

7. Building Public Facilities and Services

In order to preserve rural character and provide for growth in jobs, businesses and households, the County will need to support development within planned urban centers and residential communities. Building basic services involves both the County and State governments. Following is a list of the services covered in this chapter. This chapter addresses the basic services that will be needed to support projected economic and population growth by the year 2020.

**Table 7-1
Public Facilities and Services and Primary Agencies**

Section	Service	Primary Agency	
7.1	Regional Highways and Roads	State Department of Transportation (DOT), Highways Division; and County Department of Public Works (DPW)	
7.2	Bus Transit	County	County Transportation Agency
7.3	Bikeways	State DOT and County DPW	
7.4	Water Supply	County	Board, Department of Water Supply
7.5	Wastewater Treatment	County	DPW, Division of Wastewater Mgmt.
7.6	Drainage and Flood Control	County	DPW, Division of Engineering
7.7	Electrical Power	Private	Kaua'i Electric (public utility)
7.8	Solid Waste	County	DPW
7.9	Parks and Recreation	State DLNR, Division of Parks, and County DPW, Division of Parks	
7.11	Police and Fire Safety	County	Police Department, Fire Department
7.12	Schools	State	Department of Education

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 projections will be revised by 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.

7.1 REGIONAL HIGHWAYS AND ROADS

7.1.1 Existing Highway System

Kaua'i's regional roadway system consists of two-lane roads connecting major developed areas on the island. These two-lane facilities vary in quality from a narrow, winding highway north of Hanalei to high-quality arterial highways, such as Kūhiō Highway, Kaunali'i Highway, and Kapule Highway. A short segment of four-lane, undivided highway is located in Līhu'e town and a three-lane section is located between Hanamā'ulu and Waipouli.

Kaua‘i is served by two major highways that connect in Līhu‘e. The southern and western parts of the island are served by Kaumuali‘i Highway (Route 50), which begins at its intersection with Kūhiō Highway (Route 56) in Līhu‘e, and ends at Mānā on the west shore of Kaua‘i. The east and northern sections of the island are served by Kūhiō Highway, which begins at its intersection with Kaumuali‘i Highway in Līhu‘e and ends at Hā‘ena on the Kaua‘i’s north shore.

The existing roadways serving the various regions of Kaua‘i are summarized below:

- **West Side** – Kaumuali‘i Highway, a two-lane State arterial road, is the primary highway connecting the West Side to Kalāheo, Līhu‘e, and points eastward. Kaumuali‘i Highway extends west from ‘Ele‘ele/Port Allen to Mānā. Kōke‘e Road is the main route providing access mauka to Waimea Canyon and Kōke‘e State Park.
- **Kalāheo-Po‘ipū-Kōloa** – Kaumuali‘i Highway is the primary highway connecting the Kalāheo-Po‘ipū-Kōloa Planning District to Līhu‘e on the east and to Port Allen/‘Ele‘ele on the west. Other major roads are County-owned. They include Maluhia Road, Po‘ipū Road, the Po‘ipū By-pass, and Kōloa Road.
- **Līhu‘e** – This region is the hub which connects the two belt highways, Kaumuali‘i Highway (serving west Kaua‘i) and Kūhiō Highway (serving east Kaua‘i). Kapule Highway has been constructed to bypass Līhu‘e Town, connecting the Airport, Harbor, and industrial areas with Wailua-Kapa‘a and other points on the east side.
- **Kawaihau** – Kūhiō Highway is the primary roadway serving the Kawaihau Planning District. It is a three-lane State arterial highway between its junction with Kapule Highway and Kamoā Road in Waipouli. Two lanes are northbound, and one lane is southbound; using contra-flow, the lane usage is reversed during the morning peak hour in order to accommodate Līhu‘e-bound commuters. Between Kamoā Road and Waikaea Canal at the edge of Kapa‘a Town, the third lane is used for left turns in both directions. In Kapa‘a Town, Kūhiō Highway becomes two lanes with on-street parking through the town center. From the north edge of Kapa‘a Town to Moloa‘a, Kūhiō Highway is a two-lane arterial highway.

In 1995, a temporary Kapa‘a by-pass route was opened to traffic during daylight hours. The route runs mauka of Kūhiō Highway, utilizing private cane haul roads. It has provided some relief for Kūhiō Highway traffic through Waipouli and most of Kapa‘a Town.

Major two-lane collector roads include Kuamo‘o Road (State) and Olohena Road (County), which provide access to the Wailua Homesteads area from Kūhiō Highway in Wailua and Kapa‘a. Kawaihau Road is a County-owned two-lane collector road connecting Kapa‘a Homesteads with Kūhiō Highway.

- **North Shore** – Kūhiō Highway is the only arterial road connecting the North Shore with the rest of Kaua‘i. Throughout the North Shore, Kūhiō Highway is

a two-lane road. The highway has been improved from Moloa‘a to Princeville. From Princeville to Hā‘ena, the road has narrow pavement widths, hazardous curves, and minimal shoulders. The narrow pavement and the ten one-lane bridges between Princeville and Hā‘ena give the roadway a unique character. Only the Lumaha‘i Bridge is a modern two-lane bridge. The one-lane bridges preclude large tour buses from entering Hanalei Town, as well as precluding the entry of heavy trucks and construction equipment.

7.1.2 Existing Highway Conditions

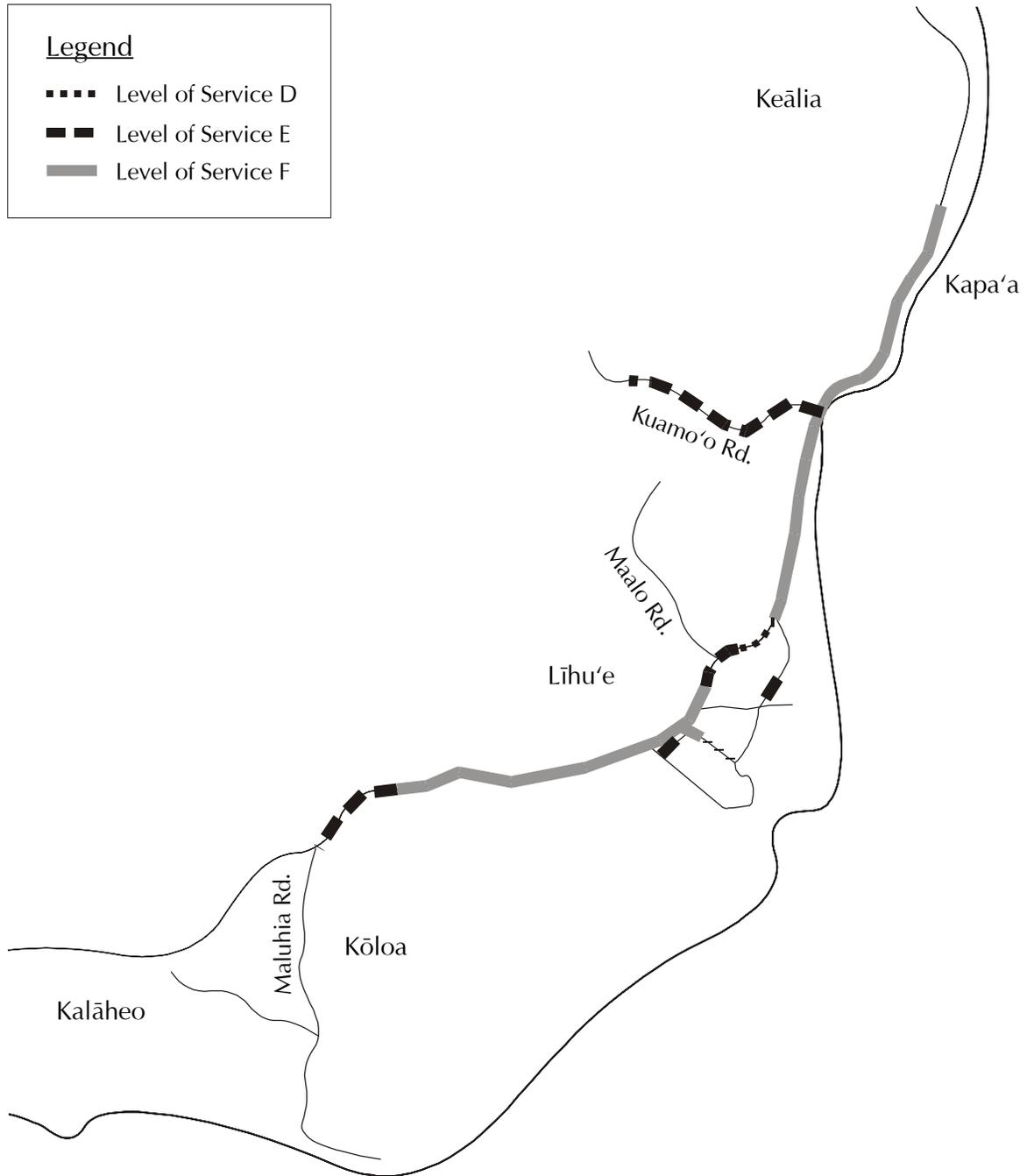
Existing traffic conditions are poor in the central part of the island. As documented in the *Kaua‘i Long-Range Land Transportation Plan* (1997), major roads in Līhu‘e, west to Maluhia Road, and east to Kapa‘a are rated Level of Service D, E or F for average daily traffic (ADT). (The Plan uses traffic data from 1995, but existing conditions are similar or worse.) Extremely poor conditions can be observed in Kapa‘a Town and during peak hours on Kaumuali‘i Highway leading into Līhu‘e. Collector roads, such as Kuamo‘o Road in Wailua, also suffer congestion during peak hours. Figure 7-1 shows the roadway segments that have existing deficiencies. Following is a summary of the needs

Curing the existing deficiencies would require widening Kaumuali‘i Highway between Līhu‘e and Maluhia Road, as well as providing a permanent by-pass for Kapa‘a. The estimated cost of building these currently-needed improvements is approximately \$97 million. This amounts to about 30 percent of highway funding needed through 2020.

