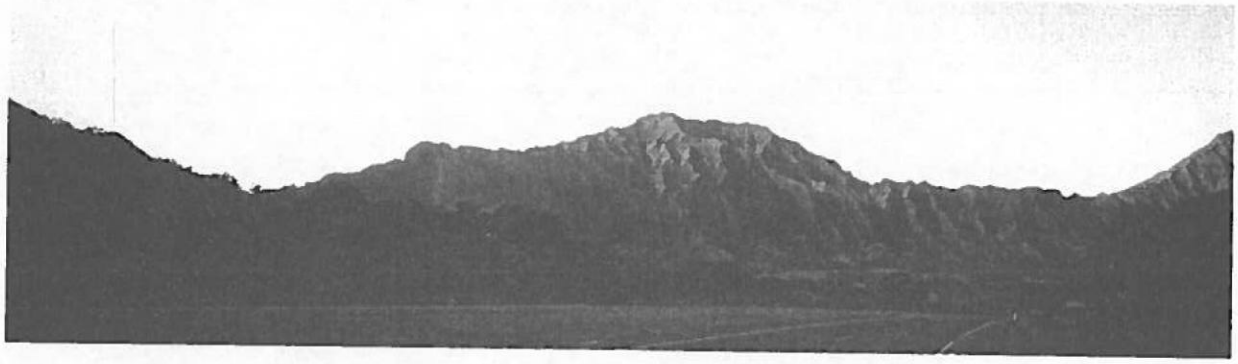
KOOLAUPOKO

SUSTAINABLE COMMUNITIES PLAN



DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
JEREMY HARRIS, MAYOR

JULY 2000

OFFICE OF THE CITY CLERK
EFFECTIVE DATE: August 25, 2000

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PREFACE & EXECUTIVE SUMMARY

The Koolaupoko *Sustainable* Communities Plan has been prepared in accordance with the Charter-prescribed requirements for development plans and is to be accorded force and effect as such for all Charter- and ordinance-prescribed purposes. It is one of eight community-oriented plans intended to help guide public policy, investment, and decision-making through the 2020 planning horizon. Each of these eight plans addresses one of eight geographic planning regions on Oahu, responding to the specific conditions and community values of each region.

Two of the eight planning regions, Ewa and the Primary Urban Center, are the areas to which major growth in population and economic activity will be directed over the next 20 years and beyond. The plans for these regions continue to be titled "Development Plans," and will serve as the policy guides for the development decisions and actions required to support that growth.

The remaining six planning regions, including Koolaupoko, are envisioned to remain relatively stable. The plans for those regions have been titled "*Sustainable* Communities Plans" and are focused on serving as policy guides for public actions in support of that goal. The vision statement and supporting provisions of the Koolaupoko *Sustainable* Communities Plan are oriented toward maintaining and enhancing the region's ability to sustain its unique character and lifestyle.

P.1 LAND USE PLANNING AND MANAGEMENT IN THE CITY AND COUNTY OF HONOLULU

The City and County of Honolulu guides and directs land use and growth through a three-tier system of objectives, policies, planning principles, guidelines and regulations. The General Plan forms the first tier of this system. First adopted by resolution in 1977, the General Plan is a relatively brief document, providing a broad statement of objectives and policies to guide the City's future. It has been amended several times, but the basic objectives and policies set forth in the 1977 plan remain intact.

The second tier of the system is formed by the development plans, which are adopted and revised by ordinance and are required to implement objectives and policies set forth in the General Plan. These plans address eight geographic regions of the island: the Primary Urban Center, East Honolulu, Central Oahu, Ewa, Waianae, North Shore, Koolauloa and Koolaupoko. The Koolaupoko Development Plan was first adopted in 1983. The development plans for East Honolulu, Central Oahu, Waianae, North Shore, Koolauloa, and Koolaupoko are now referred to as *Sustainable* Communities Plans.

The third tier of the system is composed of the implementing ordinances, including the Land Use Ordinance (Honolulu's zoning code) and the City's Capital Improvement Program. Mandated by the City Charter, these ordinances constitute the principle means for implementing the City's plans. These ordinances are required to be consistent with, and carry out the purposes of, the General Plan, the development plans (or *Sustainable* Communities Plans), and each other.

In addition to these three Charter-mandated tiers, the development plans are supplemented by two planning mechanisms that are not required by the Charter, including the functional planning process and special area planning. Functional planning activities, some of which are mandated by state or federal regulations, provide long-range guidance for the development of public facilities such as the water system, wastewater disposal, and transportation. Special area plans are intended to give specific guidance for neighborhoods, communities or specialized resources.

P.2 AUTHORITY OF THE DEVELOPMENT PLANS AND *SUSTAINABLE* COMMUNITIES PLANS

The authority of the Development Plans and *Sustainable* Communities Plans is derived from the City Charter, which mandates preparation of a general plan and development plans to guide "the development and improvement of the city." Together with the General Plan, the development plans provide a policy context for the land use and budgetary actions of the City. This is the authority the originally adopted development plans carried, and it remains unchanged in the *Sustainable* Communities Plan presented in this document.

The Charter provides that public improvement projects and subdivision and zoning ordinances shall be consistent with and carry out the purposes of the development plan for that area. Although the Development Plans or *Sustainable* Communities Plans are not themselves regulatory, they "regulate the regulators." They are policy tools and are to be used, in conjunction with the programs and budgets of the City, to accomplish the objectives of the City and as guides for the decisions made in the private sector.

P.3 EXECUTIVE SUMMARY OF THE KOOLAUPOKO *SUSTAINABLE* COMMUNITIES PLAN

This plan, which is incorporated into Ordinance 00-47 by reference, is organized in five chapters and an appendix, as follows:

- Chapter 1: Koolaupoko's Role in Oahu's Development Pattern defines the region's role and identity within the overall framework of islandwide planning and land use management.

- Chapter 2: The Vision for Koolaupoko's Future describes the vision for the future of the region and lists important elements of that vision.

- Chapter 3: Land Use Policies, Principles, and Guidelines presents the Plan's policies, and provides policy guidance for the region's various land use elements.
- Chapter 4: Public Facilities and Infrastructure Policies and Principles presents policies, principles and actions needed to support the land use policies of Chapter 3.
- Chapter 5: Implementation addresses needs for carrying out provisions outlined by the Plan.

The contents of each chapter is summarized below:

P.3.1 CHAPTER 1: KOOLAUPOKO'S ROLE IN OAHU'S DEVELOPMENT PATTERN

In carrying out the purposes of the General Plan, Koolaupoko is expected to experience essentially no growth over the 20-year projection horizon of this plan. Policies in support of this goal limit the potential for expansion of the region's housing stock, commercial centers and economic activity, and are focussed on maintaining the patterns of development characteristics of its urban fringe and rural areas.

P.3.2 CHAPTER 2: THE VISION FOR KOOLAUPOKO'S FUTURE

This vision is shaped around two principal concepts. The first of these calls for protection of the communities' natural, scenic, cultural, historic and agricultural resources. The second principal concept addresses the need to improve and replace, as necessary, the region's aging infrastructure systems. Ten key elements of the vision are identified, including:

- Adapt the concept of "*ahupua'a*" as a basis for land use and natural resources management.
- Preserve and promote open space throughout the region.
- Preserve and promote agricultural uses.
- Preserve and enhance scenic, recreational and cultural features that define Koolaupoko's sense of place.
- Emphasize alternatives to the private passenger vehicle as modes for travel.
- Adapt housing and public works standards to community character and changing needs.
- Protect residential neighborhoods.
- Define and enhance existing commercial and civic districts.
- Establish Urban Community, Rural Community, Agriculture and Preservation boundaries.
- Maintain the predominantly low-rise, low-density, single-family character of the urban fringe and rural communities identified in Figure 1-1.

P.3.3 CHAPTER 3: LAND USE POLICIES, PRINCIPLES, AND GUIDELINES

This chapter presents general policies, planning principles and guidelines for the major concerns related to land use in Koolaupoko. General policies related to each land use type are summarized below:

P.3.3.1 Open Space Preservation:

- Protect scenic views, provide recreation and promote access to shoreline and mountain areas.
- Define the boundaries of communities and provide buffers between agricultural uses, residential neighborhoods and other uses.

- Create a system of linear greenways along roadways and drainage ways.
- Prevent development in areas susceptible to landslides and similar hazards.

P.3.3.2 Island-Based Parks and Recreation:

- Employ appropriate screening and siting.
- Ensure environmental compatibility in the design and construction of park facilities.
- Integrate recreational opportunities with the characteristics of the surrounding community.
- Establish the Kaneohe area as the top priority for creating new shoreline access and/or beach parks in Koolaupoko.
- Take steps to make future beach accretion public land in perpetuity.

P.3.3.3 Community-Based Parks:

- Increase the inventory of community-based parks to provide appropriately located sports and recreation facilities.
- Provide for more intensive use of some existing facilities serving areas in which expansion of site area is constrained.
- Require developers of new residential projects to provide land for open space and recreation purposes, rather than paying the park dedication fee.
- Pursue installation of greenways along streams and drainage channels.

P.3.3.4 Historic and Cultural Resources:

- Emphasize physical references to Koolaupoko's history and cultural roots.
- Protect existing visual landmarks and support creation of new, culturally appropriate landmarks.
- Preserve significant historic features.
- Retain significant vistas associated with archaeological features.

P.3.3.5 Agricultural Uses:

- Encourage small-lot agricultural uses and prevent conversion of agricultural lands to nonagricultural uses.
- Adopt development and public works standards that are appropriate and cost-effective for rural, agricultural areas.
- Provide supporting infrastructure, services and facilities to foster and sustain agricultural operations.
- Implement policies and incentives to promote active, long-term agricultural uses.

P.3.3.6 Residential Uses:

- Modify residential street design to provide emphasis on safe, accessible, convenient and comfortable pedestrian routes, bus stops and bike routes.
- Maintain the predominantly low-rise, low-density, single-family character of the region.
- Protect the integrity of existing residential neighborhoods.
- Reduce average density guidelines to 2-8 units per acre in urban fringe areas and 0.2 – 4 units per acre in rural areas.

P.3.3.7 Commercial and Industrial Uses:

- Identify and define commercial and industrial uses in various categories appropriate to the character and needs of Koolaupoko's communities, including: rural commercial centers; neighborhood commercial centers; community commercial centers; town centers; and areas supporting light and extractive industries.
- Limit the area devoted to commercial and industrial centers to current sites.
- Expand the use of mixed-use commercial-residential designations, and apply mixed-use industrial-commercial designations to existing industrial sites in Kailua and Kaneohe.
- Rezone the frontage of Hekili Street in Kailua to commercial to avoid its future use as industrial.

P.3.3.8 Institutional Uses:

- Retain the open space character of existing institutional campuses.
- Site and design campus facilities to respect the scenic context and adjacent residential areas.

P.3.3.9 Military Uses:

- Assume MCBH and Bellows AFS will remain under military control.
- Encourage the State to continue to pursue the release of unused military lands for civilian uses, with special attention to securing permanent civilian use of all Bellows shorefront areas and provision of greater civilian shoreline access at MCBH.

P.3.4 CHAPTER 4: PUBLIC FACILITIES AND INFRASTRUCTURE POLICIES AND PRINCIPLES

This chapter presents general policies and planning principles for the major concerns related to public facilities and infrastructure in Koolaupoko. General policies related to each facility type are summarized below:

P.3.4.1 Transportation Systems:

- Reduce reliance on the private passenger vehicle by promoting transportation system management and travel demand management measures for both commuting and local trips.
- Provide adequate and improved mobility between communities, shopping, and recreation centers, especially by enhancing pedestrian, bicycle and transit modes of travel.
- Maintain adequate person-carrying capacity for peak-period commuting to and from work in the Primary Urban Center.
- Recommend no new highway widenings or interchange construction except widening to accommodate bikeways.

P.3.4.2 Water Systems Development:

- Integrate management of all potable and nonpotable water sources, including groundwater, stream water, storm water, and effluent, following State and City legislative mandates.
- Adopt and implement water conservation practices in the design of new developments and the modification of existing uses, including landscaped areas and as a major element in integrated water resource planning.

P.3.4.3 Wastewater Treatment:

- Connect all wastewater produced within the Urban Community and Rural Community boundary areas to municipal or military sewer service systems.
- Where feasible, use water recycling as a water conservation measure.
- Mitigate visual, noise, and odor impacts associated with wastewater collection and treatment systems, especially when they are located adjacent to residential designated areas.

P.3.4.4 Electrical and Communications Systems:

- Design system elements and incrementally replace facilities such as substations, transmission lines and towers to avoid or mitigate any potential adverse impacts on scenic and natural resource values and residential neighborhoods and to enhance system reliability.
- Place new utility lines underground.
- Coordinate improvements with other infrastructure improvement efforts such as roadway widening.
- Establish a long-range program for systematically relocating existing lines underground.

P.3.4.5 Solid Waste Handling and Disposal:

- Continue efforts to establish more efficient waste reduction, diversion and collection systems without adverse impact on residents.
- Further encourage green waste recycling.

P.3.4.6 Drainage Systems:

- Promote drainage system design, which emphasizes control and minimization of polluted runoff and the retention of storm water on-site and in wetlands.
- View storm water as a potential source of water for recharge of the aquifer that should be retained for absorption rather than quickly moved to coastal waters.
- Select natural and man-made vegetated drainageways and retention basins as the preferred solution to drainage problems wherever they can promote water recharge, help control nonpoint source pollution, and provide passive recreation benefits.
- Keep drainageways clear of debris to avoid flooding problems.

P.3.4.7 School and Library Facilities:

- Approve new residential developments only after the State Department of Education certifies that adequate school facilities will be available when the development is completed.
- Support State efforts to require that developers pay their fair share of costs needed to ensure provision of adequate school facilities.

P.3.4.8 Civic and Public Safety Facilities:

- Provide adequate staffing and facilities to ensure effective and efficient delivery of basic governmental services and protection of public safety.
- Locate civic facilities in areas suitable for the volume of users.

P.3.4.9 Other Community Facilities:

- Other major public, quasi-public or private facilities or utilities which provide essential community services but which have a major adverse impact on surrounding land uses should be considered through a City review process, such as the Plan Review Use process, which provides public notification, review by appropriate agencies, opportunities for public comment, and approval by the City Council.

P.3.4.10 Urban Design:

- Adopt policies and principles to enhance the natural environment and preserve the aesthetic character of the community.

P.3.5 CHAPTER 5: IMPLEMENTATION

This chapter discusses the various measures that will be necessary to ensure timely implementation of the plan, including those measures that will minimize disruption during the transition into the plan. Among the measures addressed by this chapter, changes to the zoning maps and the Land Use Ordinance will be necessary to achieve required conformance with the *Sustainable* Communities Plan, as will various other regulatory codes and standards. This chapter also addresses monitoring of plan implementation and provides for comprehensive review of the plan at five-year intervals. It also:

- Establishes development priorities in conformance with the plan.
- Sets priorities for public facility improvements.
- Substitutes conditional zoning for Development Agreements.

P.3.6 APPENDIX A

- The appendix provides three color maps that delineate many of the plan's textual provisions. The maps are intended to complement the text. Both the text and the maps are to be considered in interpreting the plan.

1. KOOLAUPOKO'S ROLE IN OAHU'S DEVELOPMENT PATTERN

The General Plan of the City and County of Honolulu designates the central portion of the Koolaupoko *Sustainable* Communities Plan Area (SCPA), shown in **Figure 1-1**, as an urban fringe area to remain a predominantly residential suburb with limited future population growth. The northern and southern portions of Koolaupoko are designated rural areas to remain in predominately agricultural and preservation land uses. The general locations of these designations and the communities that are associated with them are indicated in **Figure 1-1**.

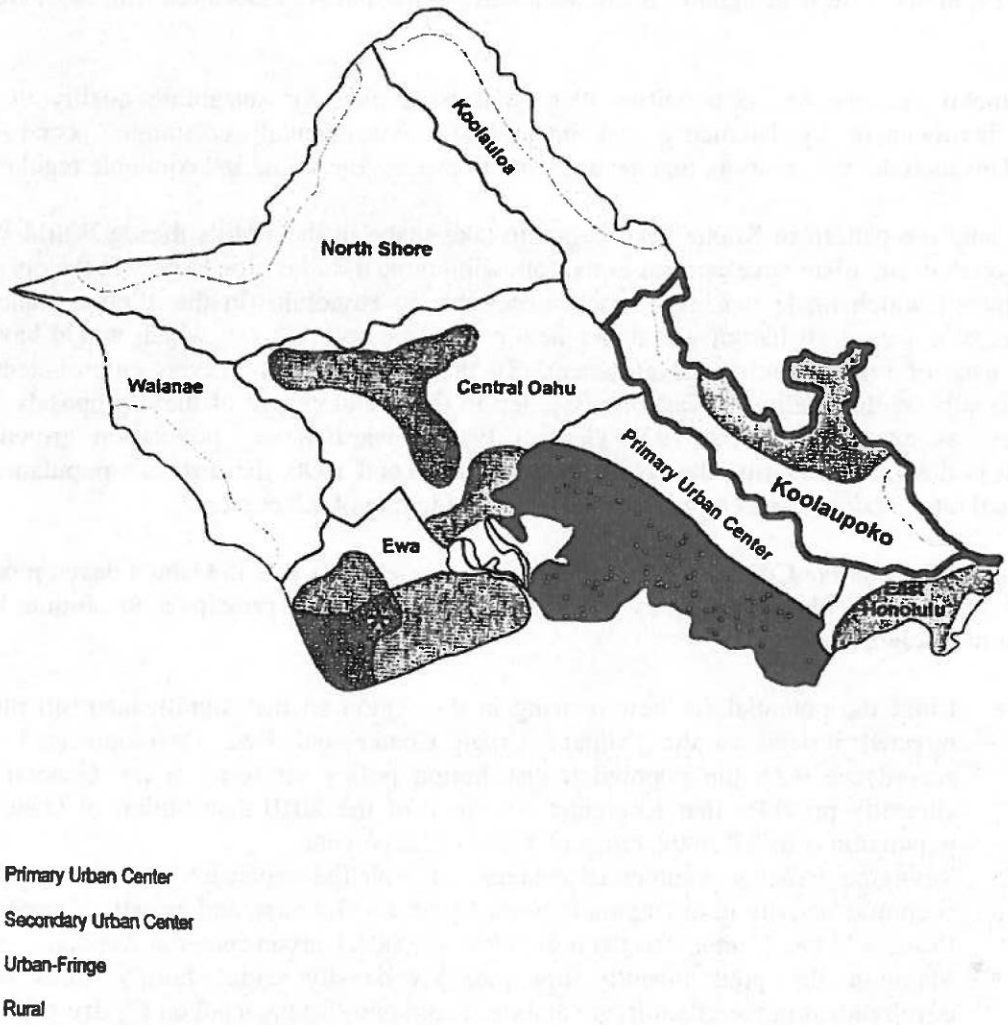
The Koolaupoko *Sustainable* Communities Plan shall be a plan for sustaining quality of life through community involvement by balancing and integrating environmental, economic, social and cultural objectives. This includes the creation, maintenance and re-evaluation of fair and equitable regulation.

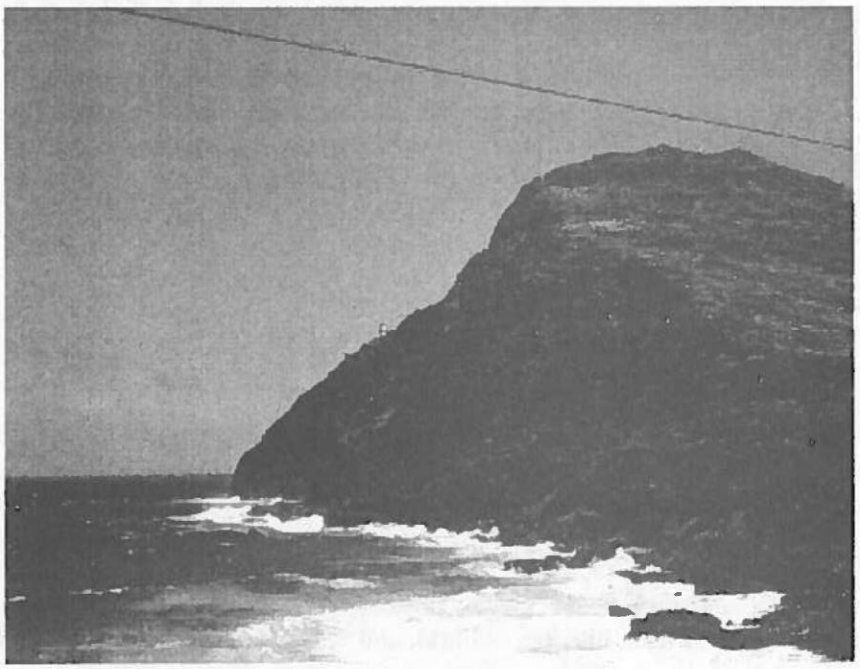
The present land use pattern in Koolaupoko began to take shape in the 1940's during World War II. There was rapid growth in suburban development in the following three decades, due largely to the opening of trans-Koolau highways which made the region more accessible to Honolulu. In the 1960's, Kaneohe was the proposed site of a deep-draft harbor and major new power generating plant, which would have spurred an even faster pace of regional urban development. By the mid-1970's, however, environmental concerns, focused especially on the quality of Kaneohe Bay, led to the abandonment of these proposals and a shift in public policy, as expressed in the 1977 General Plan, toward slower population growth and urban development in the district. During the decade between 1980 and 1990, the district's population grew at an average annual rate of 0.7 percent compared to the islandwide rate of 0.9 percent.

