires the preparation of a detailed site assessment to identify important natural resources, cultural sites, agricultural lands, and open space to be preserved during subdivision. Based upon the assessment, a CSD plan is prepared to minimize environmental impacts, protect agricultural land and open space for future generations, reduce the cost of infrastructure, and preserve the land's natural character. CSD plans are typically required for agricultural subdivisions that exceed a specified number of lots. CSDs should be sparingly used so as not to promote further development of agricultural lands.

Kula agricultural park, Kula.

Encourage Locally-grown Products

The best strategy to protect agricultural lands is to prevent non-agricultural subdivisions and create an environment where agriculture can be profitable (see Chapter 4, Economic Development). Agricultural entrepreneurs require access to support services, affordable and productive agricultural land, and affordable and reliable supplies of irrigation water.

Implementation of the 2009 Maui Agricultural Development Plan will effectuate the following: the implementation of marketing support programs; the expansion of direct marketing opportunities; the identification and implementation of programs to expand access to prime agricultural lands for small- and medium-sized farmers; support for agricultural tourism; the identification of various regulatory and non-

regulatory barriers to industry growth; and transportation of agricultural products to market. The development of additional agricultural parks and the preparation and implementation of the Agricultural Water Plan are of high importance to the viability and growth of agriculture on Maui.

Agricultural parks provide farmers with long-term access to affordable land and water resources to start or expand their operations. Although a considerable amount of agricultural land exists on Maui, much of this land is currently planted in sugar, used for grazing, or owned by developers and investors. For smaller diversified farmers, gaining affordable long-term tenancy to land and water resources can be difficult. Maui's only agricultural park is located in Kula and provides affordable land leases to farmers. The development of additional agricultural parks would facilitate the expansion of diversified agriculture. Additional agricultural parks will be strategically located throughout the island.

Complementing the Agricultural Development Plan, a comprehensive Agricultural Water Plan will be prepared to ensure that farmers continue to have affordable access to water. The report will address the availability and distribution of non-potable water resources to potential users. The plan should compare costs across user groups and develop strategies to ensure that Maui's agricultural water is cost competitive with irrigation water available to farmers statewide.

SUMMARY OF AGRICULTURAL LAND USE ISSUES

Preserving agricultural lands is important for the long term sustainability of Maui. A few agricultural resource protection challenges and opportunities include:

- Reduction of the conversion of prime and productive agricultural lands to non-agricultural uses
- Innovative planning and regulatory tools to reduce the loss of important agricultural lands
- Investment and incentives, from both the public and private sectors, to make agriculture more profitable

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

7.1 Maui will have a prosperous agricultural industry and will protect agricultural lands.

Objective:

7.1.1 Significantly reduce the loss of productive agricultural lands.

Policies:

7.1.1.a Allow, where appropriate, the clustering of development on agricultural lands when approved as a CSD plan or similar approval mechanism.

7.1.1.b Require, where appropriate, the review and approval of CSD plans prior to the subdivision of agricultural land.

7.1.1.c Discourage developing or subdividing productive agricultural lands for residential uses in which the residence would be the primary use and any agricultural activities would be secondary uses.

7.1.1.d Consider requirements for public notification and review of the subdivision of agricultural land into four or more lots.

7.1.1.e Focus urban growth, to the extent practicable, away from productive and important agricultural lands.

7.1.1.f Strongly discourage the conversion of productive and important agricultural lands (such as sugar, pineapple, and other produce lands) to rural or urban use, unless justified during the General Plan update, or when other overriding factors are present.

7.1.1.g Further develop the requirements for agricultural assessments found under Section 19.510, MCC.

7.1.1.h Provide incentives for landowners to preserve and protect agricultural lands from development through the use of TDR/PDR, tax credits, easement programs, or similar means.

7.1.1.i Promote the use of U.S.D.A. Farm and Ranch Lands Protection Program grants to fund the acquisition of conservation easements on eligible agricultural lands.

7.1.1.j Require all major developments adjacent to agricultural lands to provide an appropriate and site-specific agricultural protection buffer as part of a required site plan.

7.1.1.k Support and promote the viability of Maui's agricultural businesses through property tax incentives and other programs and subsidies.

7.1.1.l Encourage future community plan efforts to identify lands within the County Agricultural zoning district that are primarily being used for large-lot residential or rural use and consider such lands for reclassification to an appropriate County Rural zone.

Implementing Actions:

7.1.1-Action 1 Implement the Maui Island Directed Growth Strategy.

7.1.1-Action 2 Implement County responsibilities under Acts 183 (2005) and 233 (2008) to designate and establish Important Agricultural Lands (IAL) and the incentives therein.

7.1.1-Action 3 Develop, adopt, and implement TDR and PDR Programs for, productive Agricultural Lands and IALs with a preference given to lands with a current or recent history of productive agricultural uses.

7.1.1-Action 4 Revise the Agricultural District Ordinance to allow for limited clustering and CSD, where appropriate.

7.1.1-Action 5 Revise existing land use regulations to ensure that Prime Agricultural Lands are distinct from rural (primarily residential) land uses.

7.1.1-Action 6 Consider developing or amending regulations to:

(1) Reduce the subdivision of agricultural lands by strengthening applicable zoning and subdivision ordinances, and consider the creation of Agricultural categories to better reflect agricultural uses and land use patterns;

(2) Require public notification and review of the subdivision of agricultural land into four or more lots; and

(3) Require the preparation of a more detailed agricultural impact assessment for changes to the Urban Growth Boundary, Community Plan Amendments, and change in zoning requests of Prime agricultural land as required by Section 19.510, MCC.

7.1.1-Action 7 Utilize farm land trust mechanisms to preserve agricultural lands and family farms.

7.1.1-Action 8 Promote farm profitability by supporting programs or subsidies including:

(1) Low-cost, reliable transportation for export agricultural products;

(2) Hawaii Farm Bureau Federation, Maui County; and farmers cooperatives;

(3) Promotion of locally-grown products to hotels, restaurants, or other segments of the visitor industry;

(4) The expansion of marketing efforts such as Grown on Maui to the mainland or Far East markets;

(5) Development of new or value-added products; and

(6) Property tax incentives for commercial agricultural uses.

Objective:

7.1.2 Reduction of the island's dependence on off-island agricultural products and expansion of export capacity.

Policies:

7.1.2.a Coordinate with the agricultural community, associations/community groups, agricultural landowners, and the State to designate IALs.

7.1.2.b Support an incentive package for productive Agricultural Lands which aims to ensure agricultural viability for small- and commercial-scale agricultural producers.

7.1.2.c Actively look to acquire land and provide infrastructure to expand the agricultural park and establish new agricultural parks.

7.1.2.d Support the designation of a research and development area within agricultural parks to help farmers stay attuned to new technology and research**.**

7.1.2.e Support local cooperative extension services to facilitate timely technology transfer opportunities.

7.1.2.f Support plans and programs to develop additional sources of water for irrigation purposes.

7.1.2.g Consider appropriate subdivision requirements (gravel roads, above-ground utilities, etc.) in those subdivisions creating Agricultural Parks where lots are limited to agricultural production with no dwellings.

7.1.2.h Support the recommendations, policies, and actions contained within the Maui Agricultural Development Plan, July 2009, when consistent with the MIP.

7.1.2.i Allow water and tax discounts for legitimate farming operations on rural and agricultural land.

7.1.2.j Give priority in delivery and use of agricultural water and agricultural land within County agricultural parks to cultivation of food crops for local consumption.

7.1.2.k Support programs that control pests and diseases that affect agriculture.

7.1.2.l Support the development of training and apprenticeship programs to encourage an adequate supply of agricultural workers.

Implementing Actions:

7.1.2-Action 1 Identify and acquire productive and community Agricultural Lands that are appropriate for the development of agricultural parks and community gardens in each community plan area.

7.1.2-Action 2 Coordinate with the State Department of Agriculture, the development of an Agricultural Water Strategy, and incorporate an agricultural component in the Water Use and Development Plan.

7.1.2-Action 3 Revise the subdivision ordinance to create appropriate subdivision requirements for agricultural parks, and to promote research and development activities.

7.1.2-Action 4 Coordinate with industry stakeholders to develop alternative sources of irrigation water including wastewater reuse, recycled stormwater runoff, and brackish well water.

Objective:

7.1.3 Support and facilitate connectivity between communities.

Policies:

7.1.3.a Evaluate the impact of gated communities on interconnectivity.

7.1.3.b Discourage land use and urban design that impedes interconnectivity between adjacent communities.

Rural Landscape. Kula.

RURAL AREAS

Rural and agricultural lands are intrinsically linked by their physical, economic, and cultural connections. Rural communities and agricultural activities evolved to form a symbiotic relationship: each land use benefits from the other. Rural areas supply agricultural operations with labor, commercial and civic services, and a local market for agricultural goods. Conversely, agricultural areas provide rural communities with employment opportunities, local agricultural products, and a connection to a rural lifestyle. The linkages between rural and agricultural land uses dictate that the consequences of policy decisions for one must consider the implications to the other.

Background Information

Traditional rural lifestyle and settlement patterns are distinct from urban and suburban areas as a result of their strong connection to agricultural land uses. Rural settlement patterns typically consist of small towns, low-density residential development, open space, and an agricultural landscape. Rural towns are often walkable, contain human-scale buildings, cater to the everyday needs of residents, and frequently include an identifiable main street. Expanding out from the town's center, rural roads follow the natural topography of the landscape and residential development gives way to small and large scale farming and ranching operations.

Rural areas commonly possess a more flexible set of standards for infrastructure and public services. Paved roadways, traffic control, trash removal, telecommunications, emergency response, and utilities are provided at a lower-service-level standard. Reduced levels of service are not only a key characteristic of the rural lifestyle, they are important to the aesthetic and environmental objectives in the countryside.

With a mix of natural landscapes and productive agricultural lands, rural areas offer a high concentration of environmental and cultural resources. Streams, wetlands, floodplains, forestlands, steep slopes, and wildlife are common. Cultural resources include a mix of historic structures, archaeological sites, and important cultural lands. Table 7-1 provides a brief overview of the rural land regulatory controls.

Table 7 - 1: State and County Regulatory Controls for Rural Lands

	Regulation	Purpose	Description
State	**Rural District**	The State Land Use Law (Chapter 205, HRS) establishes an overall framework of land use management whereby all lands within the State are classified into one of four Districts: Urban, Rural, Agricultural, and Conservation.	State Rural Districts allow for activities and uses characterized by low-density residential development and small-scale agriculture. The minimum lot size for residential development within the State Rural District is one-half acre.
	Urban District		The State Urban District gives the most regulatory control to the Counties. It is appropriate for use in some rural areas to regulate zoning for small businesses, public and quasi-public uses, as well as a limited amount of house on smaller than one-half acre lots.
County	**Rural District**	County regulatory control over rural lands stems from the County Zoning Ordinance (Chapter 19.29, Maui County Code). The purpose of rural districts is to allow for low density development that preserves the country character of the area, allows for small-scale agricultural operations, and serves as a transition between urban density development and agricultural lands.	Maui County has a variety of districts that vary in lot size, from 0.5 acres to 10 acres or more.
	Other County Zoning Districts	Country Town Business District, Chapter 19.15; Residential Districts, Chapter 19.08; Public Quasi-Public District, Chapter 19.31; M-1 Light Industrial, Chapter 19.24, MCC; and others.	Maui County can use a number of districts normally considered "urban" to maintain the rural character of our small towns, while achieving desired business, public, residential, or other uses.

CHALLENGES AND OPPORTUNITIES

Population growth, development pressures, and decreasing agricultural activities have initiated a shift within Maui's rural landscapes. Originally, Maui's rural areas were a

mix of small country towns, limited residential development, productive agricultural operations, and natural lands. However, in recent decades the character of the landscape, stretching from Ha`ikū to `Ulupalakua and beyond, has experienced a marked increase in lower-density residential sprawl.

Land Use and Planning Management

Rural, large lot residential development pattern, Upcountry.

Standards established by the State and County agricultural and rural districts could do more to protect the character of existing towns, rural resources, lifestyles, and heritage resources. Typical subdivisions utilizing the one-acre and one-half acre minimum lot sizes permitted within the County rural districts are often not compatible with the rural character of the immediate area, but often produce a landscape pattern more appropriately identified as large-lot residential. The County could consider such things as site plan review and open space requirements as a part of their standards.

Implementing a combination of rural planning tools and techniques will help influence the form of future development and mitigate its impact on the rural landscape. Below, two such techniques are summarized.

1. Low Impact Development (LID)**:** Conventional stormwater management focuses on directing all runoff to a centrally located management system. This conventional method alters the hydrologic conditions of an area by reducing the dispersed absorption of stormwater across the landscape and channeling the water to an offsite location. Utilizing LID strategies as an alternative to conventional stormwater management encourages a decrease in land and hydrologic disturbances and the stormwater can be used for agricultural purposes and other uses. LID attempts to mimic predevelopment site hydrology by reducing offsite runoff and ensuring adequate groundwater recharge.

2. Conservation Subdivision Design (CSD): Applying conventional subdivision models to rural lands typically results in low-density residential development sprawl, which alters the natural landscape and can negatively impact community character. CSD offers an alternative approach to regulating the subdivision process on rural lands. This alternative allows for the clustering of development within a portion of a site while the remainder of the land remains undeveloped and protected. Development potential is not taken away from the developer; rather it is concentrated within a smaller portion of the parcel, allowing for the simultaneous preservation of agricultural land, environmental resources, and open space.

Development of Rural Scale Infrastructure

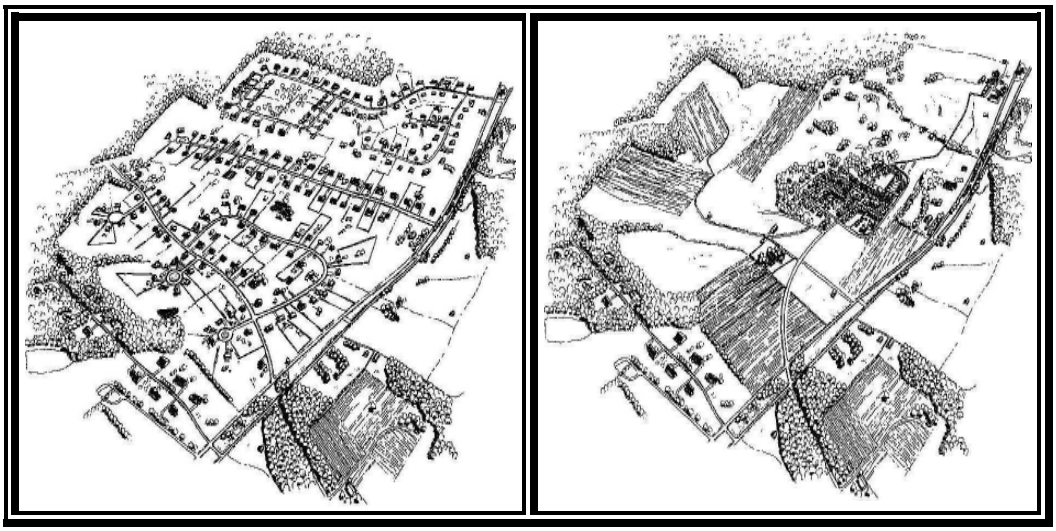


Figure 7 - 2: Conventional Subdivision Design vs. Conservation Subdivision Design. *Source: Arendt, Randall. 1994. Rural By Design. American Planning Association Planners Press. Chicago, Illinois.*

In addition to potential revisions to land use regulations, urban-like infrastructure standards threaten the character of rural areas. The County's minimum road widths and sidewalk and lighting requirements may be inappropriate for rural areas. The urban-like nature of these requirements diminishes the small-scale, rugged country atmosphere. Pavement standards for roads and parking lots may increase flooding and impact the hydrologic balance. Additionally, urban-like infrastructure and public services in rural areas elevate the cost of providing these services to sparsely populated regions.

County infrastructure system and public service standards must reflect the distinct differences that exist between the needs of urban and rural areas. Creating strong policy statements, which will dictate levels-of-service for rural infrastructure, will guide development in rural areas in a manner that complements the character of the countryside. Levels-of-service standards for infrastructure and public services should protect public health and safety, preserve natural resources, and be financially supportable at rural densities; they should not sustain or encourage urban development. In addition, interconnectivity should be encouraged between rural communities using roadways, greenways, and other forms of byways.

Numerous options exist for revising the rural zoning ordinance to improve the management of rural lands and protect rural landscapes. Rural villages and town centers should be allowed to form in rural areas to provide basic goods and services to more remote areas and to offer lifestyle choices. By utilizing the Country Town Business District, and establishing a Country Residential District, future rural development could be focused into compact village centers bounded by open space, ranching, and active agricultural lands.

SUMMARY OF RURAL LAND USE ISSUES

Large portions of the island are rural in identity and lifestyle. Maintaining that identity requires us to address certain challenges and opportunities:

- Low density rural sprawl
- Revision to our land use and planning management
- Development of rural-scale infrastructure in rural areas

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

7.2 Maui will have a rural landscape and lifestyle where natural systems, cultural resources and farm lands are protected and development enhances and compliments the viability and character of rural communities.

Objective:

7.2.1 Reduce the proliferation and impact of residential development outside of urban, small town, and rural growth boundaries.

Policies:

7.2.1.a Focus development to areas inside urban, small town, and rural growth boundaries to preserve natural, cultural, and agricultural resources.

7.2.1.b Encourage cluster development with a mandatory buffer requirement/clear edge at the interface of country towns, agricultural uses, and surrounding rural landscapes.

7.2.1.c Encourage or require, where appropriate, CSDs and the use of green spaces/natural separations to protect the character of rural landscapes.

7.2.1.d Encourage basic goods/services in business country towns.

7.2.1.e Allow for mixed uses, including residential uses, within Business Country Town Districts.

7.2.1.f Encourage the use of alternative stormwater management techniques that minimize land disturbance and preserve natural drainage features.

7.2.1.g Encourage green belts, open space buffers, and riparian zones to minimize conflicts between agriculture and residential uses.

7.2.1.h Evaluate the impact of gated communities on inter-connectivity.

Implementing Actions:

7.2.1-Action 1 Coordinate with the State to develop and revise regulations for rural development, within the State Rural District, to encourage creative design and sustainable communities.

7.2.1-Action 2 Revise the Country Town Business District Ordinance to allow mixed uses including small-scale residential uses.

7.2.1-Action 3 Create new Country Town Business zoning sub-districts and design guidelines that reflect the unique character and land use patterns of Maui's Country Towns and that recognize rural villages.

7.2.1-Action 4 Revise subdivision regulations to permit clustering and CSD within the Rural Districts and extend Hawaii Right to Farm Act protections to rural subdivisions.

Objective:

7.2.2 More appropriate service/infrastructure standards to enhance and protect the island's rural character and natural systems.

Policies:

7.2.2.a Minimize impermeable surfaces within rural areas.

7.2.2.b Protect and support the character, economic viability, and historic integrity of Maui's small towns.

7.2.2.c Use infrastructure, public service, and design standards that are appropriate to rural areas.

7.2.2.d Discourage land use and urban design that impede interconnectivity between adjacent communities.

Implementing Actions:

7.2.2-Action 1 Develop and adopt regulations to establish rural infrastructure and public facility LOS standards.

7.2.2-Action 2 Revise stormwater management regulations to allow for LID techniques and potential irrigation uses.

7.2.2-Action 3 Develop and adopt appropriate procedures and standards for the public to review development in County rural zones.

7.2.2-Action 4 Amend Chapter 19.36B, MCC, as it relates to pavement and parking requirements in rural areas.

Vineyard Street. Wailuku.

URBAN AREAS

Urban areas are characterized by a convergence of housing, jobs, civic activities, commercial services, and shopping. Less than five percent of Maui's lands are within the State Urban District. Prudent planning and managed development within these areas will determine future growth. The character, design, and timing of future growth within Maui's urban areas will have significant consequences for agricultural lands, rural communities, natural resources, and overall quality of life. Sustainable urban development will be accomplished by supporting infill development, enabling mixed-use development, assuring mobility (especially including alternate modes of transportation) and circulation, and clearly defining town edges. As a result, the MIP will promote vibrant and sustainable communities, economize on infrastructure, and protect open space.

Background Information

Existing urban, rural, and agricultural landscapes are a result of major transformations in the island's economy, technology, demographics, and population.[3] Over the last half century, Maui's settlement patterns have become significantly more centralized due, in part, to the mechanization of plantation agriculture and rapid population growth, both of which helped to supply workers for the tourism and resort development industries.

Maui's existing urban communities are characterized by a mix of commercial, industrial, civic, and residential land uses that support our economy and lifestyle. According to the U.S. Census Bureau, 2010 Census, Maui's urban communities and their populations are as listed in Table 7-2.

Table 7-2: Maui's Primary Urban Communities

Town	2010 Population
• **Wailuku**	• 15,313
• **Kahului**	• 26,337
• **Kīhei**	• 20,881
• **Lahaina**	• 11,704
• **Kā`anapali**	• 1,045
• **Nāpili-Honokōwai**	• 7,261
• **Kapalua**	• 353
• **Pukalani**	• 7,574

The three primary urban centers on Maui, measured by the regional distribution of commercial jobs, are Wailuku-Kahului (44 percent), Kīhei-Mākena (18 percent), and West Maui (28 percent). Together, these three communities represent 90 percent of all commercial jobs. The island's primary commercial airport, harbor facility, and hospital are located in Kahului. Kahului also supports the island's primary industrial zones, large retail centers, and shopping malls. The island's civic center is located in nearby Wailuku. Kīhei-Mākena and West Maui hold the island's major resort destination areas.

CHALLENGES AND OPPORTUNITIES

There are challenges and opportunities that transcend Maui's urban communities. Key issues include:

- Building compact, efficient and pleasant communities that meet the affordable housing needs of island residents;
- Fostering self-sufficient, sustainable communities that respect the island's "sense-of-place";
- Ensuring the development process is transparent and efficient; and
- Adequately protecting natural and cultural resources within Urban areas.

Maui's future urban growth will take place in four different physical forms: 1) as infill development; 2) within urban expansion areas; 3) as new towns and settlements; and 4) as orderly infill and expansion of existing country towns and villages. Each development pattern has benefits and costs that will determine the extent and location of their use.

Infill Development

In *The Next American Metropolis* (1993), Peter Calthorpe states: "infill and redevelopment should always be a central part of a region's growth policy. It represents the best utilization of our existing infrastructure and the best opportunity to preserve open space."[4]

[3] Maui Island Plan (2006). *Maui Island History: Lessons from the Past – A Guide to the Future.*

[4] The Next American Metropolis. Peter Calthorpe. 1993. p. 31.

Compact, Efficient, Human-scale Communities

Infill development offers an alternative to conventional development patterns that extend the perimeter of an urban area. Infill development focuses growth into already urbanized areas and creatively utilizes vacant or underdeveloped property. Many of the most successful infill projects provide a mix of uses, are designed to be pedestrian-oriented, and incorporate alternative modes of transportation. The benefits of such projects can be the provision of housing near job centers and transit, increased support for businesses, utilization of established public infrastructure and services, and preservation of urban-fringe natural areas and agricultural land. Infill development can also revitalize a struggling urban area, enhance daily convenience for residents, and foster a sense of place. As illustrated in the following pictures, successful infill development can transform an underused shopping center into a vibrant urban village.

Infill development of an underutilized shopping center allows for creative and beneficial recycling of land.

There are numerous infill opportunities on Maui. Throughout the island's urban areas, particularly in Kahului, Wailuku, Lahaina, and Kīhei, vacant or underutilized lots could be developed to meet community needs. Future growth can be focused inward to enhance community identity, provide affordable housing, promote convenient access to transit and services, and protect natural areas and agricultural lands.

Urban Expansion

Development within urban expansion areas represents one alternative for accommodating future growth on Maui. Urban expansion generally involves the conversion of urban fringe agricultural lands to urban use. These lands typically lie in the path of development, are proximate to existing urban infrastructure and services, and offer favorable topography, which makes development cost-efficient. When developed in a manner that promotes pedestrian and vehicular connectivity, open space, and compact mixed-use development, urban expansion can help strengthen the character and vibrancy of the community.

While urban expansion is oftentimes the most efficient and cost-effective means of accommodating growth, it should be done carefully to prevent sprawl. The location and character of potential urban expansion should be closely scrutinized to prevent land use patterns that consume valuable farmland and open space, and blur the separation between existing communities.

Key areas on Maui, including lands abutting Kahului, Waikapū, Lahaina, and northeast Kīhei, provide opportunities for expanding outward from current urban

settlement. With innovative design and appropriate scale, these urban expansion areas can enhance community identity and address some of Maui's housing needs.

New Towns

Creating new towns in appropriate locations can offer several advantages: 1) protect the unique identity and character of the island's towns by directing growth away from, rather than adjacent to, existing communities; 2) provide flexibility through the master planning process to design for mixed land uses, interconnectivity, and greenways; and 3) mitigate against sprawl conditions by defining a strong urban boundary and permanently preserving abutting agricultural lands.

While there are many advantages associated with new town development, it can be prohibitively expensive to create a new community. High infrastructure costs associated with new towns can require the development of larger communities to generate the economy-of-scale necessary to make a project feasible. High infrastructure costs may also discourage the development of affordable housing. Additionally, unless developed in response to a primary supporting industry, new towns often become bedroom communities, thus requiring long commutes to employment, and placing considerable strain on nearby public facilities and regional roadways. The development of new towns in remote locations can also facilitate urban sprawl, and impact important environmental and agricultural resources. The Hawai`i State Plan notes that new urban lands should be adjacent to existing urban lands. In *The Next American Metropolis* (1993), nationally recognized planner Peter Calthorpe states: "new towns should only be planned if a region's growth is too large to be directed to infill and adjacent New Growth Areas."[5]

Due to the potential challenges, new towns should be carefully analyzed to compare the benefits and costs of new towns to alternative forms of growth. The impact of new towns should be assessed in terms of environmental impact, infrastructure costs and agricultural land conversion. If a new town is created, the physical extent of the town should be defined with clear edges and an urban core should be planned to provide the new community with a distinct identity. Land uses within the new town should be mixed to promote self-sufficiency and a jobs/housing balance.

Country Town Infill and Expansion

Existing country towns and villages also have the ability to absorb future growth. The potential for these areas to grow must be weighed carefully against the impacts that both infill and moderate expansion will have on their unique sense of place. In addition, growth and expansion should be carefully reviewed for housing balance, commercial and service availability, and infrastructure impacts.

All four forms of future growth should avoid steep slopes, wetlands, riparian areas, native species habitat, and other environmentally important lands. Many of these areas are separated from existing development and infrastructure and are highly sensitive to disturbance.

The design of the built urban environment will greatly influence the sustainability of all communities and the overall quality of life. The following urban design and physical form principles will play a significant role in shaping growth on Maui:

- Defining town edges and greenbelts;

[5] The Next American Metropolis. Peter Calthorpe. 1993. p. 71.

- Enabling mixed-use, livable communities;
- Facilitating a jobs/housing balance;
- Assuring mobility and circulation, emphasizing alternate modes of transportation; and
- Designing pedestrian-oriented streets.

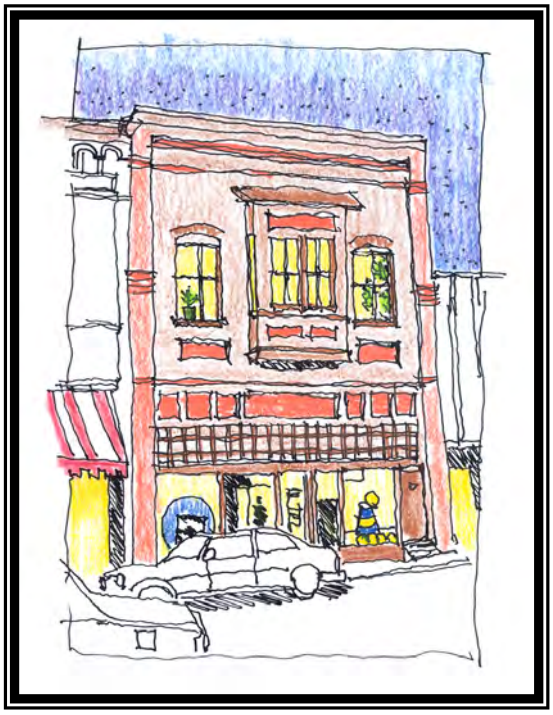
Clearly defining the edges of Maui's towns is essential to guide and shape future growth. As towns expand outward they can grow into other towns and the entire region can become one large urban mass, compromising the unique identity of each individual town and community as a whole.

Maui is home to a number of large and small towns, each with its own history and character. As these towns grow it will be critical to define the physical limits of each town, and restrict growth outside of these limits, to maintain a sense of identity for each individual community while protecting agricultural land, natural resources, and recreation areas.

Respect the Island's "Sense of Place"

The majority of Maui's future growth will be directed into already urbanized areas or proximate to existing urban areas. Therefore, quality design and composition of Maui's urban centers will be vital for ensuring walkable, bikeable, livable communities.

During the public planning events WalkStory & PlanStory and other recent design charettes, Maui residents expressed a preference for focusing future growth in existing towns and increasing population densities in appropriate locations as the best way to accommodate growth. The support for urban living was based on neighborhoods that are attractive, safe, user-friendly, and have convenient access to parks and green space. Maximizing livability is vital to making "urban living" an accepted and desired lifestyle on Maui.



Mixed-use communities bring together our everyday needs into a setting which is scaled to the pedestrian

The first step in promoting the livability of an urban area is to enable mixed-use commercial, retail, employment, civic, recreational, and educational uses into a pedestrian-scaled community. The mix of uses creates an integrated and multidimensional built-environment that reflects our way of life. Rather than creating an automobile-dependent lifestyle, mixed-use communities bring together our everyday needs into a setting that is scaled to the pedestrian. Mixed-use communities also provide for mixed housing types, lot sizes, and incomes to promote sustainable, walkable, bikeable, livable communities.

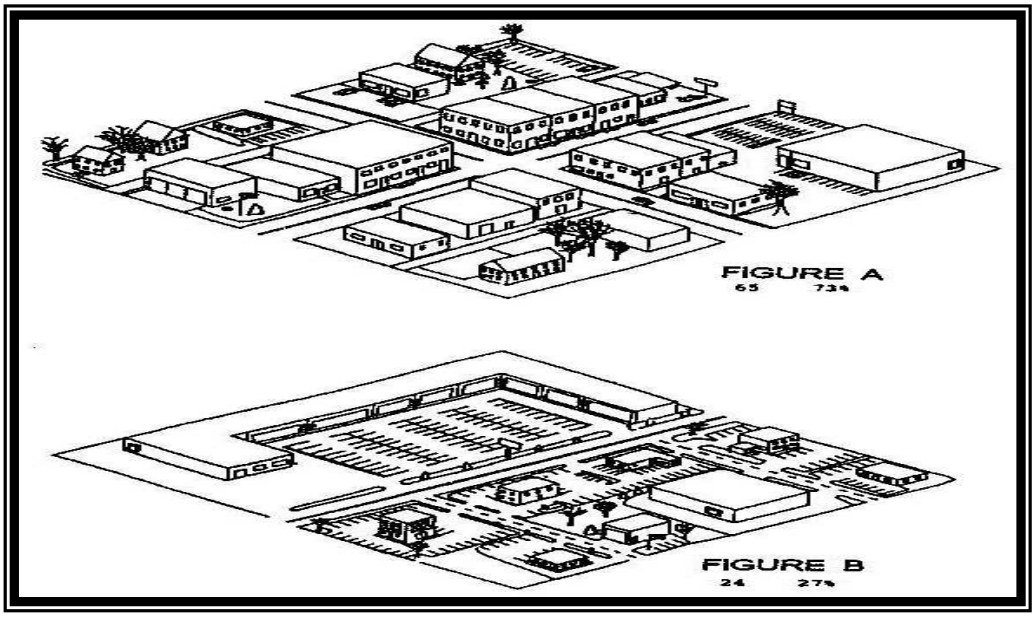
Jobs/housing balance is a measure of the harmony between employment and dwelling

units in a specific area. Striving for this balance by providing housing close to jobs can have many benefits for a community and region, including reduced congestion and commute times, reduction of carbon dioxide emissions, increased opportunities to use alternative modes of transportation, support of a more compact urban form, and reduced costs for infrastructure and services.

Self-Sufficient, Sustainable Communities

Assuring mobility and circulation within and between Maui's urban areas is an important component of promoting rich urban design and human-scale form. Land use patterns and transportation have a very close relationship – land use decisions affect transportation planning, and transportation planning affects land use patterns. Coordination must exist between transportation and land use planning decisions so they are complimentary rather than contradictory. When designing new communities, expanding current communities, or increasing density in existing communities, ensuring mobility and circulation must be a top priority. Providing for efficient movement of all levels of transportation – automobile, public transit, bike, and pedestrian – is essential to assuring the livability of a community. Parking management is also an important part of assuring mobility and circulation within Maui's urban areas. The development pattern depicted in Figure A is efficient and conducive to pedestrian mobility, while the development pattern in Figure B is shaped by large-surface parking lots that dominate the built environment and inhibit pedestrian mobility.

Street connectivity and parking management are key elements of promoting good urban design.



Source: Arendt, Randall. 1994. Rural By Design. American Planning Association Planners Press. Chicago, Illinois.

Current parking requirements often result in large surface parking lots dominating urban landscapes. To effectively address the storage of automobiles in urban areas a comprehensive parking management strategy and revision of parking standards to reduce requirements for mixed-use projects, allow for joint-use parking, and payment of cash-in-lieu fees to support centralized parking would have a mitigating effect.