Following is a brief summary of regional road conditions:

- **Kōloa-Po‘ipū-Kalāheo** – Residential growth in the Lāwa‘i-Kalāheo area, coupled with increased commuting to Līhu‘e, has caused traffic congestion on Kaumuali‘i Highway eastbound toward Līhu‘e during the morning peak hour. The level of service has declined to E and F. Improvements currently in process of design include (1) Phase 2 of the Kōloa By-Pass, connecting to Maluhia Road; and (2) improvement and signalization of the intersection of Kaumuali‘i Highway and Kōloa Road.
- **Līhu‘e** – The construction of Kapule Highway has improved traffic flow in the eastward direction. To the west, however, traffic flow into Līhu‘e is constrained by the limited capacity of the two-lane Kaumuali‘i Highway.
- **Kawaihau** – State traffic survey data for Kūhiō Highway indicate that the average daily volume exceeds capacity for the one southbound lane at Wailua, but that otherwise the highway was adequate to accommodate both daily and peak hour volumes. Traffic is generally congested along the Waipouli-Kapa‘a highway segment. The temporary Kapa‘a by-pass route has provided some relief for Kūhiō Highway traffic through Waipouli and most of Kapa‘a Town.
- **North Shore** – There is increasing traffic burden on Lighthouse Road through Kīlauea Town. There is a need for a by-pass road linking the Lighthouse Road north of the town center with the highway west of the town entry.

Figure 7-1
Regional Roadways with Level of Service D, E, or F, Kaua'i 1995



Source: *Kauai Long Range Land Transportation Plan*,
State Department of Transportation, 1997, Figure 5, Page II-19

7.1.3 New Facilities Needed by 2020

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.

Section 1.6 discusses the 2020 growth projections and a traffic analysis was prepared for alternative 2020 growth scenarios as part of the General Plan Update project. Traffic modeling was performed on two lower-growth scenarios, in comparison with the high growth projection used in the *Kaua'i Long-Range Land Transportation Plan* (May 1997). As shown in Appendix Table A-1, the results were summarized in terms of the number and cost of road improvements that would be needed under the each of the three scenarios.

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.¹: The total order-of-magnitude cost for this 20-year list of improvements is approximately \$320 to \$330 million.

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 Kaumuali'i Highway between Līhu'e and Maluhia Road. Most have not. Some are probably infeasible, such as the widening of Kuamo'o 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 Kuamo'o 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. It is not an endorsement of the projects listed. Those projects that are recommended as part of the General Plan are noted with an asterisk.

- **Waimea to Port Allen Area** – Widen Kaumuali'i Highway to 4 lanes from Waimea to 'Ele'ele.
- **Port Allen to Po'ipū Area**
 - ❖ Widen Kaumuali'i Highway to a 4-lane divided roadway between Kalāheo Town and Kōloa Road.
 - ❖ Construct a new two-lane connector road between Port Allen and Po'ipū.**
- **Po'ipū to Līhu'e Area**
 - ❖ Widen Kaumuali'i Highway to a four-lane divided highway between Kōloa Road and Kūhiō Highway/Rice Street intersection.*

¹ Kaku Associates. *Alternative Projections of Traffic and Transportation Improvements for Kaua'i*. August 27, 1999.

- ❖ Construct a new 2-lane connector road between Po‘ipū and Kīpū.
- ❖ Widen Kōloa By-Pass/Maluhia Road to 4 lanes.*
- **Lihu‘e Area**
 - ❖ Construct a new 2-lane Lihu‘e-Hanamā‘ulu By-Pass Road.**
 - ❖ Widen Kapule Highway to a 4-lane divided roadway.*
- **Kapa‘a Area**
 - ❖ Widen Kūhiō Highway to a 6-lane divided roadway between Hanamā‘ulu and the Kapa‘a By-Pass Road.
 - ❖ Construct a new 4-lane Kapa‘a By-Pass Road.**
 - ❖ Widen Kuamo‘o Road to 4 lanes between Kūhiō Highway and Kamalu Road.
 - ❖ Widen Olohena Road to 4 lanes between the Kapa‘a By-Pass Road and Kūhiō Highway.
 - ❖ Widen Kawaihau Road to 4 lanes between Kūhiō Highway and Mailihuna Road.

Note: The LRTP recommends a special study of the Kapa‘a-Wailua roadway network and future transportation needs. Adding new roads may be preferable to the widenings 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 General Plan.

** The 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:

- **Po‘ipū to Lihu‘e Area** – Widen Po‘ipū Road to a 4-lane divided roadway between Lāwa‘i Road and the Kōloa By-Pass Road.
- **Lihu‘e Area** – Construct a new 4-lane Nuhou Road between Puhi Road and Nāwiliwili Road.
- **Kapa‘a Area** – Widen Olohena Road to 4 lanes between Kaapuni Road and the Kapa‘a By-Pass Road.

7.1.4 Status of Long-Range Plan

The *Kaua‘i 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 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.

The LRTP is prepared in accordance with federal requirements, as a prerequisite to receiving federal highway transportation funds. Any project for which the DOT might wish to budget federal funds – even if only for preliminary planning – needs to be listed in the LRTP. Given the critical impact of highway planning on Kaua'i'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.

7.1.5 Policy

- (a) Use General Plan policies concerning rural character, preservation of historic and scenic resources, and scenic roadway corridors as part of the criteria for long-range highway planning and design. The goal of efficient movement of through traffic should be weighed against community goals and policies relating to community character, livability, and natural beauty.
- (b) Consider transportation alternatives to increasing the size and capacity of roadways. Alternatives include increased utilization of public transit.
- (c) Planning for the Kapa'a By-Pass should incorporate connector roads between the By-Pass and the coastal highway and between the By-Pass and roads serving the valley.
- (d) The State and the County should jointly undertake a study of the existing roadway network and the future transportation needs within the Kapa'a-Wailua homesteads area.
- (e) Reserve corridors for future roadways as shown on the General Plan Land Use Map. The corridors are conceptual only and are subject to environmental assessment and evaluation of alternative alignments.

7.1.6 Implementing Actions

- (a) In preparing the Long-Range Land Transportation Plan for Kaua'i, the State DOT should screen projects in the following ways:
 - (1) Consider County policies about preserving rural character and roadway design and propose alternative transportation improvements.
 - (2) Test the feasibility of proposed long-range improvements, especially those that pass through towns. Prepare schematic maps and cross-sections of proposed road widenings in towns in order to assess potential impacts on parking, sidewalks, and abutting properties
- (b) In preparing the Long-Range Land Transportation Plan for Kaua'i, the State DOT should develop realistic scenarios for executing projects during the 20-year planning

period, considering resource constraints, statewide needs for highway improvements, and the time needed to plan, design, and build the facility.

- (c) In order to provide better coordination between land use planning and road planning, the State should assess all Phase I highway projects and arrive at tentative preferred routes and designs, with input from the affected communities and road-users.

7.2 BUS TRANSIT

The Kaua‘i 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 (see Table 7-2). There is no service to the Līhu‘e Airport and limited service to Kōloa/Po‘ipū. In 1998, the Kaua‘i Bus averaged about 18,120 one-way riders per month.

Route Number	General Service Area
100	Kekaha to Līhu‘e
200	Līhu‘e to Kekaha
400	Hanalei to Līhu‘e
500	Līhu‘e to Hanalei
600	Līhu‘e to Kapahi
700	Līhu‘e Extension (Kukui Grove, Nāwiliwili, Rice Street/Eiwa Street, Kūhiō Highway, Hardy Street)

Source: County of Kaua‘i Transportation Agency.

