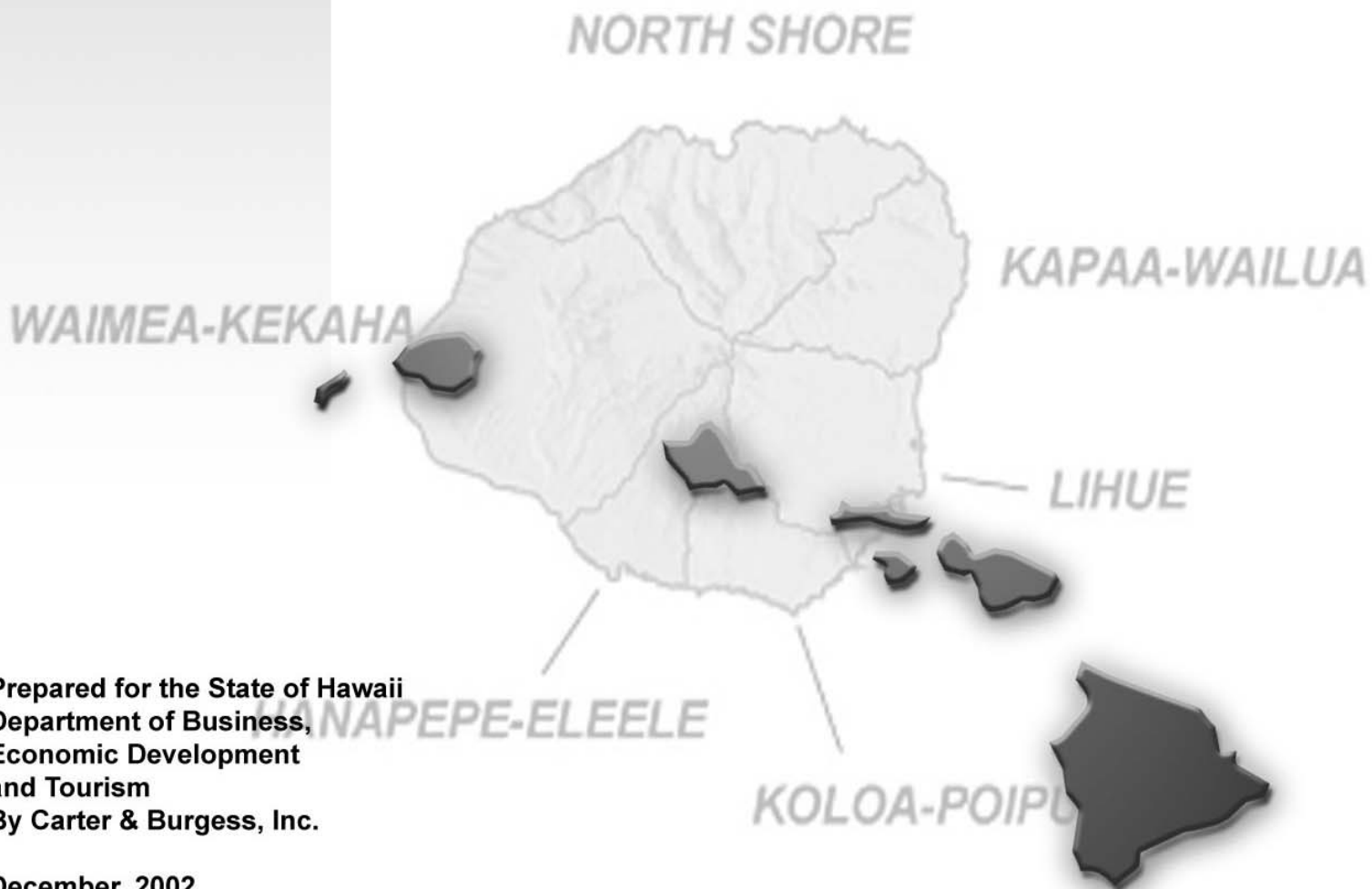


# Planning for Sustainable Tourism in Hawaii

## Part 1: INFRASTRUCTURE & ENVIRONMENTAL OVERVIEW STUDY

---

### VOLUME IV: COUNTY OF KAUAI



Prepared for the State of Hawaii  
Department of Business,  
Economic Development  
and Tourism  
By Carter & Burgess, Inc.

December, 2002

---

<b>Introduction to County of Kauai</b>	<b>5</b>
<b>Recommendations for County of Kauai</b>	<b>9</b>
<b>County of Kauai – Terrestrial Water Quality and Quantity</b>	<b>15</b>
<b>County of Kauai - Sewage</b>	<b>24</b>
<b>County of Kauai – Solid Waste Disposal</b>	<b>31</b>
<b>County of Kauai – Storm Water</b>	<b>35</b>
<b>County of Kauai – Roads</b>	<b>39</b>
<b>County of Kauai – Airports</b>	<b>45</b>
<b>County of Kauai – Harbors</b>	<b>50</b>
<b>County of Kauai - Parks</b>	<b>56</b>
<b>County of Kauai – Police, Fire and Emergency Services</b>	<b>63</b>
<b>County of Kauai – Visitor Accommodations</b>	<b>66</b>
<b>County of Kauai – Private Transportation</b>	<b>74</b>
<b>County of Kauai – Energy Systems</b>	<b>77</b>
<b>County of Kauai – Sewer Systems</b>	<b>82</b>
<b>County of Kauai – Coastal Water Quality</b>	<b>83</b>
<b>County of Kauai – Marine Ecosystem Health</b>	<b>87</b>
<b>County of Kauai – Forestry / Green Space</b>	<b>90</b>
<b>County of Kauai – Air Quality</b>	<b>92</b>
<b>County of Kauai – Beach Erosion</b>	<b>94</b>
<b>County of Kauai – Invasive Species</b>	<b>97</b>
<b>County of Kauai – Other Natural / Scenic Resources</b>	<b>98</b>
<b>County of Kauai – North Shore – Terrestrial Water Quality and Quantity</b>	<b>100</b>
<b>County of Kauai – North Shore – Sewage</b>	<b>102</b>
<b>County of Kauai – North Shore – Solid Waste Disposal</b>	<b>103</b>
<b>County of Kauai – North Shore – Storm Water</b>	<b>104</b>
<b>County of Kauai – North Shore – Roads</b>	<b>106</b>
<b>County of Kauai – North Shore – Airports</b>	<b>108</b>
<b>County of Kauai – North Shore – Harbors</b>	<b>110</b>
<b>County of Kauai – North Shore – Parks</b>	<b>111</b>
<b>County of Kauai – North Shore – Police, Fire and Emergency Services</b>	<b>113</b>
<b>County of Kauai – North Shore – Visitor Accommodations</b>	<b>114</b>
<b>County of Kauai – North Shore - Visitor Related Area</b>	<b>116</b>
<b>County of Kauai – North Shore – Private Transportation</b>	<b>121</b>
<b>County of Kauai – North Shore – Energy Systems</b>	<b>122</b>

---

<b>County of Kauai – North Shore – Sewer Systems</b>	<b>123</b>
<b>County of Kauai – North Shore – Coastal Water Quality</b>	<b>124</b>
<b>County of Kauai – North Shore – Marine Ecosystem Health</b>	<b>125</b>
<b>County of Kauai – North Shore – Forestry / Green Space</b>	<b>126</b>
<b>County of Kauai – North Shore – Air Quality</b>	<b>127</b>
<b>County of Kauai – North Shore – Beach Erosion</b>	<b>128</b>
<b>County of Kauai – North Shore – Invasive Species</b>	<b>129</b>
<b>County of Kauai – North Shore – Other Natural / Scenic Resources</b>	<b>130</b>
<b>County of Kauai – Kawaihau – Terrestrial Water Quality and Quantity</b>	<b>131</b>
<b>County of Kauai – Kawaihau – Sewage</b>	<b>133</b>
<b>County of Kauai – Kawaihau – Solid Waste Disposal</b>	<b>134</b>
<b>County of Kauai – Kawaihau – Storm Water</b>	<b>135</b>
<b>County of Kauai – Kawaihau - Roads</b>	<b>137</b>
<b>County of Kauai – Kawaihau - Airports</b>	<b>139</b>
<b>County of Kauai – Kawaihau – Harbors</b>	<b>140</b>
<b>County of Kauai -- Kawaihau -- Parks</b>	<b>141</b>
<b>County of Kauai – Kawaihau – Police, Fire and Emergency Services</b>	<b>143</b>
<b>County of Kauai – Kawaihau – Visitor Accommodations</b>	<b>144</b>
<b>County of Kauai – Kawaihau – Private Transportation</b>	<b>146</b>
<b>County of Kauai – Kawaihau – Energy Systems</b>	<b>147</b>
<b>County of Kauai – Kawaihau – Sewer Systems</b>	<b>148</b>
<b>County of Kauai – Kawaihau – Coastal Water Quality</b>	<b>149</b>
<b>County of Kauai – Kawaihau – Marine Ecosystem Health</b>	<b>150</b>
<b>County of Kauai – Kawaihau – Forestry / Green Space</b>	<b>151</b>
<b>County of Kauai – Kawaihau – Air Quality</b>	<b>152</b>
<b>County of Kauai – Kawaihau – Beach Erosion</b>	<b>153</b>
<b>County of Kauai – Kawaihau – Invasive Species</b>	<b>154</b>
<b>County of Kauai – Kawaihau – Other Natural / Scenic Resources</b>	<b>155</b>
<b>County of Kauai – Lihue – Terrestrial Water Quality and Quantity</b>	<b>156</b>
<b>County of Kauai – Lihue – Sewage</b>	<b>158</b>
<b>County of Kauai – Lihue – Solid Waste Disposal</b>	<b>159</b>
<b>County of Kauai – Lihue – Storm Water</b>	<b>160</b>
<b>County of Kauai – Lihue – Roads</b>	<b>161</b>
<b>County of Kauai – Lihue – Airports</b>	<b>163</b>
<b>County of Kauai – Lihue – Harbors</b>	<b>167</b>

---

<b>County of Kauai – Lihue – Parks</b>	<b>170</b>
<b>County of Kauai – Lihue – Police, Fire and Emergency Services</b>	<b>172</b>
<b>County of Kauai – Lihue – Visitor Accommodations</b>	<b>173</b>
<b>County of Kauai – Lihue - Visitor Related Area</b>	<b>175</b>
<b>County of Kauai – Lihue – Private Transportation</b>	<b>179</b>
<b>County of Kauai – Lihue – Energy Systems</b>	<b>180</b>
<b>County of Kauai – Lihue – Sewer Systems</b>	<b>181</b>
<b>County of Kauai – Lihue – Coastal Water Quality</b>	<b>182</b>
<b>County of Kauai – Lihue – Marine Ecosystem Health</b>	<b>183</b>
<b>County of Kauai – Lihue – Forestry / Green Space</b>	<b>184</b>
<b>County of Kauai – Lihue – Air Quality</b>	<b>185</b>
<b>County of Kauai – Lihue – Beach Erosion</b>	<b>186</b>
<b>County of Kauai – Lihue – Invasive Species</b>	<b>187</b>
<b>County of Kauai – Lihue – Other Natural / Scenic Resources</b>	<b>188</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Terrestrial Water Quality and Quantity</b>	<b>189</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Sewage</b>	<b>191</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Solid Waste Disposal</b>	<b>193</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Storm Water</b>	<b>194</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Roads</b>	<b>196</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Airports</b>	<b>198</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Harbors</b>	<b>200</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Parks</b>	<b>202</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Police, Fire and Emergency Services</b>	<b>204</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Visitor Accommodations</b>	<b>205</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Private Transportation</b>	<b>207</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Energy Systems</b>	<b>208</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Sewer Systems</b>	<b>209</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Coastal Water Quality</b>	<b>210</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Marine Ecosystem Health</b>	<b>211</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Forestry / Green Space</b>	<b>212</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Air Quality</b>	<b>213</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Beach Erosion</b>	<b>214</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Invasive Species</b>	<b>215</b>
<b>County of Kauai – Koloa-Poipu-Kalaheo – Other Natural / Scenic Resources</b>	<b>216</b>
<b>County of Kauai – West Side – Terrestrial Water Quality and Quantity</b>	<b>217</b>

<b>County of Kauai – West Side – Sewage</b>	<b>219</b>
<b>County of Kauai – West Side – Solid Waste Disposal</b>	<b>220</b>
<b>County of Kauai – West Side – Storm Water</b>	<b>222</b>
<b>County of Kauai – West Side – Roads</b>	<b>223</b>
<b>County of Kauai – West Side - Airports</b>	<b>225</b>
<b>County of Kauai – West Side – Harbors</b>	<b>226</b>
<b>County of Kauai – West Side – Parks</b>	<b>227</b>
<b>County of Kauai – West Side – Police, Fire and Emergency Services</b>	<b>229</b>
<b>County of Kauai – West Side – Visitor Accommodations</b>	<b>230</b>
<b>County of Kauai – West Side - Visitor Related Area</b>	<b>232</b>
<b>County of Kauai – West Side – Private Transportation</b>	<b>235</b>
<b>County of Kauai – West Side – Energy Systems</b>	<b>236</b>
<b>County of Kauai – West Side – Sewer Systems</b>	<b>237</b>
<b>County of Kauai – West Side – Coastal Water Quality</b>	<b>238</b>
<b>County of Kauai – West Side – Marine Ecosystem Health</b>	<b>239</b>
<b>County of Kauai – West Side – Forestry / Green Space</b>	<b>240</b>
<b>County of Kauai – West Side – Air Quality</b>	<b>241</b>
<b>County of Kauai – West Side – Beach Erosion</b>	<b>242</b>
<b>County of Kauai – West Side – Invasive Species</b>	<b>243</b>
<b>County of Kauai – West Side – Other Natural / Scenic Resources</b>	<b>244</b>
<b>Reference List</b>	<b>245</b>
<b>Contacts List</b>	<b>258</b>
<b>Kauai Appendices</b>	<b>261</b>

## Introduction to County of Kauai

Kauai is the northwestern most major island in the Hawaiian Archipelago. It is over 5 million years old. Erosion has sculpted the 552.3 square mile island into the spectacular landscapes seen today. Kauai is comprised of five planning communities. They are briefly described at the end of this introduction. (Unless otherwise indicated, the information below is from the *Kauai General Plan*.) (See map of Kauai in Appendix.)

Projections made by the State for County of Kauai for 1998-1999 were deemed unacceptable due undesirable number of daily visitors to Kauai. State Planning and the *Kauai Citizen Advisory Committee* worked together to develop alternative scenarios for population projections. Two key areas identified as variables for alternative growth scenarios were impacts of highway traffic and impacts on beaches, parks, wilderness areas and the recreationist's experience. Three scenarios were developed based on visitor industry growth. Planning was based on a Scenario A/B range.

**Table 4.01—Alternative Residential and Average Daily Visitor Projections: 2020**

	<b>Scenario A</b>	<b>Scenario B</b>	<b>Scenario C</b>
<b>Resident Population</b>	65,260	79,490	82,800
<b>Average Daily Visitor Population</b>	24,000	32,000	40,600

Source: *Kauai General Plan*

According to the projections, a transportation analysis and comparison to the Kauai Long-Range Transportation Plan, many improvements are warranted in all three scenarios. The majority of the improvements are restricted to populated areas and their environs in Scenarios A and B, the most conservative and moderate projections. In Scenario C, the highest population projection, several improvements are needed island-wide. This analysis underscores existing deficiencies in transportation needs.

An analysis of parks and natural areas concluded the following:

- There is heavy use by visitors to Kauai's wilderness areas and nature centers (80% of users are off-island visitors);
- At least one-fourth of park managers are serving the highest level of users sustainable to the park;
- State and County parks, forests and boating facilities are under funded operationally; and
- Increased usage of these resources without improvements will lead to deterioration of the resource and the visitor experience.

In 2001, the average daily visitor census for Kauai was 16,830. <sup>252,2001</sup> This figure measures overall strength of the visitor industry and prosperity of visitor-

dependent businesses, and the potential impacts of visitors on recreation resources, traffic, and infrastructure. During the 1980s, the average number of visitors per day on Kauai trended upwards, reaching an all-time high of 19,140 in 1989. Since then, Kauai's visitor industry has exhibited steady signs of recovery from the devastation of Hurricane Iniki and the national recession of the early 1990s.

Upon review of these analyses, the projections are intended to be guides to growth, not limits or goals. While utilizing these guidelines, it is also known that the natural beauty, environment and rural character are what are essential to Kauai's future. These must be preserved to ensure Kauai's tourism industry and economic future.

### ***Kawaihau***

The towns of Kawaihau community are small towns, rural in character, and have a strong sense of place. The Kapaa-Wailua urban corridor is a working town with locally owned businesses that rely on the visitor industry for patronage. Wailua has the largest, oldest and most important ancient Hawaiian heiau complex. Rebirth of Hawaiian culture has fueled the cultural tourism for this area.

Planning, especially the Build-Out Analysis seems to be well thought out and maintains the rural character of the place. There are concerns from several government agencies regarding the scale of the build-out and consistency of services and infrastructure output.

Hotel occupancy rates for Kawaihau are consistently lower than islands-wide average. There is little incentive to build in this area.

### ***Koloa-Poipu-Kalaheo***

Located between Lihue and the West Side, Koloa-Poipu-Kalaheo is home to Kauai's largest resorts. Poipu consistently has the highest hotel occupancy rates on the island. The area has grown. Restoration and renovation projects abound in this area, the aftermath from Hurricane Iniki, even though there are additional sites zoned for resort use.

Another economic force in this area is agriculture. Large and small scale agricultural lands are used for diversified uses. Coffee, seed corn and livestock are some of the uses.

Koloa is largely a historic preservation of plantation/western architecture. While renovations take place, adherence to the "Old Koloa Town" style is maintained. Agriculture and light industry takes place here.

Poipu is predominantly a resort area accommodating both residents and almost 40% of Kauai's visitors. Poipu offers many outdoor-based activities and possesses some beautiful beaches.

### ***Lihue***

Lihue is the heart of Kauai. It is the hub of transportation, culture, government, and commercial center. As provider of 50% of the island's jobs, planned urban development is focused around Lihue Town.

Lihue is the primary entry point for visitors to Kauai. Lihue Airport and Nawiliwili Harbor both are central facilities for airline and cruise ship passengers and cargo. There are ample visitor accommodations in Lihue. While there is minimal resort growth going on, it is restricted, as there are few significant vacant parcels zoned for resort use.

### ***North Shore***

The North Shore is rich in natural and scenic resources and outdoor recreation opportunities. The Na Pali coast in particular is a destination for the ecotourism and adventure visitor industry.

Population on the North Shore is experiencing a high rate of residential growth by Kauai standards. Princeville, a master-planned resort community, is expected to absorb the majority of growth and serve as the primary employment center. However, tourism related development is not occurring as quickly as planned, but residential growth is occurring in Kilauea and other agricultural subdivisions.

Tourism is the primary economic force in this community, with agriculture a close second. Although agriculture is important to the rural character of the community, costs for land are getting prohibitive. The large wetland areas are important to cultivation of native crops, like taro. Other major crops include meat and dairy.

Occupancy rates on the North Shore generally match the island-wide average. A growth trend could stimulate visitor unit development. Princeville is the primary area for resort development and visitor accommodations. Although there are several visitor accommodations located outside Princeville. Additionally, there are several planned resorts on the books.

### ***West Side***

There are two main areas of urban development on the West Side – Waimea-Kaheka and Hanapepe-Eleele. Both are low-key developments geared toward a rural lifestyle.

The West Side is unique in that the goal here is to develop residential style visitor units. The intended result is broader economic opportunities (to compensate for

the loss of Kekaha Sugar Company) and to expand the visitor distribution accommodations by offering low-key residential style accommodations. Less than 10% of Kauai's tourists visit this area.

Economic forces on the West Side include agriculture, high technology, and to a lesser degree, tourism. Olokele is one of the last active sugar plantations in the islands. The Pacific Missile Range Facility is a world-class testing and evaluation facility for the military and high-tech companies. Many visitors travel to Kokee and Waimea Canyon or charter boat tours to the area.

---

## **Recommendations for County of Kauai**

### ***Public Infrastructure***

#### **Terrestrial Water Supply Quality and Quantity**

Water quality and quantity for the Island of Kauai are acceptable at the current time. The amount of water being recharged exceeds the volume of water being used. Proactive measures to educate the public and well drillers should be taken to assure proper well drilling practices to avoid potential ground water contamination.

Kauai's water system faces some challenges for the immediate future. Water loss due to line leakage is commonplace. Aging and remotely located transmission and service lines make it difficult to keep up with the necessary repairs. Additional water supplies will need to be tapped to accommodate any growth. It is recommended that a thorough study of the water system infrastructure should be performed and a timeline to repair/ replace outdated water lines should be prepared.

#### **Sewage**

As recommended in the Kauai General Plan, 2000 the County of Kauai should develop a master plan for wastewater treatment focusing on strategic issues and funding priorities. The plan would provide direction to the program and provide a higher level of certainty for potential service customers.

It is recognized that the County has unused capacity in three of its four plants. It is also understood that connecting additional customers would increase revenues to the wastewater program at marginal cost for increased plant operations. However, Kauai County should complete a wastewater master plan prior to approving new development. This would insure that existing development can and will be served.

A review of the locations and frequency of failing on-site liquid waste systems should be tracked. The information should be used to make informed decisions about expansion of community wastewater collection systems.

#### **Solid Waste Disposal**

The remaining life in Kauai's landfill is five to six years. Therefore, a new landfill site should be identified within the next year. Other alternatives to a new landfill should be considered, such as a resource recovery facility. The facility could provide electrical power and substantially reduce the volume of waste put in the landfill.

Because the number of visitors can be as great as 25% of the island population, programs to educate visitors about recycling should be considered. Hotels and visitor accommodations should provide their guest with convenient ways of recycling.

## **Storm Water**

It is recommended that rather than prepare a “master plan” for the island, the Department of Public Works focus on specific problem areas and watersheds, with the objective of developing strategic plans that specify preventive as well as remedial actions.

It is also recommended that the County’s drainage standards be revised to provide adequate flood protection that is not structure-oriented, and to reduce polluted runoff in accordance with State and Federal non-point pollution management policies. The standards will guide future development and aid in avoiding future problems.

## **Roads**

Potential highway improvements should at least be assessed for feasibility and desirability given Kauai County’s policy to maintain rural character. It is recommended that Kauai County wait for the Department of Transportation that is planning to prepare an updated 2025 land transportation plan prior to authorizing the design and construction of new roads. Potential projects should be analyzed and rated in terms of feasibility. Options such as adding new roads rather than widening existing ones should be considered.

## **Airports**

Though a runway extension is supported by the tourism industry to accommodate the larger planes used in mainland and international flights, the passenger activity level at the Kauai’s primary airport in Lihue has decreased drastically in 2001 and tourism levels show slow growth for the island. Efforts to maximize revenue and customer service should be the focus of the airport. Concession and permit development should be promoted and positioned in a logical manner to capture customer demand and increase services to the customer. Expanded customer offerings should target the inter-island traveler as Lihue Airport’s main customer.

## **Harbors**

The improvements necessary to accept the increasing passenger and cargo levels at Kauai’s two commercial harbors in Nawiliwili and Port Allen are in berthing facilities and port infrastructure. The plans for these should be followed through. Pier extensions are needed to accommodate the increasing number of larger ships and barges serviced by the ports. Local infrastructure, especially roads and commercial space, must be improved and increased to support the higher level of activity.

## **Parks**

The Hawaii Tourism Product Assessment identified Kauai's park amenities such as restrooms, picnic areas, and trails as not being properly maintained. The assessment suggested that better service and maintenance at public areas could be achieved through privatization of certain park areas.

Kauai's parks will continue to see increased usage. The current trend of ecotourism will divert more visitors towards the natural settings of Hawaii in particular the parks and beaches of Kauai. Increased use will inevitably lead to over crowding, stressing of the natural environment and overuse of the infrastructure facilities. Maintenance and new capitol works need to be put in place to control any degradation of the park system.

The *Kauai General Plan* recommends that to pay for better parks maintenance and needed improvements to programs and facilities, the State should develop dedicated tax or user fee income from out-of-State visitors, commensurate with the proportion of their use of the parks, trails and other facilities. Such income should be restricted for use in State parks and recreational facilities. Such funds should be reserved for improving State parks and facilities.

The *Kauai General Plan* also recommends that to secure adequate long-term funding for major resource parks such as the Waimea Canyon-Na Pali Coast complex, the state should explore the feasibility of securing federal funds to support major parks or transferring parks to the National Park Service.

## **Police, Fire and Emergency Services**

The dispersed location of Kauai's resident and visitor populations stretches the limited resources of the police, fire and emergency services from one end of the island to the other. Outdated fire equipment and facilities and DOW water supplying infrastructure further compromise the abilities of the Kauai fire department. Recommendation is for additional funding to replace equipment and add satellite stations in locations consistent with long range growth plans.

## ***Private Infrastructure***

### **Visitor Accommodation**

On Kauai, the supply of land designated for resort development is greater than the project demand under the 2020 scenarios discussed in the Kauai General Plan. Cost associated with development may be higher than other locations because of the challenges created by limited public infrastructure (no island wide sewer or water service and limited road access due to light duty bridges). The desire expressed in the Kauai Vision is for the island to maintain its rural character and that visitor accommodations should focus on small scale and alternative forms of lodging.

---

## **Private Transportation**

There is not enough information to adequately evaluate this infrastructure element. Data regarding private transportation would need to be collected to evaluate Private Transportation.

## **Energy Systems**

Kauai Electric's distribution system is a typical radial system, and unlike KE's transmission looped system where there are at least two transmission lines feeding the major switchyards, if a distribution line is deenergized, there is usually an interruption of power. KE's radial distribution systems extend from substations to the load with no continuous backup. KE's distribution systems have alternate sources to feed an area, but brief outages occur due to switching that is necessary to reroute power from a different feeder or switchyard. It is recommended that the necessary redundancy be built into the system so interruptions in power can be avoided.

## **Sewer Systems**

The Sewer Systems indicator has been combined with the Sewage indicator.

## ***Environmental Features***

### **Coastal Water Quality**

While the currents surrounding the Island of Kauai move polluted water away from the coastal waters, the limited circulation of bay waters can cause them to become polluted. Non-point source discharges have a greater impact on streams and near shore waters than point source discharges. Control of water runoff from agriculture lands and urbanized areas such as the Nawiliwili and Port Allen harbors is an opportunity for the Island of Kauai. Kauai's unwritten policy to avoid construction of concrete-lined channels in preference of grassy drainage ways helps to improve coastal water quality. Procedures to further control non-point supplies and identifying point source sources, especially upland of streams and bays, should be taken.

### **Marine Ecosystem Health**

Reefs along the Kauai coast show higher fish abundance and diversity than the other main Hawaiian Islands. The island has excellent and diverse fish habitats and fishing pressure is relatively low due to a smaller human population. The lack of Marine Life Conservation Districts and research on the reefs of Kauai presents opportunities for the island. Consideration should be given to promoting County specific research into marine ecosystem health and designating unique or popular areas Marine Life Conservation Districts. The excellent quality of Kauai's marine ecosystem is considered an essential component in the island's tourism product.

## **Forestry / Green Space**

Hawaii's forests are an important source of recreational opportunities and water resources. Forest watersheds supply Hawaii with almost all of the fresh water Hawaiians need. For the County of Kauai, there is not enough county specific data to make a proper assessment of the forestry and green space indicator. The recommendation is for detailed County specific data.

## **Air Quality**

Kauai's air quality meets federal and state environmental health standards because of the lack of major polluting industries and trade winds blowing the air pollution out to sea. The majority of air pollution on Kauai is currently attributed to agriculture operations; however, the increase in development especially the addition of diesel fired generating plants may change the source and content of air pollutants in future years. Consideration should be given to increasing the number of monitoring sites and the diversity of their locations.

## **Beach Erosion**

Coastal erosion does not impact the Island of Kauai to the same extent that it does the other more heavily developed islands of the State of Hawaii. The lack of a present threat to beach health may be the reason the County of Kauai maintains a 40-foot setback for coastal construction while other Counties have increased their requirements. Consideration should be given to increasing the shoreline setback for the Island of Kauai especially in the more developed and sensitive areas of Poipu Beach, Haena and Hanalei Bay. The County of Kauai should continue permitting, monitoring and enforcing codes relating to construction in Special Management Areas especially those impacting seawalls, eroding shorelines, and beach accesses. High quality of beaches and access to them is considered essential to Hawaii's visitor industry.

## **Invasive Species**

Most invasive species of flora arrive in Hawaii via introduction for horticulture use for ornamental purposes. Education of suppliers and residents is the most effective means of controlling invasive species introductions and preventing new potentially devastating alien species from coming to Hawaii. Once established containment and eradication become the more challenging task. The Island of Kauai has been cleared from incipient *Miconia* populations. The recommendation is for a strong community education program and survey of lowlands, the principal points of entry of most introductions to the Islands, and higher elevations where non-tropical ornamentals may flourish.

## **Other Appropriate Natural and Scenic Resources**

Kauai is known for scenic beauty and variety in landscapes. Kauai is the only county that dedicates a section of its General Plan entirely to scenic resources. These features attract visitors from around the world, and therefore, have an

economic value. The Kauai General Plan states the goal of Kauai to retain the cultural and economic value of various landscape features. The recommendation is for the Planning Department to provide specific criteria and guidelines for evaluation and protection of scenic views.

### **Native Species / Extinction Issues**

Hawaii has one-third of the endangered species in the United States, and invasive alien species pose the greatest threats driving these and other native species toward extinction. For Kauai, there is not enough county specific data to make a proper assessment of the Native Species / Extinction Issues indicator. The recommendation is for detailed County specific data.

## County of Kauai – Terrestrial Water Quality and Quantity

### ***Present Capacity and Usage***

The *Kauai General Plan*, states that the Department of Water (DOW) of the County of Kauai is a semi-autonomous agency responsible for the management, control, and operation of the island’s municipal water system. DOW’s mission is to provide “safe, affordable, and sufficient drinking water.” DOW’s primary intent is to serve activities in urban and rural communities that have health and safety needs for pure water and fire protection. DOW supplies water to 13 geographic service areas, each of which is served by a single system or linked subsystems. The service areas are listed by district below (see map and tables for Kauai water supply, sources and service areas and table of groundwater quality issues in Appendix.):

- **West Side** – Hanapepe-Eleele and Waimea-Kekaha.
- **Kalaheo-Poipu-Koloa** – Kalaheo, Koloa-Poipu, and Lawai-Omao.
- **Lihue** – Puhi-Lihue-Hanamaulu.
- **Kawaihau** – Anahola, Moloaa, and Kapaa-Wailua.
- **North Shore** – Anini, Hanalei, Kilauea-Waipake-Kalihiwai, and Wainiha-Haena. <sup>47,2000</sup>

The average daily water use in the service areas varies from a low of 315 to a high of 772 gallons per unit. The range in water use patterns may be attributed to differences in development, weather patterns, meter accuracy, and other factors. <sup>47,2000</sup>

The majority of the water use is concentrated in a few of the services areas. The services areas of Wailua-Kapaa, Puhi-Lihue-Hanamaulu, and Koloa-Poipu comprise approximately 65 percent of the annual average water use. Including Waimea-Kekaha and Hanapepe-Eleele, the top five-service areas use more than 80 percent of the water delivered to DOW systems on the island. From 1995-1999, DOW’s average daily demand has been 14 mgd; this includes a 25 percent allowance for non-metered use. Below is a table of existing water demand by planning community. <sup>47, 2001</sup>

**TABLE 4.02 – Kauai County Existing Water Demand: 1999**

DISTRICTS	Average Water Demand (MGD)	Maximum Water Demand (MGD)
West Side	2.01	3.01
Kalaheo-Poipu-Koloa	2.83	4.24
Lihue	2.53	3.80
Kawaihau	2.59	3.88
North Shore	0.65	0.97
<b>ISLAND TOTAL</b>	<b>10.60</b>	<b>15.91</b>

Source: *Kauai General Plan*

As of 1999, DOW maintained 52 separate groundwater sources. There are 46 tanks ranging in size from 5,000 gallons to two million gallons, with a total storage capacity of approximately 18.5 million gallons. The average daily demand for municipal water on Kauai was approximately 10.6 million gallons per day (mgd), while the maximum demand was about 15.9 mgd.

There are several private potable water systems; Princeville operates the largest. It serves the entire Princeville community from water sources located on mauka Princeville lands. The DOW contracts with Princeville to supply water to the Anini system.<sup>47, 2001</sup>

**Table 4.03 – Kauai County Status of Municipal Water Systems: 1998**

Water Systems or Sub-Systems	Water Source Availability	Water Storage Availability	Current Restrictions
Kekaha	Near Capacity	Adequate	Large Projects
Waimea	At Capacity	Adequate	1 meter per lot
Hanapepe	At Capacity	Adequate	Large Projects
Eleele	Adequate	Adequate	Large Projects
Kalaheo	Adequate	Adequate	---
Lawai-Omao	Adequate	At Capacity	2 meters per lot
Koloa	Adequate	Adequate	---
Poipu	Adequate	At Capacity	2 meters per lot
Puhi	At Capacity	Adequate	1 meters per lot
Lihue-Hanamaulu	At Capacity	Adequate	3 meter per lot
Wailua-Homesteads	<i>Near Capacity</i>	Adequate	---
Upper Wailua	<i>Near Capacity</i>	<i>Near Capacity</i>	2 meters per lot
Wailua-Kapaa Homesteads.	Adequate	Adequate	---
Anahola	At Capacity	At Capacity	No meters available
Molooa	At Capacity	At Capacity	No meters available
Kilauea, East	<i>Near Capacity</i>	At Capacity	1 meter per lot
Kiluaea-Kalihiwai	<i>Near Capacity</i>	At Capacity	5 meters per lot
Anini	At Capacity	At Capacity	1 meter per lot
Hanalei	<i>Near Capacity</i>	Adequate	---
Wainiha-Haena	<i>Near Capacity</i>	At Capacity	3 meters per lot

Source: *Kauai General Plan*

As stated in the *Kauai General Plan*, Kauai’s municipal water systems can support existing maximum water demand and provide storage for fire emergencies. However, many water systems are operating at or near capacity, as illustrated in the table above. This has resulted in DOW placing operational restrictions on requests for new service. To accommodate future growth, most of the water systems require expansion.<sup>4, 2000</sup>

The table below is summarized from the *Water Plan 2020* – Department of Water: County of Kauai.