The Koolaupoko *Sustainable* Communities Plan reaffirms the region's role in Oahu's development pattern as intended in the General Plan policies by establishing the following principles for future land use and development in Koolaupoko:

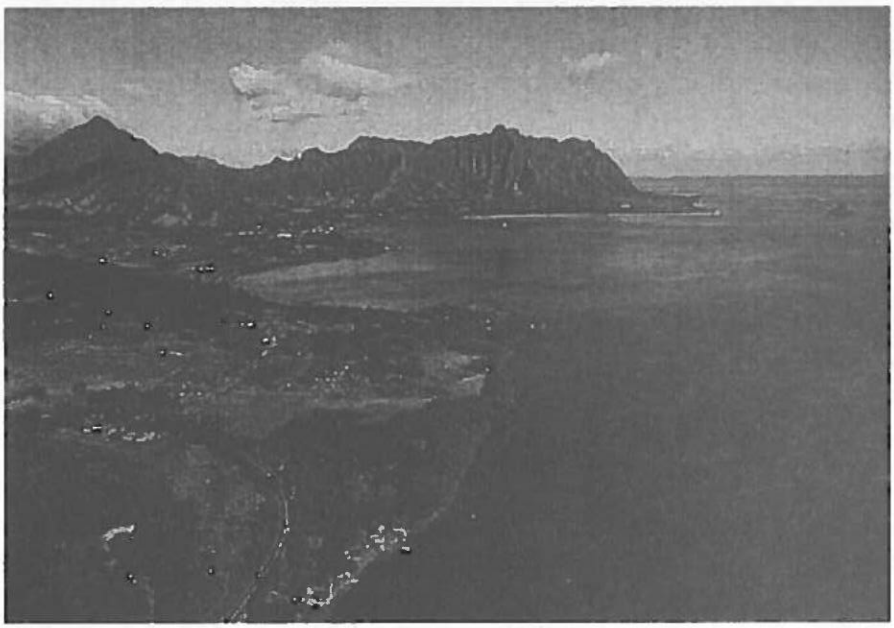
- Limit the potential for new housing in the region so that significant residential growth is directed instead to the Primary Urban Center and Ewa Development Plan Areas in accordance with the population distribution policy set forth in the General Plan, which currently provides that Koolaupoko's share of the 2010 distribution of Oahu's residential population is to fall in the range of 11.0 to 12.2 percent.
- Revitalize existing commercial centers and limit the expansion of commercial centers and economic activity in the region to promote the development and growth of employment in the Primary Urban Center, and the designated secondary urban center at Kapolei.
- Maintain the predominantly low-rise, low-density, single-family form of residential development in the urban fringe and rural communities depicted on **Figure 1-1**.
- Maintain and promote small-scale agricultural uses in the mauka areas of Waimanalo and from Kahaluu north to Kualoa.
- Avoid urbanization of flood- and erosion-prone areas and seek to restore the natural filtering, flood control, recreational, biological and aesthetic values of streams, fishponds and wetlands.
- Preserve scenic views and the scenic beauty of the ocean, bays and beaches.
- Preserve scenic views of ridges, upper valley slopes, shoreline areas from trans-Koolau and coastal highways; from coastal waters looking mauka; and from popular hiking trails that extend toward the Koolau Mountain Range and mauka from Kawainui Marsh.
- Discourage the use of shore armoring structures.
- Promote access to mountain and shoreline resources for recreational purposes and traditional hunting, fishing, gathering, religious, and cultural practices. Promote restoration of fish population in near-shore waters.
- Encourage continuation of small-scale agricultural uses in urban areas.

Figure 1-1
Communities in Koolaupoko by General Plan Type





***Koolaupoko** stretches from Makapuu Point at the region's eastern boundary ...*



... to Kaoio Point at the northernmost end of Kaneohe Bay.

2. THE VISION FOR KOOLAUPOKO'S FUTURE

This chapter expresses and describes the vision for Koolaupoko's future, discusses the key elements of the vision, and presents maps and tables.

2.1 VISION STATEMENT

The vision and plan for Koolaupoko focuses on the long-term protection of community resources and its residential character and the adoption of public improvement programs and development regulations that reflect a stable population.

2.1.1 PROTECT COMMUNITY RESOURCES

The Koolaupoko *Sustainable* Communities Plan provides a vision for preservation, conservation, and enhancement of the region's resources.

Protect Natural and Scenic Resources. Significant scenic views of ridges, upper valley slopes, shoreline areas from major public parks, highways, coastal waters and hiking trails must be protected. Furthermore, access to shoreline areas and mountainous regions should be improved and provided for all to use.

Preserve Cultural and Historical Resources. These resources should be preserved by retaining visual landmarks and significant views, protecting access rights relating to traditional cultural practices, and preserving significant historic, cultural, and archaeological features from Koolaupoko's past.

Preserve Agricultural Resources. Koolaupoko contains productive and potentially productive agricultural lands that should be preserved by adopting protective regulatory policies and implementing incentives and programs to promote active agricultural use of these lands.

Protect the Residential Environment of Neighborhoods. Preserve and enhance residential neighborhoods by improving infrastructure (roads, sewer, drainage, transportation) and by creating appropriate densities and design guidelines for residential communities.

2.1.2 ADAPT TO CHANGING COMMUNITY NEEDS

This vision for Koolaupoko extends to the year 2020. This is the horizon that was used to project potential residential development capacity of the region. Between 1995 and 2020, Koolaupoko is projected to experience minimal population growth. According to projections prepared in 1995 by the Planning Department, Koolaupoko's population might be expected to increase from about 117,700 in 1995 to approximately 122,100 by 2020, or by less than one half of one percent per year. Population growth of this magnitude is not expected to generate significant demand for additional residential or commercial development in the region.

Although Koolaupoko is nearly built-out, it will be essential to improve and replace, as necessary, the district's aging infrastructure systems to increase capacity, improve operational performance or extend the useful life of facilities. Infrastructure modifications may also be made to enhance the quality of the urban, rural, neighborhood, or natural environment.

There will be a modest increase in new dwellings and modifications to the region's existing housing stock to accommodate the small expected increase in the number of residents. As in other parts of Oahu, the proportion of elderly in the population is growing. This is likely to induce changes in housing and service needs in various ways. These changes to infrastructure systems and housing will be incremental.

2.2 KEY ELEMENTS OF THE VISION

The vision for Koolaupoko's future will be implemented through the following key elements:

- Adapt the concept of "ahupua'a" in land use and natural resource management;

- Preserve and promote open space throughout the region;
- Preserve and promote agricultural uses and define boundaries for these areas;
- Preserve and enhance scenic, recreational and cultural features that define Koolaupoko's sense of place;
- Emphasize alternatives to the private passenger vehicle as modes for travel;
- Adapt housing and public works standards to community character and changing needs;
- Protect residential neighborhoods;
- Define and enhance existing commercial and civic districts; and
- Establish Urban Community, Rural Community, Agriculture and Preservation boundaries.
- Maintain the predominantly low-rise, low-density, single-family character of the urban fringe and rural communities.

2.2.1 ADAPT THE CONCEPT OF "*AHUPUA'A*" IN LAND USES AND NATURAL RESOURCE MANAGEMENT

Prior to Western contact, Hawaiians managed the environment and organized their society through a land division system known as "*ahupua'a,*" whose boundaries are similar to those of watersheds (see **Figure 2-1**). Pukui and Elbert provide the following definition of *ahupua'a*:

> *Land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (*ahu*) of stones surmounted by an image of a pig (*pua'a*)*[1]

The *ahupua'a* has also been described as follows:

> *A principle very largely obtaining in these divisions of territory was that a land should run from the sea to the mountains, thus affording to the chief and his people a fishery residence at the warm seaside, together with the products of the high lands, such as fuel, canoe timber, mountain birds, and the right of way to the same, and all the varied products of the intermediate land as might be suitable to the soil and climate of the different altitudes from sea soil to mountainside or top.*[2]

The *ahupua'a* system recognizes the interconnected relationship between land-based and marine-based natural resources, focusing on streams as the connecting element between ridge and reef, especially in an island environment. The *ahupua'a* concept is still a useful concept for managing the natural environment and fostering desirable community development, adapted to the context of today's community needs and technology. It also may be a logical foundation for sub-planning areas in the future. Adapting and implementing the concept will require significant cooperation and integration of efforts among the various units of government whose jurisdictions encompass all or part of each *ahupua'a*.

In Koolaupoko, for example, natural wetlands and Hawaiian-built fishponds preserve wildlife habitat, filter pollutants from stormwater runoff, and provide flood protection. Over the years, the function of these wetlands and fishponds has become impaired by accelerated siltation and polluted runoff from urban

[1]Pukui and Elbert, *Hawaiian Dictionary*, 1986.

[2]In Re: Boundaries of Pulehunui, 4 Haw. 239, 241 (1879).

development and agricultural activities. Some have vanished entirely due to deliberate filling. While the filling of wetlands and fishponds has been restricted for at least two decades, regulatory and management practices such as those recommended in the State of Hawaii's Coastal Nonpoint Pollution Control Program[3] should be implemented to promote more effective maintenance of these resources and deter land-based activities which contribute to their degradation. Existing wetlands and fishponds should be preserved and restored. In addition, the potential for creating new wetlands to detain and retain stormwater should be explored to protect flood-prone areas, increase infiltration, and reduce polluted runoff into streams, estuaries and nearshore waters.

As applied to Koolaupoko's drainage system, the *ahupua'a* management concept would involve the retention of natural streambeds and, as feasible, partial or full restoration of drainageways that have been altered by concrete-lined channels. The preservation of natural streambeds implies the designation of a streamside management zone or "buffer area" where uses or activities may be controlled or modified to protect water quality and aquatic resources. It also implies revised or new public works standards to allow the dedication of passive stormwater drainage systems and minimal channel modifications to provide flood protection for improved or developed properties.

Most of Koolaupoko's native forests and other significant wildlife habitats are located within the State Conservation District (see **Figure 2-2**). Nevertheless, the State Urban District and State Agricultural District contain many natural habitats, such as stream segments and small wetlands. In the State Urban District, responsible land use under the *ahupua'a* concept will require avoiding urban development in areas susceptible to land movement soil erosion and sediment loss and using performance standards for the retention of sediment onsite during and after development activities. In the State Agricultural District, it means implementing best management practices in agricultural land use and operations.

The transition area between the Koolau Mountain Range and the urban and agricultural uses in the valleys and on the coastal plain should be preserved as a permanent greenbelt to serve as a natural, recreational and scenic resource conservation area; to prevent inappropriate development or use which may cause hazards or other undesirable environmental consequences downstream; and to provide opportunities for environmental and cultural research and education.

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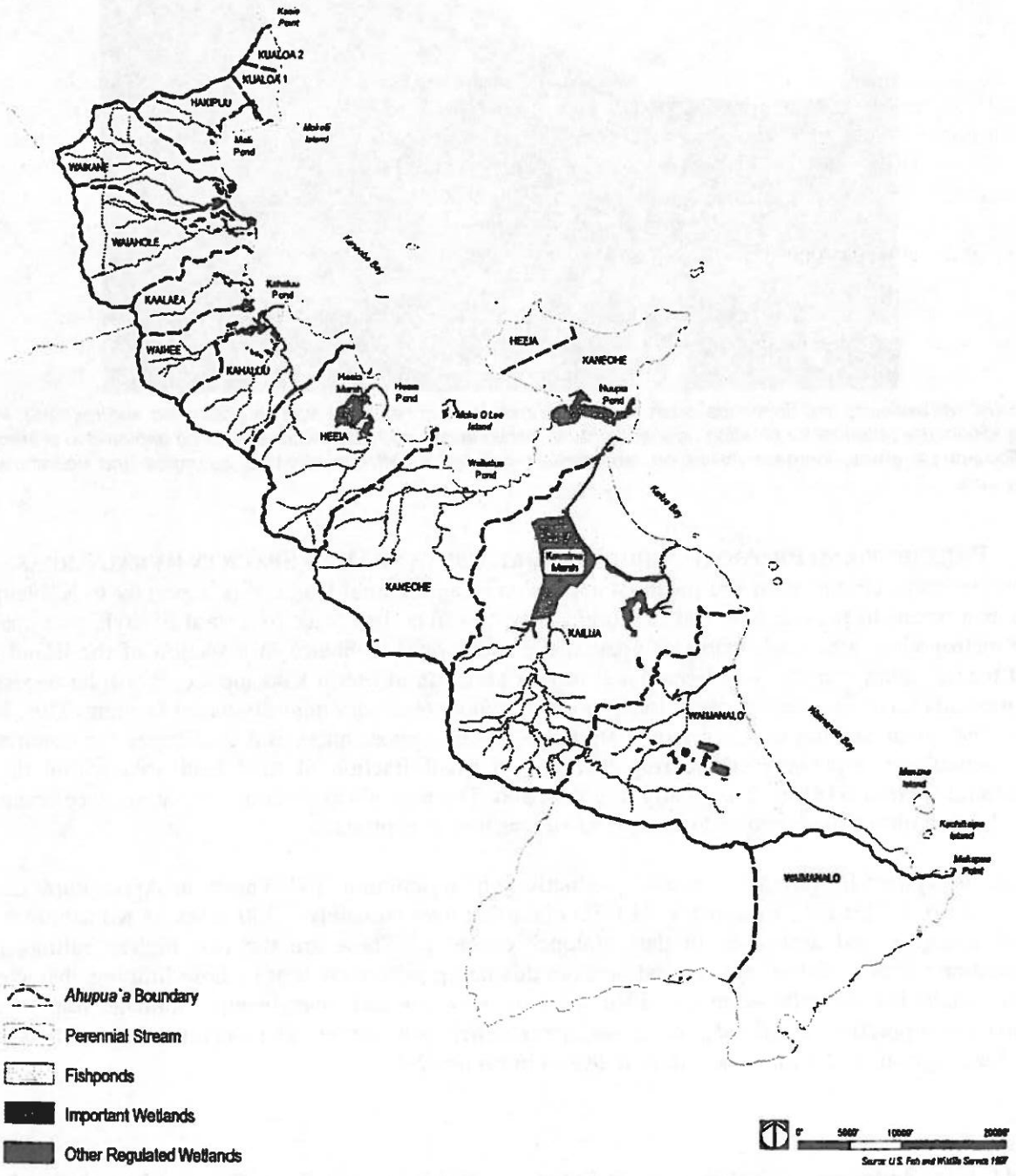
[3]Office of State Planning, *Hawaii Coastal Zone Management Program, Hawaii's Coastal Nonpoint Pollution Control Program Management Plan, Volume 1*, June 1996.

Figure 2-1
Streams, Wetlands, and Fishponds Relative to *Ahupua'a* Boundaries



***Existing** wetlands and fishponds, such as those shown here at Heeia, should be preserved and restored. In addition, the potential for creating new wetlands to detain and retain stormwater should be explored to protect flood-prone areas, increase infiltration, and reduce polluted runoff into streams, estuaries and nearshore waters.*

2.2.2 PRESERVE AND PROMOTE AGRICULTURAL USES AND OPEN SPACE IN RURAL AREAS

The preservation, continuation and potential expansion of agricultural land use is important to Koolaupoko's future as a means to provide jobs and economic activity; offers the choice of a rural lifestyle proximate to a major metropolitan area; and maintains open space and a rural ambience in a section of the island that is famed for its natural beauty. To preserve and protect agricultural use in Koolaupoko, it will be necessary to sustain commercially successful operations, as well as subsistence or culturally-based farming. This, in turn, requires an understanding of the region's strengths, future opportunities and challenges for commercially viable agriculture, especially considering that only a small fraction of total land area within the State Agricultural District on Oahu is presently in production. The region's agricultural producers face competition from other regions of the island and the state, as well as imported products.

In 1977, the system for rating the relative productivity of agricultural lands known as Agricultural Lands of Importance to the State of Hawaii (or ALISH) classified approximately 2,300 acres of Koolaupoko in the "Prime" category and 200 acres in the "Unique" category.[4] These are the two highest ratings in this classification system. "Other" agricultural lands in this rating system are those whose limiting characteristics require certain investments—such as added fertilizer or other soil amendments, drainage improvements, erosion control practices and flood control—to increase their productivity. The location of these lands relative to the State Agricultural District boundary is shown in **Figure 2-3**.

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[4] Harold L. Baker, *Agricultural Lands of Importance in the State of Hawaii*, University of Hawaii College of Tropical Agriculture and Human Resources, 1977.

Due to historical, physical and economic factors, Koolaupoko's agricultural operations consist primarily of small farms.[5] Many people are attracted to the lifestyle of the small farms in the region, pursuing agriculture for subsistence or supplemental income. However, rural areas also attract those who are seeking a large residential lot with a "country" ambience at a reasonable price. Land development, public works and environmental codes and standards should be designed to prevent the gradual conversion of agricultural areas into large-lot residential neighborhoods. The sustainability of agricultural uses will continue to be an issue of concern in the ongoing planning process and in future reviews of this plan.

Because of its wet climate and abundant perennial streams, Koolaupoko has traditionally been one of Oahu's principal regions for wetland taro cultivation and aquaculture, which in turn has renewed interest in restoring the fishponds and ancient irrigation systems. To varying degrees, Molii, Heeia and Kahaluu Fishponds are currently used for aquaculture; Kanohuluiwi and Waikalua Fishponds have potential for aquacultural operations with minor restoration improvements. To abet this potential, permanent instream flow standards should be established to maintain sufficient quantity and quality of surface water to support fishpond operations and taro cultivation. Educational tours of taro *lo'i* and fishponds could also help support these traditional agricultural activities.

Koolaupoko's wet climate also favors it as a region for certain other products, such as bananas, papayas and tropical flowers. Despite high rainfall, however, the lack of a reliable and inexpensive source of irrigation water is an impediment to agricultural uses in some areas. The State of Hawaii provides irrigation water at reasonable rates to farmers in Waimanalo and in its Waiahole Valley agricultural park. The State Commission on Water Resources Management's 1997 decision to release a greater amount of flow from Waiahole Ditch back to Windward streams makes more water available for the potential expansion of taro and other crop production in the northern valleys of the district.