The layout and design of streets has a significant impact on the character, form, and

livability of communities. As Allan Jacobs, author of *Great Streets*, eloquently stated:

> *"It is not surprising that, given their multiple roles in urban life, streets require and use vast amounts of land. In the United States, from 25 to 35 percent of a city's developed land is likely to be in public right-of-way, mostly streets. If we can develop and design streets so that they are wonderful, fulfilling places to be, community building places, attractive public places for all people of cities and neighborhoods, then we will have successfully designed about 1/3 of the city directly and will have an immense impact on the rest."*

Streets are one of the most basic elements of urban form – they play a significant role in shaping the framework and character of neighborhoods. Inappropriate street design can encourage speeding, limit pedestrian mobility, and degrade the aesthetic quality of the built environment. Well-designed streets generally have the following characteristics:

- Proper proportion and width;
- Relationship to adjoining buildings and setbacks;
- Shade;
- Sidewalks;
- Street trees;
- Lighting;
- On-street parking;
- Parking at rear of building; and
- Bike paths, bike lanes, and greenways.

The County's principal role in the management of the visitor industry involves regulation of land uses, including the location and number of visitor units and resort real estate, the management of commercial attractions for visitors, and the perpetuation of local culture by reviewing new project proposals for cultural sensitivity. The County also provides roads, parks, police and fire protection, and other services that benefit the visitor industry.[6]

SUMMARY OF URBAN LAND USE ISSUES

- Compact, efficient, human-scale communities
- Self-sufficient, sustainable communities
- Transparent planning process

[6] Plan Pacific, Inc. (October 2007). *Economic Development Issue Paper*.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

7.3 Maui will have livable human-scale urban communities, an efficient and sustainable land use pattern, and sufficient housing and services for Maui residents.

Objective:

7.3.1 Facilitate and support a more compact, efficient, human-scale urban development pattern.

Policies:

7.3.1.a Ensure higher-density compact urban communities, infill, and redevelopment of underutilized urban lots within Urban Growth Boundaries.

7.3.1.b Maintain a distinct separation between communities, such as but not limited to, Wailuku and Waikapū; Wailuku and Waihe`e; Pukalani and Makawao; Pukalani and Kula; Makawao and Hāli`imaile; Lahaina and Kā`anapali; Kīhei and Mā`alaea; and Mā`alaea and Waikapū, to protect the character and identity of Maui's communities.

7.3.1.c Strengthen evaluation requirements for new urban expansion, new towns, and major urban infill projects within urban growth areas. Tailor submittal requirements to reflect the impact or scale of different projects.

7.3.1.d Ensure future amendments to urban growth boundaries achieve the following: (1) provide a beneficial extension of the existing community; (2) are in areas where it is cost-effective to provide and operate infrastructure/public service facilities; and (3) do not promote automobile-oriented land use patterns.

7.3.1.e Evaluate the impact of gated communities on inter-connectivity.

7.3.1.f Encourage the development and implementation of neighborhood design standards that are environmentally friendly, such as LEED for Neighborhood Development (LEED – ND) standards.

7.3.1.g Discourage future pyramid zoning within the industrial zoning districts, while allowing accessory commercial uses and grandfathering existing uses.

7.3.1.h Promote agriculture by encouraging community gardening, community-supported agricultural programs, and farmers markets within and adjacent to urban areas.

7.3.1.i Discourage land use and urban design that impedes inter-connectivity between adjacent communities.

Implementing Actions:

7.3.1-Action 1 Establish minimum-density requirements and design standards within urban areas to support higher densities, infill development, and efficient land use patterns.

7.3.1-Action 2 Update zoning and development regulations to achieve the following:

(1) Facilitate environmentally friendly projects (LEED – ND);

(2) Revise the application and reporting requirements in Title 19, Maui County Code (MCC), to strengthen evaluation requirements and establish design guidelines for new urban expansion, new towns, and major projects within UGBs;

(3) Discourage future pyramid zoning within the industrial zoning districts, while allowing ancillary commercial uses; and

(4) Consider the establishment of a new zoning category that strictly defines and limits uses for heavy industrial areas.

Objective:

7.3.2 Facilitate more self-sufficient and sustainable communities.

Policies:

7.3.2.a When developing new communities, provide sufficient lands for commercial, appropriate industrial, educational, spiritual, and non-profit uses to serve the daily needs of community residents.

7.3.2.b Site community facilities such as schools, parks, libraries, and community centers within walking and biking distance of residences.

7.3.2.c Facilitate self-sufficient communities and shorten commutes by:

(1) Directing residential development to job-rich areas;

(2) Allowing for appropriate commercial development and community services to shorten commutes; and

(3) Allowing home occupations or home-based businesses that are compatible with surrounding neighborhoods and lifestyles.

7.3.2.d Ensure, where appropriate, that affordable employee housing and multi-modal transportation opportunities are located near major employment centers.

7.3.2.e Discourage the establishment of bedroom communities where long commutes are required to employment centers.

7.3.2.f Facilitate the development of housing by focusing projects in locations where land and infrastructure costs facilitate the development of affordably-priced housing.

7.3.2.g Provide incentives to facilitate the development of multifamily housing.

7.3.2.h Encourage the placement of rental housing projects in the same areas as for-sale housing to facilitate mixed-income communities.

7.3.2.i Develop communities that provide sufficient parks, schools, libraries, and other essential public facilities and services to serve resident needs.

7.3.2.j Promote agriculture by encouraging community gardening, edible landscaping, community-supported agricultural programs, and farmers markets within and adjacent to urban areas.

Implementing Actions:

7.3.2-Action 1 Develop and adopt a TDR Ordinance and a formal TDR program, and identify receiving areas within urban growth boundaries.

7.3.2-Action 2 Amend the zoning ordinance to:
(1) Reduce minimum lot sizes in urban areas;
(2) Encourage a mix of single-family and multifamily lots within the same development; and
(3) Facilitate the establishment of mixed-use towns/village centers.

7.3.2-Action 3 Update regulations to promote community gardens and edible landscapes.

7.3.2-Action 4 Consider standards to regulate the location, design, and massing of big-box retail stores.

7.3.2-Action 5 Amend the Maui County Code (MCC) to reduce parking requirements, where appropriate, in mixed-use projects, encourage joint-use parking, and allow for the use of innovative methods to meet peak parking needs.

7.3.2-Action 6 Revise the zoning ordinance to allow for mixed-use development that is appropriate and in character with the existing community.

Objective:

7.3.3 Strengthen the island's sense of place.

Policies:

7.3.3.a Protect and enhance the unique architectural and landscape characteristics of each community.

7.3.3.b Encourage Hawaiian architecture and tropical building designs.

7.3.3.c Support the continued revitalization of historic country towns, Wailuku Town, and Kahului's commercial core and harbor-front without displacing traditional, cultural, recreational and customary uses.

7.3.3.d Strongly encourage the preservation of buildings, structures, and sites of historic significance.

7.3.3.e Require community input through Design Workshops for major new urban expansion, new towns, and major urban infill projects.

7.3.3.f Require design enhancement, landscaping, and integration of park and rides, bicycle parking areas, and mass-transit infrastructure to mitigate the effect of parking lots and structured parking on the urban landscape.

7.3.3.g Ensure that safe and attractive public spaces (e.g., plazas, parks, town/village squares) are provided throughout the island's urban areas.

Implementing Actions:

7.3.3-Action 1 Implement the Wailuku Redevelopment Plan, and subsequent updates, and formulate plans for other appropriate areas.

7.3.3-Action 2 Develop and adopt regulations to require Urban Design Review Board review of all major urban expansion, new towns, and urban infill, and redevelopment projects.

7.3.3-Action 3 Prepare general Urban Design Guidelines for Central, South, and West Maui.

7.3.3-Action 4 As part of the Community Plan updates, prepare streetscape, pedestrian/bikeway/transit circulation, redevelopment and infill, and greenway infrastructure and master plan elements.

7.3.3-Action 5 Develop community planning processes to establish standards and priorities for streetscape beautification, public amenities, pedestrian and bicycle circulation, parking, redevelopment target areas, transit amenities, and sense of place and building form/design guidelines.

Objective:

7.3.4 Strengthen planning and management for the visitor industry to protect resident quality of life and enhance the visitor experience.

Policies:

7.3.4.a Discourage the conversion of hotel units to timeshares and fractional ownership.

7.3.4.b Monitor and manage the amount of, and impacts from, timeshares and fractional ownership.

7.3.4.c Manage short-term rentals and bed-and-breakfast homes through a permitting and regulatory process in accordance with adopted ordinances and community plan policies.

7.3.4.d Limit large-scale resort development to the four existing resort destination areas of Wailea, Mākena, Kapalua and Kā`anapali. "Large Scale Resort" is defined as complexes that include multiple accommodation facilities, activity businesses, retail complexes, and other amenities.

Implementing Action:

7.3.4-Action 1 Define and map the Resort Destination Areas of Wailea, Mākena , Kapalua, and Kā`anapali.

Objective:

7.3.5 Ensure that Maui's planning and development review process becomes more transparent, efficient, and innovative.

Policies:

7.3.5.a Encourage greater community involvement in land use planning and decision making.

7.3.5.b Establish a predictable and timely development review process that facilitates the approval of projects that meet planning and regulatory requirements.

7.3.5.c Increase inter-agency coordination between the Department of Planning and all State and County agencies responsible for infrastructure and public facilities provision, particularly as it relates to the mitigation of long-term cumulative impacts resulting from development projects.

7.3.5.d Provide greater certainty and transparency in the development review process.

7.3.5.e Expand and maintain land use and geographic information system databases for improved decisions, and make data and products available to the public.

Implementing Actions:

7.3.5-Action 1 Develop and adopt regulations that: (a) mandate early consultation with communities affected by planning and land use activities; and (b) establish efficient and realistic review timelines.

7.3.5-Action 2 Update the MIP and Community Plan land use designations and zoning maps with each update of the General Plan.

7.3.5-Action 3 Evaluate the establishment of time limitations on unused development entitlements for projects which have not commenced within a reasonable time period.

Chapter 8: Directed Growth Plan

An expansive view of Maui's Southern Coast, Kula.

Throughout the island, Maui's residents made it abundantly clear they had a determined desire to maintain, protect and preserve open land and the green vistas, and the rural character of Maui. This vision requires a unified commitment to the island and to future generations of Maui residents. The path we must tread to reach our desired destination cannot be traveled in total ease – it is a task that will require hard choices and individual sacrifices for our common and future good. The goal is not impossible to achieve, even in the face of population growth, but it will require the careful management and control of development so that growth can be a positive and enduring force that will enrich our residents.

The Directed Growth Plan is the backbone of the Maui Island Plan (MIP). Taking into account population projections, it prescribes and outlines how Maui will grow over the next two decades, including the location and general character of new development. The Directed Growth Plan accommodates growth in a manner that provides for economic development, yet protects environmental, agricultural, scenic and cultural resources; economizes on infrastructure and public services; meets the needs of residents; and protects community character.

Chapter 2.80B, MCC, requires the adoption of urban and rural growth areas for the island of Maui. This is the first time Maui County has established growth boundaries, and it represents a significant shift towards a more orderly and predictable development pattern. Communities throughout Hawai`i and the country have used growth boundaries as part of a comprehensive directed growth plan to preserve agricultural lands, protect environmental resources, and create a more predictable land use planning process. Directed growth strategies use population projections and density assumptions to ensure an adequate supply of land is available for future growth, to limit sprawl, and to focus infrastructure investment to areas within the growth boundaries.

The Directed Growth Plan uses MIP goals, objectives, and policies as well as guiding land use principles as a foundation for establishing urban and rural growth boundaries. This chapter describes the types of growth boundary designations and the methodology applied in the identification of these designations. In addition, this section identifies planned protected areas.

This chapter contains figures to be used for illustrative purposes only. In the event a figure is inconsistent with a diagram or map of this chapter, the diagram or map shall control.

Background Information

The following technical studies and reports provide base information for the Directed Growth Plan:

1. *Land Use Forecast (November 2006);*
2. *The Socio-Economic Forecast (June 2006);*
3. *Maui Island Housing Issue Paper, December 2006;*
4. *Infrastructure and Public Facilities Assessment Update (March and September 2007);*
5. *Maui Island Roadway Capacity Assessment (January 2007);*
6. *Scenic and Historic Resources Inventory & Mapping Study (June 2006);*
7. *WalkStory and PlanStory, A Report on the Response of Participants (December 2006);*
8. *Maui Island Plan Site Evaluation Methodology Memorandum (August 2007); and*
9. *Population and Economic Projections for the State of Hawai`i to 2040 (March 2012).*

The Department of Planning also conducted numerous regional design workshops and held meetings with State and County agencies, stakeholder groups, and the General Plan Advisory Committee to understand the perspectives of residents from all areas of the island on future growth and protected areas (see Introduction for additional information).

The Purpose of the Directed Growth Plan

The primary purpose of the MIP is to establish a managed and directed growth plan to accommodate population and employment growth in a manner that is fiscally prudent, safeguards the island's natural and cultural resources, enhances the built environment, and preserves land use opportunities for future generations. The Directed Growth Plan is based on sound planning practices and principles and utilizes

information gathered from public outreach events, the General Plan Advisory Committee, and technical studies.

The Directed Growth Plan, which is grounded on the recommendations found throughout the MIP, establishes the location and general character of future development. The Directed Growth Plan will provide the framework for future community plan and zoning changes and guide the development of the County's short-term and long-term capital improvement plan budgets.

Planning for Future Growth

As part of the *Land Use Forecast*, the demand for additional residential lands was determined by comparing build-out of existing residential land supply to the 2030 forecasted demand for residential units. The existing supply of residential land includes all lands that are community planned and zoned for either single-family or multifamily residential use. The forecasted demand for residential units takes into account both resident and nonresident demand to 2030. While an important goal of the General Plan update is to provide housing for Maui residents, the demand for housing from the offshore market cannot be ignored. If only resident demand was factored into the future need for residential units, competition between residents and nonresidents for the limited supply of residential units would likely lead to a worsening of the current high-priced housing situation, with residents being outbid by nonresidents. Therefore, both resident and nonresident demands are used to determine total future demand for residential housing. According to the land use forecast and the most recent DBEDT forecasts, an additional 10,845 residential units are needed to accommodate projected 2030 housing demand.[1] This demand was then allocated to each community plan region based on the land use forecast model output that predicts regional population and employment growth. Table 8-1 depicts total forecasted housing demand, the supply of existing housing units, and projected housing needs to 2030.

Table 8 - 1: Projected Maui Housing Needs, 2010 - 2030

Total Needed Housing Units During 2010-2030 Planning Period	
Projected 2030 Housing Demand	83,659
Minus the existing housing stock	54,070
Minus currently entitled housing units	-18,744
Equals approximate unmet housing demand	**10,845**

Types of Growth Boundaries and Protected Areas

Urban and Rural Growth Boundaries

Chapter 2.80B, MCC, requires the identification of both urban and rural growth boundaries (which can include small towns, rural residential, rural villages, and other community plan designations). The characteristics used to identify these boundaries and the policy intent for each of these areas is described in Table 8-2.

[1] The 2030 demand has been adjusted to reflect updated population forecasts released by the DBEDT (March, 2012).

Protected Areas

Part of the Directed Growth Plan is to ensure that future development patterns do not compromise Maui's unique and fragile natural resources. One tool to promote the protection and availability of passive and active recreational amenities and other environmentally sensitive areas is the identification of preservation areas, regional parks, greenways, greenbelts, and sensitive lands. Each type of protected area is described in Table 8-2. It is not the intent of the Protected Areas to regulate lands within the State Conservation District. In some instances, Conservation lands are included to provide context.

Urban, Small Town, and Rural Growth Areas

The MIP is the first comprehensive plan to establish urban, small town, and rural growth boundaries in Maui County. These boundaries will encompass approximately 5,389 acres of new planned urban and small town growth areas. The Directed Growth Maps show Urban, Small Town, and Rural Growth Boundaries (UGB, STB, and RGB) - the space inside these boundaries is referred to as Urban, Small Town, and Rural Growth Areas respectively. These boundaries are depicted with lines on the Directed Growth Maps. The growth boundary line separates a growth area from a nongrowth area.

- The UGB denotes the areas within which urban-density development requiring a full range of services, such as new multi-user sewer and water, is supported in accordance with applicable land use laws. Growth boundaries are a long-range planning tool that will be used on Maui to evaluate proposals involving community plan amendments, changes in zoning, development proposals or utility extensions.

- The STB denotes areas that are less intensely developed than urban areas with fewer services and a lower level of infrastructure. These areas may be more self-sufficient than Rural Villages. Primary employment opportunities are often in nearby urban areas.

- The RGB is intended to identify and protect the character of our rural communities. It identifies an existing or future land use pattern that includes a mixture of small farms, low density residential housing, and a limited amount of urban uses consistent with the character and scale of our country towns. The intent of this boundary is to provide a framework for further and more detailed long-range rural planning during the community plan update process. Rural areas inherently possess a lower set of standards for infrastructure and public services than urban areas. As such, it is also the intent to apply lower level-of-service standards in RGBs.

The UGBs, STBs, and RGBs are used to identify and protect farms and natural areas from sprawl and to promote the efficient use of land, and the efficient provision of public facilities and services inside the boundary.

The UGBs, STBs, and RGBs take into account future growth projections through 2030, the availability of infrastructure and services, environmental constraints, and an approximate density of land development to determine the placement of the boundary. Land outside of the UGB is intended to remain rural in character with a strong agricultural and natural-resource presence. These boundaries are intended to be static "lines in the sand" until the time at which job and housing growth cannot be accommodated within the boundaries, which, if not addressed, could exacerbate the affordable housing problems facing Maui and have a negative impact on the overall quality of life. To ensure that an adequate supply of land is available, the MIP will be updated every ten years to provide for appropriate expansion to meet new

Table 8 - 2: Growth Boundaries and Protected Area Types

GROWTH BOUNDARIES (See Maps C-1 to C-5, S-1 to S-3, U-1 to U-4, N-1 to N-2, W-1 to W-4, E-1 to E-2)		CHARACTERISTICS	PURPOSE	IMPLEMENTATION STRATEGY
GROWTH BOUNDARY TYPES	**Urban**	Urban areas contain a greater variety of land use types, including various housing types and densities, commercial, retail, industrial uses, and resort destination areas. Infrastructure is more complete and reflects the need to serve higher-density land uses.	Ensure that future development occurs in an orderly fashion; allows in-fill and revitalization opportunities and encourages "new urbanism" and "neo-traditional design" techniques.	Protect separation between communities through the use of Urban Growth Boundaries. Require community-based design processes and require design guidelines for future major development. Identify and promote redevelopment and in-fill opportunities. Encourage a mix of housing types and higher-density residential development to encourage resident housing opportunities.
	Small Town	Small Towns are less intensely developed than urban areas with fewer services and a lower level of infrastructure. They may be more self-sufficient than Rural Villages. Primary employment opportunities are usually in nearby urban areas.	Protect the integrity, unique sense of place, and economic viability of Maui's traditional small towns.	Protect separation between communities through the use of Small Town Boundaries. Allow for expansion where appropriate. Utilize design guidelines and rural infrastructure standards to protect Small Town character.
	Rural	Rural Areas contain a mixture of agricultural activities, low-density residential areas, and small villages. Rural Villages may contain limited amounts of State and County urban designated lands including residential and small clusters of businesses and civic uses mostly to support surrounding rural residential uses and agricultural activities. Level of government services is generally limited and many essential goods and services are located in a larger town. The level of infrastructure may be lower than Small Towns. Employment is generally a function of nearby Urban Areas or Small Towns. Rural Residential Areas are primarily a residential development pattern with lower residential densities (0.5 to 10 ACRE/du), agricultural activities, and few services or employment opportunities. Limited commercial and civic uses (churches, schools) may be allowed in accordance with applicable community plan and zoning.	Provide a transition between Urban Areas and Small Towns and those areas in need of protection, including agricultural lands. Contain the spread of residential uses into prime agricultural lands and provide a tool for designing villages with a mix of lots and lifestyle choices.	Minimize expansion of infrastructure that could lead to urbanization. Define areas appropriate for additional rural development patterns. Promote an equitable tax/water rate structure that reflects actual land use. Adopt appropriate infrastructure and subdivision standards to protect rural character. Maintain the separation of communities through the use of boundaries. Allow for Rural Villages where appropriate. Utilize rural design guidelines and appropriate infrastructure and subdivision standards to protect rural character.
PROTECTED AREA TYPES (See Diagrams NW-1, WC-1, S-1, N-1, NE-1, E-1, SE-1)				
PROTECTED AREA TYPES	**Preservation**	Areas with significant natural and environmental resources, scenic, open space, and recreational resources, historic resources and other important assets that warrant additional protection. Preservation areas may include accessory structures such as public restrooms, structures related to a cultural or historical resource, and other structures and ancillary uses consistent with the purpose and intent of the preservation area.	Permanent protection of areas on the island that have significant environmental, ecological, cultural and recreational value and the degradation of the resource would result in an irretrievable loss.	Protection using regulation, easements, Transfer of Development Rights (TDR) program or fee-simple purchase in cooperation with land trusts, environmental organizations, the County of Maui, State of Hawai`i and the Federal government. The appropriate community plan designation for this protected area type is park or open space as determined during a community plan update or the entitlement process.
	Park	Land areas devoted to passive (picnic facilities and gathering areas) and/or active (including, but not limited to, bike paths, hiking trails, ball fields, and tennis courts) uses that serve recreational needs.	Ensure that recreational and open space needs keep pace with future growth and are appropriately located consistent with the Maui Island Plan's Directed Growth Plan.	Acquisition, Transfer of Development Rights (TDR) program, and/or cooperative efforts with the development community during the design, project review and approval process. The appropriate community plan designation for this protected area type is park or open space as determined during a community plan update or the entitlement process.
	Greenbelt	Extensive area of largely undeveloped or sparsely occupied land established along natural corridors to protect environmental resources and to separate distinct communities. Greenbelts may include accessory structures and ancillary uses consistent with the purpose and intent of the greenbelt area.	Ensure natural and undisturbed separation between communities and protect environmentally sensitive lands.	Acquisition, Transfer of Development Rights (TDR) program, and/or cooperative efforts with the development community during the design, project review and approval process. Also implemented through the subdivision review process. The appropriate community plan designation for this protected area type is park or open space as determined during a community plan update or the entitlement process.
	Greenway	Typically a long, narrow piece of land, often times used for recreation, pedestrian, and bicycle traffic. Greenways can include community gardens and can be used to link community amenities (e.g. parks, shoreline). Greenways may include accessory structures and ancillary uses consistent with the purpose and intent of the greenway area.	Provide opportunities to inter-connect communities, ensure adequate recreational amenities, protect scenic resources, and link residential projects with service areas. Greenways may be improved to accommodate pedestrian, bicycle, equestrian and other similar uses.	Acquisition, Transfer of Development Rights (TDR) program, and/or cooperative efforts with the development community during the design, project review and approval process. Also implemented through the subdivision review process. The appropriate community plan designation for this protected area type is park or open space as determined during a community plan update or the entitlement process.
	Sensitive Land	Lands that contain development constraints including steep slopes greater than 35 percent, floodplains, significant drainage features, and adjacent intact forested areas.	Protect areas with significant development constraints and ensure sensitive areas are taken into consideration during site design.	An area that may require site design review and approval to ensure that areas with significant development constraints are avoided or appropriate mitigation measures are incorporated into projects.

housing demand. In short, the boundaries will typically include at least a 10-year surplus of urban, small town, and rural lands.

In some cases the UGBs, STBs, and RGBs split ownership parcels and vary from the owners' suggested development project boundary. This was done for a variety of reasons, some of which are to protect valuable agricultural lands, natural resources, or limit susceptibility to hazards. Generally, however, specific areas were identified throughout the island to promote balanced growth at appropriate urban or rural densities. Altogether, the growth boundaries provide sufficient land supply to meet the needs of the County to 2030.

Maui's growth boundaries are one component of Maui's land use planning and regulatory system. State land use districts, community plan designations, zoning districts, and the growth boundaries work in concert to effectively manage land use. Table 8-3 portrays the Growth Boundary Types and the Corresponding State Land Use Districts.

Table 8 - 3: Growth Boundary Types and Corresponding State Land Use Districts

GROWTH BOUNDARY TYPE	STATE LAND USE DISTRICT
Urban	Urban
Small Town	Urban/Rural
Rural	Urban (limited amounts), Rural, and Agriculture

URBAN AND SMALL TOWN GROWTH AREA GOAL AND POLICIES

The following goal and policies address Urban Growth Boundaries (UGBs) and Small Town Boundaries (STBs), and the development of land within and outside of these boundaries. They are broad in scope, and address the design intent of these areas, amendments to the boundaries, and infrastructure expansion within and outside of the boundaries. The policies set forth below establish the regulatory effect of the UGBs and STBs.

Goal:

8.1 Maui will have well-serviced, complete, and vibrant urban communities and traditional small towns through sound planning and clearly defined development expectations.

Policies:

8.1.a The County, with public input, will be responsible for designating new growth areas where infrastructure and public facilities will be provided, consistent with the policies of the MIP and in accordance with State and County infrastructure plans.

8.1.b Amendments to a UGB or STB shall be reviewed as a MIP amendment. A UGB or STB shall only be expanded if the island-wide inventory (maintained by the Department of Planning) of existing land uses (residential, commercial, industrial) indicates that additional urban density land is necessary to provide for the needs of the projected population growth within ten years of that inventory; or, during the decennial update of the MIP.

8.1.c Community plans shall provide for urban density land use designations only within UGBs and Small Towns. The County may only support and approve State Urban Land Use Designations for areas within UGBs, STBs, and Rural Villages.

8.1.d The unique character and function of existing small towns shall be protected to retain and preserve their sense of place.

8.1.e New development shall be consistent with the UGBs, STBs, and all other applicable policies of the MIP. New urban-density development shall not be allowed outside of a UGB or STB.

8.1.f The County, as a condition of development approval, shall require developers of privately owned infrastructure systems to provide financial insurance (bonding, etc.) for the operation and maintenance of these systems.

8.1.g The County shall implement a zoning program to comprehensively redistrict and rezone lands within UGBs according to updated community plan policies and map designations.

8.1.h The County will seek to focus capital improvements (schools, libraries, roads, and other infrastructure and public facilities) within the UGBs and STBs in accordance with the MIP.

8.1.i The County will promote (through incentives, financial participation, expedited project review, infrastructure/public facilities support, etc.) appropriate urban infill, redevelopment and the efficient use of buildable land within UGBs to avoid the need to expand the UGBs.

8.1.j The MIP's UGBs and STBs shall not be construed or implemented to prohibit the construction of a single-family dwelling on any existing parcel where otherwise permitted by law.

RURAL GROWTH AREA GOAL AND POLICIES

The following goal and policies address Rural Growth Boundaries (RGBs) and the development of land within and outside of these boundaries. They are broad in scope, and address the design intent of these areas, amendments to the boundaries, and infrastructure expansion both within and outside of the boundaries. The policies set forth below establish the regulatory effect of the RGBs.

Goal:

8.2 Maui will maintain opportunities for agriculture and rural communities through sound planning and clearly defined development expectations.

Policies:

8.2.a Amendments to a RGB shall be reviewed as an MIP amendment. A RGB shall only be expanded if an island-wide inventory of existing land uses (residential, commercial, industrial) indicates that additional lands are necessary to provide for the needs of the projected population growth within ten years of that inventory; or, during the decennial update of the MIP.

8.2.b New development shall be consistent with RGB and all other applicable policies and requirements of the MIP. Public, quasi-public, civic, and limited commercial or industrial uses may be allowed in the RGB when the proposed uses demonstrate a public need and are consistent with the Community Plan and zoning.

8.2.c Environmental protection and compatibility will be a top priority in rural growth areas.

8.2.d All development within rural growth areas should avoid encroachment upon prime agricultural land.

8.2.e Rural growth areas include Rural Residential Areas and Rural Villages. Rural residential areas may be designated when they are located in association with or on the border of urban growth areas or Small Towns; and/or when they provide for complete, self-sufficient rural communities with a range of uses to be developed at densities that do not require urban infrastructure.

8.2.f Community plans shall provide for rural density land use designations only within RGBs; provided that limited community plan urban designations may be allowed within Rural Villages. New rural growth areas shall not be located where urban expansion may ultimately become necessary or desirable. New rural-density development shall not be allowed outside of a RGB.

8.2.g New rural growth areas intended to be complete, self-sufficient rural communities must be located a significant distance from existing urban areas, distinctly separated by agricultural or open lands.

8.2.h Urban-scale infrastructure and public facilities shall not be provided in rural areas except as described in the defined Level-of-Service (LOS) standards. There should be no expectations of urban services in rural areas.

8.2.i Urban development standards shall not be required within RGBs except in fulfillment of Federal law.

8.2.j The unique character and function of existing small towns and rural communities shall be protected to retain and preserve their sense of place.

8.2.k Preserve rural landscapes in which natural systems, cultural resources, and agricultural lands are protected and development compliments rural character and contributes to the viability of communities and small towns.

8.2.l The MIP's RGBs shall not be construed or implemented to prohibit the construction of a single family dwelling on any existing parcel where otherwise permitted by law.

8.2.m The County shall implement a zoning program to comprehensively redistrict and rezone lands within RGBs, and to implement community plan policies and map designations.

8.2.n At the time of zoning from agricultural to rural, Council will consider prohibiting restrictions on agricultural activity.

PROTECTED AREA POLICY

8.3.a The Protected Areas in Diagrams **E-1, NW-1, N-1, NE-1, S-1, SE-1, and WC-1** should be concurrently reviewed with Table 8-2 and with any proposed land uses that may result in an adverse impact on a Protected Area. The County Council and the Administration should be notified if a Protected Area may be compromised by a development proposal.

Exceptions to Development Outside of Growth Boundaries

During the life of the MIP, there will be a need for certain land uses that may have unique impacts or requirements due to the nature of the use, and would be more appropriately located outside of identified growth boundaries. These land uses may include heavy industrial operations, such as but not limited to, infrastructure facilities, baseyards, quarries, transfer stations, landfills, and uses generating noise or odor that are undesirable for an urban environment. In addition, there may be public/quasi-public, or nonprofit uses that enhance community services and well-being that are most appropriately located outside of urban and rural areas. These uses may include parks, campgrounds, educational centers, arts and cultural facilities, communication facilities, and health and safety related facilities. Alternative energy systems and other land uses related to emerging industries may also be suitable outside of urban, small town, and rural growth boundaries when consistent with community plans and zoning. Commercial uses may also be permitted when appropriate. These uses may be approved, pursuant to the County's special or conditional use permit process contained in Title 19, MCC, or the State Land Use Commission's special use permit process contained in Chapter 205, HRS, and Chapter 15-15, Hawai`i Administrative Rules, without an amendment to the MIP. The Maui Island Plan shall not be construed or implemented to prohibit existing, legally permitted uses or structures. Any dwelling or structure that was constructed with a building permit that was approved prior to the enactment of this Plan may be reconstructed as permitted by the original building permit(s), and such dwellings or structures may be expanded or modified with a building permit, subject to the provisions of the Maui County Code and applicable laws.

Methodology for Identifying Growth Boundaries

To formulate the Directed Growth Plan, the County first developed a set of Guiding Land Use Principles. These are generally philosophical in nature, and were derived from the Focus Maui Nui WalkStory and PlanStory public outreach events; various community workshops; planning literature; public facilities, and infrastructure studies; and heritage resource, scenic and cultural resource studies.

