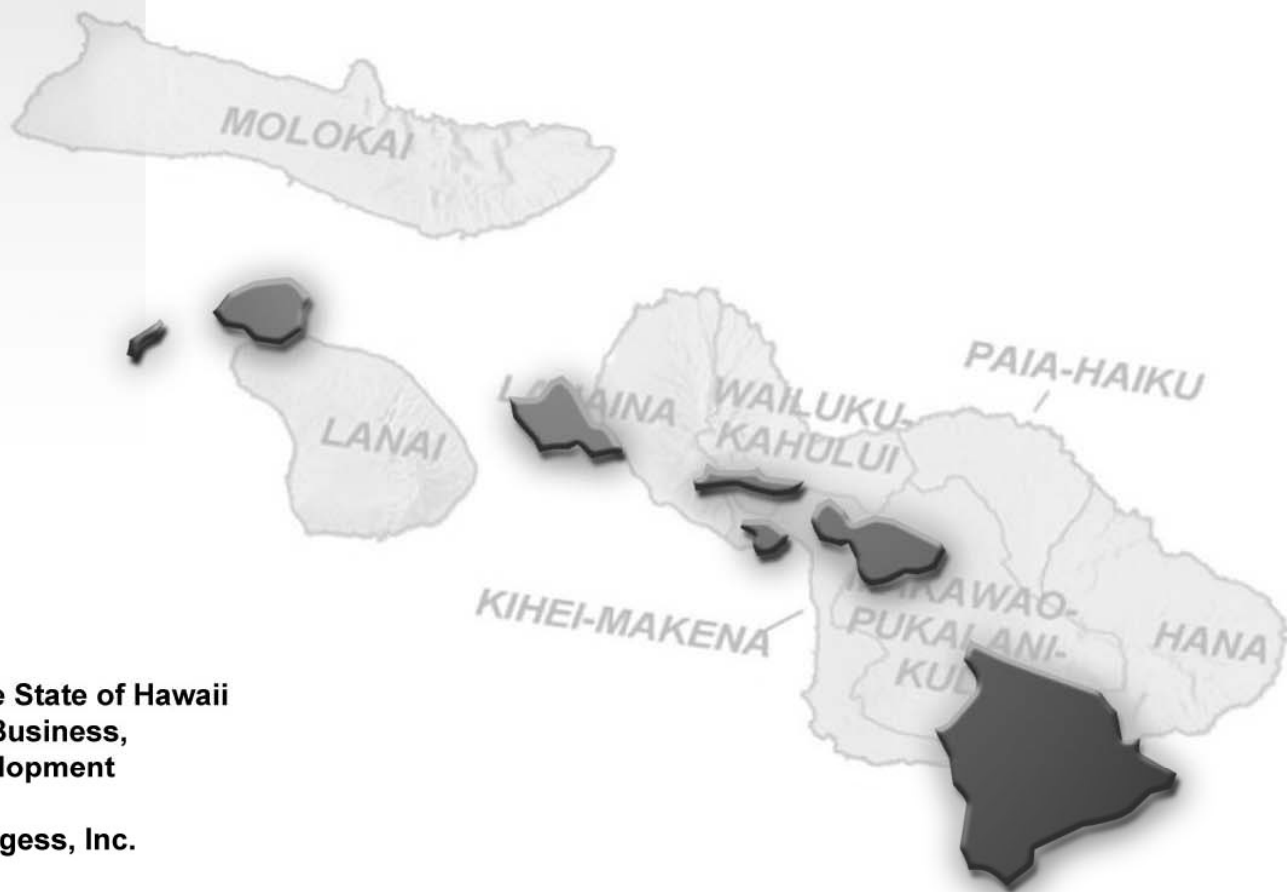


Planning for Sustainable Tourism in Hawaii

Part 1: INFRASTRUCTURE & ENVIRONMENTAL OVERVIEW STUDY

VOLUME V: COUNTY OF MAUI



Prepared for the State of Hawaii
Department of Business,
Economic Development
and Tourism
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Introduction to County of Maui

It is County of Maui's mission to promote and encourage healthy sustainable economic development within the County of Maui consistent with the community's needs and desires. The Office of Economic Development works in partnership with the community, other government agencies and businesses to strengthen and diversify the economy of the County by supporting existing businesses and industries, and by assisting in the attraction, development and expansion of new and fledgling businesses and industries.

Maui County is the only county comprised of more than one major inhabited island. It is composed of the major inhabited islands of Maui, Lanai and Molokai and the minor uninhabited island of Kohoolawe.

The current county population is 128,241, which accounts for 9.45% of the state's total resident population. Resident population projection for the year 2020 is 151,200, which would account for 10.8% of the state's resident population. The average visitor census was 40,650 for 2001.

Island of Lanai ^{30,1998}

Lanai is formed by a single volcano and covers a land area of about 140.5 square miles. Almost all of the island's residents live in Lanai City, which is situated on the central plateau just below Lanaihale, the volcanic peak. The location of this plantation community was based on the need to make the settlement area accessible to the pineapple fields though currently commercial production has ceased. Positive qualities of the "small town" environment found on Lanai are reflected in personal relationships, which exhibit honesty and concern for the welfare and well being of other members of the community. Current resident population is 3,193 and average visitor census was 1,096 for 2001.

Lanai Community Plan's major assumption is of a population projection of 4,968 residents over the next 20 years. The Plan also notes that it is important to retain the island's rural character though the island's economic base is shifting from agriculture (pineapple) to tourism.^{30, 1998}

Resort development is concentrated in two areas: at Koele, above Lanai City and at Manele/Hulopoe on the coast. The Manele/Hulopoe Bay area is host to a small boat harbor and major beach park. Manele and Hulopoe Bays are designated Marine Life Conservation Districts. The major landowner, Castle and Cooke, Inc, owns approximately 98 percent of the island.

Lanai is highly dependent on sea transportation for the provision of goods and services to sustain the local economy. Ensuring reliable ocean transportation service to Lanai is recommended. Several tour operators provide visitor day trips via ferry to Lanai from Maui.

Living on Lanai has always revolved around the availability of water and except for Maunalei Valley, water has never been overly abundant.

Island of Molokai ^{140,2001}

Island of Molokai, including Kalawao, is 260 square miles formed by three volcanoes. The character of the island remains truly mokupuni kuaaina (country island) both culturally and geographically. Kaunakakai, the island’s major population and commercial center, is located about midway along the south coast. A major resort destination area is located at Kaluakoi, on the western end of the island. There are small plantation communities rural Hawaiian homestead settlements of Hoolehua and Kalamaula. The visitor industry and diversified agriculture have been sources of additional jobs in recent years. The current population remains relatively stable at 7,404.

Lack of an adequate water supply has been a major deterrent to the development of diversified agriculture on Molokai. Limited economic opportunity is the most significant problem facing the community. There is significant need for upgrading the island’s infrastructure. Limited transportation services as well as solid waste disposal are concerns. There is a lack of social and recreational facilities for the island’s residents.

Average visitor census was 831 for 2001.

Island of Maui

The Island of Maui is 727.2 square miles. (See map of island of Maui in Appendix.) The table below illustrates the resident population distribution by district. The district divisions are not the same as the planning communities; therefore, number quoted in the text describing the planning communities may differ. The average visitor census island wide was 38,723 for 2001.

Table 5.01 -- Resident Population of Maui by District: 2000

County and district	April 1, 2000
State total	1,211,537
Maui County 1/	128,241
Hana	1,855
Makawao	36,476
Wailuku	61,346
Lahaina	17,967
Lanai	3,193
Molokai	7,257
Kalawao	147

Source: 2001 State of Hawaii Data Book

Hana ^{36,1994}

The Hana region encompasses approximately 145,000 acres in the eastern portion of the Island of Maui. Hana Town is located on the easternmost shoreline of Maui with a population of 1,855 in 2000. This region's economy is based primarily on diversified agriculture, the visitor industry, government services, and subsistence activities. Visitor accommodations are centered in Hana Town.

Kihei-Makena ^{18,1998}

Kihei has a small-town, pleasant, urban atmosphere that has grown up spontaneously, driven by supply and demand. The population of Kihei was estimated at 16,843 in 2000. Kihei has a mix of generally independent resorts and restaurants. The Kihei area starts east of Maalaea and extends along Kihei Road to Wailea. Kihei has a lived-in, day-to-day informal yet clean and wholesome atmosphere. It has good, sandy beaches, and various rocky outcroppings, which make for good snorkeling. Kihei has a small boat ramp from which boats leave for Molokini.

Makawao-Pukalani-Kula ^{33,1996}

Makawao-Pukalani-Kula region, also known as "Upcountry" because of the rural and serene environment, is located on the western slopes of Haleakala and includes portions of the Haleakala National Park. It is the only county planning region without any shoreline resources. Environmentally the planning region holds a great diversity of climates, geology, and natural resources. Agricultural uses include commercial crops of sugar cane and pineapple.

Culturally, the area is as diverse as its environmental aspects. The population is concentrated in two (2) main settlement areas, Makawao and Pukalani, which are characterized by a mixture of rural and agricultural uses. The communities are close-knit with values placed on open space and rural characteristics. In 2000, the population was approximately 36,476.

Paia-Haiku ^{34,1996}

The planning region encompasses an area of approximately 17,300 acres. A major population center is Paia, located in the northwest corner of the region, which includes the communities of Lower Paia, Upper Paia, and Kuau. A secondary center is located a few miles to the southeast in the communities of Haiku, Pauwela, and Kuiaha. Elsewhere in the region, scattered rural settlements dot the landscape above high sea cliffs and deep gulches.

As a primary urban center of the region, Paia is in close proximity to the island's major employment centers of Wailuku-Kahului. Over the last ten years, windsurfing has grown into a major sport, adding to other traditional activities in the North Shore area. The primary agricultural activity is sugar cane cultivation.

The region had a resident population of 3,732 in 1970, 5,277 in 1980, and 7,788 in 1990 and 10,892 persons in 2000. Haiku is more rural in character with small urban nodes at Kuiaha, Haiku, and Pauwela to service residents in the outlying rural and agricultural areas. Agricultural activities include pineapple cultivation, nursery operations, and diversified agriculture.

Wailuku-Kahului ^{31,2000}

The Wailuku-Kahului region is located on the north shore of Maui Island. It encompasses the civic and business centers of Wailuku and Kahului and the major seaport and airport. The surrounding agricultural lands of Central Maui, and the eastern half of the West Maui Mountains are also within this region.

The resident population, 61,346 (2000), is concentrated in the urban centers of the region. Wailuku has maintained its role as the civic-financial-cultural center while Kahului has strengthened its role in recent years as the business and industrial center. Kahului residential areas are newer than Wailuku. Because of the region's central location, primary commercial harbor, and airport facilities, major commercial, industrial, and public facilities and role as the civic and commercial/industrial hub of Maui Island, Wailuku-Kahului is a major service and employment center for outlying communities.

Kahului Harbor and Airport are major land users along the Kahului shoreline. As major ports of entry for people and goods, they serve as an important center of jobs and economic activity. Kahului Airport has not reached full capacity. Improvements to the shoreline surrounding the airport are needed to support any future expansion of airport facilities and increase recreational use of the area. The commercial port of Kahului Harbor is viewed as inadequate and approaching capacity. In addition, the recreational harbor should be investigated for additional slips or a new marina.

The growth of Maui's population over the past decade has increased demands on existing recreational and other community facilities. The Kahului wastewater treatment plant is aging and reaching its limits for expansion and efficient operation. Potable water was and is a critical factor in the long-range planning and development of the region.

West Maui ^{35,1996}

The West Maui Community Plan covers the entire Lahaina Judicial District. Existing population and urban settlements in the region are located at Olowalu, at Lahaina and in a band along the shoreline between the northern end of Lahaina and Kapalua. Resident population is 17,967 according to the most recent census (2000^{252, 2001}). Visitor units have increased to 9,632 in 2001.

Development, for the most part, reflects the region's visitor and agricultural industries. The protection and enhancement of open space is considered

important as development occurs. The activity centers include Lahaina town, Kaanapali, Honokowai, Napili, and Kapalua communities.

Recommendations for County of Maui

Public Infrastructure

Terrestrial Water Supply Quality and Quantity

It is recommended that maximization of existing water sources by expanding storage capabilities be done. Management of the County's growth activities should be consistent with the water use and development. There is a need for continuing encouragement of water conservation practices by the County's residents to enable the most efficient use of existing water system sources and facilities. There is also a need for improvement of water transmission to areas that experience critical water supply and to seek new sources of water by exploration in conjunction with other government agencies.

Within each planning community, a comprehensive water management strategy must be developed to balance between the various interests and accommodate environmental, agricultural, and residential needs of all neighboring regions. There are limited development of water resources and distribution system to meet the needs of the region. There are concerns over the development of new ground water sources in Haiku and their reallocation of this resource to service other regions of the island. Exportation of resources found within the Hana Community includes the diversion of surface water from the region.

Sewage

The wastewater treatment facilities for Maui County are approaching their design capacity, which could potentially constrain future growth and development. With the continued growth on the island, the development of new wastewater treatment facilities will be needed to meet the new demands. Working with private landowners and exploring the possibility of entering into a partnership may develop additional transmission and treatment capacities. ²⁹ 1990

Solid Waste Disposal

The Maui County General Plan recommends a comprehensive waste management program, which includes waste reduction, recycling, composting, and energy recovery/utilization. Consideration should be taken of environmental impact when developing new disposal sites. Additional recommendations include setting up convenient centers within the individual communities for recycling and reuse of solid waste and incentives for private business to establish operations within the county that promote reuse of disposed household items.

Storm Water

There was not enough information available to adequately evaluate and make recommendations for this infrastructure element. Further information is needed to be made available.

Roads

Transportation is one of the major concerns in Maui County. However, policies developed in adjoining community plan regions should be consistent with the desire of surrounding communities to preserve the natural and cultural characteristics.

Problem areas include Kahului, Kihei and Lahaina. Kahului, as the center of commerce and hub for transportation routes often necessitates that people travel through Kahului to get where they want to go. The addition of alternate routes would alleviate much of the traffic through Kahului. Piilani Highway has alleviated much of the east-west traffic through Kihei; however, an alternative route is needed for north-south moving traffic. To relieve traffic in and around Lahaina passing lanes and a bypass are needed.

Airports

The islands of Maui, Molokai and Lanai are dependent upon outside sources for goods. There is a need to improve air transportation to and from each of the islands, especially air cargo facilities.

Alternative designs for Kahului airport expansion should be proposed to accommodate public opposition to the expansion of road to the airport. Expansion should include the need to upgrade cargo facilities.

Harbors

As stated previously, as islands, Maui, Molokai and Lanai are dependent upon outside sources for goods. There is a need to improve and expand harbor facilities, for both cargo and cruise ships, on Lanai, Maui and Molokai. An upgrade at the Lahaina dock for visitors arriving by cruise ship is recommended. Improvements to the ferry terminal on Maui and Lanai would accommodate shuttles, water taxis and the ferry landing between Maui and Lanai.

Parks

Further study and detailed plans for each district are needed to identify resource areas with recreational value and to develop these areas by their assets and/or public needs assessment. Recreation programs requirements need to be taken into account in the developmental stages of the park planning process. One concern is that recreational needs not provided for in other community plan regions may result in a spillover effect into the Hana region. A concern for Lanai is the need for additional recreational facilities and services. Public park facilities

in some regions are inadequate and in need of expansion and improvements. Existing public beach parks are well utilized and do not adequately meet public demand. The improvement and expansion of park facilities in the region have not kept pace with resident population growth.

Normal funding sources, strained as they are, are stretched to their limits to maintain current infrastructure. Additional sources of funding for new facilities, renovations and staffing need to be identified to expand and/or improve Maui County parks. Some possibilities of funding are private operation/maintenance or concession stands. There may be sources of sector specific funds or partnerships with resort management or developers.

Police, Fire and Emergency Services

The economic crunch experienced by both the State of Hawaii and County of Hawaii are impacting all infrastructure elements. Current funding falls short of providing the police services expected by the public. While service calls have increased, funding has not kept pace. Research into monies available through Homeland Security and other sources needs to be done.

Unfortunately, the number of service calls for both the Police Department and Fire Department exceeds the manpower needed to respond in a timely manner. Another reason is the enormous physical area with scattered settlements. Arriving at a scene in a timely manner is challenging.

Further study, long-range planning, cost projections and study of demographics within each district is vital to efficiently and strategically place manpower and emergency response equipment and facilities. Correlation between demographics and geography may shed light on differences between resident and visitor usage of emergency services.

Private Infrastructure

Visitor Accommodation

Maui is predominantly geared toward the deluxe/luxury resort setting, while Molokai and Lanai are mostly hotels. The main recommendation for visitor accommodations is monitoring of current accommodations and appropriate planning for future developments.

Private Transportation

There is insufficient information to adequately make recommendations for this infrastructure element.

Energy Systems

Maui, as part of the State, is heavily reliant upon fossil fuels. It is recommended that a more self-sufficient approach be taken toward energy production. Conservation programs and renewable energy sources should be explored.

Sewer Systems

Sewer systems information is largely combined with public sewage. Information for individual sewer systems was not available. See Public Infrastructure, Sewage Recommendations.

Environmental Features

Coastal Water Quality

As non-point source pollution is the greatest threat to coastal water quality, it is difficult to make coastal water quality recommendations without any information regarding storm water.

Ensure that best management practices are utilized to reduce the possibility of chemicals entering the water.

Marine Ecosystem Health

Concerns regarding the carrying capacity of heavily used ocean recreation areas, like Molokini, are legitimate. Further study is required to determine the type of impacts heavy usage incurs upon more frequently used areas. Monitoring and the issuance of permits may be a recommendation of such a study. Another option is establishment of marine conservation areas for protection.

Forestry / Green Space

Preservation and restoration of native forests is in the best interest of all stakeholders. Forests are the natural filters for groundwater, so in preserving forests, the groundwater quality is also preserved. Healthy forests also supports native species. Coordinated efforts between all stakeholders are recommended in conjunction with invasive species issues. These two issues are intertwined and should be treated together.

Air Quality

Air quality on Maui is above federal and state standards. The major concern regarding air quality on Maui is when the sugarcane is burned. In general, vehicular emissions have not been a problem. Continued monitoring is recommended.

Beach Erosion

As recommended at the State level, further research is required to study and develop appropriate management strategies for each area. Appropriate building setbacks and other policies need to be implemented and enforced.

See Hawaii State Recommendations for additional Beach Erosion Recommendations.

Invasive Species

There are two primary recommendations regarding invasive species, coordination and eradication. Coordination between governmental agencies and other stakeholders will minimize duplication of efforts and maximize funding. Eradication involves eliminating what can be eliminated and containing what cannot be wholly eliminated.

Other Appropriate Natural and Scenic Resources

Efforts are underway in various planning communities to restore environmental resources, including native vegetation. It is recommended that the natural and agricultural settings be maintained and enhanced.

Riparian / Wetlands

See Coastal Water Quality recommendations.

Native Species / Extinction Issues

Restoration and preservations of native forests will benefit native species. As a whole, the County of Maui is progressive in its response to invasive species and protection of native species. Lanai has little native vegetation remaining and of what is remaining, it is threatened.

County of Maui – Water Quality and Quantity

Present Capacity and Usage

The General Plan of the County of Maui describes water resources as consisting of ground water and surface water sources. Water resources serve agricultural crop production, ranch operations, resort areas, and county residents. (See maps of Maui, Lanai and Molokai with sustainable yields/ aquifer; geographic divisions of aquifers on Maui, Lanai and Molokai; map of Central Maui Groundwater Source Withdrawals; and Graphs of Groundwater Uses in appendix.)

Maui County Department of Water Supply reports that water production from July 1, 1999 to June 30, 2000 for all facilities was just over **4 billion gallons**. This total represents a decrease in production of 24.2% over the same period the previous year. The addition of water from the Hamakuapoko and Haiku wells accounts for this reduction in demand from the surface water treatment facilities.
 40, 2000

Table 5.02 – Water Production Total in Thousands of Gallons ^{40, 2000}

Olinda	453,560	Lahaina	585,181
Piiholo	908,009	Mahinahina	868,269
Kamole	1,239,254	Total West District	1,453,450
Iao	00		
Total East District	2,600,823	Total District	4,054,273

Source: *Department of Water Supply - County of Maui: Annual Report FY 2000*

Table 5.03 – Water Production in Millions of Gallons Per Day ^{40, 2000}

Year	Groundwater	Surface Water
1995	27.6	N/a
1996	27.0	N/a
1997	24.9	9.4
1998	24.6	12.0
1999	25.9	14.1
2000	26.8	11.1

Source: *Department of Water Supply - County of Maui: Annual Report FY 2000*

Review of conflicting reports leads to a need for further study to determine whether there is adequate water supply for Maui County. The islands of Lanai and Molokai have low sustainable yields from the aquifers they draw upon, yet they provide for the current population. Water supply and allocation for the island of Maui, especially East Maui, has been contested by public interest groups. A recently released EIS supplemental should put to rest some of the water supply and allocation issues for East Maui.

Overall, Maui Department of Water Supply meets or exceeds the federal and state water quality standards. *The Department of Water Supply Water Quality Report for 2000* lists the following water sources for areas in Maui:

Table 5.04 -- Central Maui (serving Kahului, Kihei, Makena, Paia, Wailea, Wailuku) ^{38, 2001}

Primary contaminants of the water sources are: Barium, Chromium, Nitrate, Asbestos, Gross Beta, TTHMs (Total Trihalomethanes), Total Coliform, and Fecal Coliform & E. Coli.

Source Name	Origin of Water	Treatment
Iao	Tunnel	UV/Chlorination
Kepaniwai	Groundwater	Chlorination
Mokuhau	Groundwater	Chlorination
Kanoa	Groundwater	Chlorination
North Waihee	Groundwater	Chlorination
Waiehu Heights	Groundwater	Chlorination
Waihee	Groundwater	Chlorination

Source: *Department of Water Supply: Water Quality Report for 2000*

Table 5.05 -- Makawao System (serving Haiku, Hailimaile, Makawao, Pukalani) ^{38, 2001}

Primary contaminants include: Gross Beta and TTHMS.

Microbiological contaminants include: Total Coliform, Fecal Coliform & E. Coli, Lead and Copper.

Source Name	Origin of Water	Treatment
Haiku Well	Groundwater	Chlorination
Kaupakalua Well	Groundwater	Chlorination
Wailoa Ditch	Surface	Microfiltration, Chlorination

Source: *Department of Water Supply: Water Quality Report for 2000*

Table 5.06 -- Lower Kula System (serving Olinda, Kula Kai, Omaopio, Pulehu)
^{38, 2001} Primary contaminants include: Barium, Hexachlorocyclopentadiene,
 Asbestos, Gross Beta and TTHMS.

Source Name	Origin of Water	Treatment
Piiholo Reservoir	Surface	Direct Filtration, Chlorination

Source: *Department of Water Supply: Water Quality Report for 2000*

Table 5.07 -- Upper Kula System (serving Kula, Waiakoa, Keokea, Ulupalakua,
 Kanaio)^{38, 2001} Primary contaminants include: Barium, Gross Beta, and TTHMs
 Microbiological Contaminants include: Total Coliform, and Fecal Coliforms and
 E. Coli

Source Name	Origin of Water	Treatment
Waiakamoi/Kahakapao Reservoirs	Surface	Microfiltration, Chlorination

Source: *Department of Water Supply: Water Quality Report for 2000*

Table 5.08 -- Lahaina System (serving Puamana, Wainee, Kelawea, Wahikuli,
 Honokowai, Mahinahina, Kahana, Alaeloa, Napili)^{38, 2001} Primary Contaminants
 include: Barium, Nitrate, DBCP (1,2 Dibromo-3-chloropropane), Gross Beta, and
 TTHMs.

Microbiological Contaminants include: Total Coliform Bacteria

Source Name	Origin of Water	Treatment
Kanaha Wells 1 & 2	Ground	Chlorination
Waipuka Wells 1 & 2	Ground	Chlorination
Kanaha Stream	Surface	Microfiltration, Chlorination
Napili Wells B & C	Ground	Chlorination
Honokohua Well B	Ground	Chlorination
Honolulu/Honokohua Stream	Surface	Filtration, Chlorination

Source: *Department of Water Supply: Water Quality Report for 2000*

Honokohau System (serving Honokohau, but trucked in from the Lahaina
 System) has the same sources as the Lahaina System.^{38, 2001}

Table 5.09 -- Hana System (serving Wakiu, Hana, Hamoa)^{38, 2001} Primary
 Contaminants include Gross Beta.

Source Name	Origin of Water	Treatment
Wakiu Well	Ground	Chlorination
Hamoa Well	Ground	Chlorination

Source: *Department of Water Supply: Water Quality Report for 2000*

Table 5.10 -- Keanae System (serving Keanae) ^{38, 2001} Primary Contaminants include: Radon, Gross Beta, Lead, and Copper. Microbiological Contaminants include: Total Coliform Bacteria

Source Name	Origin of Water	Treatment
Keanae Well	Ground	Chlorination

Source: *Department of Water Supply: Water Quality Report for 2000*

Table 5.11 -- Nahiku System (serving Nahiku) ^{38, 2001} Primary Contaminants include: Barium.

Source Name	Origin of Water	Treatment
Nahiku Tunnel	Ground	Chlorination

Source: *Department of Water Supply: Water Quality Report for 2000*

All contaminants are under the maximum limits and meet all Federal and State standards. All water sources are safe. ^{38, 2001}

Maui County Data Book 2001 gives statistics on water consumption on the islands in the County of Maui. ^{247, 2001}

Table 5.12 – Water Consumption in Millions of Gallons year ending June 30

	1997	1998	1999
Maui County	11,485	11,729	12,547
Maui	11,110	11,399	12,199
Molokai	330	369	348

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

The County of Maui's goal is to document the locations and quantity of the various water sources in order to protect the quality and availability, and to sustaining a viable and managed rate of growth.^{29, 1993} According to the Maui Department of Water Supply, there are issues with water supply, especially for the Upcountry area. This issue needs further study.

The General Plan of the County of Maui presents difficulties Maui County would like to resolve.

- Provide an adequate supply of domestic and irrigation water to meet the needs of the population.
- Efficient use of the ground, surface and recycled water sources.^{29, 1993}

The General Plan of the County of Maui notes water system improvements, development, financing and water quality maintenance are major issues.

- While total available source is determined to be adequate to meet the future needs of the County, demands placed upon existing groundwater sources are approaching critical levels. Optimum management of existing groundwater sources to maintain their long-term water resource integrity has become a critical issue.
- The cost to deliver water to the consumer will present a significant challenge to the County policy makers, planners, and engineers. Potential source development sites are remote from service areas requiring lengthy transmission lines and in many instances, pumping of water to reach its delivery destination.
- Another issue is the need to provide water in sufficient quantities during drought conditions and at quality levels in conformance with Federal and State water quality standards.^{29, 1993}

Future and Planned Usage

The General Plan of the County of Maui notes implementing actions:

- Integrate the water use and development plan with its procedure for resource management by allocating ground water as a component of Maui County's Growth Management Program.
- Encourage the updating of the water use and development plan in a continuous and timely manner to be consistent with the community Plans.^{29, 1993}

In addition, to establishing a comprehensive approach to water system development, it is appropriate for the *General Plan* to advance objectives and policies which:

- Support Water Board, County administration, and County council to effect balanced development of water for agriculture/residential/commercial uses to coincide with growth management planning.
- Urge Water Board to require water quality to exceed minimum federal standards.
- Support Water Board to determine needs for future water requirements by referencing projections in the Community Plans and an overall countywide growth management plan.
- Encourage the cooperation and participation of new development of new development projects in planning, designing and financing required improvements
- Promote land use allocation and development sequencing which optimizes the use of available system facilities and which allows for cost effective phasing of required water system improvements
- Encourage water conservation practices by the County's residents to enable the most efficient use of existing water system sources and facilities.

Future and Planned Requirements or Changes

The County of Maui would like to achieve the following:

- Support the improvement of water transmission systems to those areas, which historically experience critical water supply problems and develop sufficient water supply during drought seasons to keep agricultural activities viable.
- To develop transmission systems to provide better fire protection.
- To manage growth activities consistent with the County's water use and development
- To exceed Federal quality standards for potable water supply
- Encourage the use of wastewater discharges and create means of supplying low cost water for agricultural purposes
- Maximize use of existing water sources by expanding storage capabilities
- Discourage the use of standpipes for fire protection in residential areas
- Seek new sources of water by exploration in conjunction with other government agencies
- Support the planning, preservation and development of water resources and systems, which service Hawaiian Home Lands.^{29, 1993}

The General Plan of the County of Maui states plans to integrate the water use and development plan with its procedure for resource management, by allocating ground water, as a component of Maui County's Growth Management Program.^{29, 1993}

Anticipated Costs for the Future

The *General Plan of the County of Maui* states to develop the necessary source and transmission systems for an integrated water system to serve Central and West Molokai the costs are estimated to be \$23.6 million. In the Kula Region of Maui, significant expenditures for storage, treatment and transmission facilities will be needed to meet requirements through the year 2000 and beyond. The total estimated cost to develop the necessary water system improvements to serve this region is \$73.26 million.^{29, 1993} Review of the Department of Water Supply shows that these expenditures are being spread over time. The table below shows the CIP budget for FY 2003 only.

Table 5.13 – Maui County FY 2001 Department of Water Supply Capital Improvement Budget

	FY 2003	Explanation
SDWA Compliance	420,000	Compliance with the EPA Safe Drinking Water Act
lao	3,225,000	Management to reduce draw on lao Aquifer
Source	150,000	N/A
Drought	50,000	Development of plans to reduce effects of drought, particularly in Upcountry
Storage	2,100,000	Upgrade storage in critical areas
Pipeline Replacement	5,618,000	Plan and implement transmission and distribution lines priorities
Pump Replacement	160,000	Repair and replacement of pumps to ensure quality service
Reliability	1,817,000	Repair and replace other water system elements as necessary
Facilities	505,200	Ensure proper maintenance and operations of facilities
Efficiency	240,000	Conservation and automation efforts
Total CIP Budget	\$14,285,200	

Source: County of Maui - Department of Water Supply

Problems, Issues and Opportunities Associated with Costs

The *Maui County Department of Water Supply Annual Report* describes that the Drinking Water State Revolving Fund is a program in which the EPA awards grants to states to establish revolving loan funds to assist public water systems with infrastructure improvements. The Maui Department of Water Supply received a \$7.8 million low-interest loan to refinance the Kamole Water Treatment Facility, which provides water to Pukalani, Makawao, Hailimaile, and parts of Haiku. This was the first State Revolving Fund loan in the state of Hawaii.^{40, 2000}

Compare Visitor and Resident Impact

Water quality and quantity can impact visitor experience, as well as Maui residents' standard of living. However, without adequate information regarding

Maui water supply use and consumption by category, a comparison of impacts cannot be made.

Major Assumptions

As the lands are taken out of agricultural production, water can be reallocated for other uses and reduction in use of agricultural chemicals may improve groundwater quality.^{29, 1993}

County of Maui – Sewage

Present Capacity and Usage

The County of Maui operates five wastewater treatment facilities and the associated collection and transmission systems. The areas within the County that are not serviced by centralized treatment facilities utilize individual wastewater disposal systems or privately operated treatment facilities. (All privately operated treatment facilities are listed in the Hawaii State Sewage Summary. Unfortunately, usage and capacities for these systems was not available.) The wastewater treatment facilities for Maui County are approaching their design capacity, which could potentially constrain future growth and development.

The County of Maui continued its efforts to increase utilization of recycled water. Several new projects have started in the past year including Micro Gaia, Piilani Shopping Center and Kanaha Cultural Park, which accounted for over 115,000 of the **four million gallons of recycled water currently utilized each day.**^{29, 1993}

The Maui County Department of Planning notes the existing Wailuku-Kahului Wastewater Reclamation Facility (WWRF) is located along the coastline within a tsunami inundation area. The facility is extremely vulnerable to tsunami, coastal erosion and salt-water corrosion. Additionally, the facility flows are reaching the design capacity and additional treatment capacity will be needed to meet future growth in Central and South Maui.

Preparation of a revised Facility plan for the Central Maui WWRF will include analysis of the current Wailuku-Kahului WWRF (short/long-term system processing capacity, tsunami vulnerability, coastal erosion impacts). The plan shall include recommended sizing, location and engineering cost estimates of the new Central Maui WWRF, to include transmission systems, pump stations, and collection system diversion options. The goal is to develop a long-term strategy for wastewater reclamation in both Central and South Maui.^{147, 2002}

The Wastewater Reclamation Division as a division of the Department of Public Works and Waste Management served 17,612 accounts throughout the County of Maui. The breakdown of accounts by sewer user class for the last two fiscal years is as follows:^{135, 2002}

Table 5.14 – Maui County Sewer User Class

Dwelling Units	Fiscal Year 2000	Fiscal Year 2001	Increase
Single Family	17,635	18,016	381
Apartment or Condominium	19,521	19,594	73
Total Dwelling Units	37,156	37,610	454
Services			
Single Family	15,271	15,629	358
Apartment or Condominium	619	620	1
Commercial	768	782	14
Residential Care Home	11	14	3
Hotel	99	99	N/A
Industrial or Restaurant	217	225	8
Government	151	151	N/A
Religious	91	92	1
Total Services	17,227	17,612	385

Source: County of Maui – Department of Public Works – Wastewater Reclamation Division

The 1999 Consent Decree settlement between the Maui County, U.S. EPA and State Department of Health stipulated numerous requirements to be accomplished over the next 10 years. The following requirements were completed during 2001:

- Completion of Supplemental Environmental Project design,
- 20-Year Systematic Rehabilitation and Replacement Schedule,
- 10-Year System Expansion Schedule,
- Preliminary Sewer System Analysis and Planning, Phase 1-Wailuku-Kahului area,
- Preliminary Sewer System Analysis and Planning, Phase 1-Lahaina area,
- Preliminary Sewer System Analysis and Planning, Phase 1-Kihei area,
- Preliminary Sewer System Analysis and Planning, Phase 1-Molokai area,
- Preliminary Sewer System Analysis and Planning, Phase 1-Lanai area,
- System-wide collection system mapping. ^{135, 2002}

Existing Problems, Issues and Opportunities

The General Plan of the County of Maui notes that the County of Maui’s municipal wastewater treatment facilities are nearing design capacity. It is expected that growth on the island will continue and new wastewater treatment facilities must be provided. Creative planning and financing approaches must be developed to meet this critical infrastructure need. The County is exploring the possibility of entering into a partnership with major landowners to develop additional transmission and treatment capacities. ^{29, 1993}

Future and Planned Usage

The *General Plan of the County of Maui* states that the protection of the environment and customer service remain the major objectives of the Maui County Wastewater Reclamation Division. A continued demand on the existing wastewater treatment facilities is anticipated and all costs associated with that demand would correspondingly increase.^{29, 1993}

Future and Planned Requirements or Changes

In order to insure that the objectives are met *The General Plan of the County of Maui* lists the following future changes:

- Encourage regional wastewater facility plans to be incorporated into each Community Plan,
- Encourage the continued cooperation between the private sector and government to achieve common goals for wastewater facilities programming and development,
- Promote land use development patterns which optimize the utilization of existing and planned wastewater facilities; and
- Support a growth management plan, which will maximize efficiencies of existing facilities and allow for an improved basis for capital programming.^{29, 1993}

Anticipated Costs for the Future

County of Maui: Fiscal Year 2002 Budget gives the anticipated budget for the FY 2003 as outlined below. The proposed budget is less than a 2% increase over the FY 2002 budget which included \$11,262,118 for wastewater operations and \$12,797,125 for administration.^{50, 2001}

Table 5.15 – Maui County Public Anticipated Costs

6-year Capital Improvement Program (FY 2003-2008)	\$73,600,000
FY 2003 Capital Improvement Budget	\$9,460,000
FY 2003 Wastewater Administration Budget	\$13,477,442
FY 2003 Wastewater Operations Budget	\$11,004,912
FY 2003 Total Revenues/Expenditures	\$33,942,354
Source: <i>County of Maui: Fiscal Year 2002 Budget</i>	

Table 5.16 – Maui County Department of Planning FY 2003 Budget ^{147, 2002.}
Source: *County of Maui: FY 2003 Budget*

DEPARTMENT OF PUBLIC WORKS AND WASTE MANAGEMENT
Wastewater Operations

Program Measures:

	FY 2001 <u>Actual</u>	FY 2002 <u>Estimate</u>	FY 2002 <u>Actual to Date</u>
<u>Summary</u>			
Total wastewater processed (gallons)	5,973,322,000	6,039,655,000	2,780,954,000
Annual compliance days (no spills or underground injection control violations)	327	365	174
Miles of sewer lines cleaned or inspected	125	125	68.1
Kilowatts per 1,000 gallons processed	3.67	3.54	4.02
Total collection & processing cost per 1,000 gallons	\$2.16	\$2.10	n/a
Recycled water cost per 1,000 gallons (operations & maintenance only; excludes debt service)	n/a	\$0.28	n/a
Development of structured training program by July, 2002 *new program	n/a	100%	n/a
<u>Collection System</u>			
Annual compliance days	336	365	177
Miles of sewer lines cleaned or inspected	125	125	68.1
Total collection cost per 1,000 gallons	0.21	\$0.28	n/a
<u>Wailuku/Kahului</u>			
Total wastewater processed (gallons)	2,112,615,000	2,175,765,000	951,819,000
Annual compliance days	362	365	182
Kilowatts per 1,000 gallons processed	3.40	3.50	3.85
Total processing cost per 1,000 gallons	\$1.76	\$1.88	n/a
<u>Lahaina</u>			
Total wastewater processed (gallons)	1,935,160,000	1,962,970,000	894,190,000
Annual compliance days	362	365	184
Kilowatts per 1,000 gallons processed	3.70	3.56	3.99
Total processing cost per 1,000 gallons	\$2.21	\$1.66	n/a
Recycled water cost per 1,000 gallons (operations & maintenance only; excludes debt service)	n/a	\$0.27	n/a
<u>Kihai</u>			
Total wastewater processed (gallons)	1,733,233,000	1,712,215,000	837,984,000
Annual compliance days	362	365	183
Kilowatts per 1,000 gallons processed	3.96	3.98	4.23
Total processing cost per 1,000 gallons	\$1.86	\$1.96	n/a
Recycled water cost per 1,000 gallons (operations & maintenance only; excludes debt service)	n/a	\$0.29	n/a
<u>Moloka'i</u>			
Total wastewater processed (gallons)	76,392,000	74,825,000	39,110,000
Annual compliance days	365	365	184
Total processing cost per 1,000 gallons	\$3.80	\$3.90	n/a

Problems, Issues and Opportunities Associated with Costs

The *Department of Public Works and Waste Management Annual Report* states the County of Maui saw an increase over the FY 2001 budgeted amount for treatment and disposal of wastewater. The increase was due to the following:

- Increase in power cost,
- Increase in sludge disposal fees,
- Rehabilitation of Lahaina pump stations 1 and 2,
- Replacement of 6 generators.

Wastewater collection and treatment and disposal cost of \$1.95 per thousand gallons increased from last year's cost of \$1.76 per thousand gallons. ^{135, 2002}

The *General Plan of the County of Maui* notes that the County of Maui has developed draft legislation, which if adopted, will assess fees to applicants of new land development activities to fund each development's pro-rata share of facilities improvements. ^{29, 1993}

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Sewage element.

Major Assumptions

The success of the Wastewater Reclamation Division is directly linked to the Division's ability to obtain the necessary funding to meet the requirements outlined in the Environmental Protection Agency / Department Of Health Consent Decree. ^{135, 2002}

County of Maui – Solid Waste Disposal

Present Capacity and Usage

The General Plan of the County of Maui describes that the County of Maui initiated a comprehensive solid waste management plan. This plan completed in 1989, recommends a comprehensive waste management program, which includes waste reduction, recycling, composting, and energy recovery/utilization.

The General Plan describes that commercial and residential uses create the largest amount of waste, a combined approximately 73% of all solid waste generated in the County of Maui. The solid waste projection calculated that the total amount of solid waste would total 894 tons per day in the year 2000.^{29, 1993}

The Annual Report 2000-2001 Department of Public Works and Waste Management describes the Solid Waste Division operates all solid waste facilities of the County of Maui; plans and implements County wide solid waste disposal strategies and plans, designs, and constructs solid waste disposal facilities; provides county-wide direction of refuse collection and landfill maintenance and operations functions.

The Department of Public Works and Waste Management, Solid Waste Division is responsible for residential refuse collection, management, and operation of 4 sanitary landfills and one convenience center. They are also responsible for landfill diversion. The Highways Division assists the Solid Waste Division with the collection of refuse and the operation of the County's sanitary landfills.

The refuse collection program increased the number of routes that it services from 12 routes to 13 routes. Refuse collection also purchased three brand new rear-loading refuse trucks to replace aging trucks and for use in the additional route.^{135, 2002}

Residential refuse accounts by districts on June 30, 2000 and June 30, 2001 are as follows:

Table 5.17 – Maui County Residential Refuse Accounts by District FY 2001

District	FY2001 Account Totals	FY2000 Account Totals
Central Maui	10,534	9,776
Makawao	7,573	7,252
Lahaina	2,015	2,022
Molokai	542	542
Lanai	785	785
Hana	232	232
Total	21,681	20,609

Source: *Annual Report – Department of Public Works and Waste Management 2000-2001*

Maui County FY2003 Capital Improvement Budget reports the following statistics on tonnage entering landfills per year.

Table 5.18 -- Maui County Landfill Disposal in Tons

	FY2001 Actual	FY2002 Estimate
Central	134,894	164,500
Hana	1,460	730
Molokai	7,300	3,650
Lanai	2,553	2,700
Total	146,204	175,960

Source: *Maui County FY2003 Capital Improvement Budget*

Table 5.19 – Maui County Landfill Disposal

	FY1999 Actual	FY2000 Estimate	FY2001 Estimate
Tonnage entering landfills per year	160,477	159,800	161,460

Source: *Maui County Department of Public Works FY2001 Budget*

Table 5.20 – Maui County Landfill Diversion

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Number of calls per day requesting recycling information	10	10	8
Diversion rate for total discards (refuse plus recyclables) (based on current year's total generation of discards)	30%	31%	32%
Total tons diverted from landfills (commercial plus residential)	68,000	69,000	70,000

Source: *Maui County Department of Public Works FY2001 Budget*

Existing Problems, Issues and Opportunities

The General Plan of the County of Maui states because land filling is the principal means of disposing solid waste, the useful life of the County landfills are rapidly decreasing. Land area requirements for a new replacement landfill in 1994 were estimated to be 129 acres. Environmental implications of developing

new landfill sites, costs to close the existing sites and the availability of sites are issues needed to be addresses.

The General Plan notes the that Maui County would like to implement solid and liquid waste disposal and reuse systems and programs to protect the environment and the overall wellness of residents and visitors.^{29, 1993}

County of Maui: Fiscal Year 2002 Budget states an increase in service will assist in the campaign to stop illegal dumping around the County.^{50, 2001}

The Annual Report - Department of Public Works and Waste Management notes that maintaining 1500 pounds/cubic yard compaction is an existing problem. To be consistent in maintaining 1500 pounds/cubic yard compaction, it is necessary to run two compactors during operating hours. However, the current system does not allow for consistent compaction due to vacation, sick leave, and industrial accidents with the present manpower of five operators and three attendants.^{135, 2002}

The Annual Report - Department of Public Works and Waste Management describes that 30% of the waste stream is recycled and is an area of opportunity. With proper diversion programs, anticipated total diversion would be 52%.^{135, 2002}

Table 5.21 – Maui Solid Waste Diverted

Fiscal Year	Rate	Budget	Actual	Cost Per Ton
2000	30%	\$596,458	\$526,713	\$42.50
2001	32%	\$812,107	\$762,505	\$19.25

Source: *Annual Report – Department of Public Works and Waste Management 2000-2001*

Future and Planned Usage

The General Plan of the County of Maui notes Maui County’s objective is to provide efficient, safe and environmentally sound systems for the disposal and reuse of liquid and solid wastes. Maui County would like to attain the following:

- Explore new waste disposal methods that are safe, economical, environmentally sound, and aesthetically pleasing, and that minimize the disposal of wastes in landfills.
- Establish programs for the development of waste disposal systems, which anticipate planned growth.
- Establish comprehensive environmental and public health standards for the treatment, disposal and or reuse of liquid and solid waste.
- Develop comprehensive and publicly acceptance methods of recycling solid and liquid waste.
- Encourage and promote public awareness to reduce, reuse, recycle and compost waste materials.^{29, 1993}

The Annual Report - Department of Public Works and Waste Management states the County will begin planning for the automation of refuse collection.^{135, 2002}

The General Plan of the County of Maui states that Maui County needs to:

- Establish a practical philosophy and program for recycling solid and liquid waste, which is tailored to Maui County's, needs and is supported by programs for community education.
- Formulate and continuously update comprehensive regional liquid and solid waste management plans.^{29, 1993}

Future and Planned Requirements or Changes

County of Maui: Fiscal Year 2002 Budget states administration is proposing to implement the following programs for the year 2002:

- Make every Sunday Amnesty Day at the Central Maui Landfill and Olowalu transfer station as opposed to the current once a month schedule.
- The pick-up of "White goods" and "bulky items" once a month as opposed to the current schedule of once a quarter.
- The initiation of "Green Waste" residential pick-ups, which is a new once a month service.^{50, 2001}

The Annual Report - Department of Public Works and Waste Management lists the following planned changes:

- Complete Central Maui Sanitary Landfill Phase IV Entrance Facility including an entrance road, perimeter road, self-haul recycling area, re-use center, self-haul disposal area, scale house, office, wash slab, and power, water, and septic systems.
- Molokai Left Turn Storage Lane
- Central Maui Sanitary Landfill Phase I and II Closure
- Olowalu Pipe Repair to repair and replace gas collection pipe damaged by a landfill fire and a brush fire.
- Installation of 3 Groundwater Monitoring Wells at the Central Maui Landfill.^{135, 2002}

The Annual Report - Department of Public Works and Waste Management states to mitigate issues with yard compaction by Revising hours of operation to an eight-hour workday for Central Maui Landfill employees. This would reduce the hours open to haulers to six per day.^{135, 2002}

The Annual Report - Department of Public Works and Waste Management notes improvements to be made to the recycling program are:

- Island-wide Subscription Yard Trimmings Curbside Program;
- Waste Audits for Businesses;
- Construction and Demolition Materials Recovery Facility;

- Recycling facility/transfer station.^{135, 2002}

Anticipated Costs for the Future

The Annual Report - Department of Public Works and Waste Management makes the following appropriations:

Table 5.22 – Maui Financial Overview of Program Expenditures

Program	FY 2000 Actual	FY 2001 Budget	FY 2001 Actual	FY 2001 Balance	FY 2001 Variance
Solid Waste Administration					
To support the collection and disposal of solid waste and the recovery of recyclable or reusable resources from the waste stream.	\$3,265,356	\$3,584,759	\$3,273,203	\$311,556	8.69%
Landfill Disposal					
To manage County integrated solid waste management facilities.	\$2,483,340	\$2,587,722	\$2,623,735	(\$36,013)	-1.39%
Residential Waste Collection					
To collect and dispose of residential solid waste efficiently and safely.	\$2,252,733	\$1,758,713	\$2,318,323	(\$559,610)	-31.82%
Diversion					
Attain a 35% diversion rate by fiscal year 2005.	\$526,713	\$584,044	\$601,944	(\$17,900)	-3.06%

Source: *Annual Report - Department of Public Works and Waste Management*

Taxpayer dollars spent to keep 32% out of the landfill are estimated to be about \$19.25 per ton of materials diverted.^{135, 2002}

Maui County Department of Planning FY2003 Budget appropriates \$1,625,000 to capital improvement projects. Other operation budgets are included in the following table.^{147, 2002}

Problems, Issues and Opportunities Associated with Costs

The Annual Report - Department of Public Works and Waste Management notes that County Ordinance 2731, (1999) authorized the County collection of \$6.00 tipping fee at all County of Maui landfills.^{135, 2002}

Compare Visitor and Resident Impact

Both visitors and residents have an impact on solid waste disposal, however no documentation of percentage or tonnage from each was found.