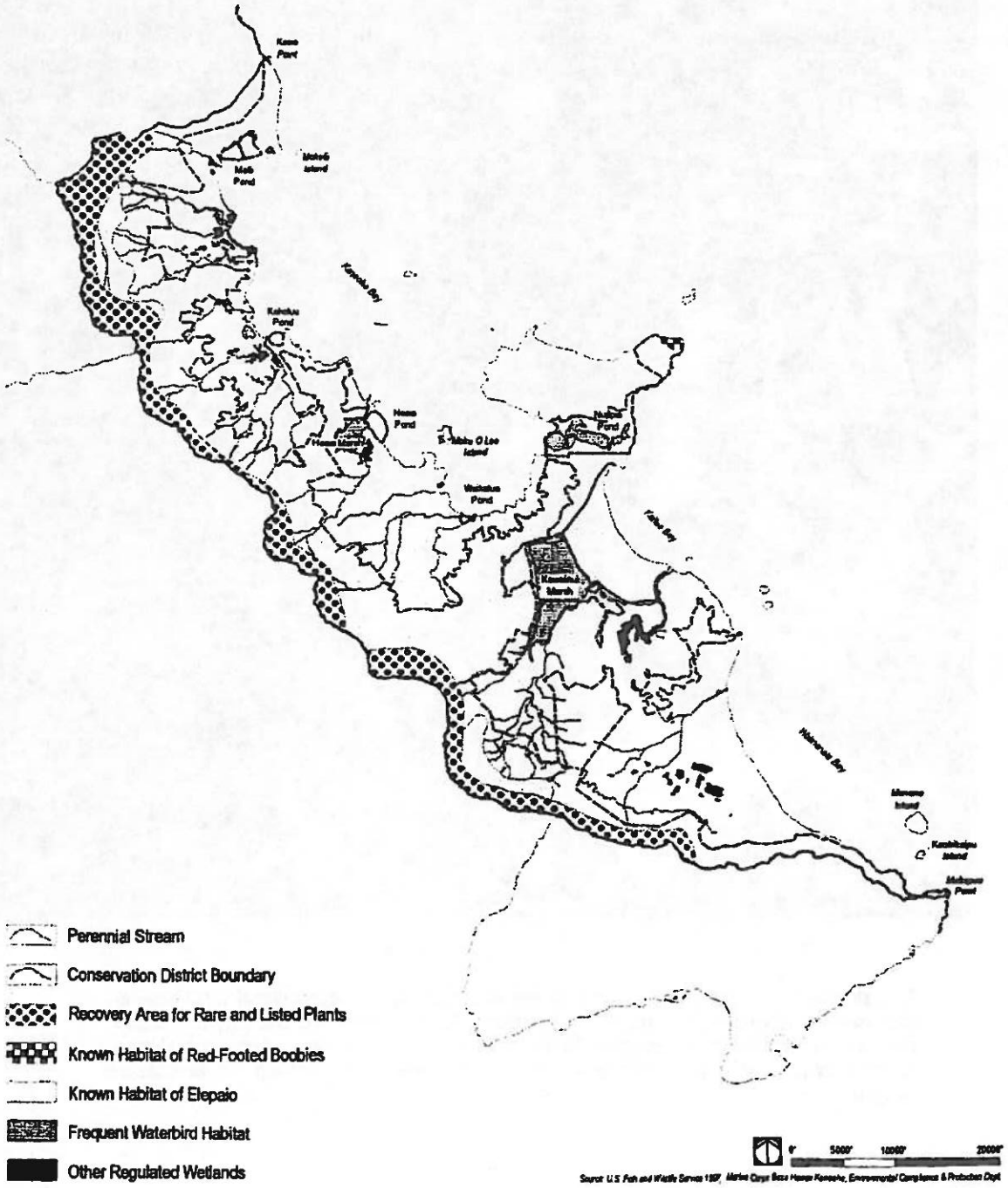
***While** active use of most of the taro lo'i and fishponds has been abandoned over the past couple of centuries, there has been revived demand for taro and aquaculture products in recent decades.*

[5] Decision Analysts Hawaii, Inc., *Koolaupoko Planning District, Oahu: Agricultural and Aquacultural Resources and Activities*, (prepared for the City and County of Honolulu Planning Department), May 1998.

Research facilities such as the University of Hawaii's Waimanalo Agricultural Experiment Station, Windward Community College, and a private fruit fly laboratory, also in Waimanalo, provide technical advice to farmers in the region. State and federal agricultural agencies also lend technical, financial and marketing support. The financial viability of commercial agricultural activity could be strengthened by providing appropriately located centers for minor composting and supplies, designated places for roadside vending and farmers' markets, and information and referral centers for potential customers and visitors. Composting facilities for green waste exist at Kapaa.

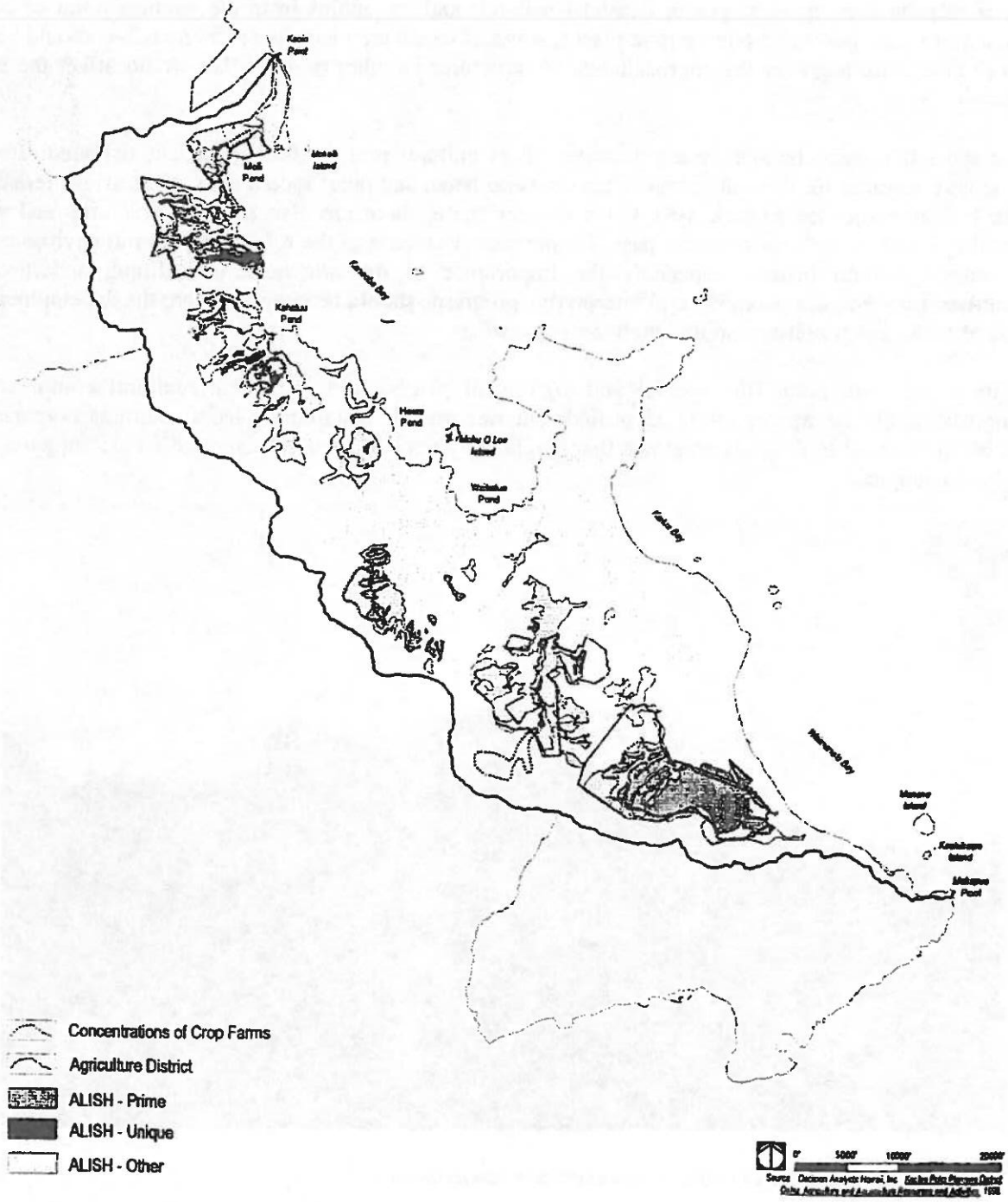
Other appropriate accessory uses including recreational or educational programs, or other uses consistent with the character of a rural, agricultural area can provide supplemental income necessary to sustain the primary agricultural activity. There should be a direct connection between these activities and the maintenance of agricultural uses on the same properties.

Figure 2-2
Wildlife Habitats Relative to State Conservation District Boundary



***The** preservation, continuation and potential expansion of agricultural land use is important to Koolaupoko's future. It provides jobs and economic activity; offers the choice of a rural lifestyle proximate to a major metropolitan area; and maintains open space and a rural ambience in a section of the island that is famed for its natural beauty.*

Figure 2-3
Crop Farms and ALISH Classifications Relative to the State Agricultural District

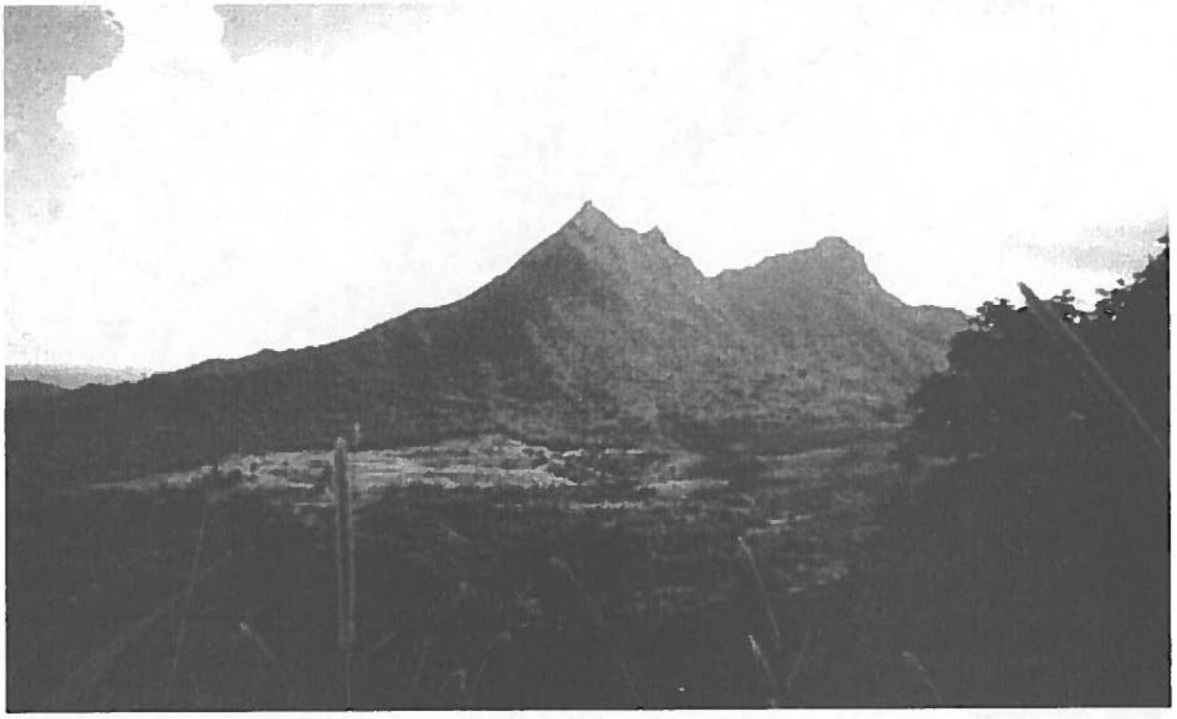


2.2.3 PRESERVE AND ENHANCE SCENIC, RECREATIONAL AND CULTURAL FEATURES THAT DEFINE A SENSE OF PLACE

Koolaupoko is replete with striking topographic features, outstanding beaches and bays, lush valleys, perennial streams and other natural features and landmarks that visually define a "windward" sense of place. Views of ridgelines or upper slopes of coastal headlands and mountains from the vantage point of coastal waters, major roads, parks and other public places, some of which are identified in **Figure 2-4**, should be kept free from land disturbance or the encroachment of structures or other projects that would affect the scenic viewplanes.

Koolaupoko's landscape includes many vestiges of its cultural past, including ancient fishponds fronting Kaneohe Bay, terraces for the cultivation of taro, several heiau and other sacred sites, and various remains of prehistoric habitation (see **Figure 2-5**). On a smaller scale, there are also historic structures and places representing Koolaupoko's more recent past. To increase awareness of the role of the natural environment in Koolaupoko's cultural history, especially the importance of the *ahupua'a* in defining activities and communities, historic site restoration and interpretive programs should be integrated into the development and creation of parks and shoreline and mountain access systems.

In addition, *na wahi pana* (the special and significant places) and *na malae* (cultural complexes) of Koolaupoko should be appropriately identified and interpreted. Community-based cultural organizations should be encouraged to develop programs that heighten appreciation for Koolaupoko's na wahi pana as na malae for na ahupua'a.



***Mount** Olomana is one of Koolaupoko's significant scenic features.*

Figure 2-4
Significant Scenic Features and Viewplanes in Koolaupoko

Figure 2-5
Significant Cultural and Historic Sites and Proposed Trails in Koolaupoko

Streams should be made more physically and visually accessible as routes for pedestrians or bicyclists, especially in urbanized areas. Existing maintenance easements or rights-of-way along several streams and drainage channels could become public greenways with natural or additional landscaping for this purpose.

Physical access to the shoreline and mountain areas should also be increased and enhanced, especially along Kaneohe Bay between MCBH Kaneohe and Heeia Fishpond; along Kailua Beach between Kailua Road and Kawainui Channel; and to beaches within the Marine Corps Base Hawaii -- Kaneohe. To maintain lateral access along public beaches the challenges of long-term and seasonal erosion of the shoreline needs to be addressed. In addition, the disposition of beach accretion should be reviewed as a statewide issue, with the intent of making it public land in perpetuity.

Improved access to mountain areas can be achieved by developing the potential of the Koolaupoko Trail Complex and the Waikane Trail. Complementary to this will be the acquisition and development of cultural and nature parks in Haiku Valley and Waikane Valley, where interpretive centers, vehicular parking and other facilities can be provided near the trailheads.

2.2.4 EMPHASIZE ALTERNATIVES TO THE PRIVATE PASSENGER VEHICLE AS MODES FOR TRAVEL

Most of Koolaupoko's urban growth has occurred since the 1950's in the form of suburban "bedroom" communities, so there has been heavy reliance on automobile travel for commuting and other trips. Trans-Koolau highways have been built and expanded to accommodate this travel demand. The completion of the H-3 Freeway in 1997 further provides service for commuter traffic, although its main purpose is for military mobility. Highway improvement projects, however, exacted environmental costs that have diminished the quality of life in the region. As an example, the widening of Kahekili Highway resulted in increased volumes of polluted runoff; heat island effects and aesthetic impacts due to the loss of and absence of shade trees in the right-of-way; and visually obtrusive acoustical barrier walls to mitigate the impacts of higher levels of vehicular noise on adjacent residences.

Current transportation plans call for additional highway widenings and interchange construction to facilitate vehicular traffic flow, as described in Section 4.1.1. Nevertheless, there are several reasons supporting a significant shift in the transportation policy for Koolaupoko. First, State highway officials acknowledge that the H-3 Freeway has absorbed a much higher percentage of the peak period trans-Koolau commuter traffic than had been anticipated, thereby substantially relieving the other two trans-Koolau routes and the connections to them. Second, the congested Leeward corridor and proposed new roadway network in the island's more rapidly urbanizing regions should have much higher priority for the use of limited highway improvement funds. Finally, emphasis on automobiles as the principal means of transportation is inconsistent with other elements of the vision expressed in this *Sustainable* Communities Plan. Transportation system improvements in Koolaupoko should be directed instead towards alternative travel modes, including public transit and pedestrian and bicycle facilities.

2.2.5 ADAPT HOUSING AND PUBLIC WORKS STANDARDS TO COMMUNITY CHARACTER AND CHANGING NEEDS

As described in Section 2.1, Koolaupoko's modest projected increase in population will be housed by developing small-scale "infill" sites or additions to existing dwellings. Paradoxically, while the average household size has declined over the past couple of decades, there has been a concurrent trend toward multi-generational and "non-traditional" households and larger dwelling sizes on single-family residential lots as aging housing stock is replaced, expanded or remodeled. The incremental physical transformation can have adverse impacts on the character of mature residential neighborhoods. Zoning and public works standards should be amended to assure that appropriate building scale and quiet, attractive and safe streets will be maintained.

***Transportation** system improvements in Koolaupoko should be directed towards alternative travel modes, including public transit and pedestrian and bicycle facilities.*

New, expanded or remodeled dwellings should be proportionate in size to their lot area and the district in which they are located. The prevailing building-to-lot size ratio should be lower than currently allowed in both urban and rural areas. The prevailing building-to-lot size ratio should be lower in rural residential areas than that allowed in urban residential areas. In all areas, single-family dwellings should have pitched roofs with relatively wide overhangs in response to the warm, rainy climate of the region.

Rear and side yard requirements should be increased. Design standards for streets and front yards should recognize their importance in defining neighborhood identity and as places for informal recreation and neighborly interaction. Landscaped front yards and pedestrian entries should be visible from the street to promote a sense of neighborhood. A strong visual relationship among neighborhood homes is also an effective measure to deter crime.

Along residential streets with wide roadways serving as through-routes, resulting in traffic speeds which threaten pedestrian and bicycle safety and increase traffic noise, traffic calming measures should be implemented. Examples include the use of intersection narrowing, speed tables and similar measures to reduce traffic speed. Priority for such traffic calming should be given to those residential streets of Kaneohe and Kailua where more conventional traffic control measures, such as traffic signals and signage, have either failed to achieve the desired results or have been resisted by residents of the area or the responsible transportation agencies.

Some new housing will be developed as multi-family residential buildings to provide for a choice in living environments, especially for the elderly population and smaller households. Multi-family housing should be located in the existing town core areas of Kaneohe and Kailua or should be located in other appropriately

designated areas in this plan and designed to reflect the suburban residential character of the surrounding neighborhood, with low building profiles, pitched roof forms and ample yard landscaping.

2.2.6 DEFINE AND ENHANCE EXISTING COMMERCIAL AND CIVIC DISTRICTS AND INSTITUTIONAL CAMPUSES

General Plan policy discourages major new employment growth in this region. Any significant retail and office expansion in this region would not be consistent with the General Plan policy to direct job growth to the Primary Urban Center and Secondary Urban Center. Furthermore, given the small amount of population growth that is forecast for Koolaupoko, there is expected to be only modest growth in the demand for commercial land uses to support the communities of this region. Nevertheless, the continued viability of existing commercial districts and institutions is an important part of the vision for Koolaupoko because they provide a significant number of jobs for residents within the region and play an integral part in the region's social and cultural life.

Koolaupoko's commercial areas developed primarily in the 1950's through the early 1980's, concurrently with the pace of suburban housing development. Typical of the suburban pattern of this era, most of the region's commercial development is oriented to the automobile. On larger lots, commercial developments tend to follow the shopping center model. On smaller lots fronting arterial highways, such as Kamehameha Highway in Kaneohe, the predominant development form is "strip commercial." In either case, commercial establishments are divorced from the sidewalk and the streets and highways that front them are congested with traffic as cars enter and exit from parking lots. There is no clear distinction between the central commercial districts of Kaneohe and smaller, outlying community shopping centers. In Kailua, the central business district is fairly clearly defined. However, both business districts have clusters of civic uses on their edges that establish their identities as regional town cores. Also, there are pockets within both districts - especially in Kailua - where the development pattern resembles a traditional commercial street, with storefronts and entries facing the public sidewalk.

Land use policy and public infrastructure investments should enhance the roles and identities of the central business districts of Kailua and Kaneohe as the region's principal town centers. To make more efficient utilization of land as properties are redeveloped or building areas are expanded and create more "walkable" districts, the town centers should be confined to the areas presently zoned for commercial, light industrial and civic uses and be treated as mixed-use zones. Although the commercial mixed-use areas will allow development of projects with both commercial and multi-family residential uses, it is not intended that such development will result in significant residential population increases beyond those set forth by the General Plan's population policies; nor is it intended that commercial zoning be significantly reduced. Applications for rezoning to business mixed use designations should be evaluated in this context.

There should be no expansion of commercial or industrial zoning or new civic uses such as post offices, libraries, and government offices in outlying areas of Kailua or Kaneohe. If civic buildings are added, expanded or remodeled, they should be sited and designed in a manner which encourages pedestrian and transit access.

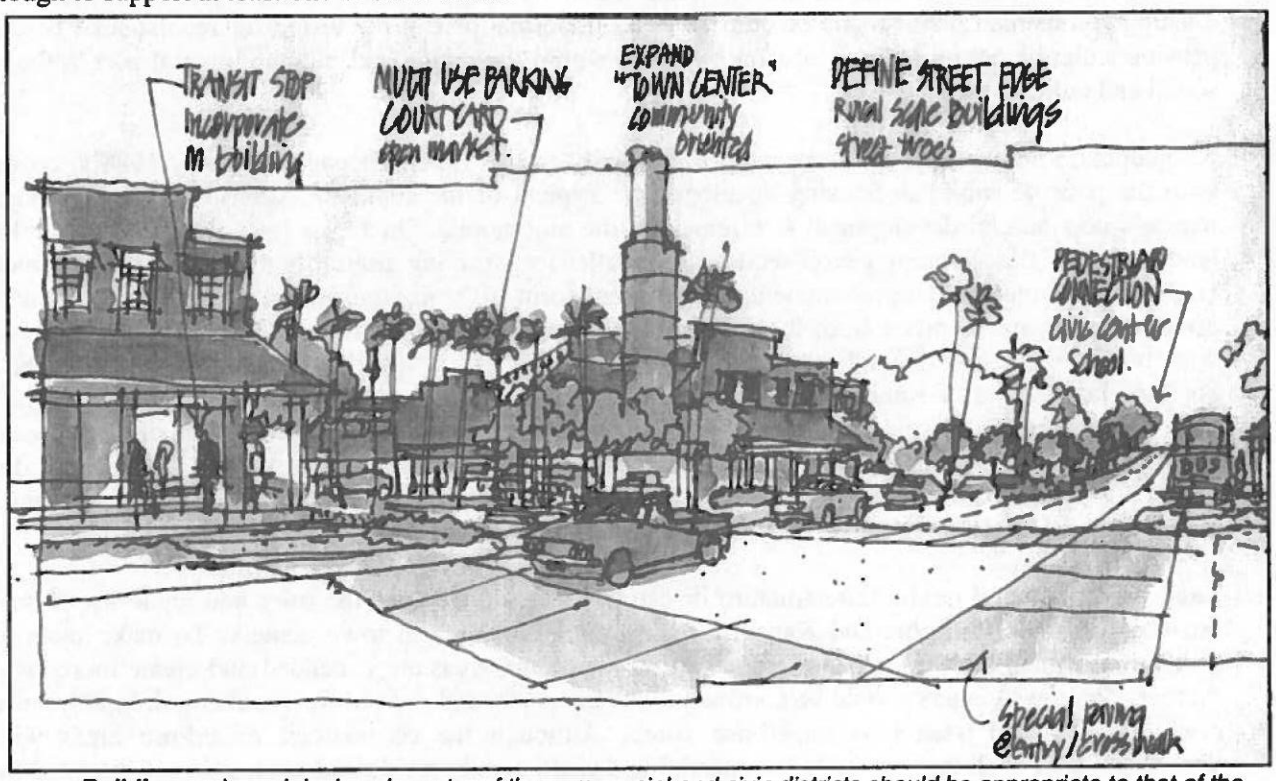
The pedestrian orientation of the town centers should be strengthened by implementing a circulation plan that improves public sidewalks, links them with through-block walkways and parking lots, and expands transit services and amenities.