GUIDING LAND USE PRINCIPLES

1. **Respect and encourage island lifestyles, cultures, and Hawaiian traditions:** The culture and lifestyle of Maui's residents is closely tied to the island's beauty and natural resources. Maintaining access to shoreline and mountain resources and protecting culturally significant sites and regions perpetuates the island lifestyle and protects Maui's unique identity. One of the most vital components of the island lifestyle and culture is Maui's people. In an island environment where resources are finite, future growth must give priority to the needs of residents in a way that perpetuates island lifestyles.
2. **Promote sustainable land use planning and livable communities:** Managing and directing future growth on Maui should promote the concept of sustainability, and the establishment of livable communities. Sustainable practices include: 1) Focusing growth into existing communities; 2) Taking advantage of infill and redevelopment opportunities; 3) Promoting compact, walkable, mixed-use development; 4) Revitalizing urban and town centers; 5) Providing

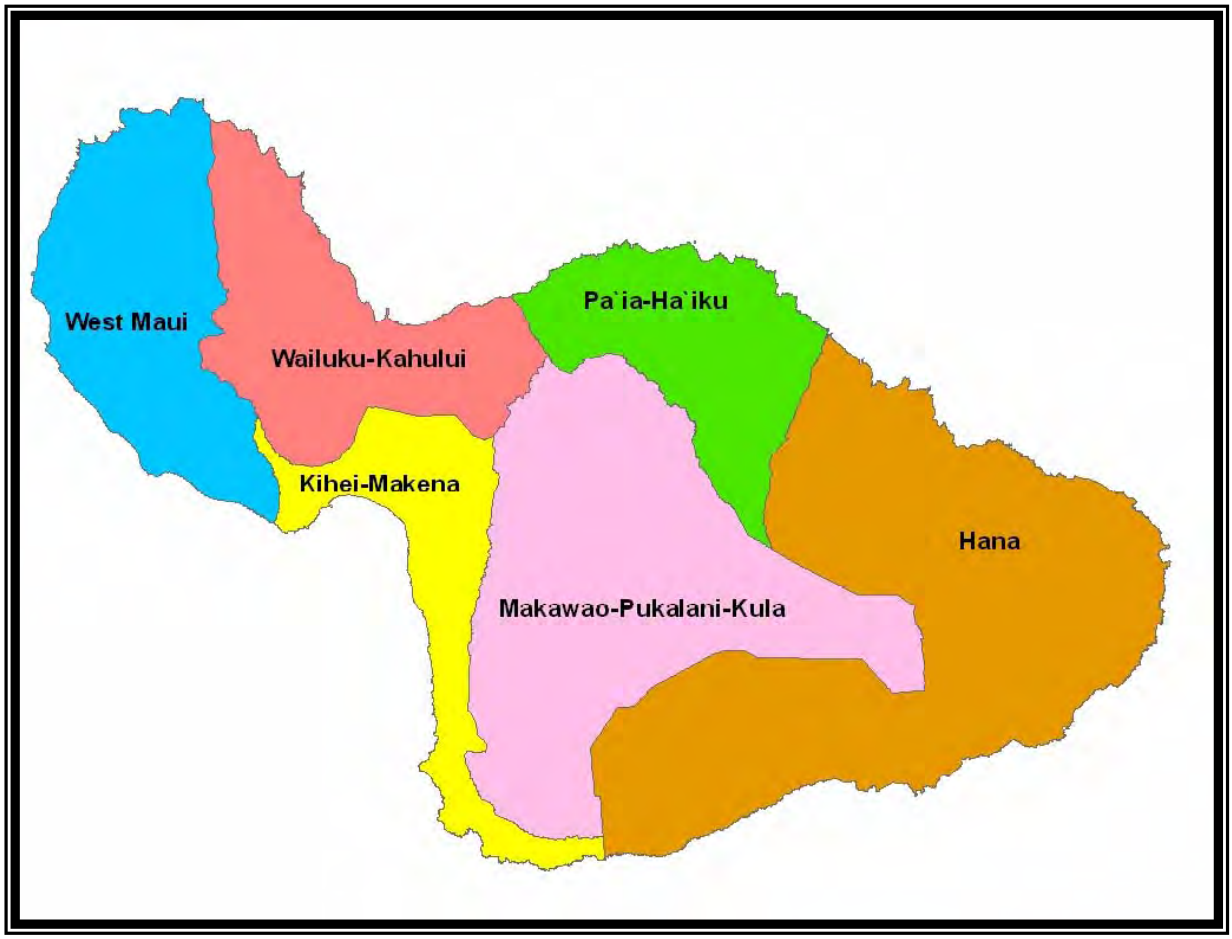
transportation connectivity and multimodal opportunities; 6) Protecting and enhancing natural and environmental resources; 7) Protecting, enhancing, and expanding communities and small towns, where appropriate; and 8) Encouraging energy and water-efficient design and renewable energy technology.

3. **Keep "urban-urban" and keep "country-country":** Given the high cost of developing public infrastructure and facilities to service remote areas, the significant environmental and social impacts associated with long vehicle commutes, and the desire to "keep the country-side country" it is preferable to develop compact communities and to locate development within or as close as possible to existing urban areas and employment centers.
4. **Protect traditional small towns:** Development within and adjacent to Maui's traditional towns should be compatible with and perpetuate their unique character. Hard edges should be maintained around new and existing communities through the use of greenbelts and significant open space.
5. **Protect open space and working agricultural landscapes:** In light of continuing urbanization, the protection of agricultural and open-space resources will depend on a healthy agricultural industry and progressive planning and regulation. Planning should utilize agricultural lands as a tool to define the edges of existing and planned urban communities, apply innovative site design, create buffers along roadways, provide visual relief, and preserve scenic views.
6. **Protect environmentally sensitive lands and natural resources:** Environmentally sensitive lands, natural areas, and valued open spaces should be preserved. Native habitat, floodways, and steep slopes should be identified so future growth can be directed away from these areas. It will be important to plan growth on Maui in a manner that preserves habitat connectivity, watersheds, undeveloped shoreline areas, and other environmentally sensitive lands.
7. **Promote equitable development that meets the needs of each community:** Each region of the island should have a mix of housing types, convenient public transit, and employment centers. Where appropriate, all neighborhoods should have adequate parks, community centers, greenways, libraries, and other public facilities. No community should have a disproportionate share of noxious activities. Additionally, a fair, efficient, and predictable planning and regulatory process must be provided. A cornerstone of equitable development should reflect a focus on providing affordable housing for all of Maui's residents over developing nonresident housing.
8. **Plan for and provide efficient and effective public facilities and infrastructure:** Many of Maui's public infrastructure systems and facilities were constructed decades ago and are in need of repairs and upgrades to meet current and future demand. Growth should be planned for areas with existing infrastructure, or where infrastructure can be expanded with minimal financial burden to the public. Transportation infrastructure should be designed to be in harmony with the surrounding area.
9. **Support sustainable economic development and the needs of small business:** Land use decisions should promote and support sustainable business activities.
10. **Promote community responsibility, empowerment, and uniqueness:** The development of community plans should be a broad-based, inclusive process. The community plans shall be reviewed by the Community Plan Advisory Committees, the planning commissions, and approved by the Council. The MIP shall provide a framework for the updated community plans. Subsequent proposed community plan amendments should be subject, as much as possible, to local community input.

Following the development of these guiding principles, a more analytically rigorous list of evaluation criteria were developed to assist in the identification of areas appropriate for both development and

protection. This approach included the application of a technique called "Suitability Analysis." The process, also referred to as "McHargian Analysis" was refined by Ian McHarg at the University of Pennsylvania in the 1960s, and has been widely applied throughout the United States. The McHargian Analysis involves layered maps of geographic information superimposed on one another to identify areas that provide, first, opportunities for particular land uses, and second, constraints to development. With the advent of Geographic Information System (GIS) technology, it is now possible to understand the relationships between vast datasets and apply weighting derived by the community to prioritize growth areas and those areas appropriate for preservation.[2]

[2] A more complete discussion of the methodology used to develop the Plan's growth boundaries can be found in: *Directed Growth Plan, Site Evaluation Methodology Memorandum.* Chris Hart & Partners, September 2007.



Community plan regions.

MAUI'S DIRECTED GROWTH PLAN

A primary objective of the Directed Growth Plan is to ensure that our urban and rural communities offer a high quality of life. Designing pedestrian-oriented communities, with a mix of uses to sustain daily needs, and close to places of employment makes for a more sustainable, vibrant, and livable environment. Providing parks and open space, tree-lined roadways, and easy connections to the natural and built environment promotes health and well-being. Beyond our urban boundaries, working agricultural landscapes, natural wildland areas, and undeveloped shorelines and beaches are vitally necessary to provide a sense of refuge and escape from the stresses of daily life.

This section identifies planned growth areas to meet the housing, employment, and recreational needs of Maui's residents to 2030. Planned growth on Maui is largely directed to Wailuku-Kahului, Kīhei, and West Maui to protect the character of the existing small towns, rural areas, agricultural lands, and open space and to allow for more dynamic urban settlements with efficient public service delivery. For the next 20 years these three regions will serve as the island's primary urban centers. Development through the planning horizon will largely take place through infill and redevelopment, urban expansion, and new towns. Every effort is made to maximize the use of urban infill and redevelopment opportunities, to avoid the need to expand the urban, small town, and rural growth areas.

How to Read this Section

For organizational purposes, the section is divided into regions that roughly correspond to the island's community plan areas. However, the regions and corresponding Directed Growth Maps do not always follow the community plan area map boundaries and may overlap with an adjacent community plan area. The section includes a brief description of the community plan region, challenges and opportunities affecting the region, growth anticipated in the region along with the new regional facilities needed to accommodate that growth. Next, each planned growth area is described in narrative followed by a table that includes background information, and planning guidelines for the planned growth area. This table, in most cases, indicates the net residential density[3], number of dwelling units, the desired mix of dwelling unit types, and the type of commercial node that will be expected within the planned growth area. Commercial nodes are classified as "neighborhood serving", "convenience shopping", and "region serving". Table 8-4 describes the characteristics of these commercial nodes.

Table 8 - 4: Characteristics of Commercial Nodes

TYPE	CHARACTERISTICS
Neighborhood Serving	Small scale commercial activities that primarily serve the needs of the immediate neighborhood. Examples include, but are not limited to, the corner grocery store, bake shop, and shave ice stand.
Convenience Shopping	Commercial activities that serve the adjacent community. Examples include, but are not limited to, a small-to-mid size supermarket, bank, barber shop, and internet cafe.
Region Serving	Commercial activities that may serve the community plan region. Examples include, but are not limited to, large supermarkets, hardware and plumbing stores, and sporting goods stores.

The planning guidelines are not meant to be prescribed requirements; rather, they identify the intent of the planned growth area. Development of the planned growth area may reasonably vary slightly from the planning guidelines provided that the overall intent of the Planning guidelines is achieved.

This section also includes a summary of the significant planned protected areas identified in each community plan region. Planned protected areas include some of the island's most treasured cultural, environmental, and recreational resources. These resources can come in the form of a coastal ridge, a burial ground, or an urban park. The planned protected area can be for the public's benefit and use, or to allow the natural habitat to exist in an unaltered state. The intent of the Protected Area is to provide one additional layer of protection to those areas that contain any number of irretrievable resources. The purpose and intent of each planned protected area is described after each planned growth area section.

[3] Net Residential Density means the total number of dwelling units to be developed at a specific site divided by the Net Residential Acres. Net Residential Acres means the gross area of a site intended for residential development minus the area of wetlands and waterbodies, parks and open space, roads and right-of-way, and other undevelopable land within the site.

Planned protected areas were identified through the Plan's public involvement process. Several of the planned protected areas draw from the following plans and studies: 1. *Pali to Puamana Parkway Master Plan* (February 2005); 2. *North Shore Corridor Report* (Fall, 2006); 3. *Infrastructure and Public Facilities Assessment Update* (March and September 2007); 4. *Scenic and Historic Resources Inventory & Mapping Study* (June 2006); and 5. *Focus Maui Nui's WalkStory and PlanStory* public outreach events (December 2006). Each planned protected area shall be incorporated into appropriate community plan updates, green infrastructure plans, capital improvement plans, special district plans, related functional plans, and urban beautification efforts.

View of Pi`ilani Highway.

A REGIONAL FRAMEWORK

In consideration of the guiding land use principles discussed above, the following four themes provide a broad island-wide framework for the identification of areas that are appropriate for future growth, the identification of areas that should be preserved, and the implementation of the directed growth plan.

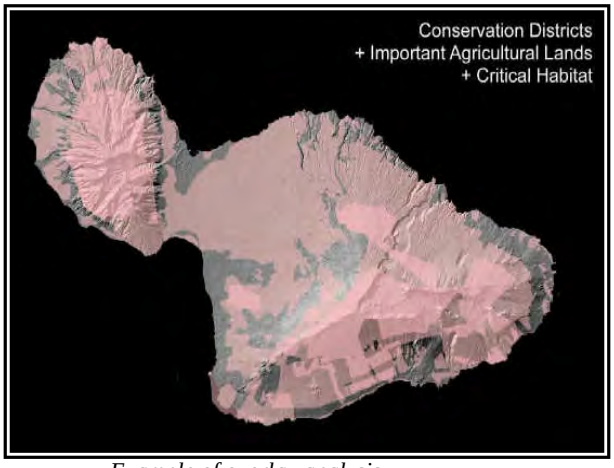
Theme One: Limit Development in Northwest and East Maui.

East and Northwest Maui are the most remote, inaccessible, and undeveloped regions on Maui. Both regions possess rugged physical beauty, agricultural landscapes, and culturally-rich communities. The island's largest intact watersheds, and natural wildland areas, including Haleakalā National Park and the West Maui Mountains, are located in Northwest and East Maui.

Development in both areas is largely dispersed, employment is limited, and infrastructure and public facility capacity is restricted. Maui residents have a strong desire to protect the natural and cultural resources of these regions.

Theme Two: Protect Maui's agricultural resource lands, especially prime and productive agricultural lands.

Maui's agricultural lands are an important resource for both current and future generations of island residents. Agricultural lands provide the opportunity for greater economic diversification; food and energy security; and better stewardship of land, water, and open space resources. Maui residents have expressed a strong desire to support the agricultural economy and protect the island's agricultural lands for both present and future generations.



Example of overlay analysis.

Theme Three: ***Direct growth to areas proximate to existing employment centers, where infrastructure and public facility capacity can be cost-effectively provided, and where housing can be affordably constructed.***

Traffic congestion, affordable housing, and convenience are major quality of life issues that Maui residents care deeply about. The same is true for quality education, public safety, and a clean environment.

Given the high cost of developing public infrastructure and facilities to service remote areas, the significant environmental and social impacts associated with long vehicle commutes, and the broad desire to "keep the country-side country" it is preferable to locate development as close as possible to existing employment centers.

There currently exists undeveloped land that is within close proximity to Wailuku-Kahului, Kīhei Town, and Lahaina-Kā`anapali-Kapalua that is feasible for development. These lands are close to existing public facilities and major centers of employment.

Theme Four: ***Within the Urban Growth Boundaries, promote livable, mixed-use communities, defined by a high quality of life.***

Maui's future growth will be accommodated largely within UGBs. These boundaries will encompass higher density mixed-use infill development, planned urban expansion, and the creation of new, self-sufficient towns.

Sketch of human-scale development.

A primary objective of the Directed Growth Plan is to ensure that our urban communities offer a high quality of life. Designing pedestrian-oriented communities with a mix of uses to sustain daily needs and close to places of employment makes for a more vibrant and livable environment. Providing parks and open space, tree lined roadways, and easy connections to the natural and built environment are necessary to promote health and well-being.

Beyond our urban boundaries, working agricultural landscapes, natural wildland areas, and undeveloped shorelines and beaches are vitally necessary to provide a sense of refuge and escape from the stresses of urban life.

WAILUKU-KAHULUI

The Wailuku-Kahului community plan region encompasses the island's Civic Center, major commercial-industrial and shipping center, and the largest resident population of all community plan regions with 54,433 people in 2010. The community plan region also has the largest employment center with 32,898 jobs in 2010. The region is comprised of four distinct sub-regions: Wailuku, Kahului, Waikapū, and Waihe`e. A brief discussion of each sub-region is provided below.

Wailuku. Wailuku serves as the Civic Center for Maui and the seat of Maui County government. Wailuku is a culturally diverse town with strong ties to Maui's Hawaiian missionary and plantation history, and serves as the gateway to `Īao Valley. Residential neighborhoods in

Wailuku are characterized by a rich mix of housing types, older homes, and a variety of lot sizes, generally laid out in a traditional street-pattern grid. Commercial areas are composed of smaller, older buildings primarily near the Main and Market Street intersection with some businesses intermixed with residential neighborhoods.

Beginning in the 1950s, Wailuku experienced a period of transition and decline as the resident population became more dispersed throughout the region, and Kahului grew into the commercial center of the island. As residents and businesses left Wailuku, the area began to deteriorate and blight conditions persisted. In the last decade, Wailuku has been undergoing revitalization initiated by community groups, the County, and local businesses.

Kahului. Kahului is the island's major commercial and industrial center. Shopping and community facilities, such as Queen Ka`ahumanu Shopping Center, Maui Arts and Cultural Center, and the University of Hawai`i Maui College, draw residents from all regions of the island. Kahului is also Maui's only shipping center with the island's major seaport and airport. Kahului first came to life in the modern era after World War II as Maui's population became decentralized and major projects such as "Dream City" and the Kahului Shopping Center were completed. Kahului's residential neighborhoods are separated from commercial uses and composed of larger suburban lots and wide curvilinear streets.

Waikapū. Waikapū is a small rural town between Wailuku and Mā`alaea on Honoapi`ilani Highway. The town is primarily residential with a small commercial component. Historically, Waikapū has been surrounded by sugarcane fields, providing a clear distinction between the town and other nearby communities. As Wailuku and Kahului grow southward, the separation between these sub-regions and Waikapū is being diminished.

**Waihe`e.** Waihe`e is another small rural town in the Wailuku-Kahului Community Plan region. It is the last town in the region along Kahekili Highway and serves as the eastern gateway to Northwest Maui. The sub-region is primarily residential with small-scale agriculture and family cultivated taro patches in the vicinity of Waihe`e Stream. Managing urbanization on the fallow agricultural lands south of the town will be important for maintaining the rural identity of the town.

CHALLENGES AND OPPORTUNITIES

The Wailuku-Kahului community plan region has several key land use issues which must be considered when planning future development in the region. Some issues apply to the region as a whole while others are specific to a sub-region. Major land use threats and opportunities include:

Loss of Community Identity and Boundaries

The Wailuku-Kahului community plan region is one of the fastest growing regions on Maui. The majority of the region's growth is occurring on vacant agricultural land at the edges of the sub-regions, particularly south of Wailuku and Kahului, with isolated areas of redevelopment opportunities. As these lands become urbanized, the region's individual towns begin to blend together and lose their unique identities. To prevent the creation of one large, sprawling urban mass, clear separation must be maintained between the area's four sub-regions through the use of regional parks, greenways and protected areas.

Auto-Dependency and Traffic Congestion

The region's land use pattern and street layout, particularly in Kahului, has led to strong auto-dependency and traffic congestion. While a public bus system services the region, it is relatively new and is making steady progress in becoming a part of everyday life for residents. Adequate bike and pedestrian infrastructure are also lacking within the region, limiting the opportunity for multimodal transportation. Clear and distinct separation of

land uses also significantly contributes to poor mobility and the need for a high number of private automobile trips.

Lack of Housing Choices

While the Wailuku-Kahului community plan region has the largest supply of residential units on Maui, only about 12 percent of the units are multifamily. This marked disparity between single-family and multifamily residential units provides residents with limited housing options in the Central Maui region. More multifamily units for purchase and rental are needed in the region to provide for a mix of housing prices and types.

Lack of Kahului Downtown Core

A major land use issue in the region is the lack of a downtown core in Kahului; the sub-region does not have an identifiable center or core with a pedestrian-friendly mix of land uses where people can gather and interact. A downtown core in Kahului will strengthen the sub-region and provide it with a unique identity. Infill and redevelopment projects, such as the Kahului Town Center Redevelopment and harbor revitalization efforts provide a unique opportunity to revitalize the area.

Revitalization of Wailuku Civic Center District

A key land use opportunity in the region is the revitalization of the Wailuku downtown and Civic Center District. Maintaining the identity of Wailuku as the County's Civic Center is an important land use goal. The *Wailuku Redevelopment Plan* (December 2000), prepared by the Maui County Department of Planning, offers key strategies for revitalizing the area. As part of the revitalization, increased mixed-use development, activity generators, streetscape beautification, additional public parking, and build out of the abutting Civic Center District with additional government office space is necessary.

Wailuku – Kahului – Planned Growth Areas

Urban infill will be a major source of additional housing units in the Wailuku-Kahului community plan region. In addition, four new planned growth areas have been identified: Wai`ale, Pu`unani, Kāhili Rural Residential, and Waikapū Tropical Plantation Town. Planned growth areas are depicted in Figure 8-1 and on Directed Growth Map #C3 and #C4.

New Regional Facilities Recommended – Wailuku-Kahului

- Maui Lani Parkway extension
- Regional Park
- Central Fire Training Facility
- Dedicated County Fairgrounds
- Water Treatment Facilities
- Intermediate School
- Elementary School
- Relocation of the County Jail from Wailuku to an appropriate location in Pulehunui (Pu`unēnē).

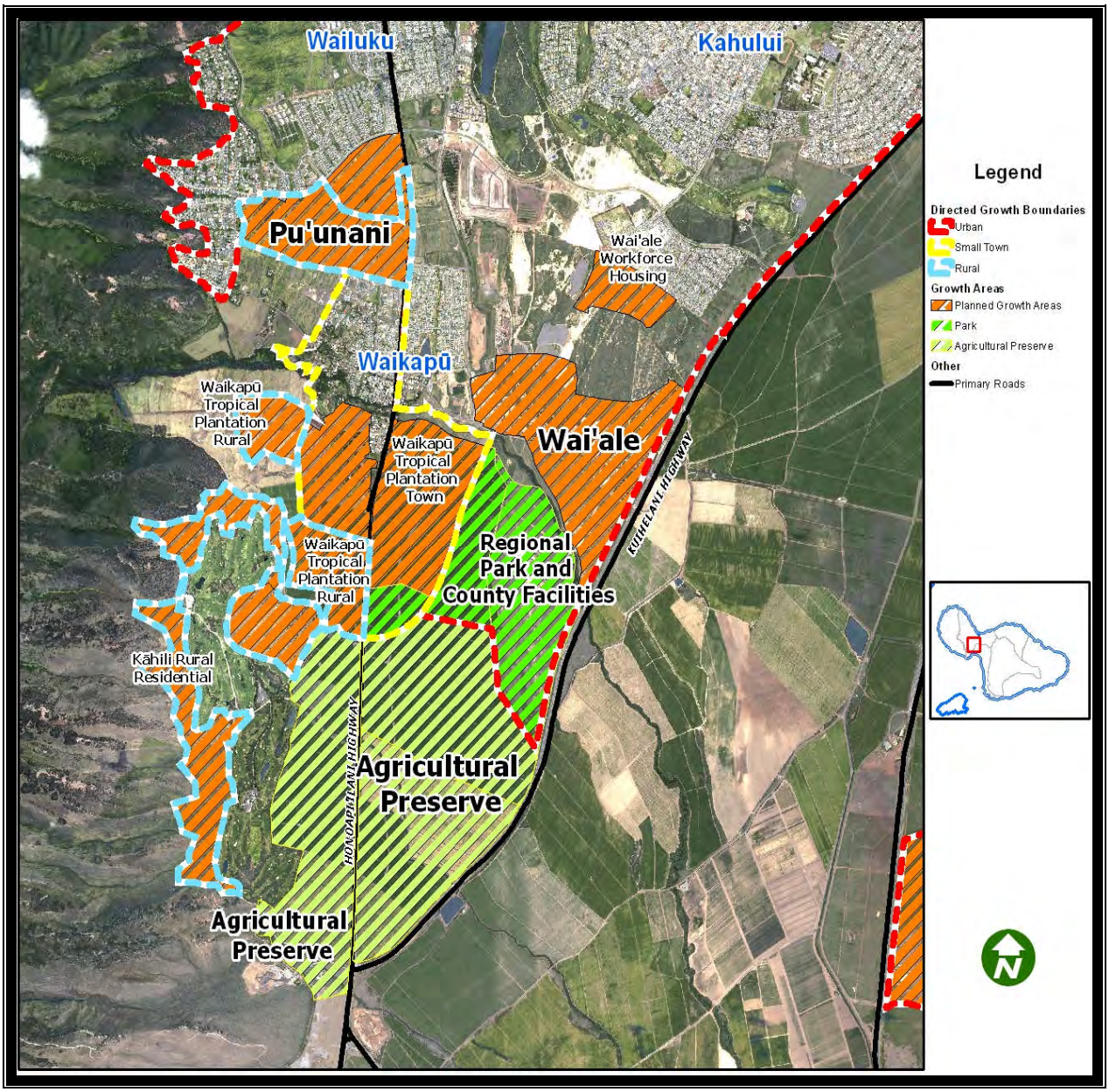


Figure 8-1: Wailuku-Kahului Planned Growth Areas.

Kahului Infill and Redevelopment and Revitalization of Wailuku Town

The plan proposes infill and redevelopment within Kahului. Much of Kahului is significantly underutilized and redevelopment will strengthen the economy, provide diverse housing opportunities within close proximity to jobs and services, and protect agricultural lands and the character of Maui's rural communities by making higher and better use of our existing urban areas. Redevelopment will also strengthen Kahului's identity, promote urban beautification and livability, and breathe vitality and life into the area.

The County should work with area landowners and the community to prepare the following studies: 1) Risk and Vulnerability Assessments (RVA); 2) specific area plans; and 3) supporting model development

ordinances. The RVA is necessary prior to redevelopment because much of urban Kahului is within the tsunami inundation area. This study will further define the areas and magnitude of potential flooding and necessary mitigation measures to protect life and property. The specific area plans and model development ordinances will further define the character of redevelopment and geographic boundaries where infill and redevelopment is feasible. The specific area plans should emphasize the opportunity for higher-density mixed-use development, pedestrian and vehicular circulation patterns, and urban beautification. A system of sidewalks, greenways, and bike lanes should be developed to reduce community reliance on the automobile.

Infill and redevelopment within Kahului on entitled urban lands could produce hundreds of new residential units. An example of this is the closed pineapple cannery behind the Queen Ka`ahumanu Shopping Center. New multifamily units at this location could be built at an urban density of at least 18 to 25 units per acre in a mixed-use design such as that of the Kahului Town Center project.

The continued revitalization of the Wailuku Redevelopment Area and the Wailuku Civic Center District also provides the opportunity to provide infill housing close to jobs and services in a manner that will strengthen the economic vitality of Wailuku Town, provide diverse housing options and shorter commuting times, and maintain Wailuku Town as the County seat of government and Civic Center.

An analysis of infill opportunities in Wailuku Town indicates significant opportunities to develop housing on vacant or underutilized lands currently entitled for development. These units would be in areas of higher density such as Lower Main Street and Happy Valley, as well as new units in Piihāna and Waiehu along Kahekili Highway. The net densities of multifamily housing should be at least 15 to 25 units per acre which is compatible with existing densities of complexes such as `Īao Parkside and Parkview Square in Wailuku.

Wai`ale

The Wai`ale planned growth area is recommended to be a compact, mixed-use town with park land, open space, a county fair grounds, an elementary or intermediate school developed in coordination with the Waikapū Tropical Plantation Project, and commercial uses. Wai`ale will be located south of Maui Lani, and it is bounded to the west by Honoapi`ilani Highway and to the east by Kūihelani Highway. While proximate to Kahului, Wailuku, and Waikapū, the Wai`ale town should be a distinct community, clearly separate from existing towns. Wai`ale is the largest proposed town on the island, and the largest planned growth area proposed for the Wailuku-Kahului community plan region.

Planned Growth Area Rationale

At build-out, the Wai`ale planned growth area is intended to provide roughly 50 percent of the additional residential units needed in the Central Maui region and address the housing needs of Maui residents. With a balance of single-family and multifamily housing units, low to moderate average lot size, and strong capacity to provide affordable housing, Wai`ale will provide housing options to address resident housing demand. The Wai`ale planned growth area is proximate to Wailuku employment opportunities and infrastructure, has adequate highway access and transit connectivity, and has favorable topography.

To prevent sprawl and further urbanization of prime agricultural resource land, a hard edge must be maintained around Wai`ale Town. A network of greenbelts, open space, and parks will be utilized to contain urban development, maintain a clear distinction between existing communities and the new town, and to prevent urbanization of agricultural lands south of the site. The planned growth area is currently bounded on at least two sides by roads which will help to contain the new community. The north portion

of the Wai`ale area is identified as Wai`ale Workforce Housing on Figure 8.1, and is intended to be an affordable housing complex of roughly 300 multifamily units on 50 acres.

It is intended that Wai`ale's infrastructure development be coordinated with neighboring developments including Maui Lani, Kehalani, Pu`unani, and Waikapū Tropical Plantation Town. A community park is also planned for the Wai`ale area to provide a clear separation between the new community and Maui Lani. A regional park will be provided to the South of Wai`ale to provide a clear separation between the new community and Ma`alaea, and to allow for the placement of active and passive recreational opportunities, County baseyards and like County facilities. Preservation areas will be established to protect Hawaiian Burials and intact sand dunes. The Wai`ale project can also include lands to house the offices of the County Department of Parks and Recreation, a community center, and a County fair grounds. (Please see Figure 8-2, Central Maui Regional Park, Community Park, Preservation, and County Facility Area.) The Wai`ale growth boundaries are located on Directed Growth Map #C3. Tables 8-5 and 8-6 provide planning guidelines for this planned growth area:

Table 8 - 5: Wai`ale Workforce Housing Planned Growth Area

Background Information:			
Project Name:	Wai`ale Workforce Housing	Directed Growth Map #:	C3
Type of Growth:	Urban Expansion	Gross Site Acreage:	50 Acres
Planning Guidelines			
Dwelling Unit Count:	Approximately 300 Units[4]	Residential Product Mix:	100% MF
Net Residential Density:	At least 10 du/acre	Parks and Open Space%[5]:	≥ 20%
		Commercial:	Neighborhood serving

Table 8 - 6: Wai`ale Planned Growth Area

Background Information:			
Project Name:	Wai`ale	Directed Growth Map #:	C3
Type of Growth:	Urban Expansion	Gross Site Acreage:	495 Acres (includes the Central Maui Community Park)
Planning Guidelines			
Dwelling Unit Count:	Approximately 2,254 Units[6]	Residential Product Mix:	Balance of SF and MF
Net Residential Density:	10 – 20 du/acre	Parks and Open Space%[7]:	≥ 30%
		Commercial:	Convenience Shopping Region Serving

[4] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[5] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Wailuku – Kahului Community Plan update and the project review and approval process.

[6] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[7] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Wailuku – Kahului Community Plan Update and the project review and approval process.

Pu`unani

The Pu`unani planned growth area is intended to be a mixed-use project located at the southwest edge of Wailuku. This urban and rural expansion is located south of Kehalani below Wailuku Heights and is bounded to the east by Honoapi`ilani Highway. The growth area will be buffered by a 200-foot greenbelt along its eastern edge and adjacent to Honoapi`ilani Highway. Additionally, a 500-foot greenbelt along the area's southern extent shall provide a separation between the Waiolani community and Wailuku. The greenbelt, greenway, and rural lands are intended to provide separation between Wailuku and Waikapu, and to provide a visual relief by creating a lower-density residential pattern than surrounding communities. This planned growth area will mark the southern boundary of Wailuku.

Planned Growth Area Rationale

Pu`unani is a residential expansion of the existing southern boundary of Wailuku Town. It is intended that infrastructure development be coordinated with neighboring developments including Kehalani, Wai`ale and Waikapū Tropical Plantation Town. The urban portion of the growth area will be comprised primarily of approximately 450 multifamily units and commercial and public/quasi-public uses. The rural component will be comprised of low-density residential lots that will provide for a transitional zone from the high-density, multifamily component of the growth area as well as Wailuku to the north. The precise rural residential densities and unit count for the rural component of the project will be determined at the time of zoning.

The area is currently zoned for agricultural use, and water and wastewater infrastructure, as well as transit access are in place. The Pu`unani planned growth area is depicted on Figure 8-1. Table 8-7 provides planning guidelines for this planned growth area:

Table 8 - 7: Pu`unani Planned Growth Area

Background Information:			
Project Name*:*	Pu`unani	Directed Growth Map #:	C3
Type of Growth:	Urban & Rural Expansion	Gross Site Acreage:	209 Acres
Planning Guidelines			
Dwelling Unit Count:	Approximately Urban - 450 Units Rural – To be determined[8]	Residential Product Mix:	MF/VMX - 64 Acres Rural - 143 Acres
Net Residential Density:	Urban – 9-12 du/acre Rural - To be determined	Parks and Open Space%[9]:	≥ 36%
		Commercial:	Neighborhood Serving

[8] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[9] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Wailuku – Kahului Community Plan Update and the project review and approval process.

Kāhili Rural Residential

The Kāhili Rural Residential planned growth area is approximately 218 acres and located mauka of the Kāhili Golf course at Waikapū in the foothills of the West Maui Mountains. Access will be provided by a connecting roadway from the Honoapi`ilani Highway. The area is bounded by Rural and Park (Golf Course) Community plan designations. The goal of the Kāhili Rural Residential planned growth area is to provide low-density rural residential lots with a minimum lot size of 2 acres.

Planned Growth Area Rationale

It is intended that the area will be sensitively developed to address stormwater runoff and drainage, and to restrict development on slopes. The Kāhili Rural Residential planned growth area is located on Directed Growth Map #C3 and #C4. Table 8-8 provides planning guidelines for this planned growth area:

Table 8 - 8: Kāhili Rural Residential Planned Growth Area

Background Information:			
Project Name:	Kāhili Rural Residential	Directed Growth Map #:	C3/C4
Type of Growth:	Rural Expansion	Gross Site Acreage:	218 Acres
Planning Guidelines			
Dwelling Unit Count:	Approximately Rural – To be determined[10]	Residential Product Mix:	Rural - Residential
Net Residential Density:	Rural – 2-acre min. lot size	Parks & Open Space%: Commercial:	N/A N/A

Waikapū Tropical Plantation Town

The Waikapū Tropical Plantation Town planned growth area is situated in the vicinity of the Maui Tropical Plantation, and includes lands on both the mauka and makai sides of Honoapi`ilani Highway. Providing the urban character of a traditional small town, this area will have a mix of single-family and multifamily rural residences, park land, open space, commercial uses, and an elementary or intermediate school developed in coordination with the Wai`ale project. The area is located south of Waikapū along Honoapi`ilani Highway, and it will incorporate the integrated agricultural and commercial uses of the existing tropical plantation complex. This area is proximate to the Wai`ale planned growth area, providing additional housing in central Maui within the Wailuku-Kahului Community plan region. As part of this project, parcels to the south of the project (identified as Agricultural Preserve on Figure 8-1) shall be protected in perpetuity for agricultural use through a conservation easement. A portion of this area may be dedicated to the County as an agricultural park administered pursuant to County regulations. Alternatively, this area can be developed as a private agricultural park available to Maui farmers, and executed through a unilateral agreement between the landowner and Maui County. The rural lots mauka of Honoapi`ilani Highway are intended to be developed using a Conservation Subdivision Design (CSD) plan. The CSD plan shall provide access to uninterrupted walking and bicycling trails and will preserve mauka and makai views while protecting environmentally sensitive lands both along Waikapū Stream and mauka of the subdivision.