New or additional services and facilities that would be needed to serve Kaua‘i’s projected 2020 population include:

- Increased bus service in Kōloa/Po‘ipū;
- 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
- 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.

7.2.1 Policy

- (a) Continue to operate The Kaua'i Bus; seek to increase ridership and expand service, subject to the availability of funds.
- (b) Improve bus stops to increase safety and convenience of service.

7.3 BIKEWAYS

Kaua'i has 3.8 miles of existing bikeways. The island's existing bikeway system consists of a bike route along Kapule Highway in Līhu'e and a bike path along the coast fronting Kapa'a Beach Park.

7.3.1 Status of Long-Range Plan

Bike Plan Hawai'i (1994), a State master plan for bikeways, proposes another 173 miles islandwide. The timetable for development will depend upon construction feasibility (including right-of-way acquisition) and funding. *Bike Plan Hawai'i* defines the various types of bikeways. Each type of facility fulfills a specific as well as general function:

- **Bicycle Route** – Any street or highway so designated, for the shared use of bicycles and motor vehicles or pedestrians or both. Bike routes are of two types: a) a widened curb lane in an urban-type area; and b) a paved right shoulder in a rural-type area.
- **Bicycle Lane** – A portion of a roadway designated by striping, signing, and pavement markings for the preferential or exclusive use of bicycles. Through travel by motor vehicles or pedestrians is not allowed unless specified by law, rule, or ordinance; however, vehicle parking may be allowed for emergencies. Crossflows by motorists to gain access to driveways or parking facilities are allowed; pedestrian crossflows to gain access to parked vehicles, bus stops, or associated land use is allowed.
- **Bicycle Path** – A completely separated right-of-way normally designated for the exclusive or semi-exclusive use of bicycles. Through travel by motor vehicles is not allowed unless specified by law, rule, or ordinance. Where such a facility is adjacent to a roadway, it is separated from the roadway by a significant amount of open space and/or a major physical barrier (such as trees or a considerable change in ground elevation).

The Master Plan proposes the development of 173 new bikeway miles distributed along both the general circumference of the island as well as in the more urbanized section of Līhu'e, Kapa'a, and in the general thoroughfare along Maluhia Road, Po'ipū Road, and Lāwa'i Road which leads to Kōloa. Proposed bike routes would extend from the West Side to the North Shore. Bicycle lanes are planned for Līhu'e, and bicycle paths are proposed for portions of the North Shore and along the coastline from Nāwiliwili to Anahola. Of the 173 proposed bikeway miles, there are 136.4 miles of bicycle routes, 8.2 miles of bicycle lanes, and 28.4 miles of bicycle paths. These proposed facilities are intended to serve as the basis for future bikeway planning and development decisions.

Areas that will require special design considerations include, but are not limited to:

- **Kōloa-Po‘ipū-Lāwa‘i** – This area requires special attention because of the high level of resident and visitor traffic in and out of the area. Roadways along the Kōloa section of the island are relatively narrow past Maluhia Road on the way towards the Po‘ipū Road/Lāwa‘i Road juncture. Major road right-of-way acquisition and possible realignment will be required to provide for sufficient bikeway development.
- **Kapa‘a** – To accommodate future bikeway development along Kūhiō Highway, the road segment between Waipouli and Keālia would have to be widened along with acquisition of sufficient right-of-way.

There is good potential for a bike path that would span 16 miles along the coast from Anahola to Nāwiliwili. This proposed bike path would offer scenic views of the Kapa‘a-Līhu‘e coastline, and would offer an excellent alternative for bicyclists commuting between Kapa‘a and Līhu‘e. In order for future bikeway development to occur, however, major efforts will be needed to acquire sufficient right-of-way, and to gain public and landowner support for a continuous bike path.

- **Princeville to Hanalei Bay to Hā‘ena** – Bicycle access in this area will require special consideration given narrow rights-of-way, especially at Hanalei Valley with its numerous one-lane bridges, narrow roads, and periodic drainage problems. A fully developed bicycle facility in this area, however, would provide coastal access and scenic views that are unique to Kaua‘i’s North Shore.

The proposed additions to Kaua‘i’s bikeway system are estimated to cost a total of approximately \$39.3 million. About 103.3 miles would be under the jurisdiction of the State at a cost of \$22.5 million, and 63.1 miles would be under the jurisdiction of the County of Kaua‘i at a cost of \$15.2 million. Approximately 6.6 proposed bikeway miles could fall under either jurisdiction and would cost \$1.6 million.

7.3.2 Policy

Support funding to develop Kaua‘i’s bikeway system to provide for alternative means of transportation, recreation, and visitor activities (economic development).

7.4 WATER SUPPLY

7.4.1 Description of Existing System

The Department of Water (DOW) of the County of Kaua‘i 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 (see Figure 7-2). The service areas are listed by district below:

- **West Side** – Hanapēpē-‘Ele‘ele and Waimea-Kekaha.
- **Kalāheo-Po‘ipū-Kōloa** – Kalāheo, Kōloa-Po‘ipū, and Lāwa‘i-‘Ōma‘o.
- **Līhu‘e** – Puhi-Līhu‘e-Hanamā‘ulu.
- **Kawaihau** – Anahola, Moloa‘a, and Kapa‘a-Wailua.
- **North Shore** – ‘Anini, Hanalei, Kīlauea-Waipake-Kalihiwai, and Wainiha-Hā‘ena.

There are several private potable water systems. The largest is operated by Princeville as a private utility. It serves the entire Princeville community from water sources located on mauka Princeville lands. The DOW contracts with Princeville to supply water to its small ‘Anini system.

The DOW also supplies potable water at a reduced price to a limited number of *bona fide* agricultural businesses. As of 1998, the DOW had approximately 300 agricultural users islandwide. DOW does not own or operate any of the island’s agricultural irrigation systems.

As of 1999, the DOW maintained 52 separate groundwater sources comprised of wells, shafts, and tunnels. 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 DOW also has 16 booster pump stations. In 1999, the average daily demand for municipal water on Kaua‘i was approximately 10.6 million gallons per day (mgd). The maximum or peak demand was about 15.9 mgd. Table 7-3 shows 1999 water demand by district.

District	Average Water Demand (mgd)	Maximum Water Demand (mgd)
West Side	2.01	3.01
Kalāheo-Po‘ipū-Kōloa	2.83	4.24
Līhu‘e	2.53	3.80
Kawaihau	2.59	3.88
North Shore	0.65	0.97
Island Total	10.60	15.91

Source: County of Kaua‘i, Department of Water.

In general, Kaua‘i’s municipal water systems have adequate source and storage capacity to support the existing maximum water demand and provide storage for fire emergencies. Many systems, however, operate at or near capacity. As a result, DOW places certain operational restrictions on requests for new service. In order to accommodate future growth, most of the water systems would need to be expanded. Table 7-4 summarizes the status of existing water systems noting DOW administrative restrictions current as of 1998.

Figure 7-2
Water Service Areas, County of Kaua'i



As the notes to the table indicate, the calculation of facility capacity is based not only on existing water use, but also on future obligations. Often, an owner will pay the “Facility Reserve Charge” at time of subdivision, even though he has no current plan to build. That payment obligates the DOW to reserve capacity for water supply to the property. Restrictions reflect the level of capacity remaining, with one meter being equivalent to 500 gpd supply, the standard projection for a single-family dwelling. The restriction “Large Projects” generally means that DOW can support whatever use zoning allows but may require a large subdivision or other new development to provide either water source or storage capacity. In local areas, there may also be restrictions due to limited capacity of the water lines.

**Table 7-4
Status of Municipal Water Systems, 1998**

Water System or Sub-System	Water Source Availability¹	Water Storage Availability¹	Current Restrictions²
Kekaha	<i>Near Capacity</i>	Adequate	Large Projects
Waimea	AT CAPACITY	Adequate	1 Meter per Lot
Hanapēpē	AT CAPACITY	Adequate	Large Projects
‘Ele‘ele	Adequate	Adequate	Large Projects
Kalāheo	Adequate	Adequate	----
Lāwa‘i-‘Ōma‘o	Adequate	AT CAPACITY	2 Meters per Lot
Kōloa	Adequate	Adequate	----
Po‘ipū	Adequate	AT CAPACITY	2 Meters per Lot
Puhi	AT CAPACITY	Adequate	1 Meter per Lot
Līhu‘e-Hanamā‘ulu	AT CAPACITY	Adequate	3 Meters per Lot
Wailua Homesteads	<i>Near Capacity</i>	Adequate	----
Upper Wailua	<i>Near Capacity</i>	<i>Near Capacity</i>	2 Meters per Lot
Wailua-Kapa‘a Hmstds.	Adequate	Adequate	----
Anahola	AT CAPACITY	AT CAPACITY	No Meters Available
Moloa‘a	AT CAPACITY	AT CAPACITY	No Meters Available
Kīlauea, East	<i>Near Capacity</i>	AT CAPACITY	1 Meter per Lot
Kīlauea-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-Hā‘ena	<i>Near Capacity</i>	AT CAPACITY	3 Meters per Lot

¹“Availability” = Total Facility Capacity *minus* (Existing Use + Obligations for Future Service)

²“Current Restrictions” are DOW’s administrative limits for approving new meters and subdivision applications.