Outside of the Kailua and Kaneohe central business districts, the smaller community-oriented shopping centers and environs of Temple Valley, Windward City, Aikahi, and Enchanted Lake should retain their suburban character and be limited to their present land area and approximate floor area. Zoning for the light industrial area near Windward City should allow a mix of commercial and industrial uses to reflect the actual pattern of development in that area and establish a more desirable streetscape.

In the commercial districts of Waimanalo and Kahaluu, building scale and design character should be appropriate to a rural area. The intent is to create and retain a "village center" ambiance for these areas, where

uses and activities such as farmers' markets and feed stores are a visible presence. Also, provisions should be made for roadside vending for the sale of agricultural products in a manner that is consistent with traffic safety and rural ambience.

To stimulate the revitalization of the town centers of Kailua and Kaneohe, land use and zoning policy should prevent the introduction of "big box" retail stores or shopping centers consisting predominately of discount or factory outlet stores within the region. This type of commercial development often results in inappropriate building scale, localized traffic and parking demand impacts, and the economic decline of existing businesses. Koolaupoko does not yet have this type of commercial development, although the region's population is large enough to support at least one of these stores.



***Building** scale and design character of the commercial and civic districts should be appropriate to that of the surrounding community.*

More favorable sites have been found for this type of commercial development in Leeward and Central Oahu, where large development parcels are more readily available and better situated to capture patronage from the island's major population growth area. The opening of the H-3 Freeway has also made these "value retail" stores more accessible to Koolaupoko's residents. Development of a "big box" store or discount center would be inconsistent with the vision for Koolaupoko's future expressed in this *Sustainable* Communities Plan; land use policy and zoning regulations should specifically prohibit retail and warehouse businesses over 90,000 square-feet in size.

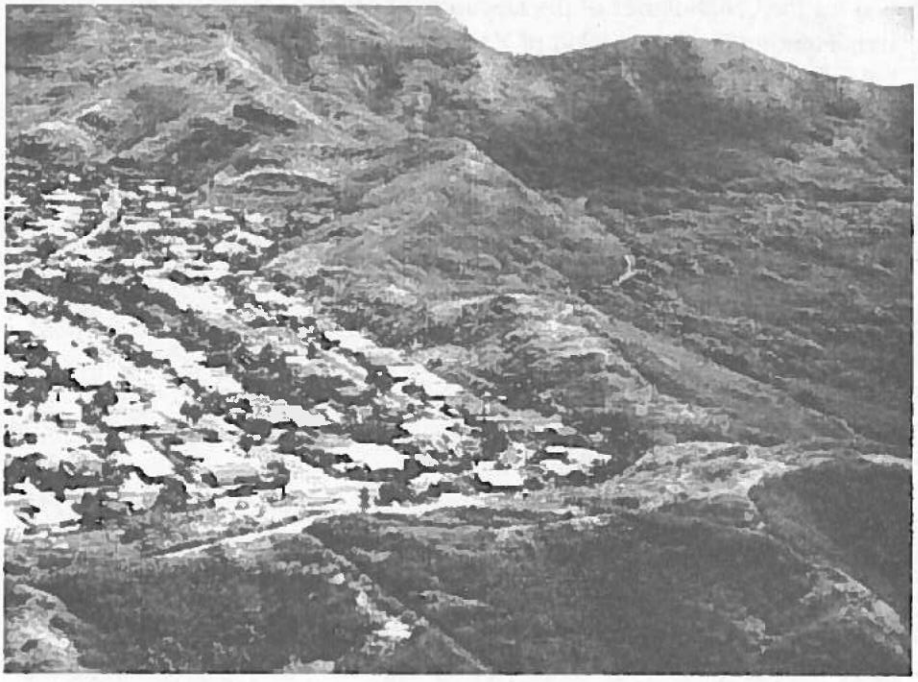
Koolaupoko currently has six major institutional campuses, including two colleges, two hospitals and two correctional facilities. No new institutional campuses are envisioned for Koolaupoko, but minor expansion or redevelopment within the existing grounds of the region's major institutions is expected to occur. Moreover, there should be more concerted attempts to integrate the activities, income and employment generated by these institutional campuses into the life of the Kaneohe and Kailua town centers. The principles and design criteria set forth in Section 3.7 are intended to guide these changes. In addition, the application of approved localized "urban design" criteria should be a major factor in redeveloping and enhancing town and village centers.

2.2.7 ESTABLISH URBAN COMMUNITY, RURAL COMMUNITY, AGRICULTURE AND PRESERVATION BOUNDARIES

Four types of boundaries have been established to guide development and preserve open space and agricultural areas. These are the Urban Community Boundary, the Rural Community Boundary, the Agriculture Boundary, and the Preservation Boundary. It is intended that these boundaries will remain fixed through the 2020 planning horizon. They are intended to help guide future development, redevelopment, and resource management within: existing zoning designations; future zoning designations and other standards or guidelines that may be developed in response to the provisions of this plan; other established entitlements; or in accordance with pertinent policy and character described in this plan.

The purpose and intent of each of the four boundaries are described below:

2.2.7.1 Urban Community Boundary



The Urban Community Boundary is intended to confine most new development to "infill" sites within existing urbanized areas and to prohibit continuous sprawl.

The Urban Community Boundary is established to define and contain the intended extent of urbanized or "built-up" areas to those districts designated as "urban fringe" by the General Plan. The purpose is to accommodate modest increases in population, to provide adequate lands for facilities or other groupings of built uses needed to support established communities while protecting lands outside this boundary (and the Rural Community Boundary) for agriculture and other resource and open space values. Areas within this boundary characteristically include extensive tracts of residential, commercial, industrial or mixed-use development clearly distinguishable from undeveloped or more "natural" portions of the region's environment. Urban Community Boundaries may include lands designated "park," "agriculture," "preservation," or areas with development-related hazards such as steep slopes or unstable soils; it is intended these areas will not be developed with uses unsuitable to their designations or in ways that may tend to exacerbate those hazards.

The Urban Community Boundary is intended to confine most new development to "infill" sites within existing urbanized areas and to prohibit continuous sprawl. This more compact form of development will help to achieve relatively lower site development costs, more efficient utilization of existing urban infrastructure systems, and reduced reliance on the automobile by making transit ridership, walking, and bicycling more feasible and attractive as modes of travel.

The Urban Community Boundary generally circumscribes the community areas of Kaneohe, Kailua, Olomana, Maunawili and Ahuimanu within the State Urban District boundary. The Urban Community Boundary is intended to include the following:

- Areas within the residential, apartment, commercial, industrial and mixed-use districts;
- Areas in the country district at Haiku Plantations, adjacent to Kailua High School, and immediately adjoining the residential district;
- Areas currently in the inventory of Hawaiian Memorial Park and the Hawaii State Veterans' Memorial Cemetery;
- Public schools serving these communities;
- The campuses of Windward Community College and the Hawaii State Hospital;
- Bayview Golf Course, Mid-Pacific Country Club, and the Klipper Golf Course at MCBH;
- Lands developed for the beneficiaries of the Department of Hawaiian Home Lands;
- Correctional and detention facilities makai of Kalanianaole Highway; and
- The industrial district area at Kapaa.

The Urban Community Boundary is intended to exclude the following areas:

- Undeveloped parcels on the slopes of Kaiwa Ridge, Oneawa Hills and Puu o Ehu;
- Undeveloped lands within and directly adjacent to Kawainui Marsh, and the wetlands of Heeia and Kaelepulu;
- Most of Heeia Kea valley;
- The slopes of Mount Olomana;
- Areas within the State Conservation District;
- Military lands, except those at MCBH developed with uses associated with the residential, apartment, commercial, industrial and mixed-use districts; and
- Portions of the slopes of Puu Maelieli and the valleys of Ahuimanu, Maunawili and Haiku where lots typically exceed one acre in size.

2.2.7.2 Rural Community Boundary

The Rural Community Boundary is established to define, protect, and contain communities in areas that the General Plan designates "rural" and that exhibit the physical characteristics of rural lifestyles. This boundary is intended to provide adequate lands to accommodate modest increases in population, to allow development of facilities needed to support these established communities, to protect such communities from the more intense land uses and patterns of development associated with more urbanized areas, and to protect areas outside the boundary for agriculture or other resource or open space values. Rural Community Boundaries may include lands designated "park," "agriculture," "preservation," or areas with development-related hazards such as steep slopes or unstable soils; it is intended these areas will not be developed with uses unsuitable to their designations or in ways that may tend to exacerbate those hazards.

Rural communities defined by this boundary consist of smaller, more dispersed, less intensively developed residential communities and towns than those of Koolaupoko's urban fringe areas. Development character should be generally low-density, low-rise, small scale, and reflective of a "country" setting. Within residential areas, the landscaping and front yards that provide the foregrounds to the dwellings should be the principal visual elements. In commercial areas, the pedestrian environment and associated amenities should predominate, and storefronts on both sides of the street should be simultaneously perceivable. Buildings should be oriented principally to the street, should relate readily to a human scale, and should be organized to encourage interaction between the public and private domains.

The Rural Community Boundary is intended to confine most new development to "infill" sites that are adjacent to existing developed sites. By discouraging sprawl, the more compact form of development will help to achieve relatively lower site development costs, more efficient utilization of existing infrastructure

systems, and reduced reliance on the automobile by making transit ridership, walking, and bicycling more feasible and attractive as modes of travel.

The Rural Community Boundary generally circumscribes the sections of Waimanalo, Kahaluu, Waiahole and Waikane in the State Urban District where there are clusters of parcels that are less than two acres in size occupied by dwellings or buildings used for community or commercial purposes other than agriculture. The Rural Community Boundary is intended to include the following:

- Areas in the residential, apartment, commercial, industrial and mixed-use districts;
- Areas developed for the beneficiaries of the Department of Hawaiian Home Lands;
- Public schools serving these communities;
- The campus of the Hawaii Job Corps; and
- Areas not designated as Agricultural Lands of Importance to the State of Hawaii that are directly adjacent to or surrounded by residential or other urban uses and are suitable for minor infill development for residential, community or commercial purposes.

The Rural Community Boundary excludes much of the State Urban District land in the vicinity of Kahaluu where a predominately agricultural use pattern currently prevails.

2.2.7.3 Agriculture Boundary

The Agriculture Boundary is established to protect important agricultural lands for their economic and open space values, and for their value in helping to give the region its identifiable rural character. Important agricultural lands include lands currently in agricultural use and lands with high value for future agricultural use. They include agriculturally important lands designated "prime," "unique," or "other" on the Agricultural Lands of Importance to the State of Hawaii (ALISH) maps.

The primary use of all lands within the Agriculture Boundary should be agriculture or directly supportive of the agriculture industry. Exceptions include "institutional" uses, which must be developed and operated to maintain compatibility with agricultural uses, and other non-urban or non-rural uses such as waste disposal or quarry sites, which must also demonstrate such compatibility.

The Agriculture Boundary is intended to include the following:

- Areas in the agricultural districts, except areas in the inventory of Hawaiian Memorial Park and the Hawaii State Veterans' Memorial Cemetery, developed golf courses, and public nature preserves or nature parks;
- Areas in the country district, except those parcels immediately adjoining a residential district lying within the Urban Community Boundary; and
- The campus of Le Jardin Academy.

2.2.7.4 Preservation Boundary

The Preservation Boundary is established to protect undeveloped lands that are not valued primarily for agriculture but which form an important part of the region's open space fabric. Such lands include important wildlife habitat, archaeological or historic sites, significant landforms or landscapes over which significant views are available, and development-related hazard areas. They exclude such features, sites or areas that are located within the Urban Community, Rural Community or Agriculture boundaries.

The Preservation Boundary generally circumscribes undeveloped lands that:

- Are necessary for protection of watersheds, water resources and water supplies;
- Are necessary for the conservation, preservation and enhancement of sites with scenic, historic, archaeological or ecological significance;

- Are necessary for providing and preserving park lands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, fish and wildlife, for forestry, and other activities related to these uses;
- Are located at an elevation below the maximum inland line of the zone of wave action, and marine waters, fishponds, and tidepools unless otherwise designated;

***The** primary use of all lands within the Agriculture Boundary should be agriculture or directly supportive of the agriculture industry.*

- Comprise offshore and outlying islands unless otherwise classified;
- Are generally characterized by topography, soils, climate or other related environmental factors that may not be normally adaptable or presently needed for urban community, rural community, or agriculture use;
- Have general slopes of 20 percent or more which provide for open space amenities and/or scenic values;
- Are susceptible to floods and soil erosion, lands undergoing major erosion damage and requiring corrective attention, and lands necessary to the protection of the health, safety and welfare of the public by reason of soil instability or the lands' susceptibility to landslides and/or inundation by tsunami and flooding;
- Are used for state or city parks outside the Urban Community and Rural Community boundaries; or
- Are suitable for growing of commercial timber, grazing, hunting, and recreation uses, including facilities accessory to such uses when such facilities are compatible with the natural and physical environment.

The Preservation Boundary is intended to include the following:

- Areas within the State Conservation District and other areas within the preservation district but not located within the Urban Community, Rural Community or Agriculture boundaries as described above;
- Public nature preserves and nature parks;
- Golf courses not located within the Urban Community and/or Agriculture Boundaries as described above;
- Military lands, except those at MCBH developed with uses associated with the residential, apartment, commercial, industrial and mixed-use districts;
- Correctional and detention facilities mauka of Kalanianaole Highway; and

- The campuses of the Oceanic Institute and Sea Life Park.

The Preservation Boundary excludes such features, sites or areas located within the Urban Community, Rural Community or Agriculture boundaries.

3. LAND USE POLICIES, PRINCIPLES, AND GUIDELINES

The vision for development of Koolaupoko described in the preceding chapter will be implemented through application of the following land use general policies, principles, and guidelines.

3.1 OPEN SPACE PRESERVATION

Open space preservation is a key element of the vision for Koolaupoko's future. Long-term protection and preservation of scenic resources, agricultural areas, natural areas, and recreational areas are important to maintaining the character and attractiveness of Koolaupoko for both residents and visitors.

3.1.1 GENERAL POLICIES

Open space will be used to:

- Protect scenic beauty and scenic views and provide recreation;
- Promote access to shoreline and mountain areas;
- Define the boundaries of communities;
- Prevent urban sprawl;
- Provide buffers between agricultural uses and residential neighborhoods;
- Create a system of linear greenways along roadways and drainage channels; and
- Prevent development in areas susceptible to landslides and similar hazards

3.1.2 PLANNING PRINCIPLES

The general policies listed above provide the basis for the following planning principles:

- ***Provide Passive and Active Open Spaces***. The open space system should consist of areas in both active and passive uses. Active areas include community-based parks, golf courses, cemeteries and intensive agricultural uses. Passive areas include lands in the State Conservation District, drainage and utility corridors, nature parks, preserves and wetlands, and agricultural lands such as pastures, aquaculture ponds and fallow fields. Beach parks, which may be either active or passive, depending on the extent to which the landscape has been modified by grading and construction of facilities and the intensity of public use, are also part of the open space system.

- ***Promote Accessibility of Recreational Open Space***. Public parks and most golf courses will be accessible for public recreational use, but the open space system should also promote the accessibility of shoreline and mountain areas (as required by City ordinance and State law). Access to mountain trails and shoreline areas should be readily available. Provision of such access should also address the need for parking and emergency vehicle access.

- ***Enhance the Visual and Physical Definition of Urban Areas***. Koolaupoko's residential communities are physically defined by topographic features; major waterbodies, including wetlands; and agricultural areas. Other forms of open space and landscaping, however, should be used to visually enhance the separation between communities, particularly where topographic features are less pronounced.

- ***Dual Use of Roadway and Drainage Corridors***. Roadways should be attractively landscaped to serve as linear open space features and create a more inviting environment for walking,

jogging and biking. Where physical modification of natural drainageways is necessary to provide adequate flood protection, such modifications should be designed and constructed to maintain habitat and aesthetic values, and to avoid degradation of stream, coastline and nearshore water quality.

3.1.3 GUIDELINES

The following provides a brief description of regional open space resources in Koolaupoko, followed by guidelines for carrying out the general policies and planning principles related to each open space element.

3.1.3.1 Mountain Areas

Mountainous regions in Koolaupoko are in the State Conservation District and thus the State Board of Land and Natural Resources (BLNR) oversees uses in these areas. Limited public access to upper reaches of valleys and mountain areas is presently available via the hiking trails described below as well as those shown in **Figure 3-1**.

- ***Koolaupoko Trail Complex***. This is a proposed 15-mile system of interconnected trails, most segments of which are already open, including the Likeke Trail and Maunawili Falls trails. This trail complex features opportunities for hiking, hunting, nature study, bird watching and photography. Horseback riding is possible in some sections, as is mountainbiking. Points of interest along the route include Maunawili Falls, the Maunawili Ditch irrigation flumes, and numerous archaeological sites, including taro *lo'i* and *heiau*. The area's rich history adds to the interpretive potential of the trails.

- ***Waikane Trail***. This trail begins in Waikane Valley and extends to the crest of the Koolau Mountain Range, where it intersects with the Koolau Ridge Trail Complex. The trailhead is within the site of Waikane Nature Preserve, which presents an excellent opportunity for related interpretive and educational programs and improved facilities for hikers.

- ***Kaiwa Trail***. This trail, following the crest of Kaiwa Ridge from Lanikai to Kalanianaole Highway, is in a relatively urban setting. It is a good vantage point for striking panoramic views of the adjacent Bellows Air Force Base and suburban communities backdropped by natural features such as Kailua Bay, Waimanalo Bay, the Koolau Mountain Range and Mount Olomana.

The State's Na Ala Hele Program manages and maintains public trails. Of the trails mentioned above, only the Kaiwa Trail and portions of the Koolaupoko Trail Complex (see Figure 3-1) are Na Ala Hele Program trails. Na Ala Hele trails that are part of the Koolaupoko Trail Complex are the:

- Maunawili-Waimanalo Access Road
- Maunawili Trail
- Maunawili Ditch Trail
- Maunawili Falls Trail
- Maunawili Falls Connector Trail

Other trails may be privately owned and/or managed. Issues regarding ownership, safety and liability must be further addressed before official access to trails can be assured.