[10] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

Planned Growth Area Rationale

Keeping the Waikapū Tropical Plantation as its town core, this area will become a self-sufficient small town with a mix of single-family and multifamily housing units in a walkable community that includes affordable housing in close proximity to Wailuku's employment centers. Schools, parks, police and fire facilities, transit infrastructure, wastewater, water supply resources, and other infrastructure should be developed efficiently, in coordination with neighboring developments including Maui Lani, Kehalani, Pu`unani and Wai`ale. The Waikapū Tropical Plantation Town planned growth area is located on Directed Growth Map #C3. Table 8-9 provides planning guidelines for this planned growth area:

Table 8 - 9: Tropical Plantation Town Planned Growth Area

Background Information:			
Project Name:	Tropical Plantation Town	Directed Growth Map #:	C3
Type of Growth:	Small Town/Rural Expansion	Gross Site Acreage:	Small Town - 360 Acres Rural - 142 Acres
Planning Guidelines			
Dwelling Unit Count:	Approximately 1,433 Units (Up to 80 of these units can be rural residences. Ohana units do not count towards the total units.[11]	Residential Product Mix:	Balance of SF and MF units The rural residential units are on the mauka side of the project. Small Town – 360 Acres Rural – 142 Acres
Net Residential Density:	9 – 12 du/acre	Parks and Open Space%[12]:	≥ 30%
		Commercial:	Convenience Shopping

[11] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[12] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Wailuku – Kahului Community Plan Update and the project review and approval process.

Wailuku – Kahului – Planned Protected Areas

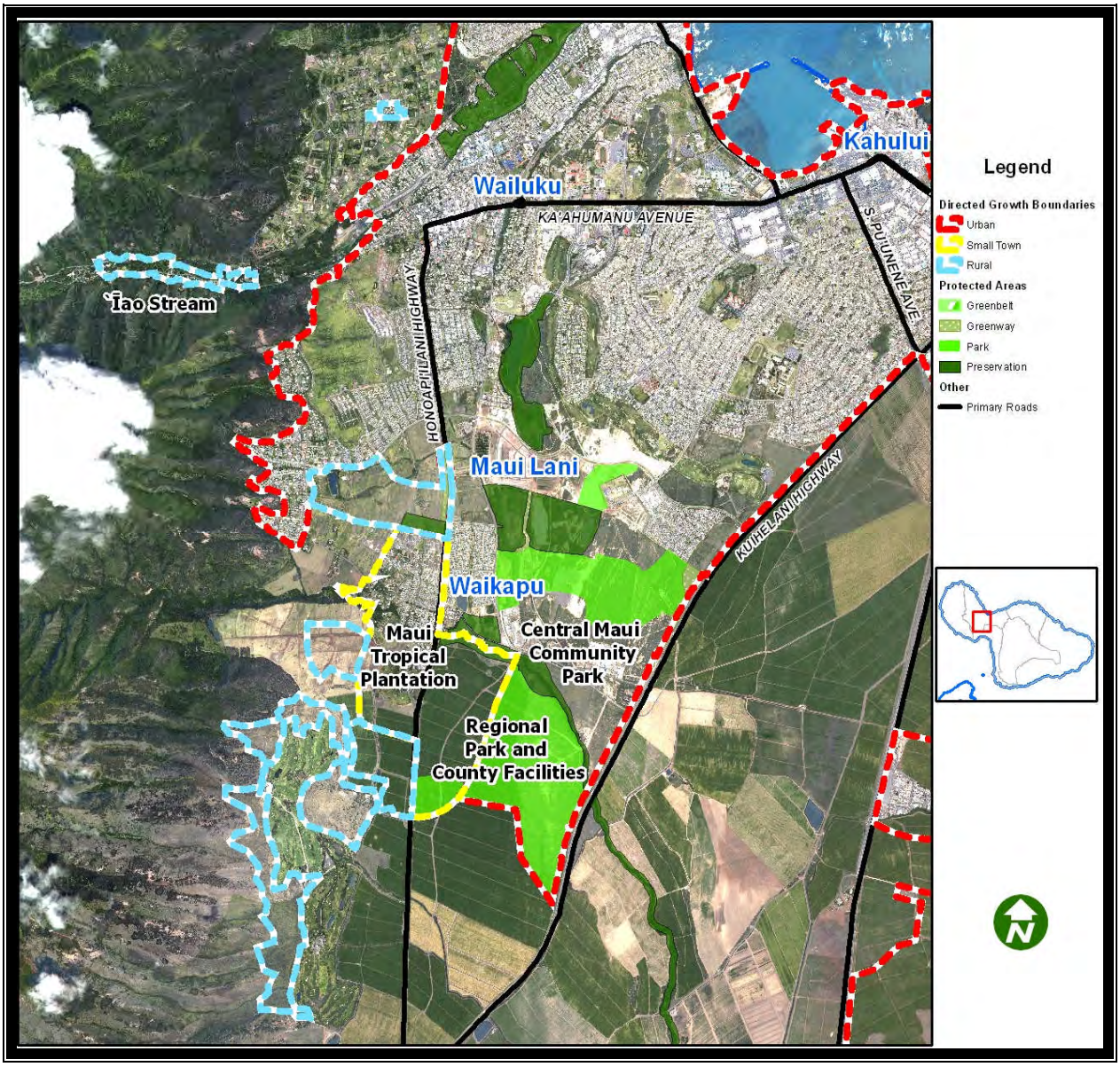


Figure 8-2: Central Maui Regional Park, Community Park, Preservation, and County Facility Area

Central Maui Regional Park, Community Park, Preservation, and County Facility Area

The Wailuku-Kahului community plan region includes two planned protected areas. The region contains the largest resident population of all community plan regions, has dramatic views of the West Maui Mountains, and includes rural towns and rich cultural resources. Creating opportunities for recreational amenities will continue to be a priority as the area grows. Both planned protected areas are described, in brief, below.

The Central Maui Regional Park, Community Park, Preservation, and County Facility Area is bordered by Kūihelani Highway, Wai`ale, and Waikapū Stream.

The Central Maui Regional Park, Community Park, Preservation, and County Facility Area is a planned open-space area within and adjacent to the Wai`ale mixed-use new town (see Figure 8-2). It is envisioned that the parks and preservation areas will be comprised of both passive and active park uses, including a network of pedestrian and bicycle pathways. The parks are intended to maintain a significant amount of open space and provide a distinct separation between the communities of Waikapū and Mā`alaea, Kahului, and Waikapū. The regional park's design should allow for the placement of sports fields with suitable topography for sports usage and may include an agricultural park and community gardens. The Protected Area will also include a preserve that will protect rich historical and cultural resources which are spread throughout the Central Maui Sand Dune system. The Central Maui community park will be established north of the Wai`ale planned growth area, proximate to a high concentration of existing and proposed residential and industrial uses, Pomaika`i Elementary School, and the primary employment center on the island. The Central Maui Regional Park may provide an area for the offices of the County Department of Parks and Recreation, a community center, County baseyards and like County facilities, and a location for the annual County Fair. The distinct boundaries of the park, specific location of the recreational uses, and the precise amenities will be further defined during the Wailuku – Kahului Community Plan update and the Wai`ale project review and approval process.

`Īao Stream Cultural Corridor Park

Figure 8 - 3: `Īao Cultural Corridor Park Protected Area.

The `Īao Stream Cultural Corridor Park is a linear open-space corridor intended to protect the remains of the Pihana Kalani heiau and other important cultural resources. The park extends from the makai portions of `Īao Stream and runs approximately 3/4 miles upstream from Waiehu Beach Road, flanking `Īao Stream (see Figure 8-3).

The planned protected area is adjacent to Wailuku's residential and industrial areas. It is envisioned that the protected area will incorporate trail systems, restroom facilities and pedestrian linkages to provide lateral and mauka-makai access to surrounding neighborhoods and business districts.

Kīhei-Mākena

The Kīhei-Mākena Community plan region is characterized by a lineal urbanization pattern, primarily makai of Pi`ilani Highway. The region has the second highest resident population with over 27,000 people in 2010. The region currently has the third highest number of jobs on the island. The region has four distinct urban sub-regions: Mā`alaea, Kīhei, Wailea, and Mākena. A brief discussion of each sub-region is provided below.

**Mā`alaea.** Mā`alaea is located at the northernmost end of the Kīhei-Mākena community plan region. Primary land uses in the sub-region are multifamily residential, vacation rental, and commercial. Major resident and visitor attractions in the area include the Maui Ocean Center and Mā`alaea Harbor.

Kīhei. The Kīhei sub-region houses the largest resident population in the region. Kīhei is a linear community lying along Maui's south shore and can be further divided into North and South Kīhei. Land uses in the sub-region include residential, commercial, and visitor amenities. The visitor industry, along with the Maui Research and Technology Park (MRTP), are major job generators in the sub-region.

Wailea. Wailea is a master-planned resort area located in the southern portion of the Kīhei-Mākena community plan region. Primary land uses are resort and commercial with most employment in the area related to the visitor industry. The off-shore real estate market plays a dominant role in the Wailea housing market.

Mākena. Mākena is the southernmost sub-region in South Maui. The area is characterized by a rugged volcanic landscape and important Hawaiian cultural sites. Mākena is distant from commercial services and infrastructure systems within the region. Resort accommodations and luxury homes are dispersed along the shoreline.

CHALLENGES AND OPPORTUNITIES

Major land use challenges and opportunities in the Kīhei-Mākena Community plan region include:

Job-rich recreationally diverse

The Kīhei-Mākena Community plan region continues to develop as a tourism-based coastal community that provides a high number of jobs within its primary visitor and related sub-industries. The region is well-known for its favorable climate and diverse recreational opportunities where newcomers are accepted readily into a wide spectrum of social and economic arrangements.

Design Matters

The region is a major contributor to the island's economy and has the potential to reshape itself into a more attractive, thriving, and progressive community. It is positioned to diversify its economy through high-technology and other knowledge-based sectors that can foster resiliency during economic downturns. One key challenge towards that end will be to integrate civic, commercial, residential, and recreational uses into vibrant, walkable, urban nodes. The incorporation of progressive urban design principles that link traditional neighborhoods will be instrumental in enhancing the region's built environment.

Auto-Dependency and Traffic Congestion

The 1998 Kīhei-Mākena Community Plan identifies poor circulation and mobility as the most significant problem within the Community Plan area. Limited intra- and inter-regional mobility, separation of land uses, and traffic congestion have become major issues in the region due to the linear design of the community. Efficient land use patterns, bicycle and pedestrian pathways, additional public transportation options, and alternate travel routes are needed to address circulation and mobility challenges.

Lack of Mixed-Use Neighborhood Centers

Residential and commercial land uses are predominantly segregated within the Kīhei-Mākena Community plan region. Mixed-use neighborhood centers are needed to provide services and jobs within close proximity to where people live and provide a more efficient land use pattern. The region has numerous infill opportunities that should be utilized to create more self-sufficient and sustainable communities that can meet resident housing demand. These infill areas include, but are not limited to, the Azeka, Kalama, and Kama`ole areas.

From Mā`alaea south to Mākena, the South Maui coastline has experienced unprecedented growth in both tourism and residential development activity. Similar to West Maui, the Kīhei shoreline offers a narrow strip of land available for construction. Much of the construction along the shoreline has been done in an environmentally-insensitive manner, allowing for NPS pollution to affect the marine environment.

Land-based Nonpoint Source Pollution

NPSP has been killing reefs and increasing the incidence of algae blooms. Algae and sedimentation from runoff is slowly smothering the remaining healthy reef, and will eventually destroy the very habitat and fish stock that the tourism industry depends on. In addition to grading and increased impervious surfaces, South Maui relies on septic systems, cesspools, and injection wells for wastewater treatment. Wastewater seepage, combined with other nonpoint source pollution, has the potential to destroy the region's nearshore water quality.

Sea Level Rise, storm run-off, flooding and Tsunami Inundation

Throughout Kīhei a significant amount of development has occurred along the coastline in areas that is threatened by stormwater runoff, flooding from other regions, tsunami inundation, and sea-level rise. Future planning must carefully consider these threats, and to the extent possible, development should be directed mauka to areas not threatened by coastal hazards. Future planning should also ensure that adequate routes exist for safe evacuation of area residents in the event of a tsunami or hurricane (see Chapter 3, Natural Hazards).

Urban Design Review

Projects proposed mauka of Pi`ilani Highway are not required to receive any formal urban design review. This may be problematic because major projects can have a significant impact on the character of a community and on scenic resources along roadways, as well as from residential and commercial neighborhoods. Proposed projects within the Kīhei-Mākena community plan region could benefit greatly from strengthened design review measures.

Kīhei – Mākena – Planned Growth Areas

Urban infill will be a major source of additional housing units in the Kīhei-Mākena community plan region. Four new planned urban growth areas have been identified in the Kīhei-Mākena community plan region: North Kīhei Residential, Kīhei Mauka, Maui Research and Technology Park (MRTP), and Pulehunui. No new rural growth areas are planned for South Maui. Planned growth areas are depicted in Figures 8-4 and 8-5 and on Directed Growth Map #S1, #C4, and #C5.

New Regional Facilities Recommended – South Maui

- North-South Collector Road
- Kīhei High School
- South Maui Regional Park
- Kīhei mauka transportation corridor (mauka of Pi`ilani Highway)
- Regional drainage master plan and related improvements
- Kīhei Police Station
- Mā`alaea-Keālia bypass highway

Kīhei Infill and Revitalization

The MIP calls for significant revitalization and redevelopment of Kīhei. Kīhei experienced significant development in the 1970s and 1980s, and the existing urban form mimics the design notions that prevailed during that period. Kīhei's development pattern during this period was guided by the "701 Plan" which laid the foundation for the linear development pattern we see today. More importantly, land uses in the area are very separated, with few examples of mixed-use development patterns.

Particular potential exists for redevelopment of aging commercial and retail centers into more vibrant mixed-use projects integrating commercial, retail, office, residential, and open-space uses within a single project. Many of the existing commercial areas, which include expansive parking areas along street frontages, may redevelop during the life of the MIP. An example of this is the Kīhei Krausz Project which is a 320,000-square-foot sustainable, mixed-use community that will create a walkable and vibrant downtown district for Kīhei. This, and similar projects, present an opportunity to redefine Kīhei into a network of individual towns within a larger town. Town and neighborhood commercial centers can become focal points of the community, strengthen civic pride, and foster economic vitality. To do this, mixed uses (residential, commercial and civic uses) need to be directly related and be proximate to employment. Future planning should create spaces that are human in scale, that reduce the dependence on the automobile, and strengthen the region's identity.

The Kīhei-Mākena Community Plan update process is the appropriate forum to begin defining the future of Kīhei and to lay the foundation for these areas to encourage their redevelopment. One constraint that must be overcome is the historical practice of adjacent land owners developing projects independently of one another. The planning process should encourage cooperation between property owners in reaching the common goal of transforming Kīhei into a place with a wide variety of housing types within close proximity of jobs, services and open space.

Extreme care should be taken to avoid development on existing wetlands in order to mitigate excessive flooding. Where possible and practicable, old wetlands should be restored.

North Kīhei Residential

The North Kīhei Residential planned growth area is envisioned as an urban expansion project along Waiakoa Gulch in North Kīhei mauka of Pi`ilani Highway. The residential housing project will incorporate traditional neighborhood design principles and provide approximately 600 single and multifamily homes, neighborhood-serving commercial uses, a park, a network of trails and bike paths, as well as open green space. The project is bounded by the existing Hale Pi`ilani residential subdivision along Kaiolohia and North Kīhei Residential Streets, and by active seed corn operations on the West side.

Planned Growth Area Rationale

The North Kīhei Residential planned growth area is situated in close proximity to the commercial areas of Kīhei, major roadways, and schools. The growth area will provide needed housing in close proximity to the commercial, recreational, and employment centers of Kīhei. The project will also provide affordable workforce housing units for Maui residents. Located in North Kīhei, this planned growth area will provide access to Pi`ilani Highway. Internal roadways should support traditional neighborhood design to the extent practicable, particularly within the multifamily component. Traditional neighborhood design concepts typically provide walkable neighborhoods, small neighborhood parks, and a tight interconnected multimodal grid for enhanced pedestrian and automobile mobility. Efforts should be made to provide safe pedestrian walkways that connect the planned growth area to the existing Hale Pi`ilani neighborhood, the Kaiwahine Villages affordable-housing project, parks and commercial areas, and along the new collector road that will serve the project. The development of infrastructure shall be coordinated with the projects to the south, including the Kīhei Mauka and the MRTP growth areas. The North Kīhei Residential planned growth area is located on Directed Growth Map #S1. Table 8-10 provides a summary of the planned growth area.

Table 8 - 10 : North Kīhei Residential Planned Growth Area

Background Information:			
Project Name:	North Kīhei Residential	Directed Growth Map #:	S1
Type of Growth:	Residential	Gross Site Acreage:	95 Acres
Planning Guidelines			
Dwelling Unit Count:	Approximately 600 Units[13]	Residential Product Mix:	Balance of SF and MF units
Net Residential Density:	9-12 du/acre	Parks and Open Space%[14]:	≥ 10%
		Commercial:	Neighborhood and Convenience Shopping

[13] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[14] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Kīhei – Mākena Community Plan Update and the project review and approval process.

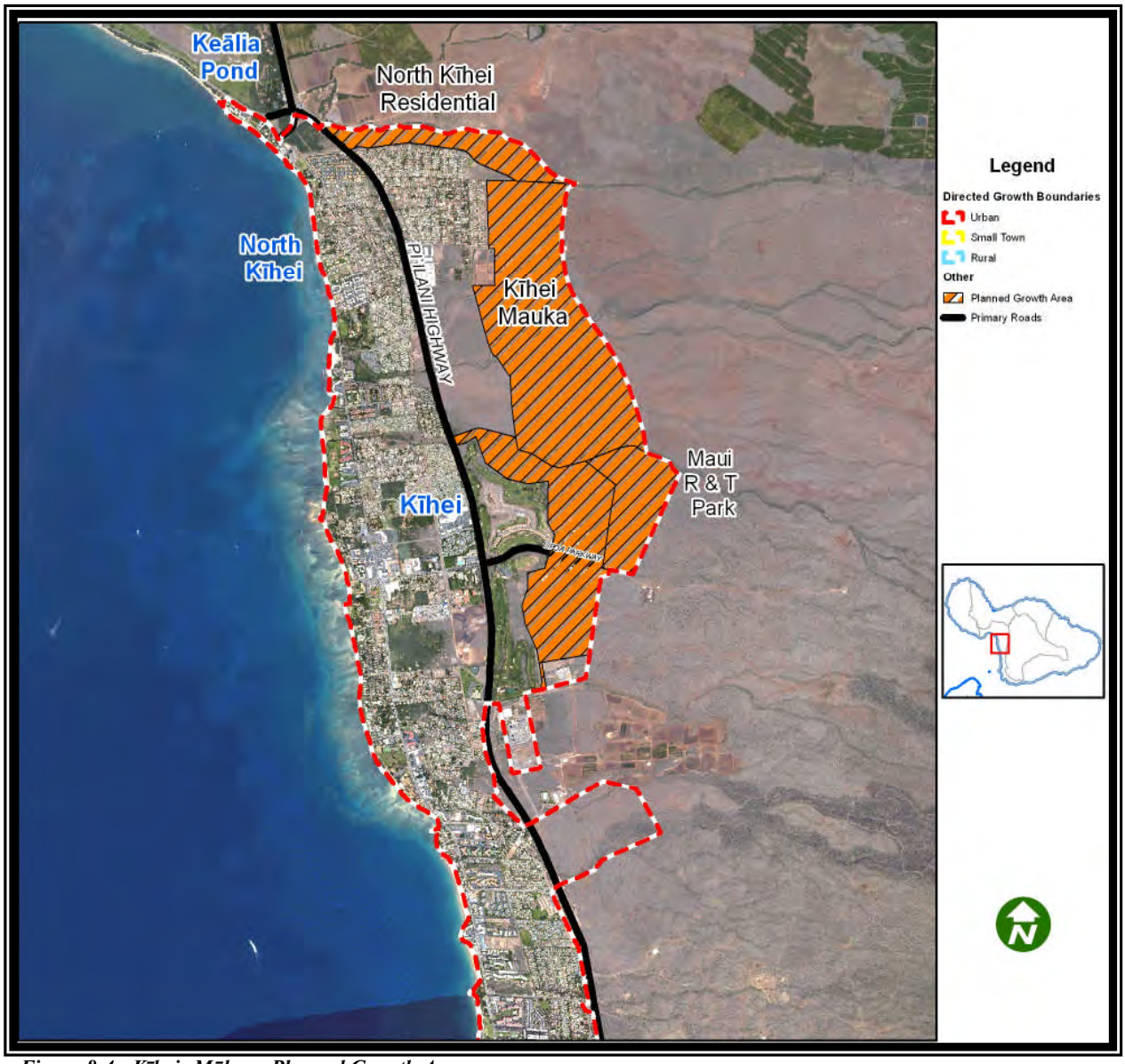


Figure 8-4: Kīhei- Mākena Planned Growth Areas.

Kīhei Mauka

Kīhei Mauka is located in North Kīhei, mauka of the Pi`ilani Highway and north of the Waipu`ilani Gulch. Kīhei Mauka will encompass more than 583 acres and be comprised of a mix of land uses, housing types, lot sizes, open space, parks, and other public facilities to create an interconnected network of walkable communities that together will create a self-sufficient town.

Planned Growth Area Rationale

The Kīhei Mauka planned growth area offers suitable topography for a new community, and is located outside of the tsunami inundation zone. Although the site is within the County's agricultural zoning district, the lands have low-agricultural suitability. Relatively few development and infrastructure constraints at the Kīhei Mauka site make it possible to provide significant quantities of workforce housing for Maui residents. Located in North Kīhei, this planned growth area will have connections to the

planned Kīhei-Upcountry Highway and Mokulele Highway, and will generate less of an impact on Pi`ilani Highway, the North-South Collector Road, and South Kīhei Road than a comparable project located further south. The Kīhei Mauka planned growth area is adjacent to the proposed Kīhei High School and the MRTP. Kīhei Mauka will provide public facilities, commercial land uses, parks and an open space network to serve the new and existing communities. The development of infrastructure will be coordinated with the North Kīhei Residential project, the continued expansion of the MRTP, and the Honua`ula and Mākena resort developments located to the south. Kīhei Mauka's proximity to large employment centers within the Kīhei-Mākena community plan region offers an ideal location for several self-sufficient villages that, together, will comprise a new town.

The expansion area should be developed based on the concept of a network of compact, walkable neighborhoods with neighborhood commercial nodes concentrated in the village centers of Kīhei Mauka. Projects proposed within this growth area should receive urban design review to ensure multimodal connectivity, and the incorporation of progressive-design treatments. A range of housing types should be provided with a significant percentage of multifamily units, and an emphasis on housing that is intended to meet resident needs. Due to the existing transportation challenges in the region and the size of the Kīhei Mauka planned growth area, progressively designed and safe pedestrian, bicycle, and ground-transportation corridors will need to connect the project to the Kīhei High School, MRTP, and the rest of Kīhei. Enhanced north-south mobility mauka of Pi`ilani Highway will be key to ensuring efficient intra- and inter-regional connectivity. Convenient public transit access should be provided to improve regional mobility. Drainage and sedimentation control systems will need to be constructed to mitigate the potential for flooding makai of the project and to prevent nonpoint source pollution from entering coastal waters. These measures can be combined with the growth area's planned park, open space, and greenbelt and greenway systems. Finally, since the site is a considerable expansion of the North Kīhei area, the project will need to be developed in phases. Each phase should be planned with adequate public facilities and commercial services to meet resident needs. The Kīhei Mauka planned growth area is located on Directed Growth Map #S1. Table 8-11 provides a summary of the planned growth area.

Table 8 - 11: Kīhei Mauka Planned Growth Area

Background Information:			
Project Name*:*	Kīhei Mauka	Directed Growth Map #:	S1
Type of Growth:	Urban Expansion	Gross Site Acreage:	583 Acres
Planning Guidelines			
Dwelling Unit Count:	Approximately 1,500 [14] Units	Residential Product Mix:	Balance of SF and MF units
Net Residential Density:	9-12 du/acre	Parks and Open Space%[15]:	≥ 30%
		Commercial:	Neighborhood Convenience Shopping Region Serving

Maui Research and Technology Park

The MRTP was the vision of a core group of community leaders in the early 1980s who sought to diversify the economic and employment base on Maui beyond tourism and agriculture. Today, the MRTP

[14] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[15] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Kīhei – Mākena Community Plan Update and the project review and approval process.

is home to a diverse range of companies and government projects that together employ approximately 400 persons in high-technology and related industries. The MRTP is envisioned to continue to be a major employment generator for Maui. The Park's mission of job creation and diversification of the island's economy remains one of vital importance.

Planned Growth Area Rationale

Since the opening of the MRTP, experts in the field of economic development have gained a better understanding of innovation clusters and the needs of knowledge workers and businesses. Technology businesses thrive in areas of diversity and activity. A diversity of businesses and workers, and the availability of a variety of commercial and industrial spaces, enhance the viability and success of individual businesses. The intent of the MRTP planned growth area is to create opportunities for a broader range of desirable knowledge-based and emerging industries,[16] which will provide high-skilled and well-paying jobs for Maui residents.

As the MRTP develops, it should utilize the principles of new urbanism, smart growth, and the Association of University Research Park's "Power of Place" study to create a community of innovation. This includes providing diverse housing options within close proximity of the MRTP's employment, and integrating neighborhood-serving retail, civic, and commercial uses in a manner that encourages bicycling, walking, and public transport. The growth area may also include exhibit halls and meeting space to support the development of the research and technology sector, and to serve the broader needs of South and Central Maui. Build-out of the MRTP should be coordinated with the development of the neighboring Kīhei Mauka planned growth area to ensure efficient intra- and inter-regional transportation connectivity for both motorized and non-motorized transportation. The MRTP should also develop pedestrian and bicycle linkages between the future Kīhei High School and the core commercial and civic uses within Central Kīhei. The MRTP planned growth area is located on Directed Growth Map #S1. Table 8-12 provides a summary of the planned growth area.

Table 8 - 12 : MRTP Planned Growth Area

Background Information:			
Project Name:	Maui Research and Technology Park	Directed Growth Map #:	S1
Type of Growth:	Urban Expansion	Gross Site Acreage:	437 Acres
	Planning Guidelines		
Dwelling Unit Count:	Approximately 1,250 [17] Units	Residential Product Mix:	Balance of SF and MF units
Net Residential Density:	9-20 du/acre	Commercial:	Neighborhood serving retail and commercial
Net acres dedicated to non knowledge-based employment (parks, civic, residential, commercial)	Approximately 35%	Knowledge based employment:	Up to 2 million sq. ft.

[16] Industries characterized by highly-skilled workers in fields such as science and research, biotechnology, clean technology, information technology, disaster mitigation, education, healthcare and medicine, media production as well as other industries supported in the Emerging Sector's Subelement, Chapter 4, MIP.

[17] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

Pulehunui

The Pulehunui planned growth area encompasses just over 639 acres and is located in the ahupua`a of Pulehunui and to the east of Mokulele Highway (see Figure 8-5). The planned growth area will be used primarily for heavy industrial, public/quasi-public, and recreational purposes. Commercial uses should be limited.

Planned Growth Area Rationale

The Pulehunui planned growth area envisions land uses that are compatible with surrounding agricultural operations. The planned growth area represents a logical expansion of industrial land use in the area. The area's location, midway between Kīhei and Kahului, makes it an ideal site to serve the island's long-term heavy industrial land use needs. Development of the area must ensure the protection of view corridors along Mokulele Highway as well as mauka and makai view planes. Linear-strip development along Mokulele Highway is strongly discouraged. Buildings should be setback significantly from the highway, and all traffic-light timing along Mokulele Highway should be coordinated for optimum traffic flow. The Pulehunui planned growth area is located on Directed Growth Map #C4 and #C5. Table 8-13 provides a summary of the planned growth area:

Table 8 - 13: Pulehunui Planned Growth Area

Background Information:			
Project Name*:*	Pulehunui Industrial	Directed Growth Map #:	C4, C5
Type of Growth:	Urban Expansion	Gross Site Acreage:	Approximately 639 Acres

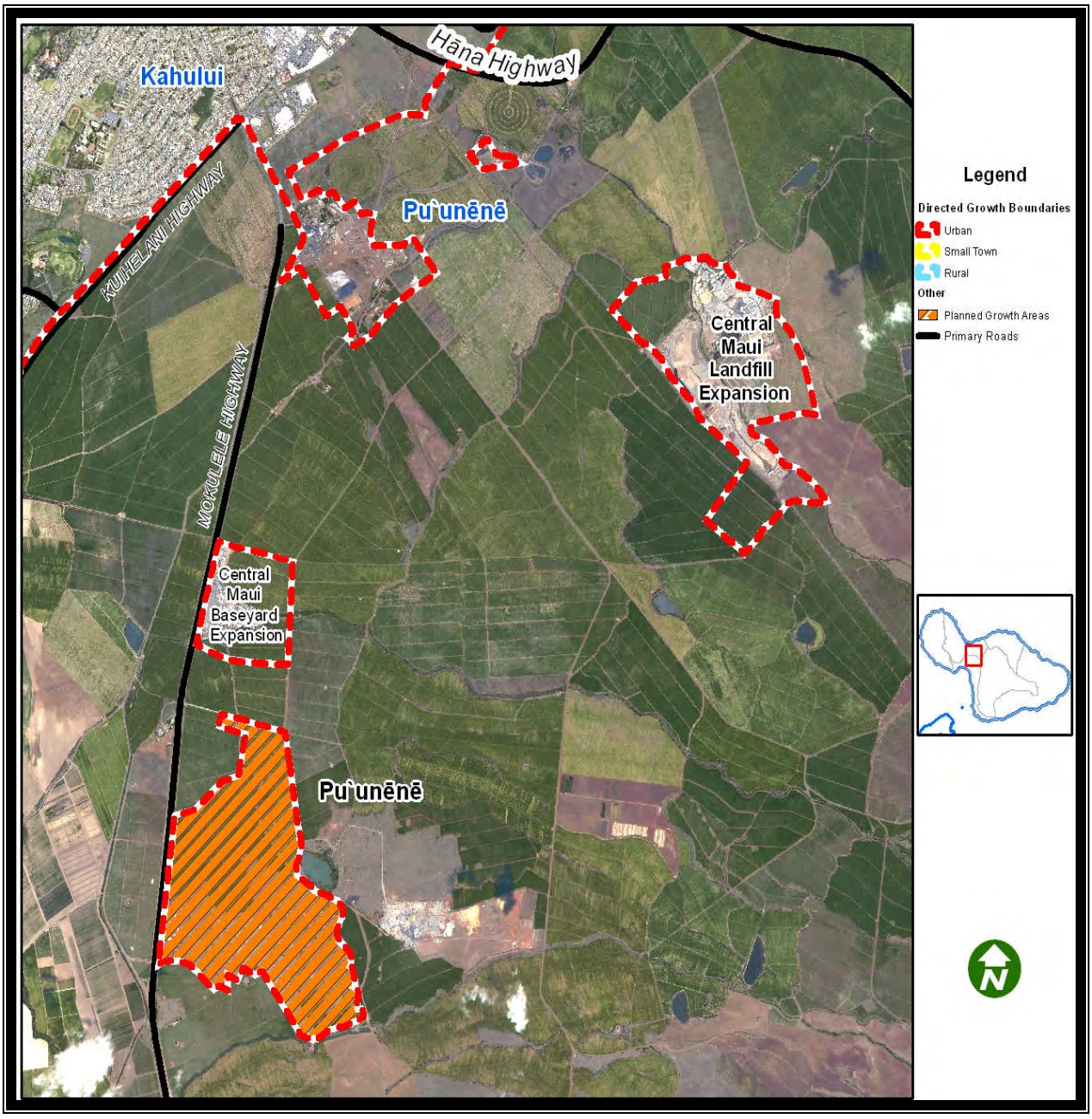


Figure 8-5: Pulehunui Planned Growth Area.

Kīhei – Mākena – Planned Protected Areas

The Kīhei-Mākena community plan region has the second highest resident population with over 27,000 people in 2010. Two planned protected areas have been identified in the Kīhei-Mākena community plan region within Mā`alaea and Mākena; the Mākena – La Perouse – Kanaio Protected Area and the Keālia National Wildlife Refuge. A brief discussion of each protected area is provided below.