See Visitor Related Areas and county level Solid Waste Disposal Summary for more information.

Major Assumptions

The General Plan of the County of Maui assumes that waste projections for the Island of Maui are expected to increase from 669 tons per day in 1990 to 1,064 tons per day in 2010, or 59 percent.^{29, 1993}

County of Maui – Storm Water

Present Capacity and Usage

Due to a lack of available documentation from the Maui Department of Public Works and Environmental Management, there is not enough data to evaluate storm water in Maui County.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Roads

Present Capacity and Usage

The State of Hawaii Data Book 2001 states that the County of Maui had 113,058 registered vehicles in 1991 and 136,473 registered vehicles by 2001, a 21% increase over the 10 year period.^{252, 2001}

The Annual Report - Department of Public Works and Waste Management describes the divisions and their areas of responsibility.

Engineering Division. Prepares construction plans, specifications and estimates for County road projects; oversees the inventory of traffic control devices; establishes procedures and controls for the installation and maintenance of traffic control devices; makes recommendations to correct hazardous conditions.

Highways Division. Maintains all County roads, streets, highways and their appurtenant structures and constructs small road projects. The activities are: tree trimming, roadside mowing, street cleaning, road patching, drainage and flood control maintenance, road striping and sign painting. To accomplish these responsibilities, the Division is divided into six districts: Wailuku, Makawao, Lahaina, Hana, Molokai, and Lanai.^{135, 2002}

Existing Problems, Issues and Opportunities

The Annual Report - Department of Public Works and Waste Management lists the existing issues for the Highways Division.

- Traffic marking has been a problem with the outlawing of the use of oil base paints.
- Districts have continued to frugally use herbicide in maintaining vegetation. A 40% reduction in urban/central Maui has been accomplished in the past two years.
- With Solid Waste support in all districts taking much, if not all, of our labor force, we have a difficult time scheduling and performing necessary roadwork. Utilization of higher paid equipment operators for flagmen and laborers is not very efficient.
- Recent decisions to defer the purchase of replacement equipment have resulted in frequent repairs and down time. We have increased the rental of private equipment to compensate for downed equipment that results in increased operational costs.
- Rust has played a major role in the deterioration of our equipment. Weather and alt air are also detrimental contributors. We would like to eventually plan for the sheltering of all our major pieces of equipment.^{135, 2002}

The Department of Transportation notes that Maui is still experiencing growth of traffic due to commercial center and housing developments and growth in tourism.^{102, 2000}

The General Plan of the County of Maui describes the increase in vehicle count has placed greater demands upon the County's existing roadway facilities. Traffic problems appear most severe where peak hour levels of service for major arterial and collectors operate near capacity. It is unlikely that over the next years needed roadway improvements will keep pace with the increasing demands being created by increases in traffic volumes. To help relieve current capacity constraints measures such as ridesharing and staggered work hours should be incorporated.

The General Plan notes existing opportunity to develop a program for anticipating and enlarging the local street and highway systems in a timely response to planned growth.^{29, 1993}

Hawaii Tourism Product Assessment finds the single circle island roadway continues to create congestion and traffic problems, especially in West Maui.^{91, 1999}

Central Maui^{63, 2002}

Problem: Congestion Along Mokulele Highway

Solution: Mokulele Highway Widening, Puunene Avenue to Piilani Highway – widen to four lanes

Potential hurdles: Land acquisition, funding, relocation of tenants, permits and clearances.

Estimated Construction Costs and Schedule:

- | | | |
|-------------|----------------|--------|
| • Phase IA | \$24.0 million | FY2001 |
| • Phase IB | \$18.0 million | FY2003 |
| • Phase IC | \$14.0 million | FY2004 |
| • Phase IIA | \$15.0 million | FY2001 |
| • Phase IIB | \$17.0 million | FY2005 |

South Maui^{63, 2002}

Problem: Congestion along Piilani Highway.

Interim solution: Interim Piilani Highway Widening, Mokulele Highway to Kilohana Drive including improved traffic signal management.

Potential hurdles: Drainage structures may require major modifications, acquisition of traffic signal poles may delay project schedule, additional construction funds may be needed to complete improvements through heavily congested segments of Piilani Highway, bicycle lanes must be relocated.

Estimated Construction costs and schedule:

- \$3.0 million/State;
- \$1.0 million/County – 2004

Future and Planned Usage

The General Plan of the County of Maui lists the following planned usage:

- Support the development adoption and regular update of a county-wide roadway study
- Ensure that transportation facilities are anticipated and programmed for construction in order to support planned growth
- Streamline maintenance methods for public highways to encourage a prompt response to road repair needs
- Support Maui County's street tree plan and encourage landscape planting, irrigation and maintenance programs along all public highways and rights-of-way.
- Encourage development and implementation of demand management programs to help relieve congestion
- Encourage cooperation between principals in new development projects and State and County agencies to formulate creative cost sharing arrangements for new roadway facilities.
- Identify potential growth areas, which can be developed through cost-effective roadway improvements, which provide for acceptable long-term levels of service.^{29, 1993}

Future and Planned Requirements or Changes

The State Department of Transportation states future planned changes are for the Lahaina Bypass, Kuihelani Highway Widening and the Kihei Upcountry Route. Design of the widening of Puunene Avenue and Mokulele Highway from Kuihelani Highway to Piilani Highway, Haleakala Highway from Hana Highway to Hailimaile Road and Honoapiilani Highway from Kuihelani Highway to North Kihei Road and from the North Kihei Road to Maalaea Harbor continues.^{102, 2000}

Anticipated Costs for the Future

County of Maui: Fiscal Year 2002 Budget makes the following appropriations:

- The proposed funding for the Lahainaluna Road design and construction is \$1.4 million. Additional Federal funds will also be used for this project.
- The proposed funding for the design phase of the North South collector road to relieve traffic from the Piilani Highway is \$500,000.
- The proposed budget for the extension of Alanui Kalemilike road is \$800,000. The federal government will provide 80% and the county will provide the remaining 20% of the funding.^{50, 2001}

Maui County Department of Planning FY2003 Budget appropriates \$14,133million for road improvements. The fund source is the County.^{147, 2002}

Table 5.23 – Maui Six Year Road Improvement Capital Program in Thousands of Dollars

	FY 2003	FY 2004-2008	TOTAL
Road Improvements			
Countywide Bikeway Program	300	1,500	1,800
Countywide Bridge Repair and Maintenance	250	1,250	1,500
Countywide Drainage Improvements	250	3,000	3,250
Countywide Highway Beautification	50		50
Countywide Highway Safety Improvements	200	1,000	1,200
Countywide Road Resurfacing	350	2,500	2,850
Countywide Speed Hump Program	300	2,500	2,800
Wheelchair Ramps at Various Locations	325	1,300	1,625

Source: *Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

The Annual Report - Department of Public Works and Waste Management states the Highways Division’s budget has been stretched to its limits as it has been for the last twelve years. A “zero increase”, flat-line budget has forced Highways to simply “make do” with what we have again this year. Major upgrading of the Highways Division’s aged equipment will be critical in the near future to maintain the Division’s level of services to the community.^{135, 2002}

County of Maui: Fiscal Year 2002 Budget notes the Maui County administration is setting aside \$2 million from the Public Service Company tax settlement for traffic mitigation measures.^{50, 2001}

The General Plan of the County of Maui states that developers of land are being asked to participate in funding of improvements on a reasonable pro-rata basis through development permit conditions, or via fees.^{29, 1993}

Compare Visitor and Resident Impact

The Annual Report - Department of Public Works and Waste Management notes poor maintenance of sidewalk areas fronting private property (residential areas), which is the responsibility of the abutting property owner has been a thorn in our roadside maintenance program. Cooperation from property owners to maintain the frontages of their properties is an uphill battle. Improper frontage maintenance is visual unappealing to visitors and creates accessibility problems.^{135, 2002}

Major Assumptions

Road improvements are based on projected population figures.

See Hawaii State Roads Summary for more information.

County of Maui – Airports

Present Capacity and Usage

The State Department of Transportation describes the three airports on the Island of Maui as follows:

Hana Airport supports commuter, unscheduled air taxi, and general aviation activities on a 119-acre site on the east shore of Maui, about three miles northwest of the town of Hana. The single runway serves the passenger terminal and general aviation and airport support facilities south of the runways. Vehicular access to the airport from Hana Highway is provided by Alalele Place.

Kahului Airport is located on the northern edge of the land bridge between Haleakala and the West Maui Mountain Range on the island of Maui. The airport occupies 1,391 acres of land and is located three miles east of the town of Kahului. The airport has two intersecting runways and air carrier facilities for domestic overseas and inter-island commercial service. Kahului Airport provides commuter/air taxi and general aviation operations, including helicopter operations in separate locations. Vehicular access to the passenger terminal, commuter/air taxi, cargo, scenic tour operators, general aviation facilities and airport support facilities is via a roadway network that connects to the Haleakala and/or Hana Highways.

The Kapalua Airport is a commercial service airport that is served by commercial propeller air carriers and commuter/air taxi aircraft only. This facility started as a private facility until its acquisition by the State. The facility consists of a single runway, terminal facilities, and support facilities. There are no air cargo facilities at this airport. Access to this airport is provided from a two-lane road off of Honoapiilani Highway.^{101, 2002}

See community level Airports Summaries for more detailed information.

Existing Problems, Issues and Opportunities

Kahului Airport:

- Insufficient space in and surrounding current cargo facilities.
- Curbside congestion.
- Current rental car location causes curbside congestion and required all cars to pass terminal.
- Baggage claim congestion
- Crowded conditions for staging of buses and group tour operations
- Air traffic control tower unable to see helicopter takeoffs.

Kapalua Airport:

- The runway, apron and other facilities cannot be expanded without changes to the existing agreement with the County of Maui.

- Operations are limited to daytime hours only.

Molokai Airport:

- Improvements are constrained by a number of factors.
- Runway extension is dependent on FAA approval and the acquisition or exchange of easement of Hawaiian Home Lands. ^{127, 1998}

See community level Airports Summaries for more detailed information.

Future and Planned Usage

Hana Airport:

- Continue to serve rural communities of East Maui with schedule commuter service.
- Development expected to remain close to current levels.

Kahului Airport:

- Based on the passenger forecast, Kahului Airport will remain the second busiest Airport in Hawaii to the year 2020
- Total aircraft operations are expected to increase 66% by 2020.

Kapalua Airport:

- Constraints preclude major airport development.
- Future CIP projects will focus on safety and compliance issues. ^{127, 1998}

See community level Airports Summaries for more detailed information.

Future and Planned Requirements or Changes

Kahului Airport future requirements:

- Expansion of Kahului Airport terminal will be required to facilitate the projected 66% growth in overseas and domestic traffic through 2020.
- Extension of Runway 2-20 needed to accommodate the projected growth.
- A parallel runway may be required to provide sufficient capacity and reduce aircraft delays for the projected overseas demands.
- Roughly, 500 acres of land will need to be acquired for runway and it's protection zone.
- Expand and relocate a central rental car facility to reduce curbside congestion due to the projected growth.
- Expansion of air cargo space to accommodate growth.
- An apron and taxiway for helicopters.

Molokai Airport future requirements:

- According to the Molokai Community Plan, projection of development is modest and will limit future demand.

Lanai Airport future requirements:

- Planned runway extension and land acquisition will position the airport to meet projected demand. ^{127, 1998}

See community level Airports Summaries for more detailed information.

Anticipated Costs for the Future

The Draft Hawaii Statewide Transportation Plan lists anticipated future costs for Maui County airports.

- Molokai Airport there are (3) programs totaling \$14.360 million.
- Lanai Airport there are (2) programs totaling \$1.010 million.
- Kahului Airport cost totals \$96.122 million by the year 2020.^{101, 2002}

Problems, Issues and Opportunities Associated with Costs

The Draft Hawaii Statewide Transportation Plan notes that since the capital improvement program is large, the DOT continues to rely on reimbursable General Obligation Bonds and federal aid to help fund programs and projects.^{101, 2002}

Compare Visitor and Resident Impact

Maui's Kahului Airport will remain Hawaii's second busiest airport to the year 2020. International passenger demand is expected to grow to 870,000 annually.

Major Assumptions

The major assumption for Maui's airports is that Kahului Airport will remain Hawaii's second busiest airport to 2020.

County of Maui – Harbors

Present Capacity and Usage

There are three main harbors in the County of Maui: Kahului Harbor, located on Maui, Kaunakakai Harbor, located on Molokai, and Kaunapali Harbor, located on Lanai. Kahului Harbor is the only deep-water harbor on Maui. There are other harbors in Maui County. Maalaea Harbor, on Maui, includes boats going to Molokini. It is undergoing expansion for harbor facilities and a world-class aquarium.

The Updated Wailuku-Kahului Community Plan states Kahului Harbor is the only commercial harbor on the Island of Maui.^{31, 2000}

State Airports, Harbors and Highways lists Kahului Harbor as the third busiest harbor in state and the busiest of all Neighbor Island harbors.^{37, 2001}

Communication from the Department of Transportation, Harbors Division states the Island of Maui received 1,818,433 short tons of cargo in the year 2001.^{93C, 2002}

See Lanai, Molokai, and Kahului Community Harbor Summaries for more information.

Existing Problems, Issues and Opportunities

The Updated Wailuku-Kahului Community Plan states Kahului Harbor serves as the transportation center of and gateway to the Island of Maui creating many issues and opportunities for the harbor.^{31, 2000}

Future Usage

See Hawaii State and Lanai, Molokai, and Kahului Community Harbor Summaries for information.

Future and Planned Requirements or Changes

See Hawaii State and Lanai, Molokai, and Kahului Community Harbor Summaries for information.

Anticipated Costs for the Future

State Airports, Harbors and Highways lists anticipated costs for Kahului Harbor as follows:

- Extension of Pier 1 by 300' \$10 million.
- Pier 1 Passenger Cruise Terminal \$988,000.
- Special maintenance projects \$541,800.^{37, 2001}

Problems, Issues and Opportunities Associated with Costs

State Airports, Harbors and Highways states Harbor Special Fund net income FY2000 was \$23,197,089.^{37, 2001}

Compare Visitor and Resident Impact

See Hawaii State and individual regional Harbors Summaries for information.

Major Assumptions

State Airports, Harbors and Highways makes the following assumptions:

- The overseas container volume to the State of Hawaii is projected to top 1,338,000 TEUs (twenty-foot equivalent units) in the year 2020.
- The 2020 Hawaii State projections for general cargo total 3,919,800 short tons.^{37, 2001}

County of Maui – Parks

Present Capacity and Usage

State of Hawaii Data Book 2001 gives statistics on parks on the islands in the County of Maui. ^{252, 2001} (See map of some Maui Parks, sports fields and pools in Appendix.)

Table 5.24 – Maui County National, State and County Parks

Parks	2001
National Parks	
Number of areas	2
Acreage	28,991
Visits	1,503,068
State Parks	
Number of areas	10
Acreage	566
Visits	1,747
County Parks	
Number of areas	143
Acreage	1,198

Source: *2001 State of Hawaii Data Book*

Table 5.25 – Maui County National and State Historic Sites

2001	Maui	Kahoolawe	Lanai	Molokai	Total Maui County
Listed Hawaii Register only	30	-	-	41	71
Listed National Register only	4	1	-	10	15
Listed both Hawaii and National Register	31	-	2	40	73
Eligible for National Register	1	-	-	2	3
Total sites	66	1	2	93	162

Source: *2001 State of Hawaii Data Book*

Table 5.26 – Parks in Maui County

County Parks	Size		Size
Charley Young Beach Right of Way		Kihei Partners Park	
Charley Young Beach Parking Lot		Kihei Regional Park	
Cove Park		Kilohana Park	
Hale Piilani Park		Lei Park 1.43 acres	
Haycraft Park		Maalaea Beach Park	
Horita's Beach Park		Mai Poina Oe Iau Beach Park/ Memorial Park	5.3 acres
Kalama Park	36.488 acres	Maluaka Beach Park	
Kalepololepo Park	1.112 acres	Mokapu Beach	
Kamaole I	2.983 acres	Oneuli Beach	
Kamaole II	2.192 acres	Palauaea Beach	
Kamaole III	5.86 acres	Polo Beach	
Kamaole Point	1.394 acres	Poolenalena Beach Park/ Paipu/Chang's Beach	
Kapoli Beach Park	5.35 acres	Sugar Beach	
Keawakapu Beach		Ulua Beach	
Kenolio Park	4.4 acres	Wailea Beach	
Keonekai Park		Waipuilani Park	
Kihei Beach Reserve		Waipuilani Park Addition	
Kihei Community Center	9 acres	Whale Sanctuary Park	1.112 acres

State Parks	Size		
Big Beach - Oneloa Beach		Maalaea Boat Harbor	
Kihei Boat Ramp	17.528 acres	Makena State - La Perouse Park	
Little Beach - Puu olai Beach		State Beach Reserves	
Kihei Wharf	31.346 acres		

Federal Parks	Size		
Ahihi-Kinau Natural Area	22.937 acres	Kealia Pond National Wildlife Refuge	
Humpback Whale Sanctuary Headquarters	1.130 acres		

Source: 2001 State of Hawaii Data Book

The General Plan of the County of Maui states that the County Department of Parks and Recreation controls over 1,000 acres of park and recreation areas. In addition, there are thirteen State parks and historic sites encompassing a total of approximately 575 acres. On the Island of Maui, there are more than 32 miles of sandy shoreline, of which approximately eight miles are considered safe, clean, accessible, and generally suitable for swimming.^{29, 1993}

County of Maui: Fiscal Year 2002 Budget reports that during the year 2000, the Construction/Maintenance Section completed 1,827 countywide facility repairs. This involved both new construction and maintenance at parks and other County facilities.^{50, 2001}

Existing Problems, Issues and Opportunities

Hawaii Tourism Product notes lack of public infrastructure such as adequate restroom and other facilities at parks and visitor locations.^{91, 1999}

The General Plan of the County of Maui states competition for coastal-based recreational resources is one of the more critical issues facing the County. Issues include conflicting uses among various coastal users (e.g. windsurfing and swimming), adequacy of access to shoreline areas, and impact of coastal development upon coastal recreational resources.^{29, 1993}

Future and Planned Usage

The General Plan of the County of Maui lists Maui County's objectives.

- To provide high-quality recreational facilities to meet the present and future needs of our residents of all ages and physical ability.
- To provide a wide range of recreational, cultural, and traditional opportunities for all the inhabitants.^{29, 1993}

County of Maui: Fiscal Year 2002 Budget states during the year 2002, the Parks Maintenance program will repair and renovate community centers, gymnasiums, civic center, swimming pool complexes, irrigation systems and equipment. Removal of trees hazards and tree planting along streets and in parks will continue to be a priority to enhance the beauty of Maui County.^{50, 2001}

The General Plan of the County of Maui notes that since coastal recreational areas are a limited resource for the County, it is essential that these areas be properly managed. The General Plan should acknowledge this need by:

- Encouraging coastal land use planning which preserves and enhances existing shoreline recreational resources and opportunities.
- Supporting the development of a coastal recreation management plan to identify conflict management resource preservation, and access enhancement strategies.
- Promote intergovernmental coordination to develop and manage new coastal recreational areas, which provide for both visitor and resident needs.^{29, 1993}

Future and Planned Requirements or Changes

The State Recreation Functional Plan, DLNR, 1991 contains the following recommendations:

1. Address the problem of saturation of the capacity of beach parks and near shore waters. Acquire additional beach parkland and rights-of-way to remaining undeveloped shorelines to provide increased capacity for future public recreational use. Cite only the pertinent following areas.
Maui: Makena, Honolua Bay, Mokeleia Bay and Honomanu Bay
Lanai: Shipwreck Beach

- Molokai: Honomuni Beach, Halawa Valley and Moanui
2. Establish near shore underwater areas for non-consumptive activities (e.g. Marine Life Conservation Districts, artificial reefs).
 3. More aggressively manage and control the use of existing beach parks.
 - a. Develop and implement an ongoing capacity analysis program including beach counts and analyses to determine appropriate uses and the maximum number of allowable users at a facility (carrying capacity or “limits of acceptable change”).
 - b. Identify heavily stressed beach parks and near shore ocean areas, prioritize them in terms of need for action, carry out capacity analyses, determine appropriate activities, set limits, and develop measures to control use, such as permits, user fees, limiting the number of users, etc.
 4. Develop areas mauka of existing beach parks to increase their capacities and to diversify and encourage activities away from the shoreline.
 5. Reduce the incidence of ocean recreation accidents. Increase support for water safety programs.
 - a. Determine the effectiveness of enhanced signage at beaches and supplemental educational programs in reducing the number of drownings and near drownings.
 - b. Coordinate water safety information programs targeted at visitors.
 6. Resolve conflicts between different activities at heavily used ocean recreation areas. Promote implementation and enforcement of an effective Ocean Recreation Management Plan.
 7. Mitigate the impact of increased use of popular ocean recreation areas by visitors. Promote recreational activities for visitors away from popular or heavily used beaches.
 8. Plan and develop facilities and areas that feature the natural and historic/cultural resources of Hawaii. Develop interpretive programs for these areas.
 9. Proceed with planning, acquisition and development of trails.
 - a. Provide adequate funding on a continuing basis for the Na Ala Hele Program.
 - b. Plan and develop demonstration and priority trails identified by the Na Ala Hele Program.
 10. Prevent the loss of access to shoreline and upland recreation areas due to new developments. Prevent blocking of existing shoreline access paths.
 - a. Draft a comprehensive public access code to require the provision of public access to shoreline and mauka recreation areas.
 11. Resolve the problem of landowner liability that seriously hampers public access over private lands.
 12. Promote and coordinate the development and implementation of environmental education and information programs to address subjects such as litter, vandalism, poaching, anchor damage of coral, depletion of recreational fisheries and destruction of native ecosystems.

The General Plan of the County of Maui lists that Maui County’s plans to:

- Maintain and upgrade existing recreational facilities to meet community needs.
- Maintain recreational facilities for both active and passive pursuits.
- Maintain the natural beauty of recreational areas.
- Develop facilities that will meet the different recreational needs of the various communities.
- Expand, improve and create new beach rights-of-way, parks, campsites, and other facilities designated for family use.
- Expand the County’s recreational programs to include cooperative program development with private agencies to meet the needs of all residents, our children, the elderly and the handicapped.
- Encourage the identification, restoration, and preservation of important archaeological, historical and cultural sites.
- Accelerate the expansion and upgrading of Maui County’s beach access facilities, to include parking, and lateral access.
- Encourage the use of public lands to expand and enhance outdoor recreational and cultural opportunities.
- Encourage the use of public facilities for both cultural and recreational activities. ^{29, 1993}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget gives the following appropriations. The proposed Fiscal Year 2003 Capital Improvement Budget for park improvements is 8.225 million dollars. ^{147, 2002}

Table 5.27 – Maui County Six Year Parks and Recreation Capital Improvement Program

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Countywide Fence and Backstop Replacement		150	150
Countywide Park Improvements	360		360
Countywide Playgrounds		150	150
	428		428

Source: Maui County Department of Planning FY2003 Budget

Problems, Issues and Opportunities Associated with Costs

See Hawaii State Parks Summary for information.

Compare Visitor and Resident Impact

See Hawaii State Parks Summary for information.

Major Assumptions

N/A

County of Maui – Police, Fire and Emergency Services

Present Capacity and Usage

Police

The Maui Police Department describe that Maui County Department of Police is the only accredited law enforcement agency in Hawaii and one of 500 worldwide.^{96C, 2002}

Table 5.28 – Maui County Police District Measures

	FY2001 Actual	FY2002 To Date
Personnel	246.1	259.1
Calls for Service	N/A	42108
Documented Cases	48986	24551
Moving Citations	18663	11802
Parking Citations	10786	4706

Source: Maui County Department of Police

The Maui Police Department districts do not match the planning districts. The following statistics breaks down the number of officers and calls for service by police district.^{96C, 2002}

Table 5.29 – Maui County Police Statistics by District

District	Calls for Service	Officers
Wailuku	21,042	83
Lanai	445	9
Hana	682	7
Lahaina	6,954	38
Molokai	2,124	21
Kihei	7,643	27

Source: Maui County Department of Police

Fire

Maui County Department of Public Works FY2001 Budget reports the following activity statistics for the Maui County Department of Fire Control.^{141, 2002}

Table 5.30 – Department of Fire Control Program Measures

	FY 1999 Actual	FY 2000 Actual	FY 2001 Estimate
Personnel	216	216	222
Fires	675	605	645
Rescues (non-fire related)	304	297	290
Emergency medical services	1373	1385	1050
Hazmat response	84	125	105
False calls (any alarm received for which response was unnecessary)	261	405	215
Company assists (another fire company responds with primary company to assist with an emergency)	1379	1577	1220
Other calls (miscellaneous services such as removing traffic hazards)	691	707	620
AED (Automated external defibrillator) response	7	10	65
Helicopter Responses	0	0	60

Source: Maui County Department of Public Works FY2001 Budget

Maui County Department of Fire Control has **13 fire stations** throughout the County of Maui. There are **9 fire stations on the Island of Maui, 3 fire stations on the Island of Molokai and 1 fire station on the Island of Lanai**. There are **13 engine companies, 1 ladder company, 1 rescue/hazmat company, 2 tankers, and 3 rescue boats**. The Island of **Maui has 9 engine companies, 1 ladder company, 1 rescue/hazmat company, 2 rescue boats and 1 tanker**. The Island of **Molokai has 3 engine companies, 1 rescue boat and 1 tanker**. The Island of **Lanai has 1 engine company**. The County of Maui, Department of Fire control consists of **279 full-time paid personnel**.^{250, 2001}

The Department of Fire Control Maui describes that within the current 13 fire stations there are 13 1500GPM pumpers, one 75 aerial apparatus, two water tankers, one hazardous material response vehicle, three rescue boats, two wave runners and 5 relief apparatus. When Wailea Station opens up it will be equipped with one 1500GPM pumper, one 95' mid-mount platform ladder apparatus and one water tanker. A 500 D Hughes helicopter is designated to the fire department 24 hours a day, stationed at the Kahului Fire Station.^{42C, 2002}

Maui County Department of Public Works reports that in FY 2000, the Department completed the equipment purchase for Automated External Defibrillators (AED). Each of fifteen companies within the Department is now equipped with this specialized life saving equipment. This increases ability to provide life saving capabilities to the citizens of Maui County.

Individual Self Contained Breathing Apparatus (SCBA) facemasks have been purchased to replace old outdated masks. Each fire fighter will be issued a mask that will allow them communication capabilities during emergencies and meet the OSHA requirements for respiratory concerns.

Capital improvement funds were expended to replace the existing Kaunakakai Fire Station driveway with concrete. Makawao Fire Station will be adding a Captain's quarters and improvements will be made to the fire fighters dormitory.
^{141, 2002}

Existing Problems, Issues and Opportunities

County of Maui: Fiscal Year 2002 Budget lists Maui Police Department existing issues:

- The Lanai Police Station is old and in disrepair. It does not adequately provide workspace for the staff assigned to it,
- Because the rapid population growth in South Maui, the Kihei Fire Station, built in 1972, is unable to meet the increasing safety needs of the community, and
- The following programs will not receive funding:
 - Neighborhood Crime Watch
 - Covert Operations Program
 - Anti-theft Task force
 - DARE Grant.^{50, 2001}

The Maui Police Department states the biggest problem for the Maui Police Department is staffing with 30 vacancies for police officers.^{96C, 2002}

The Maui County's Department of Fire Control lists existing issues:

- Obtaining resources because it is a three-island county.
- County is separated by water and transportation of personnel and equipment to Lanai and Molokai when needed is of concern.
- Logistics of providing training for personnel on the other islands as the training facilities are located on Maui.
- Cost for training of personnel and repair of equipment for the islands of Lanai and Molokai.^{42C, 2002}

Future and Planned Usage

The General Plan of the County of Maui lists Maui County's health and public safety objectives are to maintain staff and equipment levels to meet requirements to protect life and property. This will allow them to meet the health needs of all residents and visitors and create an atmosphere that will convey a sense of security for all residents and visitors.^{29, 1993}

Future and Planned Requirements or Changes

The General Plan of the County of Maui lists the following planned changes:

- Encourage the expansion and improvement of public and private medical facilities.
- Encourage the State to provide prompt and adequate 24-hour emergency services available to each community throughout the County.

- Maintain a proper state of preparedness for man-made or natural disasters.
- Encourage private industries to provide for themselves protection services to meet their special needs.
- Locate fire, police, and life saving stations in convenient areas.
- Reduce fire losses by improving and maintaining fire fighting apparatus.^{29, 1993}

Maui County Department of Planning FY2003 Budget plans renovations and facility expansion projects are anticipated for police facilities countywide to accommodate growth and operational need. Renovations would also be required to make effective use of existing space, to enhance the safety of employees and members of the public utilizing the facilities. Projects under consideration:

- Wailuku Station Secured Storage Structure Wailuku Station Landscape Improvements
- Wailuku Station Classroom Renovations^{147, 2002}

Improvements to fire facilities include roof repair, painting, termite treatments, installation of locker rooms and other repairs due to deterioration.^{147, 2002}

Communication from Maui County’s Department of Fire Control notes a department evaluation was done by a private contractor and a strategic plan for the department will be carried out very soon. Within the strategic plan a re-organization of the department is planned to meet the demand of services within the department.^{42C, 2002}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget makes the following appropriations for countywide police, fire and emergency services facilities. The fund source is the County.^{147, 2002}

Table 5.31 – Maui County Six Year Police, Fire and Emergency Services Facilities Capital Improvement Program Budget in Thousands of Dollars

Dollars In Thousands	FY2002	FY2003-2007
Countywide Emergency Shelters	50	
Countywide Fire Facilities	150	1,250
Countywide Government Facilities	500	1,250
Countywide Police Facilities	50	1,000

Source: *Maui County Department of Planning FY2003 Budget*

County of Maui: Fiscal Year 2002 Budget states the cost of constructing a new Wailea Fire Station is \$8.3million. The costs for the construction of the Lanai Police Station are \$2.6 million.^{50, 2001}

The Maui County’s Department of Fire Control notes the Department is currently working on updated equipment replacement schedule. It is noted that a fire

apparatus can cost anywhere from \$400,000- \$800,000, fully equipped. Replacement of first line apparatus approximately after 10-15 years of service is needed.^{42C, 2002}

Problems, Issues, and Opportunities Associated with Costs

There are several non-county revenue based funding sources that have previously been identified by the police and fire departments. Further study of other sources would be advised.

Communication from Maui County's Department of Fire Control states the problem meeting cost requirements is related to the present economy of the County. The budget requests from the Department, such as increases in manpower or replacement of equipment, hinge on the state of the economy.^{42C, 2002}

Compare Visitor and Resident Impact

The Maui Police Department notes that while there is a police program directed at visitors, statistics are not gathered to illustrate the impact of visitors and residents on Police and Fire services. Visitor Oriented Policing is located in the Kihei and Lahaina districts. This is a community-based partnership with the visitor industry to address public safety and issues regarding our visitor based economy. Designated officers assist tourists specifically with their problems on Maui. They assist with problems associated with being a victim of a crime or with other types of incidents such as a death while on vacation.

Other community based policing and fire programs are ongoing, but they are not directed solely at visitors. Statistics gathered annotate the location of the service call, but not whether it is visitor related. Further study is required to derive visitor versus resident impact data.^{96C, 2002}

The Maui County's Department of Fire Control notes that on any given day, Maui County has approximately 40,000 visitors on the island. The large visitor count on the island does impact emergency response capabilities and the number of responses.^{42C, 2002}

Major Assumptions

The Maui County's Department of Fire Control lists the following major assumptions:

- The most important requirements used to determine future expansion is the population density in districts.
- The anticipated future developments of certain communities.
- The demand from the nearby companies such as number of runs and types of alarms.^{42C, 2002}

County of Maui – Visitor Accommodations

Present Capacity and Usage

The Maui County Data Book 2001 notes that the average number of visitors present in Maui County on any given day was 40,651. Total visitation to Maui County for 2001 by island is summarized in the table below.^{247, 2001}

Table 5.32 – Maui County Visitation: 2001

Visitation	Maui	Molokai	Lanai	Total Maui County
Domestic	1,640,961	52,312	72,783	1,685,960
International	407,806	17,921	12,122	1,685,960
Total	2,048,768	70,233	84,905	2,104,478

Source: Maui County Data Book 2001

Below is the number of hotel and condominium properties and the number of units attributable to each category.^{247, 2001}

Table 5.33 – Maui County Visitor Accommodations by property and Units: 2001

Island	Type of Accommodation	Number of Properties	Available Units	% Change from 1998
MAUI	Apartment/ Hotel	6	93	
	Bed & Breakfast	26	115	
	Condominium Hotel	107	7,987	
	Hostel	2	30	
	Hotel	29	8,399	
	Individual Vacation Unit	65	409	
	Other	16	541	
	TOTAL		251	17,574
MOLOKAI	Bed & Breakfast	1	1	
	Condominium Hotel	4	116	
	Hotel	1	45	
	Other	2	4	
	Individual Vacation Unit	2	126	
TOTAL		10	292	-31.9%
LANAI	Bed & Breakfast	1	3	
	Hotel	3	362	
	Individual Vacation Unit	2	3	
	TOTAL	6	368	0.0%

Source: Maui County Data Book 2001

The Maui County Data Book 2001 gives a breakdown by accommodation type and units within each of the six planning areas on the Island of Maui.^{247, 2001}

Table 5.34 – Maui County Visitor Plant Inventory by Type: 2001

Area	Properties	Available Units
Hana		
Bed & Breakfast	2	5
Condominium Hotel	1	17
Hotel	2	96
Individual Vacation Units	16	30
Other	4	18
Total	25	166
Kahului-Wailuku		
Bed & Breakfast	1	7
Condominium Hotel	2	30
Hotel	3	402
Individual Vacation Units	2	7
Other	3	23
Total	11	469
Kula-Makawao		
Bed & Breakfast	8	32
Condominium Hotel	1	14
Hotel	1	6
Individual Vacation Units	19	47
Other	1	5
Total	30	104
Lahaina-Kaanapali-Napili-Kapalua		
Apartment/Hotel	4	81
Bed & Breakfast	8	47
Condominium Hotel	49	4,358
Hotel	12	4,579
Individual Vacation Units	8	78
Other	5	489
Total	86	9,632
Maalaea		
Condominium Hotel	7	257
Total	7	257
Wailea-Kihei		
Apartment/Hotel	2	12
Bed & Breakfast	7	24
Condominium Hotel	49	3,341
Hotel	11	3,316
Individual Vacation Units	20	247
Other	3	6
Total	92	6,946

Source: *Maui County Data Book 2001*

The Maui County Data Book 2001 gives the number of units available in nightly price categories. ^{247, 2001}

Table 5.35 – Maui County Visitor Accommodations by Price: 2001

Island	All levels	<\$100	\$101-\$250	\$251-\$500	>\$500
Maui	17,070	2,654	6,564	6,558	1,294

Source: *Maui County Data Book 2001*

The Maui County Data Book 2001 lists occupancy rates, average daily room rates and revenues per room for the main resort areas on the Island of Maui. ^{247, 2001}

Table 5.36 – Hotel Room Occupancy Rates: 2001

	Percent occupied	Average daily room rate (dollars)	Average revenue per available room (dollars)
Maui	77.99	226.22	176.43
Kaanapali	80.23	178.84	143.48
West Maui	74.27	212.37	157.73
Other	77.38	279.14	216.01

Source: *Maui County Data Book 2001*

The 2001 Visitor Plant Inventory notes that 46% of Maui’s rooms are in the deluxe and luxury categories. ^{80, 2001}

The State of Hawaii Data Book 2000: A Statistical Abstract notes 10,900 and 11,450 jobs were attributable to the hotel industry in 1999 and 2000 respectively. ^{64, 2001}

Existing Problems, Issues and Opportunities

The General Plan of the County of Maui states one main problem faced by the County of Maui visitor industry, is the proper allocation of land for the visitor facilities without overburdening physical and social infrastructure as well as environmental and agricultural zones. ^{29, 1993}

As stated in the *Maui County Community Plan Update Program Socio-Economic Forecast*, the main existing problem is the lack of land to develop new visitor units. ^{22, 1994}

Future and Planned Usage

The General Plan of the County of Maui states Maui County’s objectives to improve the visitor industry. These include the following:

- To require exceptional and continuing quality in the development of visitor industry facilities
- To control the development of visitor facilities so that it does not infringe upon the traditional social, economic and environmental values of our community

- To ensure that visitor industry facilities shall not disrupt agricultural and social pursuits and will not be allowed to negatively impact the County’s natural and cultural resources
- To develop a visitor industry which will enhance the social and economic lifestyles of Maui County’s residents.^{29, 1993}

The Maui County Community Plan Update Program Socio-Economic Forecast states that given the amount of developable vacant hotel-designated land and the restrictions on the use of multi-family units for visitor rentals, the adjusted amount of total visitor units projected for the year 2000 was 872 units and 5,857 units projected for the year 2005.^{20, 1992}

The General Plan of the County of Maui states that the hotel room inventory will expand by 2,810 rooms with the completion of seven additional hotels now in the planning or construction phases of development.^{29, 1993}

The Maui County Data Book 2001 notes future changes to the visitor accommodations on the Island of Maui. The table below contains additions and subtractions for the accommodations supply on the Island of Maui.^{247, 2001}

Table 5.37 – Visitor Accommodation Inventory Planned Additions and Subtractions: 2001

Name of Facility	Planned Type	Planned Units	Estimated Completion	Notes
Kaanapali Ocean Resort	Timeshare	280	N/A	Construction of Phase 1 initiated in late 2000; Project under construction
Kahului Airport Hotel	Hotel	140	N/A	Community Plan Amendment, Change in Zoning, and SMA permit pending Council approval.
Maui Lu Hotel redevelopment - Consolidated Resorts	Timeshare	252	N/A	SMA application withdrawn – Jan. 2000
Maui Marriott (Maui Ocean Club)	Timeshare	341	N/A	Planned conversion of 720 rooms to 341 timeshare units; construction on subsequent phases occurring June-November
Maui Palms Redevelopment	Hotel	136	N/A	SMA Permit application pending

Source: *Maui County Data Book 2001*

The Hawaii State Department of Business, Economic Development and Tourism gives statistics and makes projections about the visitor industry on the Island of Maui.^{84, 2000}

Table 5.38 – Hawaii Visitor Variables: Actual and Projections to 2025

	1998	2000	2005	2010	2015	2020	2025
Ratio between average daily census and occupied visitor rooms							
State	3.1	3.1	3.1	3.2	3.2	3.2	3.2
Maui	3.3	3.3	3.3	3.4	3.4	3.4	3.4
Number of occupied visitor rooms							
State	51,551	54,256	62,685	68,483	75,197	82,567	90,657
Maui	13,577	14,378	16,744	18,405	20,289	22,365	24,653
Share of occupied visitor rooms (%)							
Maui	26.3	26.5	26.7	26.9	27.0	27.1	27.2
Minimum hotel occupancy rate when new hotels are needed (%)							
State	72.1	75.9	81.7	82.5	82.8	83.0	83.0
Maui	72.8	77.1	82.0	82.5	82.5	83.0	83.0
Number of visitor rooms demanded							
State	71,480	71,480	76,744	83,010	90,867	90,479	109,226
Maui	18,650	18,650	20,419	22,309	24,593	26,946	29,704
Number of Visitor rooms (avg. annual growth rate, %)							
State	0.5	0.0	1.4	1.6	1.8	1.8	1.9
Maui	0.6	0.0	1.8	1.8	2.0	1.8	2.0

Source: *Population and Economic Projections for the State of Hawaii to 2025*

Future and Planned Requirements or Changes

The General Plan of the County of Maui plans to pursue the following:

- Limit visitor industry development to those areas identified in the appropriate community plans, and to the development of projects within those areas, which are in conformance with the goals, and objectives of those plans.
- Provide for the concept of a hotel room limit in community plan areas as part of the managed and directed growth plan and discourage any additional shoreline resort development
- Develop sufficient quality and marketing strategies for the visitor industry facilities currently planned and constructed in order to stabilize and increase the overall occupancy rate on an annual basis.
- Require that new developments contribute their fair share to infrastructure costs.

- Encourage the use of local manpower in the construction of visitor facilities and in all employment levels including management in the operation of those facilities.
- Locate buildings to retain scenic vistas.
- Encourage developers to minimize urban encroachment of ocean front lands by establishing increased shoreline setbacks and by requiring the public dedication of continuous lateral access parallel with the shoreline.
- Encourage the preservation of open beach space by maximizing the use of lands presently designated by community plans for visitor facility use and discourage rezoning of other lands for such use.
- Promote water, beach, and open space conservation in areas devoted to service for visitors.
- Protect the opportunity for Hawaii residents to enjoy of the visitor facilities through implementation of incentive programs for the kamaaina traveler.^{29, 1993}

Anticipated Costs for the Future

County of Maui: Fiscal Year 2002 Budget notes anticipated Transient Accommodation Tax for the year 2002 is of \$19,250,000.^{50, 2001}

Problems, Issues and Opportunities Associated with Costs

According to the *Maui County Community Plan Update Program Socio-Economic Forecast*, based on visitor industry analysts, the long-run minimum needed to maintain profitable operations is assumed 70% occupancy rate.^{20, 1992}

Compare Visitor and Resident Impact

The General Plan of the County of Maui notes that the visitor industry is very influential in the Maui County's economy, for that reason, the desire to create awareness in the community is imperative. They plan to do this by:

- Cooperate with the State Department of Education and the University of Hawaii to provide educational and training facilities to residents employed in the visitor industry.
- Creating awareness of the role of the visitor industry in the economy.
- Protecting citizens whose lands border visitor industry activity from excessively high taxation.^{29, 1993}

Major Assumptions

The *Maui County Community Plan Update Program Socio-Economic Forecast* states that the total visitor units projected for the year 2005 is:

- **Lanai:** 1,128 units with an annual rate of growth of 0.3%
- **Molokai:** 559 units with an annual rate of growth of 0.0%
- **Maui Island:** 31,559 units with an annual rate of growth of 3.5%^{22, 1994}

County of Maui – Private Transportation

Present Capacity and Usage

The State of Hawaii Data Book 2001 gives statistics on private transportation available in the County of Maui.^{252, 2001}

Table 5.39 – Maui County Registered Taxicabs: 2001

Island	1999	2000	2001
Maui	216	200	216
Lanai	-	-	-
Molokai	-	-	-

Source: *State of Hawaii Data Book 2001*

Table 5.40 -- MAUI COUNTY MOTOR CARRIER CHARACTERISTICS: 2001

	Passenger Carriers			Property Carriers	
	Number of Carriers	Number of Vehicles	Seating Capacity	Number of Carriers	Number of Vehicles
State Total	1,869	8,695	209,832	5,474	34,522
Maui County	308	1,914	44,052	892	4,448

Source: *State of Hawaii Data Book 2001*

Existing Problems, Issues and Opportunities

No information was uncovered regarding existing problems, issues and opportunities for Private Transportation.

Future and Planned Usage

Lanai Community Plan notes planned usage for tour bus routes and drop off points to support local businesses.^{30, 1998}

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for Private Transportation.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for Private Transportation.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for Private Transportation.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Private Transportation.