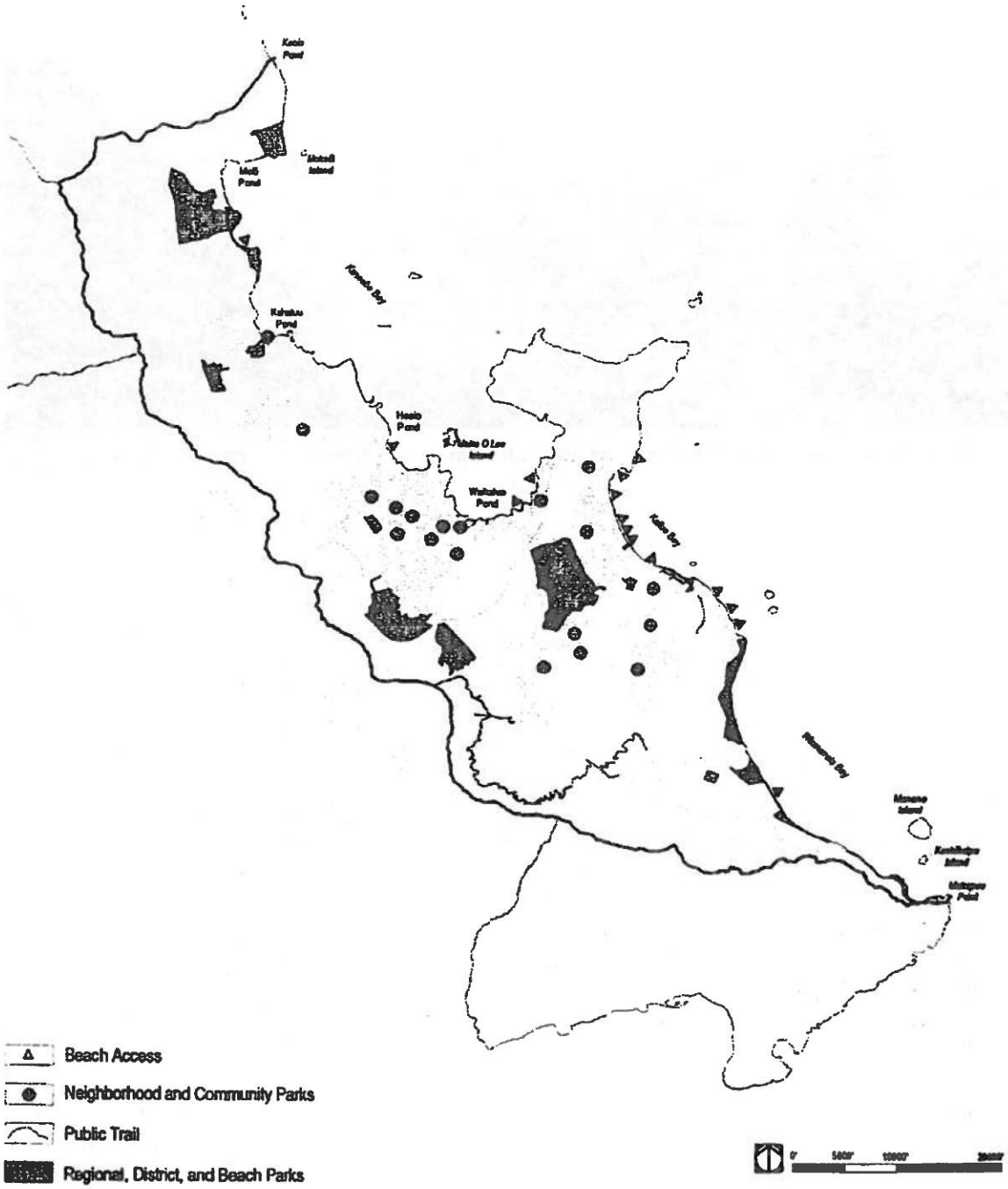
Planning and development of public access to mountain areas should incorporate provisions for adequate parking and means for minimizing and addressing complaints from neighbors near trailheads.

Because the mountains and coastal headlands are prominently visible from long distances and are a fundamental element of the regional identity, as described in Section 2.2.3, their visual integrity should be preserved by avoiding encroachment of land disturbances and structures on upper slopes and ridgelines.

Moreover, to protect important resource values in the State Conservation District, steps need to be taken to control the number and range of feral animals and other alien species and prevent overuse and misuse by humans in selected areas, such as habitats of native and endangered species.

***View** of Kaneohe from Haiku Stairs trail, looking across the bay toward Mokapu Peninsula.*

Figure 3-1
Public Parks and Recreation Areas in Koolaupoko



Guidelines pertaining to mountain areas are as follows:

- Improve access to mountain areas and enhance the physical condition and recreational and educational value of Koolaupoko's hiking trails by fully implementing the recommendations in the State of Hawaii's Na Ala Hele Program Plan.[6] Access improvements should be accompanied by funding for management of associated problems through increased trail maintenance, weed control, eradication of non-native predators, etc.

- Acquire the former U.S. Coast Guard Omega Station site, including Haiku Stairs, and combine this parcel with the adjoining Board of Water Supply parcel for the proposed Haiku Valley Cultural and Nature Preserve. In addition to its recreational, cultural and educational purposes, this park will help protect the Heeia watershed, which includes a high-quality perennial stream, a significant wetland habitat for native endangered Hawaiian waterbirds, migratory waterfowl and shorebirds. The park also will help protect an ancient Hawaiian fishpond.

- Improve the sites that have been acquired for Waihee Valley Nature Park and Waikane Nature Preserve.

- Promote the preservation of remaining undeveloped lands at the foot of the Koolau Mountain Range through protective regulatory measures, tax incentives for the establishment of conservation easements and management programs on private properties, and public acquisition of fee simple or partial interest, where necessary to create the Koolau scenic resource area or "green belt" from Waimanalo to Kualoa. (See Section 3.1.3.3, *Koolau Greenbelt.*)

- Structures should be located at higher elevations of slopes only for purposes of public safety or compelling public interest and be granted a conditional use permit only after a view impact analysis has determined that the specific site and design of the structure has incorporated every available means to avoid visibility within the viewplanes identified in **Figure 2-4**; and that unavoidable impacts have been suitably mitigated by creative design and other means; and that the public agency or utility has demonstrated there is no feasible alternative to fulfill the public need. Maintain, protect, and/or restore native forests in the State Conservation District, especially by identifying and protecting endangered species habitats and other sensitive ecological zones from threats such as fire, alien species, feral animals, and human activity and disturbance.

3.1.3.2 Shoreline Areas

Koolaupoko's shoreline characteristics are quite varied, from the rocky headlands of Makapuu at the south end of the district, to wide sandy beaches fronting Waimanalo Bay and Kailua Bay, to mud flats along Kaneohe Bay. The shoreline provides residents and visitors with significant active and passive recreational value. Thus, public access, both *mauka-makai* and lateral, should be maintained and improved. In addition, Koolaupoko's shoreline areas offer spectacular scenery. As such, views from public roads to the shoreline should be maintained or created. Particular segments of the shoreline are discussed below.

- ***Kualoa Point to Molii Fishpond***. Kualoa Regional Park provides access to the shoreline, coastal waters and Mokolii Island ("Chinaman's Hat"). Severe, long-term erosion of the ocean-fronting shoreline of the park has damaged park landscaping and structures. Littoral drift has deposited sand from this beach to the shoreline fronting Molii Fishpond.

[6] State of Hawaii Department of Land and Natural Resources, *Na Ala Hele - Hawaii Trail and Access System Program Plan*, May 1991.

- ***Kaneohe Bay, from Molii Fishpond to Ke Alohi Point (Heeia State Park).*** The narrow but stable beach is comprised of silty sand. There are relatively few structures in the shoreline area. Physical and visual access to the shoreline from Kamehameha Highway was improved significantly with the expansion and clearing of Waiahole Beach Park in the early 1990's. Intermittent views of the shoreline are available along the stretch of Kamehameha Highway between Kahaluu Fishpond and Heeia Landing. Heeia State Park, Laenani Beach Park and Kahaluu Beach Park provide physical access to the shoreline and vantage points for views of Kaneohe Bay. The expansion of Kahaluu Regional Park to include the beach park area on the makai side of Kamehameha Highway is intended to provide viewplane enhancement from the highway. Kapapa Island, the central barrier reef and "sand bar" (Ahu o Laka) in this section of Kaneohe Bay is an attraction for recreational and commercial boating. Heeia Kea Harbor provides public boating launching ramps and mooring spaces. Other launching ramps are available for small craft at Laenani Beach Park and Kahaluu Beach Park.

- ***Kaneohe Bay, from Heeia Fishpond to Nuupia Pond.*** Similar to the northern end of Kaneohe Bay, most of the shoreline in this section is stable. Vertical retaining walls have been constructed along many of the properties to support docks or to prevent soil banks from slumping into the water, but there are no chronic or significant patterns of erosion or accretion. Physical and visual access to the shoreline is very limited due to residential and other private urban or marina development along almost the entire length. Public access is available at the small Kaneohe Beach Park, where parking and facilities are very limited. There are five pedestrian rights-of-way to the shoreline at other points, but none of these have off-street parking.

- ***Mokapu Peninsula.*** Sandy beach dunes facing the ocean are situated between large remnants of volcanic craters. On one side of Nuupia Ponds, at the neck of the peninsula, is a narrow, sandy beach facing Kailua Bay, and on the other side is a siltier beach fronting Kaneohe Bay. Except at certain times for special events, the general public is denied physical access to the peninsula, which is under military jurisdiction.

- ***Kailua Bay, from Kapoho Point to Alala Point.*** Kailua Beach is wide and sandy, but dynamic and subject to significant erosion and accretion cycles. It is famed for its high quality as a recreation area. Kailua Bay is attractive for a variety of ocean recreation activities, notably swimming, body surfing, windsurfing, kayaking and canoe racing. Public access to the beach and coastal waters is provided primarily at Kailua Beach Park, on either side of the Kaelepulu Stream outlet, and at the smaller Kalama Beach Park. At both locations, vehicular parking spaces are in great demand on weekends and holidays. There are five public rights-of-way for pedestrians at dispersed points along Kalaheo Avenue, the street that runs parallel to the beach, but no off-street parking, public rest rooms or showers are available at these locations. Visual access to the shoreline from the adjacent street is available only at Alala Point and the Kaelepulu Stream crossing.

- ***Kailua Bay, from Alala Point to Wailea Point (Lanikai).*** Severe erosion is occurring at either end of Lanikai Beach, where adjacent residential property owners have built seawalls and revetments along most of the shoreline. The remaining sandy beach in the central portion is popular for recreation. Public access for pedestrians is provided at eleven points along the parallel public street, Mokulua Drive, but no off-street vehicular parking, public rest rooms or showers are available for beachgoers. Visual access to the shoreline from the street is very limited.

- ***Waimanalo Bay, from Wailea Point to Makapuu Point.*** Wide sandy beaches front almost the entire length of Waimanalo Bay. There is a narrower beach and emerging reef rock in the vicinity of Pahonu Pond in the midsection of the Bay shoreline. While Kalanianaole Highway is relatively distant from the shoreline at the northern portion of the beach, physical access is

readily available during peak recreation periods at Bellows Air Force Station and Waimanalo Bay State Recreation Area. In the beachfront residential area of Waimanalo, there are three pedestrian rights-of-way to the shoreline along Laumilo Street. Further south, at Waimanalo Beach Park and Kaiona Beach Park, the highway is close enough to the shoreline to afford both visual and physical access. In the southernmost stretch, along Kaupo Beach Park and Makapuu Beach Park, visual and physical access to the shoreline is virtually unimpeded. The highway offers dramatic vistas of coastal headlands and cliffs, ocean waters and offshore islands, and a direct link to the proposed 354-acre scenic shoreline area extending from Makapuu Point to Koko Head in East Honolulu.

Guidelines pertaining to shoreline areas are listed below:

- Maintain existing *makai* view channels along Kalanianaole Highway between Makapuu Point and Waimanalo Beach Park; along Kawailoa Road and North Kalaheo Avenue in Kailua; along Lilipuna Road in Kaneohe; and along Kamehameha Highway north of Kaneohe. Avoid visual obstructions, such as walls and dense landscaping.

- Create and maintain new *makai* view channels along Kamehameha Highway and Kahekili Highway north of Kaneohe through selective clearing of dense vegetation and the removal of structures. Such view channels should be created by public acquisition of shoreline properties along the highway or by obtaining easements and maintenance agreements with private landowners. Priority should be given to the areas where clearing would open up vistas of perennial streams, wetlands, fishponds and offshore islands.

- Place high priority on maintaining the untamed landscape quality of the Makapuu viewshed. Any modification to this shoreline area should be done in a manner that continues the landscape character of the proposed scenic shoreline corridor on the East Honolulu side of Makapuu Point.

- Consideration should be given to the establishment of buffer zones for the protection of rare coastal resources and recognition that such resources should be defined and identified.

- Increase opportunities for physical access to the shoreline areas of Kaneohe and Kailua by acquiring additional shorefront areas. The top priority for such acquisition is in Kaneohe. In Kaneohe, access is being designed at the site of the Kaneohe Wastewater Pre-Treatment Facility, to be named Waikalua Bayside Park. The park is adjacent to Kaneohe Stream, which will be dredged to a depth of nine feet. Future expansion may be possible by either acquiring the adjacent Kokokahi YWCA facility or entering into a cooperative agreement with this organization for the joint use of both properties. Other sites in Kaneohe are at King Intermediate School and at a spot north of Heeia Kea Landing. The latter may require realignment of a portion of Kamehameha Highway to create adequate land area *makai* of the roadway. In Kailua, an additional park site should be sought in either the Oneawa Beach area, near the surf spot known as "Castles" or in the frontage along Kalaheo Avenue between Kailua Beach Park and Kalama Beach Park. The latter beach park could also be expanded if there is an opportunity to acquire an adjoining property.

- Existing pedestrian rights-of-way to the shoreline should be improved by providing on-street or off-street parking nearby; secured bicycle racks where the access point adjoins an existing or planned bikeway, such as along Mokulua Drive in Lanikai and Kaneohe Bay Drive in Kaneohe; and provisions for emergency vehicle access and lateral access along the shoreline.

- To maintain lateral access along popular beaches that are subject to long-term and seasonal erosion, particularly at Lanikai and Kualoa, beach management plans should be developed and implemented, with an emphasis on non-structural approaches and prevention of adverse

effects on adjacent coral reef ecosystems. Greater shoreline setbacks should be established for new structures along these and other unstable shoreline areas, using criteria developed in various shoreline studies.[7] Plans and activities should be consistent with the objectives and policies of the State Coastal Zone Management Program.

- The placement and design of exterior lighting in areas adjacent to the shoreline may contribute to disorientation, injury or death of seabirds. Therefore, lighting should be designed and constructed to avoid such effects, using DLNR guidelines.

- The Alala Point to Wailea shoreline should be designated as an erosion-prone area and a beach management plan prepared and implemented. Periodic beach restoration activities should also focus on the Bellows Air Force Station beach and Kaupo beach.

- The shoreline along Kamehameha Highway adjacent to Kualoa Ranch to Kualoa Point should be designated as an erosion-prone area and be subject to a beach management plan.

- To preserve public ownership and use of shoreline resources, legislation should be pursued to render all shoreline accretion as public (State) property in perpetuity.

- Discourage the use of shore armoring structures.

***View** from Waimanalo Bay shoreline toward Makapuu Point.*

3.1.3.3 Wetlands, Wildlife Preserves and Nature Parks/Preserves

Koolaupoko is home to several wetlands listed by the U.S. Fish and Wildlife Service (USFWS) Oahu Team as significant because of the occurrence and abundance of native waterbirds, including the endangered Hawaiian Stilt (ae'o), Hawaiian Coot ('alae ke'oke'o), Hawaiian Duck (koloa maoli), Hawaiian Moorhen ('alae 'ula), and migratory waterfowl and shorebirds. Policies on the management of wetlands have been prepared by the U.S. Environmental Protection Agency, in cooperation with the State Department of Health[8].

The major existing wetlands, proposed nature parks/preserves and botanical gardens of Koolaupoko (see **Figure 3-1**) are described below:

- ***Hoomaluhia Botanical Garden***. This 211-acre park, maintained by the City, was originally developed as a Federally-funded flood control project and includes a large stormwater impoundment basin. It includes limited facilities for camping, horseback riding, hiking, camping and environmental education as well as botanical gardens.

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[7] See City and County of Honolulu Department of Land Utilization, *Oahu Shoreline Study, Parts 1 and 2*, (prepared by Sea Engineering, Inc.), 1988 and 1989.

[8] Hawaii Wetland Management Policy Workgroup, U.S. Environmental Protection Agency, State of Hawaii Department of Health, and Sarah Young, *Hawaii Wetland Management Policy*, April 1999.

- ***Kawainui Marsh***. Kawainui Marsh serves multiple purposes as a flood storage basin, wetland filter, wildlife habitat and cultural and scenic resource pursuant to a master plan prepared in 1994.[9] The master plan includes hiking trails through the Marsh. Also proposed are an environmental education center and a pedestrian path around the perimeter of the Marsh.

- ***Heeia Wetland***. Heeia Wetland was acquired by the State in 1991. While the State has not adopted a specific plan for Heeia, future uses may include nature trails, interpretive programs, and environmental education programs, similar to the program that has been adopted for Kawainui Marsh. The management plan may also seek to restore historic agricultural uses in a portion of the wetland, such as rice and taro cultivation.

- ***Nuupia Pond***. This large waterbody at the neck of Mokapu Peninsula is within the Marine Corps Base Hawaii, Kaneohe and is under Federal protection and management as a habitat for endangered species.

- ***Waihee Valley Nature Park***. This site covering nearly 150 acres was acquired by the City and is designated as a Nature Park, but remains undeveloped.

- ***Haiku Valley Cultural and Nature Preserve***. The City has proposed to acquire the former Omega Station site from the U.S. Coast Guard and combine it with the adjoining Board of Water Supply parcel to create a nature and cultural preserve. The site includes Haiku Stairs and potential access to the Koolaupoko Trail Complex. In addition to its recreational and educational purposes, this park will help protect the Heeia watershed, which includes a high-quality perennial stream, a significant wetland habitat for native endangered Hawaiian waterbirds and migratory waterfowl and shorebirds, and an ancient Hawaiian fishpond in relatively good condition.

***Kawainui** Marsh serves as a flood storage basin, wetland filter, wildlife habitat, and cultural and scenic resource.*

[9] State of Hawaii Department of Land and Natural Resources, *Kawai Nui Marsh Master Plan*, July 1994.

- ***Waikane Nature Preserve***. This is a site recently acquired by the City that had formerly been proposed for the development of a 27-hole private golf course. It is now designated for a nature preserve, but is currently undeveloped. The preserve will provide access to the Waikane Trail.

- ***Koolau Greenbelt***. This describes the transition area between the Koolau Mountain Range and the urban and agricultural uses in the valleys and on the coastal plain. Much of this area is presently undeveloped or used for open space purposes, including the nature parks/preserves described above or golf courses described below. The purposes of designating the remainder of this area as greenbelt are to preserve this natural, recreational and scenic resource; maintain significant view corridors; to prevent inappropriate development or use which may cause hazards or other undesirable environmental consequences downstream; and to provide opportunities for environmental and cultural research and education.

Guidelines relating to wildlife preserves in Koolaupoko are as follows:

- Prepare use and management plans for Heeia Marsh, Waihee Valley Nature Park, Haiku Valley Cultural and Nature Preserve, and Waikane Nature Preserve and develop those sites pursuant to those plans. Encourage owners of private wetlands, such as Waihee Marsh (also known as "Haia Moi"), to prepare and abide by use and management plans for those resources.

- Prohibit encroachment or intensification of residential or other urban uses near wildlife sanctuaries and nature parks.

- Wildlife preserve management plans should emphasize conservation and restoration of native plants, birds, fish and invertebrates. Private landowners should be encouraged to investigate the various State and Federal programs that provide incentives for landowners to manage their lands for the benefit of wildlife.

- Prepare and implement a plan to establish a Koolau Greenbelt.

***Hoomaluhia** Botanical Garden, a 211-acre park originally developed as a flood control project.*

3.1.3.4 Natural Gulches, Streams and Drainageways

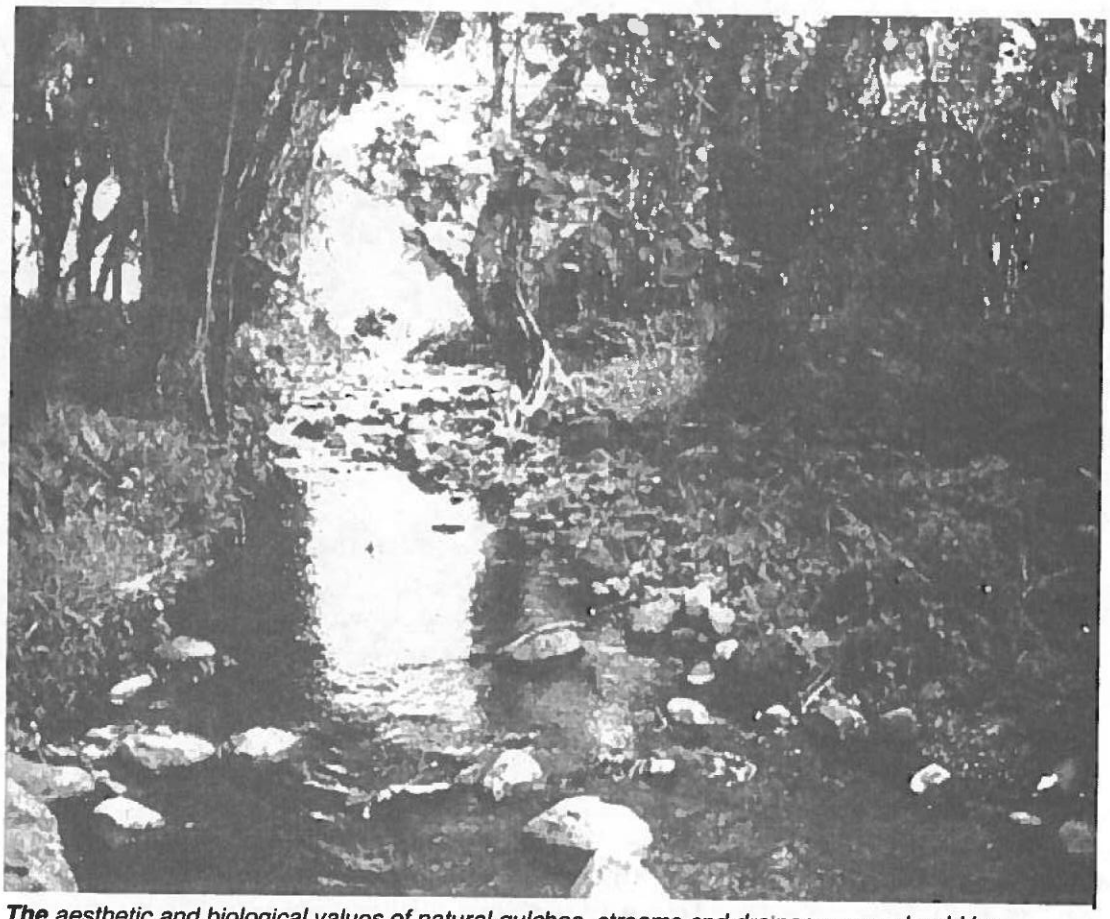
The ridges and valleys in Koolaupoko consist of natural gulches, streams and drainageways extending across the region. These stream channels are the primary means for carrying water from the inland areas to the sea and are generally capable of handling runoff from normal rainfall amounts. During periods of intense rainfall, however, a number of these drainageways overflow and create flooding problems (see discussion in Section 4.6, *Drainage Systems*).