**Table 4.04 -- Percentage of Water Use by Category in 1998-1999**

Single Family	53%
Multi-Family/Resort	25%
Government	9%
Commercial	8%
Agriculture	4%
Industrial	1%

Source: *The Water Plan 2020* – Department of Water: County of Kauai

According to the *Water Plan 2020* – Department of Water: County of Kauai, all 13 water systems owned and operated by DOW comply with drinking water standards. When contaminants are detected, the measured levels are below maximum contaminant levels. The DOW remains committed to the protection of public health through regular monitoring and maintenance of the water systems under its management.<sup>47, 2001</sup>

### ***Existing Problems, Issues and Opportunities***

As stated in the *Water Plan 2020* – Department of Water: County of Kauai, 2001 the water system is in poor condition. Old and deteriorating pipelines predominate. There are mainlines located in remote areas with poor access which impedes repair and maintenance. Undersized pipelines installed prior to adoption of current fire protection standards do not allow adequate volumes of water to be transferred. Approximately 23% of DOW's pipelines were installed prior to 1960, of these, DOW has identified 127 miles of pipeline that need replacement over the next 20 years:<sup>47, 2001</sup>

1921-1940	46 miles
1941-1960	40 miles
1961-1980	41 miles
1981-2000	128 miles

### ***Future and Planned Usage***

Based on improved metering, a reduction in non-metered water has been projected. Expansion of the leak detection program and pipeline replacements also reduces non-metered water. In some areas with limited growth, because of reduction in non-metered water, the *Water Plan 2020* forecasts decreases in overall water use during the 2000 to 2020 planning period. Historical and forecast water demands include estimated non-metered water: 25% in 1995-1999, 22.5% in 2005, 20% in 2010, and 15% in 2020.<sup>47, 2001</sup>

**Table 4.05 – Kauai County Historical and Forecast Water Use**

Water System	Historical Use (1,000 gallons/day)		Forecast Use (1,000 gallons/day)		
	1995-96	1998-99	2005	2010	2020
Waimea-Kekaha	1,444	1,621	1,590	1,701	1,918
Hanapepe-Eleele	1,020	1,071	1,149	1,218	1,361
Kalaheo	702	666	704	717	746
Lawai-Omao	441	415	435	443	458
Koloa	459	391	520	614	798
Poipu	1,980	2,325	2,454	2,628	2,953
Puhi-Lihue-Hanamaulu	3,054	3,321	3,570	3,733	4,066
Wailua-Kapaa	3,600	3,220	3,426	3,501	3,648
Anahola	256	290	321	367	460
Moloaa	2	9	7	9	13
Kilauea-Waipake-Kalihiwai	663	718	779	842	969
Anini	36	45	40	41	43
Hanalei	168	161	174	177	181
Wainiha-Haena	157	154	166	169	179
<b>TOTAL</b>	<b>13,982</b>	<b>14,407</b>	<b>15,335</b>	<b>16,160</b>	<b>17,793</b>

Source: *The Water Plan 2020 – Department of Water: County of Kauai*

*The Water Plan 2020 – Department of Water: County of Kauai* states that Kauai has potential water sources in the millions of gallons per day. According to the U.S. Geological Survey Report, *Water Budget for the Island of Kauai, Hawaii* (1995), the estimated amount of water recharging Kauai’s aquifers was 652 million gallons per day (mgd). Total used for agricultural use was 46 mgd. If these numbers are accurate then there does not appear to be a current threat of exceeding the aquifers’ sustainable yields. At this time, no part of Kauai has been declared a Groundwater Management Area.<sup>47, 2001</sup>

**Table 4.06 – Kauai County Source Needs By Water Systems**

Water Systems	Supply Needed, gpm	
	Year 2000	Year 2020
Waimea- Kekaha	0	200
Hanapepe-Eleele	0	0
Kalaheo	0	0
Lawai-Omao	0	0
Koloa-Poipu	0	0
Puhi-Lihue-Hanamaulu	1,730	0
Wailua-Kapaa	700	0
Anahola	300	0
Moloaa	0	0
Kilauea-Waipake-Kalihiwai	400	0
Anini	0	0
Hanalei	200	0
Wainiha-Haena	100	0
Island-wide Total	3430	200

Source: *The Water Plan 2020 – Department of Water: County of Kauai*

***Future and Planned Requirements or Changes***

The Level of Service standards are the criteria that guide the planning for development of new facilities and improvements to existing facilities. The Level of Service standards establish criteria for evaluating and planning sources of supply, fire protection, storage, transmission and distribution systems, pump stations, treatment, and system redundancy. The most significant changes to the level of service criteria include:

- Minimum main size of 6-inches for all the DOW installed construction; and
- Determination of maximum day supply is based on 24-hour/day pumping for source and booster pumping capacity.

In 1999, DOW prepared a new 20-year master plan specifically to address and detail the expansion and rehabilitation needs of Kauai’s municipal drinking water systems. *Kauai Water Plan 2020* includes existing and future water requirements, a financial plan (It addresses service areas, and review the cost of extending service to new areas.), capital improvements plan, capital rehabilitation plan, and a rate study.

It will be important to coordinate *Water Plan 2020* with *the General Plan*. DOW should actively support development in areas planned for urban expansion.

According to the *Kauai General Plan*, other areas of support include:

- Develop a long-range plan to guide County water systems;
- Coordinate planning of future water system development and rate structures; and
- Support compact development by giving priority to water supply improvements.<sup>47, 2001</sup>

There are multiple goals within the *Water Plan 2020* and several methods to obtain these goals.

- Ensuring a reliable future water supply;
- Caring for our deteriorating and aging water systems;
- Ensuring water quality by meeting changing state and federal drinking water regulations;
- Increasing our customer service;
- Operating our water systems in a sustainable and financially secure manner;
- Capital Improvements Program (CIP) to addresses existing deficiencies in the water system and how to meet future needs;
- Capital Rehabilitation (CRP) and Capital Replacement Program (CRPL) to repair or replace deteriorating and aging infrastructure;
- Financial Planning to examines the financial status over the next 20 years; and
- Water Rate evaluation to guide the rates and charges needed to support the implementation of the 20-year plan.<sup>47, 2001</sup>

### ***Anticipated Costs for the Future***

Improvement projects were developed and prioritized for all 13 DOW water systems. The majority of the projects are improvements or replacements because of aging infrastructure. The improvement projects were separated into three areas:

- CIP: Capital Improvement Project – new improvement designed to meet capacity;
- CRP: Capital Rehabilitation Project –replacement, no change in capacity; and
- CRPL: Capital Replacement Project – replacement project sized with additional capacity.

The projects were then prioritized across the entire system as separated into phases with the following funding requirements as outlined in the *Water Plan 2020* – Department of Water: County of Kauai, 2001:

Phase 1 (2002-2006): \$51.7 million

Phase 2 (2007-2011): \$38.0 million

Phase 3 (2012-2021): \$58.5 million <sup>47, 2001</sup>

**Table 4.07 – Water System Summary – Improvements by Phase**

Water System	# Of Projects	Cost (in millions)	Phase 1 FY01-06	Phase 2 FY07-11	Phase 3 FY12-21
Kekaha-Waimea	29	\$9.7	\$4.9	\$5.1	\$5.2
Hanapepe-Elee	14	\$11.4	\$2.1	\$0.1	\$9.3
Kalaheo	12	\$10.3	\$2.5	\$3.7	\$4.1
Lawai-Omao	12	\$7.3	\$1.7	\$3.4	\$2.3
Koloa-Poipu	18	\$12.6	\$3.2	\$4.2	\$5.2
Puhi-Lihue-Hanamaulu	33	\$24.0	\$9.4	\$7.3	\$7.3
Wailua-Kapaa	37	\$37.7	\$19.9	\$6.0	\$11.8
Anahola	9	\$5.2	\$2.7	\$0.0	\$2.5
Moloaa	2	\$0.4	\$0.4	\$0.0	\$0.0
Waipake-Kilauea-Kalihiwai	18	\$11.9	\$3.3	\$4.5	\$4.1
Anini	2	\$1.6	\$0.0	\$0.0	\$1.6
Hanalei	9	\$4.8	\$0.8	\$2.1	\$1.9
Haena-Wainiha	14	\$5.9	\$1.0	\$1.7	\$3.3
<b>Total</b>		<b>\$148.1</b>	<b>\$51.7</b>	<b>\$38.0</b>	<b>\$58.5</b>

Source: *The Water Plan 2020 – Department of Water: County of Kauai*

**Table 4.08 – Improvements by Fund Type**

Fund Type	# Of Projects	Cost (in millions)	Phase 1 FY01-06	Phase 2 FY07-11	Phase 3 FY12-21
CIP	46	\$51.8	\$24.6	\$6.0	\$21.3
CRP	74	\$20.0	\$9.1	\$4.9	\$6.1
CRPL	89	\$76.3	\$18.1	\$27.1	\$31.1
<b>TOTAL</b>	<b>209</b>	<b>\$148.1</b>	<b>\$51.7</b>	<b>\$38.0</b>	<b>\$58.5</b>

Source: *The Water Plan 2020 – Department of Water: County of Kauai*

**Table 4.09 – Improvements by Project Type**

Project Type	# Of Projects	Cost (in millions)	Phase 1 FY01-06	Phase 2 FY07-11	Phase 3 FY12-21
SOURCE	54	\$26.3	\$19.7	\$4.6	\$2.1
STORAGE	42	\$25.6	\$9.9	\$3.7	\$12.0
PIPELINE	98	\$82.9	\$19.5	\$28.7	\$34.7
BOOSTER PUMP	7	\$2.0	\$1.0	\$1.0	\$0.0
OTHER	8	\$11.3	\$1.5	\$0.0	\$9.8
<b>TOTAL</b>	<b>209</b>	<b>\$148.1</b>	<b>\$51.7</b>	<b>\$38.0</b>	<b>\$58.5</b>

Source: *The Water Plan 2020 – Department of Water: County of Kauai*

### ***Problems, Issues and Opportunities Associated with Costs***

There are several opportunities associated with the costs of upgrading the water system. The financial plan accommodates several issues. Over the 15-year period, the average annual rate increase is approximately 3.2% per year, very close to the assumed level of inflation of 3% per year.<sup>47, 2001</sup> Additionally developers can be required to incur some of the infrastructure costs. Ultimately, the costs will be passed on to the consumers in the form of rate changes.

**Table 4.10 — Adopted Rate Changes**

Meter Size	Effective July 1, 2001	Effective July 1, 2003
5/8"	\$9	\$12
3/4"	12	16
1"	18	25
1-1/2"	35	45
2"	55	75
3"	100	130
4"	165	220
6"	325	430
8"	520	680

Source: *The Water Plan 2020 – Department of Water: County of Kauai*

**Table 4.11 — Consumption Change per Thousand Gallons**

General Use Rate	Effective July 1, 2001	Effective July 1, 2003
1 <sup>st</sup> Block	2.10	2.76
2 <sup>nd</sup> Block	2.40	3.20
3 <sup>rd</sup> Block	3.40	4.50
<b>Agricultural Use Rate</b>		
0 – 25,000 gallons	\$2.10	\$2.76
Over 25,500 gallons	0.70	1.38

Source: *The Water Plan 2020 – Department of Water: County of Kauai*

### ***Compare Visitor and Resident Impact***

Analysis has uncovered little information available that distinguishes residential from visitor impacts on water usage. Residential usage will primarily be usage of public infrastructure and publicly maintained facilities, while visitor use is more likely to be privately operated and maintained facilities (not necessarily resort owned and operated).

### ***Major Assumptions***

Long-range planning projects future water demand based on the County's economic and population projections. DOW will use a projected demand for each system to estimate additional source and storage capacity required for each of its systems.

The financial plan is consistent with the operating and capital projections developed in the *Water Plan 2020*. Current cost estimates developed were escalated for future years using a 3.0 percent annual inflation rate. Key assumptions as outlined in the *Water Plan 2020 – Department of Water: County of Kauai*, include:

- Average customer growth rate of 1.0 percent per year;
- Average water sales growth rate of 1.25 percent per year;

- Approximately 60 percent of the Water Plan 2020 funding needs would be debt-financed, 4 percent would be facilities reserve charge (FRC) funded, and the remaining 36 percent would be funded with rate revenues;
- Projected 4 percent annual increases in O&M expenditures (representing 3 percent inflation plus 1 percent customer growth);
- A minimum debt service coverage level of 1.25 was maintained; and
- A minimum operating reserve level of approximately 5.0 percent of previous year's water sales revenue was maintained. <sup>47, 2001</sup>

## County of Kauai - Sewage

### *Present Capacity and Usage*

#### **Public**

According to the *Kauai General Plan*, the County of Kauai operates four wastewater treatment facilities, which serve Waimea, Hanapepe-Eleele, Lihue-Hanamaulu, and the Kuhio Highway corridor between Wailua and Kapaa. As of 1999, these systems served 3,700 business and residential customers, only one-fifth of the number of County water service accounts. (See map of wastewater facilities on Kauai in Appendix.)

**Table 4.12—County Wastewater Systems and Status: 1999**

Treatment Plant	Service Area	Design Capacity	Status
Waimea	Waimea business district, about 90% of Waimea residences	0.3 mgd	Operating at full capacity, inability to accept additional users limits new development in Waimea. Future plant expansion is limited by availability of land and users for effluent disposal via irrigation. Kekaha remains unserved.
Eleele	Port Allen, Eleele, Hanapepe business and residential areas	0.8mgd	Operating at 50% of capacity. Expansion completed in 1995 to accommodate existing and planned development. Collection system needed to extend service to Hanapepe Heights. Further expansion will be needed to accommodate future Dept. of Hawaiian Homelands development on Hanapepe Heights.
Lihue	Lihue, Nawiliwili and Hanamaulu (most areas)	2.5 mgd	Operating at approximately 50% of capacity. Plant sufficient to serve existing unsewered areas, but funding is needed to construct collection and transmission facilities. Plant expansion will be needed to accommodate Amfac Lihue Infill development, but is limited by availability of land and users for effluent disposal via irrigation.
Wailua	Wailua-Waipouli-Kapaa corridor along Kuhio Hwy	1.5 mgd	Operating at approximately 50% of capacity. The transmission system has been extended to provide future service to Kapaa but collection systems makai of the highway have not been built. Capacity is being reserved for future development of vacant resort lots in Waipouli. Source: County of Kauai, Department of Public Works, and Division of Wastewater Management, 1999.

Source: *Kauai General Plan*

The Eleele, Lihue and Wailua facilities have additional capacity for wastewater treatment, however this capacity has already been committed to existing and

planned development. As an example, the Eleele plant is intended to serve the existing residential community on Hanapepe Heights and new residential development in Eleele Nani and the Eleele industrial area.<sup>4, 2000</sup>

### **Private**

The communities, businesses, and homes within Kauai County that are not served by a centralized wastewater collection and treatment system rely upon private treatment systems and individual wastewater systems (IWS).

Over 30 private sewage treatment plants serve small and large individual developments, such as Kauai Community College, the Hyatt Regency Hotel, Lawai Beach Resort, and Outrigger Kauai Beach. Owners of large master-planned developments have formed private utility companies to operate collection, treatment and disposal systems in Princeville, Puakea-Puhi, and Kukuiula. Princeville operates a system serving the entire Princeville community. In addition, some hotels, apartment complexes and businesses operate package treatment systems primarily serving their own properties.

According to the *Kauai General Plan, 2000* private wastewater disposal is adequate and does not pose a significant public health or environmental threat. The State Department of Health (DOH) regulates the operations of both County and private wastewater systems. Historically, most IWSs were constructed as cesspools. DOH changed the regulations, however, so that septic tank systems are now required.<sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

Concerns for the County of Kauai as stated in the *Kauai General Plan* include:

- As of 1999, the centralized wastewater collection systems served 3,700 businesses and residential customers, only one-fifth of the number of Kauai County water service accounts.
- There are no communities with cesspool problems threatening public health, but some areas with poor subsurface conditions experience overflow problems. Private firms provide pump-out service on a fee basis to properties with failed or over-taxed systems. Sewage disposal records from 1997 show some sewage pumping in all communities. Records show frequent pumping on properties in Koloa Town and Lawai Valley Estates, indicating that these areas may need a treatment system in the future.<sup>4, 2000</sup>

### ***Future and Planned Usage***

#### **Public**

According to the *Kauai General Plan*, the County of Kauai should develop a master plan for wastewater treatment focusing on strategic issues and funding priorities. This would provide direction to the program and provide a higher level

of certainty for developers and potential service customers. Some key strategic issues include:

- The County has unused capacity in three of its four plants. Connecting additional customers would increase revenues to the wastewater program at marginal cost for increased plant operations. There are two options:
  - Proceed with constructing planned collection systems to serve existing developed areas; or
  - Provide plant capacity to new development on a first come, first-served basis. Facility charges could be reformulated to recapture a larger portion of the cost of plant expansion.
- In Koloa-Poipu-Kukuiula, the County has deferred planning for a regional system. In fact, the cost, increased County liability, and physical challenges of a regional system (how to dispose of large flows) may make it infeasible. Instead, the County might investigate the potential of building two smaller package plants to serve Koloa Town and east Poipu.
- In general, the County appears to have abandoned the model of a single, large regional wastewater system in favor of many dispersed systems. This makes sense for several reasons. First, smaller flows can be more readily reused as irrigation for a nearby golf course or agricultural operation. Second, the costs of transmission are minimized. Electricity costs for pumping long distances can be expensive. If the County were to adopt this as a formal policy, then it could reorient its own planning and give clearer guidance on community plans and major new development proposals.
- The availability of CIP funding for County wastewater system improvements is uncertain. A long-range County CIP financial plan could weigh the competing CIP needs of various County services and programs and set approximate funding levels for each. This would give the wastewater program practical information and would assist in making strategic decisions, such as whether or not to build planned collection systems or to abandon those plans and use plant capacity to stimulate new development.
- Should future users bear the capital cost of building new collection systems (i.e., through an improvement district), or should the County finance such improvements using tax revenues? County financing would share the burden of paying for wastewater treatment more broadly.<sup>4, 2000</sup>

It is uncertain when the County will budget funds for new collection systems to serve existing developed areas in Hanapepe, Hanamaulu, Lihue and Kapaa.

In Lihue, the Department Of Public Works (DPW) has an agreement with the Kauai Lagoons to accept up to 1.5 mgd of effluent per day for irrigation of its golf course. To increase service to the design capacity of 2.5 mgd, the DPW is planning to construct injection wells. However, this will not be sufficient to

accommodate the Lihue-Hanamaulu Infill project. As with other large master planned projects, the developer is required to provide a wastewater treatment system. The 1.5 mgd private plant would be sited on Industrial-zoned lands near the Airport. Various alternatives are being considered for disposal of effluent.

The County has taken no action to implement the 208 Plan's recommendation for a regional system to serve Koloa-Poipu-Kukuiula. A&B has constructed a WWTP to serve its Kukuiula project, and the site is large enough to be converted to a County regional facility in the future. There are two constraints. First, the existing developed areas that need wastewater service are Koloa Town and the smaller resort properties at the eastern end of the Poipu coastal area, both some distance from the Kukuiula plant. The larger hotels nearer Kukuiula (Sheraton, Waiohai) use the Kiahuna private system, and Hyatt has its own system

### **Private**

The State DOH requires that wastewater treatment be provided for any project that exceeds 50 dwelling units. Although not stated as formal policy, it has been the County's practice to require through zoning that the land developer build and operate the wastewater treatment system. In some areas served by County systems, however, planned development may not be feasible without County investment.

Several existing communities within County of Kauai are experiencing septic system failure. The town of Koloa has subsurface disposal problems, and Poipu, where smaller visitor properties and residences are currently served by a variety of small private plants. Because these plants dispose of effluent by ground injection, there is a long-term risk of polluting adjacent ocean waters. One possible solution is to expand the Kukuiula wastewater treatment plant and connect those communities. The facility would be owned and operated by the County.

### ***Future and Planned Requirements or Changes***

Most County wastewater plants were originally constructed using federal grant funds provided through the Clean Water Act. Under terms of the federal construction grants, the County is mandated to charge user fees sufficient to provide adequate operations, maintenance, and equipment replacement.

It is difficult to increase sewer rates to the relatively small portion of residents and businesses that receive County service. The environmental benefits of wastewater treatment systems consist of reducing the potential risk of groundwater contamination and coastal water pollution. Wastewater treatment also allows for high-density use in urban areas. Given that all Kauai residents share the benefits, it seems fair that costs should be shared island-wide.

In general, the County is reluctant to expend scarce CIP resources on expanding municipal wastewater systems. Each new plant increases the County’s liability to provide future service and meet State and Federal plant operation requirements. In some areas, such as Wailua, residents have opposed sewer service because of connection costs and ongoing service charges.

**Anticipated Costs for the Future**

The *Kauai General Plan* states that new wastewater treatment facilities will be needed by 2020 to support potential new urban development. The table below summarizes some of the projected development for Kauai County. <sup>4, 2000</sup>

**Table 4.13—Wastewater Treatment Plans for Future Developments**

Future Development	Plan for Wastewater Treatment	Effect on County System
<b>Kikiaola, Waimea</b>	<b>Developer to partner with County to fund plant expansion</b>	<b>Secure long-term agreement for disposal of effluent on Kikiaola lands.</b>
<b>Kapalawai Resort, Robinson Family Partners</b>	<b>Developer to provide package plant onsite.</b>	<b>None</b>
<b>Hanapepe Heights, DHHL</b>	DHHL to fund. No plans to date. Possible DHHL plant at Hanapepe; possible <b>Expansion of County Eleele plant.</b>	Possible joint development of Collection system for existing Residences and new DHHL Development.
<b>Kukuiula, A&amp;B Properties</b>	Private WWTP constructed, to be <b>expanded as needed.</b>	<b>None</b>
<b>Vacant Poipu Resort &amp; Residential Lands</b>	Developers to provide facilities. No plans <b>at present.</b>	<b>None</b>
<b>Puakea-Puhi, Grove Farm</b>	Private WWTP constructed, to be <b>expanded as needed.</b>	<b>None</b>
<b>Lihue-Hanamaulu Infill, Amfac/JMB</b>	<b>Plan to construct a private WWTP.</b>	<b>None</b>
<b>Vacant Kapaa Urban Center lands</b>	<b>No plan yet.</b>	Possible need to expand Wailua <b>Plant.</b>
<b>Anahola, DHHL Master Plan</b>	<b>Plan to construct a WWTP onsite.</b>	<b>None</b>
<b>Kilauea Town Expansion</b>	Developer to provide a package plant <b>onsite.</b>	<b>None</b>
<b>Princeville</b>	Operates own wastewater utility. Will expand existing or build new facilities <b>within Princeville.</b>	<b>None</b>

Source: *Kauai General Plan*

The following are conceptual plans for centralized wastewater treatment expansion:

Waimea – expansion of the County wastewater treatment facility to support new development at Kikia Ola provided the DPW can continue to dispose of effluent and increase flows to the low-lying agricultural fields mauka the highway. The Kikia Ola master plans shows this area as a future golf course and constructive wetland designed to accept wastewater effluent.

Eleele – new development has been planned for the western portion of Hanapepe Heights. A cost analysis needs to be performed to determine if the Eleele facility should be expanded or if a new facility constructed at Hanapepe.

### ***Problems, Issues and Opportunities Associated with Costs***

The Kauai General Plan found, that in general, the County is reluctant to expend scarce CIP resources on expanding municipal wastewater systems. <sup>4, 2000</sup>

### ***Compare Visitor and Resident Impact***

The Planning Department's projections for the year 2020 are expressed as a low-to-high range. For purposes of long-range public facilities planning, agencies should use the high end of the range. As of 1999, the high end of the range consists of a daily visitor population of 28,000, a resident population of approximately 74,300, and total jobs of about 45,000. The Planning Department will revise the projections at least every five years and/or when new information becomes available.

In 1998, there were approximately 17,200 visitors on Kauai per day. Referred to statistically as the average daily visitor census (ADVC), this figure provides a measure not only of the overall strength of the visitor industry and prosperity of visitor-dependent businesses, but also of the potential impacts of visitors on recreation resources, traffic, and infrastructure. During the 1980s, the average number of visitors per day on Kauai trended upwards, reaching an all-time high of 19,140 in 1989 (see Figure 4-1). Since then, Kauai's visitor industry has exhibited steady signs of recovery from the devastation of Hurricane Iniki and the national recession of the early 1990s. Between 1994 and 1998, Kauai's ADVC increased at an annual growth rate of 6.4 percent. <sup>4, 2000</sup>

### ***Major Assumptions***

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

## County of Kauai – Solid Waste Disposal

### ***Present Capacity and Usage***

The County of Kauai provides direct service to the public via solid waste collection and management of reuse and disposal programs. The County is responsible for regulating the disposal of all solid waste with the exception of hazardous materials. The *2020 Vision* states that the County of Kauai has the lowest per capita rate of waste generation and the highest rate of reuse and recycling statewide.

The Road Construction and Maintenance Division of the Department of Public Works administers Kauai County's solid waste facilities and services. The County has one solid waste coordinator and one clerk who are responsible for the management of the landfill and administration and budgeting of solid waste programs. As stated in the *Kauai General Plan* the County's solid waste program has its own annual operation cost supported by the Solid Waste Enterprise Fund and subsidized by the General Fund.

The following are summaries of the Kauai County solid waste facilities as stated in the *Kauai General Plan*:

- **Kekaha Landfill Phase II** – This facility began operation in 1993 and is the primary disposal site for solid waste on Kauai. In FY 1999, the Kekaha Landfill Phase II accepted approximately 67,590 tons of solid waste. This facility also serves as a drop-off point for segregated recoverable waste. During FY 1999, approximately 10.6 tons of recoverable materials (e.g., cardboard, newspaper, glass, aluminum cans, batteries) and 1,000 gallons of used oil were recovered and/or recycled from the Kekaha Phase II operations.
- **Refuse Transfer Stations** – The County operates four refuse transfer stations, which are located in Hanalei, Kapaa, Lihue, and Hanapepe. In FY 1999, a total of approximately 24,930 tons of solid waste was collected at all stations and transferred to the Kekaha Landfill Phase II. In addition, the Hanalei, Kapaa, and Hanapepe stations receive used oil through the Do-it Yourselfer (DIY) program. The Lihue station also receives scrap metal, white goods, and green waste. The latter is also received at the Kapaa and Hanapepe station.
- **Kekaha Debris Recycling Station (KDRS)** - This facility, also known as the Kekaha Landfill Phase I, was used for Hurricane Iniki debris and stopped accepting solid waste in 1993. In FY 1999, approximately 404 tons of white goods and scrap metals was received at the station and subsequently shipped off-island for recycling. The KDRS also serves as a recovery facility for segregated green waste. In addition, the facility accepts and shreds used automobile and truck tires, which are used as alternate landfill daily cover at the Kekaha Phase II operations.

According to *Kauai General Plan*, the County currently has in place six neighborhood recycling stations island wide, which receive newspaper, glass, aluminum, and paper products. Private contractors are responsible for providing the containers, hauling the materials, and servicing the site.

- **Plastic Recycling** – Princeville Corporation and volunteers in North Shore communities are mounting this effort. Volunteers in Lihue have also made efforts to recycle plastic.
- **Glass Recycling** – Through a State-subsidized program, the County contracts with a local firm to operate a glass-recycling program.
- **Green Waste Diversion Program** – Green waste represents the largest component of the residential waste stream. Currently, the County grinds the green waste and distributes it to Kauai residents, other government agencies, and businesses.

**Kauai Resource Exchange Center** – This new facility, located next to the Lihue Transfer Station, is intended to serve as a market for discarded materials such as major appliances, furniture, building materials, and electronic. From 1997 to 1999, municipal solid waste that was diverted from the landfill accounted for approximately 19 percent of the total amount of solid waste generated on the island.<sup>4, 2000</sup>

The *Kauai General Plan* states that within the next two decades, the amount of solid waste generated by residents and visitors on Kauai is expected to increase by nearly 50 percent from approximately 67,590 tons in FY 1999 to a projected 100,840 tons in 2020. New facilities needed by 2020 to accommodate this increase and changes to existing facilities are highlighted below.

- **Additional Landfill Capacity** – Basic disposal capacity is rapidly disappearing on Kauai. The 34-acre Kekaha Landfill Phase II opened in 1993 and was allowed by the State in 1998 to have its height limit increased to 60 feet. The remaining lifespan of the landfill with the addition of this vertical expansion and assuming current waste levels is about five to six years. Therefore, a new landfill site should be identified within the next year. The cost of developing the facility is estimated at \$37 million. A factor that may limit expansion capacity is the availability of feasible sites.
- **New Refuse Transfer Station** – The facility planned for Koloa is expected to cost approximately \$3 million to develop.
- **Kekaha Debris Recycling Station** – This facility will be utilized less frequently as collection of metals becomes more centralized at the Puhi Metals Recycling Center and green waste is dropped at more conveniently located private facilities.<sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

Existing problems include:

- A new landfill site is needed to replace the existing Kekaha landfill within the next five-six years.
- Additional recycling facilities are needed, as noted in the present capacity section. <sup>4, 2000</sup>

### ***Future and Planned Usage***

In 1994, the Kauai County Council approved the *County of Kauai Integrated Solid Waste Management Plan* (SWMP). The SWMP fulfills requirements of Chapter 342G, Hawaii Revised Statutes. The SWMP strongly emphasizes recycling as a means of diverting materials from the island's Kekaha landfill. State law requires the SWMP be updated and submitted to the State once every five years. Despite having limited resources and funding, the County has implemented major action items outlined in the 1994 SWMP, particularly in the area of source reduction. However more work needs to be done in the recycling, education, public information, and program funding sections. <sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

The following general policies are outlined in the *Kauai General Plan* and apply to solid waste management on Kauai. Specific policies to guide solid waste programs should be provided in the long-range SWMP.

- Using long-range integrated resource planning, the County shall manage an island wide system of solid waste collection, reuse, recycling and disposal that:
  - is environmentally sound and cost-effective;
  - increases diversion of waste from the island's landfill(s); and
  - provides for the timely and orderly expansion of solid waste facilities.
- Through a multi-faceted program of education, management measures, and financial incentives, the County shall support and stimulate Kauai businesses and residents to reduce their solid waste generation and increase the reuse and recycling of materials.
- The County shall incorporate entrepreneurial principles in managing solid waste, involve private businesses, and support market-oriented innovations and initiatives. Among other options, the County shall consider opportunities for utilizing the waste.

The County government shall:

- Prepare a long-range Solid Waste Integrated Management Plan, to be adopted by the County Council and updated every five years. The SWMP shall set policies to guide solid waste programs, facility planning, capital improvements, operations, user fees, and financing.
- Commit the necessary funding and staff resources to implement the County Integrated Solid Waste Management Plan.

- Increase the effectiveness of the County's solid waste system by maximizing the convenience of reuse and recycling centers for users.
- Establish a set of measurable goals to evaluate County efforts to divert solid waste from the island's landfill.
- Develop a proactive process for sighting and designing sanitary landfills and other facilities that incorporates early and detailed consultation and negotiation among the utility, the County government, community stakeholders, and the general public.
- Establish a practical philosophy and program for recycling solid and liquid waste that is tailored to Kauai's County's needs and supported by programs for community education and public relations.<sup>4, 2000</sup>

### ***Anticipated Costs for the Future***

According to the *Kauai General Plan*, some anticipated future costs include:

- A new landfill site will have to be identified within the next few years. Development of the new site and facility is estimated at \$37 million.
- A new refuse transfer station has been planned for Koloa and is expected to cost approximately \$3 million to develop.<sup>4, 2000</sup>

### ***Problems, Issues and Opportunities Associated with Costs***

The County of Kauai will face several challenges associated with opening a new landfill. Some of those challenges include land acquisition, permitting, facility operation and long term facility maintenance.

### ***Compare Visitor and Resident Impact***

The *Kauai General Plan* states that in 1998, there were approximately 17,200 visitors on Kauai per day. This figure provides a measure not only of the overall strength of the visitor industry and prosperity of visitor-dependent businesses, but of the potential impacts of visitors on recreation resources, traffic, and infrastructure. At times, the number of visitors can be as great as 25% of the island population. This is significant because programs aimed at residents for recycling will probably miss the visitor population.<sup>4, 2000</sup>

### ***Major Assumptions***

- Kauai County will receive funding to continue operation of its solid waste program;
- Kauai County will locate a future landfill site that is both reasonable in cost and is acceptable to the constituents of the island; and
- Kauai County will continue to increase the volume of material being recycled.

## County of Kauai – Storm Water

### ***Present Capacity and Usage***

*Kauai Vision 2020* describes a future in which “Kauai streams run freely in their natural courses . . . Because of careful land management, Kauai is free of concrete lined drainage channels.” The Vision and the policy statements that follow describe Kauai’s present situation as well as goals for the future.

- The County manages urban storm water runoff through the Drainage Standards applied to new developments by the Department of Public Works (DPW). Because most communities are situated on the coastal plain, the County must cope with upland runoff from conservation and agricultural lands.
- The County manages flood hazards through the Flood Control Ordinance, based on flood zones mapped by the Federal Emergency Management Agency. The County has not to date prepared a Drainage Master Plan, as required under the existing General Plan and the Comprehensive Zoning Ordinance.
- In past, the chief purpose of most drainage ordinances was to convey storm water quickly and efficiently away from urban areas, providing the maximum amount of land for development. Under this philosophy, the City & County of Honolulu and the County of Maui have built numerous concrete channels discharging storm waters to the ocean. Such channels are extremely efficient at delivering large amounts of polluted runoff to coastal waters.
- Kauai’s Department of Public Works has historically followed an unwritten policy to avoid construction of concrete-lined channels. DPW’s original objective was to avoid the expenses and liabilities of maintaining structured channels. As a bonus, Kauai has avoided the environmental consequences of channelization. As of 1999, Kauai was virtually free of lined channels. The DPW has constructed only one, which resulted from litigation. Two have been constructed within private subdivisions. <sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan* states that because most communities are situated on the coastal plain, the County must cope with upland runoff from conservation and agricultural lands.

According to the Department of Public Works there do exist drainage problems in Wailua-Kapaa, Nawiliwili and Poipu. Rather than prepare a “master plan” for the island, the DPW intends to focus on specific problem areas and watersheds, with the objective of developing strategic plans that specify preventive as well as remedial actions. <sup>4, 2000</sup>

### ***Future and Planned Usage***

- The Planning Department shall review and revise the Subdivision Ordinance and the Comprehensive Zoning Ordinance, including the regulations for the Open District and the Constraint Districts, in order to:
  - Assure effective regulation of steeply-sloped lands and drainage ways; and
  - Eliminate ineffective regulations and reduce unnecessary application requirements.
  
- The Department of Public Works shall identify critical urban watersheds and develop strategic Flood Prevention and Drainage Plans to guide future County actions.
  - Develop plans incrementally, evaluating watersheds according to the potential extent of future problems and the potential to achieve viable solutions.
  - Each Flood Prevention and Drainage Plan should provide a capital improvement program, estimated project costs, project priorities, and schedule.
  