Major Assumptions

No information was uncovered regarding major assumptions for Private Transportation.

County of Maui – Energy Systems

Present Capacity and Usage

Maui County Data Book 2001 gives statistics on electrical utilities on the islands in the County of Maui. ^{247, 2001}

Table 5.41 – Electrical Generating and Firm Purchased Capabilities in Megawatts

	1995	1996	1997
Maui Island	217.3	207.5	207.5
Molokai	8.7	9.8	12.1
Lanai	9.7	14.1	10.4
Maui County	235.7	231.4	230.0

Source: *Maui County Data Book 2001*

Table 5.42 – Peak Electrical Demand In Megawatts

	1995	1996	1997
Maui Island	170.7	174.8	174.7
Molokai	7.0	6.8	6.6
Lanai	4.8	5.0	5.0

Source: *Maui County Data Book 2001*

Table 5.43 – Electrical Customer Accounts

	1995	1996	1997
Total			
Maui Island	49,194	49,590	50,385
Molokai	2,812	2,816	2,858
Lanai	1,333	1,345	1,362
Maui County	53,339	53,751	54,605
Residential			
Maui Island	42,004	42,578	43,159
Molokai	2,308	2,319	2,339
Lanai	1,162	1,179	1,181
Maui County	45,474	46,076	46,679
Other			
Maui Island	7,190	7,012	7,226
Molokai	504	497	519
Lanai	171	166	181
Maui County	7,865	7,675	7,926

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

The General Plan of the County of Maui states one of the Maui County’s objectives is to become more self-sufficient in its need for non-renewable energy and more efficient in its use of energy.^{29, 1993}

Future and Planned Usage

The General Plan of the County of Maui notes Maui County’s plan to provide efficient energy supply comprises the following:

- Encourage programs to test the feasibility of alternative sources of energy production
- Create incentive programs for architects and developers to encourage the use of solar heaters and other energy-saving building design concepts and devices
- Seek to incorporate energy-saving building design concepts and devices in government buildings, as well as all new private and public developments
- Maintain an ongoing assessment of the County’s energy resources and of alternative sources in the context of a comprehensive integrated resource plan.^{29, 1993}

Future and Planned Requirements or Changes

The General Plan of the County of Maui states formulating a Maui County Integrated Resource Plan (IRP) that encompasses cost-benefit considerations of production of energy and the consumption of energy. ^{29, 1993}

Anticipated Costs for the Future

See Hawaii State Energy Summary for information.

Problems, Issues and Opportunities Associated with Costs

Maui County Data Book 2001 gives revenue statistics on electrical utilities on the islands in the County of Maui. ^{247, 2001}

Table 5.44 – Electrical Utilities Revenue in Thousands of Dollars

	1995	1996	1997
Maui Island	116,982	133,074	140,035
Molokai	5,937	6,426	6,554
Lanai	4,366	4,934	5,036
Maui County	127,284	144,434	151,624

Source: *Maui County Data Book 2001*

Compare Visitor and Resident Impact

See Hawaii State Energy Summary for information.

Major Assumptions

See Hawaii State Energy Summary for information.

County of Maui – Sewer Systems

Present Capacity and Usage

The Sewer indicator has been combined with the Sewage indicator. See County of Maui Sewage Summary for information.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Coastal Water Quality

Present Capacity and Usage

No information was uncovered regarding the present capacity and usage for the Coastal Water element. (See map of Maui and Molokai Water Quality Standards in Appendix.)

Existing Problems, Issues and Opportunities

According to the State of Hawaii 303(d) *List of Water Quality Limited Waters*, the following table shows the water quality of limited waters.^{202, 1998}

Table 5.45 – Water Quality Limited Waters: 1998

Water body Segment	Pollutants	Probable Source
South Molokai	Nutrients Suspended solids Turbidity	Agriculture

Source: *List of Water Quality Limited Waters*

Future and Planned Usage

As stated in the *Molokai Community Plan* future objectives for the development of Molokai regarding coastal water include:

- Manage, protect, and preserve shoreline dune formations throughout the planning region. These topographic features are a significant element of the natural setting, often contain burials, and should be protected from any actions, which would detract from their scenic or cultural value.
- Protect and manage coastal water quality through best management land treatment practices.
- Require fire prevention and suppression strategies as a means of protecting and preserving Molokai’s land and coastal water resources.
- Discourage any additional development of buildings, which impact the integrity of the shoreline.
- Establish shoreline setback plans based upon the unique cultural environmental and ecological shoreline characteristics of Molokai’s coastline.^{140, 2001}

Lanai Community Plan notes future usage to allow public access to coastal areas through old agriculture fields.^{30, 1998}

Future and Planned Requirements or Changes

As stated in the *Molokai Community Plan* implementing actions include:

- Control soil runoff and sedimentation of coastal water through better enforcement of grubbing and grading and through conservation practices

such as the revegetation of barren areas, control of domestic and feral animals and maintenance of fishponds and other retention basins.^{140, 2001}

Lanai Community Plan lists planned changes as follows:

- Establish floating preserves for coastal resources.
- Maintain marine life conservation district at Manele/Hulopoe bays.^{30, 1998}

Anticipated Costs for the Future

See State of Hawaii Coastal Water Summary for information.

Problems, Issues and Opportunities Associated with Costs

See State of Hawaii Coastal Water Summary for information.

Compare Visitor and Resident Impact

See State of Hawaii Coastal Water and County of Maui Marine Ecosystem Health Summary for information.

Major Assumptions

See State of Hawaii Coastal Water Summary for information.

County of Maui – Marine Ecosystem Health

Present Capacity and Usage

The *Eight Main Hawaiian Island and Coral Reef Assessment and Monitoring Program (CRAMP) Study* describes sites on Maui that have been monitored annually for a period of up to 7 years. Wave energy impact and sand transport are being evaluated. This series was selected to test effects of urbanization, sedimentation, recreational use, wave exposure, coastal construction, and hurricane damage to Hawaiian reefs. The primary work area was within the waters bounded by the Islands of Maui, Kahoolawe and Lanai in the State of Hawaii. There are currently eight sites under study on Maui County. (See map of Maui fish monitoring sites and coral reef assessment sites in Appendix.)

Ahihi-Kinau

Ahihi-Kinau is the only Natural Area Reserve System in the State of Hawaii that includes a marine component. This well protected reef system is considered the youngest on Maui. Coral cover is moderate (20-30%) on the basalt base and drops off precipitously along the end of the peninsula. Human access is limited to non-motorized vessels and hiking trails over the lava fields.

Honolua Bay

Honolua Bay is a semi-enclosed bay located on the northwestern coast of Maui. A reef crest is on the seaward edge of the reef flat. The intermittent Honolua Stream transports varying amounts of fresh water and silt into Honolua Bay during rains. As a result, inshore waters of the bay near the boat ramp area can be very murky. On either side of the bay are dense coral formations in waters ranging from 10 to 40 feet deep. Coral is more abundant and diverse along the northeastern shoreline. Small caves and archways are found near the point on the bay's south margin.

Kahekili Site

This is a watershed forest reserve. Upslope sugarcane fields have been fallow since 1999 with area planned for near shore housing and resort development. A sloping shallow reef has high coral cover with deep sites characterized by aggregated coral heads.

Maalaea Site

Maalaea small boat harbor on the south central coast of Maui is a multi-use facility for recreational and commercial boaters. Originally constructed in 1952 with a single breakwater facing the south and a 12-foot deep entrance channel, it was later closed in by the east breakwater in 1958. It is one of only 2 berthing areas for small craft on Maui.

Molokini Site

The crescent-shaped islet represents the emergent one-third of the rim of a small tuff cone about 400m in diameter. Maximum lagoon depth is 30 m (90 ft) with the surrounding waters is being approximately 150 m (450 ft.) deep. Rich coral reefs in the crater support a diverse and abundant fish fauna. Coral coverage in this area can reach over 70% of available hard substratum. The south face of the crater is a nearly vertical wall that extends down to over 100 m (300 ft.) depth and is subjected to seasonal south swells.

Molokini islet is state land and is managed as a state seabird sanctuary. Entry onto the island is prohibited. Molokini Shoal has been a Marine Life Conservation District (MLCD) since 1977. The Molokini Shoal MLCD covers 77 acres and extends 100 yards seaward of both the submerged and projecting parts of the tuff cone.

Olowalu Site

The Olowalu site contains some of the most extensive "spur and groove" reef formations seen on Maui. Coral cover is moderate to high (30-40%) in deeper water with substantial relief above the sand channels. Numerous dead coral heads are found throughout the area and appear to be killed by re-suspended sediments during high wave conditions. Live colonies also abound. This area has a highly diverse coral fauna. Many uncommon coral species are found here.

Papaula Point Site

Colonized hard bottom with thin veneer over basalt pavement. Encrusting coral colonies dominant form. Northern exposure to extreme wave impacts causes low reef relief. There is low human activity due to inaccessibility.

Puamana Site

This reef is protected from North Pacific swells by the Islands of Maui, Molokai and Lanai to the north and west. The area was decimated in 1992 by anomalous surf generated to the southwest by Hurricane Iniki. Nearly all coral was broken off by the event. The gently sloping reef zone between 5-20' eventually gives way to a sandy bottom. Shoreline area off the beach park is heavily used for surfing and snorkeling. The area to the north of the beach park is lightly used for recreational skin diving and sustenance fishing. This area provides needed recreational opportunities to visitors as well as to the local residents. This site is open access without marine protected area restrictions.^{139, 2000}

According to the *State Land Use District Boundary Review: Maui, Molokai, Lanai*, two-thirds of Molokai is privately owned, 31% is State land, and only 0.2% is federal lands. Private lands are mainly in the hands of large landowners (45% of the island), the largest being Molokai Ranch, Ltd. Small private landowners hold only 6% of the island land area.^{11, 2000}

Existing Problems, Issues and Opportunities

According to the *Eight Main Hawaiian Island and CRAMP Study*, there are the following existing conditions:

Ahihi-Kinau

- Varying degrees of exposure to physical parameters, terrestrial run-off and public use influences these areas.

Honolua Bay

- The major concern at Honolua has been the large number of visitors that utilize the area in spite of very restricted access.
- Future changes in adjacent land use on the watershed draining into Honolua raises concerns related to increased sedimentation and eutrophication.
- Anchor damage and fish feeding are also concerns.
- Honolua Bay is calm during most of the year but is severely impacted by North Pacific swells during the winter months.

Kahekili Site

- Sewage treatment plant in close proximity with 4 injection wells.
- Northern exposure.
- Nutrient inputs from agriculture and injection wells, sedimentation from runoff.

Maalaea Site

- Strong seasonal wave actions when southerly swells enter the bay.
- Controversial proposed harbor expansion.
- High algal cover on reef indicates influence of eutrophication possibly from adjacent septic systems from near shore developments.

Molokini Site

- The concern about future growth in the numbers of visitors has raised the question of "carrying capacity" of this area.

Olowalu Site

- Sections of the shoreline adjacent to the road are undergoing erosion.
- At present, there is growing concern about possible urbanization of the area in future years.
- The shoreline off Olowalu is subject to coastal erosion, a factor that contributes to reef decline.

Puamana Site

- Runoff from terrestrial sources occurs during heavy rains and sedimentation can be quite substantial in this area.
- Shoreline development and road construction along this coast may be a contributing cause to shoreline erosion, which has a negative impact on the adjacent reef. ^{139, 2000}

According to the *State Land Use District Boundary Review: Maui, Molokai, Lanai* reefs along the north and west coasts of Molokai are poorly developed due to frequent disturbance from the winter north and northwesterly swells. In addition, much of the north coast is undergoing erosion due to wave undercutting and slumping of volcanic material - a process that is continuing to this day. Reef accretion cannot occur under these conditions. The south coast, however, is protected from the north and northwest swells because of the elongate E-W structure of the island. The south coast is protected from severe south swell by the presence of Maui and Lanai, which block waves from the south. An extremely well developed fringing reef exists along the entire south coast of Molokai.^{11, 2000}

Future and Planned Usage

Maalaea Site

Plans for renovation of the harbor include enhancing existing harbor facilities such as increasing the number of berths, construction of an additional breakwater fronting the harbor to reduce swell activity within the harbor. This action is highly controversial and has been under consideration for over 30 years.^{139, 2000}

Future and Planned Requirements or Changes

See Molokai Marine Ecosystem Health Summary for information.

Anticipated Costs for the Future

See Hawaii State Marine Ecosystem Health Summary for information.

Problems, Issues and Opportunities Associated with Costs

See Hawaii State Marine Ecosystem Health Summary for information.

Compare Visitor and Resident Impact

According to the *Eight Main Hawaiian Island and CRAMP Study*, the economy of the Island of Maui is heavily dependent on tourism. Beautiful beaches and healthy reefs are very important components of the entire visitor package. Most visitors spend a part of their time swimming, skin diving, SCUBA diving, touring the coastline by boat or other marine-related activities.^{139, 2000}

According to the *State Land Use District Boundary Review: Maui, Molokai, Lanai* sustenance fishing is the major activity on Molokai reefs (Baker, 1987). A variety of techniques ranging from trolling, bottom fishing, netting and spearing are utilized. Gathering of limu (seaweed), shellfish and crustaceans is widely practiced. A limited amount of commercial catch is sold locally with some being air flown to Honolulu markets. Local inhabitants use the reefs for recreational

swimming and surfing. Only one commercial dive tour company is in operation.^{11, 2000}

Major Assumptions

See Hawaii State Marine Ecosystem Health Summary for information.

County of Maui – Forestry / Green Space

Present Capacity and Usage

The Maui County Data Book 2001 gives the following statistics on forest acreage^{247, 2001}.

Table 5.46 – Maui County Forest Acreage: 2001

Conservation District Forest Land	
Total	148,587
Forest reserve land	89,257
Private forest land	59,330
Planted Forest	
Total	15,628
Planted in preceding year	35
Total standing	15,603
Natural Areas	
Number of areas	6
Acres	20,073

Source: *Maui County Data Book 2001*

See map of Maui and Molokai Forest Reserves in Appendix.

Places We Protect describes the plateau of western Lanai has several patches of a rare dry land forest that make up Kanepuu Preserve. Kanepuu Preserve contains the largest remnants of dry land forest in Hawaii and is home to 49 plant species including three species that are federally endangered: sandalwood (iliahi), the Hawaii gardenia (nau) and the menziesii.

Places We Protect notes that the Kanepuu Preserve has been protected since 1918, when George Munro recognized the natural significance and worked to slow the ravaging erosion of Lanai's topsoil. Over three decades, Munro removed the planted windbreaks and erected fences to protect the lama (native ebony) and olopua (native olive) from the cattle, pigs, sheep, and Axis deer. Munro's legacy was carried forth with the establishment of Malama Pono O Lanai, a group of concerned community members that increased the protection efforts at Kanepuu and aided in managing the area.^{149, 2002}

The Lowland Mesic Forest identifies six reserves in Maui County four are on the Island of Maui.

Ahihi-Kinau (2,045 acres, est. 1973)

Ahihi-Kinau is the first reserve of the Natural Area Reserve System. Sparsely vegetated, the reserve is unique in that it contains an example of the most recent lava flow on the dry south flank of East Maui. Also unique about the reserve is that it contains a marine area. Visitors can find high and low salinity anchialine pools that house a high diversity of rare Hawaiian shrimps and native Hawaiian

cave animals in coastal lava tubes. Coastal dry shrub lands, coastal mesic boulder beach communities, and examples of pioneer vegetation can also be found serving as habitats for other rare native plants and animals.

West Maui (6,702 acres, est. 1986)

The reserve encompasses lowland and montane native communities ranging from dry grasslands to wet ohia forests. The reserve also includes bogs, montane lakes, forest bird habitat, and rare and endangered plants. The areas are extremely important watershed sites that contain the headwaters of perennial streams.

Hanawi (7,500 acres, est. 1986)

This reserve is located on the wet slopes on the north flank of Haleakala. It contains rare sub-alpine grassland as well as montane and lowland semi-wet and wet grasslands and forests. Rare plants and endangered birds are also protected in this reserve.

Kanaio (876 acres, est. 1991)

Kanaio is located in rough lava terrain on the southeast slope of Haleakala. The reserve protects a remnant of the native dry land forest that once covered the leeward slope of Haleakala. Kanaio provides visitors with a rich assemblage of native dry land trees and shrubs.^{126, 2002}

Forest Inventory Information Needs Assessment for the State of Hawaii states on Maui in 1970, the total area of forestland was reported to be 239,800 acres, including 10,600 acres of plantations, 30,300 acres of productive reserved forest, 142 acres of unproductive forest, and 56,900 acres of native and naturalized commercial forest.^{112, 2000}

The Molokai Forest Reserve is located on the highest part of Molokai. It is a wet summit plateau on the east side of the island. The entrance is about 10 miles from Kaunakakai reached by going 3.5 miles from Kaunakakai on 460 and another 6.5 mile on Maunahue Road which passes Homelani cemetery. It is home to several species of native and imported wildlife including axis deer, pigs, and birds.

The Lowland Mesic Forest identifies six reserves on the Island of Molokai.

Puu Alii (1,330 acres, est. 1985)

This reserve is located in the mountains of northern Molokai. It is a wet summit plateau inhabited by wet forests, mixed fern and shrub montane cliff communities, and wet shrub lands, and Hawaiian intermittent stream communities. Puu Alii reserve is an important part of a Molokai watershed and contains forest bird habitat.

Olokui (1,620 acres, est. 1985)

Olokui encompasses an isolated, cloud-shrouded mountain plateau with slopes

extending down to sea cliffs. The reserve is one of the few areas left undisturbed by feral ungulates. It contains wet and dry ecosystems and coastal dry grasslands. Lowland and montane wet and mesic forests are also represented. A 1989 survey of this pristine area confirmed the presence of rare snails. ^{126, 2002}

Kuia (1,636 acres, established in 1981)

Located on the western side of Kauai, this reserve is characterized by gradual to moderate slopes cut by intermittent streams. There are two rare ecosystems - a koa/ohia mixed montane mesic forest and a Kauai diverse lowland mesic forest. Examples of lowland dry shrub lands and montane wet forests can also be found.

Hono O Na Pali (3,150 acres, est. 1983)

This reserve contains two adjacent mountain valley systems that terminate in sea cliffs. The landscape is etched by several continuous and intermittent streams. Sea cliffs, coastal, stream, wet forest, wet shrub-land, and grassland communities are represented. The reserve also protects rare plants and rare stream animals and is a possible nesting site for Hawaiian dark-rumped petrel and Newell's shearwater. ^{126, 2002}

Places We Protect describes the plateau of western Lanai has several patches of a rare dry land forest that make up Kanepuu Preserve. Kanepuu Preserve contains the largest remnants of dry land forest in Hawaii and is home to 49 plant species including three species that are federally endangered: sandalwood (iliahi), the Hawaii gardenia (nau) and the menziesii.

Places We Protect notes that the Kanepuu Preserve has been protected since 1918, when George Munro recognized the natural significance and worked to slow the ravaging erosion of Lanai's topsoil. Over three decades, Munro removed the planted windbreaks and erected fences to protect the lama (native ebony) and olopua (native olive) from the cattle, pigs, sheep, and Axis deer.

Munro's legacy was carried forth with the establishment of Malama Pono O Lanai, a group of concerned community members that increased the protection efforts at Kanepuu and aided in managing the area. ^{149, 2002}

Existing Problems, Issues and Opportunities

The Lowland Mesic Forest notes existing issues of restoration of 100 acres of forest on the Island of Molokai to reduce erosion into ponds and marine ecosystems. ^{126, 2002}

Invasive species are known to cause economic and ecological problems around the world. Molokai does not have many of the invasive species that are already known to cause problems on other islands. Molokai has a contiguous area of intact native forest on the east Molokai Mountains that is relatively remote from population centers and serves as the primary watershed for the island. The island is home to 65 federally listed and candidate endangered plant species.

The human population and tourist industry on Molokai is small, which minimizes inter-island traffic. Therefore, Molokai has a very good chance of eradicating existing incipient populations of invasive species, preventing the establishment of additional invasive species, and preserving intact areas of native Hawaiian ecosystems.

Future and Planned Usage

The Lowland Mesic Forest states future usage of continued partnerships with private landowners to promote the conservation of our forests resources. ^{126, 2002}

Places We Protect states that in 1991, the Dole Food Company gave the Nature Conservancy a permanent conservation easement for the restoration of the Kanepuu Preserve to ensure its long-term protection. ^{149, 2002}

The Molokai Community Plan states that the restoration of the environmental integrity of Molokai's land resources can be achieved through development of a comprehensive reforestation program utilizing native species. ^{140, 2001}

Lanai Community Plan states planned usage to maintain established boundaries around Kanepuu Dry land Forest. ^{30, 1998}

Future and Planned Requirements or Changes

See Molokai Forestry and Green Space Summary for information.

Anticipated Costs for the Future

See Hawaii State Forestry and Green Space Summary for information.

Problems, Issues and Opportunities Associated with Costs

See Hawaii State Forestry and Green Space Summary for information.

Compare Visitor and Resident Impact

The Forest Inventory Information Needs Assessment states that expanding resorts and the building of attendant roads, airports, golf courses and shopping malls, while good for Hawaii's economy, usurp habitat, increase traffic and pollution, and pinch water supplies. ^{112, 2000}

Major Assumptions

See Hawaii State Forestry and Green Space Summary for information.

County of Maui – Air Quality

Present Capacity and Usage

Overall, Maui air quality is good and meets or exceeds state and federal standards. Relatively steady tradewinds blow air born pollutants out to sea.

Annual Summary Hawaii Air Quality Data: 2000 describes two air quality monitoring stations on the Island of Maui.

Kihei

This station is located in Hale Piilani Park. This special purpose monitoring station is in a residential and agricultural area and was established to monitor PM10 from sugarcane burning activities.

Paia

This station is located in a residential area at 141 Baldwin Avenue. The site is downwind of several sugarcane fields and is just northeast of the HC&S Co. Paia Mill. This site was established in August 1996 as a special PM10 sampling station for sugarcane burning activities. ^{67, 2000}

Existing Problems, Issues and Opportunities

Maui Clean Air Coalition (MCAC) is a coalition of Maui residents dedicated to the task of improving air quality on the Island of Maui. MCAC believes that periods of poor air quality on Maui are due, in part, to the open air burning of sugarcane. MCAC's desire is to coordinate with the community, elected officials, government agencies, and industry in identifying and documenting the causes of poor air quality. MCAC also desires to coordinate with the same in implementing clean air alternatives to open air cane burning and other causes of air pollution. ^{118, 1998}

Future and Planned Usage

Continued monitoring is needed to examine air quality during the burning of sugarcane.

Future and Planned Requirements or Changes

See Hawaii State Air Quality Summary for information.

Anticipated Costs for the Future

See Hawaii State Air Quality Summary for information.

Problems, Issues and Opportunities Associated with Costs

See Hawaii State Air Quality Summary for information.

Compare Visitor and Resident Impact

See Hawaii State Air Quality Summary for information.

Major Assumptions

See Hawaii State Air Quality Summary for information.

County of Maui – Beach Erosion

Present Capacity and Usage

The general coastline and tidal shoreline of the islands in Maui County are described by the *Maui County Data Book* in the table below. ^{247, 2001}

Table 5.47 – Maui County General Coastline: 2001

Island	General Coastline	Tidal Shoreline
Maui	120	149
Lanai	47	52
Molokai	88	106

Source: *Maui County Data Book*

The Hawaii Coastal Erosion Management Plan states that Maui County has a setback of up to 150 feet depending on the individual parcel size. The setback is consistent with a technical guidance manual “Coastal Protection and Beach Restoration Feasibility Study” which researched beach erosion on the island. ^{103, 2000}

The number of exemptions for shoreline management areas issued by Maui County has increased dramatically from 32 in FY 00 to 378 in FY 01. The increase has come about because the Department now records each SMA exemption issued for actions within an SMA.

During fiscal year 2001, the Planning Department completed revisions of the SMA Rules and Regulations of the Maui Planning Commission. The Planning Department amended the Shoreline Area Rules for the Molokai and Maui Planning Commissions. A mitigative plan was submitted to the Council on how to deal with claims for repetitive losses from flooding. During this period, Coastal Erosion Rate maps of the North Kaanapali and South Kaanapali areas were received from UH.

During fiscal year 2001, the CZM Program funded four fulltime positions: two clerical positions, one planner position, and one inspector position. They were supported by the rest of the Planning Department staff in assessing permit applications and monitoring and enforcing permits for compliance. ^{61, 2001}

Existing Problems, Issues and Opportunities

See Hawaii State Beach Erosion Summary for information.

Future and Planned Usage

According to the *Annual Report to the Twenty-First Legislature Regular Session*, the Planning Department will work on revisions to the shoreline area and SMA rules of the Maui, Lanai, and Molokai Planning Commissions to reflect legislative changes to the CZM law. Efforts will be underway by Maui County to update the

County's beach management guide as well as to work with UH to obtain historical shoreline erosion rates for the northern coastline of Maui, and for the remainder of West Maui. The Planning Department will continue to educate the public to increase the visibility of the CZM-related issues. ^{61, 2001}

Future and Planned Requirements or Changes

See Lanai Beach Erosion Summary for information.

Anticipated Costs for the Future

According to the *Hawaii Coastal Erosion Management Plan* Maui County budgeted \$15 million for coastal land purchases in FY'98. ^{103, 2000}

Problems, Issues and Opportunities Associated with Costs

The Annual Report to the Twenty-First Legislature Regular Session notes that the County provided over \$160,000 in services-in-kind to help match a federal grant. ^{61, 2001}

Compare Visitor and Resident Impact

The Hawaii Coastal Erosion Management Plan notes that tourism in the state is closely tied to the quality of Hawaiian beaches. If visitors find access to shorelines difficult because of development, the Hawaii may lose its appeal. As a state that relies on tourism, it must be careful not to degrade the natural environment. ^{103, 2000}

Major Assumptions

The Hawaii Coastal Erosion Management Plan makes the following major assumptions:

- Beach loss will negatively impact the visitor economy in Hawaii;
- Public access to beaches and the ocean is a right that is preserved by the State of Hawaii constitution;
- Beach loss and narrowing as well as coastal dune grading that accompanies coastal development causes environmental and ecological damage to natural resources and habitats;
- Coastal hardening can produce coastal water quality impacts through increased turbulence and turbidity; and
- Coastal water is negatively impacted by the infiltration of domestic sewage products (improperly functioning septic and cesspool systems). ^{103, 2000}

County of Maui – Invasive Species

Present Capacity and Usage

Miconia, pampas grass, fountain grass, ivy gourd, Caribbean frogs, and other species being addressed by Maui Invasive Species Committee pose serious threats to federal, state and private conservation reserves, to county watersheds, agriculture, tourism, and to the quality of life of all Maui residents and visitors. Maui Invasive Species Committee is a partnership of 16 government, private and non-profit organizations.^{132, 2002} (See Invasive Species Maps in Appendix.)

Existing Problems, Issues and Opportunities

Maui Invasive Species Committee states existing problems of populations of target species remain, established seed banks persist, landowner access is pending in some areas, additional areas remain to be surveyed, and there is a steady stream of new introductions that have the potential to devastate Hawaii's economy, environment, and quality of life.

- *Miconia calvescens* now threatens all native rain-forest ecosystems of East Maui
- Pampas grass has invaded numerous areas of rain forest and bogs on East and West Maui
- Fountain grass is highly flammable and a threat to agriculture and natural areas of Maui.
- Ivy gourd is considered eradicable. Once seeds are set, seed bank persists for at least 3-4 years
- Giant reed crowds out native plants and clogs rivers and flood control drainages
- All known populations of rubber vine will be removed by 2002
- Two species of Caribbean frogs were discovered on Maui in 2001.^{132, 2002}

Future and Planned Usage

The Maui Invasive Species Committee will continue work on Maui controlling and eradicating priority incipient invasive plant species that threaten the State's most intact federal, state, and private conservation lands and 79 federally-listed threatened and endangered plant species. The goal is to eradicate or control newly established pest before they expand beyond control, to preserve the State's native species, environment, and economy. The primary target continues to be the invasive tree *Miconia calvescens*.^{132, 2002}

Future and Planned Requirements or Changes

Maui Invasive Species Committee notes that preventing the establishment and spread of new introductions is an essential strategy. Herbicide or mechanical removal will continue. Public education about invasive species issues needs to continue and expand.^{132, 2002}

Anticipated Costs for the Future

Maui Invasive Species Committee estimated funding for Miconia control at a minimum of \$2.25 million per year for at least 10 years. ^{132, 2002}

Problems, Issues and Opportunities Associated with Costs

Maui Invasive Species Committee reports that the National Park service is presently pursuing an emergency funding initiative, through entrance fee programs, which may provide a significant portion of the support needed for Maui. ^{132, 2002}

Compare Visitor and Resident Impact

Maui Invasive Species Committee reports that visitors at numerous hotels on Maui have complained about the noise at night from Caribbean frogs and some residents have even threatened to leave Maui if the frogs could not be removed. ^{132, 2002}

Major Assumptions

See Hawaii State Invasive Species Summary for information.

County of Maui – Natural / Scenic Resources

Present Capacity and Usage

Native Extinctions

The Maui Invasive Species Committee describes the islands of Maui County alone have 138 federally listed threatened and endangered plant and animal species and over 850 additional candidate species and species of concern.^{132, 2002} (See table of endangered and threatened native species in appendix.)

Kapunakea Preserve

The West Maui Mountains hides an ecological oasis: the Kapunakea Preserve. With 11 different native communities, Kapunakea (1,264 acres) exemplifies the concentration of biological diversity that is Hawaii. These diverse communities are home to species of rare plants and the only known kauila tree of its kind on Maui. Recent species of rare land snails were reported.

Maui Lava Tubes

This preserve protects one of Hawaii's finest known lava tube ecosystems and the unique cave insects that occur only at this site. The area is protected through a conservation granted to the Conservancy by the landowner.

Waikamoi Preserve

Waikamoi Preserve (5,230 acres) takes its name from a stream that runs through this sanctuary for hundreds of native Hawaiian species, many of them endangered or rare. The windswept sub-alpine regions and rain forests of koa and ohia trees are home for the scarlet iwi, the crimson apapane, and the bright green amakihi - native forest birds dependant on East Maui's forest.

Owned by the Haleakala Ranch Company since 1888, Waikamoi Preserve became a reality in 1983 when management rights were conveyed to The Nature Conservancy through a permanent conservation easement. The preserve helps protect the 100,000-acre East Maui Watershed, which provides 60 billion gallons of clean water annually to Maui's residents, businesses, and agricultural community. Waikamoi Preserve is managed in partnership with the State Department of Land and Natural Resources through the Natural Area Partnership Program and is part of the East Maui Watershed Partnership.^{149, 2002}

The Hawaiian Endangered Bird Conservation Program describes the Maui Parrotbill. This endangered honeycreeper has a low reproductive rate. The present population of an estimated 500 birds is restricted to a relatively small area of forest in East Maui, and is currently at a high risk of extinction. Currently Haleakala National Park protects and manages habitat in the Kipahulu area, and the Service and DOFAW Partnership protects and manages habitat in the Hanawi area.^{148, 2001}

Riparian / Wetlands

Places We Protect reports that in November 1998, seven west Maui landowners and the County of Maui signed a partnership/agreement to protect more than 50,000 acres of forested lands in the West Maui Mountains Partnership, which protects a primary source of water for Maui and an area that is among the most biologically diverse and pristine in the islands.

The East Maui watershed is home to at least 63 rare plant species and a greater concentration of rare and endangered birds than any other place in the United States. It is also the largest harvested surface water in Hawaii, providing more than 60 billion gallons of fresh water in Central Maui's agricultural, residential, and commercial economies.

Existing Problems, Issues and Opportunities

Places We Protect notes a healthy forest requires dedicated management. Pigs, goats, deer, and invasive weeds threaten the current stability of the West Maui watershed. Unauthorized human use, introduction of insects and plant diseases are other significant problems.^{149, 2002}

The Hawaiian Endangered Bird Conservation Program lists limiting factors for the Maui Parrotbill may be disease, habitat degradation and food availability, predation, and competition from exotic species. Most of the original range has been converted to exotic vegetation that the species does not inhabit. Potential habitat needs to be identified, evaluated, restored, and managed.^{148, 2001}

Future and Planned Usage

Places We Protect notes that with half of the state's conservation lands under public ownership and half under private ownership, public-private partnerships like those on Maui represent the future of conservation in Hawaii.^{149, 2002}

The Hawaiian Endangered Bird Conservation Program lists increased population densities within existing Parrotbill populations, and establishing a second self-sustaining wild population through captive propagation and release in secure/restored habitat as future usage.^{148, 2001}

Future and Planned Requirements or Changes

The Hawaiian Endangered Bird Conservation Program's present goals for the Parrotbill are to develop captive breeding technology and establish a captive population, and to continue and increase restoration and protection of habitat. Habitat restoration and management is ongoing within some of the present range of the Parrotbill, but funding is limited for restoration elsewhere. Completion of the lower Hanawi-East Maui Watershed fence is needed to protect a large portion of existing habitat. Evaluation and restoration of additional habitat areas

are needed both along Parrotbill range edges as well as in areas where restoration may provide habitat for a disjunct population.^{148, 2001}

Anticipated Costs for the Future

See Hawaii State Native Extinction Summary for information.

Problems, Issues and Opportunities Associated with Costs

See Hawaii State Native Extinction Summary for information.

Compare Visitor and Resident Impact

Places We Protect states that Nature Conservancy staff and volunteers lead an interpretive hike through Waikamoi Preserve on the second Saturday of every month. Staff led work trips to Waikamoi on the third Saturday of every month. The Nature Conservancy staff and volunteers lead a monthly hike through this beach preserve. The Pelekunu Preserve is not open to the public due to its remote rugged location.^{149, 2002}

Major Assumptions

See Hawaii State Native Extinction Summary for information.

County of Maui – Lanai – Water Quality and Quantity

Present Capacity and Usage

According to the Department of Water Supply-County of Maui: Annual Report 2000, the Lanai Water Advisory Committee is focusing on two key principles. First is the Lanaihale watershed protection area. This forest is responsible for as much as half of the recharge in the fresh water area of the island, and it is severely degraded. Much effort went into reaching an agreement on watershed protective measures, including fence alignment; working toward establishment of partnership with other agencies and toward acquisition of funding to implement key measures. The second includes water allocations. **The sustainable yield of Lanai is less than 1/10 that of Molokai, and less than 2% that of Maui.** The total sustainable yield of hydrologic units on Lanai is **6 MGD**. (See maps of Maui, Lanai and Molokai with sustainable yields/ aquifer; geographic divisions of aquifers on Maui, Lanai and Molokai; map of Central Maui Groundwater Source Withdrawals; and Graphs of Groundwater Uses in appendix.)

Given the degradation of the forest's low sustainable yield and changing economic structure of that island, it was eminently important that the community / committee agree on water allocations for proposed projects, allocations were set, and a system devised by which these would be reviewed.^{40, 2000}

Existing Problems, Issues and Opportunities

Water quality from the watershed and water quantity is of concern as stated by the Department of Water Supply-County of Maui: Annual Report 2000.^{40, 2000} Historically, water quantity has always been an issue on Lanai. Conservation, reallocation and alternative potable water sources are opportunities.

Future and Planned Usage

Lanai Community Plan lists planned usage as follows:

- Establish minimum water allocation to meet agriculture needs;
- Prohibit use of aquifer water for golf course irrigation;
- Incentives for water conservation;
- Comprehensive water resources management program for allocations of water use;
- Implement Lanai water advisory board to monitor water conservation practices;
- Protect watershed and recharge;
- Continued community representation for water issues;
- Ensure water allocations are redefined in community plan and water use plan; and
- Include suggestions for demand management for water use plan.^{30, 1998}

Future and Planned Requirements or Changes

Lanai Community Plan lists planned changes as providing incentives for water conservation practices and implementing a Lanai water advisory board.^{30, 1998}

Anticipated Costs for the Future

According to the Capital Improvements Program 2002 for the County of Maui, there are no monies allocated for improvements to water.

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

See Maui County Water Quality Summary for more information.

Major Assumptions

See County of Maui Introduction Summary for population projections and County of Maui Water Summary for other information.

County of Maui – Lanai – Sewage

Present Capacity and Usage

Maui County Department of Public Works Fiscal Year 2001 Budget lists the following statistics for wastewater treatment on the Island of Lanai. The Department reported no spills and compliance with Environmental Protection Agency regulations.

Table 5.48 – Lanai Wastewater Reclamation Facilities Data: 2001

**UIC = Underground Injection Control, EPA requirement

DISTRICT MEASURES	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Spills of less than 1,000 gallons	0	0	0
Spills of 1,000 gallons or more	0	0	0
Wastewater processed (average gallons per day)	312,000	312,000	312,500
Number of days all facilities met UIC** permit requirements	364	365	365
Cost per 1,000 gallons of wastewater treated	\$0.82	\$0.82	\$0.82
Percent of effluent reused versus flow processed	100%	100%	100%

Source: *Department of Public Works - Fiscal Year 2001 Budget*

Maui County Department of Planning FY2003 Budget lists the following statistics from the Department of Public Works and Waste Management.^{147, 2002}

Table 5.49 – Lanai Wastewater Operation Program Measures

DISTRICT MEASURES	FY 2001 Actual	FY 2002 Estimate	FY 2002 Actual to Date
Total wastewater processed (gallons)	115,822,000	113,880,000	57,851,000
Annual compliance days		365	184
Total Processing cost per 1,000 gallons	\$1.26	\$.82	N/A

Source: *Maui County Department of Planning FY2003 Budget*

Existing Problems, Issues and Opportunities

An issue on Lanai regarding wastewater is connecting existing residences in mauka portion of Lanai City to wastewater treatment system.

See County of Maui Sewage Summary for information.

Future and Planned Usage

Lanai Community Plan states the following planned usage:

- Implement wastewater system master plan for Lanai for programming and implementing facilities in timely manner.
- Connect existing residences in mauka portion of Lanai City to wastewater treatment system.
- Conduct wastewater reuse feasibility study.^{30, 1998}

Future and Planned Requirements or Changes

See County of Maui Sewage Summary for information.

Anticipated Costs for the Future

See Maui County Sewage Summary.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Sewage Summary for information.

Compare Visitor and Resident Impact

See County of Maui Sewage Summary for information.

Major Assumptions

See County of Maui Introduction Summary and County of Maui Sewage Summary for information.

County of Maui – Lanai – Solid Waste Disposal

Present Capacity and Usage

Maui County Department of Public Works Fiscal Year 2001 Budget lists the following statistics. ^{141, 2002}

Table 5.50 – Lanai Landfill Disposal: 2001

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Tonnage entering landfills per year	2,555	2,700	2,700

Source: *Maui County Department of Public Works Fiscal Year 2001 Budget*

Existing Problems, Issues and Opportunities

Lanai Community Plan states existing issue is the need for an alternative site for new county landfill. ^{30, 1998}

Future and Planned Usage

Lanai Community Plan notes planned usage to fund landscaping and maintenance of solid waste facility and surrounding environments. ^{30, 1998}

Future and Planned Requirements or Changes

See County of Maui Solid Waste Summary for information.

Anticipated Costs for the Future

Maui County Department of Planning list the following anticipated costs ^{147, 2002}:

Table 5.51 – Lanai Six year Capital Improvement Program: 2002

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Solid Waste			
Lanai Landfill Partial Closure	0	2,050	2,050
Lanai Landfill Storm water System Redesign and Repair	0	35	35

Source: Maui County Department of Planning – Six-Year Capital Improvement Program

Problems, Issues and Opportunities Associated with Costs

See County of Maui Solid Waste Summary for information.

Compare Visitor and Resident Impact

See County of Maui Solid Waste Summary for information.

Major Assumptions

See County of Maui Introduction Summary and County of Maui Solid Waste Summary for information.

County of Maui – Lanai – Storm Water

Present Capacity and Usage

Due to the lack of information or response from the Maui Department of Public Works and Environmental Management, there is not enough data to evaluate Storm Water in Maui County.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

Lanai Community Plan planned usage is to update and implement watershed, flood prevention and soil conservation programs.^{30, 1998}

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Lanai – Roads

Present Capacity and Usage

Annual Report – Department of Public Works and Waste Management describes the Lanai District encompasses the entire Island of Lanai. Much of the roadside maintenance is within city limits. The Lanai District has cut back on the use of herbicide and therefore now spends more time weed whacking along the shoulders in the city. Lanai was the first district to complete sidewalk mitigation. All trees, shrubs, rocks, obstacles, etc. that were in the County road right of way have been removed.^{135, 2002}

Department of Public Works Fiscal Year 2001 Budget gives the following maintenance report.^{141, 2002}

Table 5.52 – Lanai Road, Bridge and Drainage Maintenance Measures: 2001

	FY 1999 Actual	FY 2000 Estimate	FY2001 Estimate
Complaints Received – road (including potholes) and drainage	0	4	2
Average number of days to resolve complaints	0	2	2
Potholes patching, tons of cold mix	112	100	100
Lineal feet of shoulder work	6,670	6,200	6,200
Acres of grass mowed	47	44	44
Lineal feet of culverts maintained	9	4	4
Number of catch basins maintained	18	18	18

Source: *Department of Public Works Fiscal Year 2001 Budget*

State Department of Transportation notes resurfacing was complete on Kaunalapau Highway from Kaunalapau harbor towards Airport Road.^{102, 2000}

Existing Problems, Issues and Opportunities

Lanai Community Plan states an existing issue of roadway management policies that recognize the need to establish designated bus and truck traffic routes.^{30, 1998}

Annual Report – Department of Public Works and Waste Management notes problems associated with vehicular and equipment maintenance because the Lanai District is the only district without the services of a mechanic.^{135, 2002}

Future and Planned Usage

Lanai Community Plan notes the following planned usage:

- Rural design standards for roadway improvements
- Restrict buses and truck through Lanai city
- Identify central transportation routes for commuters
- Conduct traffic study for volume, patterns, improvements

- Identify major roadways and transportation routes on Land Use map.^{30, 1998}

Future and Planned Requirements or Changes

Lanai Community Plan planned changes are to support and construct a paved by-pass road along the northern and western perimeter of Lanai City, connecting Kaunalapau Highway and Keomoku Road.^{30, 1998}

Annual Report – Department of Public Works and Waste Management states the Lanai District has gotten approval and funding for a mechanic position in Lanai. Lanai Highways equipment will be better cared for and Solid Waste’s equipment will be better serviced as well.^{135, 2002}

Anticipated Costs for the Future

State Department of Transportation anticipated costs for Lanai Capital Improvements for FY 2003 district road improvements of \$300,000 County funded.^{102, 2000}

Maui County Department of Planning FY 2003 Budget makes the following appropriations. These improvements include district resurfacing to reduce annual maintenance costs and improve overall road safety.^{191, 2002}

Table 5.53 – Lanai Six Year Capital Improvement Program: 2002

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Road Improvements			
District Road Improvements	300	400	700

Source: *Maui County Department of Planning FY 2003 Budget*

Problems, Issues and Opportunities Associated with Costs

See County of Maui Roads Summary for information.

Compare Visitor and Resident Impact

See County of Maui Roads Summary for information.

Major Assumptions

See County of Maui Introduction and County of Maui Roads Summary for information.

County of Maui – Lanai – Airports

Present Capacity and Usage

The *State of Hawaii Airport Activity Statistics Calendar Year 2001* reports activity at Lanai Airport.^{212, 2001}

Table 5.54 – Lanai Airport Activity Statistics: 2001

Fiscal Year 2000	
145,536 passengers	-10.6% change
685 tons cargo	-4.7% change
46 tons mail	-54.4% change

Source: *State of Hawaii Airport Activity Statistics Calendar Year 2001*

According to the *Final Statewide Airport Systems Plan* Lanai Airport is one of four secondary airports of Maui County. Lanai Airport is located southeast of Lanai City in the Palawai Basin. Regularly scheduled flights from Honolulu and Maui land and depart from here daily. The resorts and car rental company provide shuttles to and from the airport. There is also a limo service available at the airport. A snack bar and gift shop are located in the terminal.^{127, 1998}

Maui County Data Book 2001 gives statistics for operations activity at Lanai Airport.^{247, 2001}

Table 5.55 – Lanai Airport Enplaned / Deplaned Statistics: 2001

	1999		2000	
	Enplaned	Deplaned	Enplaned	Deplaned
Passengers	88,598	87,043	80,761	80,644
Cargo (tons)	112	665	76	642
Mail (tons)	15	113	1	99

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

Lanai Community Plan notes three existing opportunities:

- Need to improve air and sea transportation services to and from island of Lanai.
- Need to account for daily visitor traffic from Maui.
- Encourage commercial concession and lease opportunities for local residents at State airport facilities.^{30, 1998}

Hawaii Tourism Product Assessment notes the limited airport infrastructure.^{91, 1999}

Future and Planned Usage

The Final Statewide Airport Plan states aviation demand forecasts project aircraft operations to double by 2020, based on continued resort development on the island.^{127, 1998}

Future and Planned Requirements or Changes

The Final Statewide Airport Plan lists Lanai Airport future requirements:

- Planned runway extension and land acquisition will position the airport to meet projected demand.
- Development of parallel taxiways.
- Developing additional parking.
- Developing cargo facilities.
- Expansion of passenger terminal.^{127, 1998}

Lanai Community Plan lists the following future requirements:

- Extend runway at Lanai airport in direction of Lanai City.
- Prohibit aircraft flying over Lanai City.
- Restrict late-night flights.^{30, 1998}

Anticipated Costs for the Future

The Final Statewide Airport Plan states there are 2 programs totaling \$1.010 million.

- Perimeter road and fencing improvements.
- Noise Compatibility Program.^{127, 1998}

Problems, Issues and Opportunities Associated with Costs

See County of Maui Airports Summary for information.