Guidelines concerning natural gulches, streams and drainageways are as follows:

- Preserve the natural aesthetic and biological values of gulches, streams and drainageways as part of the open space system.
- If necessary to provide flood protection, alter natural drainageways in a way that preserves aesthetic and biological values, and avoids degradation of stream, coastline and nearshore water quality. For example, impacts on biological conditions may be mitigated, as appropriate, by using v-shaped bottom channels for periods of low stream flow, rip-rap boulder lining of stream banks, streamside vegetation and similar strategies to shade, cool and aerate the waters of the stream and provide riparian and stream bottom habitat.
- Incorporate erosion control measures and best management practices, as cited in the *Hawaii's Coastal Nonpoint Pollution Control Program Management Plan*[10] to prevent pollution of wetlands, streams, estuaries and nearshore waters.

[10] Office of State Planning, Hawaii Coastal Zone Management Program, *Hawaii's Coastal Nonpoint Pollution Control Program Management Plan*, Volume I, June 1996.

- Enhance, restore and preserve streams while providing public access.



The aesthetic and biological values of natural gulches, streams and drainageways should be preserved as part of Koolaupoko" open space system.

3.1.3.5 Agricultural Areas

While it is not its primary function, agriculture land use does contribute to the open space system. It defines the landscape character of large sections of Koolaupoko north of Ahuimanu and in the *mauka* portions of Waimanalo. Smaller enclaves of agricultural lands are found in Maunawili, Kailua and Kaneohe.

Guidelines relating to open space in agricultural areas are listed below:

- Design and locate buildings and other facilities that are accessory to an agricultural operation in a way that minimizes visual impacts within the view corridors identified in **Figure 2-4**.

- Retain the open space character of pastures adjacent to Kawainui Marsh and within the Hawaii Youth Correctional Facility to visually separate and define the edges of the Maunawili, Olomana and Pohakapu and Kukunono residential neighborhoods.

3.1.3.6 Community-Based Parks

There are approximately 167 acres of community-based parks in Koolaupoko. As discussed further in Section 3.3, community-based parks include district, community, neighborhood, and mini parks. The main purpose of community-based parks is to provide active recreation space for residents of the region in the form of playfields and gyms, among others. In addition to meeting the active recreation needs of the region, community-based parks also serve as open space elements and add aesthetic value to the region by providing visual relief from urban land uses.

Guidelines pertaining to community-based parks in Koolaupoko are as follows:

- Design and site structural improvements and landscaping in community-based parks in such a way as to enhance the aesthetic value of these open space elements.

3.1.3.7 Golf Courses

Golf courses are important elements of the open space system because they provide areas for active recreation and offer visual relief from adjacent urban uses. Golf courses have a manicured appearance, so they are not necessarily appropriate for areas where the retention of a natural, untamed landscape character is desired. Koolaupoko's golf courses, listed in **Table 3-3**, are located in a variety of settings. The Mid-Pacific Country Club, Bayview Golf Park, Kaneohe Klipper Golf Course and Olomana Golf Links demonstrate how golf courses in suburban settings can provide open space buffers between residential neighborhoods, passive stormwater drainage management, and opportunities to preserve significant views. The Bayview golf course, however, would present a more desirable view from Kaneohe Bay Drive if the high protective screens for golf driving range were not so obvious. The Pali, Luana Hills and Koolau golf courses have less value as contributors to the open space system because they are situated within or near forests with a dense canopy of trees and have altered the natural landscape character of those settings.

Guidelines relating to golf courses in Koolaupoko are listed below:

- Maintain golf courses to provide view amenities for adjacent urban areas, especially from well-used public rights-of-way, parks and vista points. Where necessary, redesign golf course facilities or layouts to reduce the visual prominence of protective screens or accessory buildings.

- Golf courses should be designed and maintained to avoid or minimize environmental impacts, such as siltation, pesticide and fertilizer runoff, destruction of coastal, riparian and wetland habitat, etc. Golf courses also should conform to the 1992 (or most recent edition) Office of Planning publication, *Golf Course Development in Hawaii – Impacts and Policy Recommendations*.

- Optimize the function of golf courses as passive drainageways, maximizing their potential to retain or detain stormwater runoff.

- Provide safe access through golf courses, as necessary, for regional continuity of pedestrian and bicycle systems.

- When necessary for safety reasons, use landscape screening, setbacks and modifications to the course layout rather than fencing or solid barriers.

- Provide appropriate buffers between golf courses and surrounding residential areas.

3.1.3.8 Cemeteries

Major cemeteries in Koolaupoko are Valley of the Temples Memorial Park in Ahuimanu and Hawaiian Memorial Park and Hawaii State Veterans Cemetery on adjoining sites in Kaneohe. There are other, smaller cemeteries in the region, but these three are by far the most significant in size and visibility.

Guidelines concerning cemeteries are listed below:

- Maintain the open space character of the cemeteries through very low lot coverage ratios. Above-grade structures should generally be limited to ceremonial or religious buildings; grave markers of modest size; and necessary administrative and maintenance support buildings that are minimally visible from public rights-of-way, entries and vista points.

3.1.4 RELATIONSHIP TO MAP A-1, OPEN SPACE

The following components of the regional open space system are shown on the Open Space map in Appendix A:

- ***Mountains, Wildlife Preserves and Nature Parks***. These areas are designated for preservation and are to remain outside of the Urban Community Boundary and Rural Community Boundary. Small wetlands and agricultural lots consisting of less than 10 acres may be included within these boundaries, but the intent is to preserve them in their present use, even if they are not specifically shown on Map A-1, Open Space.

- ***Shoreline Areas***. All public shoreline parks, whether managed by the City or the State, are designated for preservation and shown on Map A-1, Open Space. Smaller existing and proposed access points to the shoreline are indicated by symbols on the map.

- ***Agricultural Areas***. Map A-1, Open Space, shows all areas designated for agriculture on the Map A-2, Land Use. Some of these lands are in the State Urban District, but all are outside of the Urban Community Boundary.

- ***Community-Based Parks***. The general location of district, community and neighborhood parks are shown in **Table 3-4**. Additions to the community-based park system are appropriately determined more by community facility design considerations (see Section 3.3 below) than by their relationship to the regional open space network.

- ***Golf Courses and Cemeteries***. The golf courses and three largest cemeteries in Koolaupoko are shown for their visual contributions to open space by virtue of their size and landscape character.

- ***Natural Gulches, Streams and Drainageways***. The riparian areas of perennial streams that are significant for their natural resource quality or that have potential for recreational access in urbanized areas are designated as stream management corridors, which are discussed in Section 4.6.

3.2 ISLAND-BASED PARKS AND RECREATIONAL AREAS

This section presents an overview of island-based parks and recreational areas in Koolaupoko. General policies, planning principles, and guidelines for development of these resources follow this. The location of the region's island-based parks and recreational areas are shown on Map A-1, Open Space; Map A-2, Land Use; and Map A-3, Public Facilities.

3.2.1 OVERVIEW

The City and County of Honolulu Department of Parks and Recreation (DPR) develops and maintains a system of park and recreation facilities which it classifies in a hierarchical manner. The largest and most specialized parks are classified as island-based parks since they serve the needs of all Oahu residents. This group includes regional parks, beach/shoreline parks, beach/shoreline right-of-ways, nature parks/reserves, botanical gardens, golf courses, and zoological parks (see **Table 3-1**). State parks can also be considered part of the island-wide park system. DPR's standard for island-based parks is eight acres for every 1,000 persons. The location of public parks and recreation areas in Koolaupoko are shown in **Figure 3-1**.

Table 3-1
Types of Island-Based Parks

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.
Golf Courses	Courses that offer 18 holes or more; privately owned, military and municipal courses are included in this inventory.
Beach/Shoreline Parks	Areas and sites along the shoreline that may include facilities and support services for water activities, sunbathing, picnicking, and other passive activities.
Beach/Shoreline Rights-of-Way	Access lanes to beaches and the shoreline where residential or other uses prevent development of a beach/shoreline park.
Nature Parks/Reserve	Areas maintained primarily to preserve or conserve unique natural features.
Botanical Gardens	Areas developed for the recreational and educational appreciation of specific types of plants and plant communities.

3.2.1.1 Regional, Beach and Nature Parks

Koolaupoko's regional, beach and nature parks are listed in **Table 3-2**. Compared to other regions of the island, Koolaupoko has a disproportionate share of park acreage dedicated to natural and cultural preserves, which is a reflection of the region's physical assets and historical use. For future additions to Koolaupoko's island-based park land inventory, priority should be given to the acquisition of shorefront properties primarily in Kaneohe and secondarily in Kailua, as stated in Section 3.1.3.2.

***Waimanalo's** beach is recognized as one the island's important recreational resources.*

Table 3-2
Island-Based Parks in Koolaupoko

Park Type/Name	Acreage	Park Type/Name	Acreage
Regional Parks		**Beach/Shoreline Parks, continued**	
Kahaluu Regional Park[1]	34.6	Waiahole Beach Park	110.0
Kualoa Regional Park[1]	153.4	Waimanalo Bay Beach Park	74.8
Subtotal	188.0	Waimanalo Beach Park	37.6
Beach/Shoreline Parks		Subtotal	422.4
Bellows Field Beach Park (weekend use)	54.2	**Nature Parks**	
Heeia State Park	18.5	Waihee Valley Nature Park	149.6
Kailua Beach Park	35.2	Haiku Valley Cultural and Nature Preserve	230.0
Kaiona Beach Park	4.3	Waikane Nature Preserve	503.0
Kalama Beach Park	4.3	Subtotal	882.6
Kaneohe Beach Park	1.1	**Botanical Gardens**	
Kaupo Beach Park	8.2	Hoomaluhia Botanical Garden[2]	211.0
Makapuu Beach Park[2]	46.9	**Total Acreage**	**1,704.0**

[1] Portions of these parks function as beach parks or nature parks.
[2] A portion of this park functions as a nature park.
Source: City & County of Honolulu, Department of Parks and Recreation, Index of Oahu Parks and Facilities, April 1997; personal interviews with State and City staff.

3.2.1.2 Golf Courses

Koolaupoko has seven golf courses, most of which are available for public play. Five of these courses are available for general public play. The other two are subject to restrictive policies: the private Mid-Pacific Country Club and the military course at Marine Corps Base Hawaii, Kaneohe (see **Table 3-3**).

Golf courses are considered valuable open space and aesthetic resources and also serve a practical purpose by reducing flooding and nonpoint pollution by helping retain storm waters. However, they are highly land intensive, typically occupying 150 to 200 acres, and thus plans for future golf courses or redevelopment of existing golf courses should undergo careful evaluation. Depending on the location, design, and pricing of greens fees and/or memberships, new course development could have significant environmental, economic, and social impacts. Furthermore, Koolaupoko is mostly built-out and land areas that could possibly accommodate a new golf course are either in preservation or long-term agricultural use. Consequently, this plan does not propose development of additional golf courses in the Koolaupoko region or the continuation of land use and other development entitlements for proposed golf courses that had not been built as of the end of 1998.

Table 3-3
Golf Courses in Koolaupoko

Type/Name	Location	Public Play
Municipal:		
Pali Golf Course	Kaneohe	Yes
Daily Fee:		
Bayview Golf Links	Kaneohe	Yes
Koolau Golf Course	Kaneohe	Yes
Olomana Golf Links	Waimanalo	Yes
Semi-Private:		
Luana Hills Country Club	Kailua	Yes
Private:		
Mid-Pacific Country Club	Kailua	No; members only
Military:		
Kaneohe Klipper Golf Course	MCBH Kaneohe	No; military only

3.2.2 GENERAL POLICIES

The following general policies relate to island-based parks and recreational resources in Koolaupoko:

- Increase the inventory of island-based parks by giving priority to the acquisition of shorefront properties primarily in Kaneohe and secondarily in Kailua. (Note that expansion of the inventory of island-based parks should be given lower priority than expansion of the inventory of community-based parks in Koolaupoko as provided in Section 3.3.2.)

- Maintain and enhance present island-based parks by utilizing land area that has not been fully developed for recreation use. Island-based parks are part of the region's abundance of natural and scenic resources and contribute to the attractiveness of Koolaupoko to both residents and visitors.

3.2.3 PLANNING PRINCIPLES

The general policies for island-based parks and recreation complexes are supported by the following planning principles:

- ***Appropriate Screening and Siting***. Carefully site active playfields and supporting facilities intended for intensive use, and use appropriate landscape screening to reduce the potential impacts on surrounding areas.

- ***Environmental Compatibility***. Construct park facilities in a manner that 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.

- ***Community Integration***. Link recreational attractions, which 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.

3.2.4 GUIDELINES

The following guidelines implement the general policies and planning principles for the island-based parks and recreation areas listed above.

3.2.4.1 Passive or Nature Parks

- Expand recreational and educational resources by implementing the following:
  - Acquisition and development of the proposed Haiku Valley Cultural and Nature Preserve, including access to Haiku Stairs.
  - Improvement of the Waikane Nature Preserve and Waihee Valley Nature Park.
- Improve in a manner that preserves the area's natural scenic quality and provides educational and passive recreation opportunities.
- Protect fragile natural resources, such as the wildlife, from overuse through appropriate forms of management control.

3.2.4.2 Active Recreation Areas

- Acquire additional shorefront land for parks in Kaneohe and Kailua with particular attention to increasing shoreline access in Kaneohe.
- Mitigate visual impacts of large recreation buildings or structures, lighting, parking lots, perimeter fencing along major collector streets and other utilitarian elements through building design, plantings or other appropriate visual screens adjacent to residential areas and major roadways.
- Locate bus stops and loading areas at principal entries and adjacent to convenient pedestrian accesses to main activity areas within the park.
- Provide amenities and service facilities to accommodate "tailgate" picnics in parking areas for sporting events, including shading canopy trees within the parking lot as well as nearby picnic tables and outdoor grills.

3.3 COMMUNITY-BASED PARKS

The following section provides an overview and a list of general policies and guidelines pertaining to community-based parks and recreation areas.

3.3.1 OVERVIEW

Park areas that serve more localized populations are classified as community-based parks. This group includes district, community, and neighborhood parks as well as other, smaller park areas (see **Table 3-4**).

Table 3-4
Types of Community-Based Parks

Park Type	Average Size (Acres)	Population Service Size	Typical Facilities
District	20	25,000	Playfields, playcourts, passive areas, gym/recreation complex, swimming pool
Community	10	10,000	Playfields, playcourts, passive areas, recreation bldg
Neighborhood	6	5,000	Playfields, playcourts, passive areas, comfort station
Mini Park	Varies	High Density Area	Benches, picnic tables, children's play area

DPR uses a standard of two acres per every 1,000 persons in evaluating service needs, although this figure varies according to each community's situation. Koolaupoko contains a total of approximately 167 acres of community-based parks (see **Table 3-5**). Based on DPR's standard and Koolaupoko's 1990 population of 117,700, this represents a deficit of approximately 68 acres of community-based parks. With an expected 2020 population of 122,100, the acreage deficit will grow to 77 acres if there is no addition to the park land inventory.

Table 3-5
Community-Based Public Parks in Koolaupoko

Park Type/Name	Acreage	Park Type/Name	Acreage
District Parks		**Neighborhood Parks, continued**	
Kaneohe District Park	31.4	Kaluapuhi Neighborhood Park	5.8
Kailua District Park	18.7	Kaneohe Civic Center Park	4.2
Waimanalo District Park	25.3	Kapunahala Neighborhood Park	3.9
Subtotal	75.4	Keaalau Neighborhood Park	3.7
Community Parks		Puohala Neighborhood Park	3.9
Ahuimanu Community Park	4.0	Kalaheo Neighborhood Park	1.4
Kahaluu Community Park	5.6	Kawainui Neighborhood Park	4.8
Kaneohe Community & Senior Center	2.0	Keolu Hills Neighborhood Park	6.3
Kaneohe Community Park	5.5	Maunawili Neighborhood Park	4.2
Aikahi Community Park	4.0	Maunawili Valley Neighborhood Park	8.1
Enchanted Lake Community Park	5.8	Subtotal	59.7
Waimanalo Beach Park – *portion*	10.0*	**Mini Parks**	
Subtotal	26.9	Kaelepulu Mini Park	1.6
Neighborhood Parks		Pohakupu Mini Park	3.5
Bayview Neighborhood Park	8.0	Subtotal	5.1
Laenani Neighborhood Park	1.4	**Total Acreage**	**167.1**
Heeia Neighborhood Park	4.0		

*Acreage for this park is counted as part of the Waimanalo District Park and is not included in the Community Parks total acreage.

Source: City & County of Honolulu, Department of Parks and Recreation, *Index of Oahu Parks and Facilities*, April 1997.

At present, the only planned addition to the community-based park inventory in Koolaupoko is a one-acre expansion of Kaneohe Civic Center Neighborhood Park. Unless future land acquisitions are planned, any new park areas would have to be provided pursuant to the Park Dedication Ordinance in conjunction with private developments. This method cannot be used to make up the existing deficit in community-based park lands in Koolaupoko because the amount of new private development is expected to be very limited under the provisions of this Plan.

The ratio of population to land area is not the only factor to consider when evaluating community-based public park needs. Some of the demand for public park space is off-set by private parks that are owned and maintained by community associations in Kailua, Ahuimanu, Kaneohe and Lanikai for the use of their residents and guests. For military personnel and their dependents, the Marine Corps Base Hawaii, Kaneohe also provides a golf course and several parks.

It may be possible to increase the availability of public recreation facilities without acquiring additional land to develop for that purpose. For example, the current deficit of community-based public park land could be reduced if portions of the regional parks and beach parks were developed with more active playing fields, courts and playgrounds, as has been done at Waimanalo Beach Park. The campuses of some of Koolaupoko's public schools, including Windward Community College, have athletic facilities that could be opened for general community use, possibly under a joint use agreement between the State and the City. Similar joint use agreements also could be explored with nonprofit organizations such as the YMCA/YWCA or with Hawaii Pacific University.

The development of landscaped bikeways and walkways along streams and drainage channels is another way to both increase recreation opportunities and provide safer and more enjoyable access to existing parks, particularly in the urbanized areas of Kaneohe and Kailua. "Pocket" parks could be developed along the route on adjacent small parcels either presently owned by the City or State or acquired by the City for this purpose.

Possible additional sites for active recreational facilities would be the *mauka* portions of Kahaluu Regional Park and Bellows Field Beach Park, if and when that site is released by the military for permanent civil recreation use. Also, the former sanitary landfill site at Kapaa has been landscaped for eventual park use, and some active recreation facilities could be developed there. A portion of the former landfill area at the edge of Kawainui Marsh is already in use as a model airplane park. While all possible methods should be pursued as ways to reduce the deficit of community-based parks, emphasis realistically has to be placed on future acquisition in areas where the current deficit is most significant.

3.3.2 GENERAL POLICIES

General policies pertaining to community-based parks are as follows:

- Increase the inventory of community-based parks to provide sports and recreation facilities for Koolaupoko residents in appropriate locations in Kailua, Kaneohe, Kahaluu, and Waimanalo with land acquisition to reduce the existing deficit of such parks in these areas.

- Modify recreation facilities in existing parks and increase access to public school facilities in areas where there is limited opportunity to expand park space.

- Have new residential development provide land for open space and recreation purposes in lieu of payment of a fee for park dedication purposes, if the project is of sufficient size to set aside usable land to meet neighborhood recreational needs.