Mākena-La Perouse-Kanaio Protected Area

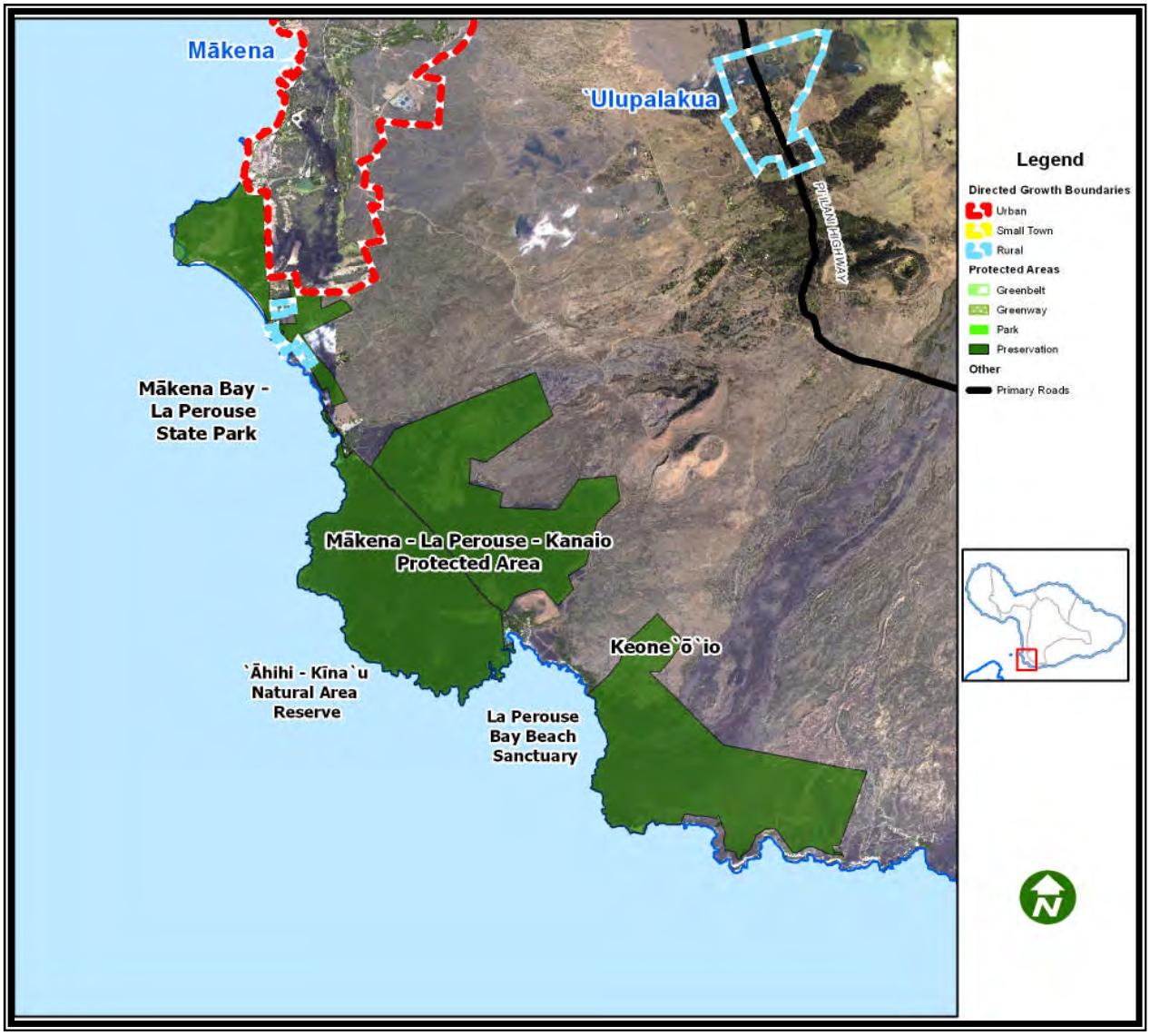


Figure 8 - 6: Mākena-La Perouse-Kanaio Protected Area.

The Mākena - La Perouse - Kanaio Protected Area is located on the southwest corner of the island and stretches from the edge of Mākena from Pu`u Ōla`i Point, along Mākena Alanui Road, Mākena Road, and extends approximately 6 miles southeast of La Perouse Bay (see Figure 8-6). This expanse of land includes a plethora of significant archaeological and cultural resources including the La Perouse Historic and Recreational Complex and the Hoapili Trail (King's Highway). The numerous environmental resources include sensitive lands, rare habitats, and the `Āhihi Kīna`u Natural Area Reserve, a marine protected area.

The Mākena-La Perouse-Kanaio Protected Area is intended to set aside and protect a series of shoreline lands with high natural and cultural resource value. The proposed design philosophy of the protected area is to create recreational access while not detracting from the inherent value of its natural condition and historic resources.

Keālia National Wildlife Refuge

The Keālia National Wildlife Refuge is a 700-acre refuge that was established in 1992 and encompasses one of the last remaining natural wetland habitats in Hawai'i (see Figure 8-7). Located along the south-central coast of Maui, between the towns of Kīhei and Mā`alaea, it is a natural basin for a 56-square mile watershed from the West Maui Mountains. The 200-acre open pond seasonally floods to 450 acres in winter months. The wetland preserve is home to 31 species of birds and migrant waterfowl, including species that are listed as endangered and threatened. In addition to providing a vital habitat, the pond serves as a sedimentation basin that protects the nearby coastal waters from sedimentation runoff that would otherwise cause reef and water quality damage.

The pond is located east of Mā`alaea and is adjacent to Sugar Beach ("Kanaio", "Palalau", and "Kale`ia"), one of the longest remaining uninterrupted beaches on the island. Public access to the refuge area is limited. However, recent efforts to improve access have allowed for the development of visitor amenities, such as a parking area, educational boardwalk, and visitor center.

The following items shall be addressed to ensure the preservation and enhancement of the Keālia National Wildlife Refuge Protected Area: 1) Optimize habitat size to accommodate seasonal flooding and a healthy wetland floodplain by constructing the Mā`alaea-Keālia bypass highway and reclassifying the existing Highway 30 as a scenic roadway; 2) Develop a master plan for recreational coastal access along North Kīhei Road; 3) Strategically locate managed access points to the refuge to include viewing stations,

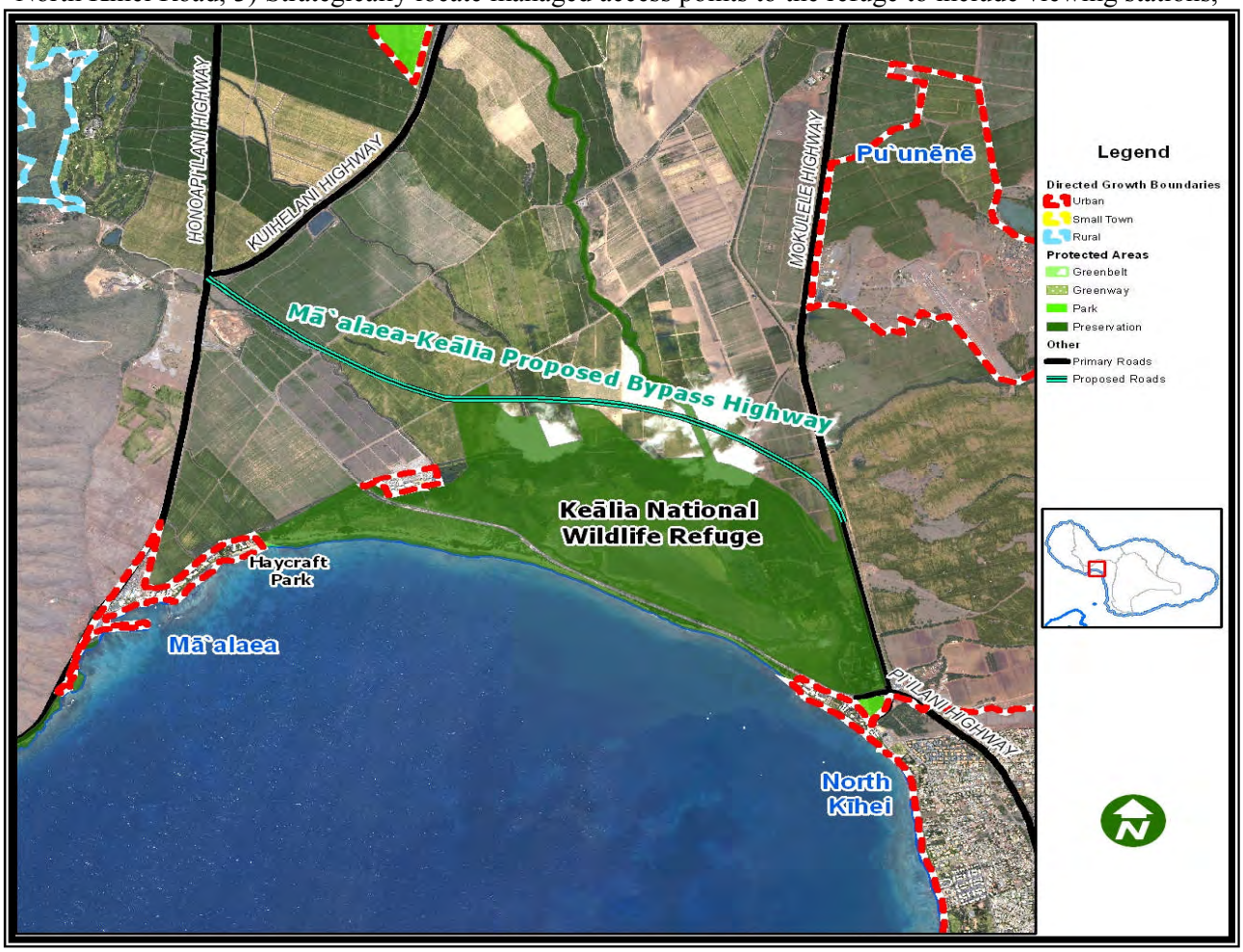


Figure 8 - 7: Keālia National Wildlife Refuge Planned Protected Area.

visual aids, and educational opportunities for visitors; 4) Provide safe vehicular access to the site and nearby shoreline resources; and 5) Maintain or construct drift fencing to promote beach stabilization and nourishment. The refuge shall be developed based on best management practices intended for wetland bird sanctuaries.

Makawao – Pukalani – Kula

The Makawao-Pukalani-Kula community plan region, also commonly referred to as Upcountry, is characterized by abundant open space, agricultural lands, and rural towns. Because of the region's cool climate, spectacular views, and country lifestyle, its popularity as a place to live on the island has grown. The region has the third largest population with just over 25,000 people in 2010. With less than 4,370 jobs in the region in 2010, the area is primarily a bedroom community for the Wailuku-Kahului employment center. The region has four distinct sub-regions; Makawao, Pukalani, Kula, and Hāli`imaile. A brief discussion of each sub-region is provided below:

Makawao. Makawao is one of the region's two main settlement areas. Makawao has a strong historic connection to cattle ranching and is traditionally known as the last "paniolo town". Commercial land uses in the sub-region are concentrated in the area of the Baldwin Avenue and Makawao Avenue intersection. Recreational and civic uses such as the Eddie Tam Memorial Center sports complex, the Makawao post office and the Makawao public library are located within or adjacent to the town center. Residential areas are composed of suburban and rural subdivisions and the town is surrounded by ranch land and pineapple fields.

Pukalani. Pukalani is the second main settlement in the Upcountry region. Land use patterns in Pukalani include a main commercial center, the Pukalani post office, the Motor Vehicles and Licensing Office (Pukalani Office), Hannibal Tavares Community Center, and suburban and rural subdivisions. Commercial services in Pukalani cater to both neighborhood and regional customers. Recently, Kulamalu, a mixed-use commercial center has been developed along Kula Highway.

Kula. The Kula sub-region is characterized by a mixture of rural residential and agricultural uses. Diversified agriculture is an important industry and land use in the region. Small rural service centers are sprinkled throughout the Kula region. Several of these service centers, including the communities of Waiakoa and Kēōkea and the Kula Ace Hardware store, serve as community focal points.

**Hāli`imaile.** Hāli`imaile is a small community makai of Makawao town which was originally developed to house workers associated with the pineapple industry. The community is primarily residential, has a park and gym, and is surrounded by pineapple and sugarcane fields.

CHALLENGES AND OPPORTUNITIES

Major land use challenges and opportunities in the Makawao-Pukalani-Kula community plan region include:

Protecting Agricultural Lands Preserving rural character, protecting prime and productive agricultural lands, and maintaining a separation between communities are significant challenges. The region contains some of the most productive agricultural lands for diversified agriculture and thus contributes an important supply of agricultural produce to local markets. The County should enhance efforts to support bona fide farms to help keep agricultural operations a viable endeavor.

Maintaining a If the region continues to grow as it has in the last two decades, separation between

Separation Between Communities communities will become blurred and each community will lose its unique identity. Future development must be focused within existing communities or be adjunct to existing urban areas, and provide, as much as possible, that large areas of open space are maintained between communities.

Rural Development Standards and Planning Tools Appropriate development and infrastructure standards are needed to preserve the region's character. Reduced level-of-service standards are not only a key characteristic of the rural lifestyle, they are important to the aesthetic and environmental objectives of the countryside. Planning tools, such as conservation subdivision design, can enable innovative site planning that will better protect natural resources and rural character.

Lack of Walkable Town Centers The Upcountry region is noted for its beauty; therefore, developments should evolve in harmony with the surrounding landscape, and minimize their urban footprint when possible. Ideally, small towns should continue to develop as small, compact commercial nodes that provide local jobs, goods, and services to immediate neighborhoods.

Except for Makawao, the Upcountry region lacks pedestrian-oriented town centers that are integrated with surrounding residential neighborhoods. Town and village centers should be enhanced to provide daily services and job opportunities for Upcountry residents.

Limited Housing Choices: Jobs/Housing Imbalance Only 2 percent of Upcountry housing units are multifamily. The lack of multifamily housing limits the housing options for residents. Future development in the region should provide a mix of single-family and multifamily housing units close to services, and in balance with employment opportunities to avoid bedroom communities

Makawao – Pukalani – Kula Planned Growth Areas

Nine planned growth areas have been identified for the Makawao – Pukalani – Kula community plan region: Makawao Makai, Makawao Town Expansion, Makawao Affordable Residential, Seabury Hall, Pukalani Expansion, Pukalani Makai, Hāli`imaile, Anuhea Place, and Ulupalakua Ranch. Planned growth areas are depicted in Figure 8-8 and on Directed Growth Maps #U1, #U2, #U3, and #U4.

New Regional Facilities Recommended – Upcountry Maui

- Network of greenways and pedestrian Pathways
- Paniolo Connector Road
- New water source development and water storage
- Solid waste baseyard

It is not the intent of the RGBs for agricultural subdivisions to rezone lands within the boundary to higher densities than is already permitted, but to apply a County Rural zoning district (2-, 5-, 10-acre minimum lot sizes) that reflects existing conditions or that is directed by the Community Plan. The Community Plan shall determine the appropriate densities and standards to apply within the Upcountry RGBs. Any restrictions on agricultural activity are prohibited. The exception to the density standard is the Anuhea Place planned growth area where the minimum lot size is one acre.

Makawao Makai

Makawao Makai is a 39-acre planned growth area south of the Makawao Veterans Cemetery on the south side of Baldwin Avenue. The site has historically been used for pineapple production.

Planned Growth Area Rationale

Makawao Makai provides a logical expansion of the existing community and provides a hard edge for the existing Makawao Town. Access will be provided from both Baldwin Avenue and `A`ala Place. The planned growth area is intended as a small town expansion with housing types and densities similar to existing Makawao Town. Parks and open space should be incorporated into the project. It will also be important to create pedestrian linkages between the town core and the expansion area to facilitate mobility. The Makawao Makai planned growth area is located on Directed Growth Map U1. Table 8-14 provides a summary of the planned growth area.

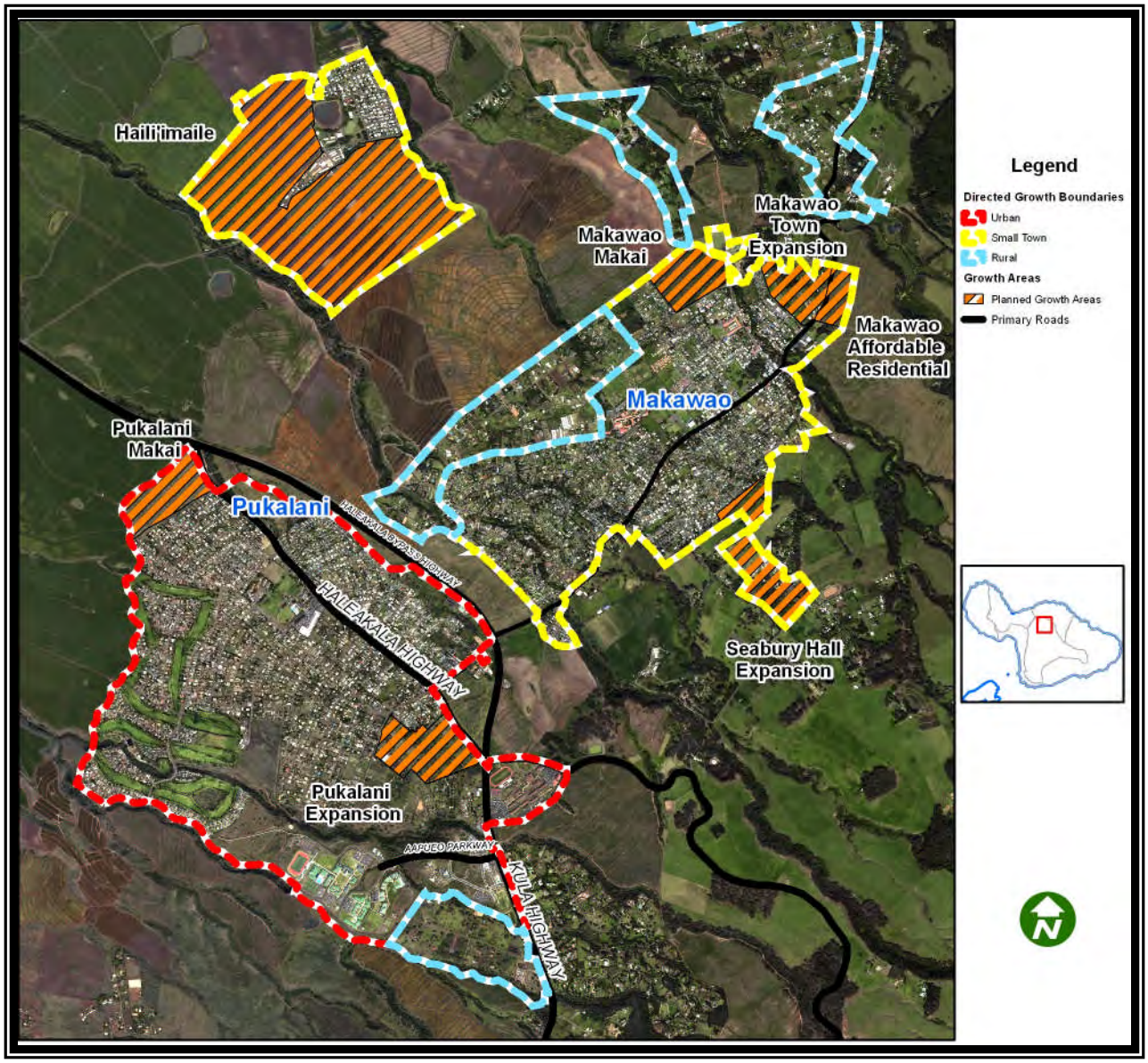


Figure 8 - 8: Makawao – Pukalani - Kula Planned Growth Areas.

Table 8 – 14: Makawao Makai Planned Growth Area

Background Information:			
Project Name*:* Makawao Makai		Directed Growth Map #:	U1
Type of Growth: Small Town Expansion		Gross Site Acreage:	39 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approximately 90 Units[18]	Residential Product Mix:	100% SF
Net Residential Density:	4-6 du/acre	Parks and Open Space%	≥ 30%[19]
		Commercial:	N/A

Makawao Town Expansion

The Makawao Town Expansion planned growth area provides an approximately 38-acre addition of land to the Makawao STB extending to the south-side of Kee Road. The growth area is intended to be developed in a manner that complements the existing Makawao Town and should preserve the existing rural character of the area as much as possible.

Makawao Affordable Residential

The Makawao Affordable Residential planned growth area is located mauka of Makawao Avenue at the intersection of Makawao Avenue and Pi`iholo Road. The area is bounded by Agricultural, Single-Family, and Public/Quasi-Public Community Plan designations. The goal of the Makawao Affordable Residential growth area is to provide affordable housing within walking distance of Makawao Town. The expansion area includes an approximately 20-acre linear growth area mauka of Makawao Avenue that begins at Pi`iholo Road and extends approximately 1,350 feet along the mauka side of Makawao Avenue and approximately 550 feet deep from Makawao Avenue.

Planned Growth Area Rationale

It is intended that the area will be developed with affordable housing. Access will be provided from Pi`iholo Road so as not to impede circulation patterns along Makawao Avenue. The purpose and intent of the Makawao Affordable Residential growth area may be further defined during the Makawao-Pukalani-Kula Community Plan update.

Seabury Hall

The Seabury Hall planned growth area adjacent to the Seabury campus is approximately 68 acres in size. The majority of the site is occupied by Seabury Hall facilities and undeveloped pasture lands. The entire growth boundary is comprised of lands owned by Seabury Hall.

Planned Growth Area Rationale

This area is included to provide for the gradual expansion of Seabury Hall and its support facilities. Limited residential facilities are planned for faculty housing. The development of employee or student housing may be appropriate as accessory uses for the school and a small number of accommodations may

[18] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[19] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Makawao-Pukalani-Kula Community Plan update and the project review and approval process.

be developed as accessory uses to the Seabury Hall campus for visiting professors, guest speakers, or campus visitors. Rural sprawl shall be avoided along Olinda Road between Makawao Town and Seabury Hall. The Seabury Hall planned growth area is located on Directed Growth Map #U1. Table 8-15 provides a summary of the growth area.

Table 8 - 15: Seabury Hall Planned Growth

Background Information:			
Project Name: Seabury Hall		Directed Growth Map #: U1	
Type of Growth: Small Town Expansion		Gross Site Acreage: 63 Acres	
Planning Guidelines:			
Dwelling Unit Count:	N/A[20]	Residential Product Mix:	N/A
Net Residential Density:	N/A	Parks and Open Space%[21]:	≥ 30%
		Commercial:	N/A

Pukalani Expansion

The Pukalani Expansion planned growth area includes areas southwest of the Pukalani Triangle across Old Haleakalā Highway on vacant agricultural land. The expansion will be primarily residential with neighborhood parks and a small commercial component. The site is surrounded by urban, rural, and agricultural lots.

Planned Growth Area Rationale

The Pukalani Expansion is compatible with existing development in the area and is bounded by existing residential land uses, Old Haleakalā Highway, and Kalialinui Gulch, which creates containment for the new community. Agricultural, rural, and residential County zoning, as well as a linear corridor of commercial uses along Makawao Avenue, surround the expansion area. Considering development and infrastructure costs and the provision of a mix of lot sizes for single-family and multifamily units, the urban expansion site has the potential to provide affordable-resident housing for the Upcountry area. Like the Pukalani Makai planned growth area on the lower slope of the Old Haleakalā Highway, this area has good transit access and is proximate to existing public facilities, including elementary and high schools, as well as the Mayor Hannibal Tavares Community Center. Linkages should be developed between the town's activity centers and neighboring communities with an emphasis on providing safe pedestrian pathways. Multimodal linkages should also be developed to connect the Pukalani Expansion area to Makawao Town, the Pukalani Shopping Center, King Kekaulike High School and Kulamalu. The Pukalani Expansion is located on Directed Growth Maps #U1 and U2. Table 8-16 provides a summary of the planned growth area.

[20] A small number of teacher cottages may be developed as accessory uses to the Seabury Hall campus to provide accommodations for visiting professors, guest speakers, campus visitors, or other lecturers. the specific location of accessory educational uses, and the precise amenities will be further defined during the Makawao-Pukalani-Kula Community Plan Update and the project review and approval process.

[21] The distinct boundaries of open space areas will be further defined during the Makawao-Pukalani-Kula Community Plan Update and the project review and approval process.

Table 8 - 16: Pukalani Expansion Planned Growth Area

Background Information:			
Project Name*:* Pukalani Expansion		Directed Growth Map #: U1 & U2	
Type of Growth: Urban Expansion		Gross Site Acreage: 56 Acres	
Planning Guidelines:			
Dwelling Unit Count:	Approximately 311 Units[22]	Residential Product Mix:	A Balance of SF and MF
Net Residential Density:	9-11 du/acre	Parks and Open Space%[23]:	≥ 20%
		Commercial: Neighborhood Serving	

Pukalani Makai

The Pukalani Makai planned growth area encompasses 45 acres of vacant agricultural land, and is located at the makai entrance of Pukalani town at the intersection of the Old Haleakalā Highway and the newer Pukalani Bypass. Along with the remnant 38-acre parcel that runs along the Pukalani Bypass between the turnoff to the Old Haleakalā Highway and Kua`āina Ridge, this area was once in pineapple cultivation and then briefly planted with papaya. This area is planned for residential single-family housing to include affordable workforce housing.

Planned Growth Area Rationale

The Pukalani Makai planned growth area will complete the makai corner of Pukalani, as it was intended in recent community plans. The area borders the existing residential land use of Pukalani Terrace above Old Haleakalā Highway on the north side, and Hāmākua Ditch below. Residential growth and a neighborhood park are intended for this area. Pukalani Makai has convenient highway access and is adjacent to the Pukalani Elementary School and the Mayor Hannibal Tavares Community Center, thus it is an appropriate location for residential growth. Parks and open space should be incorporated into the project to meet the long-term needs of the community. The Pukalani Makai planned growth area is located on Directed Growth Map #U1. Table 8-17 provides a summary of the planned growth area.

Table 8 - 17: Pukalani Makai Planned Growth Area

Background Information:			
Project Name*:* Pukalani Makai		Directed Growth Map #: U1	
Type of Growth: Urban Expansion		Gross Site Acreage: 45 Acres	
Planning Guidelines:			
Dwelling Unit Count:	Approx. 250 Units[24]	Residential Product Mix:	Single Family Dwellings
Net Residential Density:	8-11 du/acre	Parks and Open Space%[25]:	≥ 15%
		Commercial: Neighborhood Serving	

[22] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[23] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Makawao-Pukalani-Kula Community Plan Update and the project review and approval process.

[24] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[25] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Makawao-Pukalani-Kula Community Plan Update and the project review and approval process.

Hāli`imaile

The Hāli`imaile planned growth area is an expansion of the existing Hāli`imaile community. The site comprises approximately 330 acres both mauka and makai of Hāli`imaile Road. The communities will be compact with a mix of land uses, neighborhood commercial nodes, schools, parks, and open space integrated into residential areas.

Planned Growth Area Rationale

Although the expansion of Hāli`imaile will add growth to an existing town, it will be planned and designed as a new town with a town center, neighborhood commercial nodes, and public services built at the scale of the pedestrian to enhance the existing residential area and to create a complete community. The community should be designed to provide a range of affordable housing types for Maui residents. Clear edges should be established around the community to prevent sprawl, protect agricultural land, and maintain separation between Hāli`imaile and Makawao. The design and development of the Hāli`imaile planned growth area shall respect and complement the existing town and its historic precedent. Future developments shall incorporate pedestrian linkages to the existing community and minimize impacts to view planes from Baldwin Avenue towards the Hāli`imaile expansion area. Currently, the town is not visible from any roadways. The Hāli`imaile planned growth area is located on directed Growth Map #U1. Table 8-18 provides a summary of the planned growth area.

Table 8 - 18: Hāli`imaile Planned Growth Area

Background Information:			
Project Name*:* Hāli`imaile Expansion		Directed Growth Map #:	U1
Type of Growth: Small Town Expansion		Gross Site Acreage:	330 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approximately 825 Units[26]	Residential Product Mix:	Single Family Dwellings
Net Residential Density:	9-11 du/acre	Parks and Open Space%[27]:	≥ 30%
		Commercial: Neighborhood Serving	

Anuhea Place

Anuhea Place is a planned rural growth area makai and on the south side of Kula Highway. It is comprised of approximately 111 acres along Anuhea Place, and 15 lots at 5 acres each. A portion of these lots are developed with residential homes, and the remaining portion is currently undeveloped. Hale O Kāula Church also lies within the subdivision.

Planned Growth Area Rationale

The Anuhea Place planned rural growth area provides for a low-density residential expansion of the existing Pukalani community. It is located along the southern edge of the existing Pukalani Community with access provided from Anuhea Place via Kula Highway. The planned rural growth area is intended to be developed consistent with the RU-1 County zoning district and shall have minimum lot sizes of no less

[26] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[27] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Makawao-Pukalani-Kula Community Plan Update and the project review and approval process.

than one acre. No prohibitions on agricultural uses and activities shall be allowed within this rural growth boundary. The Anuhea Place planned rural growth area is located on Directed Growth Map U2.

`Ulupalakua Ranch

The `Ulupalakua Ranch planned growth area is located on the southwestern slopes of Haleakalā. The `Ulupalakua Ranch planned rural growth area encompasses the existing Ranch Store, Maui's Winery ~ Tedeschi Vineyards, and widely-scattered employee housing within close vicinity to the `Ulupalakua Ranch Store outpost on the mauka and makai sides of Kula Highway. Currently the 223-acre growth area includes employee houses and the village core.

Planned Growth Area Rationale

The Ulupalakua Ranch planned rural growth area identifies the location of ranch-owned homes and the existing small rural outpost within the heart of `Ulupalakua. Access is provided from Kula Highway. The planned rural growth area is intended to identify the boundaries of the Ranch's existing employee housing and provide limited opportunities for expansion of employee housing. It is not the intent of the RGB to develop lands for traditional nonemployee housing development. The `Ulupalakua village core is located within the rural growth area and is within easy access to existing residences. The `Ulupalakua Ranch planned rural growth area is located on Directed Growth Map #U4. Table 8-19 provides a summary of the planned growth area.

Table 8 - 19: `Ulupalakua Ranch Planned Rural Growth Area

Background Information:			
Project Name*:* `Ulupalakua Ranch		Directed Growth Map #:	U4
Type of Growth: Rural Expansion		Gross Site Acreage:	223 Acres
Planning Guidelines:			
Dwelling Unit Count:	N/A[28]	Residential Product Mix:	Single Family Dwellings
Net Residential Density:	N/A	Parks and Open Space%:	N/A
		Commercial: Neighborhood and Visitor-related	

Makawao-Pukalani-Kula – Planned Protected Areas

Upcountry Maui is characterized by abundant open space and conservation lands that provide for a diverse number of recreational outdoor activities. The region offers opportunities for biking, hiking, hunting, swimming, and organized outdoor activities in four distinct residential sub-regions; Makawao, Pukalani, Hāli`imaile, and Kula-`Ulupalakua. There are two planned protected areas in the Makawao-Pukalani-Kula community plan region: Corn Mill Camp and the Upcountry Greenway.

Corn Mill Camp

Corn was successfully grown in Hawai`i for a century from 1851 to 1951. On Maui, corn operations helped Hawai`i achieve self-sufficiency and build the ranching and agricultural industries. In 1892, Louis von Tempsky founded the Makawao Corn Mill Company with partners Randall von Tempsky and Llewellyn F. Hughes. The new company originally operated on two acres of land in Makawao known then as "David Crowningburg pasture," owned by Haleakala Ranch Company. By 1892, 4,000 acres of

[28] The growth boundary is intended to accommodate upgrades to existing employee housing within the `Ulupalakua Ranch planned growth area, and to provide for a limited expansion of future employee housing.

corn were being grown in Kula with all corn ground and processed at the Makawao Corn Mill camp. During the 1900s, Hawai`i had a good market and excellent prices for corn, with local production unable to keep up with demand. By 1909, 3,200 acres of corn were planted statewide, and Kula was known as a "corn-raising region." During the war, over 9,000 acres of corn were being grown, reflecting the plantation's response to the call to aid in the war effort. After 1920, corn production dropped quickly to less than 1,900 acres as a result of bad agricultural practices and the rise of pineapple as a profitable commodity.

The remains of the former historic Corn Mill Camp site are identified as the Corn Mill Camp Protected Area located in Pukalani. The intent of the preservation boundary shall be to protect and preserve Corn Mill Camp's historic resources, which may include the adaptive reuse of the existing Corn Mill Camp historic complex. The Secretary of the Interior's Standards shall be utilized for rehabilitating historic structures.

Upcountry Greenway

The Upcountry Greenway planned protection area is within the Makawao-Pukalani-Kula community plan region. Portions of Upcountry Greenway planned protected area are also within the Pā`ia-Ha`ikū Community plan region (*Upcountry Greenway Master Plan, 2004*). The goal of the Upcountry Greenway is to provide an integrated system of nonmotorized transportation facilities and recreation multi-user routes, trails and paths that are compatible with existing and future land uses in the region. A brief discussion of the protected area is provided below.

The Upcountry Greenway is envisioned as a regional network of bikeways, equestrian trails and pedestrian paths that provide linkages between three geographic sub-areas: Pā`ia-Ha`ikū; Makawao-Pukalani; and Kula-`Ulupalakua. Transportation components of the system will establish inter- and intra-community linkages and satisfy the origin-destination objectives of potential users. Greenway facilities may also provide transportation connections between the communities of Makawao and Pukalani or Waiakoa and Kēōkea. The trails will serve as a multifunctional regional system of nonmotorized travel ways physically separated from roadways. Ancillary facilities such as restrooms, trail guidance facilities, parking areas, and signage are also envisioned.

The following general planning principles shall be addressed during route and alignment selection and development of the trail system:

1. Off-road facilities shall be integrated with existing State and County roadway systems with consideration given to connection point safety. In integrating off-road facilities with existing State and County roadways, consideration shall be given to providing connection locations which facilitate greenway system continuity.
2. Both transportation and recreational facilities shall be limited to non-motorized uses. Thus, design of the greenway system shall at a minimum, address the needs of pedestrians (walkers, joggers, hikers, skaters) horseback riders and bicyclists.
3. The definition of trail routing and alignments shall respect existing uses, existing property boundaries, and man-made and natural physical barriers (i.e. fences, walls, topographic features, etc.) and conservation goals. Particular attention shall be given to the relationship between greenway-facility use and agricultural requirements.
4. The greenway shall be developed based on best practices for interconnected trailway systems.