Source: County of Kaua‘i, Department of Water, 1998

7.4.2 New Facilities Needed by 2020

In long-range planning for water supply, the Department of Water will project future water demand based on the County’s economic and population projections. The DOW will use projected demand for each of its systems to estimate additional source and storage capacity required for each of its systems.

While finding and tapping groundwater may be difficult in some parts of the island, Kauaʻi 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 Kauaʻi, Hawaiʻi* (1995), the estimated amount of water recharging Kauaʻi’s aquifers was 652 million gallons per day (mgd). By comparison, total pumpage of groundwater was 46 mgd, most of which was for agricultural use. Because there is no threat of exceeding sustainable levels of withdrawal from Kauaʻi’s aquifers, no part of Kauaʻi has been declared a Groundwater Management Area by the State Commission on Water Resources Management (CWRM).

Water supply in Līhuʻe is constrained by a lack of new groundwater sources. For geologic reasons, the Līhuʻe area is not favorable for development of water wells, which typically have been low yielding. This difficult problem constrains future development of Grove Farm’s Puakea master-planned project, the Līhuʻe-Hanamāʻulu Infill project, and redevelopment within Līhuʻe Town itself. 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.

Throughout the North Shore, water supply available from County water systems is limited. Expansion of these systems requires development of new sources and major improvements to transmission and storage facilities. Princeville Corporation plans to develop additional water sources and system improvements to serve future development of its properties.

7.4.3 Status of Long-Range Plans

In 1987, the State enacted the Water Code (HRS Chapter 174C) in order to protect, control, and regulate the use of the State’s water resources. The Code is implemented through the Hawaiʻi Water Plan which addresses water conservation and supply issues throughout the state. The Hawaiʻi Water Plan has various components, among them Water Use and Development Plans to be prepared by each county. The DOW prepared and submitted the *Kauaʻi Water Use and Development Plan*, and it was adopted by the State Commission on Water Resources Management in 1990. The Commission has not adopted an update prepared in 1992. Instead, the Commission plans to adopt a new “Integrated Resource Plan” framework to guide future County planning.

The water planning mandated by the State is broad and all-encompassing. It asks the DOW and the County to plan comprehensively for all water use and development on Kauaʻi, including agricultural water demand, irrigation systems and privately-owned potable water systems. The counties may need funding from the State in order to take on such broad water planning responsibilities.

In 1999, the DOW initiated preparation of a new 20-year master plan to address specifically and in detail the expansion and rehabilitation needs of Kauaʻi’s municipal drinking water systems. “Kauaʻi Water Plan 2020” will include existing and future water requirements, a financial plan, capital improvements plan, capital rehabilitation plan, and a rate study. The master plan effort includes modeling of future water demand for each water system. Future demand will be based on the Planning Department’s year 2020 economic and population projections. The planning effort will also address level-of-service standards, set service areas,

and review the cost of extending service to new areas. It is scheduled for completion in the latter part of 2000.

It will be important to coordinate Water Plan 2020 with the General Plan. DOW has been willing in the past to extend its systems to support agricultural subdivisions. This has resulted in long pipeline networks serving sparsely populated areas, which is uneconomic in terms of operation costs over revenues and in terms of long-term capital rehabilitation needs. In addition, as much as 40 percent of the potable water supplied by the Kīlauea-Waipake-Kalihiwai system is used for agricultural irrigation at subsidized rates. The General Plan responds to this problem through the policy to recognize Agricultural Communities and control future development of new tracts of Agriculture-zoned land. Conversely, the DOW should actively support development in areas planned for urban expansion.

7.4.4 Policy

- (a) Develop a long-range plan to guide expansion, improvement, and rehabilitation of County water systems.
- (b) Coordinate planning of future water system development and rate structures with General Plan policies and guidelines.
- (c) Support compact development by giving priority to water supply improvements for existing and planned Urban Center, Residential Community, and Resort areas, while also supporting development in already-established Agricultural Communities.

7.4.5 Implementing Actions

- (a) DOW should develop and update a long-range water systems plan to guide decisions on the Capital Improvement Program, improvement financing, and water rates.
- (b) DOW should establish water service area boundaries and criteria to limit expansion of service outside of areas zoned for urban use or agricultural community use.
- (c) DOW should establish criteria for funding CIP projects that give priority to system expansion and improvement in areas designated as Urban Center, Residential Community and Resort, while also supporting development in already-established Agricultural Communities.

7.5 WASTEWATER TREATMENT

7.5.1 Description of Existing Facilities

Wastewater treatment varies from community to community. The County provides service to a few communities; other communities and larger developments have private treatment systems; and many residents and businesses rely on Individual Wastewater Systems (IWSs) – i.e., cesspools and septic tank systems.

In general, 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. The effluent of most County and private plants

is used for irrigation. Service needs include a few areas of Kaua‘i that have failing individual IWSs, but commercial pumping services keep these from becoming a significant problem.

7.5.1.1 County Sewer Service

The County operates four wastewater systems serving Waimea, Hanapēpē-‘Ele‘ele, Līhu‘e-Hanamā‘ulu, and the Kūhiō Highway corridor between Wailua and Kapa‘a (see Figure 7-3).

As of 1999, these systems served 3,700 business and residential customers, only one-fifth of the number of County water service accounts. County systems are operated by the Division of Wastewater Management, Department of Public Works. Table 7-5 summarizes the County systems and their status.

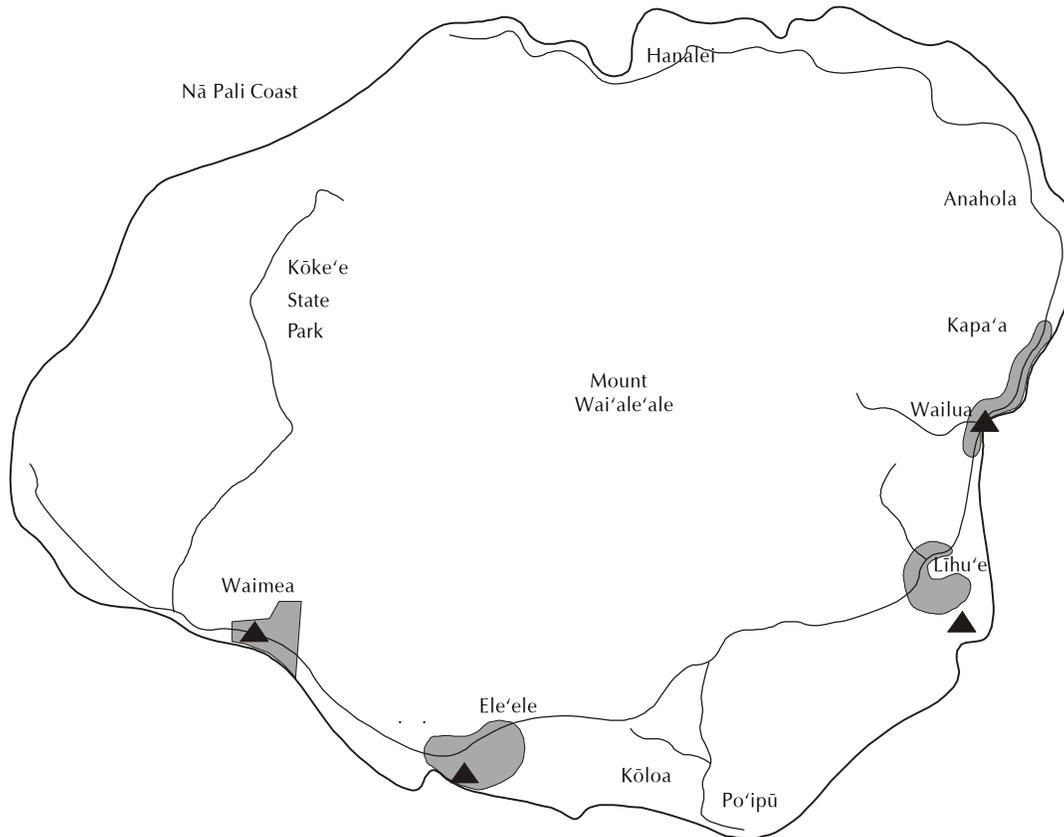
**Table 7-5
County Wastewater Systems and Status, 1999**

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.
‘Ele‘ele	Port Allen, ‘Ele‘ele, Hanapēpē 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 Hanapēpē Heights. Further expansion will be needed to accommodate future Dept. of Hawaiian Homelands development on Hanapēpē Heights.
Līhu‘e	Līhu‘e, Nāwiliwili and Hanamā‘ulu (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 Līhu‘e Infill development, but is limited by availability of land and users for effluent disposal via irrigation.
Wailua	Wailua-Waipouli-Kapa‘a corridor along Kūhiō Hwy	1.5 mgd	Operating at approximately 50% of capacity. The transmission system has been extended to provide future service to Kapa‘a 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 Kaua‘i, Department of Public Works, Division of Wastewater Management, 1999.