Compare Visitor and Resident Impact

The growing popularity and reputation of Lanai, as an upscale getaway, is likely to continue producing demand for airport facilities to accommodate private and corporate jet aircraft.^{127, 1998}

Major Assumptions

See County of Maui Introduction and County of Maui Airports Summary for information.

County of Maui – Lanai – Harbors

Present Capacity and Usage

Kaumalapau Harbor is a small commercial harbor serving the island of Lanai. The harbor handles 95 percent of all shipments of construction material, wholesale goods and other supplies required by Lanai residents.

Table 5.56 – Lanai Harbor Statistics

Island and harbor	Harbor entrance depth (feet)	Depth (feet)	Length (feet)	Width (feet)	Piers (linear feet)	Shedded	Open
Lanai: Kaumalapau	60	20-60	1/ (NA)	1/ (NA)	400	-	100

Source: 2001 *State of Hawaii Data Book*

Exiting Problems, Issues and Opportunities

Lanai Community Plan notes the following existing issues:

- Need to provide adequate commercial harbor facilities on Maui to provide to Lanai.
- Need to improve air and sea transportation services to and from Island of Lanai.^{30, 1998}

Hawaii Tourism Product Assessment states the Manele Small Boat Harbor is currently used for ocean based tour boats and activities and could be expanded.^{91, 1999}

Future and Planned Usage

Lanai Community Plan notes the following planned usage:

- Need small boating facility for Manele Small Boat Harbor.
- Encourage commercial concession and lease opportunities for local residents at State harbor facilities.^{30, 1998}

Future and Planned Requirements or Changes

Lanai Community Plan planned changes are for adequate parking and lighting at Manele Small Boat Harbor.^{30, 1998}

Anticipated Costs for the Future

See State of Hawaii and County of Maui Harbors Summary for information.

Problems, Issues and Opportunities Associated with Costs

See State of Hawaii and County of Maui Harbors Summary for information.

Compare Visitor and Resident Impact

See State of Hawaii and County of Maui Harbors Summary for information.

Major Assumptions

See State of Hawaii and County of Maui Harbors Summary and Introduction for information.

County of Maui – Lanai – Parks

Present Capacity and Usage

No information was found regarding county or state parks on Lanai.

Existing Problems, Issues and Opportunities

See County of Maui Parks Summary for information.

Future and Planned Usage

County of Maui: Fiscal Year 2002 Budget reports future improvements for the year 2002:

- Provide neighborhood parks multi-purpose
- Ensure Dole Park's value
- Maintain Cavendish Golf Course for perpetuity for future residents
- Reopen Lanai bowling alley.^{50, 2001}

Future and Planned Requirements or Changes

County of Maui: Fiscal Year 2002 Budget lists the following planned changes:

- Site selection for the Lanai Community Center
- Construction of a multi-purpose community center for Lanai to include a certified kitchen and dormitory for visiting off-island youth team.^{50, 2001}

Anticipated Costs for the Future

County of Maui: Fiscal Year 2002 Budget anticipated costs are:

- Design of the Lanai Community Center: \$150,000.
- Design and construction of the Multi-Purpose Community Center for Lanai: \$2,050,000^{50, 2001}

County of Maui FY 2003 Budget anticipated costs are:

- Design of a street course skate park: \$25,000
- Federal funding for lighting of Lanai Tennis and Basketball Courts: \$100,000^{191, 2002}

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Parks element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Parks element.

Major Assumptions

County of Maui: Fiscal Year 2002 Budget assumes the anticipated life for the Multi-Purpose Community Center is of 50 years.^{50, 2001}

County of Maui – Lanai – Police, Fire and Emergency Services

Present Capacity and Usage

Police

The Public Utilities Commission Annual Report: Fiscal Year 1999-00 gives the following statistics.^{90, 2002}

Table 5.57 – Lanai Police District Measures: 1999-2000

	FY 2001 Actual	FY 2002 To Date
Personnel	10.5	10.5
Calls for Service	1104	471
Documented Cases	720	332
Moving Citations	180	50
Parking Citations	18	1

Source: *Public Utilities Commission Annual Report: Fiscal Year 1999-00*

Fire

Maui County Department of Public Works Fiscal Year 2001 Budget gives the following statistics.^{141, 2002}

Table 5.58 – Lanai Department of Fire Control District Measures: 2001

	FY 1999 Actual	FY 2000 Actual	FY 2001 Estimate
Fires	19	17	10
Rescues (non-fire related)	4	5	5
Emergency medical services	35	55	45
Hazmat response	6	3	5
False calls (any alarm received for which response was unnecessary)	7	4	5
Company assists (another fire company responds with primary company to assist with an emergency)	0	1	5
Other calls (miscellaneous services such as removing traffic hazards)	8	11	10
AED (Automated external defibrillator) response	0	0	5

Source: *Maui County Department of Public Works Fiscal Year 2001 Budget*

Existing Problems, Issues and Opportunities

Maui County Department of Planning FY2003 Budget notes that the existing police station is in disrepair and does not adequately provide staff for existing staff. Repairs have been held off due to its age until repairs are required for safety reasons.^{147, 2002}

Future and Planned Usage

Lanai Community Plan lists Plans for Lanai Police, Fire and Emergency Medical Services include:

- Improve accessibility to medical / dental care by increasing professional or para-professional full-time staff,
- Ensure long term of medical and emergency medical facilities and services with appropriate allocation of capital improvements funding and staff positions, adequate provision of supporting programs and facilities, and ready access to state-of-the art medical technologies,
- Support the development of a new public safety facility, and
- Improve water rescue service and fire protection by providing necessary equipment, training, and staffing.^{30, 1998}

Future and Planned Requirements or Changes

Lanai Community Plan lists planned changes in Police, Fire and Emergency Medical Services for Lanai include:

- Plan, design and construct a new police station for Lanai,
- Purchase a four-wheel drive fire truck,
- Prepare a capital improvements plan to address the immediate and long-term facilities requirements for medical and public health services, and
- Identify and support a helipad site for medical transport purposes in accordance with the Maui County Disaster Plan for Lanai.^{30, 1998}

Anticipated Costs for the Future

Lanai Capital Improvement Projects FY 2002:

New Lanai Police Station \$3,600,000

The new single story building with 10,000 sq. ft will house staff offices, communications, locker rooms, meeting rooms, holding cells, fitness area and a multi-purpose room.

Lanai Capital Improvements for FY 2003:

Lanai Fire Station Garage \$75,000 (County funded)

The construction of a fire station garage is to house the water tanker truck. There is no impact on staffing or operating budget anticipated.^{147, 2002}

Problems, Issues and Opportunities Associated with Costs

See County of Maui Police, Fire and Emergency Medical Services Summary for information.

Compare Visitor and Resident Impact

See County of Maui Police, Fire and Emergency Medical Services Summary for information.

Major Assumptions

Maui County Department of Planning FY2003 Budget assumes the anticipated life of the garage is 25 years.^{147, 2002}

County of Maui – Lanai – Visitor Accommodations

Present Capacity and Usage

The 2001 Visitor Plant Inventory describes the visitor accommodations on the Island of Lanai. Three out of the six properties on Lanai are hotels, comprising 98.4% (362 rooms) of the total units on the island. There are two individual vacation unit properties and one bed and breakfast, consisting of three units each or 0.8% of the island room inventory. Lanai has most of its rooms in the Deluxe (43.5%) and Luxury (51.9%) classes.^{80, 2001}

The State of Hawaii Data Book 2001 provides the following tables.^{252, 2001}

Table 5.59 – Lanai Visitor Accommodations: 1999-2001

Year/Island	Properties			Units		
	Total	Hotels	Condo	Total	Hotels	Condo
1999	6	6	-	369	369	-
2000	6	6	-	368	368	-
2001	6	6	-	368	368	-

Source: 2001 State of Hawaii Data Book

Existing Problems, Issues and Opportunities

No information was uncovered regarding existing problems, issues and opportunities for the Visitor Accommodation element.

Future and Planned Usage

No information was uncovered regarding future and planned usage for the Visitor Accommodation element.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Visitor Accommodation element.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Visitor Accommodation element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Visitor Accommodation element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Visitor Accommodation element.

Major Assumptions

No information was uncovered regarding major assumptions for the Visitor Accommodation element.

County of Maui – Lanai – Visitor Related Area

The purpose of this EIS is to identify and assess environmental impacts that could result from the development of the proposed golf course, single- and multi-family residential units, infrastructure and other project features within and outside of the existing Lanai Project District 1-Manele. Additionally this report will address the land use changes that would occur through expansion of the project district boundary and the cumulative effects of the golf and residential with regard to the ongoing developments on Lanai.

The Manele Bay Resort site is located near the Hulopoe Bay just west of the Manele Bay on the southern coast of Lanai, Hawaii. Lanai is an 89,280 acre island leeward of Maui that is accessible by inter-island commercial flights, barge service, and boat from Maui. The Lanai Airport is the island's only airport and Lanai City is the only town center.

Lanai City is approximately eight miles north of the Manele Resort and access to the site is by way of Kaupili Road from the airport past Lanai City to Manele Road (State Route 440). The Manele Resort and project site lies on approximately 870 acres of land on a relatively remote, rugged coast.

Water

Lanai's regional water resources are from two sources: brackish basal groundwater, and water confined by high level dikes, not floating on seawater. Seawater intrusion into the basal lens creates the brackish water reserve. Rainwater collected in high level (to about 1,500 feet) aquifers of east central Lanai is the main source of potable water. This source is composed of many small aquifers, but is treated as a regional aquifer due to hydraulic connections between discrete units.

A single high level aquifer in which wells, shafts and tunnels have been developed, serves the island of Lanai. The average total recharge is estimated to be 9.1 mgd and the sustainable yield is 6.0 mgd. The present Lanai water system, as it is configured can be counted on to supply 3.0 mgd on a sustained basis expressed as an average daily flow. The total system peak instantaneous capacity is 8,300 gallons per minute (gpm), comprised of simultaneous flow of 300gpm for plantation needs, 3,000 gpm for fire flow, 1,100 gpm for domestic supply, and 1,200 gpm for landscape irrigation. New developments on Lanai are estimated to demand a supply capacity of 10,300 gpm; therefore, improvements to source and storage capacity, and transmission systems are necessary.

Wastewater

The wastewater collection system for the Manele Project District is currently under construction. The wastewater system is composed of 8-inch and 6-inch sewer lines, force mains, and three pump stations that transport the wastewater

flow to a wastewater treatment plant (WWTP). The plant, designed to process 75,000 gallons per day and with the capacity to be expanded to 140,000 gpd is located Mauka of the Project District at an elevation of 400 feet.

Wastewater anticipated from this development is domestic sewage from residential units and from the golf course activities. The quantities of sewage generated from the residential development will be 0.19 mgd on an average day, based on 425 units, and occupancy rate of 75% maximum, and following the department of Health's current regulation of 200 gpd/bedroom.

Solid Waste Disposal

Lanai's only landfill is located approximately one mile south of the airport access road between the airport and Kaunalapau Harbor. It is filled to over capacity; however, it is still accepting non-toxic and non-infectious solid waste. According to Maui County Public Works Department, the County and Castle & Cook, Inc. are in the final stages of selecting a new landfill site that meets current regulations.

Refuse is hauled from Lanai City residences weekly by Maui Co. A private hauling company services commercial establishments on the island.

Roads

The only public access from Lanai Airport is via Kaunalapau Highway to the intersection of Manele Road and along Manele Road to the resort; there are no other intersections between Kaunalapau Highway and Manele Resort. Manele Road is a State-maintained highway with two lanes within a 19-foot wide pavement and 6-foot shoulders and a posted speed limit of 35 mph between milepost 6 and 10.

Airports

Lanai has one airport comprising 93 acres in the Ahupuaa of Kalulu, located on lands owned by the State of Hawaii. The airport and all surrounding lands are designated Agricultural by the State. Any expansion of the airport would require acquisition of additional private lands from Castle & Cooke.

Harbors

Kaunalapau Harbor is a small commercial harbor serving the island of Lanai. The harbor handles 95 percent of all shipments of construction material, wholesale goods and other supplies required by Lanai residents.

There is a small boat harbor at Manele Bay owned and operated by the State of Hawaii. At present, there are 23 mooring spaces for shallow draft boats.

Recreational Facilities

Maui County operates one gymnasium, two tennis courts, a baseball field, and a community center. Recreational facilities at Lanai Elementary and High School include a gymnasium, a baseball field, two basketball courts and three tennis courts.

Lanai has no County or State parks. The State Department of Land and Natural Resources has identified Shipwreck Beach as a potential State wild coastline park.

Police and Fire Protection

The Maui County Police Department has one police station on Lanai. The existing station is a one-room facility with a separate confinement area on the same property. The Lanai police force consists of seven officers – one lieutenant, one sergeant, and five patrolmen. There are officers on duty 24 hours a day. The Office of State Planning surveyed State and Maui County departments about future governmental needs on Lanai. The Maui County Police Department estimated Lanai will need 11 additional police officers during the next 20 years (Office of State Planning, 1990).

The Maui Fire Department has one fire station on Lanai which operates 24 hours a day. It was built in 1988 on land donated by Castle & Cooke. In addition to fire protection duties, the firemen assist the island's ambulance service. The station has a crew of four firemen – two from Lanai and two who travel from Maui for their shifts. Prior to September 1989, Lanai was served by a volunteer fire crew. For ocean rescue missions the station occasionally requests assistance from the Lahaina and Wailuku fire stations on Maui. Funds have been requested from the County of Maui for one additional fireman and the purchase of ocean rescue equipment. Currently, a boat owned by one of the firemen is used for ocean rescue operations.

Emergency Services

Lanai Community Hospital is operated by the State Department of Health. It has six acute care beds and eight long-term care beds. The emergency room is open 24 hours a day. The hospital has no in-house physician. Lanai's two doctors are on call. Patients requiring surgery are referred to hospitals on Oahu.

Energy

Electric power generation units and transmission facilities on Lanai are owned and operated by Maui Electric Company (MECO). Total island generation capacity is over 12,000 kW.

The Lanai Power Plant generation capacity is approximately 4,760 kW and the Miki Power Plant capacity is 6,000 kW. The peak recorded load during 1990 was

2,950 kW and the total projected demand for existing and future loads on Lanai is estimated at 5,679 kW.

Coastal Water Quality

None of the water quality parameters exceeded values specified by DOH as “not to exceed the given value more than 10% of the time” and only the geometric mean for chlorophyll-a exceeded the “wet” criteria.

Beach Erosion

There are no sand beaches on the project site; Hulopoe Beach, fronting the Manele Hotel, is the only sand beach near the project area. Generally, the coastline is formed by low sloping cliffs from 15-20 feet high on the west end of the project to vertical cliffs of over 180 feet from Khipaa Bay to Huawai Bay. There are so boulder beaches in small coves along the shoreline.

Native and Invasive Species

The vegetation of the project site is dominated largely by introduced (or alien) species such as kiawe and buffelgrass, although in places the native ilima, hoary abutilon, and pili grass may be common. Of 44 species recorded during the botanical surveys for the proposed project six species (13%) were indigenous and six were endemic (13%) to the Hawaiian Islands. The others were introduced (74%).

Natural/Scenic Resources

Manele Golf Course and Golf Residential Project is situated on over 750 acres which slope evenly and rise in elevation from about 200 feet above mean sea level (msl) to 620 feet msl. Overlooking the ocean on southern Lanai, the project site lies above cliffs ranging from 20 to 180 feet in height along the coast. The project area is covered with scrub vegetation and lava rock, similar to much of the coastline of Lanai. A portion of the site can be seen in the vista west from Hulopoe Beach Park, the only public view shed with a sight line in the Manele Area. No portion of the proposed project site can be seen from Manele Road until the road descends to the Manele Bay Hotel area. The site is also screened from Manele Harbor by the ridges that divide Manele Bay from Hulopoe Bay.

County of Maui – Lanai – Private Transportation

Present Capacity and Usage

Not enough information was found to adequately evaluate this infrastructure element at the community level.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Lanai – Energy Systems

Present Capacity and Usage

Not enough information was found to adequately evaluate this infrastructure element at the community level.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Lanai – Sewer Systems

Present Capacity and Usage

The Sewer indicator has been combined with the Sewage indicator.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Lanai – Coastal Water Quality

Present Capacity and Usage

No information was uncovered regarding the present capacity and usage for Coastal Water Quality.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Coastal Water Quality.

Future and Planned Usage

See County of Maui Coastal Water Summary for information.

Future and Planned Requirements or Changes

See County of Maui Coastal Water Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Coastal Water Quality.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Coastal Water Quality.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Coastal Water Quality.

Major Assumptions

No information was uncovered regarding major assumptions for Coastal Water Quality.

County of Maui – Lanai – Marine Ecosystem Health

Present Capacity and Usage

See County of Maui Marine Ecosystem Health Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Usage

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Marine Ecosystem Health element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for the Marine Ecosystem Health element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for the Marine Ecosystem Health element.

Compare Visitor and Resident Impact

See County of Maui Marine Ecosystem Health Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for the Marine Ecosystem Health element.

County of Maui – Lanai – Forestry / Green Space

Present Capacity and Usage

See County of Maui Forestry and Green Space Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Usage

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding the future and planned requirements or changes for Forestry / Green Space.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Forestry / Green Space.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Forestry / Green Space.

Compare Visitor and Resident Impact

See County of Maui Forestry and Green Space Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Forestry / Green Space.

County of Maui – Lanai – Air Quality

Present Capacity and Usage

See County of Maui Air Quality Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Air Quality.

Future and Planned Usage

No information was uncovered regarding the future and planned usage for Air Quality.

Future and Planned Requirements or Changes

No information was uncovered regarding the future and planned requirements or changes for Air Quality.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Air Quality.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Air Quality.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Air Quality.

Major Assumptions

No information was uncovered regarding major assumptions for Air Quality.

County of Maui – Lanai – Beach Erosion

Present Capacity and Usage

See County of Maui Beach Erosion Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Beach Erosion.

Future and Planned Usage

No information was uncovered regarding the future and planned usage for Beach Erosion.

Future and Planned Requirements or Changes

No information was uncovered regarding the future and planned requirements or changes for Beach Erosion.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Beach Erosion.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Beach Erosion.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Beach Erosion.

Major Assumptions

No information was uncovered regarding major assumptions for Beach Erosion.

County of Maui – Lanai – Invasive Species

Present Capacity and Usage

See County of Maui Invasive Species Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Invasive Species Summary for information.

Future and Planned Usage

See County of Maui Invasive Species Summary for information.

Future and Planned Requirements or Changes

See County of Maui Invasive Species Summary for information.

Anticipated Costs for the Future

See County of Maui Invasive Species Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Invasive Species Summary for information.

Compare Visitor and Resident Impact

See County of Maui Invasive Species Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Invasive Species.

County of Maui – Lanai – Natural / Scenic Resources

Present Capacity and Usage

Not enough information was found to adequately evaluate this infrastructure element at the community level.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Wailuku-Kahului – Water Quality and Quantity

Present Capacity and Usage

The total sustainable yield of hydrologic units in Wailuku is 38 MGD. The total sustainable yield of hydrologic units in Koolau is 202 MGD. See appendix for map delineating boundaries.

See Maui County Water Summary for information.

Watershed districts do not match planning districts.

Existing Problems, Issues and Opportunities

The Updated Wailuku-Kahului Community Plan notes two existing issues.

- Providing water resources to service South Maui.
- Development and transmission of new sources of potable water to accommodate long-term growth.
- The prioritization and allocation of water resources is a major interregional issue.^{31, 2000}

Future and Planned Usage

See Maui County Water Summary for information.

Future and Planned Requirements or Changes

The Updated Wailuku-Kahului Community Plan lists the following planned changes:

- Prepare or update a water improvement master plan.
- Plan and construct water system improvements, including additional source, transmission and storage capabilities.
- Provide incentives for water and energy conservation practices.
- No further development unless the infrastructure is available prior to or concurrent with the impacts of development.^{31, 2000}

Anticipated Costs for the Future

See Maui County Water Summary for information.

Problems, Issues and Opportunities Associated with Costs

See Maui County Water Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impact for the Water Quality element.

Major Assumptions

The Updated Wailuku-Kahului Community Plan assumes 2010 population estimate between 44,876 and 48,658.^{31, 2000}

County of Maui – Wailuku-Kahului – Sewage

Present Capacity and Usage

Maui County Department of Planning FY2003 Budget gives the following wastewater statistics. They describe the number of gallons processed by the Wailuku/Kahului Wastewater Reclamation Facility and the costs associated. ^{147, 2002}

Table 5.60 – Wailuku – Kahului Wastewater Operation Measures: 2002

	FY 2001 Actual	FY 2002 Estimate	FY 2002 Actual to Date
Total wastewater processed (gallons)	2,112,615,000	2,175,765,000	951,819,000
Annual compliance days	362	365	182
Kilowatts per 1,000 gallons processed	3.40	3.50	3.85
Total processing cost per 1,000 gallons	\$1.76	\$1.88	N/A

Source: *Maui County Department of Planning FY2003 Budget*

Maui County Department of Public Works FY2001 Budget gives the following wastewater statistics: ^{141, 2002}

Table 5.61 – Wailuku – Kahului Wastewater Reclamation Facilities

Measures: 2001 (Includes Kahului and South Maui) UIC = Underground Injection Control, EPA requirement

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Spills of less than 1,000 gallons	1	1	1
Spills of 1,000 gallons or more	0	0	0
Wastewater processed (average gallons per day)	5,145,000	5,281,000	5,316,000
Sludge taken to co-composting annually (tons)	7,306	7,000	7,000
Number of days all facilities met UIC permit requirements	364	365	365
Cost per 1,000 gallons of wastewater treated	\$1.88	\$1.88	\$1.88
Percent of effluent reused versus flow processed	4.7%	5.4%	9.7%

Source: *Maui County Department of Public Works FY2001 Budget*

Existing Problems, Issues and Opportunities

The Updated Wailuku-Kahului Community Plan states the Kahului wastewater treatment plant is aging and reaching its limits for expansion and efficient operation. ^{31, 2000}

Maui County Department of Planning FY2003 Budget states the existing Wailuku WWPS force main was constructed in 1977 and is in need of replacement. The force main capacity was determined to be decreasing. Failure to replace the existing force main may result in a discharge of raw wastewater to the surrounding environment. ^{147, 2002}

Future and Planned Usage

The Updated Wailuku-Kahului Community Plan notes future usage to explore feasibility of extending sewer service to unserved areas. Investigate the feasibility of constructing a Central Maui wastewater treatment plant near Puunene sugar mill area and others east of Kuihelani Highway.^{31, 2000}

Future and Planned Requirements or Changes

The Updated Wailuku-Kahului Community Plan future changes include relocating the Kahului Wastewater Treatment Plant out of the tsunami zone. No further development unless the infrastructure is available prior to or concurrent with the impacts of development.^{31, 2000}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget makes the following appropriations:^{147, 2002}

Table 5.62 – Wailuku – Kahului Six year Capital Improvement Program:
2002 Fund Source: B = G.O. Bonds, X = Other

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Sewer			
Central Maui Gravity Transmission Line		15,000 X	15,000 X
Kahului WWPS Renovation		2,200 B	2,200 B
Kuau WWPS #1, #2, #3, #4 Renovations		1,200 B	1,200 B
Maluhia Beach Lots Wastewater Line		265 B	265 B
Reclaimed Water Force Main		6,700 B	6,700 B
Wailuku - Kahului Reclaimed Water Force Main		6,700 B	6,700 B
Wailuku - Kahului WWRF R-1 Upgrade		6,000 B	6,000 B
Wailuku WWPS Force Main Replacement	7,360 X		7,360 X

Source: Maui County Department of Planning FY2003 Budget

Problems, Issues and Opportunities Associated with Costs

See Maui County Sewage Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Sewage element.

Major Assumptions

See Maui County Sewage and Wailuku-Kahului Water Summaries for information.

County of Maui – Wailuku-Kahului – Solid Waste Disposal

Present Capacity and Usage

The Maui County Department of Public Works FY2001 Budget gives the following statistics regarding Wailuku District residential collection that includes Kahului and South Maui. ^{141, 2001}

Table 5.63 – WAILUKU/KAHULUI RESIDENTIAL COLLECTIONS

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Residential collection accounts	9,825	10,100	10,300

Source: *The Maui County Department of Public Works FY2001 Budget*

Existing Problems, Issues and Opportunities

See County of Maui Solid Waste for information.

Future and Planned Usage

The Updated Wailuku-Kahului Community Plan plans for recycling programs to reduce solid waste, including convenient drop-off points for recycled material. ^{31, 2000}

Future and Planned Requirements or Changes

The Updated Wailuku-Kahului Community Plan lists the following planned changes:

- Develop and implement a comprehensive waste management and recycling plan for the region.
- Pursue the feasibility of utilizing resource recovery systems.
- No further development unless the infrastructure is available prior to or concurrent with the impacts of development. ^{31, 2000}

The Maui County Department of Planning FY2003 Budget states planned changes of construction of Central Maui Landfill Phase IV Facility, design of a base yard for refuse trucks and the remaining portion of Phase IV. ^{147, 2002}

Anticipated Costs for the Future

The Maui County Department of Planning FY2003 Budget makes the following appropriations. Fund source is G.O. bonds. ^{147, 2002}

Table 5.64 – Wailuku – Kahului Six year Sanitation Capital Improvement Program: 2002

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Sanitation			
Central Maui Landfill Phase I, II & III Closure		10,000	10,000
Central Maui Landfill Phase IV Facility and Related Equipment	1,500	6,300	7,800
Central Maui Landfill Phase V		4,200	4,200
Materials Recovery Facility		3,150	3,150

Source: *The Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Solid Waste element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Solid Waste element.

Major Assumptions

No information was uncovered regarding major assumptions for the Solid Waste element.

County of Maui – Wailuku-Kahului – Storm Water

Present Capacity and Usage

Due to a lack of information or response from the Maui Department of Public Works and Environmental Management, there is not enough data to evaluate storm water in Maui County.

Existing Problems, Issues and Opportunities

The Updated Wailuku-Kahului Community Plan notes existing issues of a storm drain improvement program to alleviate existing problems and address safety and property loss concerns as well as the need for comprehensive flood control planning.^{31, 2000}

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

The Updated Wailuku-Kahului Community Plan lists the following planned changes:

- Encourage the use of siltation basins and other erosion control features in drainage systems.
- Update and implement a drainage master plan that considers the cumulative impacts of existing and planned development.
- Establish a comprehensive program of improvements to storm drainage system; implement maintenance program.
- Revise the County drainage rules to require that drainage system design shall not adversely affect downstream and coastal water quality.^{31, 2000}

Anticipated Costs for the Future

Maui County Department of Planning FY 2003 Budget makes the following appropriations for storm water capital improvements. Lower Main Street improvements from Hala Place to Mill Street consist of road widening, curbs and gutters, sidewalks, resurfacing and drainage facilities. Market Street improvements consist of reconstruction and resurfacing, signs, and striping and drainage improvements.^{191, 2002}

**Table 5.65 – Wailuku – Kahului Storm Water Capital Improvement Budget
 FY 2003**

Lower Main Street Improvements	
Land Acquisition	200 B
Design	250 B
Construction	3,200 F
	800 B
Construction Management	300 B
Total Cost	1,550 B
	3,200 F
Market Street Improvements	
Land Acquisition	100 B
Construction	1,000 B
	4,00 F
Construction Management	300 B
Total Cost	1,400 B
	4,000 F

Source: Maui County Department of Planning FY 2003 Budget

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Wailuku-Kahului – Roads

Present Capacity and Usage

Maui County Department of Public Works and Waste Management Annual Report describes the Wailuku District is the largest district. It encompasses the area from Makena to Maalaea to Kahakuloa and to Kahului airport.

The Wailuku District has recently repaired, widened, and paved about 2,500 feet of Kahekili Highway on the Lahaina side of Kahakuloa Village. They also repaired, widened and surface a mile of the same highway with oil and gravel penetration. Pulehu Road was widened and the old, eroded shoulders were restored and paved. An older section of Kananui Road was also widened and paved.

Paving A/C swales on the road shoulder mitigated a drainage problem on Lihī Street. Lao Stream flood control facility repairs were completed by reconstructing rock banks and re-channeling parts of the river.^{135, 2002}

Existing Problems, Issues and Opportunities

See County of Maui Roads Summary for information.

Future and Planned Usage

See County of Maui Roads Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Roads element.

Anticipated Costs for the Future

See County of Maui Roads Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Roads Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding comparison of visitor and resident impacts for the Roads element.

Major Assumptions

No information was uncovered regarding major assumptions for the Roads element.

County of Maui – Wailuku-Kahului – Airports

Present Capacity and Usage

The Final Statewide Airport System Plan describes the Kahului Airport is located on the northern edge of the land bridge between Haleakala and the West Maui Mountain Range on the island of Maui. The airport occupies 1,391 acres of land and is located three miles east of the town of Kahului. The airport has two intersecting runways and full air carrier facilities for domestic overseas and inter-island commercial service. Kahului Airport provides commuter/air taxi and general aviation operations, including helicopter operations in separate locations. Vehicular access to the passenger terminal, commuter/air taxi, cargo, scenic tour operators, general aviation facilities and airport support facilities is via a roadway network that connects to the Haleakala and/or Hana Highways.^{127, 1998}

Maui County Data Book 2001 gives statistics for aircraft operations at Kahului Airport.^{247, 2001}

Table 5.66 – Kahului Airport Statistics: 1996-2000

	1996	1997	1998	1999	2000
All Movements	178,590	173,342	180,890	188,385	174,855
Air Carrier	67,136	64,599	63,336	62,883	63,799
Air Taxi	78,722	81,105	84,546	92,569	77,779
General Aviation	29,976	25,211	29,509	29,575	29,983
Military	2,756	2,427	3,499	3,358	3,294

Source: *Maui County Data Book 2001*

Table 5.67– Kahului Airport Enplaned / Deplaned Statistics: 1999-2000

	1999		2000	
	Enplaned	Deplaned	Enplaned	Deplaned
Passengers				
Inter-island	2,129,704	2,017,788	2,141,313	2,075,141
Overseas	854,706	969,881	965,586	1,009,205
Cargo (tons)				
Inter-island	5,324	14,911	6,147	17,872
Overseas	6,945	5,937	7,390	6,688
Mail (tons)				
Inter-island	2,263	7,592	2,089	7,575
Overseas	1,102	1	641	32

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

The Final Statewide Airport System Plan notes the existing issues with the Island of Maui’s airports.

Kahului Airport:

- Insufficient space in and surrounding current cargo facilities.
- Curbside congestion.
- Current rental car location causes curbside congestion and requires all cars to pass terminal.
- Baggage claim congestion.
- Crowded conditions for staging of buses and group tour operations.
- Air traffic control tower unable to see helicopter takeoffs.^{127, 1998}

Future and Planned Usage

The Final Statewide Airport System Plan notes the planned usage for the Kahului Airport:

- Based on the passenger forecast, Kahului Airport will remain the second busiest airport in Hawaii to the year 2020. A runway is currently planned for expansion.
- Total aircraft operations are expected to increase by 66% by 2020.^{127, 1998}

Future and Planned Requirements or Changes

The Final Statewide Airport System Plan lists the Kahului Airport future requirements:

- Expansion of Kahului Airport terminal will be required to facilitate the projected 66% growth in overseas and domestic traffic through 2020.
- Extension of Runway 2-20 to accommodate the projected growth.
- A parallel runway may be required to provide sufficient capacity and reduce aircraft delays for the projected overseas demands.
- Roughly, 500 acres of land will need to be acquired for runway and its protection zone.
- Expand and relocate a central rental car facility to reduce curbside congestion due to the projected growth.
- Expansion of air cargo space to accommodate growth.
- Apron and taxiway for helicopters.^{127, 1998}

Anticipated Costs for the Future

The Final Statewide Airport System Plan states planned changes to Kahului Airport will total \$96.122 million by the year 2020.^{127, 1998}

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

The Final Statewide Airport System Plan notes Maui's Kahului Airport will remain Hawaii's second busiest airport to the 2020. International passenger demand is expected to grow to 870,000 annually.^{127, 1998}

Major Assumptions

A major assumption is that Maui's Kahului Airport will remain Hawaii's second busiest airport to the 2020.

County of Maui – Wailuku-Kahului – Harbors

Present Capacity and Usage

The Updated Wailuku-Kahului Community Plan states Kahului Harbor is the only commercial harbor on the Island of Maui.^{31, 2000}

State Airports, Harbors and Highways lists Kahului Harbor as the third busiest harbor in state and the busiest of all Neighbor Island harbors. In fiscal year 2000, the harbor handled 52,582 passengers and 2,559,124 tons of cargo.^{37, 2001}

Maui County Data Book 2001 gives statistics for vessel arrivals for Kahului Harbor.^{247, 2001}

Table 5.68 – KAHULUI HARBOR VESSEL ARRIVALS

	1997	1998	1999
Total Inbound Vessels	1,259	1,351	1,442
By Type of Vessel			
Self Propelled			
Passenger/dry Cargo	22	45	55
Tanker	0	3	2
Tow/Tugboat	534	584	614
Non-self Propelled			
Dry Cargo	615	618	656
Tanker	88	101	115

Source: *Maui County Data Book 2001*

Maui County Data Book 2001 gives statistics for freight traffic for Kahului Harbor.^{247, 2001}

Table 5.69 – KAHULUI HARBOR FREIGHT TRAFFIC

Year	Tons (in thousands)
1997	2,895
1998	2,851
1999	3,513

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

The Updated Wailuku-Kahului Community Plan states Kahului serves as the transportation center of and gateway to the Island of Maui.^{31, 2000}

Future and Planned Usage

The Updated Wailuku-Kahului Community Plan lists future usage of a new commercial harbor and new slips or a new marina at the recreational harbor.^{31, 2000}

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Harbors element.

Anticipated Costs for the Future

State Airports, Harbors and Highways lists anticipated costs for Kahului Harbor as follows:

- Extension of Pier 1 by 300' \$10 million.
- Pier 1 Passenger Cruise Terminal \$988,000.
- Special maintenance projects \$541,800.^{37, 2001}

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Harbors element.

Compare Visitor and Resident Impact

No information was uncovered regarding comparison of visitor and resident impacts for the Harbors element.

Major Assumptions

No information was uncovered regarding major assumptions for the Harbors element.

County of Maui – Wailuku-Kahului – Parks

Present Capacity and Usage

See County of Maui Parks Summary for information.

Existing Problems, Issues and Opportunities

The Updated Wailuku-Kahului Community Plan notes the following existing issues:

- Population growth has increased demands on community facilities in the region.
- Need for more active recreational playfields and passive parks; development of Keopuolani Park; permanent county fairground; upgrading of the zoo and consideration for an aquarium.
- “Greenway” along North Shore that begins at Keopuolani Park connecting Kahului to Paia via bike/ped-way.^{31, 2000}

Future and Planned Usage

See County of Maui Parks Summary for information.

Future and Planned Requirements or Changes

The Updated Wailuku-Kahului Community Plan lists the following planned changes:

- Undertake a site selection study for a permanent fairgrounds site that encourages year-round use.
- Undertake a regional park master plan.
- Prepare and implement a plan for a major regional multi-purpose center to service the entire planning district.
- Investigate the need for an additional community center in Kahului and/or the upgrading and expansion of the existing Kahului Community Center.
- Update and implement a plan for the Keopuolani Park.
- Incorporate a landscape planting master plan in the update and implementation of the Keopuolani Park Plan.^{31, 2000}

Maui County Department of Planning FY2003 Budget lists the following planned changes:

- Supplemental funding for design of a world-class campground facility at Kanaha Park Campsite.
- Supplemental funding for the construction of improvements to gunite and plaster Kokua Pool.
- Supplemental funding for the upgrading of the irrigation pump system at the Waiehu Golf Course.^{147, 2002}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget gives the following future costs: ^{147, 2002}

Table 5.70 – Wailuku-Kahului Six Year Parks and Recreation Capital Improvement Program: 2002

Fund Source: C = County, B = G.O. Bonds, F = Federal, S = State, X = Other, L = Lapsed Bond Proceeds, P = Park Assessment

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Parks and Recreation			
Central Maui Soccer Complex	1,500 B	5,000 B	6,500 B
Iron Maehara Baseball Stadium Announcers Booth		250 C	250 C
Kanaha Beach Park Expansion		1,500 B	1,500 B
Kanaha Park Campsite Design	100 C		100 C
Keopuolani Park Playground	800 C		800 C
	300 X		300 X
Kokua Pool Improvements	100 L		100 L
Waiehu Golf Course Cart Paths	300 B		300 B
		250 C	250 C
Waiehu Golf Course Irrigation Pump Replacement	150 B		150 C
Waiehu Golf Course Maintenance Building		2,000 B	2,000 B
Waiehu Golf Course Starter/Pro Shop/Restaurant Roof	80 B		80 B
War Memorial Complex Parking Lot Resurfacing		225 C	225 C
War Memorial Football Stadium Improvements		120 B	120 B
		1,300 B	1,300 B
War Memorial Gym Concession Booth		125 C	125 C
War Memorial Little League Field Restrooms and Electrical Upgrade		250 C	250 C
Wells Park Tennis Court Lighting	50 C		50 C

Source: Maui County Department of Planning FY2003 Budget

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Parks element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Parks element.

Major Assumptions

No information was uncovered regarding major assumptions for the Parks element.

County of Maui – Wailuku-Kahului – Police, Fire and Emergency Services

Present Capacity and Usage

Police

The Maui Police Department gave the following statistics showing call activity for the Wailuku/Central region.^{96C, 2002}

Table 5.71 – Wailuku – Central Police District Measures: 2002

	FY2001 Actual	FY2002 To Date
Personnel	110.7	115.6
Calls for Service	47976	24688
Documented Cases	27600	13906
Moving Citations	18024	8970
Parking Citations	3200	1474

Source: Maui County Police Department

Fire

Maui County Department of Public Works FY2001 Budget gives the following statistics:^{141, 2002}

Table 5.72 – Wailuku Departemnt of Fire Control District Measures: 2001

	FY1999 Actual	FY2000 Actual	FY2001 Estimate
Fires	102	96	90
Rescues (non-fire related)	30	15	25
Emergency medical services	91	127	60
Hazmat response	17	19	15
False calls (any alarm received for which response was unnecessary)	29	45	45
Company assists (another fire company responds with primary company to assist with an emergency)	102	106	45
Other calls (miscellaneous services such as removing traffic hazards)	102	122	90
AED (Automated external defibrillator) response	0	1	5

Source: *Maui County Department of Public Works FY2001 Budget*

Table 5.73 – Kahului Department of Fire Control District Measures: 2001

	FY1999 Actual	FY2000 Actual	FY2001 Estimate
Fires	97	104	70
Rescues (non-fire related)	72	70	70
Emergency medical services	104	93	60
Hazmat response	20	26	20
False calls (any alarm received for which response was unnecessary)	64	49	30
Company assists (another fire company responds with primary company to assist with an emergency)	774	863	700
Other calls (miscellaneous services such as removing traffic hazards)	74	100	65
AED (Automated external defibrillator) response	0	1	5

Source: *Maui County Department of Public Works FY2001 Budget*

Existing Problems, Issues and Opportunities

See County of Maui Police, Fire and Emergency Services Summary for Information.

Future and Planned Usage

The Updated Wailuku-Kahului Community Plan notes planned usages include:

- Maintain adequate police and fire protection services in the region.
- Encourage communities to establish Neighborhood Crime Watch Programs.^{31, 2000}

Future and Planned Requirements or Changes

The Updated Wailuku-Kahului Community Plan planned changes include a study into the feasibility of establishing fire and police protection facilities in the proposed Project Districts within the region.^{31, 2000}

Maui County Department of Public Works FY2001 Budget improvements to security as per the FY2001 security assessment to include exterior lighting, photo ID badges for employees of the Kalana O Maui and Kalana Pakui buildings and surrounding properties. Current storage for police evidence is inadequate for the volume of items received. Integrity of evidence for prosecution is threatened. Repainting the Wailuku police Station would extend the warranty for an additional 10 years.^{141, 2002}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget makes the following appropriations. Fund source is the county.^{147, 2002:}

Table 5.74 – Wailuku Police Station Capital Improvement Program: 2002

Dollars In Thousands	FY2002	FY2003-2007
Government Facilities		
Wailuku Police Station Classroom/Meeting Room		250
Wailuku Police Station Parking Lot		250
Kalana O Maui Complex Security System	100	
Wailuku Police Evidence Storage Expansion	300	
Wailuku Police Station Repaint	200	

Source: *Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

See County of Maui Police, Fire and Emergency Services Summary for Information.

Compare Visitor and Resident Impact

See County of Maui Police, Fire and Emergency Services Summary for Information.

Major Assumptions

The Updated Wailuku-Kahului Community Plan assumes the estimated population for the year 2010 ranges between 44,876 to 48,658 residents.^{31, 2000}

County of Maui – Wailuku-Kahului – Visitor Accommodations

Present Capacity and Usage

Maui County Data Book gives statistics on the type of visitor accommodations and the available units for the Wailuku-Kahului area. ^{247, 2001}

Table 5.75 – Wailuku – Kahului Visitor Accommodations: 2001

Type of Accommodation	Properties	Available Units
Bed & Breakfast	1	7
Condominium Hotel	3	50
Hotel	3	402
Individual Vacation Units	1	6
Other	3	28
Total	11	493

Source: *2001 Maui County Data Book*

Existing Problems, Issues and Opportunities

According to the *Updated Wailuku-Kahului Community Plan*, there is development of a hotel in downtown Wailuku Town core, Kahului Harbor and Airport. ^{31, 2000}

Future and Planned Usage

See State of Hawaii and County of Maui Visitor Accommodations for more information.

Future and Planned Requirements or Changes

See State of Hawaii and County of Maui Visitor Accommodations for more information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Visitor Accommodations element.

Problems, Issues and Opportunities Associated with Costs

See State of Hawaii and County of Maui Visitor Accommodations for more information.

Compare Visitor and Resident Impact

See State of Hawaii and County of Maui Visitor Accommodations for more information.

Major Assumptions

See State of Hawaii and County of Maui Visitor Accommodations for more information.

The Updated Wailuku-Kahului Community Plan 2000 projects the population for 2010 as an estimate between 44,876-48,658. ^{31, 2000}

County of Maui – Wailuku-Kahului – Private Transportation

Present Capacity and Usage

See County of Maui Private Transportation Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding existing problems, issues and opportunities for Private Transportation.

Future and Planned Usage

No information was uncovered regarding future and planned usage for Private Transportation.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for Private Transportation.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for Private Transportation.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for Private Transportation.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Private Transportation.

Major Assumptions

No information was uncovered regarding major assumptions for Private Transportation.

County of Maui – Wailuku-Kahului – Energy Systems

Present Capacity and Usage

See County of Maui Energy Systems Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Energy Systems Summary for information.

Future and Planned Usage

See County of Maui Energy Systems Summary for information.

Future and Planned Requirements or Changes

See County of Maui Energy Systems Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Energy Systems element.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Energy Systems Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Energy Systems element.

Major Assumptions

No information was uncovered regarding major assumptions for the Energy Systems element.

County of Maui – Wailuku-Kahului – Sewer Systems

Present Capacity and Usage

The Sewer indicator has been combined with the Sewage indicator. See Sewage Summary for information.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Wailuku-Kahului – Coastal Water Quality

Present Capacity and Usage

Not enough information was found to adequately evaluate this infrastructure element at the community level.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Wailuku-Kahului – Marine Ecosystem Health

Present Capacity and Usage

See County of Maui Marine Ecosystem Health Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Usage

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Marine Ecosystem Health element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for the Marine Ecosystem Health element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for the Marine Ecosystem Health element.

Compare Visitor and Resident Impact

See County of Maui Marine Ecosystem Health Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for the Marine Ecosystem Health element.

County of Maui – Wailuku-Kahului – Forestry / Green Space

Present Capacity and Usage

See County of Maui Forestry and Green Space Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Usage

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Forestry and Green Space element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Forestry and Green Space.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Forestry and Green Space.

Compare Visitor and Resident Impact

See County of Maui Forestry and Green Space Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Forestry and Green Space.

County of Maui – Wailuku-Kahului – Air Quality

Present Capacity and Usage

See County of Maui Air Quality Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Air Quality Summary for information.

Future and Planned Usage

See County of Maui Air Quality Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Air Quality element.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Air Quality element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Air Quality element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Air Quality element.

Major Assumptions

No information was uncovered regarding major assumptions for the Air Quality element.

County of Maui – Wailuku-Kahului – Beach Erosion

Present Capacity and Usage

See County of Maui Beach Erosion Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Beach Erosion.

Future and Planned Usage

No information was uncovered regarding future and planned usage for the Beach Erosion element.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Beach Erosion element.

Anticipated Costs for the Future

See County of Maui Beach Erosion Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Beach Erosion Summary for information.

Compare Visitor and Resident Impact

See County of Maui Beach Erosion Summary for information.

Major Assumptions

See County of Maui Beach Erosion Summary for information.

County of Maui – Wailuku-Kahului – Invasive Species

Present Capacity and Usage

See County of Maui Invasive Species Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Invasive Species Summary for information.

Future and Planned Usage

See County of Maui Invasive Species Summary for information.

Future and Planned Requirements or Changes

See County of Maui Invasive Species Summary for information.

Anticipated Costs for the Future

See County of Maui Invasive Species Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Invasive Species Summary for information.

Compare Visitor and Resident Impact

See County of Maui Invasive Species Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Invasive Species.

County of Maui – Wailuku-Kahului – Natural / Scenic Resources

Present Capacity and Usage

See County of Maui Natural and Scenic Resources Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Usage

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Requirements or Changes

See County of Maui Natural and Scenic Resources Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Natural and Scenic Resources.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Natural and Scenic Resources.