- Pursue the development of greenways along the following streams and drainage channels: Kaneohe Stream, from Kaneohe Bay to Kamehameha Highway; Keaahala Stream, from Kaneohe Bay to Kahekili Highway; Kawainui Stream, from Kailua Bay to Kawainui Marsh; Kawa Stream, from Mokulele Drive to Kaneohe Bay Drive; and Kaelepulu Stream, from Kailua Bay to Kaelepulu Pond.

3.3.3 GUIDELINES

The following guidelines implement the general policies and planning principles for community-based parks:

- Expand active recreational facilities by incorporating facilities such as playfields and playcourts in regional and beach parks and in the former sanitary landfill site at Kapaa.
- Prepare a functional plan for the acquisition of new community-based parks in Kailua, Kaneohe, Kahaluu, and Waimanalo.
- Have master plans for development of new parks or redevelopment of existing parks provide for facilities and accessible pathways from surrounding streets to facilitate pedestrian and bicycle access to parks.
- The DPR should explore ways, through cooperative agreements and mutual indemnifications with the DOE and nonprofit organizations, to design and operate facilities to achieve efficiencies and reduce duplication in the development and use of athletic, recreation, meeting, and parking facilities.

***Kaneohe's** Kaluapuhi Neighborhood Park.*

3.4 HISTORIC AND CULTURAL RESOURCES

The following sections provide an overview and a listing of policies, planning principles, and guidelines for the preservation of historic and cultural resources in Koolaupoko.

3.4.1 OVERVIEW

Due to the relatively recent urban development of the region, the most significant remnants of Koolaupoko's past are archaeological sites. In 1930, an archaeological survey of Oahu documented numerous sites in the area now defined as Koolaupoko.[11] Erosion or other land altering activities such as agricultural use and urban development had destroyed many of these sites, even at that time.

Table 3-6 lists some of the significant archaeological sites in Koolaupoko including ancient fishponds and known remaining sacred sites such as *heiau* and fishing shrines many of which are listed on the Hawaii or National Registers of Historic Places. The approximate location of these sites and other significant cultural features is shown in **Figure 2-5.** This representative list is not intended to document all significant archaeological sites in Koolaupoko.

Table 3-6
Significant Archaeological Sites in Koolaupoko

Feature	Reference	Feature	Reference
Molii Fishpond	McAllister, SHPD	Kawaewae *Heiau*, Kaneohe	McAllister, SHPD
Kualoa *Ahupua'a* Historical District	SHPD	Kanohuluiwi Pond, Kaneohe	SHPD
Puakea *Heiau*, Hakipuu	McAllister	Mokapu (Nuupia) Fishponds	SHPD
Kukuianiani *Heiau*, Waikane	McAllister	Mokapu Burial Area	SHPD
Waikane Taro Flats	SHPD	Pahukini *Heiau*, Kailua	McAllister, SHPD
Heeia Fishpond, Heeia	McAllister, SHPD	Pohakunui Heiau, Kailua	SHPD
Leleahina *Heiau*, Heeia	McAllister, SHPD	Ulupo *Heiau*	McAllister, SHPD
Ahuimanu Taro *Lo'i*, Kahaluu	SHPD	Maunawili Archaeological District	SHPD
Kahaluu Fishpond, Kahaluu	SHPD	Koa (Manana Island)	SHPD
Kahaluu Taro *Lo'i*	SHPD	Manikolu Shelter, Waimanalo	SHPD
Pohaku *Ka Luahine*	SHPD	Kukuipilau *Heiau*, Waimanalo	SHPD
Luluku Archaeological District	SHPD	Bellows Field Archaeological Area	SHPD
Kapapa Island Complex	SHPD	Pahonu Pond/*Heiau*, Waimanalo	McAllister, SHPD
Kawainui Marsh, Archaeological site #7	SHPD	Waimanalo Taro Terraces, Waimanalo	SHPD

Source: McAllister, J. Gilbert, *Archaeology of Oahu*, 1933; Sterling E.P. and C.C. Summers, *Sites of Oahu*, 1978; State Historic Preservation Division (SHPD), Hawaii and National Registers of Historic Places.

[11] McAllister, J. Gilbert. *Archaeology of Oahu*, 1933, p. 57.

Koolaupoko has many other structural landmarks that are identified with the history of the region. The following, some of which are listed on the National or Hawaii Registers of Historic Places, are among the more significant sites:

- Makapuu Lighthouse
- Waikane Store
- Lanikai Entry Marker
- Haiku Plantation Gardens, Kaneohe
- Hygienic Store, Kahaluu
- Waiahole Poi Factory
- Kaneohe State Hospital
- Hawaii Youth Correction Facility - Kawailoa, Kailua
- Byodo-in Temple, Valley of the Temples, Ahuimanu
- Boettcher Estate, Kalama Beach Park, Kailua
- Kaneohe Ranch offices, Maunawili
- Waimanalo Ditch System

There are also many private residences, at various locations, that are more than 50 years old that have sufficient architectural distinction and integrity to make them eligible for listing on either the National or State Registers.

3.4.2 GENERAL POLICIES

- Emphasize physical references to Koolaupoko's history and cultural roots.
- Protect existing visual landmarks and support the creation of new, culturally appropriate landmarks.
- Preserve significant historic features from earlier periods.
- Retain significant vistas associated with archaeological features.

3.4.3 PLANNING PRINCIPLES

The treatment of a particular historic or cultural site should depend upon its characteristics and potential value. The following planning principles should be used to determine appropriate treatment:

- ***Preservation and Protection***. Implement in situ preservation and appropriate protection measures for sites that have high preservation value because of their good condition or unique features.

- ***Compatible Setting***. Determine the appropriate treatment for a historic site by the particular qualities of the site and its relationship to its physical surroundings. The context of a historic site is usually a significant part of its value and care should be taken in the planning and design of adjacent uses to avoid conflicts or abrupt contrasts that detract from or destroy the physical integrity and historic or cultural value of the site.

- ***Accessibility and Interpretation***. Establish the degree of public access and interpretation that would best promote the preservation of the historic, cultural and educational value of the site, recognizing that economic use is sometimes the only feasible way to preserve a site. Public access to a historic site can take many forms, from direct physical contact and use to limited visual contact. In some cases, however, it may be highly advisable to restrict access to protect the physical integrity or cultural value of the site.

3.4.4 GUIDELINES

The following guidelines apply to native Hawaiian cultural and archaeological sites:

- Require preservation *in situ* only for those features that the State Historic Preservation Officer has recommended such treatment.
- Determine the appropriate preservation methods on a site-by-site basis in consultation with the State Historic Preservation Officer.
- Determine appropriate delineation of site boundaries and setbacks and restrictions for adjacent uses on a site-by-site basis in consultation with the State Historic Preservation Officer.
- Include sight lines that are significant to the original purpose and value of the site in criteria for adjacent use restrictions.
- Determine the appropriateness of public access on a site-by-site basis in consultation with the State Historic Preservation Officer and the owner of the land on which the site is located.

For historic sites and landmarks the following principles apply:

- Promote the identification, survey and listing of sites that are eligible for the Hawaii or National Registers of Historic Places.
- Preserve the architectural character, landscape setting and visual context of historic and cultural landmarks through appropriate zoning standards and development controls, as necessary, and public outreach programs such as design guidelines for the maintenance, renovation or expansion of older dwellings.
- Provide incentives for the preservation and maintenance of historic sites, such as property tax abatements.

3.5 AGRICULTURAL USE

An overview of agricultural development in Koolaupoko is presented below. This is followed by a description of general policies and guidelines that are to be applied to areas designated for agricultural use.

3.5.1 OVERVIEW

As described in Section 2.2.2, Koolaupoko's agricultural areas consist primarily of small farms. The largest concentration of high-quality agricultural land is in Waimanalo, which is also within reasonable reach of the Honolulu market and overseas shipping terminals. Other areas suitable for truck farming are in Maunawili Valley and the valleys between Ahuimanu and Kualoa at the northern end of the district.

The pattern of small farms, typically with a dwelling on the same lot, presents a paradox. On one hand, this arrangement enhances the economic feasibility of an agricultural operation by (1) minimizing land costs; (2) enhancing security for agricultural products and equipment; (3) allowing more efficient access for daily maintenance; and (4) avoiding the cost of a separate home site for the farmer. On the other hand, this pattern may lead to a gradual transformation of agricultural areas to large-lot residential neighborhoods, induced by real estate development pressures. Development pressure is exacerbated as conflicts arise between agricultural use and nearby residences, such as increased complaints from neighbors about dust, noise, overspray, odors, and other normal effects of farming. In turn, this can lead to operational changes that may be required by the enforcement of public health regulations and that adversely affect the feasibility of agriculture. One way to avoid this conflict is to require the more-recently established use to maintain adequate separation between agricultural and residential uses.

Land use policy can support agricultural activities in other ways, as well. For example, zoning and development codes can restrict nonagricultural uses to those that are intended to meet the needs of the rural community or that are related to agricultural operations in the area. It can also propose the development of facilities and programs that support agricultural activities and the marketing of products.

3.5.2 GENERAL POLICIES

The following general policies apply to lands designated for agricultural use:

- Encourage agricultural use of small lots and prevent incremental conversion of agricultural lands to exclusive residential or other nonagricultural uses.
- Adopt development and public works standards that are appropriate and cost-effective for rural, agricultural areas.
- Provide support infrastructure, services and facilities to foster and sustain agricultural operations.
- Implement tax policies that promote active, long-term agricultural uses.

3.5.3 PLANNING PRINCIPLES

The following planning principles apply to lands designated for agricultural use:

- ***Appropriate Development Standards***. Zoning and subdivision codes should prevent the conversion of agricultural lots to residential or other non-agricultural uses.
- ***Infrastructure Requirements***. Standards for public infrastructure in rural and agricultural areas should be modified in accord with the character and needs of such areas.
- ***Appropriate Use Standards***. Use standards should provide for all agricultural activities and uses customarily associated with agricultural areas, including ranching and plant nurseries (crop production with on-site retail or wholesale sales). In agricultural districts, nuisance regulations in zoning and environmental codes should give preference to agriculture use over residential use. Nonagricultural uses should be limited to those that provide support services for agricultural operations or the rural community or that are otherwise directly related to an agricultural use.
- ***Supporting Measures and Incentives***. Provide tax incentives, technical and financial assistance, and public land or facilities that support agricultural operations and/or the marketing of products. Promote land trusts, conservation easements, agricultural dedications, and other mechanisms as incentives to preserve agricultural land use.

3.5.4 GUIDELINES

- Zoning standards should limit the floor area of dwellings and prevent inappropriate urban uses, such as meeting facilities and conditional uses that have no direct relationship to agricultural or local community needs. Dwellings should be permitted only if there is an agricultural use of the same lot.
- Zoning standards should require new residential development to maintain an adequate buffer when adjacent to agricultural lands, giving consideration to topographic barriers, prevailing winds, and the noise and air-borne emissions associated with the type of agricultural operation.
- Adopt standards for roadway and other infrastructure design that are appropriate and intended for continued agricultural use rather than residential use.

- Performance standards for agricultural zoning districts should focus on preventing degradation of the natural environment, maintaining the viability of agricultural uses, and protecting the health and safety of agricultural workers rather than on disturbances to residential uses.

- Review and revise agricultural subdivision regulations as necessary to implement the plan.

- Property tax assessments and rates should be structured to encourage long-term leases for agricultural operations.

3.6 RESIDENTIAL USE

An overview of residential development in Koolaupoko is presented below. This is followed by a description of general policies and guidelines that are to be applied to existing and planned residential developments.

3.6.1 OVERVIEW

With the establishment of Urban Community, Rural Community, Agriculture and Preservation Boundaries to preserve open space and agricultural areas and contain the spread of development, housing capacity in Koolaupoko will be increased only by:

(1) "Infill" development of remaining vacant lands in areas that are already urbanized;

(2) Minor subdivisions of some larger residential lots into smaller parcels at scattered locations throughout the region;

(3) Expansions of existing homes to accommodate larger households; and

(4) Residential development on Marine Corps Base Hawaii and lands under the jurisdiction of the Department of Hawaiian Homelands or the Office of Hawaiian Affairs.

While the development of vacant parcels is readily identified and their effects are more immediately apparent, the physical changes wrought by incremental intensification of residential use in existing built-up neighborhoods through minor subdivisions and home expansions will be slower and more subtle. Effective residential lot design standards which limit building height, coverage, paving, and removal of landscaping should be implemented to avoid the long-term cumulative impact of this gradual transformation, which could adversely affect the character of existing neighborhoods.

3.6.2 GENERAL POLICIES

The following general policies may be applied to existing and planned residential developments:

- Protect the integrity of existing residential areas and enhance the desirable living amenities available to them.

- Increase housing capacity in Koolaupoko in accordance with General Plan policies through development of new homes on lots presently designated for low-density residential use and expansion of existing homes in built-up residential neighborhoods.
- Respond to the special needs of an aging population by providing future housing development for the elderly in a variety of living accommodations that are affordable to low- and moderate-income, gap group, and other elderly households; such as multi-generation households, group homes, assisted living units, and continuing care retirement communities. Except for multi-generation housing, these should be provided primarily outside of single-family districts.

- Modify residential neighborhood street design, where appropriate, to provide greater emphasis on safe, accessible, convenient and comfortable pedestrian routes, bus stops, and

bike routes, even if this requires somewhat slower travel speeds or less direct routes. This may require review and revision of City street standards.

- Allow community facilities such as schools and churches, with appropriate limitations on scale, siting and intensity of activity to respect adjacent residential uses and the prevailing character of the surrounding neighborhood.

3.6.3 PLANNING PRINCIPLES

- ***Physical Character and Definition of Neighborhoods***. Establish design guidelines to minimize long-term adverse impacts of expansions of existing homes and new infill development on surrounding neighborhoods. Use sloped roof forms with wide overhangs. Discourage paving of yard areas. Enhance the boundaries of existing neighborhoods through the use of landscaping, natural features, and building form and siting. Focus neighborhood activity on the local street, common pedestrian rights-of-way, and recreation areas.

- ***Transit-, Bicycle- and Pedestrian-Oriented Residential Streets***. Encourage bus, pedestrian, and bicycle travel, particularly to reach neighborhood destinations such as schools, parks, and convenience stores, recognizing the need for accessible design and safe travel conditions for elderly and/or disabled people. Implement passive and active automobile traffic calming measures on residential neighborhood streets and plant street trees to provide shading for sidewalks and bus stops. Provide sufficient area within the public right-of-way to accommodate shelters at bus stops.

- ***Environmental Compatibility***. Encourage energy efficient features, such as the use of solar panels for heating water, and passive solar design, such as the use of window recesses and overhangs and orientation of openings to allow natural cross-ventilation. Also, resource conservation measures such as water flow constrictors and facilities for the sorting of waste materials for recycling should be incorporated in the design of new development and expansions of existing dwellings, but in each case visual impacts of such measures should be minimized.

- ***Hillside and Floodplain Development Standards.*** Safety and health problems inherent in the development of land with steep slopes and/or potentially unstable soil conditions must be avoided. Development standards governing such conditions should be reevaluated and revised to reflect the most current civil, soils, structural engineering and geological findings related to this subject as well as the analysis of historical experience on Oahu. Development within the 100-year floodplain needs to conform with regulations and guidelines of the Federal Emergency Management Agency

- ***Nuisance regulations should give preference to residential uses in residential districts.*** Nuisance regulations in zoning and environmental codes should give preference to residential uses over other uses.

3.6.4 GUIDELINES

Guidelines to implement the general policies and planning principles are provided below:

3.6.4.1 Rural Forms of Residential Development

Rural residential areas typically exhibit the physical characteristics of a rural context, including:

- Lower population and building density than more urbanized areas;
- Smaller lot coverage and larger setbacks than encountered in more urbanized areas;
- Low-rise structures, generally not exceeding two stories;
- Relatively narrower roadway widths;
- Reduced sidewalk requirements;

- Use of grassed swales rather than curbs and gutters; and
- Rurally-oriented landscaping.

Two categories of rural residential development are recognized by this plan: Rural, and Rural Residential.

- Rural: This category consists of single-family homes on relatively large lots, e.g., lots of one acre or more. Development is low intensity and generally consists of a single-family home, ancillary structures if necessary, low site coverage, and a predominance of landscaped open space. No intensification in the use of existing Rural areas or creation of new Rural areas is intended. Existing Rural parcels are recognized, valid uses; however, no new Rural lots should be permitted.

  Two variants of the Rural category are recognized by this plan:
  - Inside the Urban Community or Rural Community boundaries, Rural areas may be developed as large-lot residential uses.
  - Outside the Urban Community or Rural Community boundaries, Rural areas should be used primarily for agricultural uses. Overall site density should not exceed one dwelling per 2 acres on lands which have been subdivided into lots of less than 5 acres, and one dwelling per 5 acres on lots that exceed this size as of the effective date of this plan. Dwellings should be subject to occupancy and size restrictions similar to those set forth in Section 3.5.4.

- Rural Residential: This category is intended to describe the bulk of existing and new residential developments located within the Rural Community boundaries. These areas consist of single-family homes in "country" settings. Currently, typical residential lot sizes range from just less than one acre to about one-eighth acre; new subdivisions, if proposed, should provide for residential lot sizes no smaller than about one-fourth acre. The allowed density range should be amended so average densities are in the range of 0.2 units per acre to 4 units per acre.

3.6.4.2 Urban Forms of Residential Development

Two categories of urban residential development are recognized by this plan: Residential and Low-Density Apartment. These categories exhibit more intense patterns of development than is intended for the rural areas. Both of these categories are found only within the Urban Community Boundary areas.

- Residential: Dwellings in this category consist of single-family detached and attached homes or townhouses with individual entries. Applicable regulations should be reviewed and revised as necessary to provide that multi-family projects must have a minimum lot size of three acres in existing residential districts. Efforts should be directed to maintaining and enhancing the protection of residential neighborhoods from incompatible uses and nuisance-producing activities. Density of development may range from two units per acre to 8 units per acre. Building heights should not exceed two stories.

- Low-Density Apartment: This category consists of predominantly 2-3 story townhouse complexes, stacked flats, or low-rise apartment buildings; parking provision may comprise a separate story, but efforts should be made to minimize overall building height and building height should not exceed 30 feet. Buildings may have elevators and common entries for multiple dwellings. Density of development may range from 10-30 units per acre.

3.6.4.3 Special Needs Housing

Special Needs Housing comprise facilities designed for certain segments of the population with special living requirements. Categories of special needs groups include low- and moderate-income sectors, senior citizens, disabled people, and people with health problems or needs for other forms of special care. Often such housing includes special features, such as congregate dining and social rooms; laundry, housekeeping and personal assistance services; shuttle bus services for project residents; and skilled nursing beds or physical therapy clinics. Special needs housing should be located in close proximity to transit services and commercial centers. Although special needs housing can occur at a variety of scales appropriate to the region's neighborhoods, it is intended that multi-family housing will be the primary form used to achieve economies of scale in the

development of special needs housing. Thus, it is anticipated that special needs housing will be accommodated primarily within the low-density apartment areas and the commercial-residential mixed use areas in the Regional Town Centers.

3.7 COMMERCIAL AND INDUSTRIAL USES

This section provides an overview of commercial and industrial land uses in Koolaupoko followed by general policies, planning principles, and guidelines for the location, expansion or renovation of such uses. Commercial and industrial uses includes retail and service establishments, offices, light industrial activities and storage facilities.

3.7.1 OVERVIEW

As described in Section 2.2.6, much of the commercial development in Koolaupoko is in the form of shopping centers. Some are located within the central business districts of Kaneohe and Kailua, while others are located in outlying areas, usually surrounded by suburban residential neighborhoods and smaller commercial properties. Listed in **Table 3-7** are the shopping centers that contained over 50,000 square feet of gross leasable area in 1998.

There is a probable demand for certain additional light industrial uses that are oriented to the needs of the region's suburban and rural communities. Such uses could include, among others, small warehouses and repair shops for equipment, appliances, vehicles and sundry household items. However, the anticipated demand for space in this region can be accommodated within the existing industrial zones of the town centers of Kailua and Kaneohe and in the vicinity of Kapaa Quarry, where similar uses are already located.

3.7.2 GENERAL POLICIES

For purposes of this Plan, the various types of commercial and industrial uses are defined and designated in five categories: Rural Community Commercial Center, Neighborhood Commercial Center, Community Commercial Center, Regional Town Center, and Light and Extractive Industry. The policies pertaining to each of these categories are as follows:

- ***Rural Community Commercial Center***. The Rural Community Commercial Center is a small cluster of commercial and service uses which serve primarily the surrounding rural community. Due to their highway exposure, many businesses also attract visitors and residents from outside the immediate community. The Rural Community Commercial Center typically consists of small business establishments located on small land parcels rather than in shopping centers. The exception is Waimanalo Shopping Center, which is small compared to most suburban shopping centers.