All but the Waimea plant have substantial amounts of available treatment plant capacity, but this capacity is already committed to existing and planned developments. Capacity at the ‘Ele‘ele plant is intended to serve the existing residential community on Hanapēpē Heights and new residential development in ‘Ele‘ele Nani and the ‘Ele‘ele industrial area.

Figure 7-3
Wastewater Systems, County of Kaua'i



Note: Does not include private wastewater treatment systems.

Capacity in the Lihū'e plant is being reserved for the Hanamā'ulu triangle, Molokoa residential subdivision, existing residential and industrial areas off lower Rice Street, and a second hotel at Kaua'i Lagoons. Collection systems are needed in the areas off lower Rice Street. Available capacity in the Wailua plant is reserved to extend service to areas between the highway and the ocean, but collection systems are needed.

7.5.1.2 Private Sewage Treatment Plants

Over 30 private sewage treatment plants serve small and large individual developments, such as Kaua'i Community College, the Hyatt Regency Hotel, Lāwa'i Beach Resort, and Outrigger Kaua'i Beach. Owners of large master-planned developments have formed private utility companies to operate collection, treatment and disposal systems in Princeville, Puakea-Puhi, and Kukui'ula. 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.

7.5.1.3 Individual Wastewater Systems

Most residential areas and some commercial areas are not sewered and rely instead on individual wastewater systems (IWSs), for which the State DOH administers permits. Historically, most IWSs were constructed as cesspools. DOH changed the regulations, however, so that septic tank systems are now required. There are no communities with cesspool problems threatening public health, but some areas with poor subsurface conditions experience overflow problems.² Private firms provide pump-out service on a fee basis to properties with failed or over-taxed systems. Septage disposal records from 1997 show some septage pumping in all communities. Records show frequent pumping on properties in Kōloa Town and Lāwa'i Valley Estates, indicating that these areas may need a treatment system in the future.

7.5.2 New Facilities Needed by 2020

New wastewater treatment facilities will be needed by 2020 to support potential new urban development in the areas listed in Table 7-6.

Future Development	Plan for Wastewater Treatment	Effect on County System
Kikīaola, Waimea	Developer to partner with County to fund plant expansion.	Secure long-term agreement for disposal of effluent on Kikīaola lands.
Kapalawai Resort, Robinson Family Partners	Developer to provide package plant onsite.	None
Hanapēpē Heights, DHHL	DHHL to fund. No plans to date. Possible DHHL plant at Hanapēpē; possible expansion of County 'Ele'ele plant.	Possible joint development of collection system for existing residences and new DHHL development.

² State of Hawai'i, Department of Health; and County of Kaua'i (prepared by KRP Information Services). *Water Quality Management Plan for the County of Kaua'i*. November 1993.

Table 7-6, continued
Wastewater Treatment Plans for Future Developments

Future Development	Plan for Wastewater Treatment	Effect on County System
Kukui'ula, A&B Properties	Private WWTP constructed, to be expanded as needed.	None
Vacant Po'ipū Resort & Residential Lands	Developers to provide facilities. No plans at present.	None
Puakea-Puhi, Grove Farm	Private WWTP constructed, to be expanded as needed.	None
Līhu'e-Hanamā'ulu Infill, Amfac/JMB	Plan to construct a private WWTP.	None
Vacant Kapa'a Urban Center lands	No plan as yet.	Possible need to expand Wailua plant.
Anahola, DHHL Master Plan	Plan to construct a WWTP onsite.	None
Kilauea Town Expansion	Developer to provide a package plant onsite.	None
Princeville	Operates own wastewater utility. Will expand existing or build new facilities within Princeville.	None

The *Water Quality Management Plan for the County of Kaua'i* (November 1993) discusses the need to create a regional system serving Kōloa Town, which has subsurface disposal problems, and Po'ipū, 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. The long-range concept is for the County to develop the regional system by expanding the Kukui'ula sewage treatment plant and assuming responsibility for plant operation. Effluent disposal is a critical factor hindering development of a regional system.

7.5.3 Status of Long-Range Plans

7.5.3.1 County Facility Plans

The County prepares facility plans for its systems as needed to support plant expansions or new collection systems. As of 1999, the DPW has no facility plans for future plant expansions. It is uncertain when the County will budget funds and prepare plans for the planned new collection systems to serve existing developed areas in Hanapēpē, Hanamā'ulu, Līhu'e and Kapa'a. Following is a summary of potential needs for future plant improvements.

In Waimea, it appears feasible to expand the County plant to support new development at Kīkīaola if the DPW can continue to dispose of effluent – and increase flows – in the low-lying agricultural fields mauka of the highway. Under the Kīkīaola master plan, this area is planned for a future golf course and constructive wetland that would accept wastewater effluent.

In ‘Ele‘ele, the largest area of planned new development lies on the western portion of Hanapēpē Heights. The feasibility of expanding the ‘Ele‘ele plant needs to be weighed against the feasibility of a new plant at Hanapēpē.

In Līhu‘e, the DPW has an agreement with the Kaua‘i 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 Līhu‘e-Hanamā‘ulu 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 Kōloa-Po‘ipū-Kukui‘ula. A&B has constructed a WWTP to serve its Kukui‘ula 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 Kōloa Town and the smaller resort properties at the eastern end of the Po‘ipū coastal area, both some distance from the Kukui‘ula plant. The larger hotels nearer Kukui‘ula (Sheraton, Waiohai) use the Kiahuna private system, and Hyatt has its own system.

7.5.3.2 Strategic Planning for Wastewater Systems

Most County wastewater plants were originally constructed using federal grant funds provided through the Clean Water Act. Such grants are no longer available. In addition, costs of operating the plants are high. 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 Kaua‘i residents share the benefits, it seems fair that costs should be shared islandwide.

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 Houselots, residents have opposed sewer service because of connection costs and ongoing service charges.

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.

Given that the County manages four disparate systems and is not seeking to develop an islandwide program, it would not be productive to develop a “master plan” for County wastewater service. Instead, it would be more useful to focus on strategic issues and funding

priorities, in order to give direction to the program and provide a higher level of certainty for developers and potential service customers. Some key strategic issues:

- The County has unused capacity in three of its four plants. This is an asset. Connecting additional customers would increase revenues to the wastewater program at marginal cost for increased plant operations. There are two options: (1) proceed with constructing planned collection systems to serve existing developed areas; or (2) 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 Kōloa-Po‘ipū-Kukui‘ula, 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 Kōloa Town and east Po‘ipū.
- 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.

7.5.4 Policy

- (a) The County and private utilities shall develop and operate wastewater collection, treatment and disposal systems as necessary to serve urban areas for the purposes of safeguarding public health, potable water supplies, and the quality of stream and ocean waters.
- (b) The County and private developers should coordinate planning, development, and operation and management of wastewater systems in accordance with long-range facility plans.

- (c) Wastewater effluent shall be reused for irrigation wherever economically feasible, in order to avoid costly and disposal facilities and to conserve potable water supplies.
- (d) The County shall seek to develop additional means of wastewater diversion and reuse, such as a graywater program.
- (e) The County shall develop a policy plan to guide future decisions regarding the allocation of unused treatment plant capacity, the expansion of municipal wastewater systems, and improvement priorities.

7.5.5 Implementing Actions

- (a) The Department of Public Works (DPW) shall prepare a long-range wastewater policy plan, to be adopted by the County Council and to be updated every five years.
- (b) The DPW shall prepare and update facility master plans as needed.
- (c) The DPW shall work with the State Department of Health to develop new methods for reusing wastewater, such as a graywater program.

7.6 DRAINAGE AND FLOOD CONTROL

Kaua‘i Vision 2020 (Chapter 2) describes a future in which “Kaua‘i streams run freely in their natural courses . . . Because of careful land management, Kaua‘i is free of concrete-lined drainage channels.” The Vision and the policy statements that follow describe Kaua‘i’s present situation as well as goals for the future. The policy statements on drainage also reinforce the policy statements on watersheds and water quality, found in the previous chapter “Caring for Land, Waters and Culture.”