Compare Visitor and Resident Impact

See County of Maui Natural and Scenic Resources Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Natural and Scenic Resources.

County of Maui – West Maui – Water Quality and Quantity

Present Capacity and Usage

Watershed districts do not match planning districts.

The total sustainable yield of hydrologic units in Lahaina is 40 MGD. See appendix for map delineating boundaries.

See County of Maui Water Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Water Summary for information.

Future and Planned Usage

West Maui Community Plan plans to:

- Update the County's Water Use and Development Plan and estimated water use for the West Maui region.
- Develop a plan for the eventual acquisition by the County of Maui of all private water systems within the region.^{35, 1996}

Future and Planned Requirements or Changes

West Maui Community Plan would like to accomplish the following:

- Protect ground water resources and improve the quality of domestic water
- Reduce potable water consumption outside urban areas
- Coordinate the construction of all water and public utility improvements to minimize construction impacts.
- Study the feasibility of integrating all regional water systems into a public water system to be managed and operated by the County
- Improve and expand the West Maui water development program projected by the County to meet future residential expansion needs and establish water treatment facilities where necessary.
- Encourage the installation of underground electrical, telephone, and cable television lines.
- Encourage reasonable rates for water and public utility services.^{35, 1996}

Anticipated Costs for the Future

See County of Maui Water Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Water Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Water element.

Major Assumptions

See County of Maui Water Summary for information.

County of Maui – West Maui – Sewage

Present Capacity and Usage

The West Maui Community Plan describes the West Maui region is served by the Lahaina Wastewater Reclamation Facility, which processes an average of **5.7 million gallons of wastewater per day**.^{35, 1996}

Table 5.76 – Lahaina Wastewater Reclamation Facilities Measures: 2001²⁰⁰²

UIC = Underground Injection Control, EPA requirement

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Spills of less than 1,000 gallons	1	2	1
Spills of 1,000 gallons or more	2	1	1
Wastewater processed (average gallons per day)	5,731,000	5,623,000	5,700,000
Sludge taken to co-composting annually (tons)	6,409	6,900	6,900
Number of days all facilities met UIC permit requirements	362	365	365
Number of months facility met reuse permit requirements	12	12	12
Cost per 1,000 gallons of wastewater treated	\$1.66	\$1.66	\$1.66
Percent of effluent reused versus flow processed	19.0%	29.4%	30.1%

Source: County of Maui Planning Department – *Fiscal Year 2001 Budget*

Maui County Department of Planning FY2003 Budget gives the following wastewater statistics^{147, 2002}:

Table 5.77 – Lahaina Wastewater Operations Program Measures: 2002

	FY 2001 Actual	FY 2002 Estimate	FY 2002 Actual to Date
Total wastewater processed (gallons)	1,935,160,000	1,962,970,000	894,190,000
Annual compliance days	362	365	184
Kilowatts per 1,000 gallons processed	3.70	3.56	3.99
Total processing cost per 1,000 gallons	\$2.21	\$1.66	N/A
Recycled water cost per 1,000 gallons	N/A	\$0.27	N/A

Source: *Maui County Department of Planning FY2003 Budget County*

Existing Problems, Issues and Opportunities

Maui County Department of Planning FY2002 Budget notes the existing force main from 20 years ago, located in the Front Street corridor, has no outage provisions. During the Front Street Improvements project, excavation of Front Street exposed the existing force main. Examination of the exposed portions of the force main identified numerous potential locations for bolting corrosion failure.^{50, 2001}

Future and Planned Usage

Maui County Department of Planning FY2002 Budget states future evaluation to ensure that the County is providing a high quality and reliable expansion of the reuse system needs to be performed. This evaluation will look at existing and

potential future users, identify potential offsite storage requirements, the locations for storage and forecast other R-1 infrastructure improvements.^{50, 2001}

Future and Planned Requirements or Changes

Maui County Department of Planning FY2002 Budget notes future usage for the West Maui Region includes:

- Conduct a study to provide alternatives for the long-term operational strategy of the 1975 Lahaina Wastewater Reclamation Facility. Additionally, provide an analysis on the operational impacts to the 1985 plant if a deep walled secondary clarifier was constructed.
- Final alignment for the replacement of the existing Front street force main is being reviewed for the most efficient and cost effective location. The final alignment choices include its current location and Mill Street.
- Perform an evaluation of the proposed water reuse system expansion. The evaluation will define existing and potential system users; identify potential offsite storage requirements, the locations for storage (land acquisition) and forecast future residential and commercial development.^{50, 2001}

Maui County Department of Public Works FY2001 Budget notes future usage for the region includes:

- Perform a study to replace emergency generators and rehabilitate equipment at Lahaina Pump Stations 1 and 2. The pump stations are approximately 22 years old and must be upgraded to comply with the EPA Consent Decree.^{141, 2001}

The West Maui Community Plan's objectives addressing the solid waste are:

- Reuse the treated effluent from the County's wastewater treatment system for irrigation and other suitable purposes in a manner that is environmentally sound.
- Reduce the disposal of solid waste in landfills through expanded recycling programs and the provision of convenient drop-off facilities.
- Improve sewage treatment services for Lahaina and provide services to residential expansion areas.
- Provide sewage disposal facilities for boats at the Lahaina Small Boat Harbor and at Mala Wharf.^{35, 1996}

Anticipated Costs for the Future

Maui County Department of Planning FY2002 Budget lists the following anticipated costs:

- Costs for the force main project totals \$3,600,000.
- Costs for the 1975 and 1985 operational strategies are \$ 1,475,000.
- Costs for the expansion of the reuse system totals: \$50,000.^{50, 2001}

Maui County Department of Public Works FY2001 Budget notes to replace emergency generators for pump stations and rehabilitate equipment at Lahaina Pump Stations 1 and 2 an approximate cost of \$500,000.^{141, 2001}

Table 5.78 – West Maui Six Year Sewer Capital Improvement Program: 2002

Fund Source: C = County B = G.O. Bonds

<i>Dollars In Thousands</i>	FY2003	FY2004-2008	TOTAL
Sewer			
Lahaina WWPS #1 Replacement		7,050 B	7,050 B
Lahaina WWPS #2 Replacement		1,800 B	1,800 B
Lahaina WWPS #3 Force Main Extension		1,200 B	1,200 B
Lahaina WWPS #3 Force Main Extension and Lahaina WWPS #2 Replacement		620 C	620 C
Lahaina WWPS #4 Replacement		1,875 B	1,875 B
Lahaina WWRF Modifications, Stage IA		1,200 B	1,200 B
Offsite Effluent Storage		1,375 B	1,375 B
Offsite Effluent Storage Land Acquisition		80 C	80 C
Wahikuli Gravity Sewer		4,350 B	4,350 B
West Maui Offsite Effluent Storage Reservoir		1,455 B	1,455 B

Source: County of Maui, Department of Planning – *Fiscal Year 2003 Budget*

Problems, Issues and Opportunities Associated with Costs

See County of Maui Sewage Summary for information.

Compare Visitor and Resident Impact

See County of Maui Sewage Summary for information.

Major Assumptions

Maui County Department of Planning FY2002 Budget makes assumptions about the anticipated life of the projects after completion:

- Force main project – 30 years
- 1975 and 1985 operational strategies – 30 years
- Expansion of the reuse system – 30 years.^{50, 2001}

County of Maui – West Maui – Solid Waste Disposal

Present Capacity and Usage

Maui County Department of Public Works FY2001 Budget gives the following statistics on Lahaina District Residential Collection.^{141, 2001}

Table 5.79 – Lahaina District Residential Collection: 1999

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Residential collection accounts	1,946	2,100	2,100

Source: *Maui County Department of Public Works FY2001 Budget*

Existing Problems, Issues and Opportunities

See County of Maui Solid Waste Summary for information.

Future and Planned Usage

The West Maui Community Plan's implementing actions for the solid waste are to develop and implement a comprehensive waste management and recycling plan for the region.^{35, 1996}

Future and Planned Requirements or Changes

Subsurface fires and above ground smoke have been a problem at Olowalu Landfill during operations, closure construction and post-closure care. Funding will replace broken pipe, as well as construct new improvements to prevent oxygen from entering the system and feeding subsurface fires.^{147, 2002}

Anticipated Costs for the Future

The Maui County Department of Planning FY2003 Budget appropriated \$50,000 for the West Maui Six Year Capital Improvement Program to repair Olowalu Landfill gas pipe.^{147, 2002}

Problems, Issues and Opportunities Associated with Costs

See County of Maui Solid Waste Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Solid Waste element.

Major Assumptions

No information was uncovered regarding major assumptions for the Solid Waste element.

County of Maui – West Maui – Storm Water

Present Capacity and Usage

Due to the lack of information or response from the Maui Department of Public Works and Environmental Management, there is not enough data to evaluate Storm Water in Maui County.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

West Maui Community Plan's objectives addressing the drainage are:

- Construct and maintain desilting basins along drainage channels.
- Construct necessary drainage improvements in flood-prone areas, incorporating landscaped swales and unlined channels to provide open space continuity.
- Urge the use of landscaped/green belt drainage channels as opposed to concrete-lined channels of culverts.
- Insure that new developments will not result in adverse flooding conditions for downstream properties by requiring onsite retention facilities for storm water run-off generated by the development.^{35, 1996}

Future and Planned Requirements or Changes

West Maui Community Plan's implementing actions for the drainage are:

- Formulate or update a drainage master plan.
- Establish a comprehensive program of improvements to the storm drain system, implement a maintenance program, and ensure that safety, property loss and the need for comprehensive planning be considered.
- Construct Drain Line F situated makai of the Lahaina Aquatic Center and Honoapiilani Highway.
- Investigate the need to improve and extent the drainage channel just north of the Lahaina Civic Center to handle potential increases in runoff generated by new development mauka of Wahikuli and Hanakaoo.^{35, 1996}

Anticipated Costs for the Future

Maui County Department of Planning FY 2003 Budget makes the following appropriations for improvements to the Lower Honoapiilani Road. Drainage improvements include new pavement, curbs and sidewalk on the mauka side and a paved shoulder on the makai side.^{191,2002}

Table 5.80 – West Maui Six year Capital Improvement Program: 2002

F = Federal Funds, B = G.O. Bonds, C = County

Lower Honoapiilani Road Improvements		
	Prior Appropriation	FY 2003
Land Acquisition	400 C	
Design		
Construction	1,200 B	800 B
	3,200 F	3,200 F
Construction Management		600 B
Total Cost	400 C	
	1,200 B	1,400 B
	3,200 F	3,200 F

Source: Maui County Department of Planning FY 2003 Budget

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – West Maui – Roads

Present Capacity and Usage

See County of Maui Roads Summary for information.

Existing Problems, Issues and Opportunities

The Joint State/County Maui Interim Transportation Plan states existing problem of congestion along Honoapiilani Highway, between Lahainaluna Road and Puamana; Honoapiilani Highway/Lahainaluna Road intersection.^{63, 2002}

Future and Planned Usage

See County of Maui Roads Summary for information.

Future and Planned Requirements or Changes

The Joint State/County Maui Interim Transportation Plan lists possible interim measures:

- Construction of interim roadway along existing Cane Haul Road, between Lahainaluna Road and Lahaina Business Park.
 - Potential hurdles: Land acquisition, possible soil contamination.
- Phased construction of Lahaina Bypass, Kapunakea Street to Lahainaluna Road; and County connector road, Honoapiilani Highway to Lahaina Bypass.
 - Potential hurdles: Completion of environmental documents and approvals, preceded land issues, land acquisition, funding.
- Honoapiilani Highway Widening, Lahainaluna Road to Puamana.
 - Potential hurdles: Impact to area residents, funding.
- Dickenson Street Extension.^{63, 2002}

Maui County Department of Public Works and Waste Management Annual Report states coordination continues with a private developer to jointly construct the Lahaina Bypass Highway. Based on public input the southern limit has been extended to Launiupoko. For the new highway linking the Kihei Technological Park with the scientific facilities at Haleakala, we have held public hearings and are now preparing archaeological inventory and cultural impact studies to include in the final environmental impact statement.^{135, 2002}

Anticipated Costs for the Future

The Joint State/County Maui Interim Transportation Plan lists the following anticipated costs:

- Construction of interim roadway along existing Cane Haul Road, between Lahainaluna Road and Lahaina Business Park.
 - \$1.0 million – 6 months following clearing of Pioneer Mill by AMFAC.

- Phased construction of Lahaina Bypass, Kapunakea Street to Lahainaluna Road; and County connector road, Honoapiilani Highway to Lahaina Bypass.
 - \$15 million – 6 years
- Honoapiilani Highway Widening, Lahainaluna Road to Puamana.
 - PE/DES \$700,000 – 1.5 years
 - CON- Phase 1: Dickenson Street 1,000 feet south of Shaw Street
\$2.0 million – 1.5 years
 - Phase 2: 1,000 feet south of Shaw Street to Front Street
\$3.4 million – 2 years^{63, 2002}

Problems, Issues and Opportunities Associated with Costs

See County of Maui Roads Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Roads element.

Major Assumptions

No information was uncovered regarding major assumptions for the Roads element.

County of Maui – West Maui – Airports

Present Capacity and Usage

The Final Statewide Airport System Plan describes the Kapalua Airport is a commercial service airport that is served by commercial propeller air carriers and commuter/air taxi aircraft only. This facility started as a private facility until its acquisition by the State. The facility consists of a single runway, terminal facilities, and support facilities. There are no air cargo facilities at this airport. Access to this airport is provided from a two-lane road off of Honoapiilani Highway.^{127, 1998}

Maui County Data Book 2001 gives statistics for operations activity at Kapalua Airport.^{247, 2001}

Table 5.81 – Kapalua Airport Enplaned / Deplaned Statistics: 2001

	1999		2000	
	Enplaned	Deplaned	Enplaned	Deplaned
Passengers	68,336	66,966	61,128	60,187
Cargo (tons)	277	360	273	316

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

The Final Statewide Airport System Plan notes the existing issues with Kapalua Airport:

- Improvements are limited to certain upgrades only.
- The runway, apron and other facilities cannot be expanded without changes to the existing agreement with the County of Maui.
- Operations are limited to daytime hours only.^{127, 1998}

Future and Planned Usage

The Final Statewide Airport System Plan notes constraints preclude major airport development for the Kapalua Airport.^{127, 1998}

Future and Planned Requirements or Changes

The Final Statewide Airport System Plan lists that future Capital Improvement Program projects will focus on safety and compliance issues.^{127, 1998}

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for the Airports element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Airports element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Airports element.

Major Assumptions

No information was uncovered regarding major assumptions for the Airports element.

County of Maui – West Maui – Harbors

Present Capacity and Usage

Analysis of county documents shows that there are no commercial harbors in West Maui region. Cruise ship tenders utilizing the Lahaina Small Boat Harbor are coordinated by the Department of Land and Natural Resources.

Existing Problems, Issues and Opportunities

Hawaii Tourism Product Assessment suggests a cruise ship berth at Lahaina.^{91, 1999}

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

A small recreational boat harbor supports the visitor sightseeing and snorkeling boat industry. Cruise ship tenders utilize the small recreational boat harbor to embark and disembark passengers however no information was uncovered regarding the comparison of visitor and resident impacts.

Major Assumptions

N/A

County of Maui – West Maui – Parks

Present Capacity and Usage

See County of Maui Parks Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Parks Summary for information.

Future and Planned Usage

West Maui Community Plan lists the following planned usages:

- Provide community-oriented park facilities including facilities for field and court games and for passive activities
- Provide resource-oriented regional park facilities and public access along the shoreline for coastal-related activities and camping
- Establish adequate public access to mauka recreational areas based on mountain access study
- Support a study for additional boat launching ramps along the West Maui coast including but not limited to, Hakana and Olowalu.^{35, 1996}

Future and Planned Requirements or Changes

West Maui Community Plan notes the following planned changes:

- Develop a long-range land acquisition program for public uses
- Appropriate funds for park acquisition and expansion consistent with the Community Plan, County's beach access plan and other State and County recreational master plans
- Develop a long-range beach park acquisition and development program involving residents, landowners, businesses, government and public interest organizations
- Adopt a beach/mountain access dedication ordinance pursuant to Chapter 46, H.R.S. and acquire accesses through purchase, dedication, condemnation or land exchange.^{35, 1996}

County of Maui: Fiscal Year 2002 Budget notes the West Maui region would like to:

- Design and construct an additional basketball court with appropriate lightning
- Design and construct phase II of Napili Park
- Install automated systems with timers and automated valves to increase savings on manpower for irrigation at Lahaina Civic Center, Launiupoko Beach Park, Wahikuli Beach Park, Honokowai Beach Park, and Ainakea Park.^{50, 2001}

Maui County Department of Planning FY2003 Budget notes the following planned changes:

- Design and construction of a "tot lot" including impact absorbing surfacing and handicapped accessibility at Honokowai Park
- Construction of a parking lot, outdoor basketball court, tot lot and jogging paths at Napili Park
- Supplemental funding to include baseball fields, lighting and fencing at Lahaina Recreation Center.^{147, 2002}

Anticipated Costs for the Future

County of Maui: Fiscal Year 2002 Budget the expected costs are:

- Basketball court and lightning: \$100,000
- Phase II of Napili Park: \$385,000
- Irrigation systems: \$200,000.^{50, 2001}

Maui County Department of Planning FY2003 Budget makes the following appropriations.^{147, 2002}

Table 5.82 – West Maui Six Year Parks and Recreation Capital Improvement Program: 2002

Fund Source: C = County, B = G.O. Bonds, L = Lapsed Bond Proceeds, P = Park Assessment

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Parks and Recreation			
Honokowai Park Improvements	80 C		80 C
Lahaina Recreation Center Soccer Fields	950 B	4,000 B	4,950 B
Lahaina Skate Board Park	100 C		100 C
Napili Park Phase II	80 L		80 L
	290 P		290 P
West Maui Irrigation System Improvements		200 C	200 C
West Maui Youth Center		2,000 B	2,000 B

Source: Maui County Department of Planning FY2003 Budget

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Parks element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Parks element.

Major Assumptions

County of Maui: Fiscal Year 2002 Budget assumes the following:

- The basketball court and lightning have an expected life of 20 years.
- The construction of Napili Park Phase II and the irrigation systems have a life of 30 years.^{50, 2001}

County of Maui – West Maui – Police, Fire and Emergency Services

Present Capacity and Usage

Police

The Maui Police Department gave the following statistics on police activity for the Lahaina district. ^{96C, 2002}

Table 5.83 – Lahaina Police District Measures: 2002

	FY 2001	FY 2002
Personnel	56.3	57
Calls for Service	18555	9613
Documented Cases	8196	3893
Moving Citations	1824	964
Parking Citations	1830	2704

Source: *Maui County Data Book 2001*

Fire

Maui County Department of Public Works FY2001 Budget gives the following statistics on fire activity for the Lahaina district and the Napili district. ^{141, 2002}

Table 5.84 – Lahaina Department of Fire Control District Measures: 2001

	FY 1999 Actual	FY 2000 Actual	FY 2001 Estimate
Fires	78	55	80
Rescues (non-fire related)	43	50	50
Emergency medical services	137	142	120
Hazmat response	16	11	15
False calls (any alarm received for which response was unnecessary)	24	36	20
Company assists (another fire company responds with primary company to assist with an emergency)	230	237	200
Other calls (miscellaneous services such as removing traffic hazards)	90	79	70
AED (Automated external defibrillator) response	1	1	5

Source: *Maui County Department of Public Works FY2001 Budget*

Table 5.85 – Napili Department of Fire Control District Measures: 2001

	FY 2000 Actual	FY2001 Estimate
Fires	21	25
Rescues (non-fire related)	34	30
Emergency medical services	59	30
Hazmat response	7	5
False calls (any alarm received for which response was unnecessary)	24	15
Company assists (another fire company responds with primary company to assist with an emergency)	41	45
Other calls (miscellaneous services such as removing traffic hazards)	39	40
AED (Automated external defibrillator) response	0	5

Source: *Maui County Department of Public Works FY2001 Budget*

Existing Problems, Issues and Opportunities

See County of Maui Police, Fire and Emergency Services Summary for Information.

Future and Planned Usage

West Maui Community Plan notes planned usages include:

- Support the appropriate level of police services in consideration of the region’s resident and visitor population,
- Establish and emergency medical care facility in West Maui,
- Enhance fire protection for multi-story buildings, and
- Continue to increase the visibility of police service in the region.^{35, 1996}

Future and Planned Requirements or Changes

West Maui Community Plan lists future implementing actions for West Maui include:

- Determine the needs and feasibility for an emergency medical care facility,
- Expand the fire-fighting capabilities at the existing fire station by providing ladder company equipment for multi-story fire fighting, and
- Expand police patrols and provide resources to assist residential areas in implementing Neighborhood Watch programs.^{35, 1996}

Maui County Department of Planning FY2003 Budget notes renovations at the Lahaina police station include locker room renovations, report-writing area with workstations, and CID office renovations.^{147, 2002}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget makes the following appropriations^{147, 2002}:

Table 5.86 – Lahaina Six Year Police Station Capital Improvement Program: 2002

Fund Source: B = G.O. Bonds, C = County

Dollars In Thousands	FY2002	FY2003-2007
Lahaina Police Station Renovations	100 C	
New Lahaina Police Station		700 B

Source: *Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

See County of Maui Police, Fire and Emergency Services Summary for Information.

Compare Visitor and Resident Impact

See County of Maui Police, Fire and Emergency Services Summary for Information.

Major Assumptions

See County of Maui Police, Fire and Emergency Services Summary for Information.

County of Maui – West Maui – Visitor Accommodations

Present Capacity and Usage

The *Maui County Data Book* gives statistics on the visitor plant in West Maui by type of property.^{247, 2001}

Table 5.87 – West Maui Visitor Accommodations: 2001

Type of Accommodation	Properties	Available Units
Apartment/Hotel	4	81
Bed & Breakfast	8	47
Condominium Hotel	49	4,358
Hotel	12	4,579
Individual Vacation Units	8	78
Other	5	489
Total	86	9,632

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

No information was uncovered regarding existing problems, issues and opportunities for the Visitor Accommodations element.

Future and Planned Usage

No information was uncovered regarding future and planned usage for the Visitor Accommodations element.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Visitor Accommodations element.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Visitor Accommodations element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Visitor Accommodations element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Visitor Accommodations element.

Major Assumptions

No information was uncovered regarding major assumptions for the Visitor Accommodations element.

County of Maui – West Maui – Private Transportation

Present Capacity and Usage

See County of Maui Private Transportation Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding existing problems, issues and opportunities for Private Transportation.

Future and Planned Usage

No information was uncovered regarding future and planned usage for Private Transportation.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for Private Transportation.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for Private Transportation.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for Private Transportation.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Private Transportation.

Major Assumptions

No information was uncovered regarding major assumptions for Private Transportation.

County of Maui – West Maui – Energy Systems

Present Capacity and Usage

See County of Maui Energy Systems Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Energy Systems Summary for information.

Future and Planned Usage

See County of Maui Energy Systems Summary for information.

Future and Planned Requirements or Changes

See County of Maui Energy Systems Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Energy Systems element.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Energy Systems Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Energy Systems element.

Major Assumptions

No information was uncovered regarding major assumptions for the Energy Systems element.

County of Maui – West Maui – Sewer Systems

Present Capacity and Usage

The Sewer indicator has been combined with the Sewage indicator. See Sewage Summary for information.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – West Maui – Coastal Water Quality

Present Capacity and Usage

Not enough information was found to adequately evaluate this infrastructure element at the community level.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – West Maui – Marine Ecosystem Health

Present Capacity and Usage

See County of Maui Marine Ecosystem Health Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Usage

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Marine Ecosystem Health element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for the Marine Ecosystem Health element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for the Marine Ecosystem Health element.

Compare Visitor and Resident Impact

See County of Maui Marine Ecosystem Health Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for the Marine Ecosystem Health element.

County of Maui – West Maui – Forestry / Green Space

Present Capacity and Usage

See County of Maui Forestry and Green Space Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Usage

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Forestry and Green Space element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Forestry and Green Space.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Forestry and Green Space.

Compare Visitor and Resident Impact

See County of Maui Forestry and Green Space Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Forestry and Green Space.

County of Maui – West Maui – Air Quality

Present Capacity and Usage

See County of Maui Air Quality Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Air Quality Summary for information.

Future and Planned Usage

See County of Maui Air Quality Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Air Quality element.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Air Quality element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Air Quality element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Air Quality element.

Major Assumptions

No information was uncovered regarding major assumptions for the Air Quality element.

County of Maui – West Maui – Beach Erosion

Present Capacity and Usage

See County of Maui Beach Erosion Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Beach Erosion.

Future and Planned Usage

No information was uncovered regarding future and planned usage for the Beach Erosion element.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Beach Erosion element.

Anticipated Costs for the Future

See County of Maui Beach Erosion Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Beach Erosion Summary for information.

Compare Visitor and Resident Impact

See County of Maui Beach Erosion Summary for information.

Major Assumptions

See County of Maui Beach Erosion Summary for information.

County of Maui – West Maui – Invasive Species

Present Capacity and Usage

See County of Maui Invasive Species Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Invasive Species Summary for information.

Future and Planned Usage

See County of Maui Invasive Species Summary for information.

Future and Planned Requirements or Changes

See County of Maui Invasive Species Summary for information.

Anticipated Costs for the Future

See County of Maui Invasive Species Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Invasive Species Summary for information.

Compare Visitor and Resident Impact

See County of Maui Invasive Species Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Invasive Species.

County of Maui – West Maui – Natural / Scenic Resources

Present Capacity and Usage

See County of Maui Natural and Scenic Resources Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Usage

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Requirements or Changes

See County of Maui Natural and Scenic Resources Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Natural and Scenic Resources.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Natural and Scenic Resources.

Compare Visitor and Resident Impact

See County of Maui Natural and Scenic Resources Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Natural and Scenic Resources.

County of Maui – Kihei-Makena – Water Quality and Quantity

Present Capacity and Usage

The total sustainable yield of hydrologic units in Central is **27 MGD**. See appendix for map delineating boundaries.

See County of Maui Water Summary for details at the regional level.

Watershed districts do not match planning districts.

Existing Problems, Issues and Opportunities

Kihei-Makena Community Plan notes an existing issues is to provide for appropriate water source and transmission improvements concurrent with planned growth.^{18, 1998}

Future and Planned Usage

See County of Maui Water Summary for information.

Future and Planned Requirements or Changes

Kihei-Makena Community Plan lists the following planned changes:

- Support and expand the projected development of the Central Maui and East Maui water systems in order to meet the needs of all Maui residents.
- Develop water conservation, reuse and educational programs.
- Encourage the use of non-potable water for irrigation purposes and water features. Prohibit the use of potable water in large water features or require substantial mitigation fees.^{18, 1998}

Anticipated Costs for the Future

See County of Maui Water Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Water Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Water Quality element.

Major Assumptions

Kihei-Makena Community Plan makes the following assumptions:

- 2010 population estimate 22,830 – 24,514.
- Planning themes:

1. Provision of needed public facilities and infrastructure.
2. Preservation and enhancement of significant natural resources.
3. Enhancement of neighborhoods.^{18, 1998}

County of Maui – Kihei-Makena – Sewage

Present Capacity and Usage

The Kihei-Makena Community Plan describes public and private wastewater treatment as follows:

Public

The Kihei region is served by the Kihei Wastewater Reclamation Facility, which processes an average of **4 million gallons of wastewater per day**. The Makena region is served primarily by on-site septic systems, although a portion of the region’s wastewater is treated by the Kihei Wastewater Reclamation Facility.

Private

A private wastewater treatment facility has been constructed at the Maui Prince Hotel. This wastewater treatment facility is not in service at this time but will ultimately provide treatment for a portion of the Makena region.^{18, 1998}

Maui County Department of Planning FY2003 Budget gives the following wastewater statistics. They describe the number of gallons processed by the Kihei Wastewater Reclamation Facility and the costs associated.^{147, 2002}

Table 5.88 – Kihei Wastewater Operations Program Measures: 2002

	FY 2001 Actual	FY 2002 Estimate	FY 2002 Actual to Date
Total wastewater processed (gallons)	1,733,233,000	1,712,215,000	837,984,000
Annual compliance days	362	365	183
Kilowatts per 1,000 gallons processed	3.96	3.98	4.23
Total processing cost per 1,000 gallons	\$1.86	\$1.96	N/A
Recycled water cost per 1,000 gallons	N/A	\$0.29	N/A

Source: *Maui County Department of Public Works FY2001 Budget*

Maui County Department of Public Works FY2001 Budget describes the wastewater statistics in Kihei.^{141, 2002}

Table 5.89 – Kihei Wastewater reclamation Facilities Measures: 2000

UIC = Underground Injection Control, EPA requirement

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Spills of less than 1,000 gallons	4	1	1
Spills of 1,000 gallons or more	0	1	1
Wastewater processed (average gallons per day)	4,013,000	4,089,000	4,100,000
Sludge taken to co-composting annually (tons)	5,120	5,000	5,000
Number of days all facilities met UIC** permit requirements	364	365	365
Number of months facility met reuse permit requirements	12	12	12
Cost per 1,000 gallons of wastewater treated	\$1.96	\$1.96	\$1.96
Percent of effluent reused versus flow processed	35.2%	36.0%	38.4%

Source: Maui County Department of Public Works FY2001 Budget

Existing Problems, Issues and Opportunities

The Kihei-Makena Community Plan notes the following existing issues:

- Coordinate improvements to sewer transmission lines and wastewater reclamation facilities to meet the needs of future population growth.
- Protect the quality of near shore waters by ensuring that land based discharges meet water quality standards.^{18, 1998}

Future and Planned Usage

The Kihei-Makena Community Plan lists the following planned usage:

- Programs should be implemented to reduce the reliance on injection wells for wastewater disposal.
- Continued monitoring of existing and future waste disposal systems is necessary to ensure their efficient operation.
- Require the use of reclaimed effluent for irrigation of golf courses, parks and landscaped areas.
- Locate Regional Park near Kihei Wastewater Reclamation Facility so that treated effluent may be used for park irrigation purposes.^{18, 1998}

Future and Planned Requirements or Changes

The County of Maui: FY2002 Budget notes the Kihei-Makena Region would like to design and construct:

- An extension of the existing 12-inch reclaimed water line in the North/South Collector Road that will extend north along South Kihei Road to service approximately 10 users for a total of 355,000 gallons per day.
- Protective structures over the Ultra Violet (UV) Disinfection Facilities and for maintenance storage. These structures are needed to enhance the performance of unit process and protect equipment from inclement weather. The reduced exposure to sunlight on the facility will reduce the amount of heat the control units are exposed to and thus, the life of the equipment will prolong.^{50, 2001}

The Maui County Department of Planning FY2003 Budget plans for completion of the recycled water line extension, South Kihei Road Phase II to complete the construction of the expansion. The segment to be constructed as part of the Engineering project is scheduled for bidding in the summer of 2003. ^{147, 2002}

Anticipated Costs for the Future

The County of Maui: FY2002 Budget shows anticipated costs for the extension of the existing 12-inch reclaimed water line will be of \$800,000 and for the UV Disinfections facilities there would be a cost of \$230,000. ^{50, 2001}

Maui County Department of Planning FY2003 Budget makes sewer appropriations. The fund source is G.O. bonds. ^{147, 2002}

Table 5.90 – Kihei – Makena Six Year Sewer Capital improvement Program: 2002

<i>Dollars In Thousands</i>	FY2003	FY2004-2008	TOTAL
Sewer			
Recycled Water Line Extension, South Kihei Road, Phase II	600		600

Source: Maui County Department of Planning FY2003 Budget

Problems, Issues and Opportunities Associated with Costs

See County of Maui Sewage Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Sewage element.

Major Assumptions

Maui County Department of Planning FY2002 Budget assumes the new extended water line and the Ultra Violet Disinfection Facilities have an expected life of 30 years. ^{50, 2001}

County of Maui – Kihei-Makena – Solid Waste Disposal

Present Capacity and Usage

See County of Maui Solid Waste Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Solid Waste Summary for information.

Future and Planned Usage

Kihei-Makena Community Plan notes future plans to provide efficient, safe and environmentally sound systems for the reuse, recycling, and disposal of liquid and solid wastes.^{18, 1998}

Future and Planned Requirements or Changes

Kihei-Makena Community Plan plans to make composting facilities available to the public.^{18, 1998}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget appropriates \$250,000 for capital improvements to the South Maui Transfer Station over the next six years. The fund source is the county.^{147, 2002}

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Solid Waste element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Solid Waste element.

Major Assumptions

No information was uncovered regarding major assumptions for the Solid Waste element.

County of Maui – Kihei-Makena – Storm Water

Present Capacity and Usage

Due to the lack of information or response from the Maui Department of Public Works and Environmental Management, there is not enough data to evaluate Storm Water in Maui County.

Existing Problems, Issues and Opportunities

Kihei-Makena Community Plan notes existing issues in storm water management are to protect the quality of near shore waters.^{18, 1998}

Future and Planned Usage

Kihei-Makena Community Plan lists the following planned usage:

- Minimize the increase in discharge of storm water runoff to coastal waters by preserving flood storage capacity in low-lying areas, and encouraging infiltration of runoff.
- Storm water run-off from proposed developments shall not adversely affect the marine environment and near shore and off shore water quality.
- Protect all wetland resources, such as those at Kealia Pond and new Road C.^{18, 1998}

Future and Planned Requirements or Changes

Kihei-Makena Community Plan lists the following planned changes:

- Formulate a drainage master plan for Kihei-Makena that considers the cumulative impacts of existing and planned development.
- Require the integration of wetlands and drainage ways into an open space, pedestrian pathway, and bikeway system within and around the Lipoa business district.
- Construct necessary drainage improvements in flood prone areas.
- Construct and maintain sediment retention basins and other best management practices to remove sediments and other pollutants from runoff.
- Support the implementation of flood control projects and sediment retention basins mauka of Piilani Highway to address present problem areas.
- Revise the County drainage rules to require that drainage system design shall not adversely affect downstream and coastal water quality.^{18, 1998}

Anticipated Costs for the Future

Maui County Department of Planning FY 2003 Budget makes the following appropriations for improvements to South Kihei Road. Improvements include road widening, curb and gutter, sidewalk repair and drainage facilities.^{191, 2002}

Table 5.91 – Kihei Roads Improvements Budget: 2002

	Prior Appropriation	FY 2003	FY 2004	FY 2005
South Kihei Road Improvements				
Land Acquisition	500 B		100 C	100 C
Design	350 C		400 C	400 C
Construction	900 C	1,100 B		500 C
	3,600 F	4,400 F		2,000 F
Construction Management		700 B		250 C
Total Cost	1,250 C		500 C	1,250 C
	500 B	1,800 B		
	3,600 F	4,400 F		2,000 F
F = Federal Funds, B = G.O. Bonds, C = County				

Source: Maui County Department of Planning FY 2003 Budget

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Kihei-Makena – Roads

Present Capacity and Usage

Maui County Department of Public Works and Waste Management Annual Report describes the Wailuku District is the largest district. It encompasses the Area from Makena to Maalaea to Kahakuloa and to Kahului airport.^{135, 2002}

Existing Problems, Issues and Opportunities

According to the *Joint State/County Maui Interim Transportation Plan*, West Maui is experiencing congestion along Honoapiilani Highway, between Lahainaluna Road and Puamana; Honoapiilani Highway/Lahainaluna Road intersection.^{63, 2002}

Future and Planned Usage

See County of Maui and Wailuku-Kahului Roads Summaries for information.

Future and Planned Requirements or Changes

See County of Maui Roads Summary for information.

Anticipated Costs for the Future

According to the *Joint State/County Maui Interim Transportation Plan*, the following are potential solutions to the congestion along Honoapiilani Highway:

- Construct an interim roadway along the existing Cane Haul Road, between Lahainaluna Road and Lahaina Business Park;
- Phased construction of the Lahaina Bypass, Kapunakea Street to Lahainaluna Road; and County connector road, Honoapiilani Highway to Lahaina Bypass;
- Widening of the Honoapiilani Highway between Lahainaluna road to Puamana; and
- Extension of Dickenson Street.^{63, 2002}

Problems, Issues and Opportunities Associated with Costs

See County of Maui and Wailuku-Kahului Roads Summaries for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Roads element.

Major Assumptions

No information was uncovered regarding major assumptions for the Roads element.

County of Maui – Kihei-Makena – Airports

Present Capacity and Usage

Analysis of county documents shows there are no airports in the Kihei-Makena region.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Kihei-Makena – Harbors

Present Capacity and Usage

Analysis of county documents shows there are no harbors in the Kihei-Makena region.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Kihei-Makena – Parks

Present Capacity and Usage

See County of Maui Parks Summary for information.

Existing Problems, Issues and Opportunities

The Kihei-Makena Community Plan lists the following issues:

- The lack of community facilities and playing fields.
- Active recreation facilities such as a community swimming pool, and soccer, baseball, softball and football fields are significant community needs.
- A community center is needed to provide a physical facility to house community forums and events and to increase the sense of neighborhood.^{18, 1998}

Future and Planned Usage

The Kihei-Makena Community Plan future planning themes are:

- Provision of needed public facilities and infrastructure.
- Preservation and enhancement of significant natural resources.
- Enhancement of neighborhoods.^{18, 1998}

Future and Planned Requirements or Changes

The Kihei-Makena Community Plan lists the following planned changes:

- Plan, design and construct a regional park on approximately 100-150 acres including a community center, swimming pool, ball fields and basketball and tennis courts.
- Provide a landscaped entry park at the north end of Kihei, north of the future commercial area, and the intersection of Lipoa Street and Piilani Highway.
- Develop a master plan for a recreational coastline access along North Kihei Road.
- Survey, map and describe the mauka boundaries of the State Beach Reserves to delineate between public and private property.
- Transfer State Beach Reserves to County jurisdiction, acquire other beachfront properties, prepare an enhancement plan, and partner with community to establish a continuous trail/greenway/bikeway.
- Create a master plan to rehabilitate the existing beach parks in the region, and to develop County-owned lands designated for park use.
- Partner with the Na Ala Hele, South Maui Heritage Corridor, Kihei 2000, and Bikeways Maui organizations to establish a continuous trail/greenway/bikeway system from Kealia Pond to Kilohana Road.

- Initiate a wetlands enhancement project with the Kihei Franks development and county owned wetland adjacent to Saint Theresa's Church to include pedestrian and bike path access to school children.
- Revise standards in the park dedication ordinance to increase the quantity and quality of parks generated by new developments.
- Implement Makena-La Perouse Park for nature-oriented recreation, including shoreline activities, camping, biking and interpretative/education pursuits with residential caretaker and security personnel.
- Support the creation and promotion of overnight campsites within the region.^{18, 1998}

The County of Maui: Fiscal Year 2002 Budget is budgeting for the construction of an off-street parking lot across Kamaole I Beach Park. The parking area will hold approximately 128 stalls when completed.

Funding for a 215-acre site will provide a site analysis and over plan, set up siting requirement for various users, fiscal analysis, entitlements, environmental assessment and building/landscaping design. This site is planned to accommodate the County Fairgrounds, a police training facility, municipal base yards and motor related recreational venues such as drag racing, stock car racing, motor-cross, and radio controlled model aircraft.^{50, 2001}

The Maui County Department of Planning FY2003 Budget makes appropriations for the following projects:

Kamaole I Beach Park Parking Lot

Construction is planned to an off-street parking lot across Kamaole I Beach Park. The parking area will hold approximately 64 cars with a landscaped area.

Kamaole III Beach Park Expansion

Construction is planned to a new restroom and parking lot at the south end of Kamaole III Beach Park to include a pavilion, picnic tables, irrigation and landscape. Due to the size of the park and high usage, improvements are necessary to upgrade the facility.

South Maui Community Park

Design and Construction is planned to a 40-acre recreational complex adjacent to Lokelani Intermediate School. A preliminary site plan is being prepared and includes 3 soccer fields, 3 ballfields, jogging paths, pavilion, restrooms, parking and tennis courts.^{147, 2002}

Anticipated Costs for the Future

County of Maui: Fiscal Year 2002 Budget states anticipated costs for the Kamaole I Beach Park are of \$230,000. The construction and design for the development of the 215-acre site have an expected cost of \$3,100,000.^{50, 2001}

Table 5.92 – Kihei – Makena Six year Parks and Recreation Capital Improvements Program

Fund Source: C = County, B = G.O. Bonds, P = Park Assessment

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Parks and Recreation			
Kamaole I Beach Park Parking Lot	250 B		250 B
Kamaole III Beach Park Expansion	50 C		50 C
		550 C	550 C
Poolenalena Beach Park		300 C	300 C
Puunene Motor Sports Park	540 B		540 B
South Maui Community Park	400 P		400 P
		11,000 B	11,000 B

Source: County of Maui Department of Planning – *Fiscal Year 2003 Budget*

Problems, Issues and Opportunities Associated with Costs

County of Maui: Fiscal Year 2002 Budget notes additional funds are required to complete the design and construction of the Kamaole I Beach Park. Operational costs for the development of the 215-acre facility will be minimal due to pro-rated fees for the multiple users. Some capital costs will also be shared with adjacent developments by other agencies.^{50, 2001}

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Parks element.

Major Assumptions

County of Maui: Fiscal Year 2002 Budget assumes that the parking lot at the Kamaole I Beach Park has an expected life of 25 years. The life of the 215-acre development has an anticipated life of 30 years.^{50, 2001}

County of Maui – Kihei-Makena – Police Fire and Emergency Services

Present Capacity and Usage

The Kihei-Makena Community Plan describes that the County of Maui in general, and Kihei-Makena in particular, witnessed significant growth in the 1980s and early 1990's. In many instances, however, public facility and infrastructure improvements lagged behind development in the region.^{18, 1998}

Police

The Maui Police Department states the Kihei district sub-station opened in April of 2000 at the Kihei Town Center. The lease expires in July 2003. Statistics on police department personnel and call activity is summarized in the following table.^{96c, 2002}

Table 5.93 – Kihei Police Department District Measures: 2002

	FY2001 Actual	FY2002 To Date
Personnel	31	38
Calls for Service	22704	10259
Documented Cases	9392	4502
Moving Citations	1736	1040
Parking Citations	668	400

Source: County of Maui *Fiscal Year 2001 Budget*

Fire

Maui County Department of Public Works FY2001 Budget gives the following statistics for activity in the Kihei fire control district.^{141, 2001}

Table 5.94 – Kihei Department of Fire Control District Measures: 2001

	FY1999 Actual	FY2000 Actual	FY2001 Estimate
Fires	96	117	120
Rescues (non-fire related)	50	57	60
Emergency medical services	306	291	200
Hazmat response	7	33	50
False calls (any alarm received for which response was unnecessary)	72	78	16
Company assists (another fire company responds with primary company to assist with an emergency)	9	18	10
Other calls (miscellaneous services such as removing traffic hazards)	108	12	100
AED (Automated external defibrillator) response	2	5	5

Source: *Maui County Department of Public Works FY2001 Budget*

Existing Problems, Issues and Opportunities

The Kihei-Makena Community Plan notes significant upgrade and expansion of existing public facilities and infrastructure is necessary. This includes:

- Improving and expanding the delivery of health and public safety services to Kihei-Makena residents and visitors,
- Driving Under the Influence Task Force is under manned, and
- Provide the establishment of a health clinic with full emergency services.^{18, 1998}

Future and Planned Usage

Maui County Department of Planning FY2003 Budget states to render services that are more effective to Maui's fastest growing community, a new fully functional facility is overdue. It will serve as the District's Headquarters for the Kihei District VI serving the South Maui area.^{147, 2002}

Future and Planned Requirements or Changes

The Kihei-Makena Community Plan lists future implementing actions for the Kihei-Makena community include:

- Providing a police station in the Kihei-Makena region,
- Expanding fire fighting and rescue capabilities,
 - Including the acquisition of a new ladder truck and
 - The provision of a fire and ambulance station in the Wailea area.^{18, 1998}

Anticipated Costs for the Future

The Maui County Department of Planning FY2003 Budget makes the following appropriations for police and fire stations in the Kihei/Makena district. The Wailea fire station and equipment will boost an inadequate response time to the Kihei area. The station will be equipped with a ladder truck, water tanker and pumper engine. The estimated cost of the trucks is \$1,500,000.^{147, 2002}

Table 5.95 – Kihei – Makena Six year Police and Fire Station Capital Improvement Program: 2002

Fund Source: B = G.O. Bonds, C = County

Dollars In Thousands	FY2002	FY2003-2007
Government Facilities		
New Kihei Police Station		5,000 B
Wailea Fire Station and Related Equipment	300 C	
	8,000 B	

Source: *Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

See Maui County Police, Fire and Emergency Services Summary for information.

Compare Visitor and Resident Impact

See Maui County Police, Fire and Emergency Services Summary for information.

Major Assumptions

The Kihei-Makena Community Plan states the year 2010 population estimate ranges from 22,830 to 24,514 residents.^{18, 1998}

County of Maui – Kihei-Makena – Visitor Accommodations

Present Capacity and Usage

Maui County Data Book 2001 gives statistics on the type of visitor accommodations and the available units for the Kihei-Makena area. ^{247, 2001}

Table 5.96 – Kihei – Makena Visitor Accommodations: 2001

Type of Accommodation	Properties	Available Units
Apartment/Hotel	3	24
Bed & Breakfast	9	29
Condominium Hotel	46	3,130
Hotel	11	3,332
Individual Vacation Units	18	188
Other	2	5
Total	89	6,708

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

See County of Maui Visitor Accommodation Summary for information.

Future and Planned Usage

See County of Maui Visitor Accommodation Summary for information.

Future and Planned Requirements or Changes

See County of Maui Visitor Accommodation Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Visitor Accommodations element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Visitor Accommodations element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Visitor Accommodations.