Pā`ia-Ha`ikū

The Pā`ia-Ha`ikū community plan region has the second smallest population and projected average annual rate of population increase of all community plan regions on the island. Even though the region's population of about 13,000 people as of 2010 is not expected to increase significantly by 2030, the manner in which the region grows is an important land use issue. The region has two sub-regions; Pā`ia and Ha`ikū. A brief discussion of each sub-region is provided below.

**Pā`ia.** Pā`ia is the primary service center for the region. Although it is close to the commercial, industrial, and employment centers of the Wailuku-Kahului Community Plan region, Pā`ia has maintained its country town scale and character. Commercial land uses are primarily located at the intersection of Hāna Highway and Baldwin Avenue and residential areas stretch along both of those roads. Pā`ia has a strong connection to Maui's plantation history and is the major tourist destination along the north shore.

**Ha`ikū.** The land use pattern in the Ha`ikū sub-region is predominantly low-density agricultural subdivisions with a few small pockets of urban settlement at Ha`ikū town, Pa`uwela and Kuiaha. Limited commercial services and jobs exist in the Ha`ikū area, concentrated in the vicinity of Ha`ikū Marketplace. A large number of cottage industries operate within this region with a proportion of businesses operating out of residences. Agricultural activities include nursery operations and other forms of diversified agriculture.

CHALLENGES AND OPPORTUNITIES

Major land use issues in the Pā`ia-Ha`ikū community plan region include:

Protecting Rural Character & Sense of Place

Maui's North Shore contains a diverse number of exceptional natural resources and landscapes, including productive agricultural lands, dense forest lands, scenic vistas, marine resources, and other environmental resources that could become fragmented and irreversibly degraded by unmanaged growth. In particular, insensitively-designed subdivisions could degrade the quality of life in this area and as such, the primary challenge will be to protect the mixture of large and small lots that give this region its unique charm and landscape. Protecting the distinctive character and natural beauty of the area can be achieved through the development of tools such as conservation subdivision design which enables innovative site planning.

Inefficient Land Use Patterns

The dominant pattern of development within the Pā`ia-Ha`ikū region is low density residential development, frequently in the form of agricultural subdivisions. This dispersed pattern of land use is inefficient and can stress regional infrastructure systems and public services. Future development in the area should be focused in existing communities and should provide a mix of uses to support area residents. Investments should be focused on providing green infrastructure throughout the region with an emphasis on providing interconnections between adjacent communities.

Protecting the North Shore's Sense of Place

Maui's North Shore has remained relatively pristine, even during periods of significant development on the rest of the island. Maui's North Shore provides a growing number of small-scale entrepreneurial opportunities, such as diversified agriculture, alternative tourism, world-class ocean and land recreational activities, and health and wellness. It is imperative that future development doesn't compromise the area's rural character and scenic and environmental resources.

Tsunami Inundation Portions of historic Pā`ia and the community of Ku`au lie within the tsunami inundation zone. Future planning must carefully consider these threats, and to the extent possible, development should be thoughtfully directed mauka to areas not threatened by coastal hazards. Future planning should also ensure that adequate routes exist for safe evacuation of area residents in the event of a tsunami or hurricane (see Chapter 3, Natural Hazards).

***Poorly Defined Ha`ikū Commercial Center*** Ha`ikū Cannery is the primary commercial node for the Ha`ikū region and continues to evolve rapidly. The Ha`ikū urban core should utilize the available urban zoned land in a more efficient manner to develop a vibrant town core. Future revitalization efforts should focus on creating a safe, walkable town as well as ensuring the safety and welfare of the community. Business should strive to create a diverse range of jobs for local residents, and should offer a variety of basic goods and services to help reduce interregional trips.

Pā`ia – Ha`ikū – Planned Growth Areas

Three new planned growth areas have been identified in the region: Pā`ia Expansion, Pā`ia Mauka, and Old Maui High School Campus Revitalization. Planned growth areas are depicted in Figure 8-9 and on Directed Growth Maps #N1 and #N2.

New Regional Facilities Recommended – North Maui

- Pā`ia Bypass Road
- Connect new planned growth areas to public wastewater
- North Shore preservation corridor, bikeway and pedestrian paths

It is not the intent of the RGB for agricultural subdivisions to rezone lands within the boundary to higher densities than is already permitted, but to apply a County Rural zoning district (2-, 5-, 10-acre minimum lot sizes) that reflects existing conditions or that is directed by the Community Plan. The Community Plan shall determine the appropriate densities and standards that shall apply within the Pā`ia- Ha`ikū growth boundaries. Any restrictions on agricultural activity are prohibited.

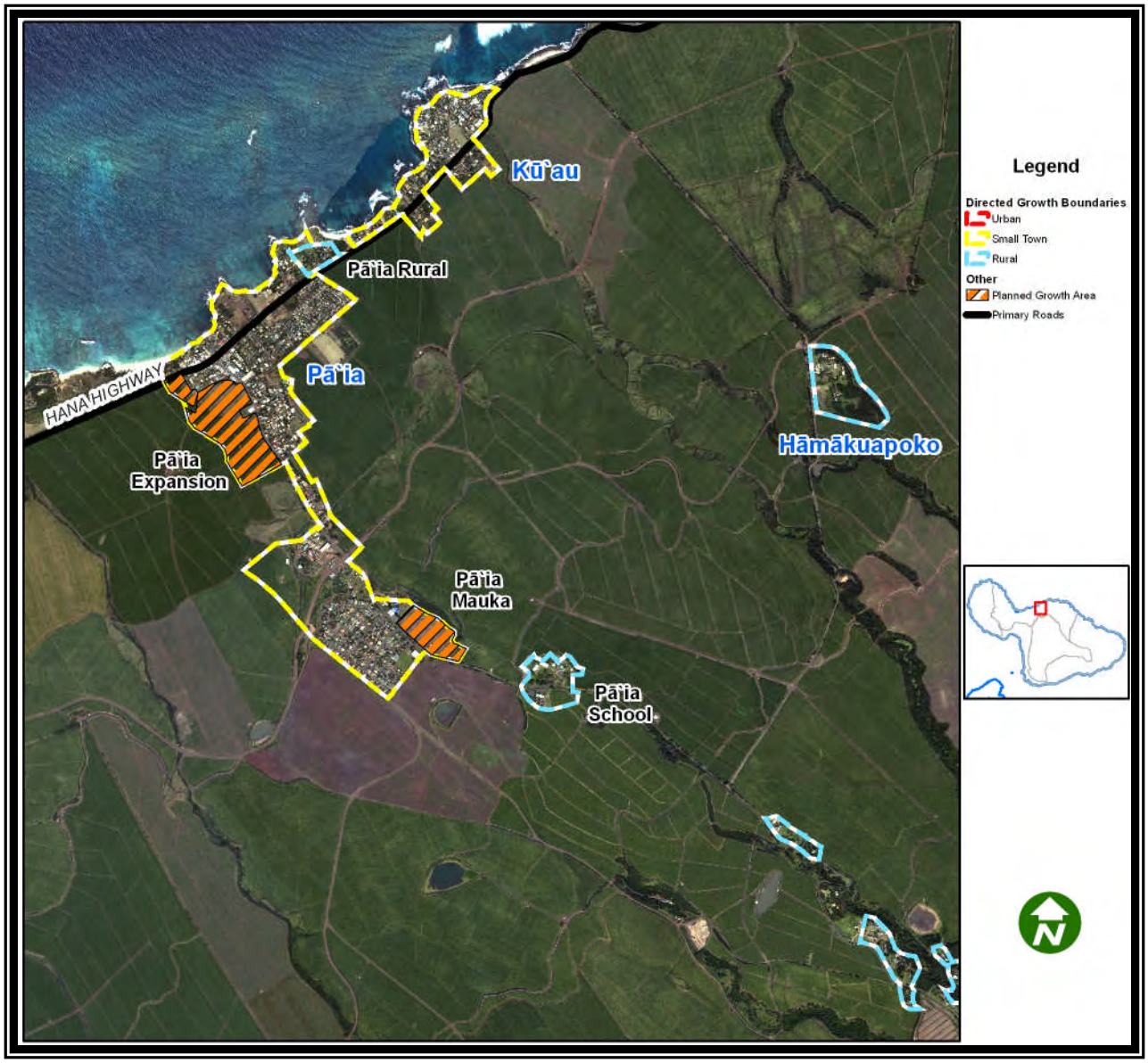


Figure 8 - 9: Pā`ia-Ha`ikū Planned Growth Areas.

Pā`ia Expansion

The Pā`ia Expansion planned growth area is approximately 41 acres and encompasses agricultural land west of Baldwin Avenue in Lower Pā`ia. The expansion is makai of the Pā`ia Post Office. The site is envisioned as a compact, mixed-use small town expansion that replicates the authentic architectural styles and design vocabulary of the business country towns of Maui.

Planned Growth Area Rationale

The Pā`ia Expansion accommodates projected growth within the Pā`ia-Ha`ikū Community Plan region with minimal impact on agricultural lands and existing infrastructure and services. Although the site is located on prime agricultural-resource land, directing regional growth to this site and requiring compact country town design will help preserve other agricultural lands and open space, and prevent the

continuation of the current trend of low-density development across the region's landscape. Additionally, urbanization of the site will provide residential housing in a location that is adjacent to Pā`ia Town's employment opportunities. The site should be developed as a dense, mixed-use expansion of the adjacent Pā`ia Town that complements the existing community. The expansion should be designed to provide multimodal connections between the existing and new community, and to other areas of the island. Development within the expansion area should include a mix of residential and commercial uses, lot sizes, and single-family and multifamily housing units. The area should also include appropriate public facilities, services, parks, a medical clinic, civic and open spaces, as well as neighborhood-serving transit stops. A hard edge will need to be maintained around the expansion to prevent urban sprawl. It will also be important to expand the study area of the existing Pā`ia-Ha`ikū Country Town Design Guidelines to include the new growth area. This will ensure that new developments complement rather than detract from Pā`ia's unique historic character. The Pā`ia Expansion planned growth area is located on Directed Growth Maps #N1 and #N2. Table 8-20 provides a summary of the planned growth area.

Table 8 - 20: Pā`ia Expansion Planned Growth Area

Background Information:			
Project Name*:* Pā`ia Expansion		Directed Growth Map #:	N1 and N2
Type of Growth: Small Town Expansion		Gross Site Acreage:	41 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approximately 207 Units[29]	Residential Product Mix:	A Balance of SF and MF units
Net Residential Density:	7-10 du/acre	Parks and Open Space%[30]	≥ 30%
		Commercial: Neighborhood Serving	

Pā`ia Mauka

The Pā`ia Mauka planned growth area is on the east side of Baldwin Avenue, mauka of the Doris Todd Memorial School campus. This 15-acre residential area is planned for an expansion of Skill Village. This growth area has a view corridor to the ocean and is directly adjacent to existing infrastructure. The Pā`ia Mauka planned growth areas is located on Directed Growth Map #N2. Table 8-21 provides a summary of the planned growth area.

Table 8 - 21: Pā`ia Mauka Planned Growth Area

Background Information:			
Project Name*:* Pā`ia Mauka Expansion		Directed Growth Map #:	N2
Type of Growth: Small Town Expansion		Gross Site Acreage:	15 Acres
Planning Guidelines			
Dwelling Unit Count:	Approximately 68 Units[31]	Residential Product Mix:	100% SF
Net Residential Density:	6-10 du/acre	Parks and Open Space%[32]	≥ 20%
		Commercial: NA	

[29] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[30] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Pā`ia - Ha`ikū Community Plan update and the project review and approval process.

[31] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[32] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Pā`ia - Ha`ikū Community Plan Update and the project review and approval process.

Old Maui High School Campus Revitalization Area

The Old Maui High School Campus Revitalization planned growth area is located in the Hāmākuapoko region. The region is comprised of fertile agricultural lands with a long history of sugarcane production. The project site is the last remaining vestige of Hāmākuapoko camp, which was once a vibrant plantation camp community. The Old Maui High School campus is comprised of three parcels totaling roughly 24 acres. The project site contains several reusable buildings, an abundance of mature landscaping, concrete walkways, open space, and approximately 15 acres of vacant land for expansion.

Planned Growth Area Rationale

Since the closure of the Old Maui High School in 1972, the campus has slowly fallen into disrepair. Efforts to restore the historic campus began in 2003 with the portion of the school designed by Charles William "C.W." Dickey, an American architect famous for developing a distinctive Hawaiian architectural style. The purpose of the planned growth area is to facilitate the preservation and rehabilitation of the site and structures at the historic school, giving the campus a new life and purpose as an educational facility. The revitalization and reuse of the Old Maui High School campus may include the development of the Patsy T. Mink Center, a youth-educational camp, an adult retreat, a conference center, a farmer's market, and campus facilities for private functions and special events. The project may also include classrooms, meeting rooms, teacher's cottages, youth-guest facilities, agricultural activities, and other similar uses.

The Old Maui High School Campus Revitalization planned rural growth area is located on Directed Growth Map #N2. Table 8-22 provides a summary of the planned rural growth area.

Table 8 - 22: Old Maui High School Campus Revitalization Planned Growth Area

Background Information:			
Project Name*:* Old Maui High School		Directed Growth Map #: N2	
Type of Growth: Rural Expansion		Gross Site Acreage: 24 Acres	
Planning Guidelines:			
Dwelling Unit Count:	N/A	Residential Product Mix:	Single Family Dwellings
Net Residential Density:	N/A	Parks and Open Space%:	N/A
		Commercial: Educational	

Pā`ia – Ha`ikū – Planned Protected Areas

The Pā`ia-Ha`ikū community plan region is known as a world class wind, kite, and wave surfing destination. Ocean sports and a string of beaches draw a large transient population to the region, infusing the community with periods of high economic activity during surfing season. Along Hāna Highway, historic Pā`ia attracts a significant visitor population for its proximity to Hāna, and its shopping and restaurants. Pā`ia is the primary small commercial town of the North Shore region. Ho`okipa Beach Park, which currently attracts professional surfing competitions, has been identified for a major expansion in the Pā`ia-Ha`ikū Community Plan. Four planned protected areas have been identified in the Pā`ia-Ha`ikū community plan region: The North Shore Preservation Corridor, the North Shore Bikeway, portions of the Upcountry Greenway, and Giggle Hill. The Upcountry Greenway is comprised of three subareas, one of which falls within the Pā`ia-Ha`ikū community plan region (see "Makawao – Pukalani – Kula Planned Protected Areas"). The North Shore Bikeway also crosses into the Wailuku-Kahului

Community plan region. A brief discussion of each of the four planned protected areas is provided below.

The North Shore Preservation Corridor

The North Shore Preservation Corridor is a protected area that encompasses a string of shoreline lands with high scenic and recreational value. The coastal preservation corridor begins at the eastern boundaries of Kanahā Pond Natural Wildlife Preserve and extends to Pa`uwela Point (see Figures 8-10a and 8-10b).

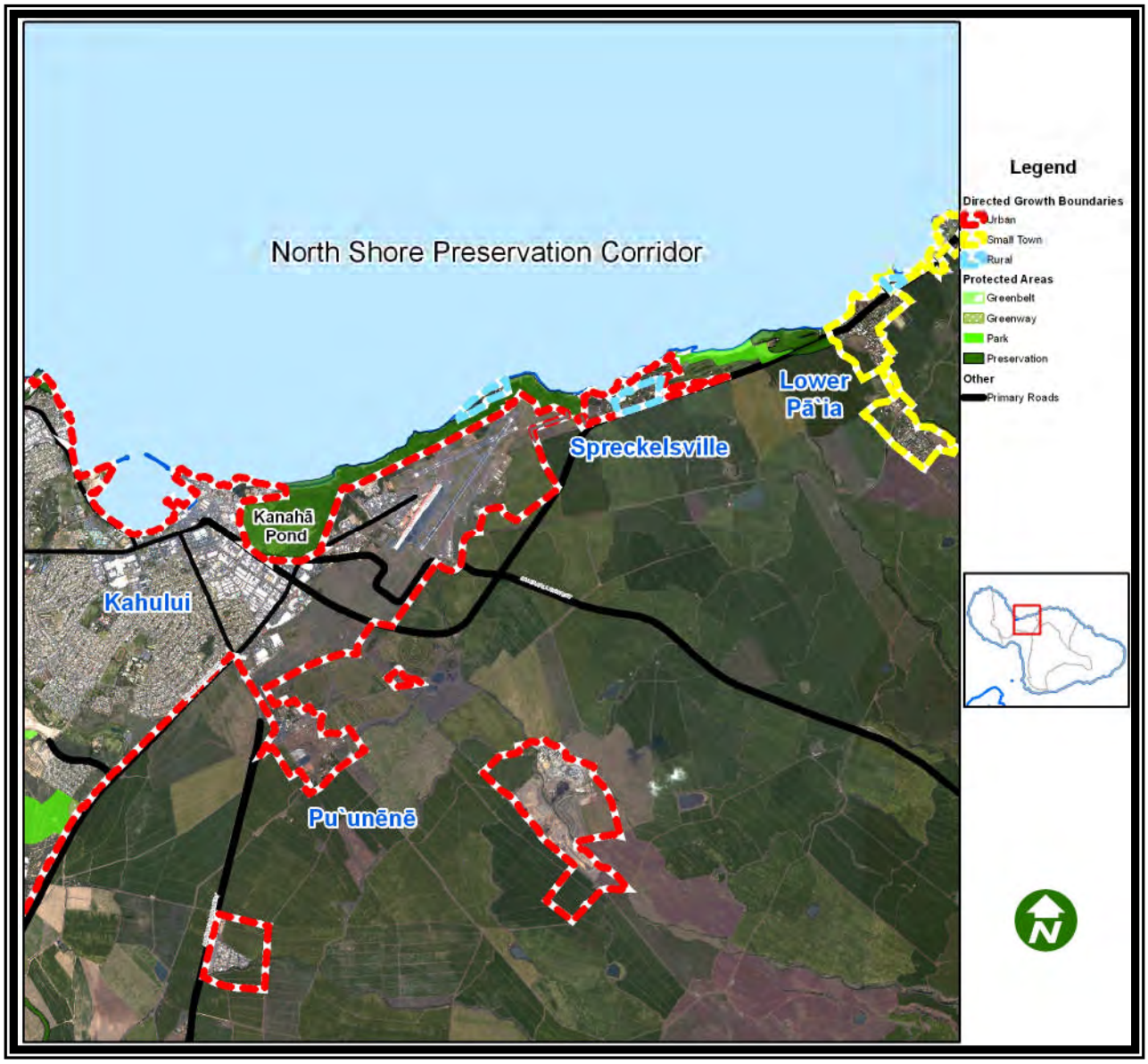


Figure 8 – 10a: North Shore Preservation Corridor.

Multiple beaches and shoreline properties are identified as part of the corridor with some inland lands also included. Numerous shoreline public access points dot the various beaches from Kanahā to the Māliko Gulch small-boat launch. The corridor also includes various isolated sites from Ho`okipa Beach Park to

Māliko Gulch, and a greenway trail from Spreckelsville to Makaiwa. The corridor also includes lands appropriate for flood control, parking, and cultural and historic interpretation.

The area will provide access to coastal lands for fishing, surfing, and swimming through multiple beach access points, and walking and biking routes. According to the North Shore Corridor Report (2006), linkages to each designated protected sub-area are intended to provide an opportunity to interpret the area's significant cultural and historic sites. The County should seek to preserve land for the establishment of a trail system along the Hāmākua Coast area, and, where possible, preserve existing sections of the Old King's Highway (Ke Ala Loa O Maui/Pi`ilani Trail). Accurate mapping of old trails and government roads for future use as public access routes will also need to be developed.

Access points to and along beaches such as Airport Beach, Baby and Baldwin Beach, Pā`ia Bay, Tavares Bay, Ho`okipa Beach Park, will be identified during the design phases.

The North Shore beaches serve thousands of residents and visitors every day. The project envisions the acquisition of shorefront sites for future parks and lands focusing on the following areas:

a. Adoption of a mauka/makai access dedication ordinance to acquire accesses through purchase, dedication, condemnation, or land exchange;
b. Development of a regional beach park between Baldwin Park and "Small Park";
c. Establishment of a community park near Ha`ikū School on Pa`uwela Road, as identified within the Community Plan map;
d. Expansion of Ho`okipa Park and the establishment of parks at Māliko Bay and Pa`uwela Point; and
e. Preservation of rodeo grounds at Māliko.

The following general planning principles shall be addressed during the design and development phases of the North Shore Preservation Corridor:

1. Access points shall be integrated with existing State and County public facilities and shall respect private property rights with consideration given to connection-point safety. In integrating access ways with existing State and County roadways, consideration shall be given to providing connection locations which facilitate greenway-system continuity.
2. The design of the greenway system should, at a minimum, maintain the existing character of the area, and address the needs of pedestrians (walkers, joggers, hikers, skaters), horseback riders, and bicyclists.
3. The definition of trail routing and alignments shall respect existing uses, existing property boundaries, manmade and natural physical barriers (i.e. fences, walls, topographic features, etc.), and conservation goals. Particular attention shall be given to the relationship between recreational uses and private property uses.
4. Shoreline resources and some inland areas shall be designated based upon their high scenic, natural resource, cultural resource, or recreational value.

The North Shore Bikeway and Upcountry Greenway System

The North Shore Bikeway is a continuous non-motorized transportation route between the coastal communities of the North Shore and Central Maui. The Bikeway serves as a recreational outlet for pedestrians, bicyclists, skaters, and other types of recreational users that is separated from the roadway, and links to various shoreline recreational resources, coastal towns, and the Upcountry Greenway system.

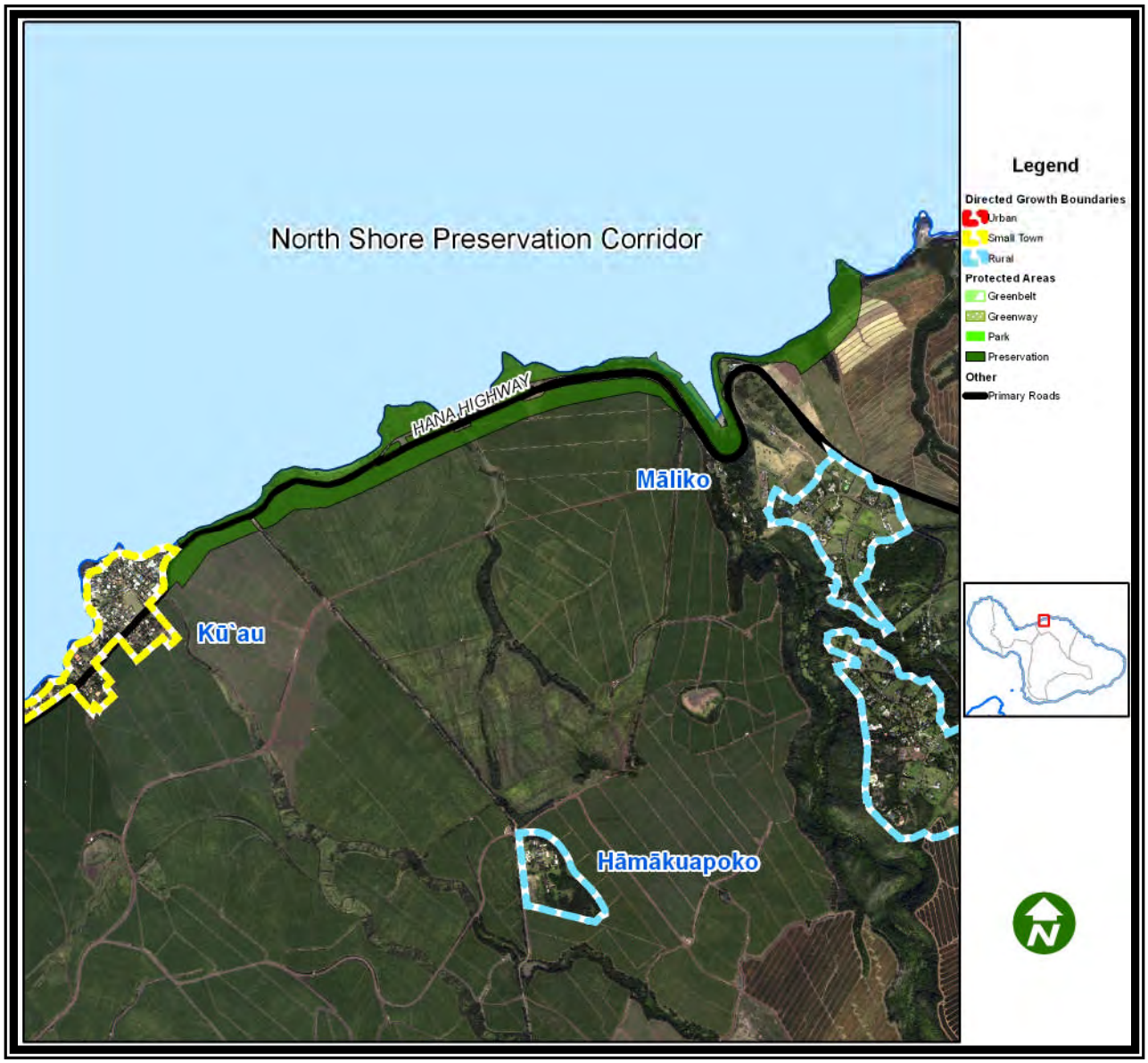


Figure 8 – 10b: North Shore Preservation Corridor.

Giggle Hill Recreational Area

Giggle Hill Recreational Area is a 95-acre regional park within the Pā`ia-Ha`ikū community plan region that encompasses the iconic Giggle Hill and provides a primary connection to the Upcountry Greenway system. It is located adjacent to the Fourth Marine Division Memorial Park, a 40-acre community park

that commemorates the site of the Fourth Marine Division camp, a military encampment that was at this location from February 1944 to November 1945. The park is used for a variety of active and passive recreational uses, including a sporting field, playgrounds, park facilities, parking, and a network of hiking and equestrian trails. Expansion of the park to include Giggle Hill will provide for public access and use of the trail system around and on top of the hill.

The Giggle Hill Recreational Area will also provide continuous non-motorized connections to the Upcountry Greenway system, which links the coastal communities of the North Shore and Upcountry. The park serves as a recreational resource for many hikers, equestrians, and other types of recreational users seeking trail systems and open-space resources that are separated from automobile roadways. Future design and planning for the area should seek to increase access for equestrians and hikers, and should maintain separation from motorized corridors as much as is practicable.

West Maui

The West Maui community plan region is somewhat isolated from the rest of the island due to topography and limited highway access. The region has the fourth largest population with over 22,000 people in 2010, and the largest visitor population. The region has four distinct sub-regions: Ukumehame, Olowalu, Lahaina, and the band of urban settlements along the shoreline from Kā`anapali to Kapalua. A brief discussion of each sub-region is provided below:

Ukumehame. Ukumehame is the southernmost settlement in the West Maui community plan region. It is a low-density agricultural subdivision that still contains vacant undeveloped lots. Today, the community consists of small agricultural lots with residential and small scale agricultural uses. The community is surrounded by fallow sugarcane fields and significant cultural resources.

Olowalu. Olowalu is north of Ukumehame in the West Maui community plan region. It is the site of an old Hawaiian settlement and the former Olowalu Sugar Company. Today the community is very small, consisting of limited commercial services and sparse residential uses. The community is surrounded by fallow sugarcane fields and significant cultural resources.

Lahaina. Lahaina Town serves as the region's visitor, service, commercial, and residential center. The area is rich with history and culture, and possesses a unique character and charm that draws residents and visitors alike. Urban development exists along the coastline and also extends mauka along Lahainaluna Road. Fallow sugarcane fields lie to the north and south of Lahaina town.

**Kā`anapali to Kapalua.** North of Lahaina is a band of urban settlement encompassing the communities of Kā`anapali, Kahana, Honokōwai, Nāpili, and Kapalua. The majority of the development in this sub-region is centered on the visitor industry, although limited resident housing does exist. The settlements are primarily along the shoreline with some development mauka of Honoapi`ilani Highway.

CHALLENGES AND OPPORTUNITIES

Major land use challenges and opportunities in the West Maui community plan region include:

Regional Isolation

West Maui is one of the fastest growing regions on Maui and is geographically isolated from the rest of the island. Honoapi`ilani Highway is currently the primary regional transportation corridor that connects West Maui to the rest of the island. During emergencies, traffic conditions are exacerbated and residents can become dangerously cut off from the rest of the island.

Self-Sufficiency

West Maui's visitor industry is a significant source of jobs and economic activity. Although West Maui contains large employment centers in Kapalua, Ka`anapali, Lahaina, and dispersed job opportunities in Kahana and Napili, the region lacks housing for employees. As the region grows, there is an opportunity to develop workforce housing and services near existing employment centers to create more self-sufficient and sustainable communities. Furthermore, the development of regional services and public facilities, such as a community hospital, would make the entire region more self-sufficient. This strategy should reduce the need for many interregional trips and provide convenience to the local residents.

Auto-Dependency and Traffic Congestion

The West Maui community plan region is a predominantly linear community dependent on one major highway. Resident and visitor population growth have surpassed the capacity of the Honoapi`ilani Highway, and traffic congestion has become an everyday problem. The Lahaina Bypass project and the realignment of the highway South of Lahaina Town (in accordance with the *Pali to Puamana Parkway Master Plan*) is necessary to alleviate this congestion, accommodate future growth, and mitigate the impact of flooding and erosion on the highway. Highway realignment also presents an important opportunity to create recreational and open space on the makai side of the highway. Efforts should also be made to increase the number of intraregional transportation linkages to increase mobility. Additional pedestrian and bike pathways, traffic calming measures, as well as public transit access are also needed to provide alternative mobility options and decrease dependency on the automobile.

Tsunami, Sea Level Rise and Fire Hazards

Tsunami, sea-level rise, and fire hazards also pose a significant threat in West Maui. Miles of developed coastline lie within the tsunami inundation zone and in the path of sea-level rise. Moving development away from these threats will be a significant challenge, particularly in the resort areas. Several times a year, forest and brush fires block highway access to the region, and threaten lives and property.

Inadequate Infrastructure

Inadequate infrastructure is a major land use problem in West Maui. Infrastructure improvements are not occurring concurrent with new development, which stresses existing public systems and services and decreases the quality of life in the region.

Loss of Agricultural Land and Open Space

With the closure of Pioneer Mill and Maui Pineapple Company, West Maui has vast acres of vacant agricultural land that are proposed for development. Agricultural land and open space are important to the region's visitor industry, and they are vital components of maintaining separation between West Maui's individual communities. Agricultural lands and natural features, such as gulches, should be used as boundaries between communities to prevent urban sprawl mauka of the existing Honoapi`ilani Highway.

Lack of Affordable Resident

Offshore buyers are a predominant force in the West Maui housing market. Affordable resident housing is scarce, leaving local families with limited housing options and long commutes to employment. Future growth in the region should be in locations conducive to providing affordable housing, and should offer a mix of housing types within close proximity to commercial services, public facilities, employment opportunities and transit.

Housing

The coastline that stretches along West Maui is famous for its white sandy beaches and scenic beauty. The last five decades have brought rapid growth and development to the region, particularly near the shoreline. This development has generated nonpoint source pollution that has degraded the region's coral reefs, fish stocks, and water quality.

Impact of Development on Marine and Shoreline Resources

There are limited development possibilities in the narrow stretch of land that surrounds the West Maui Mountains. This, combined with the inclination to build close to the shoreline, has caused a great deal of grading and paving near environmentally-sensitive shoreline areas. Unfortunately, past construction projects have resulted in the runoff of sedimentation, fertilizers, and stormwater into the area's nearshore waters. Future planned projects risk committing the same detrimental mistake.

As the population has increased, so has the number of people who spend leisure time snorkeling, boating, surfing, fishing, and swimming in the area's marine environment. The increased use of the area along with development-related nonpoint source pollution, has stressed some of the healthiest reefs left on the island.

Protection of Important Historic Landmarks and Resources

Lahaina contains a rich history and many historically significant resources deserving protection. Lahaina was established as the first capital of the Kingdom of Hawai'i circa 1798 by Kamehameha I and remained so through 1846 when it was moved to Honolulu by Kamehameha III. The site of the royal compound was Moku`ula. West Maui contains many other significant resources, including Maui County Historic Districts 1 and 2 and the Lahaina National Historic Landmark District. These and other resources are currently at risk due to neglect, inaccurate restorations, and demolitions. The County would benefit by increased efforts to protect and preserve West Maui's living and historic resources.

West Maui – Planned Growth Areas

According to the Land Use Forecast, approximately 4,000 additional residential units are needed to accommodate projected growth in the West Maui region. Seven planned growth areas have been identified within the region; Kā`anapali Town, Lahaina Town North, Lahaina Infill, Lahaina Town South, Kahoma Infill, Makila, and Olowalu Town. Planned growth areas in West Maui are depicted on Figures 8-11, 8-12, and 8-13 and on Directed Growth Maps #W2, W3, and W4.