- The Department of Public Works shall review and revise the Grading Ordinance and the Drainage Standards to incorporate the policies above and other management measures for reducing non-point pollution.
  - The Department shall submit a bill for a Drainage Ordinance to the County Council for adoption.
  - The revised grading and drainage regulations shall be consistent with current State and Federal policies, such as those set forth in the *Hawaii Coastal Non-point Pollution Control Program Management Plan* and the *Hawaii Non-point Source Management Program Update*.<sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

The 1984 General Plan mandated the preparation of a *Drainage Master Plan. Storm Water Runoff System Manual* (adopted November 2001), is the result of that mandate. The intent of the revision is both (a) to provide adequate flood protection that is not structure-oriented and (b) to reduce polluted runoff in accordance with State and Federal non-point pollution management policies. These standards will guide future development and aid in avoiding future problems.

- Establish zoning and subdivision regulations that strictly limit development on lands that are steeply-sloped and/or have highly erodible soils, in order to prevent flooding, landslides and non-point pollution; and strictly limit development on shoreline lands within coastal flood hazard areas or susceptible to shoreline erosion.

- Focusing on the most heavily impacted urban watersheds, evaluate flooding and erosion risks and develop long-range plans for drainage and flood hazard management. Establish an ongoing program to clear streams and drainage ways and maintain their capacity to accommodate storm water flows.
- Establish erosion control and drainage regulations that incorporate best management practices for controlling non-point source pollution.
- Regulations and drainage improvements shall be consistent with the following principles:
  - Use natural drainage ways for storm runoff waterways wherever possible.
  - Avoid channeling or alteration of natural drainage ways.
  - Avoid diversion of storm runoff from one basin to another.
  - Do not replace natural drainage ways with structured, closed systems, except at road crossings.
  - Require detention basins in new developments, in order to maintain predevelopment storm water flow rates. Requirements shall be based on the two-year storm but may be increased.
  - To conserve land, develop detention basins in conjunction with park or open lands and design for multiple uses.
  - Protect buildings from the 100-year flood.
  - Where there are no downstream drainage systems or if the downstream systems lack sufficient capacity, require retention facilities sufficient to maintain 100-year storm flows at pre-development rates and conditions.<sup>4, 2000</sup>

### ***Anticipated Costs for the Future***

Lack of documentation or an inadequate response from the appropriate agency indicates a need for further study.

### ***Problems, Issues and Opportunities Associated with Costs***

Future issues for Kauai County include:

- Ways to Develop and maintain an adequate supply of water for residents, visitors, agricultural and industrial needs.
- Encourage the development of new technology that will reduce the cost of providing water and the cost of waste disposal.
- Encourage a lowering of the per-capita consumption of water and the per-capita production of waste.<sup>4, 2000</sup>

### ***Compare Visitor and Resident Impact***

The Planning Department's projections for the year 2020 are expressed as a low-to-high range. For purposes of long-range public facilities planning, agencies should use the high end of the range. As of 1999, the high end of the range consists of a daily visitor population of 28,000, a resident population of

approximately 74,300, and total jobs of about 45,000. The Planning Department at least every five years and/or when new information becomes available – e.g., new Census information or new official State projections will revise the projections.

In 1998, there were approximately 17,200 visitors on Kauai per day. Referred to statistically as the average daily visitor census (ADVC), this figure provides a measure not only of the overall strength of the visitor industry and prosperity of visitor-dependent businesses, but also of the potential impacts of visitors on recreation resources, traffic, and infrastructure.

During the 1980s, the average number of visitors per day on Kauai trended upwards, reaching an all-time high of 19,140 in 1989. Since then, Kauai's visitor industry has exhibited steady signs of recovery from the devastation of Hurricane Iniki and the national recession of the early 1990s. Between 1994 and 1998, Kauai's ADVC increased at an annual growth rate of 6.4 percent.<sup>4, 2000</sup>

### ***Major Assumptions***

No information was uncovered regarding major assumptions for the Storm Water element.

## County of Kauai – Roads

### ***Present Capacity and Usage***

The *Draft Hawaii Statewide Transportation Plan* describes Kauai’s roadway system as consisting of two lane roads, which interconnect the major development areas. These two-lane facilities vary in quality from a narrow, winding highway north of Hanalei to high-quality arterial highways, such as Kuhio Highway, Kaunualii Highway, and Kapule Highway. A short segment of four-lane, undivided highway is located in Lihue town and a three-lane section is located between Hanamaulu and Waipouli.<sup>101, 2002</sup>

**Table 4.14 – Kauai County Highway Distances: 2000**

Route	Statute miles
Lihue-Haena	38.2
Lihue-Wailua	5.9
Lihue-Lihue Airport	2.0
Lihue-Poipu	11.9
Lihue-Kalalau Lookout	44.6
Poipu-Kalalau Lookout	36.8
Poipu-Princeville	40.7

Source: 2001 State of Hawaii Data Book

**Table 4.15 – Kauai County Length of Streets and Highways, Paved and Unpaved: 1998 and 1999**

Year	Total Mileage	Paved	Unpaved
1998	411.99	389.50	22.49
1999	412.41	389.92	22.49

Source: 2001 State of Hawaii Data Book

**Table 4.16 – Kauai County Vehicle Registration, by Type of Vehicle: 2001**

Type of vehicle	County of Kauai
All vehicles	65,233
Motor vehicles	62,555
Passenger vehicles	45,284
Ambulances	---
Buses	13
Trucks 1/	16,397
Truck tractors	32
Truck cranes	13
Motorcycles, motor scooters	916
Trailers and semi-trailers	2,578

Source: 2001 State of Hawaii Data Book

The existing traffic conditions are poor in the central part of the island. As documented in the *Kauai Long-Range Land Transportation Plan 1997*, major roads in Lihue, west to Maluhia Road, and east to Kapaa are rated Level of Service D, E or F for average daily traffic (ADT). The Transportation Plan uses

traffic data from 1995 however the conditions have not improved since that date. Poor conditions can be observed in Kapaa Town and during peak hours on Kaunualii Highway leading into Lihue. Collector roads, such as Kuamoo Road in Wailua, also suffer congestion during peak hours.

The number of improvements needed by 2020 reflects already-existing road capacity problems. If growth occurs without correcting existing deficiencies, then traffic congestion will worsen.

Recent improvements include the widening of streets and portions of the highway system in an attempt to reduce current and projected roadway congestion.

- The Kaunua Highway intersection improvements at Koloa Rd were completed for \$4.6 million;
- The 2 1/2 mile Kapaa bypass road was completed for \$1.2M;
- The Kaunualii Hwy at Moi Road was completed for \$.5 million; and
- The bikeway improvements at the Hualeia Stream Bridge to Rice Street were completed for \$1 million.<sup>101, 2002</sup>

From the Department of Health, Kauai District Health Office projects addressing pedestrian accessibility, drainage, guard rail/shoulder, and pavement rehabilitation were completed.

Kaunualii Highway, Pedestrian Accessible Route Improvements made our facilities in the vicinity of Waimea Town more accessible to the physically impaired.

Kaunualii Highway Drainage Improvements, vicinity of Kikiaola Boat Harbor, Kaunualii Highway Drainage Improvements, and Kuhio Highway Drainage Improvements, Hanalei Bridge to Hanalei Town, provided nearly a million dollars worth of improvements to our drainage facilities.

Kapule Highway and Kuhio Highway Guard rail and shoulder improvements brought affected portions of our highway system more in line with our current standards.

Kuhio Highway Rehabilitation, Hanamaulu to North Leho Drive (\$1.3 million) provided needed travel way improvements in this highly traveled section of our highway system.<sup>5C, 2002</sup>

### ***Existing Problems, Issues and Opportunities***

The *Draft Hawaii Statewide Transportation Plan* notes that some efforts are being made to encourage the use of alternative modes of transportation such as buses and bicycles. The ultimate goal is to reduce the dependence on automobiles.

The Kauai Bus operates a public (fixed route) bus service and a paratransit (door-to-door) bus service from Hanalei to Kekaha daily except on Sundays and County holidays. The paratransit service is for senior citizens, participants in certain agency programs, individuals at the Wilcox Hospital Adult Day Care Center, and residents with disabilities. Currently, the system has 30 buses servicing six bus routes. There is no service to the Lihue Airport and limited service to Koloa/Poipu. In 1998, the Kauai Bus averaged about 18,120 one-way riders per month.

Kauai has 3.8 miles of existing bikeways. The island's existing bikeway system consists of a bike route along Kapule Highway in Lihue and a bike path along the coast fronting Kapaa Beach Park. <sup>101, 2002</sup>

From the Department of Health, Kauai District Health Office problems that need to be addressed by the county and the tourist industry include road maintenance. There is not a concerted effort to present our island to the tourists as a clean, well-maintained island. There should be more effort to maintain all roads, especially those leading to tourist destination. The road to Kalalau lookout is not safe for driving for anyone. And the road to the lookout beyond Kalalau is a very dangerous road. <sup>5C, 2002</sup>

### ***Future and Planned Usage***

Future projects for the Island of Kauai as outlined in the Draft Hawaii Statewide Transportation Plan include:

A planning study for the Kapaa Bypass from Hanamaulu to Kapaa;

- Ensure that Kauai County arterial highway and local street systems are designed to be environmentally sensitive to the perpetuation of a rural quality of life;
- Direct economic development toward existing and proposed communities in order to minimize employee commuting and foster job/housing balance; and
- Support the State Department of Transportation in the completion and implementation of its transit study for Kauai County. <sup>101, 2002</sup>

### ***Future and Planned Requirements or Changes***

Traffic modeling was performed on two lower-growth scenarios, in comparison with the high growth projection used in the *Kauai Long-Range Land Transportation Plan* (May 1997). The results were summarized in terms of the number and cost of road improvements that would be needed under each of the three scenarios. The following is a list of roadway improvements, which, according to analysis of projected travel demand based on the Planning Department's 2020 Projections, would be needed in order to accommodate daily traffic at an acceptable level of service.

The *Kauai Long-Range Land Transportation Plan* (LRTP, May 1997) was prepared by the State DOT in conjunction with the County Planning Department. Although the 1997 LRTP and the *Kauai General Plan* share the 2020 planning horizon, the LRTP uses a State-generated set of economic and population projections that is substantially higher than the Planning Department's 2020 Projections.

Please note that the improvements listed below are based on traffic modeling only. They represent needed roadway capacity, not actual projects. Only a few have undergone actual physical planning studies – e.g., the planned widening of Kaumualii Highway between Lihue and Maluhia Road. A few projects may be infeasible, such as the widening of Kuamoo Road to four lanes. Others, such as the six-lane highway, would be undesirable. As stated in Section 5.5, Scenic Roadway Corridors, the County's policy is to have no roads larger than four lanes. Even if it were technically feasible to build four lanes on Kuamoo Road, such a project may never be constructed due to topography, historic sites, and scenic features. The following list of improvements illustrates the location and magnitude of 2020 traffic needs. Those projects that are recommended as part of the Kauai General Plan are noted with an asterisk.

- **Waimea to Port Allen Area**
  - Widen Kaumualii Highway to four (4) lanes from Waimea to Eleele.
- **Port Allen to Poipu Area**
  - Widen Kaumualii Highway to a 4-lane divided roadway between Kalaheo Town and Koloa Road.
  - Construct a new two-lane connector road between Port Allen and Poipu.
- **Poipu to Lihue Area**
  - Widen Kaumualii Highway to a four-lane divided highway between Koloa Road and Kuhio Highway/Rice Street intersection.
  - Construct a new 2-lane connector road between Poipu and Kipu.
  - Widen Koloa By-Pass/Maluhia Road to 4 lanes.
- **Lihue Area**
  - Construct a new 2-lane Lihue-Hanamaulu By-Pass Road;
  - Widen Kapule Highway to a 4-lane divided roadway.
- **Kapaa Area**
  - Widen Kuhio Highway to a 6-lane divided roadway between Hanamaulu and the Kapaa By-Pass Road;
  - Construct a new 4-lane Kapaa By-Pass Road\*;
  - Widen Kuamoo Road to 4 lanes between Kuhio Highway and Kamalu Road;
  - Widen Olohena Road to 4 lanes between the Kapaa By-Pass Road and Kuhio Highway;
  - Widen Kawaihau Road to 4 lanes between Kuhio Highway and Mailihuna Road.

**Note:** The LRTP recommends a special study of the Kapaa-Wailua roadway network and future transportation needs. Adding new roads may be preferable to the widening proposed in the LRTP. As discussed above, the listing of a long-range improvement project only indicates a need for additional roadway capacity. These projects are consistent with the Kauai General Plan.

Given the critical impact of highway planning on Kauai's growth, however, and given the County's policy to maintain rural character, potential highway improvements listed in the plan should at least be assessed for feasibility and desirability. The DOT is planning to prepare an updated land transportation plan that will extend to the year 2025. In this next long-range highway planning effort, it would be useful to analyze potential projects and rate them in terms of feasibility.

New or additional services and facilities that would be needed to serve Kauai's projected 2020 population include: Increased bus service in Koloa/Poipu,

Increased para-transit service in various regions of the island; Improvements to pullover areas along roadways in order to create safe and accessible bus stops; and designated areas at housing projects (particularly those with elderly and disabled residents) that provide safe and accessible paratransit stops. To meet current and future needs, an airport stop should be established.<sup>101, 2002</sup>

The *Kauai General Plan Land Use Map* shows general corridors for these new roads. In addition to the above, the following improvements may also be needed by 2020:

- **Poipu to Lihue Area**
  - Widen Poipu Road to a 4-lane divided roadway between Lawai Road and the Koloa By-Pass Road.
- **Lihue Area**
  - Construct a new 4-lane Nuhou Road between Puhi Road and Nawiliwili Road.
- **Kapaa Area**
  - Widen Olohena Road to 4 lanes between Kaapuni Road and the Kapaa By-Pass Road.<sup>4, 2000</sup>

### ***Anticipated Costs for the Future***

The total order-of-magnitude cost for this 20-year list of improvements outlined in the *Draft Hawaii Statewide Transportation Plan* is approximately \$320 to \$330 million. The Plan estimates the cost of building currently needed improvements is approximately \$97 million. This amounts to about 30 percent of highway funding needed through 2020.<sup>101, 2002</sup>

---

### ***Problems, Issues and Opportunities Associated with Costs***

The magnitude of improvements needed by 2020 reflects already-existing road capacity problems as well as growth. If growth occurs without correcting existing deficiencies, then traffic congestion will worsen.

### ***Compare Visitor and Resident Impact***

The island of Kauai is currently seeing a visitor population that is approximately 27 percent of the total island population. Most visitors to the island utilize rental cars and therefore are contributing to roadway congestion.

### ***Major Assumptions***

Major assumptions include:

- The 2020 growth projections are accurate;
- Section 1.6 of the *Draft Hawaii Statewide Transportation Plan* discusses the 2020 growth projections and a traffic analysis was prepared for alternative 2020 growth scenarios as part of the General Plan Update project. <sup>101, 2002</sup>

## County of Kauai – Airports

### ***Present Capacity and Usage***

The Final *Statewide Airport System Plan* states that the majority of the operations are in the category of air taxi/commuter traffic, which is dominated by helicopter operations. <sup>127, 1998</sup>

The following tables that are from the *State of Hawaii Data Book – 2001*, show updated information pertaining to Kauai County’s Airport use and capacity.

**Table 4.17 – Kauai county Airports and Heliports: 1998**

Airports					Heliports	
Island	Commercial	General aviation	Military	Semi-private	State: commercial	Semi-private
State Totals	9	7	6	1	-	5
Kauai	1	1	1	1	-	-

Source: 2001 *State of Hawaii Data Book*

**Table 4.18 – Kauai County Enplaned / Deplaned Passengers: 2001**

Airport	Passengers	
	Enplaned	Deplaned
<b>Overseas</b>		
Lihue	138,951	7,270,532
<b>Inter-island</b>		
Lihue	1,200,676	1,195,805

Source: 2001 *State of Hawaii Data Book*

Terminal concourse expansion meets the demand for additional passenger gates. Federal Inspection Service facilities welcome international travelers.

A lease lot subdivision has been developed to accommodate demand by general aviation and other airport-related uses and increases airport revenues. New helicopter facilities have been constructed to meet the needs of air tour operators. <sup>127, 1998</sup>

### ***Existing Problems, Issues and Opportunities***

According to the *Hawaii Tourism Product Assessment*, industry and DOT representatives to enhance tourism growth by permitting direct departures/flights from the islands support runway extensions for Maui and Kauai. <sup>91, 1999</sup>

The following issues were mentioned in the Final Statewide Airport System Plan:

- Need to Satisfy Forecast Demand:

- Current passenger and aircraft operations projections show continued increases in traffic resulting in demand for additional terminal and airfield facilities.
- Overseas flights directly to Lihue airport will result in the need for new or adapted terminal and/or airfield facilities.
- A higher level of security at the airports has challenged curbside traffic management as well as passenger throughput in the terminal.
- Need for Revenue enhancement and Economic Development
  - Revenue enhancement through concession and permitted development has not been actively promoted.
  - Current concession space is not maximizing opportunities for capturing customer demand
  - Retail and food beverage display areas are in need of upgrade to increase exposure and satisfy customer expectations.
- Customer Expectations
  - Visitors expect smooth provision of various transportation modes to achieve a relaxed holiday experience
  - The Lihue airport does not effectively project the image of local culture.
  - Additional demand has been demonstrated for direct service from the mainland U.S. and international points to Neighbor Islands although these destinations are not yet prepared to accept current demand.
- Enhancement of Stakeholder Relationships
  - An active public-private partnership is required to ensure full cooperation among airport stakeholders.
  - Effective working relationships need to be established and actively nurtured with community and interest group representatives
  - A need exists to ensure a user-friendly environment for airport system tenants.
- Organization of Space
  - Existing spaces are utilized for purposes other than the intended use.
  - Passenger services, e.g. concessions, are not located within the passenger flow through the airport.
  - Ground transportation facilities do not optimize use of land curb space.
  - Services, facilities, and passenger flows need to be consolidated to allow economic and efficient use of existing space.

- The allocation of space within and among the Lihue airport must be adjusted to maximize efficiency.
- Identification of Airport Facilities with Local Culture
  - There is a need to enhance marketing of Made-in-Hawaii products at the airports.
  - There is minimal feeling of “sense of place” or awareness of Hawaiian culture at the airports.
  - Displays presenting Hawaiian culture and history to visitors are either placed in inadequate space or are not sufficiently prominent to attract attention.

Princeville Airport: Both passenger and aircraft operations at Princeville Airport have been declining during the 1990s. In addition, development of the Kauai’s North Shore is expected to be limited. Therefore, operations at the privately owned airport are not likely to significantly increase safety and allow for DHC-8 aircraft in the future, which are in use at other secondary airports in the state. A terminal building in another location is also planned. <sup>127, 1998</sup>

### ***Future and Planned Usage***

The *Draft Hawaii Statewide Transportation Plan* lists the DOT’s purpose 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. <sup>101, 2002</sup>

According to the Final Statewide Airport System Plan, the runway extension at Lihue Airport will allow direct overseas and international flights in addition to inter-island traffic. <sup>127, 1998</sup>

### ***Future and Planned Requirements or Changes***

As mentioned in the *Final Statewide Airport System Plan*, facility requirements for the Lihue Airport during the planning period 1998 through 2020 are:

- Concourse expansion will be needed in the long-term to accommodate a projected increase in overseas and inter-island traffic of 55 percent through the year 2020. New heliport and general aviation facilities, including lease lot development, will be required to address future demand in these areas.
- Runway 17-35 requires extension in both the near and long-term in order to accommodate direct, long haul overseas flights. Cargo expansion is required to handle current peak demand and expected growth of approximately 65 percent through the year 2020.
- A new air traffic control tower will be required to provide adequate line-of-sight vision to the extended Runway 17-35.
- The secondary airports on Kauai are Princeville Airport and Port Allen Airport. Proposed improvements to the Princeville Airport include

- widening of the runway to conform to FAA design standards. In addition, the terminal is proposed for redevelopment in a new location.
- Improvements currently proposed for the Port Allen Airport include development of lease for helicopter operators.
  - Airfield Improvements: these will involve a single project to extend Runway 17-35 to accommodate international and domestic overseas wide body aircraft. The existing runway must be upgraded in order to accommodate heavier aircraft. This program will require three years of expenditures, beginning in FY 1998 and ending in FY 2000.
  - General Aviation Subdivision: This program involves the provision of new lease lots and upgrades to general aviation facilities. The existing supply of lease lots is insufficient to meet current demand. A program for new development will help to meet this demand and provide new revenues for LIH. Work associated with this program includes: lease lot subdivision; construction of a general aviation apron and road realignment; additional aprons and T-hangars; and relocation of the National Weather Service to enable site development. The two projects associated with this program will require three years of expenditures, starting in FY 1998 and ending in FY 2000.
  - Air Traffic Control Tower Relocation: Relocation of the control tower is necessary to meet FAA requirements for adequate sight distance and to accommodate future expansion of Runway 17-35. The two projects associated with this program will require two years of expenditures, starting in FY 1998 and ending in FY 1999.
  - Remaining Programs: The remaining five programs involve a range of airfield, terminal, and facility improvements.<sup>127, 1998</sup>

### ***Anticipated Costs for the Future***

According to the *Final Statewide Airport System Plan*, the costs for the 6-year Statewide Airport System Plan for the Lihue airport totals \$80.162 million.

Three major programs will account for nearly 90% or \$71.762 million of the \$80.162 million LIH CIP dollars. These programs include: Airfield Improvements, \$30.000 million; General Aviation Subdivision, \$17.350 million; and, Air Traffic Control Tower Relocation, \$24.412 million.

Runway and terminal improvements are scheduled for Princeville Airport. The program cost will be \$5.100 million and is scheduled for FY 1998 to FY 1999.<sup>127, 1998</sup>

### ***Problems, Issues and Opportunities Associated with Costs***

The *Draft Hawaii Statewide Transportation Plan* states that the DOT is required by law to generate its own monies to fund programs and projects.

Revenue sources are the aviation fuel tax, landing fees, airport use charges, concession fees, rental and miscellaneous earnings and investment income.

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.<sup>101, 2002</sup>

### ***Compare Visitor and Resident Impact***

The *Final Statewide Airport System Plan* predicts that air traffic at Lihue Airport expects to be dominated by inter-island travelers, although domestic overseas traffic is forecast to increase. There is no anticipation of direct international service to Kauai in the forecast.<sup>127, 1998</sup>

### ***Major Assumptions***

The *Final Statewide Airport System Plan* forecasts total aircraft operations to increase from 103,686 in 1992 to 156,600 by 2020, an overall increase of 51 percent.

Continued growth of aviation activities on Kauai is forecast, with significant gains in inter-island and overseas passenger activity at Lihue Airport. This airport is to remain the principal airport on the island. Anticipated development at Lihue airport will therefore involve continued upgrades to existing and provision of new facilities to meet user needs and to ensure safety and convenience to travelers.

Ownership by a dominant regional landowner is likely to continue. Terminal improvements paid for by the State should be considered under an agreement with the landowner. The State may not want to implement extensive terminal area and access road improvements without ownership control of the property.<sup>127, 1998</sup>

## County of Kauai – Harbors

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, Kauai’s two commercial harbors, Nawiliwili Harbor and Port Allen, are owned by the State of Hawaii and operated by the State Department of Transportation (DOT), Harbors Division. The *Kauai General Plan* mentions that Kauai’s commercial harbors are continually updated with the latest shipping systems.

Located near Lihue are major commercial and industrial facilities, Nawiliwili Harbor serves as the primary commercial harbor for Kauai. Facilities include three piers for the handling of both overseas and inter-island general and containerized cargo. The harbor is also used for charter boat fishing and recreational boating, and has become an increasingly popular port of-Call for passenger cruise ships. Since Kauai is the western-most major Hawaiian Island, Nawiliwili is frequently the first point-of-entry into the State for passenger cruise ships.

Port Allen Harbor, Kauai’s second commercial harbor, is situated off of Hanapepe Bay on the east side of the Hanapepe River. The deepwater port has a single pier and complements the primary harbor facilities at Nawiliwili on the east side of the island. Present water activities at Port Allen include U.S. Navel Vessels supporting activities at the Pacific Missile Range Facility, petroleum shipment, general cargo, commercial fisheries and other maritime activities. The U. S. Navy continues to be the primary user of the pier, with recent use by the Na Pali coast tour operators who were displaced by Hanalei River. Port Allen Harbor is also used as an alternative port-of-call for smaller passenger vessels.<sup>4, 2000</sup>

The State Airports, Harbors and Highways report activity at the commercial harbors.

**Table 4.19 – Kauai County Harbors Statistics: 2001**

	Passengers	Cargo in tons
Nawiliwili Harbor	92,219	859,195
Port Allen Harbor	-	202,531

Source: *State Airports, Harbors and Highways*

**Table 4.20 – Kauai Commercial Harbors Measures in Feet: 2001**

Harbor	Harbor entrance depth	Harbor basin			Piers	Storage area (1,000 sq ft)	
		Depth	Length	Width		Shedded	Open
Nawiliwili	40	35	1,950	1,540	1,916	70	1,379
Port Allen	35	35	1,500	1,200	1,200	35	32

Source: 2001 State of Hawaii Data Book

Several cruise lines visit Kauai. The passenger reception areas are attractive and well designed for circulation to welcoming stations and ground transportation. In 1998, nine foreign-flagged vessels made 42 stops at Nawiliwili Harbor. American Hawaii Cruises, the only company providing inter-island service, made 52 visits to Kauai.

Typically, cruise ships arrive at Nawiliwili Harbor in the morning, dock at Pier 2, and leave in the evening. Regularly scheduled container barges, fuel ships, and other large vessels also use pier 2. Pier 3 serves as an additional berth during days when two ships arrive at the Harbor. The nearest visitor-oriented destination is a small shopping mall about three quarters of a mile from the Harbor. Most destinations, including Lihue Town, are not within convenient walking distance and typically require car, bus, or taxi transport.

Statewide, the number of cruise ship passengers is expected to increase from 106,500 in 1998 to 496,500 in 2020. In terms of economic benefit, it is estimated that the cruise ship industry will generate 1,700 jobs on Kauai by 2020.<sup>4, 2000</sup>

According to the *Kauai General Plan*, the existing harbors appear to be at capacity and budget constrained.<sup>4, 2000</sup> Nawiliwili commercial harbor is multi-functional. It is used as commercial shipping terminal, cruise terminal and small boat harbor.

According to the *Kauai General Plan*, Kauai has four small boat harbors, Nawiliwili, Port Allen, Kikiaola and Kukuiula. These facilities are owned by the State of Hawaii and are managed by the State Department of Land and Natural Resources (DLNR), Division of Boating and Ocean Recreation (DOBOR). In addition, DOBOR manages various boat launching ramps. The Wailua Marina is privately operated.

Ocean touring and recreation comprise a key component of the visitor industry. Unlike the other major islands, Kauai lacks a small boat harbor that is configured primarily to serve charters and tours. Kauai also lacks a small boat harbor north of Wailua. Since commercial boat operations at the Hanalei River mouth were terminated in 1998, there is no launching point for ocean tours on the North

Shore. Most tours have migrated to Nawiliwili and Port Allen, where operations have increased.

Kikiaola Small Boat Harbor is located two miles west of the Waimea River mouth and close to the town of Kekaha on Kauai's southwest shore. It serves mainly as a small vessel launching facility for local commercial and pleasure craft. The harbor occasionally accommodates tenders serving cruise ships moored off the coast. Kikiaola Small Boat Harbor is about 16 acres in size and has 8 moorings and one boat launch ramp. <sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

The State Airports, Harbors, and Highways states the function of DOT is 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. <sup>37, 2001</sup>

The Kauai General Plan notes that increased activity from the Na Pali coast tour operators has led to overcrowded conditions at both the commercial and small boat harbor facilities. The casual parking arrangement at Port Allen is not capable of handling the increased traffic, and boat companies are forced to provide off-site parking and to bus or walk people to the boats. The restrooms are inadequate for large groups of visitors, and there is insufficient tour boat loading space. <sup>4, 2000</sup>

The Hawaii Tourism Product states that Kauai needs to work on transportation infrastructure at Nawiliwili Harbor (cruise ship berth). <sup>91, 1999</sup>

### ***Future and Planned Usage***

It is planned that further use will be made of the cruise ship terminal. Also, as the population increases, commercial shipments will increase as well.

### ***Future and Planned Requirements or Changes***

The *Kauai General Plan* reviews the Master Plans for the commercial harbors. The *2010 Master Plan for Nawiliwili Harbor* (1987) provides a general, long-range guide for growth, improvement, and efficient consolidation of land usage at Nawiliwili Harbor. The *Master Plan* was updated in 1993 in response to Hurricane Iniki. The Harbors Division is currently revising the Nawiliwili Master Plan as part of preparing *Commercial Harbors Plan 2025*.

In 1999, DOT-Harbors published the *Statewide Cruise Facilities Study* (Final, January 1999). Anticipating the growth in the cruise market, the study examined facilities throughout the state and will be used in developing the final 2020 harbor plans. Its proposals for Nawiliwili are congruent with the updated 2010 Master Plan.

The Plan designates Piers 1 and 3 for inter-island container operations and inter-island barge operations, respectively, and Pier 2 for cruise vessel and general cargo operations. Pier 3 is also used to berth a second cruise ship. Pier extensions are proposed at the west end of Pier 2 and the north end of Pier 3 to close the west corner of the Harbor basin and provide an additional 500-600 lineal feet of berth space at Pier 2. The Cruise Facilities Study also proposes two new passenger terminals and ground transportation facilities for Nawiliwili. The initial phase of improvements is scheduled for completion by 2004. According to the Cruise Facilities Study, Nawiliwili Harbor shows the highest return on investment among all proposed cruise facility improvements statewide.

- Develop capital improvements to Nawiliwili Harbor to support the future needs of cruise ships and cargo vessels.
- Develop ground transportation facilities, pedestrian circulation improvements, and terminal facilities at Nawiliwili Harbor that will accommodate 2,000-passenger cruise ships.
- Develop shuttle and other transportation improvements to move people out of the Nawiliwili Harbor area to various recreation, shopping and cultural attractions.
- Integrate planning for commercial facilities and Nawiliwili Beach Park with the harbor master plan.

The County Planning Department and Department of Public Works shall coordinate closely with the State Harbors Division in planning for Nawiliwili Harbor, particularly with regard to ground transportation for cruise ship passengers and vehicular and pedestrian circulation.

A long-range plan for Port Allen Harbor was prepared in 1987 and updated in 1994. The report, *Master Plan Update for Port Allen Harbor, 1993 Edition* (April 1994) shows future projects to include: extending the pier structure to accommodate longer vessels; acquiring additional lands to expand the capability of the harbor; improving the shoreline on both sides of the pier to accommodate small commercial vessel moorings; and repairing the breakwater.

According to the Kauai General Plan, future plans will be to encourage the development of parking and other facilities to expand the capacity of Port Allen Harbor and provide improved service.

According to the 1999 *Statewide Cruise Facilities Study*, Port Allen Harbor is susceptible to surge action and is therefore not recommended as a cruise port. Instead, the Study recommends improving Kikiaola Small Boat Harbor to receive launches from cruise ships moored off of the Waimea coast. <sup>4, 2000</sup>

### ***Anticipated Costs for the Future***

According to the *Kauai General Plan*:

Total project cost is approximately \$7.3 million. <sup>4, 2000</sup>

According to the State Airports, Harbors and Highways:  
Nawiliwili Harbor -Special maintenance projects \$249,000  
Port Allen Harbor -Special maintenance projects \$349,200<sup>37, 2001</sup>

### ***Problems, Issues and Opportunities Associated with Costs***

According to the *Kauai General Plan*, DOBOR has close-ended funding. It does not receive State General Fund support and must pay operating expenses out of its revenues. Revenues include fees from rental of boat slips and commercial boat license fees. These are considered low in comparison to the value of the harbor leases and licenses, and in comparison to fee structures in other states. Some 95 percent of gross revenues are consumed by payments to the Office of Hawaiian Affairs, debt service for harbor improvements, utility costs, and transfer payments to the State for administrative and enforcement support. This leaves only four percent of DOBOR revenues available to pay for staff. (See policies in Section 4.2.8, concerning additional funding for parks and small boat harbors.)<sup>4, 2000</sup>

As mentioned 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.<sup>37, 2001</sup>

The Draft Hawaii Statewide Transportation Plan states that the 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.<sup>101, 2002</sup>

### ***Compare Visitor and Resident Impact***

The *Kauai General Plan* cites the Planning Department's projections for the year 2020 are expressed as a low-to-high range. For purposes of long-range public facilities planning, agencies should use the high end of the range. As of 1999, the high end of the range consists of a daily visitor population of 28,000, a resident population of approximately 74,300, and total jobs of about 45,000. The Planning Department at least every five years and/or when new information becomes available – e.g., new Census information or new official State projections will revise the projections

In 1998, there were approximately 17,200 visitors on Kauai per day. Referred to statistically as the average daily visitor census (ADVC), this figure provides a measure not only of the overall strength of the visitor industry and prosperity of visitor-dependent businesses, but also of the potential impacts of visitors on recreation resources, traffic, and infrastructure.

During the 1980s, the average number of visitors per day on Kauai trended upwards, reaching an all-time high of 19,140 in 1989. Since then, Kauai's visitor industry has exhibited steady signs of recovery from the devastation of Hurricane Iniki and the national recession of the early 1990s. Between 1994 and 1998, Kauai's ADVC increased at an annual growth rate of 6.4 percent.<sup>4, 2000</sup>

### ***Major Assumptions***

The State Airports, Harbors, and Highways state that the overseas container volume is projected to top 1,338,000 TEUs in the year 2020.

The 2020 projections for general cargo total 3,919,800 short tons.<sup>37, 2001</sup>

## County of Kauai - Parks

### *Present Capacity and Usage*

Though both the State and County operate parks on Kauai the *Kauai General Plan* focuses on parks that are managed and maintained by the County Department of Public Works, Division of Parks. The State parks are typically based on natural resources similar to national parks while County parks are typically smaller, more urban and designed for active use by larger numbers of people. Kauai's approximately 400 acres of County parks are divided amongst 64 parks the largest being the 49-acre Lydgate Park in Wailua. In general, County parks have not experienced the stresses found at State facilities. Residents coexist with visitors in popular parks such as Salt Pond, Anahola, and Poipu. However, there has been conflict over County boat ramps (notably, Black Pot and Anini), which have been heavily used by both independent visitors and commercial tours. (See tables for sustainable Kauai parks, parks by district and type and high usage parks in Appendix.)