Major Assumptions

No information was uncovered regarding major assumptions for Visitor Accommodations.

County of Maui – Kihei-Makena – Private Transportation

Present Capacity and Usage

See County of Maui Private Transportation Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding existing problems, issues and opportunities for Private Transportation.

Future and Planned Usage

No information was uncovered regarding future and planned usage for Private Transportation.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for Private Transportation.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for Private Transportation.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for Private Transportation.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Private Transportation.

Major Assumptions

No information was uncovered regarding major assumptions for Private Transportation.

County of Maui – Kihei-Makena – Energy Systems

Present Capacity and Usage

See County of Maui Energy Systems Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Energy Systems Summary for information.

Future and Planned Usage

See County of Maui Energy Systems Summary for information.

Future and Planned Requirements or Changes

See County of Maui Energy Systems Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Energy Systems element.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Energy Systems Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Energy Systems element.

Major Assumptions

No information was uncovered regarding major assumptions for the Energy Systems element.

County of Maui – Kihei-Makena – Sewer Systems

Present Capacity and Usage

The Sewer indicator has been combined with the Sewage indicator. See Sewage Summary for information.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Kihei-Makena – Coastal Water

Present Capacity and Usage

Not enough information was found to adequately evaluate this infrastructure element at the community level.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Kihei-Makena – Marine Ecosystem Health

Present Capacity and Usage

See County of Maui Marine Ecosystem Health Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Usage

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Marine Ecosystem Health element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for the Marine Ecosystem Health element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for the Marine Ecosystem Health element.

Compare Visitor and Resident Impact

See County of Maui Marine Ecosystem Health Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for the Marine Ecosystem Health element.

County of Maui – Kihei-Makena – Forestry / Green Space

Present Capacity and Usage

See County of Maui Forestry and Green Space Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Usage

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Forestry and Green Space element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Forestry and Green Space.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Forestry and Green Space.

Compare Visitor and Resident Impact

See County of Maui Forestry and Green Space Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Forestry and Green Space.

County of Maui – Kihei-Makena – Air Quality

Present Capacity and Usage

See County of Maui Air Quality Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Air Quality Summary for information.

Future and Planned Usage

See County of Maui Air Quality Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Air Quality element.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Air Quality element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Air Quality element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Air Quality element.

Major Assumptions

No information was uncovered regarding major assumptions for the Air Quality element.

County of Maui – Kihei-Makena – Beach Erosion

Present Capacity and Usage

See County of Maui Beach Erosion Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Beach Erosion.

Future and Planned Usage

No information was uncovered regarding future and planned usage for the Beach Erosion element.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Beach Erosion element.

Anticipated Costs for the Future

See County of Maui Beach Erosion Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Beach Erosion Summary for information.

Compare Visitor and Resident Impact

See County of Maui Beach Erosion Summary for information.

Major Assumptions

See County of Maui Beach Erosion Summary for information.

County of Maui – Kihei-Makena – Invasive Species

Present Capacity and Usage

See County of Maui Invasive Species Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Invasive Species Summary for information.

Future and Planned Usage

See County of Maui Invasive Species Summary for information.

Future and Planned Requirements or Changes

See County of Maui Invasive Species Summary for information.

Anticipated Costs for the Future

See County of Maui Invasive Species Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Invasive Species Summary for information.

Compare Visitor and Resident Impact

See County of Maui Invasive Species Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Invasive Species.

County of Maui – Kihei-Makena – Natural / Scenic Resources

Present Capacity and Usage

See County of Maui Natural and Scenic Resources Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Usage

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Requirements or Changes

See County of Maui Natural and Scenic Resources Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Natural and Scenic Resources.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Natural and Scenic Resources.

Compare Visitor and Resident Impact

See County of Maui Natural and Scenic Resources Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Natural and Scenic Resources.

County of Maui – Makawao-Pukalani-Kula – Water Quality and Quantity

Present Capacity and Usage

The total sustainable yield of hydrologic units in **Kahikinui is 36 MGD**. See appendix for map delineating boundaries.

See County of Maui Water Summary for details at the regional level.

Watershed districts do not match planning districts.

The Draft Environmental Impact Statement describes that existing non-agricultural uses within the Makawao aquifer system are not known to have had an impact on the quality or quantity of groundwater. The proposed project's irrigation requirement is on a much smaller scale than existing agricultural irrigation and is not expected to contribute to detectable contamination.^{100, 2002}

Existing Problems, Issues and Opportunities

Makawao-Pukalani-Kula Community Plan notes that a primary concern in the region is the limited development of water resources and distribution system to meet the needs of the region. The proper allocation of water resources is considered essential to preserve agriculture and ensure the long-term viability of the region's residential and economic base.^{33, 1996}

Future and Planned Usage

The Makawao-Pukalani-Kula Community Plan lists planned water usages are:

- Improve and upgrade the existing delivery system.
- Provide tax and or water rate incentives for construction of agricultural water storage facilities.
- Increase the pumping capacity from low cost sources to upper areas to supplement the surface water supply.
- Develop and execute an agreement which ensures for the County, long-term rights to water from the lowest cost sources.
- Conduct a groundwater development feasibility study for the Upcountry region.^{33, 1996}

The Draft Environmental Impact Statement states the estimated average daily demand for the proposed development is 159,300 gallons per day (gpd).^{100, 2002}

Future and Planned Requirements or Changes

The Makawao-Pukalani-Kula Community Plan lists water objectives for the region.

- Prioritize the allocation of water to agricultural pursuits, housing and commercial development as new resources and system improvements become available.
- Encourage a flexible and comprehensive water management approach that recognizes the various collection and delivery improvements as one system
- The Department of Water Supply shall expand water supply and distribution systems.
- Seek expanded municipal withdrawal from the lowest cost source to serve the Upcountry region.
- Support the allocation of water resources for Department of Hawaiian Home Lands projects and agriculture.
- Explore the development of alternative water sources to meet the needs of diversified agriculture, businesses and residents
- Encourage the construction of additional storage capacity to help alleviate the inadequate water supply.
- Explore a comprehensive reforestation program to increase and catch more rainwater for the Upcountry area.^{33, 1996}

The Draft Environmental Impact Statement notes water usage will be minimized through use of low use water fixtures in new housing and other restrooms will reduce the quantity of water required for the proposed project. A new well will be developed which is expected to produce 1 to 1.5mgd, substantially higher than water requirements for the site. Water quality will be maintained using onsite secondary wastewater treatment and subsurface disposal.

Water needs for the site will be provided by a network of pipes that will connect to the existing waterlines at the junction of Haleakala and Kula highways, the waterlines on Makawao Avenue, and to the existing waterline on Old Haleakala Highway. Fire hydrants will be placed along roadways at intervals of no more than 250 feet.^{100, 2002}

Anticipated Costs for the Future

Maui County Department of Planning FY 2003 Budget appropriates \$100,000 to Kula Agricultural Park improvements. The improvements include water and electrical improvements, signage and security fencing.^{191, 2002}

Problems, Issues and Opportunities Associated with Costs

See County of Maui Water Summary for information.

Compare Visitor and Resident Impact

See County of Maui Water Summary for information.

Major Assumptions

The Draft Environmental Impact Statement assumes that projected demand for potable water for the proposed development will be approximately 0.247 million gallons per day (mgd).^{100, 2002}

County of Maui – Makawao-Pukalani-Kula – Sewage

Present Capacity and Usage

Makawao-Pukalani-Kula Community Plan describes public and private wastewater treatment as follows:

Public

There are no public wastewater facilities for the Makawao-Pukalani-Kula Community.

Private

The Makawao and Kula regions are served by on-site septic systems. The Pukalani region is served by Sport Shinco a private wastewater management/reclamation company. Currently, Sport Shinco treats the wastewater from approximately 500 homes.^{33, 1996}

Existing Problems, Issues and Opportunities

See County of Maui Sewage Summary for information.

Future and Planned Usage

See County of Maui Sewage Summary for information.

Future and Planned Requirements or Changes

Makawao-Pukalani-Kula Community Plan lists the following planned changes:

- Continue and expand a pro-active County waste management strategy, which includes reduction, recycling and reuse of solid waste and wastewater as major components.
- Construct a wastewater collection and treatment system.
- Utilize treated effluent for irrigation of farms, golf courses, parks and highway landscaping.^{33, 1996}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget appropriates \$500,000 to sewer capital improvement in the Makawao-Pukalani-Kula district over the next six years. Improvements include an Upcountry Wastewater Master Plan. The fund source is the county.^{147, 2002}

Problems, Issues and Opportunities Associated with Costs

See County of Maui Sewage Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Sewage element.

Major Assumptions

No information was uncovered regarding major assumptions for the Sewage element.

County of Maui – Makawao-Pukalani-Kula – Solid Waste Disposal

Present Capacity and Usage

Maui County Department of Public Works FY2001 Budget gives the following statistics regarding the central landfill and Makawao district residential collection areas. ^{141, 2002}

Table 5.97 – Central and Makawao Landfill Disposal: 2001 (includes Kula, Pukalani, Paia, and Haiku)

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Tonnage entering landfills per year	149,162	150,000	150,000
Residential collection accounts	7,156	7,500	7,500

Source: *Maui County Department of Public Works FY2001 Budget*

Existing Problems, Issues and Opportunities

See County of Maui Solid Waste for information.

Future and Planned Usage

Makawao-Pukalani-Kula Community Plan lists the following objectives to improve solid waste disposal:

- Improve solid waste disposal facilities and services and maintain a waste transfer station site.
- Support solid waste reduction, recycling and reuse programs in the Upcountry region. ^{33, 1996}

Future and Planned Requirements or Changes

See County of Maui Solid Waste for information.

Anticipated Costs for the Future

See County of Maui Solid Waste for information.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Solid Waste element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Solid Waste element.

Major Assumptions

No information was uncovered regarding major assumptions for the Solid Waste element.

County of Maui – Makawao-Pukalani-Kula – Storm Water

Present Capacity and Usage

Due to a lack of information or response from the Maui Department of Public Works and Environmental Management, there is not enough data to evaluate storm water in Maui County.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

Makawao-Pukalani-Kula Community Plan lists the following planned changes to drainage:

- Implement comprehensive drainage improvements and maintenance procedures to ensure that the overall system will meet public safety and welfare needs of the region's residents.
- Reduce the threat of property loss and environmental degradation attributed to storm water through a comprehensive reforestation program.
- Support the Soil and Water Conservation Districts in their efforts to implement soil erosion and drainage control management programs.
- Plan, program budget and construct drainage system capital improvement projects to improve safety and drainage systems.^{33, 1996}

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Makawao-Pukalani-Kula – Roads

Present Capacity and Usage

Maui County Department of Public Works and Waste Management Annual Report describes the Makawao District has tried to improve the roads by paving in areas which have minor erosion problems.

The improvements included widening the shoulders along Baldwin Avenue and installing new guardrails (925 feet) in the dangerous drop off areas. Portions of Haiku Road were also widened in spots along the shoulders. Haumana Road (800 feet) was improved by scarifying, rebased and re-compacted. Polipoli Road (2,000 feet) was improved by hot mix paving, as was Kealakapu Road (950 feet). The older dirt portion of Calasa Road in Kula was also hot mix paved (1,000 feet). Olinda, Hanamu, Makawao Ave., and Old Haleakala Highway had work done to improve sight distance by removing embankments. Makawao District replaced the deteriorated culvert on Kaupakalua Road.^{135, 2002}

Existing Problems, Issues and Opportunities

According to the *Joint State/County Maui Interim Transportation Plan*, there exists some congestion along the Mokulele Highway.^{63, 2002}

Future and Planned Usage

As stated in the *Joint State/County Maui Interim Transportation Plan* the congestion along the Mokulele Highway could be relieved by widening the Highway to four lanes between Puunene Avenue to Piilani Highway. Potential hurdles to this solution include land acquisition, funding, relocation of tenants, permits and clearances.^{63, 2002}

Future and Planned Requirements or Changes

Maui County Department of Public Works and Waste Management Annual Report states that construction of a new garage facility for Makawao is anticipated to go out to bid shortly. The new garage facility will do much to improve our maintenance capabilities of the Makawao District vehicles and equipment.^{135, 2002}

Anticipated Costs for the Future

See County of Maui Roads Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Roads Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Roads element.

Major Assumptions

No information was uncovered regarding major assumptions for the Roads element.

County of Maui – Makawao-Pukalani-Kula – Airports

Present Capacity and Usage

Analysis of county documents shows there are no airports in the Makawao-Pukalani-Kula region.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Makawao-Pukalani-Kula – Harbors

Present Capacity and Usage

Analysis of county documents shows there are no harbors in the Makawao-Pukalani-Kula region.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Makawao-Pukalani-Kula – Parks

Present Capacity and Usage

National Park Service Statistical Abstract 2001 describes Haleakala National Park has a total gross area of 29,830.15 acres, from which 28,968.52 is Federal land and 861.63 is non-Federal land. The Park had 1,410,974 visits in 2001.^{136, 2002}

Existing Problems, Issues and Opportunities

The County of Maui: Fiscal Year 2002 Budget states that the Makawao-Pukalani-Kula region would like to complete the requirements of the Pukalani Park Master Plan, which consist of linking with footpaths the softball/soccer field, the Upcountry pool, the small ball field, and expanded parking area at the baseball/soccer field and multi-activity area. Also, new picnic amenities would be located at appropriate areas throughout the park and the tennis court lights will be reoriented.

The irrigation system at the Eddie Tam Memorial Complex built in the early 1970's has clogged over the years and because of this, the staff is required to manually operate the system.^{50, 2001}

Future and Planned Usage

The Makawao-Pukalani-Kula Community Plan's objectives:

- Develop a system of parks serving dispersed residential areas, including a regional park of at least 50 acres in the Upcountry region.
- Improve park utilities and operations by expanding organized sports program and encouraging use of facilities
- Pursue the development of equestrian trails, pathways, and greenways, which will meet recreational needs.^{33, 1996}

Future and Planned Requirements or Changes

The Makawao-Pukalani-Kula Community Plan's implementing actions:

- Prepare an Upcountry greenway Master Plan to identify routing alternatives and capital programming requirements for equestrian trails, jogging and walking paths, and bikeways.
- Expand and provide additional parking and recreational facilities at the Mayor Eddie Tam Memorial Center.
- Explore the use of the old Keokea School as a community recreation resource.
- The County shall condemn or negotiate for a regional park of at least 50 acres in the Upcountry region.^{33, 1996}

The County of Maui: Fiscal Year 2002 Budget notes future plans to design and construct an automatic irrigation system for the softball field and soccer/ball field at the Eddie Tam Memorial Complex.^{50, 2001}

The Maui County Department of Planning FY2003 Budget notes the following planned changes:

Kula Tennis Courts

Construction of two additional tennis courts adjacent to the existing courts to meet the demand for use by the area residence. Multiple courts at one location are more suitable for league and tournament play.

Pukalani Park Improvements

Supplemental funding is necessary for the construction of jogging paths, parking lot and improvements to the existing irrigation system at Pukalani Park.^{147, 2002}

Anticipated Costs for the Future

The County of Maui: Fiscal Year 2002 Budget has anticipated costs for design and construction of \$70,000 and costs for the completion of the Pukalani Park Master Plan of \$100,000.^{50, 2001}

The Maui County Department of Planning FY2003 Budget makes the following appropriations:^{147, 2002}

Table 5.98 – Makawao – Pukalani – Kula Six Year Parks and Recreation Capital Improvement Program: 2002

Fund Source: C = County, B = G.O. Bonds, L = Lapsed Bond Proceeds

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Parks and Recreation			
Eddie Tam Gym Improvements		150 C	150 C
Kula Tennis Courts	120 L		120 L
	230 B		230 B
Pukalani Park Improvements	250 B		250 B
Sun Yet Sen Park Improvements	50 C		50 C
Upcountry Pool Improvements		50 C	50 C

Source: *The Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities with costs for the Parks element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impact for the Parks element.

Major Assumptions

The County of Maui: Fiscal Year 2002 Budget makes the following assumptions:

- Anticipated life for the construction of the automatic irrigation system at the Eddie Tam Memorial Complex is of 30 years.
- Expected life after the completion of the Pukalani Park Master Plan is of 20 years.^{50, 2001}

National Park Service Statistical Abstract 2001 gives 2002 forecast of recreation visits for the Haleakala National Park of 1,514,350 visits, 7.33% more than in 2001. The 2003 forecast is 1,476,156 visits.^{136, 2002}

County of Maui – Makawao-Pukalani-Kula – Police, Fire and Emergency Services

Present Capacity and Usage

Police

The Maui Police Department states there is no data specifically for the Makawao-Pukalani-Kula community because the police districts are not the same as the planning communities. Although there is data for the police district in which the community lies, it would require further study to separate it.^{96C, 2002}

Fire

Maui County Department of Public Works FY2001 Budget gives the following statistics regarding call activity for the Makawao and Kula fire control districts.^{141, 2002}

Table 5.99 – Makawao Department of Fire Control District Measures: 2001

	FY 1999 Actual	FY 2000 Actual	FY 2001 Estimate
Fires	55	50	50
Rescues (non-fire related)	7	12	10
Emergency medical services	90	94	60
Hazmat response	5	5	5
False calls (any alarm received for which response was unnecessary)	17	15	15
Company assists (another fire company responds with primary company to assist with an emergency)	65	89	40
Other calls (miscellaneous services such as removing traffic hazards)	105	73	80
AED (Automated external defibrillator) response	0	0	5

Source: *Maui County Department of Public Works FY2001 Budget*

Table 5.100 – Kula Department of Fire Control District Measures: 2001

	FY 1999 Actual	FY 2000 Actual	FY 2001 Estimate
Fires	61	48	50
Rescues (non-fire related)	11	6	5
Emergency medical services	64	94	45
Hazmat response	2	9	5
False calls (any alarm received for which response was unnecessary)	7	5	5
Company assists (another fire company responds with primary company to assist with an emergency)	61	54	40
Other calls (miscellaneous services such as removing traffic hazards)	48	54	40
AED (Automated external defibrillator) response	0	0	5

Source: *Maui County Department of Public Works FY2001 Budget*

Existing Problems, Issues and Opportunities

The Makawao-Pukalani-Kula Community Plan notes inadequacies in public and quasi-public services and facilities are cited as major community issues. The upgrading, expansion of, and addition to fire protection, police protection and emergency medical facilities are required to meet the growing needs of the region’s residents.^{33, 1996}

Future and Planned Usage

The Makawao-Kula-Kula Community Plan objectives for police, fire and emergency services are:

- Establish a centrally located comprehensive health center with full emergency services to all communities.
- Improve street lighting and security around schools, parks, and other public facilities.
- Improve police protection services by providing a police sub-station in the Upcountry region.^{33, 1996}

Future and Planned Requirements or Changes

The Makawao-Kula-Kula Community Plan planned changes for Upcountry include:

- Develop an Upcountry public safety center centrally located in Pukalani, which will provide facilities for health and emergency services, and a police substation,
- Explore the establishment of general hospital services at Kula San Hospital, and
- Move ambulance services from Kula San to the Kula Fire Station.^{33, 1996}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget makes the following appropriations for capital improvements to the police stations in the Makawao district.^{147, 2002}

Table 5.101 – Makawao District Six Year Police Station Capital Improvement Program: 2002

Fund Source: C = County B = G.O. Bonds

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Government Facilities			
New Makawao District Police Station		7,000 B	7000 B
Makawao Public Restroom/Community Police Officer Station Design	30 C		

Source: Maui County Department of Planning FY2003 Budget

Problems, Issues and Opportunities Associated with Costs

See County of Maui Police, Fire and Emergency Services Summary for information.

Compare Visitor and Resident Impact

See County of Maui Police, Fire and Emergency Services Summary for information.

Major Assumptions

Maui County Department of Planning FY2003 Budget assumes facilities changes will have an anticipated life of 30 years.

County of Maui – Makawao-Pukalani-Kula – Visitor Accommodations

Present Capacity and Usage

Maui County Data Book gives statistics on the type of visitor accommodations and the available units for the Makawao-Pukalani-Kula area. ^{247, 2001}

Table 5.102 – Makawao – Pukalani – Kula Visitor Accommodations: 2001

Type of Accommodation	Properties	Available Units
Bed & Breakfast	9	36
Condominium Hotel	1	12
Hotel	1	6
Individual Vacation Units	13	34
Other	1	5
Total	25	93

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

See County of Maui Visitor Accommodation Summary for information.

Future and Planned Usage

See County of Maui Visitor Accommodation Summary for information.

Future and Planned Requirements or Changes

See County of Maui Visitor Accommodation Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Visitor Accommodations element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Visitor Accommodations element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Visitor Accommodations element.

Major Assumptions

No information was uncovered regarding major assumptions for the Visitor Accommodations element.

County of Maui – Makawao-Pukalani-Kula – Private Transportation

Present Capacity and Usage

See County of Maui Private Transportation Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding existing problems, issues and opportunities for Private Transportation.

Future and Planned Usage

No information was uncovered regarding future and planned usage for Private Transportation.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for Private Transportation.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for Private Transportation.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for Private Transportation.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Private Transportation.

Major Assumptions

No information was uncovered regarding major assumptions for Private Transportation.

County of Maui – Makawao-Pukalani-Kula – Energy Systems

Present Capacity and Usage

See County of Maui Energy Systems Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Energy Systems Summary for information.

Future and Planned Usage

See County of Maui Energy Systems Summary for information.

Future and Planned Requirements or Changes

See County of Maui Energy Systems Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Energy Systems element.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Energy Systems Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Energy Systems element.

Major Assumptions

No information was uncovered regarding major assumptions for the Energy Systems element.

County of Maui – Makawao-Pukalani-Kula – Sewer Systems

Present Capacity and Usage

The Sewer indicator has been combined with the Sewage indicator. See Sewage Summary for information.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Makawao-Pukalani-Kula – Coastal Water Quality

Present Capacity and Usage

Not enough information was found to adequately evaluate this infrastructure element at the community level.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Makawao-Pukalani-Kula – Marine Ecosystem Health

Present Capacity and Usage

See County of Maui Marine Ecosystem Health Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Usage

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Marine Ecosystem Health element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for the Marine Ecosystem Health element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for the Marine Ecosystem Health element.

Compare Visitor and Resident Impact

See County of Maui Marine Ecosystem Health Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for the Marine Ecosystem Health element.

County of Maui – Makawao-Pukalani-Kula – Forestry / Green Space

Present Capacity and Usage

See County of Maui Forestry and Green Space Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Usage

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Forestry and Green Space element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Forestry and Green Space.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Forestry and Green Space.

Compare Visitor and Resident Impact

See County of Maui Forestry and Green Space Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Forestry and Green Space.

County of Maui – Makawao-Pukalani-Kula – Air Quality

Present Capacity and Usage

See County of Maui Air Quality Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Air Quality Summary for information.

Future and Planned Usage

See County of Maui Air Quality Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Air Quality element.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Air Quality element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Air Quality element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Air Quality element.

Major Assumptions

No information was uncovered regarding major assumptions for the Air Quality element.

County of Maui – Makawao-Pukalani-Kula – Beach Erosion

Present Capacity and Usage

See County of Maui Beach Erosion Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Beach Erosion.

Future and Planned Usage

No information was uncovered regarding future and planned usage for the Beach Erosion element.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Beach Erosion element.

Anticipated Costs for the Future

See County of Maui Beach Erosion Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Beach Erosion Summary for information.

Compare Visitor and Resident Impact

See County of Maui Beach Erosion Summary for information.

Major Assumptions

See County of Maui Beach Erosion Summary for information.

County of Maui – Makawao-Pukalani-Kula – Invasive Species

Present Capacity and Usage

See County of Maui Invasive Species Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Invasive Species Summary for information.

Future and Planned Usage

See County of Maui Invasive Species Summary for information.

Future and Planned Requirements or Changes

See County of Maui Invasive Species Summary for information.

Anticipated Costs for the Future

See County of Maui Invasive Species Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Invasive Species Summary for information.

Compare Visitor and Resident Impact

See County of Maui Invasive Species Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Invasive Species.

County of Maui – Makawao-Pukalani-Kula – Natural / Scenic Resources

Present Capacity and Usage

See County of Maui Natural and Scenic Resources Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Usage

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Requirements or Changes

See County of Maui Natural and Scenic Resources Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Natural and Scenic Resources.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Natural and Scenic Resources.

Compare Visitor and Resident Impact

See County of Maui Natural and Scenic Resources Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Natural and Scenic Resources.

County of Maui – Hana – Water Quality and Quantity

Present Capacity and Usage

The total sustainable yield of hydrologic units in Hana is 133 MGD. See appendix for map delineating boundaries.

See County of Maui Water Summary for information.

Watershed districts do not match planning districts.

Existing Problems, Issues and Opportunities

Hana Community Plan notes the diversion of surface water from the region is an existing problem.^{36, 1994}

Future and Planned Usage

See County of Maui Water Summary for information.

Future and Planned Requirements or Changes

Hana Community Plan lists the following planned changes:

- Provide municipal water service to Kipahulu and Upper Nahiku.
- Prepare a domestic water system master plan for the Hana region.
- Develop and maintain a groundwater and surface water resources monitoring program to define and monitor water levels.
- Prepare watershed management plans for the Hana District to protect the district's surface, ground and coastal waters.^{36, 1994}

Anticipated Costs for the Future

See County of Maui Water Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Water Quality element.

Major Assumptions

Hana Community Plan assumes the population of Hana will be 2349-2452 by year 2010.

- Land use to preserve and protect Hana's unique natural and cultural resources for stable and harmonious Hana lifestyle.^{36, 1994}

County of Maui – Hana – Sewage

Present Capacity and Usage

Analysis of county documents shows that there are no public wastewater treatment facilities in Hana. The Hana region is served by on-site septic systems.

Existing Problems, Issues and Opportunities

Hana Community Plan notes water recycling as an existing opportunity.^{36, 1994}

Future and Planned Usage

See County of Maui Sewage Summary for information.

Future and Planned Requirements or Changes

Hana Community Plan planned changes include:

- Use of gray water, including household recycling, in the County's wastewater reuse strategy.
- Prepare a wastewater system master plan for the Hana Region.^{36, 1994}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget makes the following appropriations. The fund source is the county.^{147, 2002}

Table 5.103 – Hana Six Year Sewer Capital Improvement Program: 2002

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Sewer			
East Maui Wastewater Master Plan		500	500

Source: *Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

See County of Maui Sewage Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Sewage element.

Major Assumptions

No information was uncovered regarding major assumptions for the Sewage element.

County of Maui – Hana – Solid Waste Disposal

Present Capacity and Usage

Maui County Department of Public Works FY2001 Budget gives the following statistics for Hana Landfill disposal^{141, 2001}:

Table 5.104 – Hana Landfill Disposal: 2001

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Tonnage entering landfills per year	1,460	1,100	1,460

Source: *Maui County Department of Planning FY2003 Budget*

Existing Problems, Issues and Opportunities

Maui County Department of Public Works and Waste Management Annual Report notes that the solid waste operations in Hana have required:

- Highways personnel to support the operation with a three-man refuse collection crew every Friday;
- A three-fold increase of refuse collected;
- Highways personnel to haul cover material for the landfill at an estimated 160 man hours a month.^{135, 2002}

Future and Planned Usage

See Maui County Solid Waste Summary.

Future and Planned Requirements or Changes

Maui County Department of Public Works and Waste Management Annual Report states a need for increased manpower in Hana may be imminent.^{135, 2002}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget makes the following appropriations for capital improvement projects. The fund source is G.O. bonds.^{147, 2002}

Table 5.105 – Hana Six Year Sanitation Capital Improvemt Program: 2002

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Sanitation			
Hana Landfill	75 B	550 B	625 B

Source: *Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

See County of Maui Solid Waste Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Solid Waste element.

Major Assumptions

See County of Maui Solid Waste Summary for information.

County of Maui – Hana – Storm Water

Present Capacity and Usage

Due to a lack of information or response from the Maui Department of Public Works and Environmental Management, there is not enough data to evaluate storm water in Maui County.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Hana – Roads

Present Capacity and Usage

Maui County Department of Public Works and Waste Management Annual Report describes the Hana District maintains the bridges, roads, drains, culverts, and equipment in Hana. ^{135, 2002}

Existing Problems, Issues and Opportunities

Maui County Department of Public Works and Waste Management Annual Report states Hana District had to do major repairs to the roads in their district after the last storm's flash floods. Twelve inches of rain fell in Hana damaging Ulaino Road, Kala Road, Kakio Road, Waikaloa Road and its streambed, the Public Works parking lot and the Public Works equipment parking lot.

Since the Hana Road has been recognized as a "Millennium Trail/Historic Road", the Hana District has to be more concerned about how and what they cut, remove, and repair along this road. This means they have a greater need for increased manual "labor." ^{135, 2002}

Future and Planned Usage

Maui County Department of Public Works and Waste Management Annual Report states the crews continue to slowly upgrade Piilani Highway's shoulders and keep all the drains clear after each rain. They utilize a hoe ram to widen the shoulders to accommodate two vehicles at some narrow spots along this highway.

The Hana District's emphasis in the past years has been to improve striping in Molokai and Kihei especially cross walks. ^{135, 2002}

Future and Planned Requirements or Changes

See County of Maui Roads Summary for information.

Anticipated Costs for the Future

See County of Maui Roads Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Roads Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Roads element.

Major Assumptions

No information was uncovered regarding major assumptions for the Roads element.

County of Maui – Hana – Airports

Present Capacity and Usage

The Final Statewide Airport System Plan describes the Hana Airport supports commuter, unscheduled air taxi, and general aviation activities on a 119-acre site on the east shore of Maui, about three miles northwest of the town of Hana. The single runway serves the passenger terminal and general aviation and airport support facilities south of the runways. Vehicular access to the airport from Hana Highway is provided by Alalele Place. ^{127, 1998}

Maui County Data Book 2001 gives statistics for operations activity at Hana Airport. ^{247, 2001}

Table 5.106 – Hana Airport Enplaned / Deplaned Airport Statistics: 2001

	1999		2000	
	Enplaned	Deplaned	Enplaned	Deplaned
Passengers	4,184	3,909	8	9
Cargo (tons)	42	11	25	10

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

According to the *Statewide Airport Systems Plan*, improvements to Hana airport are currently limited to the upgrade of the navigational aids and terminal building expansion. ^{127, 1998}

Future and Planned Usage

According to the *Statewide Airport Systems Plan* planned usage for Hana Airport is:

- Continue to serve rural communities of East Maui with schedule commuter service.
- Based on the Community Plan for the region, population, tourism and commercial development are expected to remain close to current levels. ^{127, 1998}

Future and Planned Requirements or Changes

The *Statewide Airport Systems Plan* lists planned changes.

- Future improvements contemplated include a taxiway paralleling the runway.
- Widening of the access road, and expansion of the passenger terminal and parking facilities.
- These facilities will be pursued as air traffic increases.
- Compliance and safety issues are expected to drive airport development. ^{127, 1998}

Anticipated Costs for the Future

The *Statewide Airport Systems Plan* notes the Hana Airport is schedule to receive \$250,000 in NAVAIDS improvements during FY1998. ^{127, 1998}

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Airports element.

Major Assumptions

No information was uncovered regarding major assumptions for the Airport element.

County of Maui – Hana – Harbors

Present Capacity and Usage

Analysis of county documents shows there are no commercial harbors in the Hana region.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Hana – Parks

Present Capacity and Usage

See County of Maui Parks Summary for information.

Existing Problems, Issues and Opportunities

The Hana Community Plan notes commercial and residential usage of public recreational areas as an existing problem.^{36, 1994}

The County of Maui: Fiscal Year 2002 Budget states that the existing restroom facility at the Keanae Park is too small to handle current usage by bus tours and the community.^{50, 2001}

Future and Planned Usage

See County of Maui Parks Summary for information.

Future and Planned Requirements or Changes

The Hana Community Plan lists the following future changes:

- Prepare a recreation management plan for Hana Bay to identify compatible and conflicting uses and to establish regulatory context for uses in conjunction with the Hana Harbor Advisory Committee.
- Establish and maintain an area for canoes at Hana Bay.
- Prohibit dry-docking of boats within Hana Bay area except during adverse weather.
- Hana Bay Beach Park and Hana Ball Park primary recreational areas with traffic management programs during events.
- Develop a larger multi-purpose facility.
- Establish and maintain passive parks and regional recreation parks in remote areas.
- Improve and maintain Keanae Community Park.^{36, 1994}

The County of Maui: Fiscal Year 2002 Budget notes that the Keanae Park restrooms will be expanded from its existing size to accommodate an additional two basins and two toilets for the women's side and an additional urinal and two basins for the men's side. Four new poles and lights will be added to the existing six poles and lights at the Hana Ballpark.^{50, 2001}

Anticipated Costs for the Future

The County of Maui: Fiscal Year 2002 Budget lists the following anticipated costs:

- Supplemental funding for construction of additional lighting for the Hana Ball field to bring the lighting levels up to recreational standards. Cost of the addition of the four new poles is of \$50,000 for the County.

- The design and construction costs for the construction of the new restrooms facilities at the Keanae Park is \$200,000.^{50, 2001}

Maui County Department of Planning FY2003 Budget gives the following appropriations. The funds source is the county.^{147, 2002}

Table 5.107 – Hana Six Year Parks and Recreation Capital Improvement Program: 2002

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Parks and Recreation			
Hana Community Center Fire Sprinkler System		225	225
Keanae Park Restroom and Ballfield Improvements	150		150

Source: *Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Parks element.

Compare Visitor and Resident Impact

The Maui County Department of Planning FY2003 Budget notes the Keanae Park is visited daily by bus tours and the existing restroom is too small to handle current usage. The pavilion will serve the visitors as well as the community in providing a shade and eating area.^{147, 2002}

The Hana Community Plan states a need for regulation of commercial use of Hana Bay Pavilion and picnicking area.^{36, 1994}

Major Assumptions

The County of Maui: Fiscal Year 2002 Budget makes the following assumptions:

- Expected life of the Hana Ball field improvements is of 25 years.
- The anticipated life for the new restroom at the Keanae Park is of 50 years.^{50, 2001}

County of Maui – Hana – Police, Fire and Emergency Services

Present Capacity and Usage

Police

The Maui Police Department gave statistics on police activity in the Hana region.^{96C, 2002}

Table 5.108 – Hana police District Measures: 2002

	FY2001 Actual	FY2002 To Date
Personnel	9	9
Calls for Service	2130	695

Source: Maui County Police Department

Fire

Maui County Department of Public Works FY2001 Budget gives the following statistics regarding fire control activities in the Hana District.^{141, 2002}

Table 5.109 – Hana Department of Fire Control District Measures: 2001

	FY1999 Actual	FY2000 Actual	FY2001 Estimate
Fires	10	4	10
Rescues (non-fire related)	11	14	10
Emergency medical services	33	39	30
Hazmat response	2	7	5
False calls (any alarm received for which response was unnecessary)	4	1	5
Company assists (another fire company responds with primary company to assist with an emergency)	0	2	5
Other calls (miscellaneous services such as removing traffic hazards)	13	19	15
AED (Automated external defibrillator) response	0	0	5

Source: *Maui County Department of Planning FY2003 Budget*

Existing Problems, Issues and Opportunities

The Hana Community Plan lists existing problems in Hana to improve emergency rescue services and medical services for the Hana region include:

- Improve fire protection, prevention and suppression services in the Hana region.
- Encourage the recruitment and retention of police department personnel who are thoroughly familiar with the needs of the community.^{36, 1994}

Future and Planned Usage

See County of Maui Police, Fire and Emergency Services Summary for information.

Future and Planned Requirements or Changes

The Hana Community Plan notes future changes in Hana include:

- Provide water safety officers for Hana Bay.
- Establish and maintain a Rescue Squad at the new Hana Fire Station.
- Maintain a civil defense coordinator position for Hana and establish emergency evacuation centers for remote centers of the region.
- Increase police force, possibly by deputizing part-time officers in more remote areas.
- Improve emergency communications equipment.
- Develop a recruitment/incentive program to attract Hana region residents into PFEM services.^{36, 1994}

Anticipated Costs for the Future

See County of Maui Police, Fire and Emergency Services Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Police, Fire and Emergency Services Summary for information.

Compare Visitor and Resident Impact

See County of Maui Police, Fire and Emergency Services Summary for information.

Major Assumptions

The Hana Community Plan assumes that the anticipated population of the Hana region by the year 2010 will range from 2,349 -2,452 residents.^{36, 1994}

County of Maui – Hana – Visitor Accommodations

Present Capacity and Usage

Maui County Data Book gives statistics on the type of visitor accommodations and the available units for the Hana area. ^{247, 2001}

Table 5.110 – Hana Visitor Accommodations: 2001

Type of Accommodation	Properties	Available Units
Bed & Breakfast	2	4
Condominium Hotel	1	17
Hotel	2	96
Individual Vacation Units	15	30
Other	3	16
Total	23	163

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

The Hana Community Plan states that the land use and development levels are a problem. ^{36, 1994}

Future and Planned Usage

The Hana Community Plan notes future land use to preserve and protect Hana's unique natural and cultural resources for stable and harmonious Hana lifestyle. ^{36, 1994}

Future and Planned Requirements or Changes

The Hana Community Plan states that within the Hotel District, the total ground area occupied by all buildings shall not exceed 25% of the lot area. ^{36, 1994}

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for Visitor Accommodations.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for Visitor Accommodations.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Visitor Accommodations.

Major Assumptions

The Hana Community Plan assumes the estimated 2010 population for the Hana region ranges from 2,349 to 2,452 residents. ^{36, 1994}

County of Maui – Hana – Private Transportation

Present Capacity and Usage

See County of Maui Private Transportation Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding existing problems, issues and opportunities for Private Transportation.

Future and Planned Usage

No information was uncovered regarding future and planned usage for Private Transportation.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for Private Transportation.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for Private Transportation.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for Private Transportation.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Private Transportation.

Major Assumptions

No information was uncovered regarding major assumptions for Private Transportation.

County of Maui – Hana – Energy Systems

Present Capacity and Usage

See County of Maui Energy Systems Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Energy Systems Summary for information.

Future and Planned Usage

See County of Maui Energy Systems Summary for information.

Future and Planned Requirements or Changes

See County of Maui Energy Systems Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Energy Systems element.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Energy Systems Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Energy Systems element.

Major Assumptions

No information was uncovered regarding major assumptions for the Energy Systems element.

County of Maui – Hana – Sewer Systems

Present Capacity and Usage

The Sewer indicator has been combined with the Sewage indicator. See Sewage Summary for information.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Hana – Coastal Water Quality

Present Capacity and Usage

Not enough information was found to adequately evaluate this infrastructure element at the community level.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Hana – Marine Ecosystem Health

Present Capacity and Usage

See County of Maui Marine Ecosystem Health Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Usage

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Marine Ecosystem Health element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for the Marine Ecosystem Health element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for the Marine Ecosystem Health element.

Compare Visitor and Resident Impact

See County of Maui Marine Ecosystem Health Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for the Marine Ecosystem Health element.

County of Maui – Hana – Forestry / Green Space

Present Capacity and Usage

See County of Maui Forestry and Green Space Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Usage

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Forestry and Green Space element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Forestry and Green Space.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Forestry and Green Space.

Compare Visitor and Resident Impact

See County of Maui Forestry and Green Space Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Forestry and Green Space.

County of Maui – Hana – Air Quality

Present Capacity and Usage

See County of Maui Air Quality Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Air Quality Summary for information.

Future and Planned Usage

See County of Maui Air Quality Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Air Quality element.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Air Quality element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Air Quality element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Air Quality element.

Major Assumptions

No information was uncovered regarding major assumptions for the Air Quality element.

County of Maui – Hana – Beach Erosion

Present Capacity and Usage

See County of Maui Beach Erosion Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Beach Erosion.

Future and Planned Usage

No information was uncovered regarding future and planned usage for the Beach Erosion element.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Beach Erosion element.

Anticipated Costs for the Future

See County of Maui Beach Erosion Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Beach Erosion Summary for information.

Compare Visitor and Resident Impact

See County of Maui Beach Erosion Summary for information.

Major Assumptions

See County of Maui Beach Erosion Summary for information.

County of Maui – Hana – Invasive Species

Present Capacity and Usage

See County of Maui Invasive Species Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Invasive Species Summary for information.

Future and Planned Usage

See County of Maui Invasive Species Summary for information.

Future and Planned Requirements or Changes

See County of Maui Invasive Species Summary for information.

Anticipated Costs for the Future

See County of Maui Invasive Species Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Invasive Species Summary for information.

Compare Visitor and Resident Impact

See County of Maui Invasive Species Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Invasive Species.

County of Maui – Hana – Natural / Scenic Resources

Present Capacity and Usage

See County of Maui Natural and Scenic Resources Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Usage

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Requirements or Changes

See County of Maui Natural and Scenic Resources Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Natural and Scenic Resources.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Natural and Scenic Resources.

Compare Visitor and Resident Impact

See County of Maui Natural and Scenic Resources Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Natural and Scenic Resources.

County of Maui – Paia-Haiku – Water Quality and Quantity

Present Capacity and Usage

See appendix for map delineating boundaries. Watershed districts do not match planning districts.

See County of Maui Water Summary for details at the regional level.

Existing Problems, Issues and Opportunities

Paia-Haiku Community Plan notes the following existing issues:

- The development of new ground water sources in Haiku to service the Central Maui area of Wailuku-Kahului and Kihei-Makena raises a concern over the allocation of water resources to these other regions when the present and future needs of the Paia-Haiku area are not met.
- Protect the quality of surface and ground water resources.^{34, 1995}

Future and Planned Usage

See County of Maui Water Summary for information.

Future and Planned Requirements or Changes

Paia-Haiku Community Plan lists the following planned changes:

- Prepare or update a water improvement master plan for the Paia-Haiku region.
- Update the County's Water Use and Development Plan and estimated water use for the Paia-Haiku region based on the adopted Community Plan and include a reserve capacity for drought conditions
- Develop a comprehensive agriculture water system, including the use of recycled water and a dual water system for domestic and irrigation uses.
- Provide incentives for water conservation practices.^{34, 1995}

Anticipated Costs for the Future

See County of Maui Water Summary for information.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Water element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Water element.

Major Assumptions

Paia-Haiku Community Plan assumes 2010 estimated population of between 9,902 and 10,379.^{34, 1995}

County of Maui – Paia-Haiku – Sewage

Present Capacity and Usage

The *Paia-Haiku Community Plan* describes public and private wastewater treatment as follows:

Public

A centralized wastewater collection system serves the Paia region. The system, which consists of primarily gravity sewer lines, feed into the Kahului Wastewater Reclamation Facility.

Private

The Haiku region is served by on-site septic systems, which range in age from 2 – 40 years.^{34, 1995}

Existing Problems, Issues and Opportunities

An existing issue noted in the *Paia-Haiku Community Plan* is to connect urban residential communities to the County's wastewater treatment system.^{34, 1995}

Future and Planned Usage

See County of Maui Sewage Summary for information.

Future and Planned Requirements or Changes

The *Paia-Haiku Community Plan* planned change is to extend the service area of the sewer system to include new major urban residential communities delineated in the Community Plan.^{34, 1995}

Anticipated Costs for the Future

See County of Maui Sewage Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Sewage Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Sewage element.

Major Assumptions

See Paia-Haiku Water Summary for information.

County of Maui – Paia-Haiku – Solid Waste Disposal

Present Capacity and Usage

Maui County Department of Public Works FY2001 Budget gives the following statistics for the Central Landfill and Makawao District residential collection services. Community planning districts do not correspond to the districts used by the Department of Public Works. ^{141, 2002}

See County of Maui - Makawao – Pukalani – Kula Solid Waste Disposal Summary for details regarding tonnage and accounts.

Existing Problems, Issues and Opportunities

The Paia-Haiku Community Plan notes an existing issues is to reduce the disposal of solid waste in the landfills. ^{34, 1995}

Future and Planned Usage

See County of Maui Solid Waste Summary for information.

Future and Planned Requirements or Changes

The Paia-Haiku Community Plan states that a planned changes is to develop and implement a comprehensive waste management and recycling program for the region. ^{34, 1995}

Anticipated Costs for the Future

See County of Maui Solid Waste Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Solid Waste Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Solid Waste element.

Major Assumptions

No information was uncovered regarding major assumptions for the Solid Waste element.

County of Maui – Paia-Haiku – Storm Water

Present Capacity and Usage

Due to the lack of information or response from the Maui Department of Public Works and Environmental Management, there is not enough data to evaluate Storm Water in Maui County.

Existing Problems, Issues and Opportunities

The Paia-Haiku Community Plan states there are existing drainage problems in the region, and concerns that the design of new drainage improvements are inadequate, in terms of protecting down slope properties and the quality of offshore waters.^{34, 1995}

Future and Planned Usage

The Paia-Haiku Community Plan lists the following planned usage:

- Ensure that storm water run-off and siltation from proposed development will not adversely affect the marine environment and near shore and offshore water quality.
- Effectively control agriculture run-off.^{34, 1995}

Future and Planned Requirements or Changes

The Paia-Haiku Community Plan plans to encourage the construction of natural grass-lined drainage channels as opposed to concrete channels and the installation of siltation basins.^{34, 1995}

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Paia-Haiku – Roads

Present Capacity and Usage

The State Department of Transportation is doing multiple bridge widening projects on Hana Highway in Haiku. ^{135, 2002}

Existing Problems, Issues and Opportunities

The *Joint State/County Maui Interim Transportation Plan* states congestion through Paia Town and along Haleakala Highway, Haleakala/Hana Highway Intersection as existing problems in the East Maui/Upcountry district. ^{63, 2002}

Future and Planned Usage

See County of Maui Roads Summary for information.