The County manages urban stormwater 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. 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 stormwater 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 stormwaters to the ocean. Such channels are extremely efficient at delivering large amounts of polluted runoff to coastal waters.

Kaua‘i’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, Kaua‘i has avoided the environmental consequences of channelization. As of 1999, Kaua‘i was virtually free of lined channels. The DPW has constructed only one, which resulted from litigation. Two have been constructed within private subdivisions.

7.6.1 Status of Long-Range Plans

The 1984 General Plan mandated the preparation of a “Drainage Master Plan.” While such a plan has not been prepared, in 1998 the DPW initiated a project to revise the County’s drainage standards. 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 nonpoint pollution management policies. These standards will guide future development and aid in avoiding future problems.

According to the DPW, there are existing drainage problems in Wailua-Kapa‘a, Nāwiliwili and Po‘ipū. 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.

7.6.2 Policy

- (a) Establish zoning and subdivision regulations that (1) strictly limit development on lands that are steeply-sloped and/or have highly erodible soils, in order to prevent flooding, landslides and nonpoint pollution; and (2) strictly limit development on shoreline lands within coastal flood hazard areas or susceptible to shoreline erosion.
- (b) 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 drainageways and maintain their capacity to accommodate stormwater flows.
- (c) Establish erosion control and drainage regulations that incorporate best management practices for controlling nonpoint source pollution.
- (d) Regulations and drainage improvements shall be consistent with the following principles:
 - (1) Use natural drainageways for storm runoff waterways wherever possible.
 - (2) Avoid channelization or alteration of natural drainageways.
 - (3) Avoid diversion of storm runoff from one basin to another.
 - (4) Do not replace natural drainageways with structured, closed systems, except at road crossings.
 - (5) Require detention basins in new developments, in order to maintain pre-development stormwater flow rates. Requirements shall be based on the two-year storm but may be increased.
 - (6) To conserve land, develop detention basins in conjunction with park or open lands and design for multiple uses.
 - (7) Protect buildings from the 100-year flood.

- (8) Where there are no downstream drainage systems or if the downstream systems lacks sufficient capacity, require retention facilities sufficient to maintain 100-year storm flows at pre-development rates and conditions.

7.6.3 Implementing Actions

- (a) 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: (1) assure effective regulation of steeply-sloped lands and drainageways; and (2) eliminate ineffective regulations and reduce unnecessary application requirements.
- (b) The Department of Public Works shall identify critical urban watersheds and develop strategic Flood Prevention and Drainage Plans to guide future County actions.
 - (1) Develop plans incrementally, evaluating watersheds according to the potential extent of future problems and the potential to achieve viable solutions.
 - (2) Each Flood Prevention and Drainage Plan should provide a capital improvement program, estimated project costs, project priorities, and schedule.
- (c) 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 nonpoint pollution.
 - (1) The Department shall submit a bill for a Drainage Ordinance to the County Council for adoption.
 - (2) The revised grading and drainage regulations shall be consistent with current State and Federal policies, such as those set forth in the *Hawai'i Coastal Nonpoint Pollution Control Program Management Plan* and the *Hawai'i Nonpoint Source Management Program Update*.

7.7 ENERGY

7.7.1 Overview

The County's chartered electrical public utility, Kaua'i Electric (KE), builds and operates power generating and distribution systems. In 2000, a locally-owned cooperative sought to purchase Kaua'i Electric from Citizens Utilities. The Gas Company (GASCO) distributes LP-Gas by truck, primarily to commercial and industrial customers. The State Public Utility Commission (PUC) regulates the rates and operations of KE and GASCO.

While not a service provider, the County is a major electric power consumer and plays important roles in consumer advocacy and in administering development regulations. The County staffs an Energy Coordinator position in the Office of Economic Development. This position is responsible for developing energy efficiency in County government operations; advocating on behalf of Kaua'i consumers before the Public Utility Commission; planning energy emergency preparedness; and providing training and grant-funded programs through the County Energy Extension Service.

In the long term, energy generation and use on Kaua‘i will be affected by the cost of imported fuels, technological innovations in energy generation, and deregulation of energy utilities. The cost of imported fuel will drive innovation and encourage energy self-sufficiency. Future development of fuel cell technology and cost-effective photovoltaic generation may enable households and businesses to generate much of their own electrical energy. This in turn may reduce the need for distribution systems. It may also enable broad use of net metering, by which individual establishments can sell energy back to the utility.

Purchase of fuel constitutes a substantial flow of money out of the local economy. Replacement of imported fuel with renewable energy produced on Kaua‘i would provide jobs and retain money to circulate and strengthen the island’s economy. Opportunities include generating energy from solid waste or from biomass crops; producing liquid fuels from biomass crops; and developing solar and wind generation facilities, either large- or small-scale. Developing additional hydro-electric power should be considered.

7.7.2 Kaua‘i Electric System

7.7.2.1 Existing System

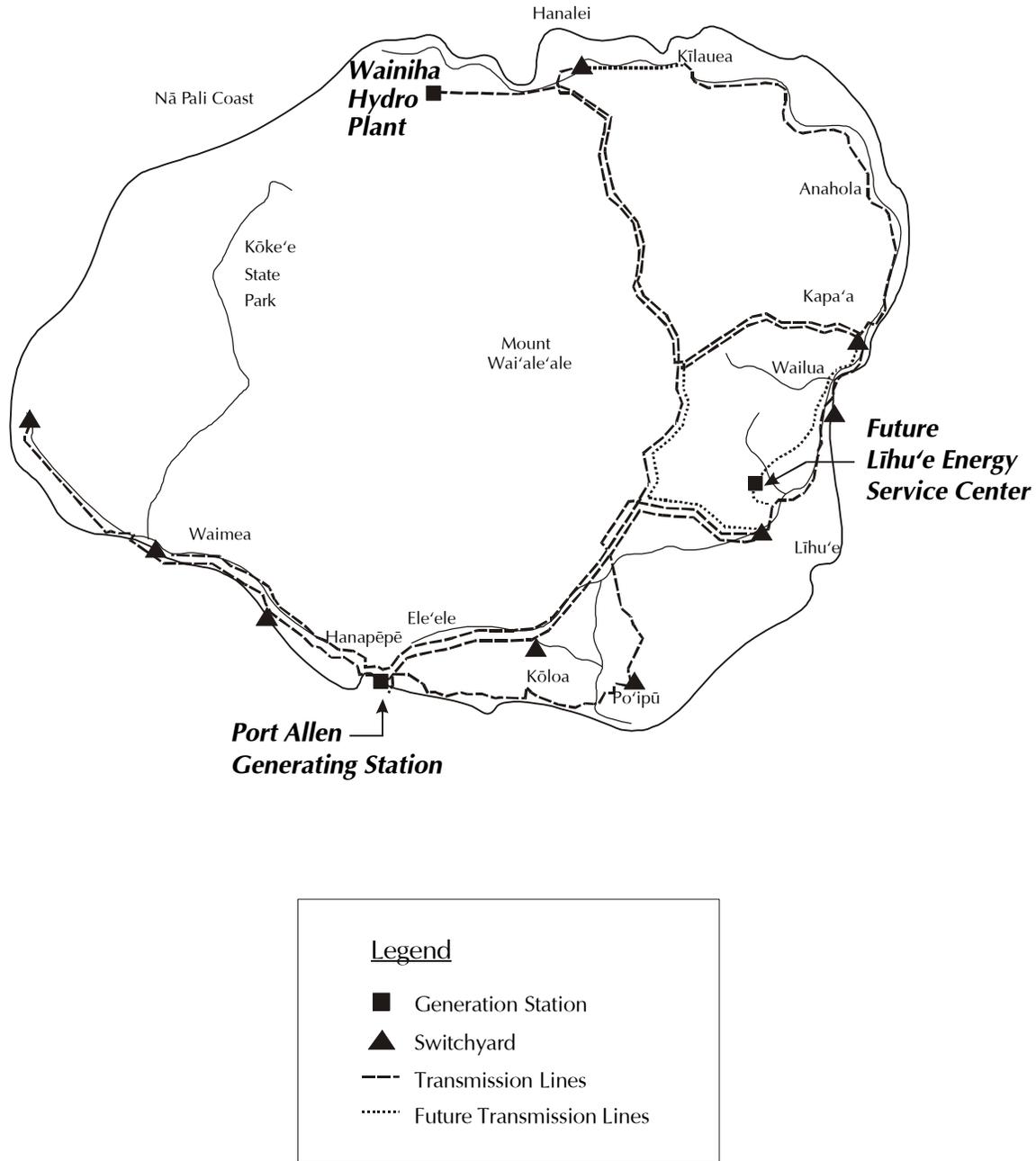
In 1999, Kaua‘i Electric served approximately 29,300 customers. KE provides four levels of basic service: residential, commercial, large power, and street lighting. Major load centers are Kapa‘a-Wailua, Līhu‘e, and Kōloa-Po‘ipū. KE’s existing transmission system is shown in Figure 7-4.