The *Kauai General Plan* states that Kauai's resource parks—Ha'ena State Park, Koke'e State Park, Na Pali Coast State Park and Kilauea Point National Wildlife Refuge, are heavily patronized by visitors to Kauai (upwards of 80 percent of daily patrons). In 1998, these parks collectively received approximately 2.2 million visitors. In every case except Polihale, tourists accounted for 80-95 percent of patronage. <sup>4,2000</sup>

The table below summarizes county parks by district and type. Descriptions of the different park types are provided below.

- **Regional Parks** – Large areas that may serve the entire island or a region of the island and may include a variety of recreation park types and facilities, natural and cultural sites.
- **Beach Parks** – Areas and sites along the shoreline that may include facilities and support services for water activities, sunbathing, picnicking, and other passive activities.
- **Passive Parks** – Maintained primarily to preserve or conserve unique natural features.
- **District** – May have playfields, play courts, passive areas, gym/recreation complex, and swimming pool.
- **Community** – May have playfields, play courts, passive areas, and recreation building.
- **Neighborhood** – May have playfields; play courts, passive areas, and comfort station. <sup>4, 2000</sup>

**Table 4.21 – Kauai Parks by District and Type: 2000**

District/Park Type	Acres	District/Park Type	Acres
<b>North Shore</b>	<b>38.7</b>	<b>Koloa-Poipu-Kalaheo</b>	<b>61.3</b>
Beach Parks	28.3	Beach Parks	6.4
Community Parks	10.4	Passive Park	4.4
		District Parks	32.3
<b>Kawaihau</b>	<b>134.3</b>	Community Parks	9.1
Regional Park	48.9	Neighborhood Park	9.0
Beach Parks	22.0		
District Park	18.1	<b>West Side</b>	<b>80.0</b>
Community Parks	45.4	Beach Parks	20.9
		District Parks	34.9
<b>Lihue</b>	<b>86.8</b>	Community Parks	24.2
District Park	34.0		
Beach Parks	16.1	<b>ISLANDWIDE TOTAL</b>	<b>401.0</b>
Community Parks	36.6		

Source: *Kauai General Plan*

The Department of Public Works classifies parks into five categories of varying levels of use. Class I and Class II levels are considered “extremely high use” and “high use”, respectively. The table below includes use by both resident and visitors. <sup>4, 2000</sup>

**Table 4.22 – Kauai Parks with High Levels of Use: 2000**

Use Category/Park	Park Type	Acres	Use Category/Park	Park Type	Acres
<b>EXTREMELY HIGH USE:</b>			<b>HIGH USE:</b>		
<b>North Shore</b>			<b>North Shore</b>		
Anini Beach Park	Beach	12.5	Hanalei Black Pot	Beach	2.5
<b>Kawaihau</b>			Hanalei Pavilion	Beach	1.3
Lydgate Park	Regional	48.9	Haena Park	Beach	5.5
Kapaa New Park	District	18.1	Kilauea Park	Community	4.9
<b>Lihue</b>			<b>Kawaihau</b>		
Vidinha Stadium	District	34.0	Anahola Beach Park	Beach	1.5
Isenberg Park	Community	9.2	Kapahi Park	Community	4.0
<b>Koloa Poipu-Kalaheo</b>			Wailua Houselots Park	Community	10.1
Poipu Beach Park	Beach	5.4	<b>Lihue</b>		
Spouting Horn Park	Passive	4.4	Hanamaulu Beach	Beach	6.5
Kalawai Park	District	21.0	Nawiliwili Park	Beach	6.3
Koloa Park	District	11.3	Lihue County Park	Community	3.3
<b>West Side</b>			<b>Koloa-Poipu-Kalaheo</b>		
Hanapepe Pavilion	Beach	0.8	Kalaheo Little League	Community	1.4
Salt Pond Park	Beach	5.9			
Hanapepe Stadium	District	14.7			
Kekaha Faye Park	District	8.5			

Source: *Kauai General Plan*

The *Kauai General Plan* found that the only park that is currently sustainable without major improvements is Na Pali Coast State Park. <sup>4, 2000</sup>

**Table 4.23 – Kauai Parks Visitation: 2000**

Park/Site	Annual Number Of Patrons	Sustainable	Need for Improvements
Federal			
Kilauea Point NWR	300,000		
State			
Haena State Park	663,000		
Wailua River State Park	381,333		
Waimea Canyon State Park	345,000		
Kokee State Park	304,000		
Polihale State Park	138,000		
Na Pali Coast State Park	107,000		
County			
Poipu Beach Park	278,217		
Lydgate Park	189,858		
Salt Pond Park	162,419		
Other			
Kokee Natural History Museum	111,810		

Source: *Kauai General Plan*

County parks actively support and enhance ecotourism activities offered by State parks. More visitors are seeking ecotourism, defined as “nature-based travel.” Typically, it involves hiking, bicycling, kayaking, or boating to a scenic and/or wilderness land destination. It may also include camping, and ocean-based tours and recreational activities, such as windsurfing and snorkeling. Many small commercial businesses are renting equipment or providing tours to this market. Among visitors to the State, visitors to Kauai tend to be the most interested in ecotourism and outdoor recreation.

County parks, specifically those offering camping, play an active role in supporting ecotourism activity. Visitors and organized tour groups often visit Lucy Wright Park, Hanapepe Pavilion, Hanamaulu Beach Park, Anahola Beach Park, Anini Beach Park, and Haena Beach Park in succession as they camp their way around the island.

County parks often serve as staging areas with overnight camping before and after excursions into the State parks (e.g., Na Pali Coast trail trips). Anini Beach Park and Haena Beach Park are especially popular since they are located at the gateway to the Na Pali coast. <sup>4, 2000</sup>

***Existing Problems, Issues and Opportunities***

In their 1999 *Hawaii Tourism Product Assessment*, the Hawaii Tourism Authority found various problems and opportunities with parks in Kauai. Inadequate maintenance of park amenities (restrooms, trails, etc) and conflicts with the State’s DLNR have hindered Kauai’s tourism resources. Opportunities therefore include better maintenance at public areas such as visitor centers, public restrooms at beaches, and parks and privatization of certain park areas to provide users with better service and maintenance. <sup>91, 1999</sup>

The *Kauai General Plan* reports the results of a survey of parks managers who projected future patronage based on alternative growth proposals. (The results are shown under Future and Planned Requirements or Changes.) The survey indicates that five of the 11 major sites could not sustain significant additional patronage without making improvements and providing greater funding for operations. Another five sites could sustain increased patronage to the level of Scenario A but would require significant investment to handle patronage above that level. The State Parks Division provided estimates for needed capital improvements totaling over \$15 million.

The Kauai General Plan Visitor Industry Task Group were concerned that Kauai is being marketed as an ecotourism destination but parks managers have had to limit hiking and camping permits and close some roads and trails. <sup>4, 2000</sup>

### ***Future and Planned Usage***

In order to adequately accommodate the projected growth of residents and visitors the Kauai General Plan suggests the following improvements to County parks:

Kawaihau:

- Kealia cane haul road - extension of the planned regional shoreline bikeway from Ninini to Anahola

Lihue:

- Nawiliwili Beach Park - implementation of the master plan;
- Lydgate Park - implementation of the master plan for the expansion of camping sites, restrooms and parking

West Side:

- Kekaha Beach Park - development of a comfort station

Kalaheo:

- Salt Pond Park - land acquisition to relocate camping to a mauka site
- Poipu Beach - land acquisition in the Waiohai area for additional parking and restrooms

North Shore:

- Anini Beach Park – additional parking and restrooms
- Hanalei Black Pot Park – acquire additional park land for separate camping and picnicking areas, and additional parking and restrooms
- Haena Beach Park – addition of a comfort station, parking and personnel. <sup>4, 2000</sup>

### ***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.

- Kauai: Haena, Hanalei, Mahaulepu and Poipu
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 *Kauai General Plan* stated planned requirements for Kauai’s parks include:

- Develop and maintain Kauai’s parks to meet the needs of both residents and visitors;
- Provide convenient access to all of Kauai’s beaches and inland recreation areas;
- Provide safe public parks and recreation facilities;
- Improve maintenance of grounds and comfort stations by committing the necessary staffing and funding for maintenance of existing facilities, capital improvements, expansion of recreational offerings, and enforcement;
- Acquire and develop additional beach parks and community or neighborhood parks in communities that are under-served or experiencing growth;
- Consider community concerns in all planning efforts;
- Provide flexibility in administering the park dedication requirements, so that developer land dedication or fee payments result in a usable park complete with facilities. Create new parks through County-developer partnerships;
- Review, evaluate, and update the *Kauai Parks & Recreation Master Plan* (April 1978) to reflect current needs and the policies of the General Plan;
- Manage County parks according to the following policies:
  - Conserve resources;
  - Provide for use by the public – i.e., individuals, families, ohanas; and
  - Allow for group use (including commercial tours and equipment rentals) within conservation limits.
- Review and revise the park dedication regulations so that it is a more effective tool for developing needed parks;
- Evaluate state and county park facilities and operations in order to streamline and achieve a better division of responsibility;
- The County DPW shall develop a comprehensive park permit system for regulating organized group activities in County parks. The system shall provide for permit fees, as appropriate;
- Permit commercial activities, such as windsurfing and kayaking at certain parks and under specified conditions;
- Develop new sites, facilities, and recreational opportunities in areas that are deficient in outdoor recreational opportunities or overburdened by the number of park users;
- Construct park facilities in a manner, which avoids adverse impacts on natural resources, or processes in the coastal zone or any other environmentally sensitive area. In the design of recreation areas, incorporate natural features of the site and use landscape materials that are indigenous to the area in order to retain a sense of place;
- Link recreational attractions, that may be designed to have distinct identities and entries, with surrounding areas through the use of

- connecting roadways, bikeways, walkways, landscape features and/or architectural design;
- Emphasize developing large regional recreation parks rather than many small parks;
  - Supplement recreational and ecotourism activities in state and county parks with bikeways, particularly along scenic coastlines, as outlined in the State's master plan, *Bike Plan Hawaii* (1994);
  - Explore lease agreements to open up the old cane haul road to those beaches that extend beyond Donkey Beach to Anahola; and
  - Review and evaluate the utilization of fields and scheduled sporting events at County parks that offer such activities. <sup>4, 2000</sup>

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

The Department of Land and Natural Resources, Kauai District Health Office found the most immediate problem concerning Kauai parks to be insufficient funding to properly maintain the parks. Tourist dollars are not being used to maintain current infrastructure or improve the infrastructure of parks, beaches, etc. <sup>5C, 2002</sup>

### ***Compare Visitor and Resident Impact***

On all resource parks (Haena State Park, Kokee State Park, Na Pali Coast State Park, Polihale State Park, Wailua River State Park, Waimea Canyon State Park and Kilauea Point National Wildlife Refuge) except Polihale, tourists accounted for 80-90 percent of patronage. <sup>4, 2000</sup>

The *Kauai General Plan* forecasts increased usage for Kauai's parks. The current trend of ecotourism will divert more visitors towards the natural settings of Hawaii in particular the parks and beaches of Kauai. <sup>4, 2000</sup>

### ***Major Assumptions***

The *Kauai General Plan* assumes that Kauai's parks will continue to see increased usage and that current trends in tourism for ecotourism products will divert more visitors towards the natural settings of Hawaii, in particular the parks and beaches of Kauai. Increased use will inevitably lead to over crowding, stress on the natural environment and overuse of the infrastructure facilities. Planning, maintenance and new capitol works are needed to control any degradation of the park system. Unless these actions are undertaken then it can only be assumed that the attraction of these areas will diminish, for visitors and residents. <sup>4, 2000</sup>

## County of Kauai – Police, Fire and Emergency Services

### ***Present Capacity and Usage***

#### **Police**

According to the *Kauai General Plan*, the Kauai Police Department has three stations, located approximately 25 miles apart. The main police station and administrative headquarters is located in Lihue. Smaller police stations at Waimea and Hanalei are co-located with fire stations. In 1999, the police department had 145 officers island wide and 35 civilian employees.<sup>4, 2000</sup>

#### **Fire**

The *Kauai General Plan* provides information about the fire infrastructures on Kauai. The Kauai Fire Department has a main station and administrative headquarters in Lihue. Other fire stations are located in Waimea, Hanapepe, Kalaheo, Koloa, Kapaa, and Hanalei. The County has a unified, island wide system of fire protection and rescue services. Stations located at Waimea and Hanalei anchor the system, providing service to the farthest settled areas. Other stations located in major towns provide service to both the towns and outlying rural areas.<sup>4, 2000</sup>

According to the *Welcome to the Garden Island of Kauai – Access to Kauai County Agencies*, inventory for the year 2001 includes 7 fire stations, 15 vehicles of various assortment, 126 fire personnel, and 26 lifeguards. There were 3500 calls in 2001; of these 80-85% were rescues. Roughly, 60 percent of these calls were for emergency medical services. About 300 calls were for fires and 400 were visitor related. In order to improve its resources and capabilities, the Fire Department plans to add two satellite stations and replace the existing Kapaa Station, which is presently located in a flood zone. Satellite stations typically have two to three men per station and provide quick response to medical emergency calls.<sup>45, 2002</sup>

### ***Existing Problems, Issues and Opportunities***

#### **Police**

The main police station in Lihue, built in 1953, is outdated and overcrowded, according to the *Kauai General Plan*. There is no room for expansion.<sup>4, 2000</sup>

#### **Fire**

The *Welcome to the Garden Island of Kauai – Access to Kauai County Agencies* identifies that there are two main issues- burning of sugarcane and the resultant vacant brush fires and the increase in emergency rescue calls.<sup>45, 2002</sup>

## ***Future and Planned Usage***

### **Police**

In reference to the *Kauai General Plan*, other than the police station adjacent to the Kauai Judiciary Complex, the Police Department does not have any other facility plans. The new facility will house the Kauai Police Department, Kauai County Civil Defense, and the Kauai County Prosecuting Attorney's Office. The new police station will also house a crime laboratory and will accommodate future staffing needs. The new facility is expected to have a total area of 58,000 to 60,000 gross square feet for the Main Police Station/Emergency Operating Center and 9,400 square feet for the Office of Prosecuting Attorney. Construction is scheduled to begin in mid-2000. <sup>4, 2000</sup>

### **Fire**

Stated in the *Kauai General Plan*, the Kauai Fire Department plans to add satellite stations in Anahola and the Wailua Homesteads area. The Department also plans to replace the existing Kapaa Station with one in Kapaa Heights on a site near Mahelona Hospital. These projects have not received funding, and there is no estimated schedule for completion. <sup>4, 2000</sup>

### **Other**

According to the *Kauai General Plan*, with federal funding, the Department of Health currently has the opportunity to expand and improve Emergency Preparedness infrastructure to address emergencies including Bio-terrorism and other emerging diseases. <sup>4, 2000</sup>

## ***Future and Planned Requirements or Changes***

According to the *Kauai General Plan*, County of Kauai plans to:

- Provide adequate staffing and facilities to ensure effective and efficient delivery of basic police and fire protection,
- Improve fire protection, develop additional facilities according to a long-range system plan,
- Evaluate fire protection Service Island wide, with particular attention to the east side, from Wailua to Anahola,
- Working with the Water Department, the County shall prepare a long-range plan for fire protection, to include the following elements:
  - Evaluation of existing level-of-service and response time for all communities, work with the Water Department to determine fire flow levels.
  - Development of standards for urban and rural levels of service, including response time and fire flow requirements.
  - Development of a long-range, phased facilities plan to attain an adequate level of Service Island wide. <sup>4, 2000</sup>

## ***Anticipated Costs for the Future***

### **Police**

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

### **Fire**

The *Welcome to the Garden Island of Kauai – Access to Kauai County Agencies* anticipates costs for the Kauai County Fire Department. There are 18 new fire-fighting positions at \$60,000 each to outfit with gear equals \$1,080,000 in personnel costs. This figure does not include salaries and equipment needing to be replaced. <sup>45, 2002</sup>

## ***Problems, Issues and Opportunities Associated with Costs***

The *Welcome to the Garden Island of Kauai – Access to Kauai County Agencies* identifies problems associated with costs include budget restrictions, user fees/cost and the residential tax base. <sup>45, 2002</sup>

## ***Compare Visitor and Resident Impact***

According to *Welcome to the Garden Island of Kauai – Access to Kauai County Agencies* there is an approximate 2:1 visitor to resident ratio of emergency and rescue calls, heart attack, accidents, drowning, and trail rescue. This is based on the geographic location of the calls. Approximately 10.5% of the annual calls were visitor related. Further study of incidences at the community level may also reveal the number of incidences within visitor related areas. <sup>45, 2002</sup>

## ***Major Assumptions***

Both the *Kauai General Plan* and the *Welcome to the Garden Island of Kauai – Access to Kauai County Agencies* offer major assumptions. The Kauai Police Department assumes 2.5 officers per 1,000 residents and a 5% increase in calls annually regarding visitor and resident emergencies. In order to provide adequate service to Kauai's projected 2020 population of 74,300, an additional 41 officers would be needed. <sup>4, 2000 45, 2002</sup>

## County of Kauai – Visitor Accommodations

### *Present Capacity and Usage*

The *State of Hawaii Data Book* gives statistics on visitation to the County of Kauai. The average number of visitors present in Kauai County on any given day was 16,830 visitors. The state total was 158,247 visitors. Total visitation to Kauai County for 2001 is summarized in the table below.<sup>252, 2001</sup>

**Table 4.24 – Kauai Visitation: 2001**

Visitation	Total Kauai County
Domestic	839,368
International	80,528
<b>Total</b>	<b>919,896</b>

Source: 2001 *State of Hawaii Data Book*

According to the *2001 Visitor Plant Inventory Report* the supply of visitor units affects availability and the number of visitors that Kauai is able to accommodate during peak periods. The table below shows that in 2001 Kauai had approximately 7,202 visitor units, ranging from first-class resorts to hostels. Kauai County visitor accommodation units increased from 7,159 units in 2000 to 7,202 units in 2001; this is an increase of 0.6%.<sup>80, 2001</sup>

**Table 4.25 – Kauai Visitor Accommodations: 2001**

TYPE	PROPERTIES	AVAILABLE UNITS
Apartment/Hotel	1	4
Bed & Breakfast	34	105
Condominium Hotel	37	2,879
Hostel	1	40
Hotel	14	2,689
Individual Vacation Unit	147	337
Other	23	1,148
<b>TOTAL</b>	<b>257</b>	<b>7,202</b>

Source: 2001 *Visitor Plant Inventory*

In the *2001 Visitor Plant Inventory*, the capacity on Kauai includes individual vacation unit properties that account for the largest number of properties with 57.2% (147) of the island's total; but ranks fourth in terms of room inventory (337 or 4.7%). Condominium hotels account for the second largest group in terms of properties (37 or 5.4%) but represent 37.3% of total rooms (2,689). Hostels are represented by one property (0.4%) with 40 units while apartment/hotels comprise the smallest category of one property with four units (less than 1%). Kauai's upper class rooms account for 39.8 percent of all rooms on the island.<sup>80, 2001</sup>

**Table 4.26 – Kauai Visitor Plant Inventory by Area and Type: 2001**

<b>Area</b>	<b>Properties</b>	<b>Available Units</b>
<b>Kalaheo/Waimea</b>		
Bed & Breakfast	5	9
Hotel	1	50
Individual Vacation Unit	8	41
Other	1	1
<b>Total</b>	<b>15</b>	<b>101</b>
<b>Lihue</b>		
Condominium Hotel	2	179
Hotel	5	425
Individual Vacation Unit	1	4
Other	2	608
<b>Total</b>	<b>10</b>	<b>1,216</b>
<b>Poipu/Kukuiula</b>		
Bed & Breakfast	7	21
Condominium Hotel	16	1,251
Hotel	2	1,015
Individual Vacation Unit	28	90
Other	2	5
<b>Total</b>	<b>55</b>	<b>2,382</b>
<b>Princeville/Hanalei</b>		
Apartment/Hotel	1	4
Bed & Breakfast	9	24
Condominium Hotel	8	579
Hotel	1	252
Individual Vacation Unit	83	171
Other	16	531
<b>Total</b>	<b>118</b>	<b>1,561</b>
<b>Wailua/Kapaa</b>		
Bed & Breakfast	13	51
Condominium Hotel	11	870
Hostel	1	40
Hotel	5	947
Individual Vacation Unit	27	31
Other	2	3
<b>Total</b>	<b>59</b>	<b>1,942</b>

Source: 2001 Visitor Plant Inventory

The *Visitor Plant Inventory* survey also includes questions about the class of units at each property. The table to follow shows the percent of each class of units available on each island. <sup>80, 2001</sup>

**Table 4.27 – Kauai Visitor Accommodations by Price**

Class	Available Units	Percent
Budget Up to \$100 per night	1,032	14.5%
Standard \$101 to \$250 per night	3,257	45.7%
Deluxe \$251 to \$500 per night	2,229	31.3%
Luxury Over \$500 per night	604	8.5%
<b>TOTAL</b>	<b>7,122</b>	<b>100%</b>

Source: 2001 Visitor Plant Inventory

The State of Hawaii Data Book lists occupancy rates, average daily room rates and revenues per room for the main resort areas on the Island of Kauai. <sup>252, 2001</sup>

**Table 4.28 – Hotel Room Occupancy and Room Rates: 2001**

	Percent occupied	Average daily room rate (dollars)	Average revenue per available room (dollars)
Kauai Total	74.84	170.54	127.63
North	74.34	204.79	152.23
Central	71.68	111.57	79.97
South	77.49	203.46	157.66

Source: 2001 State of Hawaii Data Book

The Hawaii State Department of Business, Economic Development and Tourism gives statistics and makes projections about the visitor industry on the Island of Kauai. <sup>84, 2000</sup>

**Table 4.29 – Kauai 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
Kauai	3.7	3.7	3.7	3.8	3.8	3.8	3.8
Number of occupied visitor rooms							
State	51,551	54,256	62,685	68,483	75,197	82,567	90,657
Kauai	4,669	5,002	5,889	6,529	7,236	8,018	8,884
Share of occupied visitor rooms (%)							
Kauai	9.1	9.2	9.4	9.5	9.6	9.7	9.8
Minimum hotel occupancy rate when new hotels are needed (%)							
State	72.1	75.9	81.7	82.5	82.8	83.0	83.0
Kauai	67.0	71.8	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
Kauai	6,969	6,969	7,182	7,914	8,771	9,661	10,704
Number of Visitor rooms (avg. annual growth rate, %)							
State	0.5	0.0	1.4	1.6	1.8	1.8	1.9
Kauai	3.3	0.0	0.6	2.0	2.1	2.0	2.1

Source: 2001 Visitor Plant Inventory

### **Existing Problems, Issues and Opportunities**

The *Kauai General Plan* forecast development of visitor units based on historic development trends and the estimates of overall demand for 2020 such as the total number of units needed, assuming historic and targeted occupancy rates. The supply of Resort-designated land is greater than the projected demand under the 2020 scenarios discussed in the *Kauai General Plan*. It illustrates that it is unlikely that all of the potential growth will occur. Growth in Kauai's visitor unit inventory depends on strong market demand and specific investment decisions by individual landowners and developers. Even if a property is planned and zoned for resort use, it does not mean that it will be developed within the planning period. Some sites zoned for resort development for 20 years or more remain vacant today. On the other hand, an adequate supply of land distributed among the different regions of the island stimulates competition. Given the existing supply of Resort-designated land, there is no cause to make major

redesignations through the General Plan Update. The addition of the two West Side sites provides a potential for visitor industry development not previously available in that region. <sup>4, 2000</sup>

### ***Future and Planned Usage***

The *Kauai General Plan* considers from the standpoint of real estate investment, that a slower rate of development should be projected for the next 20 years – probably in the range of 2,000-3,000 additional visitor units.

Lands zoned for resort use, according to the *Kauai General Plan*, can accommodate over 5,500 visitor units, and lands designated resort but not zoned would accommodate approximately 800 additional units. This includes about 2,840 units in the major resort destinations of the North Shore and Kawaihau. In the Koloa-Poipu-Kalaheo area, lands zoned for resort use would accommodate 2,500 planned units. Finally, the total includes approximately 600 units on the West Side, comprised of 100 units with zoning and 500 units in two areas proposed for re-designation through the GP Update.

The *Kauai General Plan* states that since the 1980s, there has been a large increase in the number of bed and breakfast operations (B&Bs) and single-family transient vacation rentals on Kauai. Alternative lodgings are found in existing single-family residences located in single-family residential neighborhoods or in agricultural subdivisions. The County estimates that there are over 200 B&Bs and single-family vacation rentals presently operating on the island, though the number could be much higher. Providing an alternative lodging experience, B&Bs and single-family vacation rentals allow visitors to learn about Hawaii's culture and environment from a community setting.

The *Draft Tourism Strategic Plan* (TSP), located in the *Kauai General Plan*, also advocates allowing alternative visitor accommodations within agricultural lands, as one part of a strategy for supporting agriculture-based tourism. The concept is that visitors could enjoy an agricultural setting, providing revenue to enable the landowner to maintain large land areas in less profitable agricultural use. Several organizations and individuals have expressed the need for zoning regulations that would allow visitor accommodations as part of a retreat center, horse ranch, health and wellness center, lodge, country inn, or other small-scale, activity-related complex. Such facilities are generally located outside of visitor destination areas. The Kokee Lodge (12 units) and Kahili Mountain Park (29 units) are examples of small-scale accommodations that are located far from urban resort areas. The chief obstacle to such facilities is the existing land use regulations – particularly the State regulations that do not allow such uses in the State Agriculture District.

As locally owned small businesses, alternative accommodations such as B&Bs keep a large share of their revenues within the County and the State. For

example, the B&B or vacation rental owner is likely to buy equipment and supplies from local businesses. Similarly, the B&B owner will typically spend net income (profit) on Kauai.

Of the estimated 100-200 B&Bs operating on Kauai today, only eight have obtained Planning Commission-approved Use Permits. Single-family vacation rental operators claim that since the CZO is silent on the issue of single-family vacation rentals, they need not apply for use permits in areas zoned for residential, agriculture, and open space. While it has not adopted a formal interpretation, the Planning Department has generally not required use permits for vacation rentals. <sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

*The Kauai General Plan* gives a summary of potential visitor units by status and area. <sup>4, 2000</sup>

**Table 4.30 – Kauai Potential Visitor Units by Status and Area: 2001**

n.d. = number of units not determined for vacant resort sites at Nukoli

Status and Geographic Area	Estimated Potential Units		
	Resort Projects	Multi-Family Projects	Total
<b>Planned Projects with Zoning &amp; Previously Approved Permits</b>	1,660	0	1,660
North Shore	230	0	230
Kawaihau	1,030	0	1,030
Lihue	400	0	400
<b>Planned Projects with Zoning Only (No Permits)</b>	2,590	1,310	3,900
North Shore	620	250	870
Kawaihau	350	80	430
Koloa-Poipu-Kalaheo	1,520	980	2,490
West Side	100	0	100
<b>Planned Projects on GP Map Only (No Zoning or Permits)</b>	500	280	780
North Shore	0	280	280
Lihue	n.d.	n.d.	n.d.
West Side	500	0	500
<b>ISLANDWIDE TOTAL</b>	<b>4,750</b>	<b>1,590</b>	<b>6,340</b>

Source: 2001 Visitor Plant Inventory

**Table 4.31 – Kauai Estimate of Overall Demand for Visitor Units in 2020**

	Scenario O	Scenario A	Scenario A/B	Scenario B
Average Daily Visitor Census	19,000	24,000	28,000	32,000
Effective Demand (Occupied Visitor units)	4,940	6,230	7,270	8,310
<b>Overall Demand for Visitor Units</b>				
Using historic average occupancy rate (69%)	7,150	9,030	10,540	12,050
Using targeted occupancy rate (80%)	6,170	7,790	9,090	10,390
<b>Existing Visitor Units (1999)</b>	<b>7,030</b>	<b>7,030</b>	<b>7,030</b>	<b>7,030</b>
<b>Visitor Units Needed (1999-2020)</b>				
Using historic average occupancy rate (69%)	130	2,010	3,510	5,020
Using targeted occupancy rate (80%)	(860)	770	2,060	3,360

Source: 2001 Visitor Plant Inventory

### ***Anticipated Costs for the Future***

No information was uncovered regarding anticipated cost 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***

Analysis of county documents shows that the strong growth in Kauai's visitor industry seen in the 1980's has not returned after Hurricane Iniki. The 1990's have seen a modest increase in annual growth rate of 6.4 percent. Kauai County's occupancy rates are consistent with state levels and may spur future development though there are no immediate plans for increases in visitor accommodations.

### ***Major Assumptions***

*The Kauai General Plan* assumed that 65 percent of the units in multifamily projects would be visitor units. The Plan produces estimates of overall demand for visitor units using four average daily visitor census levels.<sup>4, 2000</sup>

## County of Kauai – Private Transportation

### ***Present Capacity and Usage***

Kauai County does not require licensing of taxis; therefore, information is difficult to collect. Further study is required in this area.

Tour companies utilize smaller buses and vans for operations as compared to other islands.

**Table 4.32 – Kauai Motor Vehicle Registration**

(Includes passenger cars, buses, trucks and motorcycles)<sup>101, 2002</sup>

Year	State total	County of Kauai
1991	897,193	57,751
1992	885,761	51,165
1993	880,152	54,068
1994	875,144	52,817
1995	877,756	52,364
1996	884,617	52,984
1997	884,267	53,904
1998	893,427	56,554
1999	906,935	57,882
2000	941,242	61,316
2001	967,146	62,655

Source: *Draft Hawaii Statewide Transportation Plan, State of Hawaii Department of Transportation*

**Table 4.33 – Kauai Vehicle Registration by type of Vehicle: 1996**

Type of vehicle	State total	County of Kauai
All vehicles	986,555	65,233
Motor vehicles	967,146	62,555
Passenger vehicles	775,737	45,284
Ambulances	53	-
Buses	2,847	13
Trucks	168,414	16,397
Truck tractors	495	32
Truck cranes	314	13
Motorcycles, motor scooters	19,286	916
Trailers and semi-trailers	19,409	2,578

***Existing Problems, Issues and Opportunities***

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

***Future and Planned Usage***

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

***Future and planned Requirements or Changes***

According to the *Kauai General Plan*, new or additional services and facilities that would be needed to serve Kauai’s projected 2020 population include:

- Increased bus service in Koloa/Poipu;
- Increased paratransit service in various regions of the island;
- Improvements to pullover areas along roadways in order to create safe and accessible bus stops; and
- To meet current and future needs, an Airport stop should be established.

***Anticipated Costs for the Future***

According to the *Kauai General Plan*, the total order-of-magnitude cost for this 20-year list of improvements is approximately \$320 to \$330 million.

***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

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

### ***Major Assumptions***

No information was uncovered regarding major assumptions for the Private Transportation element.

## County of Kauai – Energy Systems

### ***Present Capacity and Usage***

The Island of Kauai is looking toward renewable energy sources to supply a growing portion of its energy needs. Currently, fuel cells are used in outer-lying areas of the island. Kauai is dedicated to the efficient use of energy and seeks opportunities to retain “park like” aesthetics.

According to the *Kauai Electric 1997 Integrated Resource Plan 1998-2017* Kauai Electric (KE) serves approximately 20,300 customers. The customers are served under the following class rates: residential, commercial, large power or industrial, streetlights, and irrigation.

Kauai Electric’s current resources are located at Port Allen on the southern coast of Kauai, with the exception of the Lihue Plantation power plant. The total capacity of the Port Allen Generating Station is 96.55 Megawatts. The type, power output and approximate age of KE’s equipment are listed in the table below.<sup>211, 1997</sup>

**Table 4.34 – Kauai Electric 1997 Adequacy of Electrical Supply**

Unit	Installation	Peak Capacity, KW
Gas Turbine No. 1	1973	19,200
Gas Turbine No. 2	1977	23,700
Steam	1968	10,000
Diesel #1	1964	2,000
Diesel #2	1964	2,000
Diesel #3	1968	2,750
Diesel #4	1968	2,750
Diesel #5	1968	2,750
Diesel #6	1990	7,580
Diesel #7	1990	7,850
Diesel #8	1991	7,850
Diesel #9	1991	7,850
Lihue Plant Power Plant	1981	14,000
<b>Totals</b>		
System Total KW		110,550 KW
Less Largest Unit out of service		-23,799
Capacity, Largest unit out of service		86,850 KW
1997 Estimated Firm Peak		72,000 KW
Capacity Less Peak		14,850 KW

Source: *Kauai Electric 1997 Integrated Resource Plan*

Kauai Electric’s current planning criteria calls for sufficient installed capacity to meet the annual peak load without the largest unit available, and to meet the morning peak loads without the largest unit available and the third largest unit on scheduled maintenance.

Kauai Electric continues to rely on power and energy purchases from sugar plantation sources. Amfac Sugar Kauai (Lihue Plantation) provides 14 MW of firm dispatchable power under terms of Power Purchase Agreement. Separate contracts are in place with Gay & Robinson Inc., Kekaha Sugar Company, and McBryde Sugar Company for surplus (non-firm) energy.<sup>211, 1997</sup>

The *State of Hawaii Data Book 2001* gives statistics on energy for the County of Kauai.<sup>252, 2001</sup>

**Table 4.35 – Kauai Electric Utilities: 2001**

	Customers, Dec. 31			Gross System Peak (MW)	Power sold (1,000 kWh)		
	Total	Residential	Other		Total	Residential	Other
State total	436,150	376,054	60,096	-	9,776,882	2,802,432	6,974,450
Kauai	31,158	23,922	7,236	71.1	406,521	137,264	269,257

Source: *State of Hawaii Data Book 2001*

**Table 4.36 – Kauai Electric Utilities Revenues: 2001**

	Average annual use (kWh)		Average rate (dollars per kWh)		Revenues (\$1,000)		
	Residential	Other	Residential	Other	Total	Residential	Other
State total	7,452	116,055	1.16336	0.13095	1,371,113	457,797	913,317
Kauai	5,738	37,211	0.23684	0.22001	91,750	32,510	59,240

Source: *State of Hawaii Data Book 2001*

***Existing Problems, Issues and Opportunities***

As stated in the *Kauai Electric 1997 Integrated Resource Plan 1998-2017* Kauai Electric’s distribution system is a typical radial system. Unlike KE’s transmission looped system where there are at least two transmission lines feeding the major switchyards, if a distribution line is deenergized, there is usually an interruption of power. KE’s radial distribution systems extend from substations to the load with no continuous backup. KE’s distribution systems have alternate sources to feed an area, but brief outages occur due to switching that is necessary to reroute power from a different feeder or switchyard.<sup>211, 1997</sup>

***Future and Planned Usage***

According to the *Kauai Electric 1997 Integrated Resource Plan 1998-2017* the Demand-Side Management (DSM) targeted by 2002-2004 is expected to save approximately 37,000 MWH with an expected peak impact of 5.1 MW at a cost

not to exceed \$16,000,000 in 1997 dollars. The primary focus includes: energy efficient lighting, HVAC, motors and controls, and water heating conservation.