Future and Planned Requirements or Changes

The *Joint State/County Maui Interim Transportation Plan* lists possible interim measures:

- Restrict left turn movements from Hana Highway during the afternoon peak period.
- Restrict on-street parking through Paia Town during the afternoon peak period.
- One-Way Reliever road, between Hana Highway and Baldwin Avenue (project by A&B Properties).
- Haleakala Highway Widening, Hana Highway to Pukalani. ^{63, 2002}

Anticipated Costs for the Future

The *Joint State/County Maui Interim Transportation Plan* states estimated CON costs of \$19.8 million. ^{63, 2002}

Problems, Issues and Opportunities Associated with Costs

See County of Maui Roads Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Roads element.

Major Assumptions

No information was uncovered regarding major assumptions for the Roads element.

County of Maui – Paia-Haiku – Airports

Present Capacity and Usage

Analysis of county documents shows there are no airports in the Paia-Haiku region.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Paia-Haiku – Harbors

Present Capacity and Usage

Analysis of county documents shows there are no harbors in the Paia-Haiku region.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Paia-Haiku – Parks

Present Capacity and Usage

See County of Maui Parks Summary for information.

Existing Problems, Issues and Opportunities

Paia-Haiku Community Plan lists existing issues as follows:

- The public park facilities in the region are inadequate and in need of expansion and improvement.
- Traffic congestion and safety concerns because of heavy use of Hookipa Park, especially during windsurfing events and inadequacies of existing park facilities.
- Preserve shoreline open space vistas and expand opportunities for Public Park uses. ^{34, 1995}

County of Maui: Fiscal Year 2002 Budget states existing parking facilities on the Hana end of Hookipa Park are inadequate during special events. ^{50, 2001}

Future and Planned Usage

County of Maui: Fiscal Year 2002 Budget describes the preliminary design and archaeological study for recently acquired beachfront property in Kuau. Elements of the plan include passive picnic facilities, parking lot, and a permanent site for re-burial of exposed burials from the eroded shoreline of the park parcel. Another project is the improvements of a playground in the Paia Community Park. ^{50, 2001}

Future and Planned Requirements or Changes

Paia-Haiku Community Plan notes the following planned changes:

- Designate the following areas for park use:
 - Baldwin Park to “Small Park” in Paia,
 - Hookipa Park expansion including land around the existing park for immediate development,
 - Kaulahao Beach (Blue Tile Beach),
 - Near Pauwela Road and mauka of the Haiku School and existing residential developments,
 - Mauka of 4th Division Marine Park for an active park area and Kauhikoa Hill for a passive recreational/scenic area.
- Limit and manage windsurfing meets at Hookipa in order to better accommodate traditional uses, such as fishing and surfing, and maintain other public recreational uses of the area.
- Implement a program to acquire shorefront sites for future parks and lands for new and expanded parks.

- Expand camping opportunities in the region in attractive areas such as Hookipa Park.
- Develop a gymnasium for Haiku region.
- Provide youth recreation programs, including team sports, archery and tennis.
- Revise standards in the Park Dedication Ordinance to increase the quantity and quality of parks generated by new developments.^{34, 1995}

Maui County Department of Planning FY2003 Budget lists planned changes.

- Tennis Courts at Fourth Marine Park.
- Supplemental funding for construction of a parking lot on the vacant parcel abutting the Haiku Youth Center/Community Center and Haiku Elementary School.
- Design for protection of escarpment and lower parking lot, including SMA permit at Hookipa Park.^{147, 2002}

Anticipated Costs for the Future

County of Maui: Fiscal Year 2002 Budget lists the following appropriations:

- Anticipated costs for the project in the Kuau beach is of \$70,000 for the county.
- The expenditures for the Paia Community Park Playground Improvements are of \$145,000.
- The additional parking for the Hookipa Park would cost approximately \$55,000.^{50, 2001}

Maui County Department of Planning FY2003 Budget gives a six-year cost plan for the parks and recreational areas in the Paia-Haiku region.^{147, 2002}

Table 5.111 – Paia - Haiku Six Year Parks and Recreation Capital Improvement Program: 2002

Fund Source: C = County, B = G.O. Bonds

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Parks and Recreation			
Fourth Marine Park	125 B		125 B
Haiku Community Center Parking Lot	140 B		140 B
Hookipa Park Improvements	50 C	300 C	350 C
Hookipa Park Parking Lot		100 C	100 C
Kuau Bayview Beach Park	80 C		80 C
Paia Community Center Base yard Building		300 C	300 C

Source: *Maui County Department of Planning FY2003 Budget*

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Parks element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Parks element.

Major Assumptions

County of Maui: Fiscal Year 2002 Budget assumes the following:

- The Paia Community Park Playground is expected a life of 20 years.
- The parking structure for the Hookipa park has an anticipated life of 25 years.^{50, 2001}

County of Maui – Paia-Haiku – Police, Fire and Emergency Services

Present Capacity and Usage

Police

The Maui Police Department notes there is no data specifically for the Paia-Haiku community because the police districts are not the same as the planning communities. Although there is data for the police district in which the community lies, it would require further study to separate it.^{96C, 2002}

Fire

Maui County Department of Public Works FY2001 Budget gives the following statistics for Paia District fire control activity.^{141, 2002}

Table 5.112 – Paia Department of Fire Control District Measures: 2001

	FY1999 Actual	FY2000 Actual	FY2001 Estimate
Fires	41	52	40
Rescues (non-fire related)	13	26	10
Emergency medical services	99	89	100
Hazmat response	3	5	10
False calls (any alarm received for which response was unnecessary)	15	22	10
Company assists (another fire company responds with primary company to assist with an emergency)	43	50	30
Other calls (miscellaneous services such as removing traffic hazards)	65	49	60
AED (Automated external defibrillator) response	0	1	5

Source: *Maui County Department of Planning FY2003 Budget*

Existing Problems, Issues and Opportunities

See County of Maui Police, Fire and Emergency Services Summary for information.

Future and Planned Usage

Paia-Haiku Community Plan notes planned usage include:

- Improvement fire protection capabilities in the Haiku area and ensure adequate water pressure for fire protection, particularly in urban and rural areas.
- Expansion of surveillance at beach park areas.^{34, 1995}

Future and Planned Requirements or Changes

Paia-Haiku Community Plan planned changes include:

- Providing a fire station and sub-station in Haiku in the vicinity of Haiku Elementary School and near Hana Highway.

- Providing more police patrols, especially in beach park areas.^{34, 1995}

Anticipated Costs for the Future

Maui County Department of Planning FY2003 Budget appropriates \$2.7million in capital improvement program for a Haiku Fire Station. The fund source is G.O. bonds.^{147, 2002}

Problems, Issues and Opportunities Associated with Costs

See County of Maui Police, Fire and Emergency Services Summary for information.

Compare Visitor and Resident Impact

See County of Maui Police, Fire and Emergency Services Summary for information.

Major Assumptions

Paia-Haiku Community Plan assumes the 2010 population estimated for Paia-Haiku ranges between 9,902 and 10,379 residents.^{34, 1995}

County of Maui – Paia-Haiku – Visitor Accommodations

Present Capacity and Usage

As stated in the *Paia-Haiku Community Plan*, visitor accommodations are limited to owner-occupied “bed and breakfast” establishments that are residential in scale and character.

See County of Maui Visitor Accommodation Summary for information.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

According to the *Paia-Haiku Community Plan*, it prohibits hotel/resort development within the region.^{34, 1995}

Future and Planned Requirements or Changes

Any proposed “bed and breakfast” should not be situated near the shoreline to avoid the proliferation of this use and subsequent changes in the character of the region’s coast.^{34, 1995}

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Paia-Haiku – Private Transportation

Present Capacity and Usage

See County of Maui Private Transportation Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding existing problems, issues and opportunities for Private Transportation.

Future and Planned Usage

No information was uncovered regarding future and planned usage for Private Transportation.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for Private Transportation.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for Private Transportation.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for Private Transportation.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Private Transportation.

Major Assumptions

No information was uncovered regarding major assumptions for Private Transportation.

County of Maui – Paia-Haiku – Energy Systems

Present Capacity and Usage

See County of Maui Energy Systems Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Energy Systems Summary for information.

Future and Planned Usage

See County of Maui Energy Systems Summary for information.

Future and Planned Requirements or Changes

See County of Maui Energy Systems Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Energy Systems element.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Energy Systems Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Energy Systems element.

Major Assumptions

No information was uncovered regarding major assumptions for the Energy Systems element.

County of Maui – Paia-Haiku – Sewer Systems

Present Capacity and Usage

The Sewer indicator has been combined with the Sewage indicator. See Sewage Summary for information.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Paia-Haiku – Coastal Water Quality

Present Capacity and Usage

Not enough information was found to adequately evaluate this infrastructure element at the community level.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Paia-Haiku – Marine Ecosystem Health

Present Capacity and Usage

See County of Maui Marine Ecosystem Health Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Usage

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Marine Ecosystem Health element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for the Marine Ecosystem Health element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for the Marine Ecosystem Health element.

Compare Visitor and Resident Impact

See County of Maui Marine Ecosystem Health Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for the Marine Ecosystem Health element.

County of Maui – Paia-Haiku – Forestry / Green Space

Present Capacity and Usage

See County of Maui Forestry and Green Space Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Usage

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Forestry and Green Space element.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Forestry and Green Space.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Forestry and Green Space.

Compare Visitor and Resident Impact

See County of Maui Forestry and Green Space Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Forestry and Green Space.

County of Maui – Paia-Haiku – Air Quality

Present Capacity and Usage

See County of Maui Air Quality Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Air Quality Summary for information.

Future and Planned Usage

See County of Maui Air Quality Summary for information.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Air Quality element.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Air Quality element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Air Quality element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Air Quality element.

Major Assumptions

No information was uncovered regarding major assumptions for the Air Quality element.

County of Maui – Paia-Haiku – Beach Erosion

Present Capacity and Usage

See County of Maui Beach Erosion Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Beach Erosion.

Future and Planned Usage

No information was uncovered regarding future and planned usage for the Beach Erosion element.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Beach Erosion element.

Anticipated Costs for the Future

See County of Maui Beach Erosion Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Beach Erosion Summary for information.

Compare Visitor and Resident Impact

See County of Maui Beach Erosion Summary for information.

Major Assumptions

See County of Maui Beach Erosion Summary for information.

County of Maui – Paia-Haiku – Invasive Species

Present Capacity and Usage

See County of Maui Invasive Species Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Invasive Species Summary for information.

Future and Planned Usage

See County of Maui Invasive Species Summary for information.

Future and Planned Requirements or Changes

See County of Maui Invasive Species Summary for information.

Anticipated Costs for the Future

See County of Maui Invasive Species Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Invasive Species Summary for information.

Compare Visitor and Resident Impact

See County of Maui Invasive Species Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Invasive Species.

County of Maui – Paia-Haiku – Natural / Scenic Resources

Present Capacity and Usage

See County of Maui Natural and Scenic Resources Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Usage

See County of Maui Natural and Scenic Resources Summary for information.

Future and Planned Requirements or Changes

See County of Maui Natural and Scenic Resources Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Natural and Scenic Resources.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Natural and Scenic Resources.

Compare Visitor and Resident Impact

See County of Maui Natural and Scenic Resources Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Natural and Scenic Resources.

County of Maui – Molokai – Water Quality and Quantity

Present Capacity and Usage

The water supply on the Island of Molokai is comprised of three watershed areas. The amount of water that can be removed from the watershed without compromising its levels is the sustainable yield. **The total sustainable yield of hydrologic units on Molokai is 81 MGD.** (See maps of Maui, Lanai and Molokai with sustainable yields/ aquifer; geographic divisions of aquifers on Maui, Lanai and Molokai; map of Central Maui Groundwater Source Withdrawals; and Graphs of Groundwater Uses in appendix.) Little additional information was uncovered regarding water quantity for Molokai.

Table 5.113 -- KAUNAKAKAI SYSTEM

(Serving Kaunakakai, Kamiloloa, Kawela)

Primary Contaminants include: Nitrate, Asbestos, Gross Beta.

Source Name	Origin of Water	Treatment
Kualapuu Well	Ground	Chlorination
Kawela Wells	Ground	Chlorination

Table 5.114 -- UALAPUE SYSTEM (Serving Wailua, Ualapue, Kamalo)

Primary Contaminants include: Nitrate, Gross Beta.

Source Name	Origin of Water	Treatment
Ualapue Wells	Ground	Chlorination

Table 5.115 -- KALAE SYSTEM

(Serving Kalae)

Primary Contaminants include: Gross Beta.

Source Name	Origin of Water	Treatment
Waikalae Tunnel	Ground	Chlorination

Source: *Department of Water Supply: Water Quality Report for 2000*

According to the *Department of Water Supply: Water Quality Report for 2000*, Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems. However, all of these contaminants are under the maximum limits and meet all Federal and State Standards.^{38, 2001}

See Maui County Water Quality Summary for more information.

Existing Problems, Issues and Opportunities

As stated in *Research Projects 2001*, the impact of land runoff and groundwater seepage on coastal water quality around Maui and Molokai has been a concern for many years. The most publicized problems have probably been related to the blooms of algae such as *Cladophora*, *Hypnea*, and more recently *Ulva*. There are also concerns related to seepage of sewage from cesspools and from injection of treated sewage into the ground. During storms, soil erosion and associated discharges of sediment into the coastal ocean continue to be a concern. The purpose of Department of Health (DOH) is to identify what are the water quality criteria that are being violated by these problems and to encourage/support a community-based effort to bring water quality in both streams and the coastal ocean into conformance with DOH standards insofar as this may be practical and possible with current technology.^{170, 2001}

Future and Planned Usage

The Molokai Community Plan states the following objectives:

- Future water allocations for agricultural/aquaculture and Hawaiian Home Lands use should be given first priority and the consideration should be given to other viable economic development initiatives.
- Provide adequate and competitively priced irrigation water to agricultural lands without altering or endangering fresh water streams.
- Improve current water quality and distribution system and develop new water sources for the Molokai Community Plan area without taking water from Pelekunu and Wailau Valleys.
- Develop improved transmission and/or storage systems to provide better fire protection.
- Promote programs for water conservation as well as ground water and wellhead protection.
- Recognize Hawaiian water rights.
- Establish a Molokai Water advisory committee to the Commission of Water Resource Management to better addresses Molokai water issues on Molokai.^{140, 2001}

Future and Planned Requirements or Changes

The Molokai Community Plan states the following implementing actions:

- Amend building code requirement to require the installation of water conservation devices.
- Update and revise the current Molokai Water Use and Development Plan to include the recommendations of the 1993 Molokai Working Group Report.^{140, 2001}

Anticipated Costs for the Future

See Maui County Water Quality Summary for more information.

Problems, Issues and Opportunities Associated with Costs

See Maui County Water Quality Summary for more information.

Compare Visitor and Resident Impact

See Maui County Water Quality Summary for more information.

Major Assumptions

See Maui County Water Quality Summary for more information.

County of Maui – Molokai – Sewage

Present Capacity and Usage

According to the *Fiscal Year 2001 Budget*, the following table describes the Molokai wastewater reclamation facilities. The Molokai Wastewater Reclamation Facility (WWRF) had no spills and was compliance with Environmental Protection Agency regulations for fiscal years 1999 to 2001.^{141, 2002}

Table 5.116 – Molokai Wastewater Reclamation Facilities Measures: 2002

UIC = Underground Injection Control, EPA requirement

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Spills of less than 1,000 gallons	0	0	0
Spills of 1,000 gallons or more	0	0	0
Wastewater processed (average gallons per day)	207,000	206,000	206,500
Number of days all facilities met UIC** permit requirements	365	365	365
Cost per 1,000 gallons of wastewater treated	\$3.90	\$3.90	\$3.90
Percent of effluent reused versus flow processed	8.7%	12.1%	7.1%

Source: County of Maui Department of Planning *Fiscal Year 2003 Budget*

According to the *FY 2003 Budget*, the following table looks at wastewater operations.^{147, 2002}

Table 5.117 – Molokai Wastewater Operations Measures: 2002

	FY 2001 Actual	FY 2002 Estimate	FY 2002 Actual to Date
Total wastewater processed (gallons)	76,392,000	74,825,000	39,110,000
Annual compliance days	365	365	184
Total processing cost per 1,000 gallons	\$3.80	\$3.90	N/A

Source: County of Maui Department of Planning *Fiscal Year 2003 Budget*

Existing Problems, Issues and Opportunities

See County of Maui Sewage Summary for more information.

Future and Planned Usage

The *Molokai Community Plan* states its future objectives:

- Expand wastewater treatment capacity in Kaunakakai, improve the current system, and provide service to the East End.
- Explore the use of alternative waste treatment technologies such as composting toilets.
- Designate an alternate site for the wastewater treatment plant, if needed.
140, 2001

Future and Planned Requirements or Changes

See County of Maui Sewage Summary for more information.

Anticipated Costs for the Future

No anticipated costs were uncovered for Molokai.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Sewage Summary for more information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts on Sewage.

Major Assumptions

See Hawaii State and County of Maui Sewage Summaries for more information.

County of Maui – Molokai – Solid Waste Disposal

Present Capacity and Usage

Maui County Department of Public Works Fiscal Year 2001 Budget provides the following table on waste entering landfills per year. The solid waste on Molokai is disposed of in landfills.^{141, 2002}

Table 5.118 – Molokai Integrated Solid Waste Disposal: 2000

	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Tonnage entering landfills per year	7,300	6,000	7,300

Source: *Maui County Department of Public Works Fiscal Year 2001 Budget*

Existing Problems, Issues and Opportunities

See Hawaii State and County of Maui Solid Waste Summaries for more information.

Future and Planned Usage

The Molokai Community Plan states the future objectives including:

- Encourage comprehensive waste management of the island, which includes recycling, and reuse of solid waste and wastewater as major plan components.
- Encourage widespread participation in the county trash collection service.
- Encourage the re-use of yard debris/trimmings for composting of on-site landscaping of agricultural uses.
- Investigate alternative means of disposal of grubbed material and rock other than disposal at County landfills.
- Incorporate mandatory waste recycling and reuse as major elements of the Island’s environmental resource management and protection program.
140, 2001

Future and Planned Requirements or Changes

The Molokai Community Plan states the implementing actions including:

- Provide solid waste transfer stations at both the East and West End.
- Implement a full recycling and mandatory trash separation programs, including source separation, on Molokai as a county prototype project.
- Require that for all construction projects a solid waste reduction, re-use recycling program be implemented to reduce the amount of solid waste to be disposed of at the County landfill.
- Develop a toxic disposal strategy whereby the Department of public works and Waste management shall be responsible for establishing a household Hazardous Waste disposal site on Molokai for the collection and disposal of non-commercial waste products.

- Establish an environmental resource management and protection program for the island, which incorporates mandatory waste recycling and reuse as major elements. ^{140, 2001}

Anticipated Costs for the Future

The Fiscal Year 2003 Budget provides the capital improvement program for the landfills of Molokai. ^{147, 2002}

Table 5.119 – Molokai Six Year Sanitation Capital Improvement Program: 2002

Fund Source: C = County B = G.O. Bonds

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Sanitation			
Molokai Landfill Phase III		300 C	300 C
Storage Lane, Entrance to Molokai Integrated Solid Waste Facility		500 B	500 B

Source: County of Maui Department of Planning – Fiscal Year 2003 Budget

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the Solid Waste element.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Solid Waste element.

Major Assumptions

No information was uncovered regarding major assumptions for the Solid Waste element.

County of Maui – Molokai – Storm Water

Present Capacity and Usage

Due to the lack of information or response from the Maui Department of Public Works and Environmental Management, there is not enough data to evaluate Storm Water in Maui County.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

The Molokai Community Plan states its implementing activities:

- Require an environmentally sensitive drainage system, which provides for a high standard in preventing flooding and property damage while not adversely affecting wetlands, the marine environment and near shore and offshore water quality. It is necessary to alleviate existing problems, institute maintenance procedures, and ensure that the overall system will meet future growth requirements.
- Prepare, adopt and implement a drainage master plan for settlement areas, which emphasizes land management techniques, such as the use of natural landscape swales, periodic maintenance and annual cleaning of stream channels and avoidance of development of flood-prone areas to minimize the potential of flood damage.
- Encourage a stream-cleaning program to improve public safety and mitigate environmental impacts in the East End.
- Require compliance or pro-rata share contributions to the Kaunakakai Drainage Master Plan for all building permits within the service area.
- Encourage the development of environmentally sensitive drainage master plans, which consider development opportunities and constraints in flood prone areas, stream channels, and gulches.^{140, 2001}

Future and Planned Requirements or Changes

The Molokai Community Plan states its implementing activities:

- Seek CIP funding to construct improvements as recommended by the Kaunakakai Drainage Master Plan.
- Initiate legislation to assign responsibility, and provide adequate funds for periodic stream cleaning.
- Implement the drainage master plan for Kaunakakai Town.^{140, 2001}

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Molokai – Roads

Present Capacity and Usage

According to the *Annual Report – Department of Public Works and Waste Management*, the Molokai District encompasses the entire island of Molokai with the exception of Kalawao County. The Molokai District continues to utilize cold plane materials from the state resurfacing projects on Molokai to improve the dirt roads in the Department of Hawaiian Home Land’s subdivision roads. These cost free materials lessen repair costs, improve dust control, and help prevent erosion and general wear of the roads.^{135, 2002}

The Fiscal Year 2001 Budget provided the following table on district measures.
^{141, 2001}

Table 5.120 – Molokai Road, Bridge and Drainage Maintenance Measures: 2001

	FY 1999 Actual	FY 2000 Estimate	FY2001 Estimate
Complaints Received – road (including potholes) and drainage	7	10	7
Average number of days to resolve complaints	1	3	2
Potholes patching, tons of cold mix	80	100	100
Lineal feet of shoulder work	30,000	22,000	22,000
Acres of grass mowed	148	114	114
Lineal feet of culverts maintained	800	880	880
Number of catch basins maintained	70	90	90

Source: *County of Maui Department of Planning Fiscal Year 2001 Budget*

Existing Problems, Issues and Opportunities

According to the *Annual Report – Department of Public Works and Waste Management*, the Molokai District acquired eight more miles of roads in four new subdivisions. They have also maintained an additional 68 miles of roads, three miles of Hoolehua dirt roads, and the repair of two and a half miles of the Moomomi Beach Pavilion public access road. This project used 3,000 tons of cold plane materials from the State Highways projects.^{135, 2002}

According to the State Department of Transportation, resurfacing was completed on Maunaloa Highway from Mahana to Maunaloa Village, Puupeelua Avenue, and Farrington Avenue guardrail and shoulder improvements on Maunaloa Highway between Kaunakakai and Maunaloa Village.^{102, 2000}

Future and Planned Usage

According to the *County of Maui: Fiscal Year 2002 Budget*, resurfacing will reduce annual maintenance costs and improve overall road safety. The number and length of streets resurfaced is dependant on the work required (resurface only or replacement of base course), and general condition of the road.

Another project is to construct a two-lane roadway with 24-foot wide pavement and 4-foot paved shoulders, traffic signs, striping and drainage improvements from Kalohi Street to Kamehameha V highway.^{50, 2001}

Objectives stated in the *Molokai Community Plan* include:

- Improve traffic circulation in Kaunakakai business district, including the establishment of a public parking lot mauka of Kamehameha V highway.
- Consider an additional access road to ford Kaunakakai gulch between Makaena Place and Manila Place concurrent with future expansion of Manila Camp.
- Maintain the East End Highway at its current pavement width except for blind turns or other places necessary for public safety.
- Provide and maintain safe pedestrian trails, bikeways, jogging paths and equestrian trails along highways.
- Improve the maintenance of roads and shoulders, particularly for local streets in the Kaunakakai area.
- Provide education and enforcement for a safe and litter free highway system.
- Encourage innovative and alternative traffic management strategies to avoid use of traffic lights.^{140, 2001}

Future and Planned Requirements or Changes

Implemented actions stated in the *Molokai Community Plan* include:

- Extend Kalohi Street to Kamehameha V Highway.
- Pursue acquisition of land for a public parking lot in Kaunakakai mauka of Kamehameha V Highway.
- Connect Makaena/Manila Place with Olo Olo Road.
- Provide guardrails in appropriate locations to improve highway safety.
- Upgrade highway lightning from Kaunakakai to Hotel Molokai.
- Local roadways, shall not exceed 20 feet in pavement width with two travel lanes, except in areas where on –street parking is desired, or where shoulders are necessary for safety purposes, or jogging paths/bike lanes.
- Highways and major roadways shall have a minimum pavement width of 20 feet and shoulder width of 2 feet, to provide for the safe passage of two-way traffic, except in areas where natural landforms, historic structures and other environmental constraints preclude widening beyond existing roadway widths.
- Except within Kaunakakai Town and for clear safety reasons, urban-standard curbs, gutters, and sidewalks shall not be required on the island of Molokai. Instead, roadway standards, which shall reflect the island’s rural character, shall be incorporated as is appropriate. Grassed shoulders shall be allowed without cubs. Sidewalks shall be separated

from roadways by a minimum 2-foot wide planting strip along residential streets, and a minimum 4-foot wide planting strip along highways.

- Provide bridges instead of fords on Kamehameha V highway at Kapualei and Pukoo for safety purposes. ^{140, 2001}

Anticipated Costs for the Future

The *County of Maui: Fiscal Year 2002 Budget* states that the total construction costs for the resurfacing project are of \$1,415,000 and the total costs for the roadway extension are of \$2,200,000. ^{50, 2001}

Table 5.121 – Molokai Six Year Road Capital Improvement Program: 2002

Fund Source: C = County B = G.O. Bonds

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Road Improvements			
Kaunakakai Drainage	1,200 B	2,000 B	3,200 B
		500 C	500 C
Molokai District Road Resurfacing	200 C	1,000 C	1,200 C

Source: *County of Maui: Fiscal Year 2002 Budget*

Problems, Issues and Opportunities Associated with Costs

See Maui County Roads Summary for more information.

Compare Visitor and Resident Impact

See Maui County Roads Summary for more information.

Major Assumptions

According to the *County of Maui: Fiscal Year 2002 Budget*, anticipated life for the resurfacing is of 10 years, and 20 years for the roadway extension. ^{50, 2001}

County of Maui – Molokai – Airports

Present Capacity and Usage

According to the *State Airport Systems Plan*, the Island of Molokai is home to two of the four secondary airports of Maui County.^{127, 1998}

According to the *Airport Division Department of Transportation*, Molokai Airport occupies 288 acres on the central plateau of the island of Molokai. The airport has two runways that accommodate commuter/air taxi and general aviation activities, as well as some military flights. The passenger terminal complex and general aviation facilities are north of the runway intersection; the passenger terminal complex is near the principal runway and the general aviation facilities are near the crosswind runway. Separate access roadways provide vehicular access to these two areas, each connecting with Keonelele Avenue. Existing facilities are generally adequate to meet foreseeable demand; therefore, there are no plans for significant improvements except those commensurate with increases in demand.

Kalaupapa Airport occupies 55 acres on the northern peninsula of Molokai, two miles north of the Kalaupapa community. The airport serves commuter/air taxi operations and some air cargo operations. Facilities at the airport include a single runway, a small passenger terminal, and airport support areas.^{127, 1998}

The following table was taken from the *State Airports, Harbors, and Highways 2001* book.^{37, 2001}

Table 5.122 – MOLOKAI AIRPORT ACTIVITY STATISTICS

Fiscal Year 2001	Passengers	Cargo (tons)	Mail (tons)	Operations
Molokai	215,638	1,322	84	43,806
% Change	16.4%	7.0%	52.5%	2.0%
Kalaupapa	2,547	185	3	-
% Change	-	8.3%	100%	-

Source: *State Airports, Harbors, and Highways 2001*

Maui County Data Book 2001 gives statistics for aircraft operations at Molokai Airport.^{247, 2001}

Table 5.123 – Molokai Air Movements: 1996-2000

	1996	1997	1998	1999	2000
All Movements	49,221	44,667	49,353	49,184	44,691
Air Carrier	1,003	1,017	1,163	1,469	1,484
Air Taxi	34,753	31,290	30,080	30,286	27,385
General Aviation	10,744	10,844	15,425	14,169	11,869
Military	2,721	1,516	2,685	3,260	3,953

Source: *Maui County Data Book 2001*

Maui County Data Book 2001 gives statistics for operations activity at Molokai Airport. ^{247, 2001}

Table 5.124 – Molokai Airports Enplaned / Deplaned Statistics: 2001

	Molokai Airport		Kaluapapa Airport	
	Enplaned	Deplaned	Enplaned	Deplaned
Passengers	124,670	128,838	1,148	1,007
Cargo (tons)	485	847	12	190
Mail (tons)	5	171	0	5

Source: *Maui County Data Book 2001*

Existing Problems, Issues and Opportunities

In accordance with the Hawaii Tourism Product Assessment, there is limited air access from the other islands. ^{91, 1999}

Molokai Airport:

The Final Statewide Airport System Plan notes that improvements are constrained by a number of factors. Runway extension is dependent on FAA approval and the acquisition, exchange, or aviation easement of Hawaiian Home Lands. Finally, development and population increases projected for Molokai in the Molokai Community Plan are modest and will limit future demand for airport facilities. ^{127, 1998}

Kalaupapa Airport:

In accordance with the *Final Statewide Airport System Plan*, this airport is likely to continue to be served only by commuter airlines. Air service to Kalaupapa and airport improvements is constrained by an agreement between the Department of Transportation and the National Park Service because the airport is located within the Kalaupapa National Park. Residents of the Kalaupapa Settlement have placed a limit on visitors to 100 daily. Kalaupapa airport does not have a control tower. ^{127, 1998}

Future and Planned Usage

According to the *State Airports, Harbors, and Highways* it is necessary to facilitate the rapid, safe and economical movement of people and goods into,

within, and out of the state by providing and operating transportation facilities and supporting services.^{37, 2001}

The objectives according to the *Molokai Community Plan* include improving and expanding facilities at the existing airport rather than pursuing an alternate airport site as well as maintaining the existing practice of allowing free overnight parking on an unimproved grassy area at the airport.^{140, 2001}

Final Statewide Airport System Plan states the following:

Molokai Airport:

- If demand were to increase dramatically because of tourism or other influences, both the existing runway and passenger terminal facilities would need to be expanded significantly.

Kalaupapa Airport:

- The development of perimeter fencing and PAPI facilities.
- To comply with the wishes of the community and to minimize disturbance to the surrounding national park, no other significant improvements are currently planned.^{127, 1998}

Future and Planned Requirements or Changes

Molokai Airport:

According to the *Final Statewide Airport System Plan*, the future programs for the Molokai Airport are: runway extension, access road & evacuation road improvements, and noise compatibility program. Molokai Airport will require terminal facility upgrades and the removal of the displaced threshold. The removal of the threshold will effectively lengthen the runway. This action will, however, require the relocation of the two residences in compliance with FAA design standards. Acquisition of additional land is proposed. Terminal facilities planned for improvements include: passenger terminal redevelopment, access road improvements, and parking lot improvements. Runway extension is dependent on FAA approval and the acquisition, exchange, or aviation easement of Hawaiian Home Lands. According to the Molokai Community Plan projection of development and population are modest and will limit future demand.

Kalaupapa Airport:

The improvements planned for Kalaupapa Airport include the development of the perimeter fencing and PAPI facilities. Constraints preclude major airport development and the future CIP projects will focus on safety and compliance issues.^{127, 1998}

Anticipated Costs for the Future

The Final Statewide Airport System Plan states that with the Molokai Airport's three programs: runway extension, access road & evacuation road

improvements, and noise compatibility program, the total would be approximately \$14.36 million.^{127, 1998}

Problems, Issues and Opportunities Associated with Costs

According to the *DRAFT Hawaii Statewide Transportation Plan, State of Hawaii Department*, as provided in Section 261-5(a), Hawaii Revised Statutes, the DOT is required to generate revenues sufficient to meet all of the expenditures of the statewide system of airports. State airports are thus developed, operated, and maintained on a self-sustaining basis. The three sources of revenue available to the airports division of the DOT are the Airport Special Fund, grants from the federal government through the FAA, and state revenue bonds. Of these, only the Airport Special fund can be used for operation and maintenance on an ongoing basis. All three can be used for capital improvements. Federal grants can sometimes be used for major non-recurring operations and maintenance expenditures.^{101, 2002}

Compare Visitor and Resident Impact

According to the *Final Statewide Airport System Plan*, Hawaii's airports should reflect the local culture, constantly reminding passengers of where they are and the special ambiance. Hawaii residents expect and deserve a user- friendly air travel experience for holiday and business purposes.^{127, 1998}

Major Assumptions

The *Final Statewide Airport System Plan (SASP)* sees that there is a potential for increase demand will remain low therefore existing facilities will be adequate to meet these demands.

Facility development assumptions for SASP: This airport may be required by circumstances to modify and constrain its operations to match its present airfield configuration and capacity. A situation may arise in which only safety and compliance projects will be feasible because of constraints.^{127, 1998}

County of Maui – Molokai – Harbors

Present Capacity and Usage

Table 5.125 – Molokai Harbor Statistics

Island and harbor	Harbor entrance depth (feet)	Depth (feet)	Length (feet)	Width (feet)	Piers (linear feet)	Shedded	Open
Molokai: Kaunakakai	23	23	1,500	600	691	7.4	129

Source: 2001 State of Hawaii Data Book

According to the *State Airports, Harbors, and Highways*, there is 128,400 tons of cargo passing through Kaunakakai Harbor. The Harbor Special Fund net income in 2000 was \$23,197,089. The Island of Molokai received 74,934 short tons of cargo in the year 2001.^{37, 2001}

Existing Problems, Issues and Opportunities

As stated in the *State Airports, Harbors, and Highways* the DOT is required by law to generate its own monies to fund programs and projects. Revenue sources are fees and charges for wharf age, dockage, demurrage, and the rental of land and wharf space at the state’s commercial harbors and various service charges, permits and licenses. 5% of special fund’s gross revenues after debt service are contributed to the State General Fund for central services. Since the Capital Improvement Program is large, the DOT continues to rely on reimbursable General Obligation Bonds and federal aid to help fund programs and projects.^{37, 2001}

Future and Planned Usage

In accordance with the *State Airports, Harbors, and Highways* it is necessary to facilitate the rapid, safe, and economical movement of people and goods into, within, and out of the state by providing and operating transportation facilities and supporting services.^{37, 2001}

According to the *Molokai Community Plan* the objectives include:

- Encourage the expansion of Kaunakakai Harbor.
- Develop Hale O Lono Harbor for recreational purposes and ensure public access, while maintaining its ability to provide back-up commercial capacity to Kaunakakai.^{140, 2001}

Future and Planned Requirements or Changes

According to the *Molokai Community Plan* the implementing actions:

- Implement plans for expansion of Kaunakakai Harbor.
- Install navigational lights at Hale O Lono Harbor.^{140, 2001}

Anticipated Costs for the Future

According to the *State Airports, Harbors and Highways* the special maintenance projects for Kaunakakai Harbor is \$128,400.^{37, 2001}

Problems, Issues and Opportunities Associated with Costs

According to the *DRAFT Hawaii Statewide Transportation Plan, State of Hawaii Department* financing for the water-related transportation facilities comes from two primary sources. The Harbors Special Fund is used to finance the operations and maintenance as well as the capital improvement program for the harbor system. The state also uses revenue bonds to fund its capital improvement program. The harbor revenue bonds are collateralized by a charge and lien on the gross revenues of the program and upon all improvements and funds and securities created in whole or in part from the revenues or from the proceeds of the bonds. The Certificate requires that the Harbor Division impose, prescribe and collect revenues that will yield net revenues and taxes at least equal to 1.35 times the total interest, principal and sinking fund requirements for the ensuing 12 months.^{101, 2002}

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Harbors element.

Major Assumptions

No information was uncovered regarding the comparison of visitor and resident impacts for the Harbors element.

County of Maui – Molokai – Parks

Present Capacity and Usage

According to the *National Park Service Statistical Abstract*, the number of visits to the Kalaupapa National Historic Park was of 63,006 for the year 2001. It has a gross area of 10,778.88 acres, from which, 22.88 acres is Federal land, and 10,756 acres is non-Federal land.^{136, 2002}

Existing Problems, Issues and Opportunities

See Hawaii State and County of Maui Parks Summaries for more information.

Future and Planned Usage

According to the *County of Maui: Fiscal Year 2002 Budget*, the Molokai region plans to complete construction of a baseball/soccer field at Duke Maliu Regional Park.^{50, 2001}

Future and Planned Requirements or Changes

See Hawaii State and County of Maui Parks Summaries for more information.

Anticipated Costs for the Future

According to the *County of Maui: Fiscal Year 2002 Budget*, total construction costs for the completion of the Duke Maliu Regional Park are of \$589,000.^{50, 2001}

Table 5.126 – Molokai Six Year Parks and Recreation Capital Improvements Program: 2002

Fund source G.O. bonds

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Parks and Recreation			
Molokai Parks Base yard	350	0	350
One Alii Park Improvements	200	0	200

Source: *County of Maui: Fiscal Year 2002 Budget*

Problems, Issues and Opportunities Associated with Costs

According to the *County of Maui: Fiscal Year 2002 Budget*, bids were opened in November 2000 with the low bid exceeding the funds available. The contractor agreed to hold his bid price until July 2001.^{50, 2001}

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Parks element.

Major Assumptions

According to the *County of Maui: Fiscal Year 2002 Budget*, anticipated life for the Duke Maliu Regional Park is of 30 years.^{50, 2001}

As stated in the *National Park Service Statistical Abstract* the 2002 forecast for the Kalaupapa National Historic Park is of 66,749 visits, 5.94% more than in the year 2001. The forecast of the year 2003 is of 64,510 visits.^{136, 2002}

County of Maui – Molokai – Police, Fire and Emergency Services

Present Capacity and Usage

Police

The Maui County Department of Police gives the following statistics.^{90c, 2000}

Table 5.127 – MOLOKAI POLICE DISTRICT MEASURES

	FY 2001 Actual	FY 2002 To Date
Personnel	28.3	29
Calls for Service	4737	2382
Documented Cases	2660	1374
Moving Citations	736	406
Parking Citations	40	25

Source: Maui County Department of Police

Fire

Maui County Department of Public Works Fiscal Year 2001 Budget gives the following statistics showing call activity for the fire department on the Island of Molokai.^{141, 2002}

Table 5.128 – MOLOKAI DEPARTMENT OF FIRE CONTROL DISTRICT MEASURES

	FY 1999 Actual	FY 2000 Actual	FY2001 Estimate
Fires	93	41	100
Rescues (non-fire related)	14	8	15
Emergency medical services	370	303	300
Hazmat response	2	0	5
False calls (any alarm received for which response was unnecessary)	13	12	5
Company assists (another fire company responds with primary company to assist with an emergency)	46	59	100
Other calls (miscellaneous services such as removing traffic hazards)	50	41	50
AED (Automated external defibrillator) response	4	1	10

Source: *Maui County Department of Public Works Fiscal Year 2001 Budget*

Existing Problems, Issues and Opportunities

As with the majority of police, fire and emergency services statewide, funding is a source of concern.

Future and Planned Usage

According to the *Molokai Community Plan*, the following are objectives for Molokai.

- Improve public health and safety-related services, which supports the well-being and health consciousness of the community.
- Provide enhanced medical and mental health services for the community, with qualified professionals located on the island.
- Improve emergency rescue and transport services for the community.
- Encourage programs to minimize the risk of fire above Kaunakakai including a pasture management program, and public recreational areas such as an outdoor amphitheater or municipal golf course.^{140, 2001}

Future and Planned Requirements or Changes

As stated in the *Molokai Community Plan* the following actions are being implemented:

- Provide public health education programs with outreach services to more remote areas.
- Establish a community health center the East End between Ualaupe and Pukoo.
- Maintain and enhance Molokai General Hospital, particularly in the areas of provision of acute care and obstetrics services.
- Develop fire, police, and ambulance substations at the West End and at the East End, between Ualaupe and Pukoo.
- Establish fulltime mental health case management positions, psychologists, and psychiatrists on island, in the Department of Health.^{140, 2001}

Anticipated Costs for the Future

The *Fiscal Year 2003 Budget* provides the following capital improvements program chart. Fund source is G.O. bonds.^{147, 2002}

Table 5.129 – Molokai Six year Police Station Capital Improvement Program: 2002

Dollars In Thousands	FY2003	FY2004-2008	TOTAL
Government Facilities			
Molokai Police Station Expansion		600	600

Source: County of Maui *Fiscal Year 2003 Budget*

Problems, Issues and Opportunities Associated with Costs

See Maui County Police, Fire, and Emergency Services Summary for information.

Compare Visitor and Resident Impact

See Maui County Police, Fire, and Emergency Services Summary for information.

Major Assumptions

See Maui County Police, Fire, and Emergency Services Summary for information.

County of Maui – Molokai – Visitor Accommodations

Present Capacity and Usage

The 2001 Visitor Plant Inventory states that Molokai’s condominium hotels comprise four of the island’s ten properties (40%), containing 39.7 percent of the island’s total units. “Other” visitor accommodations account for 20 percent of the island’s total and the largest number of units, 43.2% of Molokai’s rooms inventory. Individual vacation units also account for 20 percent of the island properties, but contributes only 1.4% of the island’s room inventory. A hotel, with 45 units and a bed and breakfast with 0.3% of the room inventory, round out the categories. Molokai has 43.2 percent of its rooms in the deluxe class, but none in the Luxury class.^{80, 2001}

The State of Hawaii Data Book 2001, provided the following tables on Visitor Accommodations.^{64, 2001}

Table 5.130 – Molokai Visitor Accommodations: 1999-2001

Year	Properties			Units		
	Total	Hotels	Condo	Total	Hotels	Condo
1999	11	6	5	558	327	231
2000	10	6	4	429	312	117
2001	10	1	4	292	45	116

Source: 2001 State of Hawaii Data Book

Table 5.131 – Molokai Hotel Room Occupancy Rates: 2000-2001

	Percent occupied
2000	42.72
2001	47.36

Source: 2001 State of Hawaii Data Book

Existing Problems, Issues and Opportunities

See Hawaii State and County of Maui Visitor Accommodations Summaries for more information.

Future and Planned Usage

See Hawaii State and County of Maui Visitor Accommodations Summaries for more information.

Future and Planned Requirements or Changes

See Hawaii State and County of Maui Visitor Accommodations Summaries for more information.

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Visitor Accommodations element.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding problems, issues and opportunities associated with costs for the future for the Visitor Accommodations element.

Compare Visitor and Resident Impact

According to the *Molokai Community Plan*, it would like to limit the visitor accommodation center to the West Molokai and require that any expansion approvals reflect the employment needs of the island's resident work force.^{140, 2001}

Major Assumptions

See Maui County Visitor Accommodations Summary for more information.

County of Maui – Molokai – Visitor Related Area

The Kalamaula Residence Lots – Unit 1 is a project proposed by the Department of Hawaiian Home Lands (DHHL). DHHL proposes to develop approximately 133 acres in Kalamaula, Molokai, for homestead lots. The projects are an integral part of a development plan for the entire District of Kalamaula. The residential component of the Kalamaula Development Plan will consist of 124 homestead lots each averaging one-acre on size. Upon completion of required infrastructure, homestead lots will be distributed to qualified beneficiaries of native Hawaii ancestry.

DHHL will improve existing and provide new roadways, drainage facilities, potable water storage and transmission systems. Sewage disposal will consist of a combination of a transmission system and cesspools as may be permitted by the State Department of Health. The development of basic infrastructure will be integrated, to the greatest practical extent, with the agricultural and commercial/industrial components proposed for Kalamaula.

Water

The Molokai Water System Phase 2-A provides storage and transmission of adequate volumes of potable water to the project site. Presently, a 12-inch water main transports water to the Kalanianaʻole Colony for on-site distribution. DHHL proposes to upgrade the on-site system with 12- and 8-inch water lines. The proposed system would be adequate to serve anticipated demand for residential and subsistence farming needs on a limited basis. Expansions to the proposed system may be needed in the future if crop production exceeds the system's capacity.

Wastewater

Existing homesteads in the Kalanianaʻole Colony have no central sewage disposal system. Residents use individual cesspools for wastewater disposal. The nearest sewage treatment facility is located approximately 1,000 feet to the east near Kaunakakai.

Solid Waste

Existing homesteads in the Kalanianaʻole Colony have no central sewage disposal system.

Storm Water

The project site falls within two drainage areas, the East and West Drainage Areas. The East Drainage Area consists of approximately 318 acres and two natural drainage channels which discharges runoff in the vicinity of the Kamehameha Coconut Grove and at a location approximately 800 feet east of the eastern project boundary. The West Drainage Area consists of

approximately 619 acres and contains three drainage features which discharge runoff Makai of Maunaloa Highway via existing bridges. Other than the five natural drainage features, there are no drainage structures on site.

Roads

Maunaloa Highway, a State owned two-lane improved roadway, provides access to the District of Kalamaula and is the “backbone” roadway in East Molokai. Existing unpaved roadways off Maunaloa Highway provides access to the project site. Existing traffic on Maunaloa Highway is minimal due the area’s minimal development.

DHHL proposes to provide two access roads from Maunaloa Highway to serve as the “backbone” with local connector roads leading to the individual parcels. The roadway system would be designed to County rural standards, i.e. no curbs or gutters but paved roadways for dedication to the County. The present roadway surface has been mass graded and is unpaved, without gravel surfaces in most areas.

Airports

Not applicable.

Harbors

Not applicable.

Parks

N/A

Fire and Police Protection

The Kalamaula area is serviced by two fire stations and one substation on Molokai. The Kaunakakai Fire Station is located about one-half mile from the project site. The station is staffed by a five-man crew and service is available 24 hours a day. The Hoolehua Fire Station is located seven miles away from the project site. Similarly, the station is staffed by a five-man crew and open 24 hours daily. The East End Substation is located 15 to 16 miles away from the project site, and has a crew of two men.