New Regional Facilities Recommended – West Maui

- Lahaina bypass
- Honoapi`ilani Highway (Pali to Mā`alaea) bypass
- Honoapi`ilani Highway Realignment (Pali to Puamana Parkway)
- Lahaina Flood Control Project
- Move fire station
- New police station
- Recycling center
- Elementary and intermediate schools
- Cemetery
- Regional park
- Lahaina Harbor Improvements
- Additional park and ride facilities
- Expanded transit service
- West Maui acute care hospital
- Wastewater reuse
- Cesspool retirement – connection to sewer
- West Maui Watershed Restoration Project

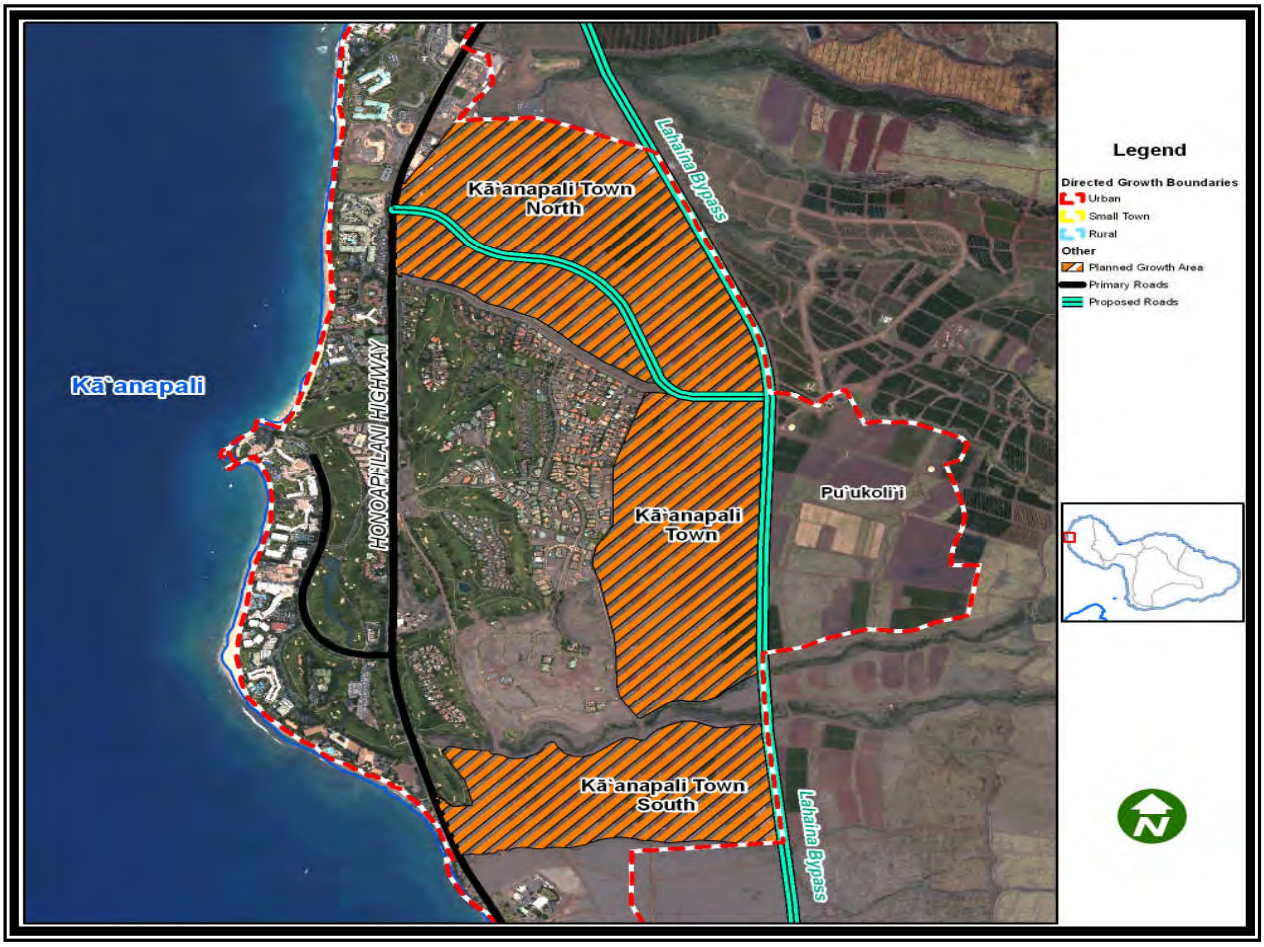


Figure 8 - 11: Kā`anapali Town – Planned Growth Area.

Except as otherwise provided for this region, it is not the intent of the RGBs for agricultural subdivisions to rezone lands within the boundary to higher densities than is already permitted, but to apply a County Rural zoning district (2-, 5-, 10-acre minimum lot sizes) that reflects existing conditions or that is directed by the Community Plan. The Community Plan shall determine the appropriate densities and standards to apply within the West Maui RGBs. Any restrictions on agricultural activity are prohibited.

Kā`anapali Town

Located on the mauka side of the Kā`anapali Resort and Golf Course, Kā`anapali Town consists of the Kā`anapali 2020 planned development located between the Lahaina Civic Center at the south end of the planned growth area and the Honokōwai Gulch on the north end of the planned growth area. The growth area follows the proposed West Maui Highway Realignment transit corridor on the mauka slope up to the Pu`ukoli`i Village area and Kā`anapali Coffee Farms.

Planned Growth Area Rationale

Kā`anapali Town consists of three distinct pieces: lower North Honokōwai, lower East Honokōwai, and lower South Honokōwai. The Kā`anapali Town planned growth area is 840 acres. Kā`anapali Town is intended to be a self-sufficient community with a relatively even split of single-family and multifamily dwelling units, commercial uses, an interconnected network of parks and open spaces, schools and other

public facilities. A network of trails and bikeways will integrate Kā`anapali Town with Kā`anapali Resort and the Pu`ukoli`i Village community. The north piece may contain an acute-care facility. The northern portion has a proposed veterans' memorial cemetery. The project is intended to provide an opportunity for more resident housing in close proximity to employment at Kā`anapali Resort. Due to existing traffic congestion in West Maui, improvements to the regional highway system are needed to accommodate the population at Kā`anapali Town. The existing highway and implementation of the proposed Lahaina Bypass will provide transportation connectivity and hard edges to contain the planned growth area. Table 8-23 provides planning standards and guidelines for this planned growth area.

The Kā`anapali Town planned growth area is depicted on Figure 8-11 and on Directed Growth Map #W2.

Table 8-23 provides a summary of the planned growth area:

Table 8 - 23: Kā`anapali Town Planned Growth Area

Background Information:			
Project Name*:*	Kā`anapali Town	Directed Growth Map #:	W2
Type of Growth:	Urban Expansion	Gross Site Acreage:	840 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approximately 1,800 Units[33]	Residential Product Mix:	Balance of SF and MF units
Net Residential Density:	6-9 du/acre	Parks and Open Space%[34]:	≥ 25%
		Commercial: Convenience Shopping; Region Serving	

Lahaina Town North

Lahaina Town North is a portion of the master planned project known as "Villages of Leiali`i". Lahaina Town North is a moderate-sized urban expansion located north of Lahaina Town. It is a Hawai`i Housing Finance Development Corporation (HHFDC) project. The planned growth area is intended to be compact, and contain a mix of uses, and have a relatively even split of single-family and multifamily housing units.

Planned Growth Area Rationale

Lahaina Town North is a logical expansion of the existing Lahaina community. Being an HHFDC project with a mix of housing types and moderate single-family lot sizes, the project will address the need for additional affordable resident housing in West Maui in close proximity to Lahaina's employment opportunities. The project should include a mix of land uses, park land, and open space, and will be proximate to public facilities such as the Lahaina Civic Center. Thus, the project is intended to evolve into a livable community based on sustainable land use planning. The Lahaina Town North planned growth area is depicted on Figure 8-12, and on Directed Growth Map #W2 and W3. Table 8-24 provides a summary of the planned growth area**:**

Table 8-24: Lahaina Town North

[33] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[34] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the West Maui Community Plan update and the project review and approval process.

Background Information:			
Project Name:	Lahaina Town North	Directed Growth Map #:	W2 and W3
Type of Growth:	Urban Expansion	Gross Site Acreage:	245 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approximately 1200 Units[35]	Residential Product Mix:	Balance of SF and M units
Net Residential Density	10-12 du/acre	Parks and Open Space%[36]:	≥ 30%
		Commercial:	Convenience Shopping

Lahaina Infill

The Lahaina Infill planned growth area is approximately 22 acres and is bounded by Kahoma Stream, Front Street, Kenui Street, and Honoapi`ilani Highway. It is an infill site that will contain a mixture of single-family and multifamily residential units, and parks and open space.

Planned Growth Area Rationale

The Lahaina Infill project provides an efficient use of vacant land within Lahaina's urban area. The project takes advantage of existing infrastructure and does not expand Lahaina's urban boundary. The Lahaina Infill site will have single-family and multifamily residential uses and park land to service the new and existing community. Innovative site planning shall be incorporated into the housing project to create a compact and walkable community. Creating a pedestrian-friendly project with transit access points should be a priority to meet senior citizen needs. The Lahaina Infill planned growth area is depicted on Figure 8-12 and on Directed Growth Map #W3. Table 8-25 provides a summary of the project.

Table 8 - 25: Lahaina Infill Planned Growth Area

Background Information:			
Project Name:	Lahaina Infill	Directed Growth Map #:	W3
Type of Growth:	Urban Infill	Gross Site Acreage:	22 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approx. 214 Units[37]	Residential Product Mix:	Balance of SF / MF units
Net Residential Density:	13-20 du/acre	Parks and Open Space%[38]	+/– 2 acres
		Commercial:	N/A

Lahaina Town South

[35] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[36] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the West Maui Community Plan Update and the project review and approval process.

[37] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[38] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the West Maui Community Plan Update and the project review and approval process.

The Lahaina Town South planned growth area is located mauka of Honoapi`ilani Highway, surrounding the Lahaina Aquatic and Recreation Center. The development will be a compact, mixed-use urban expansion with approximately 1,100 residential units.

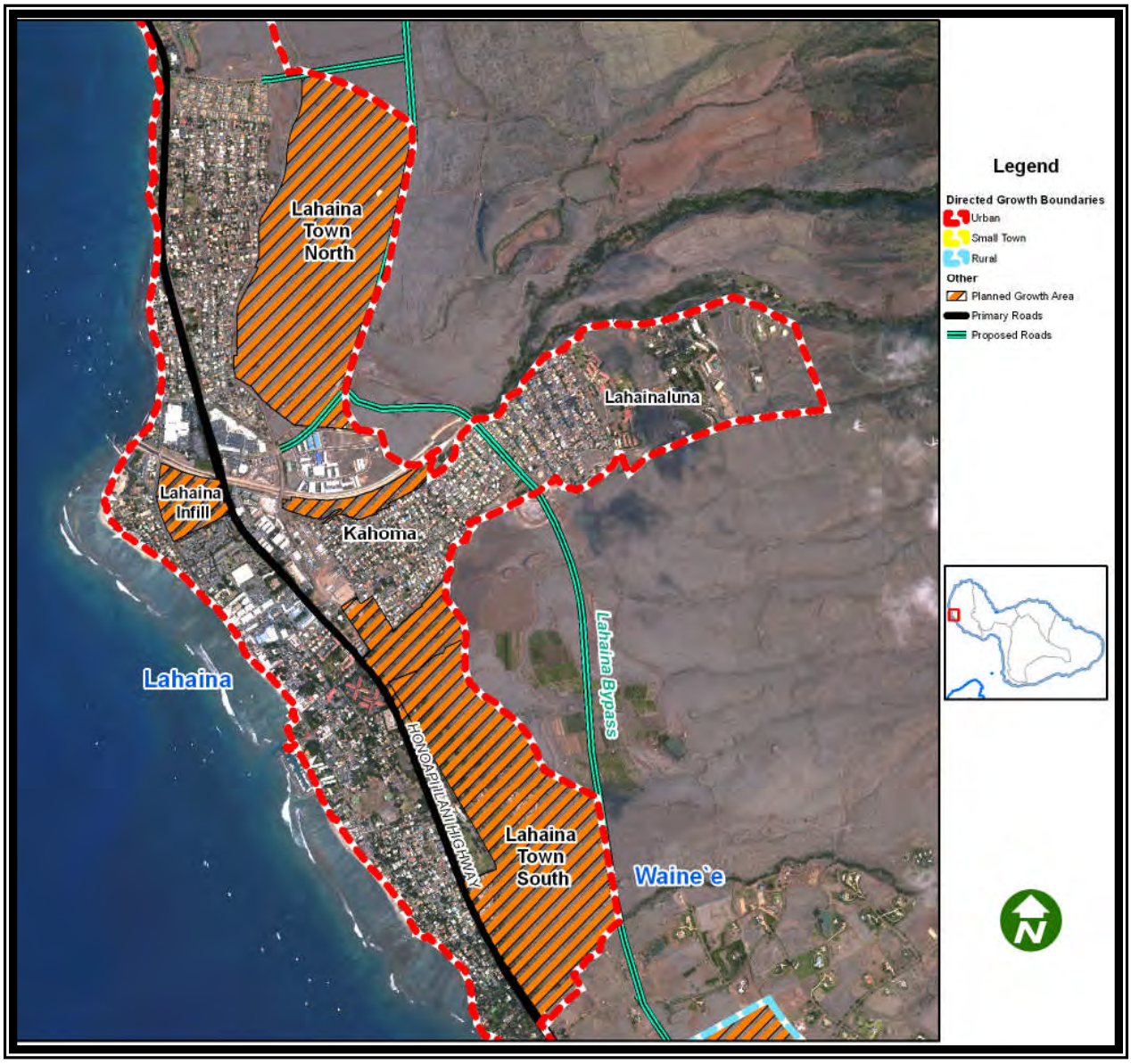


Figure 8 - 12: Lahaina Town North – Planned Growth Area.

Planned Growth Area Rationale

The site is contiguous with Lahaina Town and is a logical area for urban expansion to accommodate growth to 2030. The site is approximately 269 acres and is close to existing public facilities and infrastructure and West Maui employment. The planned growth area will provide a mix of commercial uses, housing types, and lot sizes. Given the growth area location and characteristics, it is likely to provide housing for Maui residents rather than off-island second home buyers. There should be a sufficient proportion of multi-family units developed to meet local needs.

Due to the existing traffic congestion in Lahaina Town, it will be paramount to ensure adequate highway access and develop multi-modal transportation options. The proposed Lahaina Bypass realignment should be completed prior to the growth site's build-out. Highway improvements should respect the surrounding land uses, view corridors and environmental conditions as much as possible. The Lahaina Town South planned growth area is depicted on Figure 8-12 and on Directed Growth Map #W3. Table 8-26 provides a summary of the project.

Table 8 - 26: Lahaina Town South Planned Growth Area

Background Information:			
Project Name:	Lahaina Town South	Directed Growth Map #:	W3
Type of Growth:	Urban Expansion	Gross Site Acreage:	269 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approximately 1,100 Units[39]	Residential Product Mix:	Mix of SF and MF
Net Residential Density:	10-12 du/acre	Parks and Open Space%[40]:	≥ 20%
		Commercial:	Convenience Shopping

Kahoma Infill

The Kahoma Infill planned growth area is bordered by Honoapi`ilani Highway at the west bottom of the hill makai of the stormwater diversion structure. The project is an affordable housing project on approximately 18 acres.

Planned Growth Area Rationale

The Kahoma Infill planned growth area is intended to meet the needs of Maui residents and is surrounded by previously developed lands. Greenways are planned for the area and should include a bike trail and linkages to Lahaina Town. An open-space buffer is planned to accommodate a stormwater diversion structure. Table 8-27 provides a summary of the project. The Kahoma Infill planned growth area is depicted on Figure 8-12 and on Directed Growth Map #W3.

[39] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[40] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the West Maui Community Plan update and the project review and approval process.

Table 8 - 27: Kahoma Planned Growth Area

Background Information:			
Project Name:	Kahoma Infill	Directed Growth Map #:	W3
Type of Growth:	Urban Infill	Gross Site Acreage:	18 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approximately 68 Units[41]	Residential Product Mix:	100% SF
Net Residential Density:	7-10 du/acre	Parks and Open Space[42]:	NA
		Commercial: NA	

Makila

The Makila planned rural growth area is located east of Lahaina Town on the mauka side of Honoapi`ilani Highway. The rural project shall be developed using a CSD plan that is intended to preserve open space; maximize the efficient use of infrastructure; and protect natural, agricultural, and scenic resources. The CSD plan shall cluster development within portion(s) of the site to keep the remainder of the land undeveloped and protected. The project may include limited neighborhood facilities and services to support the Makila community. The site is surrounded by agricultural lands.

Planned Growth Area Rationale

The Makila project is a rural subdivision adjacent to agricultural subdivisions that have occurred in and around Launiupoko. Linkages should be developed between the Makila project and neighboring communities including Launiupoko and Lahaina Town. An emphasis should be placed on providing safe pedestrian pathways and supporting regional-greenway systems. A 500-foot greenbelt shall be provided along the makai side of the project to ensure an open space buffer within the growth area and between the Honoapi`ilani Highway Bypass and future rural development. The project should utilize Low Impact Development techniques, such as drainage sedimentation control systems, to mitigate the potential for flooding makai of the project and to prevent nonpoint source pollution from entering coastal waters. The Makila planned growth area is depicted on Figure 8-13 and Directed Growth Map #W3. Table 8-28 provides a summary of the planned growth area.

Table 8 - 28: Makila Planned Growth Area

Background Information:			
Project Name:	Makila	Directed Growth Map #:	W3
Type of Growth:	Rural Growth	Gross Site Acreage:	270 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approximately 200 Units[43]	Residential Product Mix:	SF – CSD
Net Residential Density:	1-2 du/acre	Parks and Open Space%[44]:	≥ 50%
		Commercial: Neighborhood Serving	

[41] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[42] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the West Maui Community Plan Update and the project review and approval process.

[43] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[44] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the West Maui Community Plan Update and the project review and approval process.

Olowalu Town

The Olowalu Town planned growth area is located approximately four miles south of Lahaina Town on the southwestern foothills of the West Maui Mountains. Olowalu is rich in cultural, scenic, natural, and marine resources. The area's coral reefs are among the healthiest in the main Hawaiian Islands. Olowalu is known for its small plantation village environs, supported by small neighborhood-commercial uses along Honoapi`ilani Highway with convenient access to the ocean.

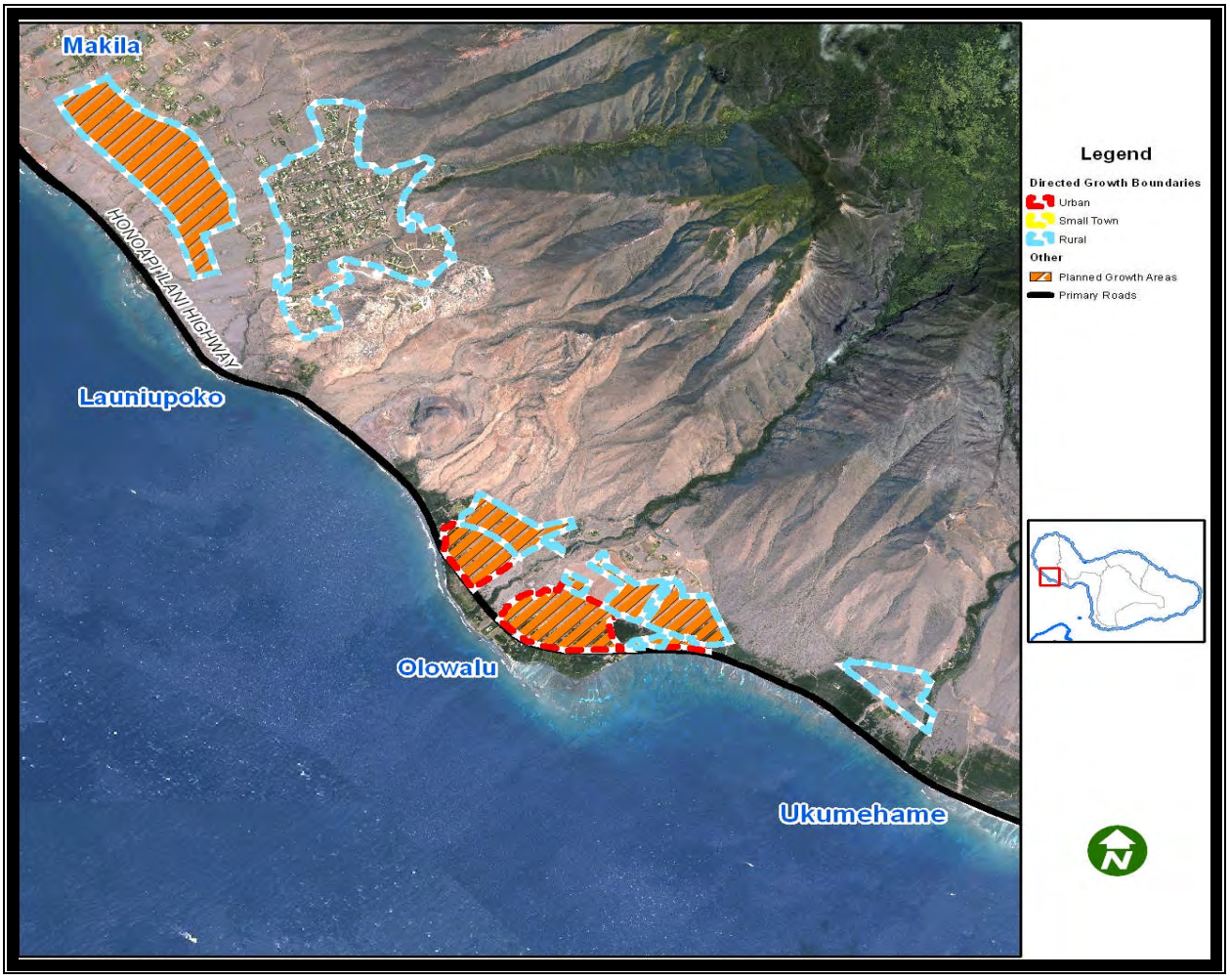


Figure 8-13: Olowalu Town – Planned Growth Area.

Planned Growth Area Rationale

The project is intended to meet the needs of Maui residents as a revitalized and sustainable Olowalu community. Olowalu Town will provide housing, employment, recreational, and cultural opportunities in the context of a mixed-use sustainable community that preserves the area's natural, cultural, and historic resources. Olowalu Town is envisioned as a pedestrian-friendly community that integrates a variety of housing types with employment opportunities, commercial, and recreational uses developed concurrently with public services and infrastructure.

Olowalu Town will be designed to recognize and perpetuate the land and resource management system of ahupua`a. As such, the town will provide public access between the ocean and the mountains; protect the natural environment, particularly Olowalu Stream, the shoreline, and coral reefs and marine resources; preserve mauka and makai view corridors; and perpetuate the Olowalu Cultural Reserve. Table 8-29 provides a summary of the Olowalu Town planned growth area.

Table 8 - 29: Olowalu Town Planned Growth Area

Background Information:			
Project Name:	Olowalu Town	Directed Growth Map #:	W4[45]
Type of Growth:	New Town	Gross Site Acreage:	613 Acres
Planning Guidelines:			
Dwelling Unit Count:	Approx. 1,500 Units[46]	Residential Product Mix:	Balance of SF and MF
Net Residential Density:	8-12 du/acre	Parks and Open Space[47]:	≥ 30%
		Commercial:	Convenience Shopping; Region Serving

West Maui – Planned Protected Areas

The West Maui community plan region has the fourth largest population with over 22,000 people in 2010, and the largest visitor population. The region contains Kā`anapali and Lahaina, which draws large numbers of tourists to its historic districts, particularly on days when cruise ships anchor off of the Lahaina Harbor. Since the closing of the Pioneer Mill, agricultural activities have declined and the conversion of agricultural land to residential uses has dramatically increased. Many cherished open-space landscapes are currently at risk of being lost forever to real estate development. A brief discussion of each protected area is provided below. Two planned protected areas have been identified within the region:

Figure 8-14: Moku`ula, Loko o Mokuhinia Preservation Area.

[45] The future delineation of potential urban growth areas makai of the existing Honoapiilani Highway may be undertaken in conjunction with updates or amendments to the West Maui Community Plan. Such delineation may consider the need to: protect adjacent coastal and marine ecosystems (including the reefs at Olowalu), enhance public shoreline access and open space, and implement the proposed Pali to Puamana Parkway plan.

[46] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

[47] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the West Maui Community Plan Update and the project review and approval process.

Moku`ula Preservation Area and the Pali to Puamana Parkway.

Moku`ula, Loko o Mokuhinia

The Moku`ula, Loko o Mokuhinia Preservation Area is envisioned as an environmental and cultural restoration project that will reconstruct the royal compound and "redevelop the site as a cultural park/preserve." The site is located on Front Street in Lahaina Historic District No. 1 and is proximate to the commercial core of Lahaina Town (see Figure 8-14). The project will include restoration of the wetland, including indigenous plants, and reconstruction of the buildings that originally comprised the royal compound. The rebuilding of Moku'ula and the restoration of the freshwater pond called Loko o Mokuhinia that surrounded the island, will provide Maui with an opportunity to learn about Hawaiian spirituality, values, ancient technology and traditions, and will perpetuate a renewed appreciation for indigenous culture. The restoration of the property will also represent an important contribution to the Lahaina National Historic Landmark, because it will be the largest historical site in the district when completed.

Moku`ula was an island sited on a 7-acre, spring-fed freshwater pond called Loko o Mokuhinia. It was established sometime in the 1500s by Pi`ilani (1570-1600) as a royal compound from which he ruled a unified Kingdom of Maui. It served as a political and religious center from ancient times in Hawai`i through the emergence of the ancient Maui Kingdom, the unification of the islands, the introduction of Christianity, and the period when Lahaina was the capital of the Hawaiian Kingdom. This sacred island was also the home of King Kamehameha III from 1837 to 1845, who resided in the hale pili and in other structures that were a part of the royal compound on Moku`ula. A coral block palace called Hale Piula was erected for him fronting the beach, makai of Moku`ula. The pond, royal taro patches near the beach, a pond on Chapel Street, and the entire site was buried in 1916 when Loko o Mokuhinia was filled in by Pioneer Mill Company.

For many Native Hawaiians, Lahaina remains a sacred place because of Moku`ula. It is considered an axis mundi (the point between heaven and earth) of the Hawaiian world where political rule and religious ritual operated in concert. The mauka portion of the site, consisting of roughly 4.7 acres, is used as Malu `Ulu `Olele Park. The 1.8-acre makai property adjacent to the ocean encompasses the existing Kamehameha Iki Park. Both parks are under the management of the County of Maui, Parks and Recreation Department.

Pali to Puamana Parkway

The Pali to Puamana Parkway is envisioned as a series of passive and active recreational areas that tie together the existing beach parks between Pāpalaua Wayside Park and Puamana Beach Park (see Figure 8-15). The creation of this eight mile long coastal park and open space resource is a byproduct of a visionary effort to realign the Honoapi`ilani Highway inland. Honoapi`ilani Highway is the principal link between the west side of Maui and the rest of the island. Honoapi`ilani Highway traverses through the ahupua`a of (east to west) Ukumehame, Olowalu, and Launiupoko. At Launiupoko, the realigned highway will join with the proposed Lahaina Bypass. The total distance of the proposed re-alignment is 8 miles. The West Maui Community Plan (1996) stipulates that the Honoapi`ilani Highway shall be relocated south of Puamana to reduce potential inundation and disruption of service due to storm-generated wave action. Where the highway is relocated, lands makai of the new alignment will be designated Open Space or Park. The Open Space and Park portions of the project will include a mix of beach park amenities, camping, passive recreational areas, and pedestrian and bicycle facilities. The specific alignment of the new highway corridor shown in Figure 8-15 (Pali to Puamana Parkway) will be finalized through environmental review processes administered by the State of Hawai`i Department of Transportation in consultation with the County. Thus, the route shown on Figure 8-15 may be adjusted.

Furthermore, it is anticipated that the final route of the Lahaina By-Pass Phase 1B-2 will be accommodated within the area designated as Park on Diagram WC-1 (Lahaina-Central), south of Kai Hele Ku Street to the vicinity of the former Olowalu landfill. The Park designation shall not apply to the final route selected for the Lahaina Bypass Phase 1B-2.

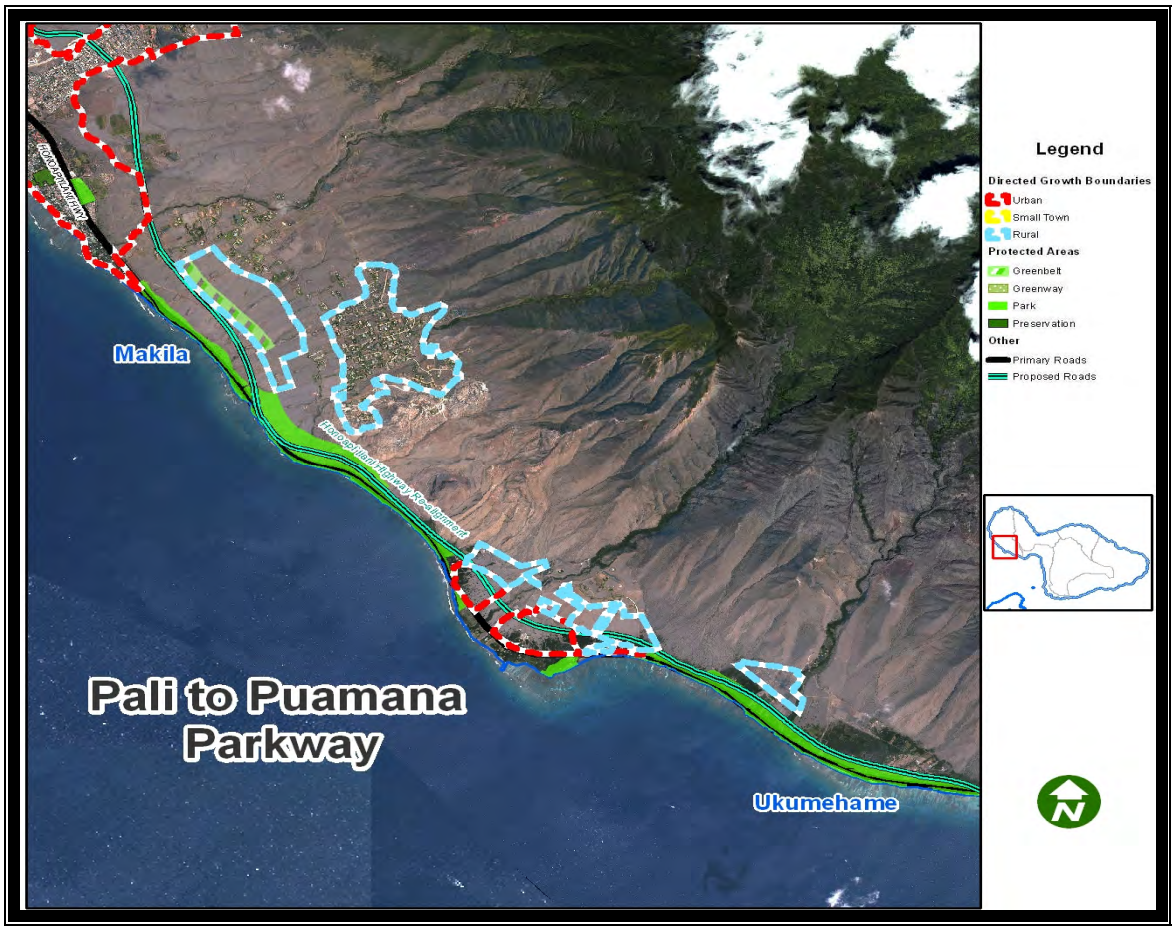


Figure 8-15: Pali to Puamana Parkway.

Hāna

The Hāna community plan region encompasses the eastern-most area of the island. The boundary of the region, from the northern shoreline of Makaiwa Bay, runs mauka along `O`opuloa and Waikamoi Streams, then along the boundaries of Haleakalā National Park and the Kahikinui Forest Reserve and finally makai along the boundary between Auahi and Kanaio to Kanaloa point on the southern shoreline of the region. The region is rich in natural, scenic and cultural resources. Of Hawai`i's rare, threatened and endangered species, one third are found only on Maui, and many of them within the Hāna community plan region. Some of the most intact and extensive native forests left in Hawai`i today occur in the East Maui watershed.[48]

The population of the community plan region was 2,291 in 2010, but the area's population is expected to grow to nearly 2,800 by 2030. This represents an average annual growth rate of 1.5 percent.

[48] Myers, R.L., and Cory, C., Gon III, S. (August 1997). *Monitoring Strangers in Paradise: A Multi-Scale Study of Native Hawaiian Rainforest.*

Hāna Town is located on the easternmost shoreline of Maui, and the region includes the dispersed small rural settlements of Ko`olau, Hāna, Kīpahulu and Kaupō. A brief discussion of each of these sub-regions is provided below.

**Ko`olau.** Located at the northern portion of East Maui, this area experiences significant rainfall and its many streams provide water for the taro growers of Ke`anae and Wailua. Taro lo`i blanket the region, and many are still in active cultivation. There are 20 recorded heiau in Ko`olau.

Hāna. Hāna is steeped in legend and was a major center of population and political power in ancient Hawai`i. Plantation sugar was cultivated here through the mid-twentieth century, destroying many traditional structures. The ruggedness of the land and the persistence of a large Hawaiian population have contributed to significant preservation efforts. Hāna has 32 recorded heiau, including Pi`ilani Hale, the largest heiau in the state.

Kīpahulu. Kīpahulu also experienced plantation agriculture for a period of approximately 40 years during which countless taro terraces, traditional housing sites and heiau were destroyed. However, at least six heiau still exist and others are still intact in the more rugged areas not suitable for cane production.