Demand-Side Management plans include the following major programs: commercial retrofit, commercial new construction, residential retrofit, residential direct install, and residential new construction.

- Convert existing 2.3 KV and 4.16 KV distribution circuits to 12.47 KV which would eliminate existing step-down substations to reduce system losses;
- Develop a timeline for building new substations and increasing capacity of existing substations;
- Review design to replace Hanalei Tap to Wainiha lattice towers with steel poles; and
- Continue transmission line hardening program (storm guying).

The following low and high economic growth scenarios are from the *Kauai Electric 1997 Integrated Resource Plan 1998-2017*:

In a **high economic growth scenario**, it is suggested that as early as 2002 new resources would be required assuming the Lihue purchase contract remains available. The DSM resource can delay the next supply addition to 2003 or 2004. Due to the lower economic and fuel price assumptions describing the high economic scenario, the DSM resources are slightly lower than the results shown for the baseline. Although the load forecast is higher, the avoided energy costs are lower. The result is a tradeoff between relatively lower supply costs and the need for new resources. The decision analysis results, the plan with the IPP option and DSM are the best plan across the various weightings of the measures. The supply only plan and the plan containing wind generation are nearly equal based on the average overall utility. However, the wind plan has a wider range and can be considered more risky given the measure weights used in the analysis. In comparison to the base line plans, the more conventional supply options such as diesel units and combustion turbines move up in rank due to the lower fuel cost risk describing the high economic scenario. The high capital supply options continue to rank last.

In the **low economic growth scenario**, it is assumed that fuel prices would increase. This forecast also assumes that electric rates will increase to reflect changes in fuel prices. The analysis showed that KE would not require new supply resources until the 2010 or 2011 time frame assuming the Lihue purchase contract remains available. In fact, the low forecast could be met entirely with DSM resources. The higher economic and fuel price assumptions do not allow more DSM to become cost-effective due to lower need to avoid capacity costs. Due to the limited need for new resources, the integrated analysis developed three plans for the low economic scenario – a DSM only plan, the lowest cost combination of supply and DSM and a supply-only plan.

Based on the scenarios, the supply-side option that offers the lowest cost and flexibility to KE's system is a purchase of capacity and energy from an Independent Power Producer's (IPP) combustion turbine plant. The demand-side management targets are focused on the 2002-2004 time and combine those options that are consistently cost-effective relative to most supply plans across all scenarios. From an environmental and energy self-sufficiency standpoint, KE is committed to establishing and evaluating solar water heating and has included it as a preferred DSM option.<sup>211, 1997</sup>

The *Final Environmental Impact Statement* for Kauai Electric Lihue Energy Service Center describes three growth level scenarios for power demand in the future.

#### Forecast Electrical Energy Demand

A **Baseline Scenario** that forecasts a continuation of recent trends with a slow recovery from the effects of Hurricane Iniki yielding relatively slow growth in population and employment. This scenario anticipates that visitor activity will continue to recover but the rate of growth will remain well below the pace experienced in the 1980s. This scenario also assumes a continuation of current regulatory policies concerning the environment, energy, and the electric utility industry. Peak demand under the Baseline Scenario is expected to rise from about 74 MW in 1998, to 132 MW in 2019.

A **High Economic Growth Scenario** that assumes rapid recovery from the effects of Hurricane Iniki. Growth in visitor activity, population, and employment is assumed to return to levels typical of the pre-Iniki period, and the U.S. and Japanese economies are assumed robust. Peak demand in the High Economic Growth Scenario is expected to rise from about 74 MW in 1998, to 193 MW in 2019.

A **Low Economic Growth Scenario** that assumes an extremely slow recovery from the effects of Hurricane Iniki. It anticipates lower levels of population growth, economic activity, and increases in visitor arrivals than were experienced during the late 1980's. This scenario also assumes that the U.S. and Japanese economies are stagnant. Under the Low Economic Growth Scenario, there is little increase in electrical demand. Peak use in 2019 under this scenario is only 89 MW, only 20 percent greater than anticipated peak in 1998.<sup>217, 1999</sup>

#### ***Future and Planned Requirements or Changes***

Base materials are not predicted to change. However, a movement toward energy self-sufficiency or renewable energy may lessen the amount of petroleum-based fuels needed.

The *Final Environmental Impact Statement* for Kauai Electric Lihue Energy Service Center describes Kauai Electric's plans to develop a master-planned Energy Service Center in Lihue, Kauai. The Final EIS describes two power generating alternatives and three site alternatives however KE has sought land use approvals only for the Field 390 site at this time. Immediate construction of an Advanced Steam-injected combustion turbine will occur over the next 4 years but full build-out of the site is expected to take at least 30 years.<sup>217, 1999</sup>

### ***Anticipated Costs for the Future***

Anticipated costs for future supplies are difficult to determine. The price of fuel can be unpredictable and render any estimates moot. Given the volatility of base materials, the longer-term predictions can become highly inaccurate.

### ***Problems, Issues and Opportunities Associated with Costs***

Analysis of options, as stated in *Kauai Electric 1997 Integrated Resource Plan 1998-2017* the more cost-effective approach to be demand-side forecasting. However, KE works with a relatively small market, which was not taken into consideration.

Due to slower than anticipated growth and poor post-hurricane economic conditions, market potential for each market segments has been adjusted to reflect the economic impact. Current new construction activities are low and forecasted to continue at a slower than originally anticipated rate. KE proposes start up of Residential New Construction and Commercial New Construction as stand-alone programs in year four of this plan.<sup>211, 1997</sup>

### ***Compare Visitor and Resident Impact***

According to the *Kauai Electric 1997 Integrated Resource Plan 1998-2017* visitor populations show statistically significant relationship with residential customer growth during post-Iniki recovery. Visitor usage is measured by 2 variables:

- Percentage of visitors to total population; and
- Total number of visitor arrivals to total population.

The first variable measures off-island influences on average energy consumption. The second variable measures seasonal shifts in average energy use during visitor season. The visitor impact is up during the winter months of November, January and February and the summer months. The highest energy consumption occurs in August.<sup>211, 1997</sup>

### ***Major Assumptions***

Three basic assumptions are made regarding energy systems:

- Economic assumptions and load forecasts are the same as predicted;
- Energy self-sufficiency and environmental issues will be of increasing concern; and
- Fuel prices will remain within 3-4% of predictions.

---

## **County of Kauai – Sewer Systems**

### ***Present Capacity and Usage***

The Sewer indicator has been combined with the Sewage indicator. See County of Kauai 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 Kauai – Coastal Water Quality

### ***Present Capacity and Usage***

Correspondence from the Department of Health, Kauai District Health Office states that they are the sponsoring agency for the Water Safety Task Force with the focus of prevention of drowning incidences on the island of Kauai. The task force works closely with the mayor’s office to address manpower in public beaches, community awareness, and public education. Environmental health address water pollution issues on Kauai waterways and public beaches, safe drinking water, wastewater management, restaurant sanitation, noise complaints, indoor air quality; review all building plans to meet safety and building codes, including commercial entities.<sup>92C, 2002</sup>

### ***Existing Problems, Issues and Opportunities***

The *State of Hawaii List of Water Quality Limited Waters* gives information on the pollutants and their probable sources for the bays of the Island of Kauai.

**Table 4.37 – Kauai Water quality Limited Waters: 1998<sup>202, 1998</sup>**

Water body Segment	Pollutants	Probable Source
Hanapepe Bay	Nutrients	Agriculture
Nawiliwili Bay	Turbidity	Urban runoff Agriculture
Waimea Bay	Suspended solids Turbidity	Agriculture

Source: *State of Hawaii List of Water Quality Limited Waters*

The *Kauai General Plan* notes that the *State Coastal Zone Management (CZM) Office* and the Department of Health (DOH) are currently collaborating on planning for polluted runoff and protection of water quality. The State intends to join CZM and Polluted Runoff plans into a single unified document. The DOH is seeking to strengthen existing county and agriculture programs and regulations and to bring together current programs and agencies in a coordinated network.

Non-point source discharges have a greater impact on streams and near shore waters than point source discharges (i.e., a discharge from a pipe, ditch or other specific source). Non-point pollutants primarily consist of sediments from eroded soils, nutrients, and toxic chemicals. Increased turbidity can stir up sediments in coastal waters that then can accumulate on coral reefs and other critical habitats. Nutrients, including fertilizers, can lead to eutrophication in coastal waters. Toxic chemicals, including metals, petroleum-based products, and pesticides can pose a risk to water quality and marine plants and animals.

Storms and heavy rains generate runoff, which picks up the non-point sources of pollution associated with these activities, and carries them downstream to the coastal waters. Coastal pollution is increased when land-based activities degrade wetlands and riparian areas that would otherwise absorb and filter polluted runoff before it reaches coastal waters.

The DOH report “Hawaii’s Water Quality-Limited Waters: The 1997 Assessment,” catalogues polluted water bodies that are targeted for additional water pollution controls and management programs. Four bays and five perennial streams were found to be impaired; the study also lists five major streams or rivers that do not have impaired water quality, including Hanalei River and Wailua River. <sup>4, 2000</sup>

**Table 4.38—Water Bodies with Impaired Water Quality: 1997**

<b>Stream or River</b>	<b>Coastal Waters</b>
Kapaa Stream	<i>No impairment</i>
Hanamaulu Stream	Hanamaulu Bay
Nawiliwili Stream	Nawiliwili Bay
Hanapepe River	Hanapepe Bay
Waimea River	Waimea Bay

Source: *Kauai General Plan*

DOH selected the Nawiliwili Bay unified watershed as one of five statewide “Category I/Priority Watersheds” for which federal funding would be made available. DOH has contracted with the East Kauai Soil and Water Conservation District to undertake the detailed assessment of the Nawiliwili Bay watershed. This will result in the development and future implementation of watershed restoration strategies. Hanamaulu was included among DOH Category II watersheds.

A key concern is the long-term organizational structure for watershed management. Each restoration project will develop and draw upon a network of government and community based organizations. But it is unclear which agency or organization will accept responsibility and be funded to coordinate restoration and management over the long term, or how such an agency would function within the existing management network.

As set forth in the Hawaii Coastal Non-point Pollution Control Management Plan, County agencies play the lead role in management of non-point pollution in urban areas. In other geographic areas and management categories, State and other agencies play the lead role.

Subdivision permitting is staffed by the Planning Department, with heavy participation from the DOW and the DPW; decisions are made by the Planning Commission.

The County has no authority within the State Conservation District, which includes the mountainous parts of the island, some coastal lands, and all

submerged lands – over 55 percent of Kauai’s land area. Management of these areas as well as of stream and ocean waters is delegated by statute to the State Board of Land and Natural Resources and the State Commission on Water Resource Management. <sup>4, 2000</sup>

### ***Future and Planned Usage***

The Department of Public Works administers the Flood Control Ordinance, the Drainage Ordinance and the Grading, Grubbing and Stockpiling Ordinance – all of which are related to actual construction activities. The subdivision ordinance controls the design and layout of subdivisions, which is a key element in minimizing drainage and erosion impacts.

Other implementing Actions include:

- The Planning Department shall revise the Comprehensive Zoning Ordinance and the Subdivision Ordinance as needed to implement the policy and shall utilize the policy to guide the granting of land use permits. In particular, the Department shall review and revise the Drainage way Constraint District to provide overlay regulation protecting stream and wetland riparian areas and floodplains.
- The Department of Public Works shall implement the policy in revising the County’s Drainage Standards and preparing a Drainage Ordinance. The DPW shall also review and revise the Grading, Grubbing and Stockpiling Ordinance as needed to implement the policy; and shall utilize the policy to guide the granting of site development and construction permits.
- The Department of Public Works shall maintain effective coordination with the Soil and Water Conservation Districts, in order to ensure enforcement of the Grading Ordinance. <sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

According to the *Kauai General Plan*, in developing County roads and drainage facilities and in administering the grading, flood control, and drainage regulations, the County of Kauai shall carry out the following policies.

- New Development
  - Reduce average annual post-development sediment in runoff (total suspended solids), so that it is no greater than pre-development levels.
  - Maintain post-development peak runoff rate and average volume at levels similar to pre-development.
  - Work with other government agencies and community organizations to seek ways of reducing all types of non-point source water pollutants.
- Site Development. Plan, design and develop sites to:
  - Protect areas that provide important water quality benefits;
  - Protect areas that are particularly susceptible to erosion and sediment loss;

- Promote the use of permeable surfaces for driveways and parking and limit increases of impervious areas;
  - Limit land disturbance activities such as clearing and grading, and cut and fill to reduce erosion and sediment loss; and
  - Avoid disturbance of natural drainage features and vegetation.
- Construction Site Erosion and Sediment Control
  - Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction.
  - Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.
- Watershed Management
  - Manage land use and earth-moving activities from the standpoint of the entire watershed, considering important characteristics such as scenic landscape features, historic sites, native species of plants and animals, and other special resources.
  - Specify relevant best management practices as a condition of approving land use permits that affect stream corridors.
  - Collaborate with State agencies (Office of Planning, DLNR, DOH), federal agencies (U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service), and community organizations (e.g., Soil and Water Conservation Districts) in order to plan and manage watersheds.

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

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

### ***Major Assumptions***

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

## County of Kauai – Marine Ecosystem Health

### ***Present Capacity and Usage***

Compared to the other Hawaiian Islands there has been relatively little research conducted on the reefs of Kauai. Generally, this is due to a lack of research institutions on the island. Accordingly, many research opportunities exist here with abundant and diverse reef resources that in many cases are not severely impacted by human activity.

Reefs along the Kauai coast are dominated by the corals *Porites lobata* and *Pocillopora meandrina*, with other common species that include *Montipora patula*, *Montipora flabellata*, *Leptastrea purpurea* and *Montipora verrucosa*. Most areas show higher fish abundance and diversity than Oahu, Maui and Hawaii. Fishing pressure is relatively low due to a smaller human population. Also, Kauai has excellent and diverse fish habitats.

A number of fish species that are rare on shallow reefs of the Main Hawaiian Islands can be found on Kauai. A number of these species are commonly found in the Northwestern Hawaiian Islands (NWHI) where it is thought that cooler ocean temperatures, geographical isolation, diversity of habitats, and proximity to major ocean currents provide the necessary ecological requirements of these species. The proximity of Kauai to the NWHI and its northern location favor the occurrence of these species. The bandit angelfish (*Desmoholocanthus arcuatus*) is relatively common on shallow reefs off Kauai. On the other islands, this fish is only encountered at depths greater than 100 feet. The Knifejaw (*Oplegnathidae*) is rare in the main islands but two species (*Oplegnathus fasciatus* and *O. punctatus*) are occasionally encountered around Kauai. The whiskered armorhead (*Evistias acutirostris*) also occurs off Kauai. <sup>139, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

According to the *Coral Reef Assessment and Monitoring Program (CRAMP)* study sites, the circular shape of Kauai and lack of any nearby islands results in a situation of extremely high wave energy on all shorelines. Hurricane waves caused considerable damage to the south shore reefs of Kauai in 1982 and 1992. Winter swell from the north, summer swell from the south and persistent trade wind swell strike Kauai with full force and refract around its circular shape. The oceanic currents in the vicinity of Kauai generally follow the prevailing wind patterns.

No Marine Life Conservation Districts have been established on the reefs of Kauai. The few areas with special rules governing human activity consist only of areas being managed in an attempt to sustain recreational

fisheries. Two fisheries management areas have been established in coastal waters, with restrictions that mainly apply to the types of fishing gear that can be legally used:

- Waimea Bay and Waimea recreational Pier on the south coast and
- Hanamaulu Bay and Ahukini Recreational Pier on the eastern coast. Authority for managing the marine resources within three miles (4.8 km) of the high tide mark lies with the Division of Aquatic Resources at Department of Land and Natural Resources.

Recovery of the reefs from Hurricane Iwa in 1982 and Hurricane Iniki in 1992 took between 5-10 years to re-establish moderate coral cover along much of the south coast that was wave damaged. Wreckage swept from land (including buildings, vehicles, and household contents) was removed within the first couple of years following the hurricanes. Traces of wreckage can still be found, but the cleanup effort was quite thorough.<sup>139, 2000</sup>

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Marine Ecosystem Health element.

### ***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 anticipated costs for the future for the Marine Ecosystem Health element.

### ***Problems, Issues and Opportunities Associated with Costs***

According to the *Eight Main Hawaiian Island and CRAMP* study sites, the economy of the Island of Kauai 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.

Tourism is a major economic activity, particularly along the south and east shores. Hurricane Iwa (1982) and Hurricane Iniki (1992) caused extensive damage to the island. Damage to buildings, crops, reefs and the consequent lack of visitors in the years following both hurricanes resulted in major economic impact.<sup>139, 2000</sup>

### ***Major Assumptions***

There was not enough data at the county level to assess this environmental feature; see Hawaii State Marine Ecosystem Health summary.

## **County of Kauai – Forestry / Green Space**

### ***Present Capacity and Usage***

The *Lowland Mesic Forest* report by the Division of Forestry identifies two reserves on Kauai.

#### **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 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.<sup>126, 2002</sup>

For trails information, please see the State of Hawaii Forestry Summary and related Appendix.

### ***Existing Problems, Issues and Opportunities***

No information was uncovered regarding existing problems, issues and opportunities for the Forestry / Green Space element.

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Forestry / Green Space element.

### ***Future and Planned Requirements or Changes***

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

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

***Compare Visitor and Resident Impact***

No information was uncovered regarding the comparison of visitor and resident impacts for the Forestry / Green Space element.

***Major Assumptions***

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

## **County of Kauai – Air Quality**

### ***Present Capacity and Usage***

*The Analysis of Renewable Portfolio Standard Options for Hawaii* reviewed the State's air quality. Hawaii's air quality meets federal and state environmental health standards because Hawaii's trade winds and the lack of major polluting industries reduce the buildup of air pollution over the islands.<sup>137, 2001</sup>

The *Annual Summary Hawaii Air Quality Data:2000* reports that the Department of Health has 17 air quality monitoring stations on Oahu, Kauai, Maui, and Hawaii. Most commercial, industrial and transportation activities and their associated air quality effects occur on Oahu where nine of the stations are located.

The Lihue monitoring station is located in downtown Lihue at the District Health Office, 3034 Umi Street. This site is in a commercial and residential area with nearby agricultural areas. It is a SLAMS station that was established in November 1972 for the sampling of total particulates but was changed to a PM10 sampling site in October 1985.<sup>67, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

The *Annual Summary Hawaii Air Quality Data:2000* reports that agricultural operations produce the greatest air quality impacts on Maui and Kauai.<sup>67, 2000</sup>

### ***Future and Planned Usage***

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

### ***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 Kauai – Beach Erosion

### ***Present Capacity and Usage***

This parameter is not a conducive measure of Beach Erosion; therefore, a discussion regarding management issues is below.

The *Hawaii Coastal Erosion Management Plan* states that Kauai has maintained the minimum 40-foot setback except where county rules permit a lesser setback.  
103, 2000

The *Coastal Zone Management Annual Report to the Twenty-First Legislature* reviews the responsibilities of the Kauai County Planning Department in regards to beach erosion.

**Monitoring:** A Coastal Zone Management (CZM) planner and inspector are responsible for the bulk of the monitoring program on Kauai. Both planner and inspector monitor shoreline certifications and conditions at sensitive areas such seawalls, eroding shorelines, and beach accesses.

**Permits and Violations:** The Department approves permits for Special Management Areas (SMA). The major permits included construction of retaining structures, residential units, resort facility amenities and parking. The planning staff investigates reports on structures built without a permit, grading and clearing, non-permitted uses, and non-compliance to permit conditions within the SMA and SSA.

**Initiatives:** The Kauai County Planning Department hosted the Hawaii Congress of Planning Officials annual meeting in August. The three-day event of field trips, lectures, discussion groups, and displays included discussions on coastal hazards, public access, and watershed management. Planning staff attended community meetings to discuss coastal resource issues.

**Educational Outreach:** The Planning Department front counter staff provides the public with information on the CZM Hawaii Program and coastal resources.<sup>61,</sup>  
2001

### ***Existing Problems, Issues and Opportunities***

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

### ***Future and Planned Usage***

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

### ***Future and Planned Requirements or Changes***

*The Coastal Zone Management Annual Report to the Twenty-First Legislature* reports plans for the County of Kauai. It is expected to complete the revisions to the County SMA Rules and Regulations, and the County Shoreline Setback Rules mentioned above under initiatives. The Planning Department will continue to meet with the Na Ala Hele State Trails Program, the Hanalei Heritage River Organization, CZM Statewide Advisory Erosion Subcommittee, and the DOBOR Northern and Southern Ocean Recreation Management Advisory Committees. The County will continue to review; process, and monitor SMA permit applications. There are two coastal trail and access project proposals involving the relocation of a current public beach access and a 2.4 mile long pedestrian and bicycle trail. The County reviewed an airport project improvement proposal that impacts existing cultural resources, and monitored a new hotel condominium construction. The County will continue to monitor the proposed Wailua River Navigable Waters and State Park Restricted Area Plan. Kauai County will continue to educate and encourage property owners to use beach nourishment and re-vegetation as preferred methods for shoreline protection when structures are threatened. In addition, the County will encourage proposed projects in areas historically subject to shoreline erosion to widen the setback area beyond what is allowed by regulation. Ongoing efforts to do hazard risk and vulnerability assessments and mitigation strategies, in coordination with CZM Hawaii and other partners, will continue. <sup>61, 2001</sup>

### ***Anticipated Costs for the Future***

*The Annual Report to the Twenty-First Legislature* reviews the staffing and matching fund support. The County of Kauai Planning Department has four full-time positions funded by the CZM Program. The staff positions include a planner, account clerk, CZM inspector, and a CZM permit technician. <sup>61, 2001</sup>

### ***Problems, Issues and Opportunities Associated with Costs***

The County contributes \$65,000 in matching funds in the form of in-kind services that include a portion of time by other staff members in the County Planning Department, administrative support services, office space, utilities, and vehicle maintenance. <sup>61, 2001</sup>

### ***Compare Visitor and Resident Impact***

There was no documentation to support residential or visitor impact on beach erosion.

### ***Major Assumptions***

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

- Beach loss seriously impacts 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, and 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 the direct flow of domestic sewage products into coastal waters because of the prevalence of sewage soil filtration (septic and cesspool systems) on shoreline plots.<sup>103, 2000</sup>

## County of Kauai – Invasive Species

### ***Present Capacity and Usage***

**Table 4.39 – Kauai Targeted Invasive Species: 2002**

<b>Species Common Name</b>	<b>Source</b>
Miconia	South and Central America
Frogs	Caribbean

Source: *Kauai Invasive Species Committee*

The Island of Kauai will likely have formed the Kauai Invasive Species Committee (KISC) by the end of the year 2002.<sup>257, 2002</sup>

### ***Existing Problems, Issues and Opportunities***

No information was uncovered regarding existing problems, issues and opportunities for the Invasive Species element.

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Invasive Species element.

### ***Future and Planned Requirements or Changes***

KISC will need to sustain and build additional personnel capacity in the future. This includes acquiring a Coordinator to oversee budgeting, field operations, outreach activities, and to raise funds.<sup>257, 2002</sup>

### ***Anticipated Costs for the Future***

No information was uncovered regarding anticipated costs for the future for the Invasive Species element.

### ***Problems, Issues and Opportunities Associated with Costs***

Coordinating Group of Alien Plant Species (CGAPS), and the U.S. Forest Service for 3 field technicians to carry out survey and weed control work, primarily on Miconia.

Funding is already available through the State of Hawaii.

### ***Compare Visitor and Resident Impact***

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

### ***Major Assumptions***

No information was uncovered regarding major assumptions for the Invasive Species element.

## County of Kauai – Other Natural / Scenic Resources

### *Present Capacity and Usage*

**Table 4.40—Riparian Zones with Impaired Water Quality: 2000**

Stream / Source	Coastal Water / Terminus
Kapaa Stream	No impairment
Hanamaula Stream	Hanamaula Bay
Nawiliwili Stream	Nawiliwili Bay
Hanapepe River	Hanapepe Bay
Waimea River	Waimea Bay

Source: *Kauai General Plan*

Review of various county documents reveals that Kauai is the only county that dedicates a section entirely to scenic resources. Kauai is known for the beauty and variety in landscapes. These features attract visitors from around the world, and therefore, have an economic value.

Views of various landscape features should be preserved for their cultural and economic value. Coastal views are especially unique and important views for all to enjoy. Zoning in these areas should be carefully thought out.<sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

The Planning Department can provide specific criteria and guidelines for evaluation and protection of scenic views.<sup>4, 2000</sup>

### ***Future and Planned Usage***

The *Kauai General Plan* states the goal of Kauai to retain the cultural and economic value of various landscape features.<sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

No information was uncovered regarding future and planned requirements or changes for the Other Natural and Scenic Resources element.

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

No information was uncovered regarding the comparison of visitor and resident impacts for the Other Natural and Scenic Resources element.

### ***Major Assumptions***

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

## County of Kauai – North Shore – Terrestrial Water Quality and Quantity

### ***Present Capacity and Usage***

The following is a summary of the water supply, storage capacity, and the infrastructure as outlined in the Department of Water: County of Kauai – *Water Plan 2020*:

#### **Hanalei:**

##### Supply

2000: Need new 200 gpm source for redundancy

2020: Adequate

##### Storage

2000: Need a new 100,000-gallon tank

2020: Adequate

##### Distribution

Fire flow is deficient for commercial, school, and Weke Road areas.

Oldest pipe installed in 1924; and

Remainder installed after 1962.

#### **Wainiha – Haena:**

##### Supply

2000: Need new 100 gpm source

2020: Adequate

##### Storage

2000: Construct new 10,000 gallon and 200,000 gallon tanks

2020: Adequate

##### Distribution

Wainiha Valley is fire flow deficient; and

Pipes installed in 1960 and later.<sup>47, 2001</sup>

### ***Existing Problems, Issues and Opportunities***

According to the *Kauai General Plan, 2000*, water is only available in a few locations throughout the North Shore. Expansion of the system would require development of new sources and major improvements to transmission and storage facilities. The Princeville Corporation plans to develop additional water sources and system improvements to serve future development of its properties.  
4, 2000

### ***Future and Planned Usage***

See Appendix for planned improvements and changes.

***Future and Planned Requirements or Changes***

See Appendix for planned improvements and changes.

***Anticipated Costs for the Future***

See Appendix for cost for the future.

***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai for Water Summary information. Details at the district level require further study.

***Compare Visitor and Resident Impact***

See County of Kauai for Water Summary information. Details at the district level require further study.

***Major Assumptions***

See County of Kauai for Water Summary information. Details at the district level require further study.

## **County of Kauai – North Shore – Sewage**

### ***Present Capacity and Usage***

According to the *Kauai General Plan* there are no County operated wastewater treatment plants in the North Shore. Owners of large master-planned developments have formed private utility companies to operate collection, treatment and disposal systems in Princeville, Puakea-Puhi, and Kukuiula. Princeville operates a system serving the entire Princeville community.<sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Future and Planned Usage***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Anticipated Costs for the Future***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Major Assumptions***

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

---

## **County of Kauai – North Shore – Solid Waste Disposal**

### ***Present Capacity and Usage***

In accordance with the *Kauai General Plan*, Kauai County maintains an island wide system of solid waste collection and disposal that serves its resident and visitor population. One of the four refuse transfer stations is located in Hanalei.

In FY 1999, a total of 24,930 tons of solid waste was collected and transferred to the Kekaha Landfill Phase II. The Hanalei station receives used motor oil through the Do-it Yourselfer (DIY) program. <sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Future and Planned Usage***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Anticipated Costs for the Future***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Major Assumptions***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

## **County of Kauai – North Shore – Storm Water**

### ***Present Capacity and Usage***

The *Kauai General Plan* states that the County manages urban storm water runoff through the Drainage Standards applied to new developments by the Department of Public Works. Because most communities are situated on the coastal plain, the County must cope with upland runoff from conservation and agricultural lands. Kauai's Department of Public Works (DPW) has historically followed an unwritten policy to avoid construction of concrete-lined channels.<sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan* states the County has not to date prepared a Drainage Master Plan, as required under the existing General Plan and the Comprehensive Zoning Ordinance.<sup>4, 2000</sup>

See Hanalei Bay Visitor Related Area Summary for more information.

### ***Future and Planned Usage***

According to the *Kauai General Plan* rather than prepare a master plan for the island, the Department of Public Works intends to focus on specific problem areas and watersheds, with the objective of developing strategic plans that specify preventive as well as remedial actions.<sup>4, 2000</sup>

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Anticipated Costs for the Future***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Major Assumptions***

No information was uncovered regarding major assumptions for the Storm Water element.

## **County of Kauai – North Shore – Roads**

### ***Present Capacity and Usage***

See State of Hawaii and Kauai County Roads Summaries for information. Details at the community level would require more study.

### ***Existing Problems, Issues and Opportunities***

Kuhio Highway, a two-lane road, is the only arterial road connecting the North Shore with the rest of Kauai. Though the highway has been improved between Moloaa and Princeville, from Princeville to Haena the road has narrow pavement widths, hazardous curves, and minimal shoulders. The narrow pavement and ten one-lane bridges preclude large tour buses from entering Hanalei Town, as well as precluding the entry of heavy trucks and construction equipment. Only the Lumahai Bridge is a modern two-lane bridge. The increasing traffic burden on Lighthouse Road through Kilauea Town necessitates a by-pass road linking the Lighthouse Road north of the town center with the highway west of the town entry.<sup>101, 2002</sup>

See Hanalei Bay Visitor Related Area Summary for more information.

### ***Future and Planned Usage***

See Kauai County Roads Summary for information. Details at the community level would require more study.

### ***Future and Planned Requirements or Changes***

See Kauai County Roads Summary for information. Details at the community level would require more study.

### ***Anticipated Costs for the Future***

The *Draft Hawaii Statewide Transportation Plan* estimates the cost of building currently needed improvements is approximately \$97 million. This amounts to about 30 percent of highway funding needed through 2020.<sup>101, 2002</sup>

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County Roads Summary for information. Details at the community level would require more study.

### ***Compare Visitor and Resident Impact***

See Kauai County Roads Summary for information. Details at the community level would require more study.

### ***Major Assumptions***

See Kauai County Roads Summary for information. Details at the community level would require more study.

## **County of Kauai – North Shore – Airports**

### ***Present Capacity and Usage***

The secondary airports on Kauai are Princeville Airport and Port Allen Airport, Koloa.

### ***Existing Problems, Issues and Opportunities***

The *Final Statewide Airport System Plan* predicts that development on Kauai's North Shore will be limited. Both passenger and aircraft operations at Princeville Airport have been declining during the 1990s. Therefore, operations at the privately owned airport are not likely to significantly increase. A terminal building in another location is planned.<sup>127, 1998</sup>

### ***Future and Planned Usage***

Construction or changes to the North Shore Airports will consist of maintenance of operations.

### ***Future and Planned Requirements or Changes***

Princeville Airport proposed improvements noted in the *Final Statewide Airport System Plan* include widening of the runway to conform to FAA design standards and redevelopment of the terminal in a new location.

Improvements currently proposed for the Port Allen Airport include development of lease space for helicopter operators.<sup>127, 1998</sup>

### ***Anticipated Costs for the Future***

See Kauai County for Airports Summary information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See State of Hawaii and County of Kauai Airports Summaries for more information.

### ***Compare Visitor and Resident Impact***

Visitors primarily use sightseeing tours and charters based at the Princeville Airport. Any expansion in facilities that accommodates a growth in operators, such as the planned lease space for helicopters, will increase visitor usage of this facility.

### ***Major Assumptions***

The *Final Statewide Airport System Plan* notes that ownership by a dominant regional landowner is likely to continue. Terminal improvements paid for by the

State should be considered under an agreement with the landowner. The State may not want to implement extensive terminal area and access road improvements without ownership control of the property.<sup>127, 1998</sup>

## **County of Kauai – North Shore – Harbors**

According to the *Kauai General Plan*, there are no harbor terminals in this district.  
4, 2000

### ***Present Capacity and Usage***

N/A

### ***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 Kauai – North Shore – Parks

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, North Shore has 38.7 acres of parks. The following table illustrates the park types and their corresponding acreage. <sup>4, 2000</sup>

**Table 4.40 – North shore County Parks by Type: 2000**

District / Park Type	Acres
<b>North Shore</b>	<b>38.7</b>
Beach Parks	28.3
Community Parks	10.4

Source: *Kauai General Plan*

The Department of Public Works classifies parks into five categories of varying levels of use. Class I and Class II levels are considered “extremely high use” and “high use”, respectively. Parks in these use levels are used heavily by both residents and visitors. <sup>4, 2000</sup>

**Table 4.41 – North Shore County parks with High Levels of Use: 2000**  
 (See Appendix map of park locations.)

Use Category/Park	Park Type	Acres
<b>Extremely High Level Use:</b>		
Anini Beach Park	Beach	12.5
<b>High Level Use:</b>		
Hanalei Black Pot	Beach	2.5
Hanalei Pavilion	Beach	1.3
Haena Park	Beach	5.5
Kilauea Park	Community	4.9

Source: *Kauai General Plan*

### ***Existing Problems, Issues and Opportunities***

High use areas are more prone to deterioration and detract from the user experience.

### ***Future and Planned Usage***

The *Kauai General Plan* plans for additional parking and restrooms at Anini Beach Park; acquire, subject to funding, additional parkland for separate camping and picnicking areas and additional parking and restrooms at Hanalei Black Pot Park; and addition of comfort station, parking and staff person at Haena Beach Park. <sup>4, 2000</sup>

***Future and Planned Requirements or Changes***

See Kauai County for Parks Summary information. See Hanalei Bay Visitor Related Area Summary for more information.

***Anticipated Costs for the Future***

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

***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Parks Summary information.

***Compare Visitor and Resident Impact***

See Kauai County for Parks Summary information. See Hanalei Bay Visitor Related Area Summary for more information.

***Major Assumptions***

See Kauai County for Parks Summary information.