The total firm electrical generating capacity on Kaua‘i is presently slightly over 110 megawatts (MW). KE generates its own power from a 96-megawatt (MW), diesel-fired power plant located at Port Allen and purchases 14 MW of firm capacity from Līhu‘e Plantation. The utility also purchases non-firm power from Island Coffee and the Gay & Robinson sugar mill. This nominal amount is acquired under “surplus power” contracts with the companies and cannot be relied upon to meet peak demand. These non-firm sources generate a total of approximately 4.1 MW of power. About 20 percent of KE's power output is generated from renewable resources including bagasse, a sugar cane by-product, and hydropower.

The following briefly describes how electric power is distributed to the various regions of Kaua‘i:

- **West Side** – The main transmission line for the West Side extends from Pt. Allen to Mānā along Kaumuali‘i Highway, including double circuits between Pt. Allen and Kekaha. Switchyards are located at Port Allen and Kekaha, with substations in Mānā and Kaumakani.
- **Kalāheo-Po‘ipū-Kōloa** – This region is served by four transmission circuits – one extending east from Pt. Allen and another extending south from Kaumuali‘i Highway. There is a switchyard in Kōloa and a substation in Lāwa‘i.

Figure 7-4
Electric Transmission System, County of Kaua'i



Līhu‘e – This area is served by four transmission circuits from KE’s islandwide transmission system. Although Līhu‘e Plantation provides power to the system, the primary source of electricity is the Pt. Allen Generating Station.

- **Kawaihau** – This region is served via a tap off of the mauka transmission line that connects the Wainiha Hydroelectric Plant with Port Allen. This tap provides power via the Kapa‘a Switchyard to Kapa‘a Town and other developed coastal areas, as well as to residential communities in Kapa‘a and Wailua homestead areas. Kapa‘a Switchyard is also linked to the Lydgate Substation and the Līhu‘e Switchyard.
- **North Shore** – This area is served by electrical power provided by transmission lines along the Power Line Trail supplemented by power from the Wainiha Hydroelectric Plant.

The County has the ability to guide the location, siting, and design of electrical generation and transmission facilities through a combination of land use policies, zoning regulations, and design guidelines. Electric and other energy-related utilities are considered industrial uses. Generating stations involve heavy machinery and trucking, create air pollution, use water for cooling or generating processes, and impact scenic resources. For these reasons, siting and impact mitigation are carefully considered in the planning, environmental assessment, and permitting of new generating facilities.

Overhead transmission and utility lines affect the scenic quality of viewplanes and open spaces, as well as the visual appearance of urbanized areas. View impacts can be reduced by simple measures such as painting transmission towers and utility poles a color that visually blends with the natural landscape. A complete though costly solution to visual impacts is to place utility lines underground. During the 1998-1999 General Plan Update, the Kaua‘i Outdoor Circle and other community members expressed interest in undergrounding. Responding to the concerns of various communities around the State, the Public Utilities Commission has opened a docket to examine the visual, technical and cost issues related to placing electrical lines underground. In recognition of the cost and feasibility factors involved, the CAC deferred this issue to the PUC.

7.7.2.2 New Facilities Needed by 2020

Kaua‘i Electric is proposing to develop the Līhu‘e Energy Service Center, which will provide sufficient space for incremental additions to meet power generation needs over the next 50 years. The Center would also decentralize power generation (which is now concentrated in Port Allen), and provide greater reliability in avoiding widespread power failure. Within the 20-year horizon, KE’s current plan is to add generating capacity at the Līhu‘e Energy Service Center in 2002 and 2012. Aside from lines serving the Līhu‘e Energy Service Center, new transmission lines will be needed only in the Līhu‘e-Wailua corridor and from Kīlauea to the Princeville substation. No other transmission lines are currently planned through 2020. New lines are shown schematically in Figure 7-4.

7.7.2.3 Status of Long-Range Plan

Under State PUC regulations, Kaua‘i Electric is required to prepare a long-range (20-year) Integrated Resource Plan (IRP), to be updated every three years. The IRP guides KE’s

service delivery and capital improvement programming. The current long-range plan guiding KE is the *1997 Integrated Resource Plan*. An update is scheduled for submittal in 2000.

7.7.3 Policy

The following general policies provide guidance to the County in areas in which it has decision-making capacity and also supports state-level policies and PUC-mandated laws:

- (a) Promote renewable energy sources to reduce Kaua‘i’s dependence on imported fossil fuels, taking into consideration cost, reliability, and environmental impacts.
- (b) Actively promote solar water-heating and other energy-saving devices such as roof insulation and natural ventilation and cooling of buildings.
- (c) Develop low-cost financing programs to enable households and small businesses to invest in solar water-heating and other energy-saving technologies.
- (d) Minimize health, safety, cultural and scenic impacts of electrical power installations. In particular, seek opportunities and economic methods to render power generation facilities and transmission lines inconspicuous in order to preserve and enhance a park-like appearance throughout the Garden Island.
- (e) Require new buildings to incorporate economically-feasible design and equipment to save energy.
- (f) Establish a set of measurable goals to evaluate energy conservation and self-sufficiency.

7.7.4 Implementing Actions

The County government shall:

- (a) Actively participate in preparing the long-range Integrated Resource Plan with the franchised electric power public utility company; advocate in favor of transition to technologies, facilities, and practices that use renewable fuels, conserve nonrenewable resources, and reduce payments for and reliance on imported fuels.
- (b) Maintain an energy advocacy/coordination function in County government.
- (c) Advocate on behalf of Kaua‘i residents and businesses before the State Public Utilities Commission with regard to the regulation of utility companies and the setting of electrical rates. Attend especially to the needs of lower-income residents and small businesses.
- (d) Continually review and revise the Building Code to mandate energy efficiency in buildings.
- (e) Invest capital funds to make County facilities energy-efficient and to reduce operating costs.

The County shall work with the electric power public utility company(nies) to:

- (a) Site and design power generation plants and transmission facilities to blend with the natural landscape and to avoid impacts to important historic sites and viewplanes. Solutions include constructing underground facilities when economically feasible. While other factors are also important in site selection and design, the County of Kaua'i places a high value on historic sites and views of the natural landscape.
- (b) Develop a proactive process for siting and designing power generation plants and transmission lines that incorporates early and detailed consultation and negotiation among the utility, the County government, community stakeholders, and the general public.

7.8 SOLID WASTE

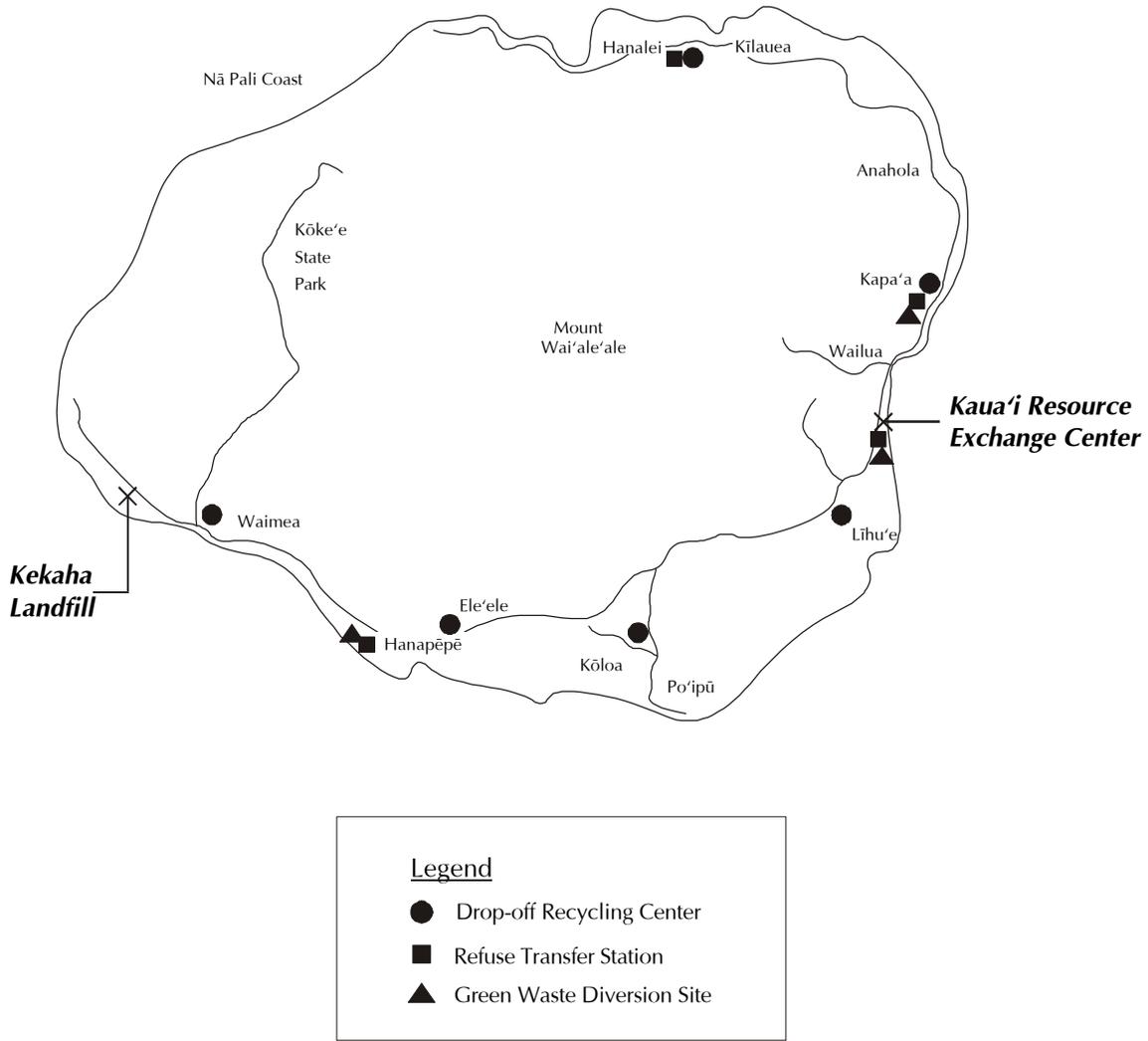
The County government plays the primary role in solid waste management, guided by federal and state laws and regulations. The County provides direct service to the public by collecting solid waste and operating facilities and programs for reuse and disposal. With the exception of hazardous materials, the County is also responsible for regulating the disposal of solid waste. The 2020 Vision (Chapter 2) foresees the County of Kaua'i having the lowest per capita rate of waste generation and the highest rate of reuse and recycling statewide.