Kaupō. Kaupō supported a large population before an earthquake modified the hydrology and altered springs that once provided irrigation to Manawainui and Naholoku. Numerous agricultural terraces and traditional housing sites are spread throughout the landscape. Lo`alo`a heiau is a National Landmark, one of 30 heiau in the district.

CHALLENGES AND OPPORTUNITIES

The Hāna community plan region has several key land use issues which must be considered when planning future development in the region. Some issues apply to the region as a whole while others are specific to a sub-region. The major land use challenges, or threats, and opportunities include:

The Protection and Preservation of Cultural Resources

Protecting the vast array of cultural resources in the Hāna District is important to not only the people of Hāna, but to the entire Island of Maui and the Hawaiian people. The district's historic sites provide evidence of Hāna's history and serve as tools for conveying the heritage of the region to its youth as a legacy for the future. Great care must be given to ensure that future development is done in a culturally sensitive manner. The Hāna Belt Road, designated as a National Historic District, is one such resource deserving protection.

Environmental Protection

The Hāna region's native rainforests are among the most imperiled in the world. The forests that remain contain a high concentration of threatened and endangered species and are in serious danger of being destroyed by introduced feral animals and aggressive weeds. Habitat destruction is considered the most pressing threat facing the region in terms of minimizing species loss. Native plants and animals are vulnerable to displacement by alien species invasions.[49] Recognizing that many residents depend upon the region's natural environment, it is essential to ensure the sustainability of these resources as well as the Hawaiian lifestyle of the area's residents. Through

[49] Myers, R.L., and Cory, C., Gon III, S. (August 1997). *Monitoring Strangers in Paradise: A Multi-Scale Study of Native Hawaiian Rainforest.*

respect for and proper management of Hāna's natural resources, future generations of residents and visitors will continue to enjoy all that makes Hāna – "Hāna."

Lack of Defined Town Core Hāna Town has a small handful of neighborhood serving commercial areas and public facilities that cater to local residents and visitors. Tourists traveling along the Hāna Highway, often stop along their way to Hāna Town and again within Hāna Town, for goods and supplies. Most civic activity occurs in and around the town's focal points (i.e., Hāna Bay). If supported by the community, the town could identify additional opportunities for public spaces, civic centers, and commercial areas. This would provide residents with more opportunities for interaction and commerce.

Affordable Housing Opportunities Hāna has felt significant pressure and competition from the offshore housing market. This pressure has had significant social and cultural impacts, and has created an affordable housing problem for the area's residents. Identification of affordable housing solutions to meet the needs of existing and future residents is a fundamental community need.

Develop Future Economic Opportunities The relative isolation of Hāna from the rest of the island has created significant constraints to meaningful employment opportunities for area residents. It will be a significant challenge to diversify and grow the region's economy while ensuring such growth doesn't compromise the area's rural character and treasured resources.

Hāna Affordable Residential

The Hāna Affordable Residential planned growth area is located mauka of the Hāna Highway at the forked intersection of Uakea Road and Hāna Highway. The area is bounded by Agricultural, Single-Family, and Public/Quasi-Public Community Plan designations. The first phase of the project is 15 acres and is currently designated Single-Family within the Hāna Community Plan. The precise boundaries and location can be determined during the Hāna Community Plan update, or in coordination with the community, and the project review and approval process. At full build-out, the development will be comprised of approximately 200 affordable residential units and community facilities.

Planned Growth Area Rationale

The Hāna Affordable Residential planned growth area is intended to meet the needs of Hāna's residents. Although the Land Use Forecast (2006) indicates that the Hāna region has available supply of buildable vacant lands in agricultural and rural subdivisions, as well as significant areas of vacant planned single-family residential lands, the price of these potential housing units may not be affordable to the community. The project is intended to meet Hāna's affordable housing needs.

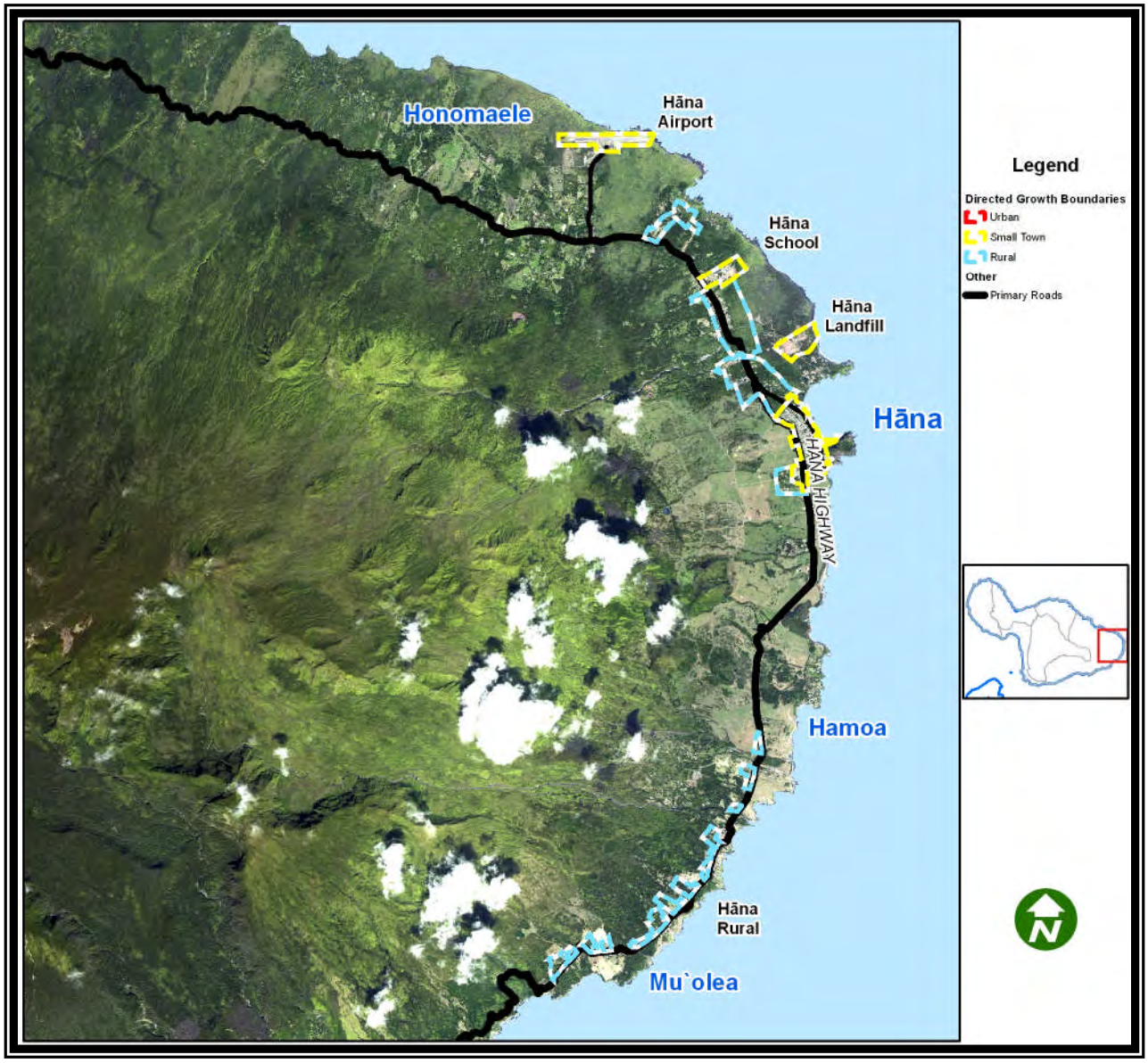


Figure 8-16: Hāna – Planned Rural Growth Area.

East Maui – Planned Protected Area

The Hāna region contains the island's largest inventory of environmentally and culturally intact resources. Many rich and diverse ecosystems thrive in East Maui. The 51-mile scenic route along Hāna Highway enjoys a reputation as one of the world's ultimate driving tours. While en route to Hāna Town, visitors enjoy spectacular vistas and verdant landscapes, and historic landmarks. A brief discussion of the protected area is provided below.

One planned protected area has been identified within the region: the Hāna Belt Road.

Hāna Belt Road

The Hāna Belt Road encompasses portions of Hāna Highway that retain the greatest historic integrity and character. This section of the roadway, beginning at Huelo and extending to Kīpahulu, is relatively unaltered and is the most spectacular portion of Maui's historic belt road system both in its scenery and its historic character. The protected area will duplicate the boundaries of the 1999 National Register of Historic Places district and National Millennium Legacy Trail. The Hāna Highway includes the highest concentration of stylistically consistent historic bridges in the State of Hawai`i built from circa 1900 to 1947. The boundaries of the protected area are coterminous with its historic right-of-way. The right-of-way varies but is approximately 40 feet wide for the portion of the road under the jurisdiction of the State of Hawai`i. The historic district begins near Mile Marker 3 on the Hāna Highway, State Route 360, near Huelo, and ends on the south end of Koukou`ai Bridge near Kīpahulu on Route 31.

Chapter 9: Monitoring and Evaluation

A single day of freezing weather is not enough to create three feet of ice.
~ Chinese Proverb

Agricultural Fields of the Central Plains.

The Maui Island Plan is just that – a plan of action. It rests with all of us to see that we travel the long road ahead with our vision lighting the way, and our every step along the path monitored and evaluated to ensure we are moving ever closer to our ultimate goal. For that we need predesigned and designated measurement tools. We need prearranged benchmarks to test the effectiveness of our actions. We need courage to move forward into the future, we need commitment to hold to our values, and we need the patience to wait for the fruits of our labor. This Chapter outlines a comprehensive strategy to monitor the attainment of the MIP's goals and objectives, moving us ever closer to our vision of the future.

How will we know if quality of life is improving on Maui? Some actions proposed will have perceivable impacts in the short term, while others will take much longer to develop, fund, and implement. The Monitoring and Evaluation Program described in this chapter establishes a strategy to track the implementation, evaluate the effectiveness of policies and programs, monitor the quality of life on Maui, and allow for periodic program adjustments. This strategy includes establishing and monitoring performance indicators to help implementing agencies attain planned outcomes.

The MIP's indicators provide the foundation for the Monitoring and Evaluation Program. Specific benchmarks should be used to measure progress in the implementation of MIP policies and actions. Physical, environmental, cultural, and socio-economic indicators are used to assess the overall quality-of-life on Maui.

The Department of Planning will oversee the Monitoring and Evaluation Program, which will include the preparation of the Monitoring Report. The Department may modify or add indicators, as needed, to track the impacts of plan implementation. The Department will prepare a monitoring report to report on the progress of plan implementation and provide a portrait of the quality of life on Maui.

Agricultural fields near Pukalani.

Benchmarks to Measure Progress

Benchmarks will be developed for major proposed programs and actions such as the TDR/PDR program, updating the 1984 Cultural Resources Management Plan for Maui, and amending the County Zoning Code. Benchmarks are established targets that track the phases of implementation and should be clear, realistic, include a time element, and be measurable, if possible. For example, benchmarks for the TDR/PDR program might include: 1) Fully implement TDR/PDR program by 2010; 2) 1,000 acres of prime agricultural resource land preserved in perpetuity by 2015; and 3) 5,000 acres of prime agricultural resource land preserved in perpetuity by 2030.

The Department of Planning will coordinate with the appropriate agencies and program specialists to establish benchmarks for major programs and initiatives. The benchmarks will be set following adoption of the MIP; analysis of the benchmarks will be provided in the Monitoring Report. This analysis will reveal whether benchmarks are being exceeded, attained, or not being met. Periodic monitoring provides the opportunity to consider the need for new or revised strategies or implementation measures. Benchmarks may also be revised as necessary in response to periodic program evaluations.

Quality of Life Indicators

The Department of Planning will monitor a core set of indicators. Table 9-1 includes a core set of 36 indicators that could be used to monitor progress toward achieving the goals and objectives of the MIP. Many indicators identified in this plan have been borrowed from existing plans, programs and reports, and are based on available and reliable data to ensure their usefulness throughout the planning horizon. However, they can be modified and updated as new data becomes available.

Pāpalaua Beach, Lahaina.

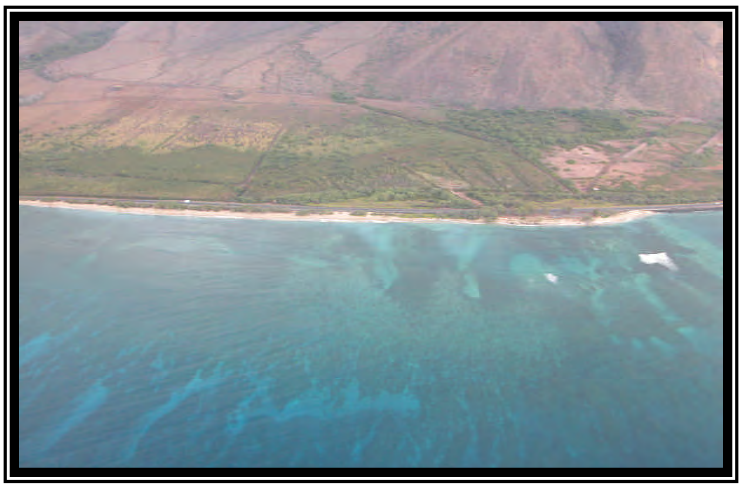
Furthermore, the quality of life indicators are intended to represent a range of measurements across the various chapters of the MIP. The indicators are regional in nature to focus on the island as a whole, rather than individual communities. Where possible, commonly used indicators have been chosen in order to facilitate comparisons between Maui and other jurisdictions. The indicators are grouped by the following three thematic areas and nine categories:

Built Environment	Social Environment	Natural Environment
• Land Use • Infrastructure and Public Facilities • Transportation	• Cultural Heritage Resources • Economic Development • Population	• Watershed Systems • Marine Environment • Wildlife and Natural Areas

These core indicators not only provide a snapshot of the quality of life on Maui, but also track the progress of key issues that the MIP intends to address. Table 9-2 articulates how the indicators relate to the MIP goals and details appropriate sources of data.

Monitoring and Evaluation Program Management

The Monitoring and Evaluation Program is a comprehensive and dynamic tool designed to track plan implementation throughout the 2030 planning horizon. Active and ongoing management of the program is essential for ensuring its usefulness and success. The Department of Planning will manage and update the Monitoring and Evaluation Program and initiate adjustments to the program as needed.



Coral reef at Ukumehame.

Monitoring Report

The Department of Planning will complete the Monitoring Report, which will report on the established quality of life indicators and the status of implementing MIP programs against established benchmarks. The report will discuss the significance and findings of each indicator and will address emerging indicator trends to provide a snapshot of the quality of life on Maui.

Paniolos herding cattle at Thompson Ranch, Keokea.

The report will document the changes in the core indicators, provide analysis as to the observable trends, and assess the progress towards the plan's goals. In this report, core indicators can be augmented by additional data and indicators. An example is Indicator 15, which tracks "Dollars Spent per day per Visitor"; this can be used to assess the economic value of tourism and can be supplemented by data on Hotel Occupancy Rates, the total number of Hotel Rooms, Time Shares, Vacation Rental Condos, and Bed and Breakfast accommodations. In addition, the report will examine the progress made on the various benchmarks. Comparing actual achievements with established milestones will help in determining whether community desires are being attained, exceeded, or not being met within the established timeframe. It is intended that the General Plan Monitoring Report serve as a "report card" for plan implementation and identify successes, weaknesses, and strategies for improvement.

Table 9 – 1: Core Indicators

BUILT ENVIRONMENT INDICATORS	
LAND USE	
1	Building Permits issued inside UGB vs. outside UGB
2	Average Density of new developments
3	% of Infill vs. Greenfield development
4	Housing affordability index
TRANSPORTATION	
5	Vehicle Miles Travelled (VMT)
6	Commute mode shares
7	Annual Transit Ridership
8	Total Mileage of dedicated bike lanes
INFRASTRUCTURE	
9	Percentage of waste that is recycled
10	Parks and Open Space per 1000/population
11	% of energy consumption by source of production
12	Energy consumption per capita
SOCIAL ENVIRONMENT INDICATORS	
ECONOMIC DEVELOPMENT	
13	Cost of Living Index
14	Value of Agricultural Production
15	$ spent per day per visitor
16	% of Fruit and Vegetables consumed that are grown on Maui
POPULATION / COMMUNITY	
17	Unemployment rate
18	Poverty rate
19	College bound rate
20	Prevalence of overweight and obese adults
CULTURAL HERITAGE	
21	Course enrollment in Hawaiian Language programs
22	Tons of Taro grown and sold
23	# of new designated heritage and cultural sites
24	Scenic Roadways – total miles
NATURAL ENVIRONMENT INDICATORS	
WATERSHED SYSTEMS	
25	% of streams on monitoring list
26	Reclaimed water use
27	Watershed health
28	Drinking water quality
OCEAN / MARINE ENVIRONMENT	
29	Coastal water quality
30	% of healthy coral reefs
31	# of Shoreline postings (beach closures due to pollution)
32	Amount of reef fish biomass
WILDLIFE AND NATURAL AREAS	
33	# of Threatened and endangered species
34	Acres of Protected and Conservation lands
35	Air Quality Index
36	Habitat Fragmentation

Table 9 – 2: MIP Performance and Quality of Life Indicators : Goals Association and Potential Data Sources

	Built Environment Indicators	***Goal Association***	***Data Sources***
	LAND USE		
1	Building Permits issued inside UGB vs. outside UGB	Protect Agricultural Land, Make Livable Communities	County of Maui Planning Dept.
2	Avg. Density of new developments	Make walkable communities, increase housing affordability	County of Maui Planning Dept.
3	% of Infill vs. Greenfield development	Create compact, efficient, human scale communities	County of Maui Planning Dept.
4	Housing affordability index	Increase housing affordability	NAR methodology, UHERO, County Data Book
	TRANSPORTATION		
5	Vehicle Miles Travelled	Reduce fossil fuel consumption	County Data Book / HI DOT (Highways Div., Planning Branch)
6	Commute mode shares	Provide transportation options, reduce fossil fuel consumption	State DOT
7	Annual Transit Ridership	Provide integrated transit systems	Maui County DOT
8	Total Mileage of dedicated bike lanes	Provide a multi-modal transportation system	HI DOT bike master plan
	INFRASTRUCTURE		
9	Percentage of waste that is recycled	Minimize solid waste, divert solid waste to recycling	County of Maui Environmental Management
10	Parks and Open Space per 1000/population	Expand opportunities for recreation, provide public amenities at LOS standards	County of Maui Dept. of Parks
11	% of energy consumption by source	Reduce fossil fuel consumption, increase use of renewable energy	DBEDT
12	Energy consumption per capita	Sustainable development indicator, reduce fossil fuel consumption	DBEDT

Table 9 – 2: MIP Performance and Quality of Life Indicators : Goals Association and Potential Data Sources

	Social Environment indicators	*Goal Association*	*Data Sources*
	ECONOMIC DEVELOPMENT		
13	Cost of Living Index	Quality of life indicator	County of Maui data book
14	Value of Agricultural Production	Maintain AG's share of island economy	UHERO
15	$ spent per day per visitor	Increase financial contribution of tourism	DBEDT
16	% of Fruit and Vegetables consumed that are grown on Maui	Increase locally grown food, decrease imported food	Dept. of Agriculture - State of Hawai`i / UH College of Tropical Agriculture
	POPULATION / COMMUNITY		
17	Unemployment rate	Quality of life indicator	UHERO > U.S. Dept. of Labor, Bureau of Labor Statistics
18	Poverty rate	Quality of life indicator	US Census Community Survey via DBEDT
19	College bound rate	Increase post-secondary education	Kids Count Data Centre, Annie E. Casey Foundation
20	Prevalence of overweight and obese adults	Quality of life indicator	CDC / NIH
	CULTURAL HERITAGE		
21	Enrollment in Hawaiian Language courses	Healthy + vibrant Island culture	Dept. of Education, State of Hawai`i
22	Tons of Taro grown and sold	Healthy + vibrant Island culture, local traditions	County of Maui data book
23	# of new designated heritage / cultural sites	Protection of cultural resources	HI State DLNR, Preservation Div.
24	Miles of Scenic Roadways + # of Scenic Vistas	Protect + enhance scenic vistas	County of Maui

Table 9 – 2: MIP Performance and Quality of Life Indicators : Goals Association and Potential Data Sources

	Natural Environment indicators	*Goal Association*	*Data Sources*
	WATERSHED SYSTEMS		
25	% of streams on monitoring list	Enhance the functioning + vitality of streams	HI, DOH, Environmental Planning Office
26	Reclaimed water use	Decrease pollution , sustainability indicator	County of Maui Department of Water Supply
27	Watershed health	Protect + enhance native eco-systems	DLNR, University of Hawai`i, Pacific Neon
28	Drinking water quality	Increase water quality, basic quality of life	County of Maui Department of Water Supply
	OCEAN / MARINE ENVIRONMENT		
29	Coastal water quality	Decrease pollution	HI, DOH, Clean Water Branch
30	% of healthy coral reefs	Improve reef health	Division of Aquatic Resources, Dept. of Land and Natural Resources, HI
31	# of Shoreline postings (i.e. beach closures due to pollution)	Decrease pollution	HI, DOH, Clean Water Branch
32	Amount of reef fish biomass	Increase reef health, preserve biodiversity	Division of Aquatic Resources, Dept. of Land and Natural Resources, HI
	WILDLIFE AND NATURAL AREAS		
33	# of Threatened and endangered species	Preserve biodiversity	US Fish + Wildlife Service
34	Acres of Protected and conservation lands	Protect sensitive lands	County of Maui
35	Air Quality Index	Quality of life indicator	US EPA, Air Quality Index Report
36	Habitat Fragmentation	Protect natural ecosystems	

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Steve Brinkman Photography: I-9.

Tony Martie: 2-2; 2-3; I-8; 6-1.

Erratum

Chapter 4

There is one footnote incorrectly numbered on page 4-12 as number "4", which should be number "5". Thus, there are two non-sequential footnotes in Chapter 4 with different references on pages 4-4 and 4-12. Both footnotes refer to the correct reference in the body of the document and in the Works Cited section. We have not renumbered the footnotes accordingly in the Maui Island Plan March 2013 publication.

On p. 4-4:
[4] Hawai`i Tourism Authority (2006). *Maui County Tourism Strategic Plan: 2006-2015*. (p. 4-4)

On p. 4-12:
[4] Chris Hart & Partners (September 2006). *General Plan 2030, Maui Island Plan, Maui Island History: Lessons from the Past – A Guide to the Future.* (p. 4-12)

Chapter 8

There is one footnote incorrectly numbered on page 8-31 as number "14", which should be number "15". Thus, there are two non-sequential footnotes in Chapter 8 with different references on pages 8-29 and 8-31. Both footnotes refer to the correct reference in the body of the document. We have not renumbered the footnotes accordingly in the Maui Island Plan March 2013 publication.

On p. 8-29:
[14] The distinct boundaries of the parks and open space, specific location of the recreational uses, and the precise amenities will be further defined during the Kīhei – Mākena Community Plan Update and the project review and approval process.

On p. 8-31:
[14] Additional units may be permitted through a transfer of development rights program or to provide affordable housing in excess of what is required by law. Unit counts may be further defined through the entitlement process in response to infrastructure and environmental constraints.

Photo Credits

Several photographs were credited incorrectly in the Photo Credits section. The following are complete lists that amend errors found in these four sources:

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Simone Bosco: I-1; 2-8; 2-9; 2-10; 2-15; 2-20; 2-34; 4-27; 5-1; 5-4; 6-38; 6-46; 7-5; 7-13; 7-17; 8-1; 9-1.

Tony Martie: I-8; 2-2; 2-3; 2-43; 4-3; 6-1.

APPENDIX A

Glossary

Archaeological District - A place or group of physical sites in which evidence of past human activity, either prehistoric or at least fifty years of age, has been designated for preservation, research, or both.

Beach Nourishment - A technique used to restore an eroding beach or to create a new sandy shoreline by placing sand fill, with or without supporting structures, along the shoreline to widen the beach.

Buffer - Generally refers to the designated area around a land use or geographic feature, deliberately left in a specific condition, typically to protect a natural resource, mitigate development impacts, or protect the character or a community.

Class 'A', low-silt sand - Coarse sand with no silt.

Community Development Corporation - A broad term referring to not-for-profit organizations incorporated to provide programs and offer services that often focus on serving lower-income residents or struggling neighborhoods.

Community Facilities Districts - A special district that can issue tax-exempt bonds for the planning, design, acquisition, construction, and/or operation of infrastructure or public facilities.

Comprehensive Long Range Multi-modal Plan – A plan that provides a framework to guide transportation decisions and investments that enhance the economy, support local communities, and protects the natural/man-made environment. The plan also addresses the mobility of people, goods, services, and information across all transportation modes, including biking, walking, driving, transit, railway, ferries, ships, aviation, and electronic communications.

Conservation Easement – A legal mechanism whereby a landowner retains ownership of his land, but grants some right(s), which stipulate that the described land will remain in its natural state and preclude future or additional development. Conservation easements are typically used for the preservation of open space, environmentally sensitive areas, scenic views, wetland buffers, and agricultural land.

Conservation Subdivision Design – An approach to laying out subdivisions so that a significant percentage of buildable lands are permanently protected in such a manner as to create interconnected networks of conservation lands. This approach is distinct from clustering and planned unit development in terms of the higher open space ratios and conscious design to forge community-wide networks of open space. Conservation subdivisions are generally density-neutral, meaning that the overall number of dwellings built is not different from that done in conventional developments.

Cultural Impact Assessment - A report documenting cultural values, materials, and associations related to an area or a resource. A cultural impact assessment provides an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.

Cultural Landscape Report - A report that analyzes the history and integrity of a cultural landscape, including any proposed changes to its geographical context, features, materials, and use.

Design Guidelines - A set of guidelines or parameters to be followed in a site or building design and development.

Development - Any of the uses, activities, or operations on land or in or under water that are included below:

(1) Placement or erection of any solid material or any gaseous, liquid, solid, or thermal waste;
(2) Grading, removing, dredging, mining, or extraction of any materials;
(3) Change in the density or intensity of use of land, including but not limited to the division or subdivision of land;
(4) Change in the intensity of use of water, ecology related thereto, or of access thereto; and
(5) Construction, reconstruction, demolition, or alteration of the size of any structure.

"Development" does not include the following:

(1) Construction of a single-family residence that is not part of a larger development;
(2) Repair or maintenance of roads and highways within existing rights-of-way;
(3) Routine maintenance dredging of existing streams, channels, and drainage ways;
(4) Repair and maintenance of underground utility lines, including but not limited to water, sewer, power, and telephone and minor appurtenant structures such as pad mounted transformers and sewer pump stations;
(5) Zoning variances, except for height, density, parking, and shoreline setback;
(6) Repair, maintenance, or interior alterations to existing structures;
(7) Demolition or removal of structures, except those structures located on any historic site as designated in national or state registers;
(8) Use of any land for the purpose of cultivating, planting, growing, and harvesting plants, crops, trees, and other agricultural, horticultural, or forestry products or animal husbandry, or aquaculture or mariculture of plants or animals, or other agricultural purposes;
(9) Transfer of title to land;
(10) Creation or termination of easements, covenants, or other rights in structures or land;
(11) Subdivision of land into lots greater than twenty acres in size;
(12) Subdivision of a parcel of land into four or fewer parcels when no associated construction activities are proposed; provided that any land which is so subdivided shall not thereafter qualify for this exception with respect to any subsequent subdivision of any of the resulting parcels;
(13) Installation of underground utility lines and appurtenant aboveground fixtures less than four feet in height along existing corridors;
(14) Structural and nonstructural improvements to existing single-family residences, where otherwise permissible;
(15) Nonstructural improvements to existing commercial structures; and
(16) Construction, installation, maintenance, repair, and replacement of civil defense warning or signal devices and sirens.

Endangered Species - A species or ecosystem that is so reduced or delicate that it is threatened with, or on the verge of, extinction.

Greenbelts – An extensive area of largely undeveloped or sparsely occupied land established along natural corridors to protect environmental resources and to separate distinct communities. Greenbelts may include accessory structures and ancillary uses consistent with the purpose and intent of the greenbelt area.

Greenway – Typically a long, narrow piece of land, often times used for recreation, pedestrian, and bicycle traffic. Greenways can include community gardens and can be used to link community

amenities (e.g. parks, shoreline). Greenways may include accessory structures and ancillary uses consistent with the purpose and intent of the greenway area.

Heritage Area - A designated area where natural, cultural, historical and scenic resources combine to form a cohesive and distinct landscape arising from patterns of human activity shaped by geography. The focus of the designation is on the protection and conservation of critical resources including the natural, cultural, historical, and scenic resources that uniquely identify an area and give a community a sense of place. Areas typically have the following characteristics:

(1) Contains an outstanding example of a particular type of resource;
(2) Possesses exceptional value or quality in illustrating or interpreting the natural or cultural themes of the Island's heritage;
(3) Offers superlative opportunities for recreation, public use, and enjoyment or for scientific study; and
(4) Retains a high degree of integrity as a true, accurate and relatively unaltered example of a resource.

Heritage Area Plan - A plan that documents the history, significance, and treatment of a heritage area; the plan includes detailed guidelines and recommendations for the protection of the environmental and cultural integrity of a designated heritage area.

Infill Development – Development of land that is largely vacant or underutilized within areas that are already largely developed.

Jobs/Housing Balance - The ratio of jobs to households when both the type (such as single family, multi-family, rental) and quantity of housing opportunities match the job opportunities within an area.

Level-of-service Standards - Measures of the amount and/or quality of a public facility or infrastructure that must be provided to meet a community's basic needs and expectations. Level-of-service standards measures are typically quantitative and are expressed as ratios of facility capacity to demand by existing and projected future users. Level-of-service standards measures the size, amount, capacity, or quality of the capital facility.

Linkage - A physical or economic concept pertaining to the time and distance between land use and support facilities, or between people and their activities.

Livable Community - An urban, suburban, rural, or neighborhood community that:

(1) Provides safe and reliable transportation choices;
(2) Provides some affordable, energy-efficient, and location-efficient housing choices for people of all ages, incomes, races, and ethnicities;
(3) Supports, revitalizes, and encourages the growth of existing communities and maximizes the cost effectiveness of existing infrastructure;
(4) Promotes economic development and economic competitiveness;
(5) Preserves the environment and natural resources;
(6) Protects agricultural land, rural land, and green spaces; and
(7) Supports public health and improves the quality of life for residents of and workers in the community.

Long Term Care Home – A variety of homes, dwellings, and buildings ranging from traditional nursing homes to buildings that provide home-like environments on a twenty-four-hour basis to

persons who need constant care and supervision. Long term care homes include, but are not limited to, care homes, foster homes, assisted living, and nursing homes.

Low Impact Development - An approach to land development or re-development that incorporates a suite of landscaping and design techniques known as "better site design" that attempts to maintain the natural, pre-development hydrology of a site and the surrounding watershed. Low impact development also integrates a range of structural best management practices for road design and storm water and wastewater management systems that minimize environmental impacts.

Marine Life Conservation Districts - A type of marine managed area; usually prohibits or only allows for limited fishing and other consumptive uses.

Marine Managed Area / Marine Protected Areas - Any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural or cultural resources contained therein.

Native Species - A species that occurs naturally in an area and is not introduced.

New Towns - A form of urban development designed as a unified concept of sufficient scale to provide its residents with a full range, or substantial range, of necessary land uses, public facilities, services, and employment opportunities. New towns typically include multiple pedestrian neighborhoods and they have a substantial employment base with a regional commercial or civic focus.

New Urbanism - The process of reintegrating the components of modern life, such as housing, workplace, shopping, and recreation, into compact, pedestrian-friendly, and mixed-use neighborhoods linked by transit and set in a larger regional open space framework.

Overlay District - An area where certain additional requirements are superimposed upon a base zoning district or underlying district and where the requirements of the base or underlying district may or may not be altered.

Productive Agricultural Land – Land that is capable of supporting sustained high yields of agriculture when treated and managed according to accepted farming methods and technology.

Pyramid Zoning - A zoning scheme that allows lower, less intense uses, such as residences, to be located in higher, more intensive zoning districts, such as commercial or industrial.

Resort Destination Area - One of the planned resort destination areas of Kā`anapali, Kapalua, Mākena, and Wailea, which is intended as a major tourist destination area, consistent with the general and community plans.

Threatened Species - A species likely to become endangered if limiting factors are not reversed.

Transfer of Development Rights - A program that can relocate potential development from areas where proposed land use or environmental impacts are considered undesirable to another site chosen on the basis of its ability to accommodate additional units of development beyond that for which it was zoned, with minimal environmental, social, and aesthetic impacts.

Transportation Demand Management - Various strategies that change travel behavior to increase transport system efficiency and achieve specific planning objectives.

Transportation Impact Fees - Charges assessed by local governments against new development projects to recover the cost incurred by government in providing the public facilities required to serve this new development. Impact fees are only used to fund facilities (e.g., roads, bus stops, transit centers) that are directly associated with the new development.

Transportation System Management - Transportation strategies designed to improve both the movement of people and goods and the operational efficiency of the existing transportation system at minimal cost.

Urban Expansion – New growth areas typically located at the edge of an existing community and often include urban uses, such as housing, commercial, retail, or recreational uses.

Wetland - Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Wildland – An area or region where the habitat remains in a natural state due to the minimization or prohibition of development and human activities that would alter the landscape and potentially harm the species that rely on the health of the ecosystem.

Xeriscaping - The practice of using native species and hardscape materials to create low-water-use landscaping.