---

## **County of Kauai – North Shore – Police, Fire and Emergency Services**

### ***Present Capacity and Usage***

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

### ***Existing Problems, Issues and Opportunities***

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

### ***Future and Planned Usage***

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

### ***Future and Planned Requirements or Changes***

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

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

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

### ***Major Assumptions***

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

## County of Kauai – North Shore – Visitor Accommodations

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, as of 1999, the North Shore had approximately 1,300 visitor units, with Princeville accounting for the large majority. The North Shore also has a large number of Bed-and-Breakfast (B&B) units and houses used as vacation rentals.<sup>4, 2000</sup>

**Table 4.42 – North Shore Visitor Accommodations by Type: 2001**

District	Hotel	Condo Hotel	Other	Timeshare	Units	Percent Island wide of Total
North Shore	250	540	150	350	1,300	18%

Source: *2001 Visitor Plant Inventory*

The *2001 Visitor Plant Inventory* gives visitor accommodations by area.<sup>80, 2001</sup>

**Table 4.43 – Wailua/Kapaa Summary by Type: 2001**

	Properties	Available Units
<b>Wailua/Kapaa</b>		
Bed & Breakfast	13	51
Condominium Hotel	11	870
Hostel	1	40
Hotel	5	947
Individual Vacation Unit	27	31
Other	2	3
<b>Total</b>	<b>59</b>	<b>1,942</b>

Source: *2001 Visitor Plant Inventory*

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan* lists North Shore occupancy rates at 70 percent, matching the island wide average and trending up slightly in the late 1990's. If the upward trend improves, it could stimulate additional visitor unit development. Princeville has a substantial supply of land planned and zoned for resort, which could accommodate about 1,100 additional visitor units. Lands not yet zoned but designated "Resort" on the *General Plan Land Use Map* could accommodate another 280 units.<sup>4, 2000</sup>

### ***Future and Planned Usage***

The *Kauai General Plan* gives a summary of potential visitor units by status and area.<sup>4, 2000</sup>

**Table 4.44 – NORTH SHORE SUMMARY OF POTENTIAL VISITOR UNITS, BY STATUS**

Status and Geographic Area	Estimated Potential Units		
	Resort Projects	Multi-Family Projects	Total
Planned Projects with Zoning & Previously Approved Permits	230	0	230
Planned Projects with Zoning Only (No Permits)	620	250	870
Planned Projects on GP Map Only (No Zoning or Permits)	0	280	280

Source: *Kauai General Plan*

***Future and Planned Requirements or Changes***

See County of Kauai Visitor Accommodations Summary for more information.

***Anticipated Costs for the Future***

No information was uncovered regarding anticipated cost 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***

See County of Kauai Visitor Accommodations Summary for more information.

***Major Assumptions***

See Introduction to Kauai County and Kauai County Visitor Accommodations Summary for more information.

## County of Kauai – North Shore - Visitor Related Area

### ***Introduction***

The Hanalei Pier Reconstruction EIS is the basis for the information contained in this North shore Visitor Related Area. The pier is a staging area for commercial boating tours. As a visitor attraction, it gets visitor related usage.

The objective is to reconstruct the existing pier; make it safe for recreational use by the public; preserve the visual and historic significance of the pier. It is to the benefit of residents, community groups and tourists to see that the pier be returned to an active recreational facility. The facility could then be used for fishing, sightseeing and picnicking.

The North Shore Charter Boat Association additionally, proposes to conduct excursion boat staging operations along the southern bank of the Hanalei River on the north shore of Kauai. Specifically, the activity is proposed to originate and terminate from the riverbank fronting the privately owned and operated Hanalei Excursion Boat Base Yard at Weke Road. The existing boat yard was approved, with conditions, through a temporary Special Management Area permit and zoning permit by the County of Kauai Planning Commission on June 24, 1987. The following information regarding pier reconstruction is taken from the *Hanalei Excursion Boat Staging Operations; Hanalei, Kauai; Draft Environmental Impact Statement*. It is intended to give an idea of the surrounding conditions. <sup>231,1990</sup>

### ***Water***

Three municipal water systems and one private system serve the communities of the North Shore area. The project site is serviced by the Hanalei municipal system that serves Hanalei Town through Makahoa Point at the western extremity of Hanalei Bay. <sup>231,1990</sup>

### ***Sewage***

Within the North Shore area, there are no municipal sewage treatment facilities. The Princeville resort community is serviced by a sewage treatment plant that is privately owned and operated. Also connected to this treatment plant via a sewage lift station is Hanalei Bay Resort. The Ching Young Village Shopping Center is currently being renovated and shall be equipped with a “package” sewage treatment station. All other communities and improvements are served by individual cesspools, including the Hanalei Excursion Boat Base Yard. <sup>231,1990</sup>

### ***Solid Waste***

Currently Halehaka Sanitary Landfill in Lihue is the nearest solid waste disposal facility for the North Shore, but it is nearing its capacity. Once the landfill is closed, the Kekaha Landfill will be the sole disposal site for the island. <sup>231,1990</sup>

## **Storm Water**

The water near the Hanalei Pier had about 20 feet visibility with considerable freshwater intrusion from the nearby Hanalei River mouth. The fresh water entering the bay from the Wailoi and Waipa Streams and the Hanalei River should create an out flowing layer above the bay's seawater. After periods of heavy rainfall, discharge from these freshwater sources creates a muddy freshwater lens on the surface of Hanalei Bay. <sup>230,1990</sup>

## **Roads**

The main transportation corridor between the North Shore and other points on Kauai is Kuhio Highway, Route 56, which has two lanes throughout the North Shore area. The pavement width of the Highway varies from 24 feet near Moloaa Bay to 20 feet near Wainiha Bay to its end Haena. The width of the highway shoulder varies with terrain. Most of the area west of Kalihiwai has little or no shoulder.

While traffic congestion is not generally evident and roadway capacities are adequate, increased traffic, particularly as a result of more rental cars driven by visitors touring the island, has somewhat affected driving quality by reducing the freedom to pass, lengthening lines behind slower vehicles and increasing waits at single lane bridge crossings. These are relatively minor inconveniences, however, in relation to the potential maximum capacity of the roads.

The existing access to the Hanalei area is by way of the State owned Kuhio Highway. The Hanalei Bridge is located on Kuhio Highway and is a steel truss bridge with a wooden decking. It is owned and maintained by the State Department of Transportation. The bridge is 116 feet long and 20 feet wide. It has a single 15-foot wide traffic lane. The load carrying capacity of this bridge is 15 tons. <sup>230,1990</sup>

## **Airports**

The excursion boat staging operations will have no impact on airports. <sup>231,1990</sup>

## **Harbors**

Pier reconstruction will enhance existing harbor conditions. The excursion boat staging operations will have no impact on harbors. <sup>231,1990</sup>

Hanalei Bay Pier is located on the eastern side of Hanalei Bay, near the mouth of the Hanalei River on the island of Kauai. The pier is located on a 0.499 acre site next to the County's Black Pot Park at the northwestern end of Weke Road. The existing Hanalei Pier extends 535 feet and consists of a 12'6" wide concrete ramp supported by concrete pilings. A concrete platform at the end of the pier supports a wooden shed. The following information regarding pier reconstruction

is taken from the “Hanalei Pier Reconstruction Final Environmental Impact Statement.” It is intended to give an idea of the surrounding conditions. <sup>230,1990</sup>

### ***Parks***

The staging operations will draw more people to the area. Parking and crowding may become an issue. <sup>231,1990</sup>

The Hanalei Bay Pier is owned by the State of Hawaii. In 1979, it was placed on the State and Federal registers of historical places. The reconstruction of the pier will enable the residents and visitors to once again fully utilize the pier for recreational purposes. <sup>230,1990</sup>

### ***Police, Fire and Emergency Services***

A combination fire and police station serves the North Shore area. It is centrally located along Kuhio Highway near Princeville. Notably excursion boat operators have long been instrumental in ocean rescue operations in support of rescue services provided by fire station and the U.S. Coast Guard based at Nawiliwili Harbor.

Emergency medical services are provided by paramedics on duty at the Hanalei Fire Station. There are also two medical clinics serving the North Shore area, the North Shore Medical Clinic and the Princeville Clinic. <sup>231,1990</sup>

### ***Visitor Accommodation***

The excursion boat staging operations will have no impact on visitor accommodations. <sup>231,1990</sup>

### ***Private Transportation***

Hanalei Bay Pier has no impact on private transportation. Since the pier is not located alongside Kuhio Highway, it is not visited by many visitors. <sup>230,1990</sup> The excursion boat staging operations will have no impact on private transportation. <sup>231,1990</sup>

### ***Energy***

Electrical power is generated and distributed by the Kauai Electric Company. In 1986, sales for the County of Kauai exceeded 252 million kilowatt-hours or 5,306 kilowatt-hours per household. Electrical service is available for all communities on the North Shore of Kauai. <sup>231,1990</sup>

### ***Coastal Water Quality***

Hanalei Bay is defined as an “embayment,” with Class AA waters in Chapter 37-A, Water Quality Standards, of the DOH Public Health Regulations. It is the largest embayment estuary on Kauai, and the third largest in the State.

The circulation of the bay waters has not been studied in any detail. The tidal movement is generally in a clockwise direction during flood tides and counter-clockwise during ebb tides and plays a major role in the flushing characteristics of the bay.

The project will have insignificant and temporary impact on the water quality for the area. Increase in turbidity will be short term. <sup>230,1990</sup>

### ***Marine Ecosystems Health***

The biota on and associated with the pilings of the Hanalei Bay Pier are typical of a “wharf piling” community and consist mainly of filter-feeding bivalves. Fish were observed near the pier’s foundation. The project will have insignificant and temporary impact on the marine flora and fauna in the area. All marine animals and plants are expected to return after reconstruction is completed. <sup>230,1990</sup>

### ***Forestry***

The excursion boat staging operations will have no impact on forestry. <sup>231,1990</sup>

### ***Air Quality***

Minimal short-term impacts on air quality are to be expected. Watering of bare soil will mitigate some of the effects. <sup>231,1990</sup>

For the greater portion of the year, Hawaii’s trade winds (northeasterly winds) carry pollutants in a southwesterly direction toward the Haena coast. Air Quality is generally good because of the trades. Air pollution problems may occur during times of “Kona” winds (southwesterly winds). These problems are usually localized and occur most often during the winter months.

The project will have a temporary impact on the local air quality, mainly generation of dust. <sup>230,1990</sup>

### ***Beach Erosion***

No information was given regarding beach erosion during pier reconstruction.

### ***Invasive Species***

The excursion boat staging operations will have no impact on invasive species. <sup>231,1990</sup>

### ***Natural / Scenic Resources***

The Hanalei Bay Pier is significant as a good example of a typical finger pier constructed prior to the 1920’s in Hawaii. The pier is historically significant as one of the last remaining vestiges of the rice industry in Hawaii. The pier is well known as a picturesque site to residents and visitors of the island. It is used for promotional films of the area and has been used for various movies.

Due to the pier's deteriorated condition, large chunks of decking at the end of the pier have collapsed. <sup>230,1990</sup>

### ***Native Species***

The excursion boat staging operations will have no impact on native species. <sup>231,1990</sup>

---

## **County of Kauai – North Shore – Private Transportation**

### ***Present Capacity and Usage***

See County of Kauai Private Transportation Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

See County of Kauai Private Transportation Summary for information.

### ***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 Kauai – North Shore – Energy Systems**

### ***Present Capacity and Usage***

See County of Kauai Energy Systems Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Usage***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai Energy Systems Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Energy Systems Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Energy Systems Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Energy Systems Summary for information.

### ***Major Assumptions***

See County of Kauai Energy Systems Summary for information.

---

## **County of Kauai – North Shore – Sewer Systems**

### ***Present Capacity and Usage***

The Sewer indicator has been combined with the Sewage indicator. See County of Kauai 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 Kauai – North Shore – Coastal Water Quality**

### ***Present Capacity and Usage***

See County of Kauai Coastal Water Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Usage***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai 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 Kauai – North Shore – Marine Ecosystem Health**

### ***Present Capacity and Usage***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Marine Ecosystem Health element.

### ***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***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Major Assumptions***

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

---

## **County of Kauai – North Shore – Forestry / Green Space**

### ***Present Capacity and Usage***

See County of Kauai Forestry / Green Space Summary for information.

### ***Existing Problems, Issues and Opportunities***

No information was uncovered regarding existing problems, issues and opportunities for the Forestry / Green Space element.

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Forestry / Green Space element.

### ***Future and Planned Requirements or Changes***

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

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

No information was uncovered regarding the comparison of visitor and resident impacts for the Forestry / Green Space element.

### ***Major Assumptions***

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

---

## **County of Kauai – North Shore – Air Quality**

### ***Present Capacity and Usage***

See County of Kauai Air Quality Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Air Quality Summary for information.

### ***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 Kauai – North Shore – Beach Erosion**

### ***Present Capacity and Usage***

See County of Kauai 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 Beach Erosion.

### ***Future and Planned Requirements or Changes***

See County of Kauai Beach Erosion Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Beach Erosion Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Beach Erosion Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Beach Erosion Summary for information.

### ***Major Assumptions***

See County of Kauai Beach Erosion Summary for information.

---

## **County of Kauai – North Shore – Invasive Species**

### ***Present Capacity and Usage***

See County of Kauai Invasive Species Summary for information.

### ***Existing Problems, Issues and Opportunities***

No information was uncovered regarding existing problems, issues and opportunities for the Invasive Species element.

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Invasive Species element.

### ***Future and Planned Requirements or Changes***

See County of Kauai Invasive Species Summary for information.

### ***Anticipated Costs for the Future***

No information was uncovered regarding anticipated costs for the future for the Invasive Species element.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Invasive Species Summary for information.

### ***Compare Visitor and Resident Impact***

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

### ***Major Assumptions***

No information was uncovered regarding major assumptions for the Invasive Species element.

---

## **County of Kauai – North Shore – Other Natural / Scenic Resources**

### ***Present Capacity and Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Future and Planned Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Future and Planned Requirements or Changes***

No information was uncovered regarding future and planned requirements or changes for the Other Natural and Scenic Resources element.

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

No information was uncovered regarding the comparison of visitor and resident impacts for the Other Natural and Scenic Resources element.

### ***Major Assumptions***

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

## County of Kauai – Kawaihau – Terrestrial Water Quality and Quantity

### ***Present Capacity and Usage***

The following is a summary of the water supply, storage capacity, and the infrastructure as outlined in the Department of Water: County of Kauai – *Water Plan 2020*:

#### **Anahola:**

##### Supply

2000: Need new 300 gpm source

2020: Adequate

##### Storage

2000: Adequate

2020: Need 400,000-gallon tank

##### Distribution

Fire flow is deficient in Anahola Village;  
Anahola Road pipe was installed in 1929; and  
Remainder installed after 1956.

#### **Moloaa:**

##### Supply

Currently purchases water.

##### Storage

2000: Construct new 15,000-gallon tank

2020: Adequate

##### Distribution

PVC pipe was installed in 1985

#### **Kilauea – Waipake – Kalihiwai:**

##### Supply

2000: Need new 400-gpm source

2020: Adequate

##### Storage

2000: Construct a new 0.65 MG tank. Install pressure reducing valve stations.

2020: Adequate

##### Distribution

Sea Cliff Plantation has low pressure;  
Fire flow is deficient for commercial, schools and Kalihiwai Valley; and  
Oldest pipe was installed in 1972. <sup>47,2001</sup>

### ***Existing Problems, Issues and Opportunities***

See Present Usage and Capacity.

---

### ***Future and Planned Usage***

See County of Kauai for Water Summary information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

The Department of Water reviewed the proposed a Build-Out Analysis outlined in the *Kauai General Plan* and made the following recommendations. The DOW projected a need for approximately ten new production wells and four new storage tanks to provide adequate water supply for scenario. In order to meet the demand transmission and distribution lines would also need to be upgraded.  
4, 2000

### ***Anticipated Costs for the Future***

See County of Kauai for Water Summary information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai for Water Summary information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See County of Kauai for Water Summary information. Details at the district level require further study.

### ***Major Assumptions***

See County of Kauai for Water Summary information. Details at the district level require further study.

## **County of Kauai – Kawaihau – Sewage**

### ***Present Capacity and Usage***

The *Kauai General Plan* list one of the four County operated wastewater treatment facilities in Wailua. The service area is Wailua-Waipouli-Kapaa corridor along Kuhio Highway. The design capacity is 1.5 mgd and it is generating at about 50% of that capacity. <sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

In general, wastewater disposal is adequate and does not pose a significant public health or environmental threat.

The transmission system has been extended to provide future service to Kapaa but collection systems makai of the highway have not been built. <sup>4, 2000</sup>

### ***Future and Planned Usage***

Capacity is being reserved for future development of vacant resort lots in Waipouli according to the *Kauai General Plan*. <sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Anticipated Costs for the Future***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

The Kauai General Plan found that in general, the County is reluctant to expend scarce CIP resources on expanding municipal wastewater systems. <sup>4, 2000</sup>

### ***Compare Visitor and Resident Impact***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Major Assumptions***

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

---

## **County of Kauai – Kawaihau – Solid Waste Disposal**

### ***Present Capacity and Usage***

In accordance with the *Kauai General Plan*, Kauai County maintains an island wide system of solid waste collection and disposal that serves its resident and visitor population. One of four refuse transfer stations is located in Kapaa.

In FY 1999, a total of 24,930 tons of solid waste was collected and transferred to the Kekaha Landfill Phase II. The Kapaa station receives used motor oil through the Do-it Yourselfer (DIY) program and green waste. <sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Future and Planned Usage***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Anticipated Costs for the Future***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Major Assumptions***

See Kauai County for Solid Waste Summary information. Details at the district level require further study.

## **County of Kauai – Kawaihau – Storm Water**

### ***Present Capacity and Usage***

See Kauai County for Storm Water Summary information.

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan* states that according to the Department of Public Works (DPW), there do exist drainage problems in Wailua-Kapaa, Nawiliwili and Poipu. The County has not prepared a Drainage Master Plan, as required under the existing General Plan and the Comprehensive Zoning Ordinance.<sup>4, 2000</sup>

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Future and Planned Usage***

According to the *Kauai General Plan* rather than prepare a master plan for the island, the DPW intends to focus on specific problem areas and watersheds, with the objective of developing strategic plans that specify preventive as well as remedial actions.<sup>4, 2000</sup>

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

The *Kauai General Plan* proposed a Build-Out Analysis and requested that County service agencies review it. DPW estimates that storm water runoff in the Kapaa-Wailua basin might increase 20-40 percent because of the build-out and the increased amount of impermeable surfaces. According to the DPW, this would present downstream drainage problems and would require more and larger detention basins.<sup>4, 2000</sup>

### ***Anticipated Costs for the Future***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Major Assumptions***

No information was uncovered regarding major assumptions for the Storm Water element.

## County of Kauai – Kawaihau - Roads

### ***Present Capacity and Usage***

In the Kawaihau district, the *Draft Hawaii Statewide Transportation Plan* finds that Kuhio Highway, a three-lane State arterial highway, is the primary roadway serving the Kawaihau Planning District. The center lane is used either as a contra-flow lane for Lihue-bound morning commuters (between Kapule Highway and Kamoia Road in Waipouli) or a bi-directional turn lane (between Kamoia Road and Waiakea Canal at the edge of Kapaa Town). In Kapaa Town, Kuhio Highway becomes two lanes with on street parking through the town center then continuing as a two-lane arterial highway to Moloaa. Major two-lane collector roads include Kuamoo Road (State) and Olohena Road (County), which provide access to the Wailua Homesteads area from Kuhio Highway in Wailua and Kapaa. Kawaihau Road is a County-owned two-lane collector road connecting Kapaa Homesteads with Kuhio Highway.  
<sup>101, 2002</sup>

### ***Existing Problems, Issues and Opportunities***

The *Draft Hawaii Statewide Transportation Plan* observed that in 1995, to provide relief for traffic through Waipouli and most of Kapaa Town, a temporary by-pass route utilizing private cane hauls roads was opened to traffic during daylight hours.  
<sup>101, 2002</sup>

### ***Future and Planned Usage***

See Kauai County Roads Summary for information. Details at the community level would require more study.

### ***Future and Planned Requirements or Changes***

The *Kauai General Plan Update* provided estimates of automobile traffic based on the Build-Out Analysis totals. Average daily levels of traffic were projected by the Department of Public Works to necessitate expansion to four lanes Kuamoo Road, Olohena Road, and Kawaihau Road, which would need to be converted to a 50-mile-per-hour highway in order to have sufficient capacity. The terrain, historic resources and residential buildings along the routes makes such a project extremely difficult and “above the financial capabilities of the County.” Also, traffic at the levels projected would severely affect traffic operations at intersections with Kuhio Highway and the future By-Pass Highway.

Local opposition to the Department of Transportation (DOT) proposed expansion of Kuhio Highway through Kapaa Town forced the DOT to reassess alternatives. A new By-Pass running parallel to Kuhio Highway between Wailua and Kapaa was suggested as a way to provide additional highway capacity and an extended route for through-traffic in the corridor. The Kapaa By-Pass is an essential project

to relieve one of Kauai's most congested travel corridors. A new By-Pass would require not only building connector roads but also reevaluating land use policies for the effected areas. If a new bridge across Wailua River is needed careful assessment of impacts on sacred sites and on Wailua River State Park must be considered. The project is expected to benefit North Shore residents as well as Kawaihau residents.<sup>4, 2000</sup>

### ***Anticipated Costs for the Future***

The *Draft Hawaii Statewide Transportation Plan* estimates the cost of building currently needed improvements is approximately \$97 million. This amounts to about 30 percent of highway funding needed through 2020.<sup>101, 2002</sup>

### ***Problems, Issues and Opportunities Associated with Costs***

See State of Hawaii and Kauai County Roads Summary for information. Details at the community level would require more study.

### ***Compare Visitor and Resident Impact***

See Kauai County Roads Summary for information. Details at the community level would require more study.

### ***Major Assumptions***

See Kauai County Roads Summary for information. Details at the community level would require more study.

---

## **County of Kauai – Kawaihau - Airports**

### ***Present Capacity and Usage***

According to the Kauai General Plan, 2000, there are no airport facilities in this district. <sup>4, 2000</sup>

### ***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 Kauai – Kawaihau – Harbors**

### ***Present Capacity and Usage***

According to the *Kauai General Plan, 2000*, there are no harbor terminals in this district. <sup>4, 2000</sup>

### ***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 Kauai -- Kawaihau -- Parks

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, Kawaihau has 134.3 acres of parks. The following table illustrates the park types and their corresponding acreage.<sup>4, 2000</sup>

**Table 4.45 – Kawaihau County parks by Type: 2000**

District/Park Type	Acres
Kawaihau Total	134.3
Regional Park	48.9
Beach Parks	22.0
District Park	18.1
Community Parks	45.4

Source: *Kauai General Plan*

The Department of Public Works classifies parks into five categories of varying levels of use. Class I and Class II levels are considered “extremely high use” and “high use”, respectively. Parks in these use levels are used heavily by both residents and visitors.<sup>4, 2000</sup>

**Table 4.46 – Kawaihau County Parks with High Usage: 2000**

Use Category/Park	Park Type	Acres
<b>EXTREMELY HIGH USE:</b>		
Lydgate Park	Regional	48.9
Kapaa New Park	District	18.1
<b>HIGH USE:</b>		
Anahola Beach Park	Beach	1.5
Kapahi Park	Community	4.0

Source: *Kauai General Plan*

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Parks Summary for information.

### ***Future and Planned Usage***

In order to adequately accommodate the projected growth of residents and visitors the *Kauai General Plan* suggests the following improvements to County parks:

Kawaihau:

- Kealia cane haul road - extension of the planned regional shoreline bikeway from Ninini to Anahola

### ***Future and Planned Requirements or Changes***

See County of Kauai Parks Summary for information.

***Anticipated Costs for the Future***

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

***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Parks Summary for information.

***Compare Visitor and Resident Impact***

See County of Kauai Parks Summary for information.

***Major Assumptions***

See County of Kauai Parks Summary for information.

---

## **County of Kauai – Kawaihau – Police, Fire and Emergency Services**

### ***Present Capacity and Usage***

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

### ***Existing Problems, Issues and Opportunities***

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

### ***Future and Planned Usage***

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

### ***Future and Planned Requirements or Changes***

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

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

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

### ***Major Assumptions***

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

## County of Kauai – Kawaihau – Visitor Accommodations

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, there are approximately 1200 units of hotel accommodation, 350 condominium units, 380 timeshare units, and almost 200 other. Kawaihau accounts for 30% of Kauai’s total visitor accommodation units.  
 4, 2000

**Table 4.47—Visitor Units by Type: 2001**

District	Hotel	Condo Hotel	Other	Timeshare	Units	% Of Kauai Total
Kawaihau	947	870	215	-	1942	27

Source: 2001 Visitor Plant Inventory

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan* evaluates Kawaihau. The occupancy rates for Central Kauai average about 60 percent, consistently five points below the island wide average. Rates ran higher in 1999 a possible start of an upward trend. No new visitor units have been built since Pono Kai in 1980. With the lowest room prices and the lowest occupancy rate in recent history, there has been little incentive to build new units. Substantial growth appears unlikely.

According to the *Kauai General Plan*, while there is sufficient land zoned to accommodate 1,500 additional units, much of it is leasehold and therefore less attractive to developers.

Wastewater and water supply treatment plant capacity has been reserved for future development of the resort sites at Waipouli. However, to complete development of all vacant resort properties, water and sewer improvements would be needed.  
 4, 2000

### ***Future and Planned Usage***

The *Kauai General Plan* gives a summary of potential visitor units by status and area.  
 4, 2000

**Table 4.48 – Kawaihau Summary of Potential Visitor Units: 2000**

Estimated Potential Units			
Status and Geographic Area	Resort Projects	Multi-Family Projects	Total
Planned Projects with Zoning & Previously Approved Permits	1,030	0	1,030
Planned Projects with Zoning Only (No Permits)	350	80	430

Source: *Kauai General Plan*

### ***Future and Planned Requirements or Changes***

Coco Palms, closed since Hurricane Iniki, is expected to be redeveloped.

### ***Anticipated Costs for the Future***

No information was uncovered regarding anticipated cost 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 Kauai – Kawaihau – Private Transportation**

### ***Present Capacity and Usage***

See County of Kauai Private Transportation Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

See County of Kauai Private Transportation Summary for information.

### ***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 Kauai – Kawaihau – Energy Systems**

### ***Present Capacity and Usage***

See County of Kauai Energy Systems Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Usage***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai Energy Systems Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Energy Systems Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Energy Systems Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Energy Systems Summary for information.

### ***Major Assumptions***

See County of Kauai Energy Systems Summary for information.

---

## **County of Kauai – Kawaihau – Sewer Systems**

### ***Present Capacity and Usage***

The Sewer indicator has been combined with the Sewage indicator. See County of Kauai 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 Kauai – Kawaihau – Coastal Water Quality**

### ***Present Capacity and Usage***

See County of Kauai Coastal Water Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Usage***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai 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 Kauai – Kawaihau – Marine Ecosystem Health**

### ***Present Capacity and Usage***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Marine Ecosystem Health element.

### ***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***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Major Assumptions***

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

---

## **County of Kauai – Kawaihau – Forestry / Green Space**

### ***Present Capacity and Usage***

See County of Kauai Forestry / Green Space Summary for information.

### ***Existing Problems, Issues and Opportunities***

No information was uncovered regarding existing problems, issues and opportunities for the Forestry / Green Space element.

### ***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 Kauai – Kawaihau – Air Quality**

### ***Present Capacity and Usage***

See County of Kauai Air Quality Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Air Quality Summary for information.

### ***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 Kauai – Kawaihau – Beach Erosion**

### ***Present Capacity and Usage***

See County of Kauai Beach Erosion Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

N/A

### ***Future and Planned Requirements or Changes***

See County of Kauai Beach Erosion Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Beach Erosion Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Beach Erosion Summary for information.

### ***Compare Visitor and Resident Impact***

N/A

### ***Major Assumptions***

N/A

---

## **County of Kauai – Kawaihau – Invasive Species**

### ***Present Capacity and Usage***

See County of Kauai Invasive Species Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

N/A

### ***Future and Planned Requirements or Changes***

See County of Kauai Invasive Species Summary for information.

### ***Anticipated Costs for the Future***

N/A

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Invasive Species Summary for information.

### ***Compare Visitor and Resident Impact***

N/A

### ***Major Assumptions***

N/A

---

## **County of Kauai – Kawaihau – Other Natural / Scenic Resources**

### ***Present Capacity and Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Future and Planned Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***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 Kauai – Lihue – Terrestrial Water Quality and Quantity

### ***Present Capacity and Usage***

The following is a summary of the water supply, storage capacity, and the infrastructure as outlined in the Department of Water: County of Kauai – *Water Plan 2020*:

#### **Puhi – Lihue – Hanamaulu:**

##### Supply

2000: Adequate once Hanamaulu 1,3,4, Pukaki, and Puhi 5a & 5b are on-line

2020: Adequate

##### Storage

Adequate.

##### Distribution

Fire flow is deficient in the commercial, school and older subdivisions;  
Oldest pipe installed in 1926 - 1935, remainder after 1946.

#### **Wailua – Kapaa:**

##### Supply

2000: Adequate: however, surplus cannot be moved due to system limitations. Install piping and boosters or rehabilitate Akalikuli Tunnel and acquire new 400-gpm source.

2020: Adequate

##### Storage

2000: Construct new 900,000-gallon tank, a new 350,000-gallon tank, and a 900,000-gallon tank.

2020: Adequate.

##### Distribution

Vivian Heights and upper Wailua Homesteads have low pressure;  
Fire flow is deficient in the Waipouli makai area, agriculture/open and older subdivisions;

Some pipe installed before 1930;

Wailua Homesteads main – 1937; and

Kawaihau Road cast iron main – 1945.<sup>47, 2001</sup>

### ***Existing Problems, Issues and Opportunities***

According to the *Water Plan 2020* – Department of Water, 2001 the Lihue region does not have favorable geologic conditions for development of ground water production wells. The wells that have been drilled are typically low yielding. The future development of Grove Farm’s Puakea master-planned project, the Lihue-Hanamaulu Infill project, and redevelopment within Lihue Town itself is limited without adequate water supply. Both Grove Farm and Amfac/JMB are obligated under their zoning ordinances to provide water source, transmission and storage facilities. Both control large acreages of mauka lands, but face the same

geological constraints. One possibility under consideration is the use of surface waters, which would require the construction and operation of water treatment plants.<sup>47, 2001</sup>

***Future and Planned Usage***

See County of Kauai for Water Summary information.

***Future and Planned Requirements or Changes***

See Appendix for maps and improvements.

***Anticipated Costs for the Future***

See Appendix for maps and improvements.

***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai for Water Summary information.

***Compare Visitor and Resident Impact***

See County of Kauai for Water Summary information.

***Major Assumptions***

See County of Kauai for Water Summary information.

## **County of Kauai – Lihue – Sewage**

### ***Present Capacity and Usage***

The *Kauai General Plan* list one of four County operated wastewater treatment facilities is located in Lihue. The service area is Lihue, Nawiliwili and Hanamaulu (most areas). The design capacity is 2.5 mgd. Operating at approximately 50% of capacity. <sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

Plant expansion will be needed to accommodate Amfac Lihue Infill development, but is limited by availability of land and users for effluent disposal via irrigation. <sup>4, 2000</sup>

### ***Future and Planned Usage***

The *Kauai General Plan* states that the Department of Public Works has an agreement with the Kauai Lagoons to accept up to 1.5 mgd of effluent per day for irrigation of its golf course.

### ***Future and Planned Requirements or Changes***

The *Kauai General Plan* finds that to increase service to the design capacity of 2.5 mgd, the Department of Public Works is planning to construct injection wells. The Lihue Hanamaulu Infill project is required to provide a wastewater treatment system. <sup>4, 2000</sup>

### ***Anticipated Costs for the Future***

The *Kauai General Plan* notes that the plant is sufficient to serve existing unsewered areas, but funding is needed to construct collection and transmission facilities. <sup>4, 2000</sup>

### ***Problems, Issues and Opportunities Associated with Costs***

In general, the County is reluctant to expend scarce CIP resources on expanding municipal wastewater systems. <sup>4, 2000</sup>

### ***Compare Visitor and Resident Impact***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Major Assumptions***

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

---

## **County of Kauai – Lihue – Solid Waste Disposal**

### ***Present Capacity and Usage***

In accordance with the *Kauai General Plan*, Kauai County maintains an island wide system of solid waste collection and disposal that serves its resident and visitor population. One of the four refuse transfer stations is located in Lihue.

In FY 1999, a total of 24,930 tons of solid waste was collected and transferred to the Kekaha Landfill Phase II. The Lihue station receives scrap metal, white goods and green waste. <sup>4,2000</sup>

### ***Existing Problems, Issues and Opportunities***

See Kauai County for Solid Waste Summary information.

### ***Future and Planned Usage***

See Kauai County for Solid Waste Summary information.

### ***Future and Planned Requirements or Changes***

See Kauai County for Solid Waste Summary information.

### ***Anticipated Costs for the Future***

See Kauai County for Solid Waste Summary information.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Solid Waste Summary information.

### ***Compare Visitor and Resident Impact***

See Kauai County for Solid Waste Summary information.

### ***Major Assumptions***

See Kauai County for Solid Waste Summary information.

## **County of Kauai – Lihue – Storm Water**

### ***Present Capacity and Usage***

See Kauai County for Storm Water Summary information. at the district level require further study.

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan* states that according to the Department of Public Works (DPW), there do exist drainage problems in Wailua-Kapaa, Nawiliwili and Poipu. The County has not to date prepared a Drainage Master Plan, as required under the existing General Plan and the Comprehensive Zoning Ordinance.<sup>4, 2000</sup>

See Kauai County for Storm Water Summary information.

See Lihue Area Related Summary for more information.

### ***Future and Planned Usage***

According to the *Kauai General Plan* rather than prepare a master plan for the island, the DPW intends to focus on specific problem areas and watersheds, with the objective of developing strategic plans that specify preventive as well as remedial actions.<sup>4, 2000</sup>

See Kauai County for Storm Water Summary and Lihue Visitor Area Related Summary for more information.

### ***Future and Planned Requirements or Changes***

See Lihue Area Related Summary for more information.

### ***Anticipated Costs for the Future***

See Kauai County for Storm Water Summary information.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Storm Water Summary information.

### ***Compare Visitor and Resident Impact***

See Kauai County for Storm Water Summary information.

### ***Major Assumptions***

N/A

## **County of Kauai – Lihue – Roads**

### ***Present Capacity and Usage***

The *Kauai General Plan* states that the Lihue region is the hub that connects the two belt highways. The construction of Kapule Highway has improved traffic flow in the eastward direction. See Kauai County Roads Summary for information. Details at the community level would require more study.<sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan* notes that to the west traffic flow into Lihue is constrained by the limited capacity of the two-lane Kaunualii Highway.<sup>4, 2000</sup>

The *Draft Hawaii Statewide Transportation Plan* cites the *Kauai Long-Range Land Transportation Plan* (1997) as a reference for describing the extremely poor traffic conditions in the central part of the island. As documented the major roads in Lihue, west to Maluhia Road, and east to Kapaa are rated Level of Service D, E or F for average daily traffic. (The Plan uses traffic data from 1995, but existing conditions are similar or worse.) Extremely poor conditions can be observed in Kapaa Town and during peak hours on Kaunualii Highway leading into Lihue. Collector roads, such as Kuamoo Road in Wailua, also suffer congestion during peak hours.<sup>101, 2002</sup>

See Lihue Visitor Related Area Summary for more information.