7.8.1 Description of Existing System

Kaua'i County maintains an islandwide system of solid waste collection and disposal which serves its resident and visitor population. County solid waste facilities and services are administered by the Road Construction and Maintenance Division of the Department of Public Works. The County has one solid waste coordinator and one clerk who are responsible for the overall management of the landfill and administration and budgeting of solid waste programs. 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. Components of Kaua'i's solid waste system are briefly described below and shown in Figure 7-5:

- **Kekaha Landfill Phase II** – This facility began operation in 1993 and is the primary disposal site for solid waste on Kaua'i. 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, Kapa'a, Līhu'e, and Hanapēpē. 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, Kapa'a, and Hanapēpē stations receive used oil through the Do-it Yourselfer (DIY) program. The Līhu'e station also receives scrap metal, white goods, and greenwaste. The latter is also received at the Kapa'a and Hanapēpē station.

Figure 7-5
Solid Waste Facilities, County of Kaua'i



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 greenwaste. 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.

Neighborhood Recycling – The County currently has in place six stations islandwide that receive newspaper, glass, aluminum, and paper products. Private contractors are responsible for providing the containers, hauling the materials, and servicing the site.

- **Plastic Recycling** – This effort is being mounted by Princeville Corporation and volunteers in North Shore communities. Volunteers in Līhu‘e 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 Kaua‘i residents, other government agencies, and businesses.
- **Kaua‘i Resource Exchange Center** – This new facility, located next to the Līhu‘e 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.

7.8.2 New Facilities Needed by 2020

Over the next two decades, the amount of solid waste generated by residents and visitors on Kaua‘i is expected to increase by nearly 50 percent from approximately 67,590 tons in FY 1999 to a projected 100,840 tons in 2020.³ 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 Kaua‘i. 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. With the addition of this vertical expansion, the remaining lifespan of the landfill, assuming current waste levels, is about five to six years. A new landfill site should be identified in about one year and the cost of developing the facility is estimated at \$37 million. Factors that may limit expansion capacity is the availability of feasible sites.

³ Solid waste generation is estimated at 5.4 pounds per person per day.

- **New Refuse Transfer Station** – A facility is planned for Kōloa. It is expected to cost approximately \$3 million to develop.
- **Kekaha Debris Recycling Station** – This facility will be used less as collection of metals becomes more centralized at the Puhi Metals Recycling Center and more conveniently located private facilities divert greenwaste from KDRS.

7.8.3 Status of Long-Range Plan

In 1994, the Kaua‘i County Council approved the *County of Kaua‘i Integrated Solid Waste Management Plan* (SWMP). The SWMP fulfills requirements of Chapter 342G, Hawai‘i Revised Statutes. The SWMP strongly emphasizes recycling as a means of diverting materials from the island’s Kekaha landfill. According to state law, the SWMP must be updated and submitted to the State once every five years.

Despite having limited resources and funding, the County has implemented major action items stated in the 1994 SWMP, particularly in the area of source reduction. More needs to be done, however, in the areas of recycling, education, public information, and program funding.

7.8.4 Policy

The following general policies apply to solid waste management on Kaua‘i. Specific policies to guide solid waste programs should be provided in the long-range SWMP.

- (a) Using long-range integrated resource planning, the County shall manage an islandwide system of solid waste collection, reuse, recycling and disposal that (1) is environmentally sound and cost-effective; (2) increases diversion of waste from the island’s landfill(s); and (3) provides for the timely and orderly expansion of solid waste facilities.
- (b) Through a multi-faceted program of education, management measures, and financial incentives, the County shall support and stimulate Kaua‘i businesses and residents to reduce their solid waste generation and increase the reuse and recycling of materials.
- (c) 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 stream for energy generation.

7.8.5 Implementing Actions

The County government shall:

- (a) 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.

- (b) Commit the necessary funding and staff resources to implement the County Integrated Solid Waste Management Plan.
- (c) Increase the effectiveness of the County's solid waste system by maximizing the convenience of reuse and recycling centers for users.
- (d) Establish a set of measurable goals to evaluate County efforts to divert solid waste from the island's landfill.
- (e) Develop a proactive process for siting 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.

7.9 POLICE AND FIRE SAFETY

7.9.1 Police

The Kaua'i Police Department has three stations, located approximately 25 miles apart. The main station and administrative headquarters is in Līhu'e. Smaller stations at Waimea and Hanalei are co-located with fire stations.

To ensure continued levels of public safety, a new County police headquarters is being planned to serve the Sector 5 area and the County. The current main station in Līhu'e, built in 1953, is outdated and overcrowded with no room for further expansion for a crime laboratory and future staffing needs. The new facility will house the Kaua'i Police Department, Kaua'i County Civil Defense, and the Kaua'i County Prosecuting Attorney's Office. It will be constructed on a 18.5-acre site owned by the County of Kaua'i near Kapule Highway and between Vidinha Memorial Stadium and Ahukini Road. The site adjacent to the site of the planned Kaua'i Judiciary Complex.

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. The Kaua'i Police Department does not have any other long-range facility plans.

In 1999, the Police Department had 145 officers islandwide and 35 civilian employees. In order to provide adequate service to Kaua'i's projected 2020 population of 74,300, an additional 41 officers would be needed.⁴

7.9.2 Fire

The Kaua'i Fire Department has a main station and administrative headquarters in Līhu'e. Other fire stations are located in Waimea, Hanapēpē, Kalāheo, Kōloa, Kapa'a, and Hanalei. The County has a unified, islandwide 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.

⁴ The Kaua'i Police Department assumes 2.5 officers per 1,000 residents.

In fiscal year 1999, the Kaua'i Fire Department had a total workforce of 126. There were three crews per station for a total of 114 firefighters. The Fire Department in fiscal year 1999 responded to approximately 3,800 calls. Over 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 Kapa'a 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. The Kaua'i Fire Department plans to add satellite stations in Anahola and the Wailua Homesteads area. The Department also plans to replace the existing Kapa'a Station with one in Kapa'a Heights on a site near Mahelona Hospital. These projects have not received funding, and there is no estimated time schedule for completion.

7.9.3 Policy

- (a) Provide adequate staffing and facilities to ensure effective and efficient delivery of basic police and fire protection.
- (b) To improve fire protection, develop additional facilities according to a long-range system plan.
- (c) Evaluate fire protection service islandwide, with particular attention to the east side, from Wailua to Anahola.

7.9.4 Implementing Actions

Working with the Water Department, the County shall prepare a long-range plan for fire protection, to include the following elements:

- (a) Evaluation of existing level-of-service and response time for all communities, work with the Water Department to determine fire flow levels.
- (b) Development of standards for urban and rural levels of service, including response time and fire flow requirements.
- (c) Development of a long-range, phased facilities plan to attain an adequate level of service islandwide.