The Police Department is located adjacent to the fire stations on Molokai. The police station in Kaunakakai services the Kalamaula site. Two officers are assigned to the island of Molokai while one patrolman is assigned to the project area. At present, the County of Maui does not plan to increase police department staffing or facilities on Molokai. However, the area’s long-term police protection requirements may be re-evaluated as the population increases due the Kalamaula Houselots project.

Visitor Accommodation

N/A

Private Transportation

N/A

Energy

Kalamaula is served by Molokai Electric Company. A new generating plant is located adjacent to the Naiwa industrial park near the western boundary of Kalamaula. Electrical service to the project site will require extending the existing lines to service new residential lots in the area. Electricity would be provided by other means such as generators and solar energy collectors.

Coastal Water Quality

N/A

Marine Ecosystems Health

N/A

Forestry

N/A

Air Quality

Existing air quality at the site generally has very low levels of urban generated pollutants due to the site's low residential density and distance from the air emission sources. Other than localized short-term impacts from road, drainage improvement, and individual lot improvements activities, development of the site for homestead and pastoral use is not anticipated to have a significant adverse impact on the area's air quality.

Beach Erosion

N/A

Invasive Species

The vegetation throughout the majority of the property consists of open, low grassland with scattered koa-haole shrubs and kiawe trees. A dense stand of taller kiawe trees is found long the lower boundary.

Kalamaula Houselots project site is moderately sloping and supports an open, low grassland composed primarily of buffelgrass (*Cenchrus ciliaris*) and feather fingergrass (*Chloris virgata*), which is locally abundant in places. Woody components of the mixed grassland consist of scattered koa-haole shrubs, 3 to 7 feet tall, and a few kiawe trees (*Prosopis pallida*). The charred remnants of

kiawe tress, evidence of recent fires, are also occasionally encountered. One such brush fire occurred in 1992 and destroyed much of the area's vegetation.

Along the lower boundary on the western half, grassland is replaced by a band of somewhat dense kiawe forest, 18 to 30 feet tall. The grass and herbaceous cover become less dense under the trees.

There is very little of botanical concern on the houselots site and the proposed drainage channel area. The proposed uses are not expected to have a significant negative impact on the botanical resources. There are no botanical reasons to impose any restrictions, conditions, or impediments to the development of the two sites.

Natural / Scenic Resources

Located on the leeward slopes of east Molokai, the site affords unobstructed views towards Kaunakakai and the Pacific Ocean to the south and southeast, and the top of the East Molokai Range on cloud-free periods. The most prominent feature of the landscape in the area is Puu Luahine, a cinder cone that gently rises approximately 200 feet above the surrounding land.

Native Species

There are no rare or endangered wildlife known to inhabit the project site. Other than deer, pigs, and game birds that inhabit the uplands of Kalamaula, there are no other significant animal populations in the vicinity of the project.

County of Maui – Molokai – Private Transportation

Present Capacity and Usage

No information was uncovered regarding the present capacity and usage for Private Transportation.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Private Transportation.

Future and Planned Usage

No information was uncovered regarding the future and planned usage for Private Transportation.

Future and Planned Requirements or Changes

No information was uncovered regarding the future and planned requirements or changes for Private Transportation.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Private Transportation.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Private Transportation.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Private Transportation.

Major Assumptions

No information was uncovered regarding major assumptions for Private Transportation.

County of Maui – Molokai – Energy Systems

Present Capacity and Usage

See County of Maui Energy Systems Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Energy Systems Summary for information.

Future and Planned Usage

According to the *Molokai Community Plan*, the following are objectives:

- Accelerate the development of alternatives energy sources, such as a solar and wind to help reduce the dependence on oil and fossil fuels.
- Provide incentives to promote the use of alternative energy sources.
- Promote energy efficiency, conservation, and awareness programs.
- Encourage the development of alternative sources of energy by supporting programs to test their feasibility.
- Require the use of alternative energy, environmental design and energy saving devices in the development of new buildings, especially State and County buildings.
- Encourage the under grounding of existing overhead utility lines as well as the provision of underground utility lines in major new development.^{140, 2001}

Future and Planned Requirements or Changes

According to the *Molokai Community Plan*, the following are implementing actions:

- Adopt an updated building code requiring increased energy and water conservation.
- Provide loan programs/tax incentives to individuals or business using photovoltaic energy and other energy saving initiatives.^{140, 2001}

Anticipated Costs for the Future

No information was uncovered regarding anticipated costs for the future for the Energy Systems element.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Energy Systems Summary for information.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for the Energy Systems element.

Major Assumptions

No information was uncovered regarding major assumptions for the Energy Systems element.

County of Maui – Molokai – Sewer Systems

Present Capacity and Usage

The Sewer indicator has been combined with the Sewage indicator.

Existing Problems, Issues and Opportunities

N/A

Future and Planned Usage

N/A

Future and Planned Requirements or Changes

N/A

Anticipated Costs for the Future

N/A

Problems, Issues and Opportunities Associated with Costs

N/A

Compare Visitor and Resident Impact

N/A

Major Assumptions

N/A

County of Maui – Molokai – Coastal Water Quality

Present Capacity and Usage

No information was uncovered regarding the present capacity and usage for Coastal Water Quality.

Existing Problems, Issues and Opportunities

See County of Maui Coastal Water Summary for information.

Future and Planned Usage

See County of Maui Coastal Water Summary for information.

Future and Planned Requirements or Changes

See County of Maui Coastal Water Summary for information.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Coastal Water Quality.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Coastal Water Quality.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Coastal Water Quality.

Major Assumptions

No information was uncovered regarding major assumptions for Coastal Water Quality.

County of Maui – Molokai – Marine Ecosystem Health

Present Capacity and Usage

See County of Maui Marine Ecosystem Health Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Marine Ecosystem Health Summary for information.

Future and Planned Usage

The *Molokai Community Plan* desires to manage, protect, and where appropriate, restore reef habitats, fishponds, and other coastal resources unique to the Island of Molokai.^{140, 2001}

Future and Planned Requirements or Changes

The implementing actions for the *Molokai Community Plan* regarding marine health are:

- Establish marine conservation and fishing management programs and maintain Moomomi Dunes as a natural area reserve in perpetuity.
- Develop a comprehensive marine resource management program that considers the role of hatcheries, sanctuaries, and related projects and programs.^{140, 2001}

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Marine Ecosystem Health.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Marine Ecosystem Health.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Marine Ecosystem Health.

Major Assumptions

No information was uncovered regarding major assumptions for Marine Ecosystem Health.

County of Maui – Molokai – Forestry / Green Space

Present Capacity and Usage

See County of Maui Forestry and Green Space Summary for information.

Existing Problems, Issues and Opportunities

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Usage

See County of Maui Forestry and Green Space Summary for information.

Future and Planned Requirements or Changes

According to the *Molokai Community Plan* the development pre-suppression and suppression plans will help minimize the impacts of wild fires upon native species.^{140, 2001}

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Forestry / Green Space.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Forestry / Green Space.

Compare Visitor and Resident Impact

See County of Maui Forestry and Green Space Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Forestry / Green Space.

County of Maui – Molokai – Air Quality

Present Capacity and Usage

See County of Maui Air Quality Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Air Quality.

Future and Planned Usage

No information was uncovered regarding the future and planned usage for Air Quality.

Future and Planned Requirements or Changes

No information was uncovered regarding the future and planned requirements or changes for Air Quality.

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Air Quality.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Air Quality.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Air Quality.

Major Assumptions

No information was uncovered regarding major assumptions for Air Quality.

County of Maui – Molokai – Beach Erosion

Present Capacity and Usage

See County of Maui Beach Erosion Summary for information.

Existing Problems, Issues and Opportunities

No information was uncovered regarding the existing problems, issues and opportunities for Beach Erosion.

Future and Planned Usage

No information was uncovered regarding future and planned usage for the Beach Erosion element.

Future and Planned Requirements or Changes

No information was uncovered regarding future and planned requirements or changes for the Beach Erosion element.

Anticipated Costs for the Future

See County of Maui Beach Erosion Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Beach Erosion Summary for information.

Compare Visitor and Resident Impact

See County of Maui Beach Erosion Summary for information.

Major Assumptions

See County of Maui Beach Erosion Summary for information.

County of Maui – Molokai – Invasive Species

Present Capacity and Usage

According to the *Report to the 21st Legislature Regular Session 2001*, the following tables show the sources of invasive species on Molokai.^{58, 2001}

Table 5.132 – Molokai Invasive Species Committee Target Species: 2002

Species Common Name	Source
Pampas grass	South America
Cat's claw	Asia
New Zealand Flax	New Zealand
Fountain Grass	Africa
Potential Invasive Species	
Miconia	South and Central America
Asiatic Clam	Asia
Coqui	Caribbean
Greenhouse frog	Caribbean
Red imported fire ant	Brazil
Brown tree snake	Indonesia, South Pacific Islands, Australia

Source: Molokai Invasive Species Committee

Existing Problems, Issues and Opportunities

As stated in the *Report to the 21st Legislature Regular Session 2001*, Pampas grass was identified in Maunaloa and all plants were removed MoMISC surveyed the area and established an agreement with the landowner for follow-up surveys. The second known population of New Zealand flax was surveyed and GPS mapped in Molokai Forest Preserve, and MoMISC coordinated with Maui DLNR to eradicate this population. One Caribbean frog was captured, and MoMISC investigated one population of giant reed for eradication.^{58, 2001}

Future and Planned Usage

See County of Maui Invasive Species Summary for information.

Future and Planned Requirements or Changes

See County of Maui Invasive Species Summary for information.

Anticipated Costs for the Future

See County of Maui Invasive Species Summary for information.

Problems, Issues and Opportunities Associated with Costs

See County of Maui Invasive Species Summary for information.

Compare Visitor and Resident Impact

See County of Maui Invasive Species Summary for information.

Major Assumptions

No information was uncovered regarding major assumptions for Invasive Species.

County of Maui – Molokai – Natural / Scenic Resources

Present Capacity and Usage

Native Extinctions

Moomomi Preserve

Moomomi Preserve (921 acres), created in 1988, is an intact beach and sand dune where communities of native grasses and shrubs grow more rare coastal species than in any other single place in the main Hawaiian Islands. The preserve harbors more than 22 native Hawaiian plant species (four of which are globally rare or endangered), as well as an important nesting site for the endangered green sea turtle. The Hawaiian owl (pueo) is one of the few native land birds that can still be observed regularly at Moomomi. Native shorebirds, like sanderlings and plovers, and seabirds, like the great frigatebird (iwa) can also be seen along the shoreline. Moomomi Preserve is managed in partnership with the State Department of Land and Natural Resources through the Natural Area Partnership Program.

Riparian / Wetlands

Pelekunu Preserve

According to the *Places We Protect – Watershed Partnerships and Preserves* 2002, in 1987, The Nature Conservancy purchased the area now known as Pelekunu Preserve (5,714 acres) principally from Molokai Ranch, Ltd. Located along Molokai's extremely rugged north coast, featuring the tallest sea cliffs in the world, Pelekunu Preserve protects one of Hawaii's last remaining free-flowing streams, home to at least seven native aquatic species.

Pelekunu Preserve is managed in partnership with the State Department of Land & Natural Resources through the Natural Area Partnership Program.^{149, 2002}

Existing Problems, Issues and Opportunities

Places We Protect notes a healthy forest requires dedicated management. Pigs, goats, deer, and invasive weeds threaten the current stability of the West Maui watershed. Unauthorized human use, introduction of insects and plant diseases are other significant problems.^{149, 2002}

Future and Planned Usage

Places We Protect notes that with half of the state's conservation lands under public ownership and half under private ownership, public-private partnerships like those on Maui represent the future of conservation in Hawaii. The focus of the Molokai partnership is protecting and enhancing high quality natural rain forest communities using the traditional Hawaiian land approach. Such an approach will protect water areas from the mountaintop to the sea.^{149, 2002}

Future and Planned Requirements or Changes

Riparian / Wetlands

The Kamalo/Kapualei project will help the landowners manage their sections of the water:

- Protecting the upper forest with a contour fence,
- Reducing goat populations, and
- Establishing a monitoring system to help with long-range planning. Increased streams directly benefit the ahupuaa landowners and tenants by having water available and economic activities while reducing the siltation that impacts the near-shore fishponds.^{149, 2002}

Anticipated Costs for the Future

No information was uncovered regarding the anticipated costs for the future for Natural and Scenic Resources.

Problems, Issues and Opportunities Associated with Costs

No information was uncovered regarding the problems, issues and opportunities associated with costs for Natural and Scenic Resources.

Compare Visitor and Resident Impact

No information was uncovered regarding the comparison of visitor and resident impacts for Natural and Scenic Resources.

Major Assumptions

No information was uncovered regarding major assumptions for Natural and Scenic Resources.

ID	TITLE	DATE	AGENCY
1	Maui Community Plan Update Infrastructure Assessment	September-92	Maui - Department of Planning
2	West Maui Master Plan for Wastewater Collection, Treatment and Disposal	June-90	Maui - Department of Public Works
3	Maui Public Facilities Assessment; Final Report	July-92	Maui - Department of Planning
4	Kauai General Plan	November-00	Kauai - Department of Planning
6	State Land Use District Boundary Review: Oahu	January-92	State - Office of Planning
8	State Land Use District Boundary Review: Executive Summary, Kauai	January-92	State - Office of Planning
9	State Land Use District Boundary Review: Kauai	January-92	State - Office of Planning
10	State Land Use District Boundary Review: Executive Summary: Maui, Molokai, Lanai	January-92	State - Office of Planning
11	State Land Use District Boundary Review: Maui, Molokai, Lanai	January-92	State - Office of Planning
12	State Land Use District Boundary Review: Executive Summary, Hawaii	January-92	State - Office of Planning
13	State Land Use District Boundary Review: Hawaii	January-92	State - Office of Planning
14	DUPLICATE The General Plan of the County of Maui: 1990 Update	June-90	Maui - Department of Planning
15	DUPLICATE The General Plan of the County of Maui: 1990 Update	November-90	Maui - Department of Planning
16	Lahaina Community Plan of the County of Maui	December-83	Maui - Department of Planning
17	Kahoolawe Community Plan of County of Maui	May-95	Maui - Department of Planning
18	Kihei-Makena Community Plan: County of Maui	March-98	Maui - Department of Planning
19	DUPLICATE The General Plan of the County of Maui: 1990 Update	September-90	Maui - Department of Planning
20	Maui County Community Plan Update Program Socio-Economic Forecast Report	July-92	Maui - Department of Planning
21	DUPLICATE - General Plan 1990: County of Maui	January-90	Maui - Department of Planning
22	Maui County Community Plan Update Program Socio-Economic Forecast Report: Final Report	January-94	Maui - Department of Planning
23	DUPLICATE - Kihei-Makena Community Plan: County of Maui	March-98	Maui - Department of Planning
24	DUPLICATE Molokai Community Plan: County of Maui	January-84	Maui - Department of Planning
25	DUPLICATE - Makawao-Pukalani-Kula Community Plan: County of Maui	October-81	Maui - Department of Planning
26	DUPLICATE - Lanai Community Plan: County of Maui	April-83	Maui - Department of Planning
27	County of Hawaii General Plan Revision	December-01	Hawaii - Department of Planning
28	General Plan: City and County of Honolulu	January-92	Honolulu - Department of Planning and Permitting

29	The General Plan of the County of Maui	April-93	Maui - Department of Planning
30	Lanai Community Plan	December-98	Maui - Department of Planning
31	The Updated Wailuku-Kahului Community Plan	December-00	Maui - Department of Planning
32	DUPLICATE Kihei-Makena Community Plan	March-98	Maui - Department of Planning
33	Makawao-Pukalani-Kula Community Plan	July-96	Maui - Department of Planning
34	Paia-Haiku Community Plan	May-95	Maui - Department of Planning
35	West Maui Community Plan	February-96	Maui - Department of Planning
36	Hana Community Plan	July-94	Maui - Department of Planning
37	State Airports, Harbors and Highways	January-01	State - Office of Planning
38	Department of Water Supply: Water Quality Report for 2000	July-01	Maui - Department of Water Supply
39	The County of Hawaii Annual Report 1999-2000	June-00	Hawaii - Department of Planning
40	Department of Water Supply - County of Maui: Annual Report. Fiscal Year Ending June 30,2000.	June-00	Department of Water Supply
42	Statewide Framework for Updating the Hawaii Water Plan	February-00	Commission on Water Resource Management
43	Water Resource Planning	February-00	Commission on Water Resource Management
44	Water Resources on Oahu	January-01	Honolulu - Department of Planning and Permitting
45	Welcome to the Garden Island of Kauai - Access to Kauai County Agencies	January-00	Kauai - Department of Planning
46	Report to the Governor on the Effectiveness of the Capacity Development Strategy	July-01	Hawaii - Department of Planning
47	Water Plan 2020 - Department of Water: County of Kauai	March-01	Kauai - Department of Water Supply
48	Safe Drinking Water Query Results	April-02	Honolulu - Department of Planning and Permitting
49	Maui County: State of Hawaii	January-00	Maui - Department of Planning
50	County of Maui: Fiscal Year 2002 Budget	March-01	Maui - Department of Planning
51	County of Hawaii: 1999 - 2000 Annual Report	September-00	County of Hawaii

52	DEPARTMENT OF PARKS AND RECREATION	November-01	Honolulu - Department of Planning and Permitting
53	Honolulu Police Department 2000 Annual Report	September-00	Honolulu - Department of Planning and Permitting
54	Fiscal Year 2002 Operating Budget-Maui County	July-01	Maui - Department of Water Supply
55	Survey of Cruiseship Passengers in Hawaii-Fall 2000	March-01	State - Office of Planning
56	The Integrated Solid Waste Management Plan	January-91	State - Office of Planning
57	Hawaiian Streams: The Mauka to Makai Connection	April-02	State - Office of Planning
58	REPORT TO THE TWENTY-FIRST LEGISLATURE REGULAR SESSION OF 2002 ON PROGRESS REPORT ON EXPENDITURES AND EFFECTIVENESS OF INVASIVE SPECIES PROGRAMS FOR THE PERIOD JULY 1, 2001 TO OCTOBER 31, 2001	November-01	State - Office of Planning
59	PORT Hawaii Commercial Harbors System HANDBOOK	January-93	State - Office of Planning
61	Annual Report to the Twenty-First Legislature-Regular Session 2002/Hawaii Coastal Zone Management	December-01	State - Office of Planning
62	Hawaii Tourism Authority: 2001 Annual Report to the Hawaii State Legislature	December-01	State - Hawaii Tourism Authority
63	Joint State/County Maui Interim Transportation Plan	January-02	Maui - Department of Public Works
64	The State of Hawaii Data Book 2000: A Statistical Abstract	2001	State - Department of Business, Economic Development and Tourism
65	Long-Range Financial Plan and Solid Waste User Free Study	April-99	Honolulu - Department of Environmental Services
66	Koolaupoko: Sustainable Communities Plan	August-00	Honolulu - Department of Planning and Permitting
67	Annual Summary Hawaii Air Quality Data: 2000	January-00	State - Department of Health
68	Report to Legislature, Progress on the Study, Planning for Sustainable Tourism in Hawaii, January 2002	January-02	State - Department of Business, Economic Development and Tourism
69	DUPLICATE Draft Hawaii Statewide Transportation Plan	March-02	State - Office of Planning

70	Statewide Transportation Improvement Program: Fiscal Years 2002, 2003, and 2004	October-01	State - Office of Planning
71	Alternative Funding Mechanisms for Environmental Programs	January-02	State - Office of Planning
72	Hawaii Trail Analysis: Survey & Risk Management Data Profile	March-01	State - Department of Land and Natural Resources
74	Environmental Report Card 2001	January-01	State - Environmental Council
75	Identification of Rivers and Streams Worthy of Protection	November-01	State - Department of Land and Natural Resources
76	Potential Sources of Permanent Funding; REPORT TO THE TWENTY-FIRST LEGISLATURE REGULAR SESSION OF 2002 ON PROGRESS REPORT ON EXPENDITURES AND EFFECTIVENESS OF INVASIVE SPECIES PROGRAMS FOR THE PERIOD JULY 1, 2001 TO OCTOBER 31, 2001	January-02	State - Office of Planning
77	State Energy Resources Coordinator: Annual Report 2001	January-01	State - Department of Business, Economic Development and Tourism
78	2000 State of Hawaii: Facts and Figures	January-01	State - Department of Business, Economic Development and Tourism
79	150 Years of Aloha: Hawaii State Department of Health 2001 Annual Report	January-01	State - Department of Health
80	2001 Visitor Plant Inventory	April-02	State - Department of Business, Economic Development and Tourism
81	Task Force to Create a Master Plan for Water Quality and Flood Mitigation for Waimanalo	December-01	State - Department of Land and Natural Resources
82	What Could Hawaii Do With Teaming With Wildlife (TWW) Dollars?	January-00	Hawaii - Department of Planning
83	Relating to Watershed Protection	October-01	State - Department of Land and Natural Resources
84	Population and Economic Projections for the State of Hawaii to 2025	February-00	State - Department of Business, Economic Development and Tourism
85	Progress Report on Expenditures and Effectiveness of Invasive Species Programs	November-01	State - Department of Land and Natural Resources

86	Report to the Twenty-First Legislature Relating to Integrated Solid Waste Management	September-01	State - Department of Health
87	Annual Report to the Twenty-First Legislature Regular Session of 2002 Relating to the Forest Stewardship Program	November-01	State - Department of Land and Natural Resources
88	Analysis of Once-Per-Week Refuse Collection	April-99	Honolulu - Department of Environmental Services
89	An Inventory of Non-Native Timber Resources on Hawaii - A Supplement to the 1999 Waiakea and Hamakua Timber Inventory	January-01	State - DLNR Division of Forestry and Wildlife
90	Annual Report: Fiscal Year 1999-2000 - Public Utilities Commission	December-00	State - Public Utilities Commission
91	Hawaii Tourism Product Assessment	June-99	State - Hawaii Tourism Authority
92	Central Oahu Sustainable Communities Plan	February-02	Honolulu - Department of Planning and Permitting
93	East Honolulu Sustainable Communities Plan	April-01	Honolulu - Department of Planning and Permitting
94	Ewa Development Plan	August-97	Honolulu - Department of Planning and Permitting
95	Koolau Loa Sustainable Communities Plan	October-99	Honolulu - Department of Planning and Permitting
96	North Shore Sustainable Communities Plan	July-00	Honolulu - Department of Planning and Permitting
97	Waianae Sustainable Communities Plan	July-00	Honolulu - Department of Planning and Permitting
99	Annual Report to the Twenty-First Legislature 2001 Regular Session on Act 152 SLH 2001 (HB 2835, HD2, SD2, CD1) RELATING TO WATERSHED PROTECTION	October-02	State - DLNR Division of Forestry and Wildlife
100	Upcountry Town Center, Pukulani, Maui, Hawaii, Draft Environmental Impact Statement	April-02	Maui - Department of Planning
101	DRAFT Hawaii Statewide Transportation Plan, State of Hawaii Department of Transportation	March-02	State - Department of Transportation - Highway Division
102	Department of Transportation Annual Report 2000	January-00	State - Department of Transportation
103	Hawaii Coastal Erosion Management Plan (COEMAP)	January-00	State - Department of Land and Natural Resources

104	DRAFT Kailua Bay Advisory Council Master Plan	March-02	Kailua Bay Advisory Council
105	Final Technical Program Report	March-01	Kailua Bay Advisory Council
107	2000 Annual Visitors Research Report	2000	State - Department of Business, Economic Development and Tourism
108	ANNUAL REPORT TO THE TWENTY-FIRST LEGISLATURE REGULAR SESSION OF 2002 ON THE STATUS OF THE ISSUANCE OF INCIDENTAL TAKE LICENSES FOR ENDANGERED, THREATENED, PROPOSED, AND CANDIDATE SPECIES; AND THE CONDITION OF THE ENDANGERED SPECIES TRUST FUND	November-01	State- DLNR Division of Forestry and Wildlife
111	DUPLICATE Annual Summary Hawaii Air Quality Data	January-00	State - Department of Health (DOH)
112	Forest Inventory Information Needs Assessment for the State of Hawaii with Emphasis on the Island of Maui	April-00	USDA Forest Service
113	Observation of Asian Pollution Over Hawaii	March-01	Hawaii Institute of Geophysics and Planetology
114	Indicators of Environmental Quality	January-02	State - Department of Health (DOH)
115	Reply to ASK-AN-EARTH-SCIENTIST	January-01	Hawaii Institute of Geophysics and Planetology
117	Breathing Protection During Volcanic Air Pollution	January-02	American Lung Association
118	Maui Clean Air Coalition	December-98	Maui Clean Air Coalition
119	DUPLICATE WORLD HEALTH ORGANIZATION CITIES AND A HEALTH RESEARCH PROGRAM	March-00	City and County of Honolulu
120	What is baseline Air Quality?	January-00	Climate Monitoring and Diagnostics Laboratory
121	THE STATE OF THE AIR 2001 IN HAWAII	January-02	American Lung Association
122	Environmental Health - Clean Air Branch	January-02	State - Department of Health
123	Watershed Protection and Management Program	October-01	State - DLNR Division of Forestry and Wildlife
124	USGS Geological Survey Programs in Hawaii & the Pacific	November-96	U.S. Geological Survey
125	Rx for Hawaii's Dry Forests: It's Not Limiting Grazing	June-00	Society of American Foresters

126	The Lowland Mesic Forests	March-02	State - DLNR Division of Forestry and Wildlife
127	Final Statewide Airport System Plan	June-98	State - Department of Transportation
128	Hawaii Sea Grant College Program	May-02	County of Hawaii
129	Division of Boating and Ocean Recreation - DBEDT Sustainable Tourism Analysis	May-02	State - Department of Land and Natural Resources
130	Honolulu Fire Department Response to the DBEDT Sustainable Tourism Analysis	May-02	Honolulu - Fire Department
131	State Parks of the Islands	January-02	State - Department of Land and Natural Resources
132	Maui Invasive Species Committee (MISC) Pulling Together Initiative - 2002 Project Proposal	October-02	US Fish and Wildlife - Ecological Division
134	Impact on Alien Plants on Hawaii's Native Biota	May-98	University of Hawaii
135	Annual Report - Department of Public Works & Waste Management - 2000-2001	January-02	Maui - Department of Public Works
136	National Park Service Statistical Abstract 2001	January-02	National Park Service
137	Analysis of Renewable Portfolio Standard Options for Hawaii.	March-01	State - Department of Business, Economic Development and Tourism
139	The Eight Main Hawaiian Island and CRAMP study sites	September-00	Hawaii Institute of Marine Biology
140	Molokai Community Plan 2001	December-01	Maui - Department of Planning
141	Fiscal Year 2001 Budget	May-02	Maui - Department of Public Works
142	County of Hawaii Data Book - 2001	October-01	County of Hawaii
144	Big Island of Hawaii Flora and Fauna	January-01	Hawaii State Vacation Planner
145	Mauna Kea Silversword	January-02	National Wildlife Federation
146	Hawaii's Endangered Species	January-02	Maui - Department of Public Works
147	FY 2003 Budget	March-02	Maui - Department of Planning

148	The Hawaiian Endangered Bird Conservation Program The Hawaiian Endangered Bird Conservation The Hawaiian Endangered Bird Conservation Program Five-Year Program (2001-2005) Five-Year Workplan (2001 – 2005)	October-01	State - Department of Land and Natural Resources
149	Places We Protect - Watershed Partnerships and Preserves	January-02	The Nature Conservancy
150	The Dirty Dozen: America's Least Wanted	January-01	Nature Serve
151	The Hawaiian Ecoregion: A Crucible of Evolution	September-96	Sierra Club, Hawaii Chapter
152	Hawaii's Endangered Species	March-00	Bishop Museum
153	Water for Life: The History and Future of Water on Oahu.	January-02	Honolulu - Board of Water Supply
154	Report to the World Health Organization	March-00	City and County of Honolulu
155	Vision Projects FY2002	March-02	City and County of Honolulu
156	H3: The Island Interstate	August-93	U.S. Department of Transportation
157	Appendix for Hawaii	January-01	Surfrider Foundation
158	Oahu Water Recycling May Expand	August-01	Honolulu Star Bulletin
159	Recycling Water is Smart Thinking	August-01	Honolulu Star Bulletin
160	About Honolulu's Clean Water Program	January-02	City and County of Honolulu
161	Mayor Jeremy Harris' State of the City Address	January-02	Honolulu Advertiser
162	Recreation	January-01	Hawaii State Vacation Planner
163	Oahu in Focus	January-02	Destinations2go.com
164	Department Organization: Emergency Medical Services Division	February-97	Oahu - Department of Emergency Services
165	Finance Division	January-02	Honolulu - Police Department
166	STATE OF THE STATE ADDRESS BY GOVERNOR BENJAMIN J. CAYETANO BEFORE THE JOINT SESSION OF THE TWENTY-FIRST HAWAII STATE LEGISLATURE	January-02	State - Office of the Governor
167	STATE EMERGENCY MEDICAL SERVICES & INJURY PREVENTION SYSTEM	October-01	State - Department of Health (DOH)

168	Chapter Eco-activism	October-00	Surfrider Foundation
169	[Flood Control and Drainage] Flooding and Other Natural Hazards	December-01	County of Hawaii
170	Research Projects	September-01	State - Department of Health (DOH)
171	Addendum to the Integrated Solid Waste Management Plan for the County of Hawaii	May-02	County of Hawaii
172	Atlas of Hawaii	December-98	Juvik and Juvik
173	Place Names of Hawaii	December-76	Pukui, Elbert and Mookini
174	Hawaiian Word Processing Tools: Hawaiian Language Fonts	December-95	Guava Graphics
175	Hawaiian Dictionary: Hawaiian-English English-Hawaiian	December-86	Pukui and Elbert
177	Strategic Plan Update for Hawaii's Environmental Protection Programs	August-01	State - Department of Health
178	Hawaii Marine Life Conservation Districts	January-01	State - Department of Land and Natural Resources
179	Hawaii- Department of Aquatic Resources Agency	January-01	State - Department of Land and Natural Resources
180	Hawaii Stock Management (USDoC-NOAA)	January-01	USDoc-NOAA
181	National Marine Fisheries Honolulu Laboratory	January-01	National Marine Fisheries Service
182	Hawaiian streams: the Mauka to Makai Connection	January-01	State - Department of Land and Natural Resources
183	Alien Species in Hawaiian Streams	January-01	State - Department of Land and Natural Resources
184	Hawaii's Native Stream Animals	January-01	State - Department of Land and Natural Resources
185	Economic Analysis of Critical Habitat Designations for 76 Plants from the Islands of Kauai and Niihau	January-02	US Fish and Wildlife Service
186	Wetlands	January-01	State - Department of Business, Economic Development and Tourism
187	Company; Kawai Nui Marsh (' www.aecos.com/KOOLAU/Kawai_Nui_2.html)	January-01	Aecos, Co.
188	Hawaiian Islands Initiative	January-01	Ducks Unlimited
189	Kawa Stream TMDL Project Stream Assessment Report	January-02	Aecos, Co.
190	Kawa Stream (' www.pixi.com/~isd/KawaStr.html)	January-01	Pixi, Co.

191	County of Maui FY 2003 Budget	December-02	Maui - Mayor's Office
193	Comprehensive Annual Financial Report	June-01	County of Hawaii
194	Executive Supplemental Budget FY 2003	January-02	State of Hawaii - Department of Budget and Finance
195	Coral Reef Assessment and Monitoring Program (CRAMP) - Final Report 1998-99	January-00	Hawaii Institute of Marine Biology
196	Coral Reef Assessment and Monitoring Program (CRAMP) - Final Report 1999-2000	January-01	Hawaii Institute of Marine Biology
197	Fire Department	December-01	Hawaii - Department of Fire Control
198	DUPLICATE Department of Parks and Recreation	December-01	Hawaii - Department of Parks and Recreation
199	Police Department	December-01	Hawaii - Police Department
200	Department of Public Works	December-01	Hawaii - Department of Public Works
201	Department of Water Supply	December-01	Hawaii - Board of Water Supply
202	State of Hawaii 303(d) List of Water Quality Limited Waters - 1998	December-98	State - Department of Health
203	Learning to Live with the Dynamic Hawaiian Shoreline (http://www.soest.hawaii.edu/SEAGRANT/LiveWithTheHawaiianShoreline/index.htm)	April-02	SOEST
204	Hawaii's Most Invasive Horticultural Plants: An Introduction	May-01	State - Department of Land and Natural Resources
205	Big Island Invasive Species Committee	February-00	U.S. Geological Survey
206	Kapalua Mauka	December-01	Maui - Department of Planning
207	DUPLICATE Waikiki Beach Walk	January-02	Honolulu - Department of Planning and Permitting
208	DUPLICATE Ocean Bay Plantation	June-02	Kauai - Department of Planning
209	Voyager Submarines Hawaii Artificial Reef Installation	April-98	Hawaii - Department of Planning
210	Hawaiian Electric Company, Inc. Integrated Resource Plan 1998-2017	January-98	Hawaiian Electric Company
211	Kauai Electric 1997 Integrated Resource Plan	April-97	Kauai Electric
212	The State of Hawaii Airport Activity Statistics Calendar Year 2001	May-01	State - Department of Transportation

213	Final Supplemental Environmental Impact Statement Mauna Lani Cove Mauna Lani Resort South Kohala, Hawaii	October-90	Hawaii - Department of Planning
214	Environmental Impact Statement Kohanaiki Mauka Kohaniki, North Kona, Hawaii	October-91	Hawaii - Department of Planning
215	Final Environmental Impact Statement and Site Selection Study for the New Hanalei Middle School	May-99	Hawaii - Department of Accounting and General Services
216	Supplemental Environmental Impact Statement Kukuiula Bay Resort Kukuiula Planned Community Koloa, Kauai, Hawaii	August-98	Kauai - Department of Planning
217	Final Impact Statement Kauai Electric Lihue Energy Service Center	March-99	Kauai - Department of Planning
218	Ocean Bay Plantation at Hanamaulu; Hanamaulu, Kauai, Hawaii	June-02	Kauai - Department of Planning
219	Waikiki Development Plan Final Impact Statement	November-01	Honolulu - Department of Planning
220	Waikiki Beach Walk Waikiki, Oahu, Hawaii Final Impact Statement	January-02	Honolulu - Department of Planning
221	Final Impact Statement Voyager Submarines Hawaii Artificial Reef Installation	April-98	State - Department of Land and Natural Resources
222	Final Environmental Impact Statement for the Supplemental Waiialua-Haleiwa Wastewater Facility Plan	June-96	Honolulu - Department of Wastewater Management
223	Final Environmental Impact Statement Lanai Airport Master Plan Improvements; Lanai Airport, Lanai, Hawaii	December-90	State - Department of Transportation
224	County of Maui: Kalamaula Landfill Closure Project; Draft Environmental Impact Statement	February-93	Maui - Department of Public Works and Waste Management
225	Kihei Upcountry Maui Highway; Final Environmental Impact Statement	February-02	State - Department of Transportation
226	Kapalua Mauka; Draft Environmental Impact Statement	December-01	Maui - Department of Planning
227	Kona Civic Center Site Selection Study / Final Environmental Impact Statement	August-94	Hawaii - Department of Accounting and General Services
228	Final Environmental Impact Statement for Kohala Water Transmission System North And South Kohala Districts, Island of Hawaii	November-95	Hawaii - Board of Water Supply
229	Hawaii Energy Strategy 2000	December-00	State - Department of Business, Economic Development and Tourism
230	Hanalei Pier Reconstruction Final Environmental Impact Statement	June-90	State - Department of Land and Natural Resources
231	Hanalei Excursion Boat Staging Operations; Hanalei, Kauai; Draft Environmental Impact Statement	October-90	Kauai - Department of Planning
232	Draft Environmental Impact Statement Kapalawai, Kauai, Hawaii; Kapalawai Resort	October-99	Kauai - Department of Planning

233	Draft Environmental Impact Statement Kalamaula Residence Lots- Unit 1; Kalamaula, Molokai, Hawaii	May-95	State Department of Hawaiian Home Lands
234	Upcountry Town Center, Pukulani, Maui, Hawaii; Draft Environmental Impact Statement	April-02	Maui - Department of Planning
235	Manele Golf course and Golf Residential Project, Lanai, Hawaii; Final Environmental Impact Statement	October-91	Maui - Department of Planning
236	Kaupulehu Resort Final Environmental Impact Statement	October-94	Hawaii - Department of Planning
237	Final Environmental Impact Statement Amanresort Waikoekoe and Kanahonua, Hamakua district, Hawaii	February-94	Hawaii - Department of Planning
238	Maniniowali Residential Community North Kona, Hawaii Final Environmental Impact Statement	February-92	Hawaii - Department of Planning
239	DUPLICATE County of Hawaii Data Book	October-01	Hawaii - Department of Research and Development
240	Annual Report Fiscal Year 2000-2001	August-01	County of Hawaii
241	Primary Urban Center Development Plan	May-02	Honolulu - Department of Planning and Permitting
242	The Hawaii State Plan: Recreation	May-91	State - Department of Land and Natural Resources
243	Funds Required for Reconstruction of Park Facilities 2002-2012	January-02	Honolulu - Department of Planning and Permitting
244	World Health Organization Cities and a Health Research Program	May-02	Honolulu - Emergency Services
245	Six-Year CIP and Budget FY 2003-2008	January-02	Honolulu- Department of Budget and Finance
246	DUPLICATE County of Maui Fiscal Year 2003 Budget	September-02	Maui- Mayor's Office
247	Maui County Data Book 2001	June-01	Maui Office of Economic Development
248	Hawaii's Implementation Plan for Polluted Runoff Control	July-00	State - Department of Health
249	Public Comment Draft 2002 List of Impaired Waters in Hawaii Prepared Under Clean Water Act 303d	August-02	State - Department of Health
250	Maui County Department of Fire Control	January-01	Maui - Department of Fire Control
251	Visit Your Parks Park Guide	October-02	Honolulu Advertiser
252	2001 The State of Hawaii Data Book	2002	State - Department of Business, Economic Development and Tourism

253	Transportation Plan for Oahu TOP 2025	April-01	Oahu Metropolitan Planning Organization and its Participating Agencies
254	Commission on Water Resource Management: Learn about the Water Commission- Frequently Asked Questions	January-11	State - Commission on Water Resource Management
255	The County of Hawaii Annual Report 1999-2000	January-01	Hawaii - Department of Public Works
256	The County of Hawaii Annual Report 2000-2001	January-01	Hawaii - Department of Public Works
257	Kauai Invasive Species Committee	January-02	Kauai Invasive Species Committee

ID c	FIRST NAME	LAST NAME	DATE	AGENCY
1	Deanne	Obatake	4/3/2002	Hawai'i Natural Heritage Program
2	Ben	Schlapeck	4/22/2002	State - Office of Planning
3	Fred	Pascua	4/17/2002	State - Office of Planning
4	Craig	Tasaka	4/25/2002	State - Office of Planning
5	Glen	Fukunaga	4/25/2002	State - Department of Health
6	Joan	Esposito	4/25/2002	State - Office of Planning
7	Iris	Ishida	4/23/2002	State - Office of Planning
8	Fred	Pascua	4/23/2002	State - Office of Planning
10	Fred	Pascua	4/17/2002	State - Office of Planning
11	Ron	Michols	4/13/2002	State - Office of Planning
12	Karen	Tanoë	4/13/2002	State - Office of Planning
13	Lisa	N/A	4/13/2002	Hawaii - Department of Planning
14	Eileen	n/a	4/16/2002	State - Office of Planning
15	Cathy	Tam	4/16/2002	State - Office of Planning
16	Chris	Kam	4/17/2002	State - Office of Planning
17	Stan / Shirley	n/a	4/13/2002	State - Office of Planning
18	Jeff	Hull	4/13/2002	State - Office of Planning
19	n/a	n/a	4/17/2002	State - Office of Planning
20	Glenn	Yasui	4/1/2002	State - Office of Planning
22	Steve	Kyono	4/1/2002	State - Office of Planning
23	Richard	Soo	5/3/2002	Oahu -Fire Department
25	Daniel	Quinn	6/4/2002	State - Office of Planning
26	Ian	Birnie	5/7/2002	State - Hawaii Tourism Authority
27	Thomas	Cunningham	5/7/2002	State - Hawaii Tourism Authority
28	Robert	Crowell	5/7/2002	Kauai - Department of Transportation - Harbor Division
29	David	Goode	5/7/2002	Maui - Department of Public Works
30	David	Craddick	5/7/2002	Oahu - Department of Water Supply
31	William	Balfour	4/30/2002	Oahu - Department of Parks and Recreation
32	Linnel	Nishioka	5/7/2002	Commission on Water Resource Management
33	Clifford	Jamile	5/7/2002	Oahu - Department of Water Supply
34	Barry	Kim	4/30/2002	Oahu - Department of Transportation - Harbor Division
35	Lee	Donohue	5/7/2002	Oahu -Police Department
36	Salvatore	Lanzilotti	5/7/2002	Oahu - Department of Emergency Services
37	Attilio	Leonardi	5/7/2002	Oahu - Fire Department
38	Thomas	Phillips	5/7/2002	Police Department
39	Jeffrey	Bearman	5/7/2002	Hawaii - Small Boat Harbors
40	Vaughan	Tyndzik	5/7/2002	Kauai - Small Boat Harbors
41	Charles	Penque	5/7/2002	Maui - Small Boat Harbors
42	Clayton	Ishikawa	5/7/2002	Maui - Department of Fire Control

43	Glenn	Yasui	4/30/2002	State - Department of Transportation - Highway Division
44	N/A	N/A	4/30/2002	Hawaii - Board of Water Supply
45	David	Sproat	4/30/2002	Kauai - Department of Fire Control
46	George	Fretias	4/30/2002	Kauai - Department of Fire Control
47	Dely	Sasaki	4/30/2002	State - Department of Health (DOH)
48	Darryl	Oliveira	4/30/2002	Hawaii - Department of Fire Control
50	Curt	Murimoto	5/7/2002	Maui - Department of Emergency Service
51	Mason	Young	5/7/2002	Oahu - Small Boat Harbors
52	Kevin	N/A	5/7/2002	Hawaii - Board of Water Supply
53	Fred	Nunes	5/7/2002	Oahu - Department of Transportation - Harbor Division
54	n/a	n/a	5/7/2002	Oahu - Department of Environmental Services
55	Tim	Houghton	5/7/2002	Division of Environmental Quality
56	Kenneth	Kaneshiro	5/7/2002	Natural Resources Conservation Service
57	Gary	Barbano	5/7/2002	National Park Service
58	Rae	Loui	5/7/2002	Department of Design and Construction
59	n/a	n/a	5/7/2002	Fish and Wildlife - Ecological Division
60	David	Helweg	5/7/2002	U.S. Geological Survey
61	Jill	N/A	5/7/2002	U.S. Geological Survey
62	Lorean	n/a	5/7/2002	U.S. Geological Survey
63	Charlene	N/A	5/7/2002	U.S. Geological Survey
64	Wendy	n/a	5/7/2002	National Marine Fisheries Service
65	Jim	Maskrey	5/13/2002	Hawaiian Electric Company
66	Hans	?	5/10/2002	National Weather Service
68	Pearlyn	Fukuba	5/8/2002	State - Department of Land and Natural Resources
69	Melia	Lane-Kamahele	5/21/2002	National Park Service
70	Sandra	Kirschenbaum	5/16/2002	State - Department of Transportation
71	Jack	Liu	5/20/2002	Division of Environmental Quality
72	Lowell	Chun	5/14/2002	Honolulu - Department of Planning and Permitting
73	Brian	Miskae	5/14/2002	Maui - Department of Planning
74	Tim	Blume	5/14/2002	Kauai Electric
75	Joyce	Mitsunaga	6/4/2002	Department of Parks and Recreation
76	Nancy	Murphy	5/21/2002	Hawaii - Small Boat Harbors
77	Michael	Buck	5/22/2002	State - DLNR Division of Forestry and Wildlife
78	Glenn	Taguchi	6/4/2002	State - DLNR Division of State Parks
79	Gareth	Sakakida	5/10/2002	Hawaii Transportation Association
80	Steven	Levins	5/10/2002	Department of Taxation
81	Linda	Cantorna	5/21/2002	Department of Taxation
82	Carol	Shay	5/21/2002	Maui - Small Boat Harbors
83	Phillip	Ohta	6/5/2002	State - DLNR Division of State Parks
84	Paul Scotty	Paiva	5/2/2002	Fire Department

85	Jerry	Matsuda	5/7/2002	Department of Transportation - Airport Division
86	Bob	Hobdy	6/5/2002	State - DLNR Division of Forestry and Wildlife
87	George	Kuo	4/30/2002	Hawaii - Board of Water Supply
88	Jon	Griffin	6/5/2002	State - DLNR Division of Forestry and Wildlife
90	John	Rooney	6/10/2002	Coastal Geology Group
91	James	Correa	4/30/2002	Police Department
92	Lenay	Lijima	6/26/2002	Department of Health
93	Glenn	Soma	7/2/2002	Oahu - Department of Transportation - Harbor Division
94	Brian	Minaai	5/30/2002	State - Department of Transportation
95	Neil	Reimer	7/5/2002	State of Hawaii - Department of Agriculture
96	Greer	Prince	7/22/2002	Maui - Police Department
97	Glenn	Miyao	7/9/2002	Hawaii - Department of Parks and Recreation
99	Bill	Medeiros	6/30/2002	Maui - Department of Planning
100	Gary	Hashiro	8/20/2002	Hawaiian Electric, Inc.
101	Steve	Alber	8/20/2002	State - Department of Business, Economic Development and Tourism
102	Peter	Boucher	8/1/2002	Hawaii - Department of Public Works
103	Greer	Prince	7/23/2002	Maui Police
104	Shannon	MacElvaney	7/1/2002	Hawaii Natural Heritage