### ***Future and Planned Usage***

See Lihue Visitor Related Area Summary for more information.

### ***Future and Planned Requirements or Changes***

The *Draft Hawaii Statewide Transportation Plan* recommends constructing a new 2-lane Lihue-Hanamoulu By-Pass road, widening Kapule Highway to 4 lanes and constructing a new 4 lane Nuhou Road between Puhi Road and Nawiliwili Road.<sup>101, 2002</sup>

See Lihue Visitor Related Area Summary for more information.

### ***Anticipated Costs for the Future***

See State of Hawaii and Kauai County Roads Summaries for more information.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County Roads Summary for information.

### ***Compare Visitor and Resident Impact***

See Kauai County Roads Summary for information.

***Major Assumptions***

See Kauai County Roads Summary for information.

## County of Kauai – Lihue – Airports

### ***Present Capacity and Usage***

The *State Airports, Harbors and Highways* lists the fiscal year 2001 changes in activity at Lihue Airport as follows:

**Table 4.49 – Lihue Airport Statistics: 2001**

Fiscal Year 2001

2,678,917 passengers	-7.1% change
13,543 tons cargo	-11.4% change
3,245 tons mail	-7.7% change
95,508 operations	-16.1% change <sup>37, 2001</sup>

Source: *State Airports, Harbors and Highways*

According to the *Final Statewide Airport System Plan*, the majority of the operations at Lihue airport are in the category of air taxi/commuter traffic, which is dominated by helicopter operations. Terminal concourse expansion meets the demand for additional passenger gates. Federal Inspection Service facilities welcome international travelers. A lease lot subdivision has been developed to accommodate demand by general aviation and other airport-related uses and to increase airport revenues. New helicopter facilities have been constructed to meet the needs of air tour operators.<sup>127, 1998</sup>

### ***Existing Problems, Issues and Opportunities***

The *Hawaii Tourism Product Assessment* states that runway extensions for Kauai are supported by industry and DOT representatives to enhance tourism growth by permitting direct flights to and from the island.<sup>91, 1999</sup>

The following was taken from the *Final Statewide Airport System Plan*.

Need to Satisfy Forecast Demand:

- Current passenger and aircraft operations projections show continued increases in traffic resulting in demand for additional terminal and airfield facilities.
- Overseas flights directly to Lihue airport will result in the need for new or adapted terminal and/or airfield facilities.
- A higher level of security at the airports has challenged curbside traffic management as well as passenger throughput in the terminal.

Need for Revenue enhancement and Economic Development

- Revenue enhancement through concession and permittee development has not been actively promoted.
- Current concession space is not maximizing opportunities for capturing customer demand
- Retail and food beverage display areas are in need of upgrade to increase exposure and satisfy customer expectations.

### Customer Expectations

- Visitors expect smooth provision of various transportation modes to achieve a relaxed holiday experience
- The Lihue airport does not effectively project the image of local culture.
- Additional demand has been demonstrated for direct service from the mainland U.S. and international points to Neighbor Islands although these destinations are not yet prepared to accept current demand.

### Enhancement of Stakeholder Relationships

- An active public-private partnership is required to ensure full cooperation among airport stakeholders.
- Effective working relationships need to be established and actively nurtured with community and interest group representatives
- A need exists to ensure a user-friendly environment for airport system tenants.

### Organization of Space

- Existing spaces are utilized for purposes other than the intended use.
- Passenger services, e.g. concessions, are not located within the passenger flow through the airport.
- Ground transportation facilities do not optimize use of land curb space.
- Services, facilities, and passenger flows need to be consolidated to allow economic and efficient use of existing space.
- The allocation of space within and among the Lihue airport must be adjusted to maximize efficiency.

### Identification of Airport Facilities with Local Culture

- There is a need to enhance marketing of Made-in-Hawaii products at the airports.
- There is minimal feeling of “sense of place” or awareness of Hawaiian culture at the airports.
- Displays presenting Hawaiian culture and history to visitors are either placed in inadequate space or are not sufficiently prominent to attract attention. <sup>127, 1998</sup>

## ***Future and Planned Usage***

The *Final Statewide Airport System Plan* states that the runway extension at Lihue Airport will allow direct overseas and international flights in addition to inter-island traffic. <sup>127, 1998</sup>

According to the *State Airports, Harbors and Highways* future requirements are 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. <sup>37, 2001</sup>

### ***Future and Planned Requirements or Changes***

According to the *Final Statewide Airport System Plan* facility requirements for the Lihue Airport during the planning period 1998 through 2020 are:

Terminal Area Complex: Concourse expansion will be needed in the long-term to accommodate a projected increase in overseas and inter-island traffic of 55 percent through the year 2020. New heliport and general aviation facilities, including lease lot development, will be required to address future demand in these areas.

Airfield and Support Facilities: Runway 17-35 requires extension in both the near and long-term in order to accommodate direct, long haul overseas flights. Cargo expansion is required to handle current peak demand and expected growth of approximately 65 percent through the year 2020.

Airport Support and Infrastructure: A new air traffic control tower will be required to provide adequate line-of-sight vision to the extended Runway 17-35.

Airfield Improvements: these will involve a single project to extend Runway 17-35 to accommodate international and domestic overseas wide body aircraft. The existing runway must be upgraded in order to accommodate heavier aircraft. This program will require three years of expenditures, beginning in FY 1998 and ending in FY 2000.

General Aviation Subdivision: This program involves the provision of new lease lots and upgrades to general aviation facilities. The existing supply of lease lots is insufficient to meet current demand. A program for new development will help to meet this demand and provide new revenues for LIH. Work associated with this program includes: lease lot subdivision; construction of a general aviation apron and road realignment; additional aprons and T-hangars; and relocation of the National Weather Service to enable site development. The two projects associated with this program will require three years of expenditures, starting in FY 1998 and ending in FY 2000.

Air Traffic Control Tower Relocation: Relocation of the control tower is necessary to meet FAA requirements for adequate sight distance and to accommodate future expansion of Runway 17-35. The two projects associated with this program will require two years of expenditures, starting in FY 1998 and ending in FY 1999.

Remaining Programs: The remaining five programs involve a range of airfield, terminal, and facility improvements. <sup>127, 1998</sup>

### ***Anticipated Costs for the Future***

The *Final Statewide Airport System Plan* states that the costs for the 6-year Statewide Airport System Plan for the Lihue airport totals \$80.162 million. Three major programs will account for nearly 90% or \$71.762 million of the \$80.162 million LIH CIP dollars. These programs include: Airfield Improvements, \$30.000 million; General Aviation Subdivision, \$17.350 million; and, Air Traffic Control Tower Relocation, \$24.412 million. <sup>127, 1998</sup>

### ***Problems, Issues and Opportunities Associated with Costs***

See State of Hawaii and Kauai County for more information.

### ***Compare Visitor and Resident Impact***

See Kauai County for Airports Summary information. Details at the district level require further study.

### ***Major Assumptions***

The *Final Statewide Airport System Plan* mentions that air traffic at Lihue Airport is expected to be dominated by inter-island travelers, although domestic overseas traffic is forecast to increase. There is no anticipation of direct international service to Kauai in the forecast. Total aircraft operations are forecast to increase from 103,686 in 1992 to 156,600 by 2020, an overall increase of 51 percent.

Continued growth of aviation activities on Kauai is forecast, with significant gains in inter-island and overseas passenger activity at Lihue Airport. This airport is to remain the principal airport on the island. Anticipated development at Lihue airport will therefore involve continued upgrades to existing and provision of new facilities to meet user needs and to ensure safety and convenience to travelers. <sup>127, 1998</sup>

## County of Kauai – Lihue – Harbors

### ***Present Capacity and Usage***

The following was listed in *State Airports, Harbors and Highways*:

**Table 4.50 – Nawiliwili Harbor Statistics: 2000**

Nawiliwili Harbor	
FY2000	92,219 passengers
	859,195 tons of cargo <sup>37, 2001</sup>

Source: *State Airports, Harbors and Highways*

For more harbor statistics see County of Kauai Harbors Summary.

According to the *Kauai General Plan*, Kauai's two commercial harbors, Nawiliwili Harbor and Port Allen are owned by the State of Hawaii and operated by the State Department of Transportation (DOT), Harbors Division.

Located near Lihue and major commercial and industrial facilities, Nawiliwili Harbor serves as the primary commercial harbor for Kauai. Facilities include three piers for the handling of both overseas and inter-island general and containerized cargo. Regularly scheduled container barges, fuel ships, and other large vessels also use pier 2. Pier 3 serves as an additional berth during days when two ships arrive at the Harbor.

Nawiliwili Harbor has become an increasingly popular port of call for passenger cruise ships. Since Kauai is the western-most major Hawaiian Island, Nawiliwili is frequently the first point-of-entry into the State for passenger cruise ships. In 1998, nine foreign-flagged vessels made 42 stops at Nawiliwili Harbor. American Hawaii Cruises, the only company providing inter-island service, made 52 visits to Kauai. Typically, cruise ships arrive at Nawiliwili Harbor in the morning, dock at Pier 2, and leave in the evening.

In terms of economic benefit, it is estimated that the cruise ship industry will generate 1,700 jobs on Kauai by 2020.

The harbor is also used for charter boat fishing and recreational boating.<sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

In reference to The Hawaii Tourism Product Assessment Kauai, there is a need to work on transportation infrastructure at Nawiliwili Harbor (cruise ship berth).<sup>91, 1999</sup>

### ***Future and Planned Usage***

Use of Nawiliwili Harbor for cruise ships will increase as the visitor projections do. Use of the commercial terminals will increase as the projected population increases.

### ***Future and Planned Requirements or Changes***

According to the State Airports, Harbors and Highways future requirements are 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.<sup>37, 2001</sup>

Kauai General Plan states that the 2010 Master Plan for Nawiliwili Harbor (1987) provides a general, long-range guide for growth, improvement, and efficient consolidation of land usage at Nawiliwili Harbor. The *Master Plan* was updated in 1993 in response to Hurricane Iniki. The Harbors Division is currently revising the Nawiliwili Master Plan as part of preparing *Commercial Harbors Plan 2025*.

In 1999, DOT-Harbors published the *Statewide Cruise Facilities Study* (Final, January 1999). Anticipating the growth in the cruise market, the study examined facilities throughout the state and will be used in developing the final 2020 harbor plans. Its proposals for Nawiliwili are congruent with the updated 2010 Master Plan.

The Plan designates Piers 1 and 3 for inter-island container operations and inter-island barge operations, respectively, and Pier 2 for cruise vessel and general cargo operations. Pier 3 is also used to berth a second cruise ship. Pier extensions are proposed at the west end of Pier 2 and the north end of Pier 3 to close the west corner of the Harbor basin and provide an additional 500-600 lineal feet of berth space at Pier 2. The Cruise Facilities Study also proposes two new passenger terminals and ground transportation facilities for Nawiliwili. The initial phase of improvements is scheduled for completion by 2004. According to the Cruise Facilities Study, Nawiliwili Harbor shows the highest return on investment among all proposed cruise facility improvements statewide.

- Develop capital improvements to Nawiliwili Harbor to support the future needs of cruise ships and cargo vessels.
- Develop ground transportation facilities, pedestrian circulation improvements, and terminal facilities at Nawiliwili Harbor that will accommodate 2,000-passenger cruise ships.
- Develop shuttle and other transportation improvements to move people out of the Nawiliwili Harbor area to various recreation, shopping and cultural attractions.
- Integrate planning for commercial facilities and Nawiliwili Beach Park with the harbor master plan.

The County Planning Department and Department of Public Works shall coordinate closely with the State Harbors Division in planning for Nawiliwili

Harbor, particularly with regard to ground transportation for cruise ship passengers and vehicular and pedestrian circulation.<sup>4, 2000</sup>

### ***Anticipated Costs for the Future***

According to the State Airports, Harbors and Highways:  
Nawiliwili Harbor  
Special maintenance projects \$249,000<sup>37, 2001</sup>

### ***Problems, Issues and Opportunities Associated with Cost***

See State of Hawaii and Kauai County for more information.

### ***Compare Visitor and Resident Impact***

Analysis of county documents shows a forecasted increase in cruise ship visits to Kauai. Statewide a 500% increase in cruise ship passengers is expected over the next 20 years.

### ***Major Assumptions***

The State Airports, Harbors and Highways lists:

- The overseas container volume is projected to top 1,338,000 TEUs in the year 2020.
- The 2020 projections for general cargo total 3,919,800 short tons.<sup>37, 2001</sup>

## County of Kauai – Lihue – Parks

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, Lihue has 86.8 acres of parks. The following table illustrates the park types and their corresponding acreage. <sup>4, 2000</sup>

**Table 4.51 – Lihue County Parks by Type: 2000**

District / Park Type	Acres
<b>Lihue</b>	<b>86.8</b>
District Park	34.0
Beach Parks	16.1
Community Parks	36.6

Source: *Kauai General Plan*

The Department of Public Works classifies parks into five categories of varying levels of use. Class I and Class II levels are considered “extremely high use” and “high use”, respectively. Parks in these use levels are used heavily by both residents and visitors. <sup>4, 2000</sup>

**Table 4.52 – Lihue County Parks with High Levels of Usage: 2000**

Use Category/Park	Park Type	Acres
<b>Extremely High Use:</b>		
Vidinha Stadium	District	34.0
Isenberg Park	Community	9.2
<b>High Use:</b>		
Hanamaulu Beach	Beach	6.5
Nawiliwili Park	Beach	6.3
Lihue County Park	Community	3.3

Source: *Kauai General Plan*

### ***Existing Problems, Issues and Opportunities***

See State of Hawaii and Kauai County for Parks Summaries information.

### ***Future and Planned Usage***

The *Kauai General Plan* plans for implementation of the master plan for Nawiliwili Beach Park. <sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

See State of Hawaii and Kauai County for Parks Summaries information.

***Anticipated Costs for the Future***

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

***Problems, Issues and Opportunities Associated with Costs***

See State of Hawaii and Kauai County for Parks Summaries information.

***Compare Visitor and Resident Impact***

See State of Hawaii and Kauai County for Parks Summaries information.

***Major Assumptions***

See State of Hawaii and Kauai County for Parks Summaries information.

## **County of Kauai – Lihue – Police, Fire and Emergency Services**

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, the Kauai Fire Department has a main station and administrative headquarters in Lihue. See County of Kauai Police, Fire and Emergency Medical Services Summary for more information. Details at the district level require further study.<sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

In reference to the *Kauai General Plan*, the current main station in Lihue, built in 1953, is outdated and overcrowded with no room for further expansion for a crime laboratory and future staffing needs. See County of Kauai Police, Fire and Emergency Medical Services Summary for more information. Details at the district level require further study.<sup>4, 2000</sup>

### ***Future and Planned Usage***

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

### ***Future and Planned Requirements or Changes***

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

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

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

### ***Major Assumptions***

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

## County of Kauai – Lihue – Visitor Accommodations

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, in Lihue, approximately 1,000 units were developed in the Lihue region during the 1980s. This figure includes almost 600 units at the Marriott, which was originally constructed as the Kauai Surf about 20 years previous. The only substantial new addition was the Outrigger/Beach Villas at Nukolii, which added about 400 units in the 1980s. Lower occupancy rates for this area probably reflect the Nukolii units more than the Marriott resort.  
 4, 2000

**Table 4.53 – Lihue Visitor Units by Type: 2001**

District	Hotel	Condo Hotel	Other	Timeshare	Units	Percent Island wide of Total
Lihue	425	179	612	-	1216	17%

Source: *2001 Visitor Inventory Plant*

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan* finds that new growth in the Lihue district is most likely to occur at the “Running Waters” site, the only significant vacant parcel zoned for resort use. That site is projected to receive 350- 400 hotel units.  
 4, 2000

### ***Future and Planned Usage***

The *Kauai General Plan* gives a summary of potential visitor units by status and area.  
 4, 2000

**Table 4.54 – LIHUE SUMMARY OF POTENTIAL VISITOR UNITS BY SATUS, 2001**

Resort / Hotel / Condo Projects	Multi-Family Projects	Total
3039	3100	6139

Source: *2001 Visitor Plant Inventory*

### ***Future and Planned Requirements or Changes***

See County of Kauai Visitor Accommodations Summary for more information.

### ***Anticipated Costs for the Future***

No information was uncovered regarding anticipated cost 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***

See County of Kauai Visitor Accommodations Summary for more information.

***Major Assumptions***

See County of Kauai Visitor Accommodations Summary for more information.

## County of Kauai – Lihue - Visitor Related Area

### ***Introduction***

*Final Impact Statement Kauai Electric Lihue Energy Service Center* describes Kauai Electric plans to develop a master-planned Energy Service Center in Lihue, Kauai. The Final EIS describes two power generating alternatives and three site alternatives however KE has sought land use approvals only for the Field 390 site at this time. Immediate construction of an Advanced Steam-injected combustion turbine will occur over the next 4 years but full build-out of the site is expected to take at least 30 years.

The information gleaned from the EIS can be used to conceptualize the Lihue area. This is to augment information contained in the Summaries regarding Lihue infrastructure and the environment.

### ***Water***

The proposed power plant will use water for a variety of purposes. These include steam production; equipment and plant wash down, injection for air pollution control, landscape irrigation, and domestic use by operating personnel. Water supply requirements will range between 0.75 and 0.79 millions gallons per day. At the Field 390 site the source of supply for would be surface water from the Lihue Plantation Company's irrigation system. Minor amounts of water would be used from Department of Water system.

### ***Sewage***

Of the total water supplied 0.42 to 0.52 MGD, would be discharged into the atmosphere and the remaining 0.24 to 0.36 MGD would be returned to surface or ground water sources. At the Field 390 site, the wastewater produced would be returned to the irrigation system for reuse.

### ***Solid Waste***

No impact on solid waste is mentioned.

### ***Storm Water***

Runoff from sugar cane fields typically has high turbidity, high suspended solids, and higher than background levels of fertilizer chemicals such as nitrate. The conversion to a power plant site will provide a more stable land surface that will not be susceptible to soil loss by erosion. Using drainage structures to deliver runoff to the stream or gully below would also eliminate the erosion that occurs when runoff overtops perimeter berms and cascades down steep slopes. These changes mean the power plant runoff is likely to have lesser turbidity, suspended solids, and fertilizer chemicals than does runoff from the existing agricultural fields.

## ***Roads***

Two major highways serve the Island of Kauai. Kaunualii Highway serves the southern and western parts of the island. It begins in Lihue at the intersection of Rice Street and Kuhio Highway and ends at Mana on Kauai's western shore. Kuhio Highway connects with Kaunualii Highway at the Rice Street intersection and extends from there to Haena on Kauai's north shore.

### Recommendations

- Widen Kaunualii Highway to a four lane divided highway between Koloa Road and Kuhio Highway/Rice Street intersection.
- Realign Ahukini Road to connect to Ehiku Street and widen to a four lane divided roadway between Kuhio Highway and Kapule Highway.
- Widen Kuhio Highway to a four lane divided highway between Ehiku Street and Eha Street.
- Widen Kapule Highway to a four lane divided highway between Rice Street and Kuhio Highway.
- Construct the four lane divided Lihue-Hanamaulu mauka bypass road with two lane connector roads to Ehiku Street, Nawiliwili Road and proposed Nuhou Road.

## ***Airports***

No impact on airports is mentioned.

## ***Harbors***

All fuel deliveries for Kauai Electric are presently made through Port Allen. It is piped directly from the harbor to Chevron U.S.A.'s fuel storage tanks immediately makai of the company's Port Allen Generating Station.

## ***Parks***

No impact on parks is mentioned.

## ***Police, Fire and Emergency Services***

No impact on police, fire or emergency services is mentioned.

## ***Visitor Accommodation***

No impact on visitor accommodations is mentioned.

## ***Private Transportation***

Three types of vehicular traffic would be generated with the proposed facility; employees reporting to or leaving from work; employees being dispatched to the field and returning to their respective base yards; and fuel trucks traveling between fuel unloading and storage facilities.

## ***Energy***

Kauai Electric must install additional generating capacity if it is to meet its customers' electrical power needs over the coming decades.

Generating Alternative 1 includes two 26.4 Megawatt capacity Advanced Steam-Injected Cycle Combustion Turbines, a 58-MW capacity Dual Train Combustion Turbine consisting of two 20-MW Combustion Turbines, two Heat Recovery Steam Generators and one 18-MW capacity Steam Turbine Generator; and four 10-MW diesels. All units would be oil fired.

Generating Alternative 2 contains the same two 26.4-MW Advanced Steam-Injected Cycle Combustion Turbines and four 10-MW diesels and a coal fired fluidized bed steam generating unit.

### **Forecast Electrical Energy Demand**

A Baseline Scenario that forecasts a continuation of recent trends with a slow recovery from the effects of Hurricane Iniki yielding relatively slow growth in population and employment. This scenario anticipates that visitor activity will continue to recover but the rate of growth will remain well below the pace experienced in the 1980s. This scenario also assumes a continuation of current regulatory policies concerning the environment, energy, and the electric utility industry. Peak demand under the Baseline Scenario is expected to rise from about 74 MW in 1998, to 132 MW in 2019.

A High Economic Growth Scenario that assumes rapid recovery from the effects of Hurricane Iniki. Growth in visitor activity, population, and employment is assumed to return to levels typical of the pre-Iniki period, and the U.S. and Japanese economies are assumed robust. This scenario also assumes a continuation of current regulatory policies concerning the environment, energy, and the electric utility industry. Peak demand in the High Economic Growth Scenario is expected to rise from about 74 MW in 1998, to 193 MW in 2019.

A Low Economic Growth Scenario that assumes an extremely slow recovery from the effects of Hurricane Iniki. It anticipates lower levels of population growth, economic activity, and increases in visitor arrivals than were experienced during the late 1980's. This scenario also assumes that the U.S. and Japanese economies are stagnant. Finally, it assumes a continuation of current regulatory policies concerning the environment, energy, and the electric utility industry. Under the Low Economic Growth Scenario, there is little increase in electrical demand. Peak use in 2019 under this scenario is only 89 MW, only 20 percent greater than anticipated peak in 1998.

## ***Coastal Water Quality***

There are no streams or ponds on any of the sites under consideration.

---

### ***Marine Ecosystems Health***

No impact on marine ecosystems is mentioned.

### ***Forestry***

No endangered botanical species were observed at the Field 390 site.

### ***Air Quality***

Federal and State Air Quality Standards will be met. The regulations require that each generating unit incorporate the most effective feasible emission control technology available at the time the permit is issued.

### ***Beach Erosion***

No impact on beach erosion is mentioned.

### ***Invasive Species***

No impact on invasive species is mentioned.

### ***Natural / Scenic Resources***

The Field 390 site has been a cultivated sugar cane field for years no impact on natural or scenic resources is anticipated.

### ***Native Species***

The endangered Hawaiian hoary bat was not observed during the field survey however, the vegetated gulch adjacent to the Field 390 site provides suitable habitat for them. A longer survey period might identify bats at the Field 390 location.

---

## **County of Kauai – Lihue – Private Transportation**

### ***Present Capacity and Usage***

See County of Kauai Private Transportation Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

See County of Kauai Private Transportation Summary for information.

### ***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 Kauai – Lihue – Energy Systems**

### ***Present Capacity and Usage***

See County of Kauai Energy Systems Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Usage***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai Energy Systems Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Energy Systems Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Energy Systems Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Energy Systems Summary for information.

### ***Major Assumptions***

See County of Kauai Energy Systems Summary for information.

---

## **County of Kauai – Lihue – Sewer Systems**

### ***Present Capacity and Usage***

The Sewer indicator has been combined with the Sewage indicator. See County of Kauai 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 Kauai – Lihue – Coastal Water Quality**

### ***Present Capacity and Usage***

See County of Kauai Coastal Water Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Usage***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai 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 Kauai – Lihue – Marine Ecosystem Health**

### ***Present Capacity and Usage***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Marine Ecosystem Health element.

### ***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***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Major Assumptions***

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

## **County of Kauai – Lihue – Forestry / Green Space**

### ***Present Capacity and Usage***

See County of Kauai Forestry / Green Space Summary for information.

### ***Existing Problems, Issues and Opportunities***

No information was uncovered regarding existing problems, issues and opportunities for the Forestry / Green Space element.

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Forestry / Green Space element.

### ***Future and Planned Requirements or Changes***

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

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

No information was uncovered regarding the comparison of visitor and resident impacts for the Forestry / Green Space element.

### ***Major Assumptions***

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

---

## **County of Kauai – Lihue – Air Quality**

### ***Present Capacity and Usage***

See County of Kauai Air Quality Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Air Quality Summary for information.

### ***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 Kauai – Lihue – Beach Erosion**

### ***Present Capacity and Usage***

See County of Kauai 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 Beach Erosion.

### ***Future and Planned Requirements or Changes***

See County of Kauai Beach Erosion Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Beach Erosion Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Beach Erosion Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Beach Erosion Summary for information.

### ***Major Assumptions***

See County of Kauai Beach Erosion Summary for information.

---

## **County of Kauai – Lihue – Invasive Species**

### ***Present Capacity and Usage***

See County of Kauai Invasive Species Summary for information.

### ***Existing Problems, Issues and Opportunities***

No information was uncovered regarding existing problems, issues and opportunities for the Invasive Species element.

### ***Future and Planned Usage***

No information was uncovered regarding future and planned usage for the Invasive Species element.

### ***Future and Planned Requirements or Changes***

See County of Kauai Invasive Species Summary for information.

### ***Anticipated Costs for the Future***

No information was uncovered regarding anticipated costs for the future for the Invasive Species element.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Invasive Species Summary for information.

### ***Compare Visitor and Resident Impact***

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

### ***Major Assumptions***

No information was uncovered regarding major assumptions for the Invasive Species element.

---

## **County of Kauai – Lihue – Other Natural / Scenic Resources**

### ***Present Capacity and Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Future and Planned Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Future and Planned Requirements or Changes***

No information was uncovered regarding future and planned requirements or changes for the Other Natural and Scenic Resources element.

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

No information was uncovered regarding the comparison of visitor and resident impacts for the Other Natural and Scenic Resources element.

### ***Major Assumptions***

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

## County of Kauai – Koloa-Poipu-Kalaheo – Terrestrial Water Quality and Quantity

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, the Department of Water (DOW) of the County of Kauai is a semi-autonomous agency responsible for the management, control, and operation of the island’s municipal water system. DOW supplies water to Koloa-Poipu-Kalaheo, which consists of Kalaheo, Koloa Poipu, and Lawai Omao.<sup>4, 2000</sup>

**Table 4.55 – Koloa Area Existing Water Demand: 2000**

District	Average Water Demand (mgd)	Maximum Water Demand (mgd)
West Side	2.01	3.01
Kalaheo-Poipu-Koloa	2.83	4.24
Lihue	2.53	3.8
Kawaihau	2.59	3.88
North Shore	0.65	0.97
Island Total	<b>10.60</b>	<b>15.91</b>

Source: *Kauai General Plan*

The following is a summary of the water supply, storage capacity, and the infrastructure as outlined in the *Department of Water: County of Kauai – Water Plan 2020*:

**Lawai – Omao:**

Supply: Adequate - Connected to Kaheo

Storage

2000: Needs a 250,000-gallon tank in 677 Zone.

2020: Adequate.

Distribution

Hailima Road area has low pressure;

Fire flow is deficient in the commercial, agricultural/open areas and private roads;

Oldest pipe installed in Omao in 1953, others after 1960.

**Koloa - Poipu:**

Supply: Adequate

Storage

2000: Rehabilitate Omao Tank or construct new a 500,000-gallon tank.

2020: Construct new 1.0 million gallon tank. If Omao is repaired then construct a 250,000-gallon tank in 366 Zone.

Distribution

Fire flow deficient in Koloa Town and agricultural/open areas;

Koloa Town pipe installed in 1924 - 1937; and

Older pipes are galvanized steel and cast iron.

**Kalaheo:**

Supply: Adequate - Connected to Lawai  
Storage

2000: Adequate once new 500,000-gallon tank is on-line and a PRV station is constructed.

2020: Adequate.

Distribution

Ag/ Open areas are deficient in fire flow;  
Oldest pipe installed in 1942 to 1953. <sup>47, 2001</sup>

***Existing Problems, Issues and Opportunities***

See Kauai County for Water Summary information.

***Future and Planned Usage***

See Kauai County for Water Summary information. See Koloa Area Visitor Related Summary for more information.

***Future and Planned Requirements or Changes***

See Kauai County for Water Summary information. See Koloa Area Visitor Related Summary for more information.

***Anticipated Costs for the Future***

See Kauai County for Water Summary information.

***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Water Summary information. See Koloa Area Visitor Related Summary for more information.

***Compare Visitor and Resident Impact***

See Kauai County for Water Summary information. See Koloa Area Visitor Related Summary for more information.

***Major Assumptions***

See Kauai County for Water Summary information.

## **County of Kauai – Koloa-Poipu-Kalaheo – Sewage**

### ***Present Capacity and Usage***

As stated in the *Kauai General Plan* the Kukuiula resort has constructed its own wastewater treatment facility and is further looking to develop water resources. Other resort developments in the area will require expansion of Kauai County water supply and private wastewater facilities.

The Eleele wastewater treatment facility services Port Allen, Eleele, and Hanapepe's business as well as residential areas. The treatment facility is currently operating at 50% capacity. An expansion was completed in 1995 to accommodate existing and planned development. According to the *Kauai General Plan* a wastewater collection system is needed to extend service to Hanapepe Heights. <sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

As stated in the *Kauai General Plan* further expansion will be needed to accommodate future Department of Hawaiian Homelands development on Hanapepe Heights. <sup>4, 2000</sup>

### ***Future and Planned Usage***

See Kauai County for Sewage Summary information. See Koloa Area Visitor Related Summary for more information.

### ***Future and Planned Requirements or Changes***

See Kauai County for Sewage Summary information. See Koloa Area Visitor Related Summary for more information.

### ***Anticipated Costs for the Future***

See Kauai County for Sewage Summary information.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Sewage Summary information.

### ***Compare Visitor and Resident Impact***

See Kauai County for Sewage Summary information. See Koloa Area Visitor Related Summary for more information.

### ***Major Assumptions***

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

## **County of Kauai – Koloa-Poipu-Kalaheo – Solid Waste Disposal**

### ***Present Capacity and Usage***

In accordance with the *Kauai General Plan*, Kauai County maintains an island wide system of solid waste collection and disposal that serves its resident and visitor population. One of the four refuse transfer stations is located in Hanapepe.

In FY 1999, a total of 24,930 tons of solid waste was collected and transferred to the Kekaha Landfill Phase II. The Hanapepe station is set up to receive used motor oil through the Do-it Yourselfer (DIY) program. <sup>4,2000</sup>

### ***Existing Problems, Issues and Opportunities***

See Kauai County for Solid Waste Summary information.

### ***Future and Planned Usage***

See Kauai County for Solid Waste Summary information. See Koloa Area Visitor Related Summary for more information.

### ***Future and Planned Requirements or Changes***

The *Kauai General Plan 2000* states that a new refuse transfer station is planned for Koloa. It is expected to cost approximately \$3 million to develop. <sup>4,2000</sup>

See Koloa Area Visitor Related Summary for more information.

### ***Anticipated Costs for the Future***

See Kauai County for Solid Waste Summary information.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Solid Waste Summary information.

### ***Compare Visitor and Resident Impact***

See Kauai County for Solid Waste Summary information. See Koloa Area Visitor Related Summary for more information.

### ***Major Assumptions***

See Kauai County for Solid Waste Summary information.

## **County of Kauai – Koloa-Poipu-Kalaheo – Storm Water**

### ***Present Capacity and Usage***

In accordance with the *Kauai General Plan*, Kauai is free of concrete-lined drainage channels. The County manages urban storm water runoff through the Drainage Standards applied to new developments by the Department of Public Works (DPW). <sup>4,2000</sup>

### ***Existing Problems, Issues and Opportunities***

According to the *Kauai General Plan*, there do exist drainage problems in Poipu. Rather than prepare a “master plan” for the island, the DPW intends to focus on specific problem areas and watersheds, with the objective of developing strategic plans that specify preventive as well as remedial actions. <sup>4,2000</sup>

### ***Future and Planned Usage***

According to the *Kauai General Plan* rather than prepare a master plan for the island, the DPW intends to focus on specific problem areas and watersheds, with the objective of developing strategic plans that specify preventive as well as remedial actions. <sup>4, 2000</sup>

See Kauai County for Storm Water Summary information. See Koloa Area Visitor Related Summary for more information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

See Kauai County for Storm Water Summary information. See Koloa Area Visitor Related Summary for more information. Details at the district level require further study.

### ***Anticipated Costs for the Future***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See Kauai County for Storm Water Summary information. See Koloa Area Visitor Related Summary for more information. Details at the district level require further study.

### ***Major Assumptions***

No information was uncovered regarding major assumptions for the Storm Water element.

## County of Kauai – Koloa-Poipu-Kalaheo – Roads

### ***Present Capacity and Usage***

As stated In the *Kauai General Plan* the Kaumualii Highway is the primary highway connecting the Kalaheo-Poipu-Koloa Planning District to Lihue on the east and to Port Allen/Eleele on the west. Kauai County maintains Maluhia Road, Poipu Road, the Poipu By-pass, and Koloa Road. <sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

According to the *Kauai General Plan*, the residential growth in the Lawai-Kalaheo area has increased the commute time to Lihue. Traffic congestion is seen on the Kaumualii Highway eastbound toward Lihue during the morning and afternoon. <sup>4, 2000</sup>

### ***Future and Planned Usage***

As stated in the *Kauai General Plan* future planned improvements for the Koloa District include:

- Phase II of the Koloa By-Pass connecting to Maluhia Road; and
- Improvement and signalization of the Kaumualii Highway and Koloa Road intersection.

According to the *Kauai General Plan*, the following are needed road improvements for Kauai County:

- Waimea to Port Allen Area
  - Widen Kaumualii Highway to 4 lanes from Waimea to Eleele
- Port Allen to Poipu Area
  - Widen Kaumualii Highway to a 4 lane divided roadway between Kalaheo Town and Koloa Road
  - Construct a new two-lane connector road between Port Allen and Poipu
- Poipu to Lihue Area
  - Widen Kaumualii Highway to a four-lane divided highway between Koloa Road and Kuhio Highway/Rice Street intersection
  - Construct a new 2-lane connector road between Poipu and Kipu
  - Widen Koloa By-Pass/Maluhia Road to 4 lanes <sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

See Kauai County for Roads Summary information. See Koloa Area Visitor Related Summary for more information. Details at the district level require further study.

***Anticipated Costs for the Future***

See Kauai County for Roads Summary information. Details at the district level require further study.

***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Roads Summary information. Details at the district level require further study.

***Compare Visitor and Resident Impact***

See Kauai County for Roads Summary information. See Koloa Area Visitor Related Summary for more information. Details at the district level require further study.

***Major Assumptions***

See Kauai County for Roads Summary information. Details at the district level require further study.

## **County of Kauai – Koloa-Poipu-Kalaheo – Airports**

### ***Present Capacity and Usage***

According to the *Kauai General Plan* the State Department of Transportation, Airports Division, operates two facilities on Kauai: Lihue Airport, the primary air terminal for the island; and Port Allen Airport, a general aviation airport with minimal facilities.

The Port Allen Airport is a single runway with two-helicopter landing and take-off pads, general aviation airport with minimal facilities. It is located on Puolo Point at the western edge of Hanapepe Bay. This facility is known as Burns Field by the local residents and is one of four general aviation airports within the statewide airport system. Port Allen Airport serves the need of west Kauai for general aviation, emergency helicopter operations, and helicopter air tour flights. The majority of activity is recreational pleasure flying. <sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan 2000* states that the Port Allen Airport currently lacks the physical facilities or buildings to adequately accommodate the needs of the helicopter operators. <sup>4, 2000</sup>

### ***Future and Planned Usage***

See State of Hawaii and Kauai County for Airports Summaries information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

See State of Hawaii and Kauai County for Airports Summaries information. Details at the district level require further study.

### ***Anticipated Costs for the Future***

See State of Hawaii and Kauai County for Airports Summaries information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See State of Hawaii and Kauai County for Airports Summaries information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See State of Hawaii and Kauai County for Airports Summaries information. Details at the district level require further study.

### ***Major Assumptions***

See State of Hawaii and Kauai County for Airports Summaries information.  
Details at the district level require further study.

## County of Kauai – Koloa-Poipu-Kalaheo – Harbors

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, the Port Allen Harbor is Kauai's second commercial harbor and is owned by the State of Hawaii and managed by the State Department of Land and Natural Resources, Division of Boating and Ocean Recreation (DOBOR). It is located on the south shore of Kauai and off Hanapepe Bay on the east side of the Hanapepe River. This 12-acre small deepwater boat harbor has a single pier and complements the primary harbor facilities at Nawiliwili on the east side of the island. It has a two-lane 30-foot wide launch ramp, 34 berths, six moorings, one pier, a fish hoist, restrooms, a harbor office, and a parking area.

Present waterfront activities at Port Allen include U.S. Naval vessels supporting activities of the Pacific Missile Range Facility, petroleum shipments, general cargo, commercial fisheries, and other maritime activities. The U.S. Navy continues to be the primary user of the pier, with recent use by Na Pali coast tour operators who were displaced from the Hanalei River. Port Allen Harbor is also used as an alternative port-of-call for smaller passenger vessels.

According to the *Kauai General Plan*, Kauai has four small boat harbors, Nawiliwili, Port Allen, Kikiaola and Kukuiula.<sup>4, 2000</sup>

### ***Existing Problems, Issues and Opportunities***

In accordance with the *Kauai General Plan* increased activity from the Na Pali coast tour operators and commercial boat operators has led to overcrowded conditions at both the commercial and small boat harbor facilities due to the tour operators displacement from Hanalei River. The casual parking arrangement at Port Allen is not capable of handling the increased traffic, and boat companies are forced to provide off-site parking and to bus or walk people to the boats. The restrooms are inadequate for large groups of visitors and there is insufficient tour boat loading space.

Opportunities include parking and restroom facilities needing improvement and expansion.<sup>4, 2000</sup>

### ***Future and Planned Usage***

See State of Hawaii and Kauai County for Harbors Summaries information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

See State of Hawaii and Kauai County for Harbors Summaries information. Details at the district level require further study.

***Anticipated Costs for the Future***

See State of Hawaii and Kauai County for Harbors Summaries information.  
Details at the district level require further study.

***Problems, Issues and Opportunities Associated with Costs***

See State of Hawaii and Kauai County for Harbors Summaries information.  
Details at the district level require further study.

***Compare Visitor and Resident Impact***

See State of Hawaii and Kauai County for Harbors Summaries information.  
Details at the district level require further study.

***Major Assumptions***

See State of Hawaii and Kauai County for Harbors Summaries information.  
Details at the district level require further study.

## County of Kauai – Koloa-Poipu-Kalaheo – Parks

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, Koloa-Poipu-Kalaheo has 61.3 acres of parks. The following table illustrates the park types and their corresponding acreage.<sup>4, 2000</sup>

**Table 4.56 – Koloa – Poipu – Kalaheo County Parks by Type: 2000**

District / Park Type	Acres
<b>Koloa-Poipu-Kalaheo</b>	<b>61.3</b>
Beach Parks	6.4
Passive Parks	4.4
District Parks	32.3
Community Parks	9.1
Neighborhood Parks	9.0

Source: *Kauai General Plan*

The Department of Public Works classifies parks into five categories of varying levels of use. Class I and Class II levels are considered “extremely high use” and “high use”, respectively. Parks in these use levels are used heavily by both residents and visitors (see table below).

**Table 4.57 – Koloa – Poipu - Kalaheo County Parks with High Usage: 2000**

Use Category/Park	Park Type	Acres
<b>Extremely High Use:</b>		
<b>Koloa-Poipu-Kalaheo</b>		
Poipu Beach Park	Beach	5.4
Spouting Horn Park	Passive	4.4
Kalawai Park	District	21.0
Koloa Park	District	11.3
<b>High Use:</b>		
Kalaheo Little League	Community	1.4

Source: *Kauai General Plan*

### ***Existing Problems, Issues and Opportunities***

See Kauai County for Parks Summary information.

### ***Future and Planned Usage***

In accordance with the *Kauai General Plan*, new facilities for existing parks are scheduled for construction. The expansion of Poipu Beach towards Waiohai will require the acquisition of private land. The acquired area will be used for additional parking, and restrooms.<sup>4, 2000</sup>

***Future and Planned Requirements or Changes***

See State of Hawaii and Kauai County for Parks Summaries for information.

***Anticipated Costs for the Future***

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

***Problems, Issues and Opportunities Associated with Costs***

See State of Hawaii and Kauai County for Parks Summaries information.

***Compare Visitor and Resident Impact***

See State of Hawaii and Kauai County for Parks Summaries information.

***Major Assumptions***

See State of Hawaii and Kauai County for Parks Summaries information.

## **County of Kauai – Koloa-Poipu-Kalaheo – Police, Fire and Emergency Services**

### ***Present Capacity and Usage***

#### **Police**

See Kauai County for Police, Fire, and Emergency Services Summary information.

#### **Fire**

According to the *Kauai General Plan*, there are fire stations located in Hanapepe and Kalaheo. <sup>4,2000</sup>

### ***Existing Problems, Issues and Opportunities***

See Kauai County for Police, Fire, and Emergency Services Summary information. See Koloa Area Visitor Related Summary for more information.

### ***Future and Planned Usage***

See Kauai County for Police, Fire, and Emergency Services Summary information. See Koloa Area Visitor Related Summary for more information.

### ***Future and Planned Requirements or Changes***

See Kauai County for Police, Fire, and Emergency Services Summary information.

### ***Anticipated Costs for the Future***

See Kauai County for Police, Fire, and Emergency Services Summary information.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Police, Fire, and Emergency Services Summary information.

### ***Compare Visitor and Resident Impact***

See Kauai County for Police, Fire, and Emergency Services Summary information. See Koloa Area Visitor Related Summary for more information.

### ***Major Assumptions***

See Kauai County for Police, Fire, and Emergency Services Summary information.

## County of Kauai – Koloa-Poipu-Kalaheo – Visitor Accommodations

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, the Koloa-Poipu-Kalaheo area is the largest resort destination as well as the most active agricultural area on Kauai. It has consistently posted the highest occupancy rates among Kauai resort regions.

Hotels and resort condominiums are centered on the beaches and golf courses of Poipu. Visitors are drawn to bicycling and ocean recreation, as well as attractions such as the Allerton Gardens and Lawai Kai, the historic towns. Large and small-scale agricultural activities are located principally in the sunny, well-irrigated coastal lands of Kuhio Highway.

In the Koloa-Poipu-Kalaheo region, there are 2,360 visitor units that account for one-third of the island’s visitor inventory. <sup>4, 2000</sup>

**Table 4.58 – Koloa Visitor Units by Type: 2001**

District	Hotel	Condo Hotel	Other	Timeshare	Units	Percent Island wide of Total
Koloa-Poipu-Kalaheo	1015	1251	116	-	2,382	33%

Source: *2001 Visitor Plant Inventory*

### ***Existing Problems, Issues and Opportunities***

See Kauai County for Visitor Accommodations Summary information.

### ***Future and Planned Usage***

The *Kauai General Plan* notes that anticipated renovation of the Waiohai property will add about 230 timeshare units to the inventory. Future rehabilitation of the Poipu Beach Hotel would restore another 129 units. Other zoned sites, if developed, could add 2,000 units more. This includes 500 timeshare units and 200 hotel units at Alexander & Baldwin’s Kukuiula project. Future resort use has also been proposed at Mahaulepu. <sup>4, 2000</sup>

**Table 4.59 – Koloa Summary of Potential Visitor Units by Status: 2001**

Resort Projects	Multi-Family Projects	Total
1,520	980	2,490

Source: *Kauai General Plan*

See Koloa Area Visitor Related Summary for more information.

***Future and Planned Requirements or Changes***

See Kauai County for Visitor Accommodations Summary information. See Koloa Area Visitor Related Summary 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 Visitor Accommodations element.

***Compare Visitor and Resident Impact***

See Kauai County for Visitor Accommodations Summary information. See Koloa Area Visitor Related Summary for more information.

***Major Assumptions***

See Kauai County for Visitor Accommodations Summary information.

---

## **County of Kauai – Koloa-Poipu-Kalaheo – Private Transportation**

### ***Present Capacity and Usage***

See County of Kauai Private Transportation Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

See County of Kauai Private Transportation Summary for information.

### ***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 Kauai – Koloa-Poipu-Kalaheo – Energy Systems**

### ***Present Capacity and Usage***

See County of Kauai Energy Systems Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Usage***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai Energy Systems Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Energy Systems Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Energy Systems Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Energy Systems Summary for information.

### ***Major Assumptions***

See County of Kauai Energy Systems Summary for information.

---

## **County of Kauai – Koloa-Poipu-Kalaheo – Sewer Systems**

### ***Present Capacity and Usage***

The Sewer indicator has been combined with the Sewage indicator. See County of Kauai 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 Kauai – Koloa-Poipu-Kalaheo – Coastal Water Quality**

### ***Present Capacity and Usage***

See County of Kauai Coastal Water Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Usage***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai Coastal Water Summary for information.

### ***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 Kauai – Koloa-Poipu-Kalaheo – Marine Ecosystem Health**

### ***Present Capacity and Usage***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***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***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Major Assumptions***

N/A

---

## **County of Kauai – Koloa-Poipu-Kalaheo – Forestry / Green Space**

### ***Present Capacity and Usage***

See County of Kauai Forestry / Green Space 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 Kauai – Koloa-Poipu-Kalaheo – Air Quality**

### ***Present Capacity and Usage***

See County of Kauai Air Quality Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Air Quality Summary for information.

### ***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 Kauai – Koloa-Poipu-Kalaheo – Beach Erosion**

### ***Present Capacity and Usage***

See County of Kauai Beach Erosion Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

N/A

### ***Future and Planned Requirements or Changes***

See County of Kauai Beach Erosion Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Beach Erosion Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Beach Erosion Summary for information.

### ***Compare Visitor and Resident Impact***

N/A

### ***Major Assumptions***

N/A

---

## **County of Kauai – Koloa-Poipu-Kalaheo – Invasive Species**

### ***Present Capacity and Usage***

See County of Kauai Invasive Species Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

N/A

### ***Future and Planned Requirements or Changes***

See County of Kauai Invasive Species Summary for information.

### ***Anticipated Costs for the Future***

N/A

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Invasive Species Summary for information.

### ***Compare Visitor and Resident Impact***

N/A

### ***Major Assumptions***

N/A

---

## **County of Kauai – Koloa-Poipu-Kalaheo – Other Natural / Scenic Resources**

### ***Present Capacity and Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Future and Planned Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***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 Kauai – West Side – Terrestrial Water Quality and Quantity**

### ***Present Capacity and Usage***

The following is a summary of the water supply, storage capacity, and the infrastructure as outlined in the Department of Water: County of Kauai – *Water Plan 2020*:

#### **Hanapepe – Eleele:**

##### Supply

2000: Adequate

2020: Institute conservation measures

##### Storage

2000: Adequate. Rehabilitate/replace tanks

2020: Install pressure reducing valve (PRV) stations. Institute conservation measures

##### Distribution

Salt Pond area is deficient in fire flow;

Hanapepe Town pipe was installed in 1920s;

Hanapepe Valley pipe, 1933; and

Hanapepe Heights pipe, 1946.

#### **Kekaha – Waimea:**

##### Supply

2000: Adequate once well comes on-line

2020: Rehabilitate Waimea Shaft #9 to get 200 gpm or develop another well

##### Storage

2000: Install 600,000-gallon tank at Kapilimao Well site

2020: Install 500,000-gallon tank in Waimea 196 Zone

##### Distribution

Fire flow deficient in commercial and residential areas that are served by undersized and older pipes;

Many pipes installed in 1924; and

Remainder installed in 1950's and later.<sup>47, 2001</sup>

### ***Existing Problems, Issues and Opportunities***

See Appendix for water quality maps and improvements.

### ***Future and Planned Usage***

See Appendix for water quality maps and improvements.

### ***Future and Planned Requirements or Changes***

See Appendix for water quality maps and improvements.

***Anticipated Costs for the Future***

See Appendix for water quality maps and improvements.

***Problems, Issues and Opportunities Associated with Costs***

See Appendix for water quality maps and improvements.

***Compare Visitor and Resident Impact***

See Appendix for water quality maps and improvements.

***Major Assumptions***

See Appendix for water quality maps and improvements.

## **County of Kauai – West Side – Sewage**

### ***Present Capacity and Usage***

The *Kauai General Plan* list one of four County operated wastewater treatment facilities in Waimea. The service area is Waimea business district and 90% of Waimea residences. The design capacity is 0.3 mgd. The *Kauai General Plan* notes that the Waimea wastewater treatment facility is operating at full capacity.  
4, 2000

### ***Existing Problems, Issues and Opportunities***

The plants inability to accept additional users limits new development in Waimea.  
4, 2000

### ***Future and Planned Usage***

The Kauai General Plan states that future plant expansion is limited by availability of land and users for effluent disposal via irrigation. Kekaha remains unserved.  
4, 2000

### ***Future and Planned Requirements or Changes***

The *Kauai General Plan* finds that in Waimea, it appears feasible to expand the County plant to support new development at Kikiaola if the Department of Public works can continue to dispose of effluent – and increase flows – in the low-lying agricultural fields mauka of the highway. Under the Kikiaola master plan, this area is planned for a future golf course and constructive wetland that would accept wastewater effluent.  
4, 2000

### ***Anticipated Costs for the Future***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

The *Kauai General Plan* found that in general, the County is reluctant to expend scarce CIP resources on expanding municipal wastewater systems.  
4, 2000

### ***Compare Visitor and Resident Impact***

See County of Kauai Sewage Summary for more information. Details at the district level require further study.

### ***Major Assumptions***

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

## **County of Kauai – West Side – Solid Waste Disposal**

### ***Present Capacity and Usage***

The *Kauai General Plan* lists the County of Kauai as the primary provider of solid waste management. Kauai County maintains an island wide system of solid waste collection and disposal that serves its resident and visitor population. The Road Construction and Maintenance Division of the Department of Public Works administer county solid waste facilities and services.

Kekaha Landfill Phase II – This facility began operation in 1993 and is the primary disposal site for solid waste on Kauai. In FY 1999, the Kekaha Landfill Phase II accepted approximately 67,590 tons of solid waste. This facility also serves as a drop-off point for segregated recoverable waste. During FY 1999, approximately 10.6 tons of recoverable materials (e.g., cardboard, newspaper, glass, aluminum cans, batteries) and 1,000 gallons of used oil were recovered and/or recycled from the Kekaha Phase II operations. <sup>4,2000</sup>

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan* states that the remaining lifespan of the landfill, assuming current waste levels, is about five to six years. <sup>4, 2000</sup>

### ***Future and Planned Usage***

See State of Hawaii and Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

See State of Hawaii and Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Anticipated Costs for the Future***

See State of Hawaii and Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See State of Hawaii and Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See State of Hawaii and Kauai County for Solid Waste Summary information. Details at the district level require further study.

### ***Major Assumptions***

Analysis of county documents show a general assumption that waste levels will remain steady and the Kekaha Landfill should last another 5-6 years.

## **County of Kauai – West Side – Storm Water**

### ***Present Capacity and Usage***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Existing Problems, Issues and Opportunities***

Correspondence from the Department of Health, Kauai District Health Office describes projects impacting drainage facilities: Kaumualii Highway Drainage Improvements, Vicinity of Kikiaola Boat Harbor, Kaumualii Highway Drainage Improvements, MP6.0, 21.9 and Makeke Road, and Kuhio Highway Drainage Improvements, Hanalei Bridge to Hanalei Town, provided nearly a million dollars worth of improvements to our drainage facilities.<sup>92C, 2002</sup>

### ***Future and Planned Usage***

According to the *Kauai General Plan* rather than prepare a master plan for the island, the Department of Public Works (DPW) intends to focus on specific problem areas and watersheds, with the objective of developing strategic plans that specify preventive as well as remedial actions.<sup>4, 2000</sup>

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Future and Planned Requirements or Changes***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Anticipated Costs for the Future***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Compare Visitor and Resident Impact***

See Kauai County for Storm Water Summary information. Details at the district level require further study.

### ***Major Assumptions***

No information was uncovered regarding major assumptions for the Storm Water element.

## **County of Kauai – West Side – Roads**

### ***Present Capacity and Usage***

The *Draft Hawaii Statewide Transportation Plan* describes Kaumualii Highway, a two-lane State arterial road, as the primary highway connecting the West Side to Kalaheo, Lihue, and points eastward. Kaumualii Highway extends west from Eleele/Port Allen to Mana. Kokee Road is the main route providing access mauka to Waimea Canyon and Kokee State Park.

Recent projects include the Kaumua Highway intersection improvements at Koloa Rd. (\$4.6M), the 2 1/2-mile Kapaa bypass road (\$1.2M), and the Kaumualii Hwy at Moi Rd (\$.5). These expenditures are below the projected funding needs of the islands future transportation demands.<sup>101, 2002</sup>

### ***Existing Problems, Issues and Opportunities***

Correspondence from the Department of Health, Kauai District Health Office identified problems that need to be addressed by the County and the tourist industry as: Road maintenance—there is not a concerted effort to present our island to the tourists as a clean, well-maintained island. There should be more effort to maintain all roads, especially those leading to tourist destination. The road to Kalalau lookout is a very dangerous road.

Kapule Highway and Kuhio Highway Guard rail and Shoulder Improvements brought affected portions of our highway system more in line with our current standards. Kuhio Highway Rehabilitation, Hanamaulu to North Leho Drive (\$1.3 million) provided needed travel way improvements in this highly traveled section of our highway system.

Projects addressing pedestrian accessibility, drainage, guard rail/shoulder, and pavement rehabilitation were completed. Kaumualii Highway, Pedestrian Accessible Route Improvements made our facilities in the vicinity of Waimea Town more accessible to the physically impaired.<sup>92C, 2002</sup>

### ***Future and Planned Usage***

See State of Hawaii and Kauai County Roads Summaries for information. Details at the community level would require more study.

### ***Future and Planned Requirements or Changes***

See State of Hawaii and Kauai County Roads Summaries for information. Details at the community level would require more study.

***Anticipated Costs for the Future***

See State of Hawaii and Kauai County Roads Summaries for information. Details at the community level would require more study.

***Problems, Issues and Opportunities Associated with Costs***

See State of Hawaii and Kauai County Roads Summaries for information. Details at the community level would require more study.

***Compare Visitor and Resident Impact***

See State of Hawaii and Kauai County Roads Summaries for information. Details at the community level would require more study.

***Major Assumptions***

See State of Hawaii and Kauai County Roads Summaries for information. Details at the community level would require more study.

---

## **County of Kauai – West Side - Airports**

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, there are no air terminals in this community. <sup>4,2000</sup>

### ***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 Kauai – West Side – Harbors**

### ***Present Capacity and Usage***

Kikiaola Small Boat Harbor is located two miles west of the Waimea River mouth and close to the town of Kekaha on the Kauai's southwest shore. It serves mainly as a small vessel launching facility for local commercial and pleasure craft. Trailer boat users use the harbor, owners of boats requiring moored slips, and charter and tour boat operators. The harbor occasionally accommodates tenders serving cruise ships moored off the coast. Kikiaola Small Boat Harbor is about 16 acres in size and has 8 moorings and one ramp. <sup>4,2000</sup>

### ***Existing Problems, Issues and Opportunities***

The *Kauai General Plan 2000* states that ocean touring and recreation comprise a key component of the visitor industry. Unlike the other major islands, Kauai lacks a small boat harbor that is configured primarily to serve charters and tours. <sup>4,2000</sup>

### ***Future and Planned Usage***

According to the *Kauai General Plan 2000* The State working and the U.S. Army Corps of Engineers, has prepared a plan to expand Kikiaola Harbor. The expansion, dredging and breakwater improvements are intended to provide not only for anticipated expansion in recreational and commercial boating, but also expansion in cruise ship calls on the West Side. <sup>4,2000</sup>

### ***Future and Planned Requirements or Changes***

See County of Kauai Harbors Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Harbors Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Harbors Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Harbors Summary for information.

### ***Major Assumptions***

See County of Kauai Harbors Summary for information.

## County of Kauai – West Side – Parks

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, West Side has 80 acres of parks. The following table illustrates the park types and their corresponding acreage.<sup>4, 2000</sup>

**Table 4.60 – West Side County Parks by Type: 2000**

District / Park Type	Acres
<b>West Side</b>	<b>80.0</b>
Beach Parks	20.9
District Parks	34.9
Community Parks	24.2

Source: *Kauai General Plan*

The Department of Public Works classifies parks into five categories of varying levels of use. Class I and Class II levels are considered “extremely high use” and “high use”, respectively. Parks in these use levels are used heavily by both residents and visitors.<sup>4, 2000</sup>

**Table 4.61 – West Side County Parks with High Levels of Usage: 2000**

Extremely High Use Category/Park	Park Type	Acres
Hanapepe Pavilion	Beach	0.8
Salt Pond Park	Beach	5.9
Hanapepe Stadium	District	14.7
Kekaha Faye Park	District	8.5
Waimea Athletic Field	District	11.7

Source: *Kauai General Plan*

### ***Existing Problems, Issues and Opportunities***

See Kauai County for Parks Summary information.

### ***Future and Planned Usage***

A new facility needed by 2020 in the *Kauai General Plan* is land acquisition to expand Salt Pond Park, relocation of camping to a mauka site and development of a comfort station at Kekaha Beach Park.<sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

See Appendix for maps and sustainability of Kauai’s parks

### ***Anticipated Costs for the Future***

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

***Problems, Issues and Opportunities Associated with Costs***

See Kauai County for Parks Summary information.

***Compare Visitor and Resident Impact***

See Kauai County for Parks Summary information.

***Major Assumptions***

See Kauai County for Parks Summary information.

---

## **County of Kauai – West Side – Police, Fire and Emergency Services**

### ***Present Capacity and Usage***

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

### ***Existing Problems, Issues and Opportunities***

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

### ***Future and Planned Usage***

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

### ***Future and Planned Requirements or Changes***

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

### ***Anticipated Costs for the Future***

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

### ***Problems, Issues and Opportunities Associated with Costs***

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

### ***Compare Visitor and Resident Impact***

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

### ***Major Assumptions***

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

## County of Kauai – West Side – Visitor Accommodations

### ***Present Capacity and Usage***

According to the *Kauai General Plan*, there are 50 units in hotels and 20 units in other types of visitor properties located on the West Side. This accounts for 1% of Kauai’s total visitor units. <sup>4, 2000</sup>

**Table 4.62 – West Side Visitor Units: 2001**

District	Hotel	Condo Hotel	Other	Timeshare	Units	Percent Island wide of Total
West Side	50	-	51	-	101	1%

Source: 2001 Visitor Plant Inventory

### ***Existing Problems, Issues and Opportunities***

The 2020 Vision, stated in the *Kauai General Plan*, specifically calls for development of additional “residential-style” visitor units on the West Side. This represents a change in County policy to encourage a certain kind of resort development on the West Side, which currently has only 70 visitor units (one percent of the island’s total). <sup>4, 2000</sup>

### ***Future and Planned Usage***

*The Kauai General Plan* looks at future and planned usage. Plans include development of residential style units for visitor accommodation to retain the character and sense of place of the community. The intent is twofold:

- To broaden economic opportunities on the West Side, which has suffered job losses with the decline of Kekaha Sugar Company; and
- To expand the distribution of visitor accommodations by offering a distinctly low key, residential-style experience on the West Side.

While current zoning would only accommodate an additional 100 units, both Kikiaola Land Company and the Robinson Family Partners have proposed that additional lands need to be designated for resort use on the General Plan Land Use Map. As of 1999, their proposals each called for about 250 units. The Robinson project will have its own water and wastewater facilities. Resort expansion at Kikiaola, however, depends on expansion of County water and wastewater facilities serving Waimea. Robinson Family Partners have also proposed future resort use on two additional shorefront parcels in Makaweli. <sup>4, 2000</sup>

### ***Future and Planned Requirements or Changes***

*The Kauai General Plan* gives a summary of potential visitor units by status in the West Side area. <sup>4, 2000</sup>

**Table 4.63 – West Side Summary of Potential Visitor Units**

Source: 2001 Visitor Plant Inventory

Status and Geographic Area	Estimated Potential Units		
	Resort Projects	Multi-Family Projects	Total
Planned Projects with Zoning Only (No Permits)	100	0	100
Planned Projects on GP Map Only (No Zoning or Permits)	500	0	500

***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***

See Kauai County Visitor Accommodations Summary for information.

***Major Assumptions***

See Kauai County Visitor Accommodations Summary for information.

## **County of Kauai – West Side - Visitor Related Area**

### ***Introduction***

The *Kapalawai resort Final Environmental Impact Statement* outlines the proposed resort is located on the 120-acre Kapalawai property and is located in the ahupuaa of Makaweli, in the judicial district of Waimea, on the west side of the island of Kauai, Hawaii. The proposed resort includes 250 visitor units that are dispersed throughout the project site resulting in an overall density of 1.5 units per acre. The information below is to augment the West Side Summaries.

### ***Water***

Water service from the Kauai Department of Water (DOW) is not available from the project site. DOW's Waimea system ends at the Waimea River, 0.8 miles west of the Kapalawai. Even if water transmission lines were extended to Kapalawai, the DOW system does not have source capacity to serve Kapalawai. DOW's system is serving the Hanapepe area ends four miles to the east of Kapalawai.

### ***Wastewater***

The County of Kauai operated a wastewater treatment plant (WWTP) in Waimea, about one mile from the project site. The service area for this WWTP stops at the Waimea River, about 0.5 miles from the project site. The design flow for this facility is 0.3 million gallons per day. The WWTP is presently operating at capacity and there are no plans to include the project site in its service area.

### ***Solid Waste***

The County of Kauai's only municipal solid waster landfill is located in Kekaha, approximately seven miles to the west. The capacity and life span of the landfill was severely shortened after receiving waste and debris generated by Hurricane Iniki in 1992. At present, the landfill has approximately 5-1/2 years of capacity remaining.

### ***Storm Water***

No impact on storm water is mentioned.

### ***Roads***

Kaumualii Highway is the major roadway serving the areas in the vicinity of the project site.

### ***Airports***

No impact on airports is mentioned.

### ***Harbors***

No impact on harbors is mentioned.

### ***Parks***

The West Kauai community is blessed with some of the most diverse and spectacular recreational resources in Hawaii. There are a number of federal, state, and county facilities that offer Kauai residents and visitors the opportunity to boat, fish, hike, swim, surf, picnic, camp, snorkel, and otherwise enjoy the outdoors.

### ***Police, Fire and Emergency Services***

The Waimea district has one beat officer on patrol at any time. There are three nine-hour shifts, so there is some overlap between the patrol officers. One sergeant oversees four officers from Koloa to Polihale, and provides backup to beat officers during the evening and late night shifts. During the day shift, the district commander takes care of administrative matter at the Waimea Substation, and provides additional backup in response to the beat officer and sergeant.

Fire protection services are provided by Station 6 in Hanapepe and Station 7 in Waimea. Either of both stations would respond to structural fires on the property. Each station has a 5-man crew. Response time from Waimea to the project site would be about 3 minutes; from Hanapepe about 6 minutes.

Emergency services on Kauai are contracted by the State to American Medical Response. The Waimea unit serves the project area. Its service area runs from Polihale and Kokee in the west to near Kalaheo in the east. It is an advanced life support unit with one paramedic and one emergency medical technician.

### ***Visitor Accommodation***

No impact on visitor accommodations is mentioned.

### ***Private Transportation***

No impact on private transportation is mentioned.

### ***Energy and Communications***

Electric service from Kauai Electric is readily available from overhead lines on Kaunualii Highway

### ***Coastal Water Quality***

No impact on coastal water quality is mentioned.

---

### ***Marine Ecosystems Health***

No impact on marine ecosystem health is mentioned.

### ***Forestry***

No impact on forestry is mentioned.

### ***Air Quality***

Present air quality in the vicinity of the project area is affected by air pollutants from natural, vehicular, and agricultural sources.

Natural sources of air pollution that may affect the area but cannot be quantified accurately include the ocean, plants and wind blown dust. In the case of the project site, wind blown dust could originate from agricultural fields adjacent to the property. This particular pollutant would be affected by seasonal variations in factors affecting soil cover and moisture content. Wind blown dust could also originate from within the project site. Kaunualii Highway, which borders the project site, is the region's major arterial roadway, and as a result, is the source of exhaust from motor vehicles. Agricultural operations in the area also affect air quality with the operation of the sugar mill at Kaumakani, approximately one mile east of the project site.

### ***Beach Erosion***

No impact on beach erosion is mentioned.

### ***Invasive Species***

No impact on invasive species is mentioned.

### ***Natural / Scenic Resources***

The physical ambience of West Kauai is characterized by its rural nature, dominated by open space and the presence of sugar cane. Sugar cane has been a dominant visual condition in West Kauai for many decades. Recently, other agricultural crops have been introduced in the region, most notably coffee on former sugar lands near Eleele, and experimental corn in Makaweli. The dominant colors of the region are influenced by the bright blues of sky and ocean, the vibrant greens of agricultural fields, and the reds and browns of the soil. Development in the region is decidedly low-rise in nature, and plantation-era in style, including the two main towns of Hanapepe and Waimea.

### ***Native Species***

No impact on native species is mentioned.

---

## **County of Kauai – West Side – Private Transportation**

### ***Present Capacity and Usage***

See County of Kauai Private Transportation Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

See County of Kauai Private Transportation Summary for information.

### ***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 Kauai – West Side – Energy Systems**

### ***Present Capacity and Usage***

See County of Kauai Energy Systems Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Usage***

See County of Kauai Energy Systems Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai Energy Systems Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Energy Systems Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Energy Systems Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Energy Systems Summary for information.

### ***Major Assumptions***

See County of Kauai Energy Systems Summary for information.

---

## **County of Kauai – West Side – Sewer Systems**

### ***Present Capacity and Usage***

The Sewer indicator has been combined with the Sewage indicator. See County of Kauai 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 Kauai – West Side – Coastal Water Quality**

### ***Present Capacity and Usage***

See County of Kauai Coastal Water Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Usage***

See County of Kauai Coastal Water Summary for information.

### ***Future and Planned Requirements or Changes***

See County of Kauai Coastal Water Summary for information.

### ***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 Kauai – West Side – Marine Ecosystem Health**

### ***Present Capacity and Usage***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***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***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Compare Visitor and Resident Impact***

See County of Kauai Maui Marine Ecosystem Health Summary for information.

### ***Major Assumptions***

N/A

---

## **County of Kauai – West Side – Forestry / Green Space**

### ***Present Capacity and Usage***

See County of Kauai Forestry / Green Space 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 Kauai – West Side – Air Quality**

### ***Present Capacity and Usage***

See County of Kauai Air Quality Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Air Quality Summary for information.

### ***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 Kauai – West Side – Beach Erosion**

### ***Present Capacity and Usage***

See County of Kauai Beach Erosion Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

N/A

### ***Future and Planned Requirements or Changes***

See County of Kauai Beach Erosion Summary for information.

### ***Anticipated Costs for the Future***

See County of Kauai Beach Erosion Summary for information.

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Beach Erosion Summary for information.

### ***Compare Visitor and Resident Impact***

N/A

### ***Major Assumptions***

N/A

---

## **County of Kauai – West Side – Invasive Species**

### ***Present Capacity and Usage***

See County of Kauai Invasive Species Summary for information.

### ***Existing Problems, Issues and Opportunities***

N/A

### ***Future and Planned Usage***

N/A

### ***Future and Planned Requirements or Changes***

See County of Kauai Invasive Species Summary for information.

### ***Anticipated Costs for the Future***

N/A

### ***Problems, Issues and Opportunities Associated with Costs***

See County of Kauai Invasive Species Summary for information.

### ***Compare Visitor and Resident Impact***

N/A

### ***Major Assumptions***

N/A

---

## **County of Kauai – West Side – Other Natural / Scenic Resources**

### ***Present Capacity and Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Existing Problems, Issues and Opportunities***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***Future and Planned Usage***

See County of Kauai Other Natural and Scenic Resources Summary for information.

### ***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

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 (' <a href="http://www.aecos.com/KOOLAU/Kawai_Nui_2.html">www.aecos.com/KOOLAU/Kawai_Nui_2.html</a> )	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 (' <a href="http://www.pixi.com/~isd/KawaStr.html">www.pixi.com/~isd/KawaStr.html</a> )	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 ( <a href="http://www.soest.hawaii.edu/SEAGRANT/LiveWithTheHawaiianShoreline/index.htm">http://www.soest.hawaii.edu/SEAGRANT/LiveWithTheHawaiianShoreline/index.htm</a> )	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	Tanoie	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