Table 3-7
Major Shopping Centers in Koolaupoko

Shopping Center	Site Area (Acres)	Gross Leasable Area (Sq Ft)	Location Characteristics
Windward Mall	32.0	530,000	Edge of Kaneohe central business district; across from Kaneohe Bay Shopping Center
Windward City	15.4	231,782	Within Kaneohe at major highway intersection; small commercial and industrial properties nearby
Kaneohe Bay	10.0	106,000	Edge of Kaneohe central business district; across Kamehameha Highway from Windward Mall
Aikahi Park	7.9	103,000	Outskirts of Kailua at major collector road intersection; Pali Palms Center across street
Temple Valley	12.3	100,866	Within Ahuimanu community; surrounded by townhouse and low density apartment development
Windward Town & Country	5.6	87,639	Within Kailua central business district
Kailua	2.3	84,222	Within Kailua central business district
Enchanted Lake	5.5	75,000	Within Enchanted Lake community in the outskirts of Kailua; other small commercial properties located adjacent and across street
Kaneohe	3.3	54,000	Within Kaneohe central business district

Source: International Council of Shopping Centers, *1992 Directory*; interviews with property managers.
"Major" is defined as those with over 50,000 sq. ft. of gross leasable floor area.

- ***Neighborhood Commercial Center***. The Neighborhood Commercial Center typically encompasses an area of about five to ten acres or less, with an aggregate floor area of up to 100,000 square feet. It may consist of a shopping center on a single lot, a concentration of commercial establishments on smaller lots, or a combination of the two. It is located within or adjacent to a residential neighborhood and contains services and shops catering to common household needs.

- ***Community Commercial Centers***. The typical Community Commercial Center is situated along an arterial road or at the juncture of major roads. The nucleus is a retail shopping center that occupies between 10 to 30 acres and contains up to 250,000 square feet of floor area, but with the addition of adjacent, smaller sites the entire Community Commercial Center may encompass up to 50 acres. In addition to the uses found in Neighborhood Commercial Centers, Community Commercial Centers may include offices, service industrial establishments, entertainment and social centers. Windward City Shopping Center and adjacent commercial uses fall into this category.

- ***Regional Town Centers***. The commercial core areas of Kaneohe and Kailua are defined as "Regional Town Centers". They offer a wider range of shopping and services than the other commercial centers in the region, including light industrial uses. Their roles will be intensified and enhanced by directing new commercial development to these centers, increasing the mix of uses and types of services and activities in the centers and providing more convenient public transportation access and pedestrian amenities within and leading to the centers.

- ***Light and Extractive Industry***. This description pertains to light industrial uses and resource extractive activities, such as sand and rock quarrying. Koolaupoko has two quarries, one in Waimanalo and the other at Kapaa. The former quarry at Kapaa was for many years the site of the City's largest sanitary landfill until its recent closure. A portion of the existing Kapaa quarry is bounded by light industrial uses. This plan anticipates the continuation of existing quarries, and the opening of a new quarry site in Kapaa on the other side of the H-3 Freeway. When extractions from the Kapaa quarries have been completed, they should be considered for natural conditions or an expansion of light-industrial uses, if sufficient demand can be demonstrated. The industrial zoned (but not presently developed as industrial) area along the frontage of Hekili Street in Kailua should be rezoned to commercial.

3.7.3 PLANNING PRINCIPLES

The following planning principles apply to the expansion or renovation of the existing commercial centers and industrial uses described above.

- ***Scale and Purpose of Rural Community Commercial Centers***. The intent in designating a specific location for the Rural Community Commercial Centers of Kahaluu and Waimanalo is to promote a more concentrated, but small-scale center for commercial activities and services for rural communities and agricultural enterprises. At present, commercial uses within the Rural Community Boundaries are somewhat dispersed along highway frontages. New or expanded commercial uses outside of the Urban Community Boundary areas should occur only in the Rural Community Commercial Centers.

- ***Scale and Purpose of Neighborhood Commercial Centers***. The Neighborhood Commercial Center designation applies to commercial properties within the Urban Community Boundary that are not defined as Community Commercial Centers or Regional Town Centers. To maintain their present scale and purpose, the number and size of Neighborhood Commercial Centers should not be increased through zoning actions. Minor expansions of floor area may occur on lots that are presently zoned for commercial use. These centers should continue to emphasize retail stores and personal services and public facilities designed to serve the needs of the surrounding community; i.e., typically residents within a one- to two-mile radius.

- ***Scale and Purpose of Community Commercial Centers***. These centers should retain their present purpose and approximate size. Modest additions of floor area and parking could be made to these centers through redesign of the sites they presently occupy. There should be no expansion of commercial zoning to additional lots in the vicinity of these centers, except for those near Windward City that are presently zoned light industrial but are predominantly in commercial-type uses.

- ***Mix of Uses in the Regional Town Centers***. The centers of Kaneohe and Kailua will be composed of four components:

  —Given their size and location relative to principal travel routes in the region, the centers of Kaneohe and Kailua should be designated as the focal points for regional shopping and services. This may include small to medium-sized office buildings and "service-industrial" establishments.

  —Light industrial zones should be converted to commercial-industrial mixed use to reflect actual use patterns and promote storefront uses along the sidewalks.

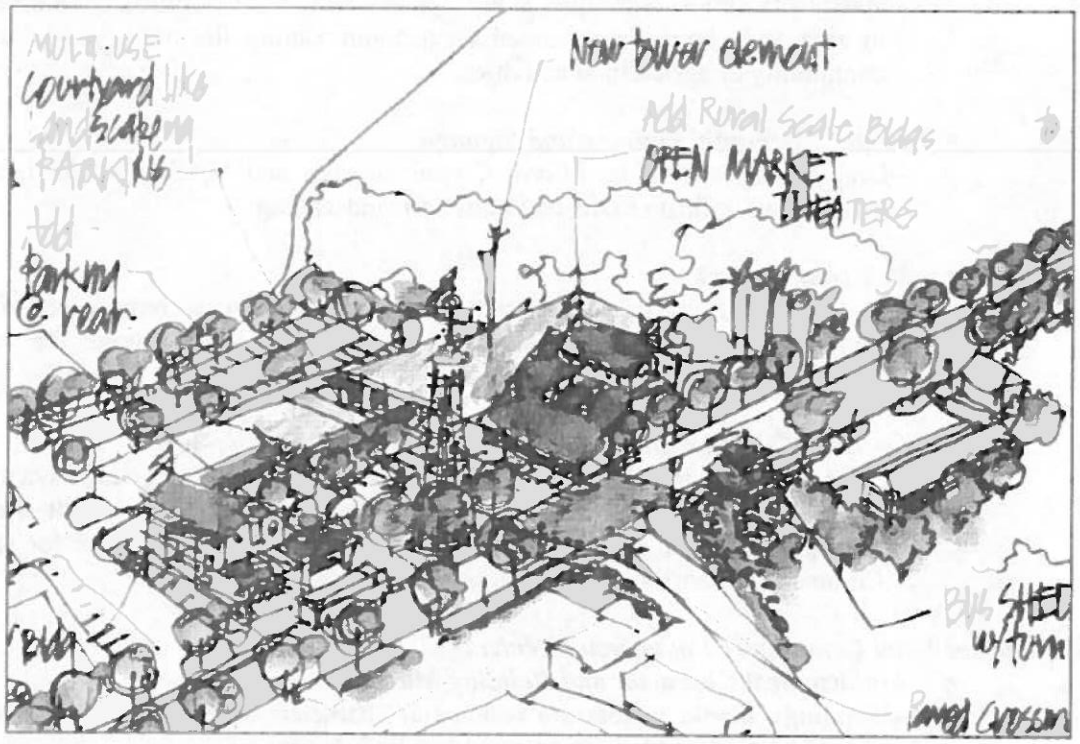
  —Low-density apartment and special needs housing uses should be allowed in the commercial district to stimulate business activity and create a livelier environment, but not to the extent that it is inconsistent with General Plan population policies, nor to the extent that a net loss of commercial floor area is realized in the affected Regional Town Center.

  —Building Heights. As is currently established in all areas of Koolaupoko, commercial building heights should not exceed 40 feet.

- ***Pedestrian Orientation in the Regional Town Centers***. The centers of Kaneohe and Kailua should have an integrated pedestrian circulation system consisting of linkages through blocks to public sidewalks and transit stops. Storefronts and entries to business establishments should support this pedestrian orientation. Encouraging shared use of parking should reduce the dominance of parking lots. Consideration should be given to implementing a parking improvement district in Kaneohe and expanding the one in Kailua.

- ***Physical Accessibility***. Incorporate site design and facilities to promote pedestrian, bicycle and transit access. Pedestrian and bicycle access should be provided at the Neighborhood Commercial Centers and Community Commercial Centers; and transit access should be convenient for patrons of the Regional Town Centers. Efficiencies and other improvements in traffic and parking conditions could be achieved by redesigning or re-siting parking lots, driveways (particularly in the Kailua Regional Town Center) and walkways and providing shuttle bus services within the Kailua and Kaneohe communities and their respective Regional Town Centers.

- ***Appropriate Scale and Architectural Style***. Maintain consistency between the building mass of a commercial center and its urban and natural setting. The architectural character of commercial centers should respect the surrounding urban and natural features, particularly when located adjacent to a residential area or significant natural or historic feature. Commercial centers lend themselves to the application of urban design features that provide distinctiveness to each center and strengthen the characteristics of the communities they serve. Rural Community Commercial Centers should reflect the rural characteristics of the surrounding community. Neighborhood Commercial Centers should be compatible in design and scale with the surrounding area. The Regional Town Centers may reflect a more urban architectural character, with emphasis on pedestrian-scaled design and features. Building height and mass also should not conflict with the surrounding urban and natural setting.



The region's town centers should reflect greater pedestrian orientation, including through-block walkway links, building entries directly from the sidewalk, and placement of parking behind the buildings.

- ***Environmental Compatibility***. Encourage energy efficient features, such as the use of solar panels for heating water, and passive solar design, such as the use of arcades, window recesses and awnings and orientation of openings to allow natural cross-ventilation. Also, resource conservation measures such as water flow constrictors and facilities for the sorting of waste materials for recycling should be incorporated in the design of new development.

- ***Compatible Reuse Plans for Quarry Sites***. The reuse plan for the Kapaa quarry sites should emphasize the restoration of natural conditions rather than urban uses. Fill material should be engineered and generally consist of natural materials or nontoxic construction debris and limited in quantity to the amount necessary to simulate the original topographic conditions of the site. There should also be a suitable depth of topsoil to establish plant material similar to that in the surrounding area. In Waimanalo, the quarry site may be reused for the development of Hawaiian Home Lands residential lots; a mini-park may also be provided for the neighborhood.

3.7.4 GUIDELINES

The following guidelines are intended to implement the general policies and planning principles listed above.

Rural Community Commercial Centers

- ***Architectural Character and Building Mass***

  —Buildings should have a rustic appearance, with pitched roof forms or "false-front" parapets characteristic of rural towns in Hawaii.

  —Individual business establishments within the center should be relatively small and should be focussed on provision of goods and services primarily to the surrounding rural community or agricultural activities.

—Buildings should be sited close to the roadway in the manner of a traditional rural village.
—Meeting facilities, other than public schools or service facilities, should be relatively small in area and should be focussed on accommodating the needs of the surrounding rural community or agricultural activities.

- ***Visual Screening, Lighting and Signage***
  —Landscaping should be informal, road signage and lighting subdued, and parking lots visually subordinate to the buildings and landscaping.

- ***Vehicular Access***
  —No new off-street parking or loading areas designed to accommodate private vehicles for more than 15 passengers should be permitted, except those for school or public transportation.

- ***Outlying Commercial Uses***
  —Outside of the Rural Community Commercial Centers, structures occupied by existing commercial, light industrial or community facility uses may be rebuilt or remodeled within their present floor area, provided they meet the design guidelines for Rural Community Commercial Centers.

Neighborhood and Community Commercial Centers

- ***Architectural Character and Building Mass***
  —Buildings should maintain a residential character; height, size, and massing of building should be compatible with adjacent residential areas.
  —The total floor area of Neighborhood Community Centers should not exceed 100,000 square feet; aggregate floor area of all properties within Community Commercial Centers should not exceed 350,000 square feet.
  —Encourage gable and hip-form roofs, using breaks in the roof line to reduce the apparent scale of large roof plates.
  —Express residential character by using exterior materials and colors that are typically found in neighborhood houses.

- ***Vehicular Access***
  —Access to the parking and loading areas should be from a collector street.
  —Encourage use of shared driveways to access parking areas between buildings.
  —Permit access to a local residential street only if it is for emergency or secondary access and would not encourage through traffic along the local street.

- ***Pedestrian and Bicycle Facilities***
  —There should be at least one pedestrian access from the public sidewalk or other off-site pedestrian pathway to the entrance of establishments in the commercial center that does not require crossing a traffic lane or parking lot aisle or driveway.
  —There should be a direct pedestrian connection from the interior walkways in the commercial center to a bus stop.
  —Design and place bicycle racks to provide security and be visible and readily accessible from the street entry.

- ***Visual Screening, Lighting, and Signage***
  —Visually screen parking and service areas from streets and residential areas.
  —Include a landscaped screen of trees and hedges along the street frontages and property lines.

—Provide and maintain shade trees throughout parking lots.

—Use only low-level or indirect lighting which meet safety and security requirements in parking lots.

—Ensure compatibility between the type, size, design, placement, and color of signage and the context of adjacent facilities and uses and in conformance with approved urban design guidelines of the community.

Regional Town Centers (Kailua and Kaneohe)

- ***Mix of Uses***

—Public uses serving a regional purpose -- such as Satellite City Halls, regional libraries, police substations, post offices, and civic centers - should be located within either or both of these Regional Town Centers and not in outlying areas. Public facilities that have smaller service areas or that are an integral part of a regional network, such as elementary schools, fire stations, pump stations, and utility substations, may be located in outlying areas.

—Service industrial uses should be located within enclosed buildings. Locate, design, and operate uses that generate undue noise levels in a way that will keep noise to an acceptable level in adjacent areas.

- ***Architectural Character and Building Massing***

—Architectural character may be varied, depending on the context, the theme, and the individual community's approved urban design guidelines for the particular center. Portions of commercial center buildings that are adjacent to or readily visible from residential areas should reflect, and be compatible with, a more residential character; or be screened from view from such areas by landscaping.

—Secondary entries to business establishments may be provided from parking areas. Development of cooperative parking agreements among neighboring businesses and landowners is encouraged.

—Avoid blank facades on portions of buildings visible from public areas by using texture, articulation, color, and fenestration to create visual interest.

—Building heights should not exceed 40 feet, with height setback transitions from street frontages, the shoreline, and adjacent residential areas.

- ***Pedestrian, Bicycle, and Transit Facilities***

—Provide street frontage improvements for bus stops, each including a bus shelter and a pull-out off a traffic lane, along all abutting streets that have bus routes.

—Provide a pedestrian pathway from the bus stop to an entrance to the main building of the commercial center. The pathway should be clearly indicated with special paving or markings and covered to provide weather protection, if the commercial center building is not directly connected to the bus shelter.

—Design and place bicycle racks to provide security and be visible and readily accessible from the street entry to the commercial center.

- ***Visual Screening, Lighting and Signage***

—Buffer noise and other adverse impacts related to parking, loading and service areas from adjacent residential areas by landscaped berms or solid walls fronted by landscaping.

—Plant a landscape screen, consisting of trees and hedges, along streets fronting parking lots or garages. Shade trees should be planted throughout parking lots.

—Visually screen storage areas for vehicles, equipment, and supplies from the street and adjacent lots by privacy walls and buildings, fronted by landscaping used to soften the appearance of large solid walls. An attractive center is also good for business.

—Signage may be directly illuminated, but use of direct illumination of building features should be discouraged. High intensity lighting should be shielded to avoid direct visibility from residential areas.

Light and Extractive Industry

- ***Visual Screening, Lighting and Signage***

—Buffer noise and other adverse impacts from quarrying operations from adjacent urban uses, wildlife preserves and public roads by a combination of landscaped berms and setbacks.

—For light industrial buildings, buffer noise and other adverse impacts from parking, loading and service areas from adjacent urban uses, wildlife preserves and public roads by a combination of solid walls or berms and landscaped setbacks.

—Plant a landscape screen, consisting of trees and hedges, along roads fronting parking lots or garages.

—Visually screen storage areas for vehicles, equipment, and supplies from adjacent roads, wildlife preserves and urban uses by privacy walls and buildings, fronted by landscaping used to soften the appearance of large buildings and solid walls.

- ***Drainage and Waste Material***

—Stormwater runoff should be managed through application of Best Management Practices (BMPs) or contained or filtered onsite. To minimize the creation of impervious surfaces, alternatives to hardscape should be encouraged. There should be no discharge into adjacent wildlife preserves, water resources, sanitary sewage systems, or other urban use areas.

—Leachates from underground storage tanks or fill material should be prevented from migrating offsite, applying particularly stringent measures to sites near wildlife preserves.

—Litter and other waste material should be prevented from encroaching into adjacent sites through the use of landscaping as well as proper maintenance of the site.

3.7.5 RELATION TO MAP A-2, LAND USE

Commercial and industrial areas are shown on Map A-2, Land Use, as follows:

- ***Rural Community Commercial Centers***. The Rural Community Commercial Centers of the rural communities of Waimanalo and Kahaluu are designated in red, with the designation "RC."

- ***Neighborhood Commercial Centers and Community Commercial Centers***. The locations of Community Commercial Centers and Neighborhood Community Centers with an aggregate floor area of more than 50,000 square feet are designated in red with the designations "CC" and "nc."

- ***Regional Town Centers***. The components of the Regional Town Centers of Kailua and Kaneohe are designated in red, with the designation "TC," representing the general location, size and shape of the respective land areas.

- ***Light and Extractive Industry***. Industrial areas are designated in purple.

3.8 INSTITUTIONAL USES

3.8.1 OVERVIEW

Koolaupoko is home to several public and private institutional campuses. Its secondary school campuses are listed and discussed in Section 4.7. **Table 3-8** lists other significant institutions.

Table 3-8
Institutional Campuses in Koolaupoko

Institution	1998 Capacity	Location Characteristic
Hawaii Pacific University	1,500 students*	In State Conservation District surrounded by open space
Windward Community College	1,517 students	Situated between Kaneohe State Hospital and Kaneohe District Park
Oceanic Institute	N.A.	*Mauka* of Kalanianaole Highway near Makapuu
Hawaii Job Corps	210 beds	*Mauka* of Kalanianaole Highway in Waimanalo
Castle Memorial Hospital	150 beds	At edge of Kawainui Marsh and the entry to Kailua
Kaneohe State Hospital	202 beds	*Mauka* of Windward Community College and Kaneohe District Park to the Conservation District
Women's Community Correctional Center	210 women	*Makai* of Kalanianaole Highway at edge of Kailua
Hawaii Youth Correctional Facility – Koolau	50 boys	*Makai* of Kalanianaole Highway at edge of Kailua
Hawaii Youth Correctional Facility – Kawailoa	8 girls	*Mauka* of Kalanianaole Highway at edge of Kailua

* This is the number of students estimated to be present on campus at any time; total enrollment at all campuses of Hawaii Pacific University, including classes on military bases, was about 8,200 students in 1998.
Source: Interviews with representatives of respective institutions.

3.8.2 GENERAL POLICIES

The following general policies are applicable to institutional campuses:

- ***New Campuses***. The small increase in population forecast for 2020 in Koolaupoko does not warrant major new schools, hospitals, or similar institutions to serve these communities. Furthermore, establishment of a large institution in Koolaupoko for the purposes of creating additional employment in the region would be contrary to the General Plan policy to direct job growth to the Primary and Secondary Urban Centers. Therefore, no new institutional campuses are proposed in this plan.

- ***Existing Campuses***. Existing institutions may expand facilities and programs within the campuses they presently occupy. However, because the major institutions are located adjacent to significant scenic resources, the campuses should retain an open space character and buildings and facilities on the campus should be sited and designed to respect the scenic context.

3.8.3 PLANNING PRINCIPLES

The following planning principles apply to the expansion or renovation of existing institutional campuses:

- ***Appropriate Scale and Architectural Style***. Maintain consistency between the building mass of an institution and its campus setting. The architectural character of institutional buildings and structures should respect the surrounding urban and natural features, particularly when located adjacent to a residential area or significant natural or historic feature.

- ***Environmental Compatibility***. Encourage energy efficient features, such as the use of solar panels for heating water, and passive solar design, such as the use of window recesses and overhangs and orientation of openings to allow natural cross-ventilation. Also, resource conservation measures such as water flow constrictors and facilities for the sorting of waste materials for recycling should be incorporated in the design of new development.

3.8.4 GUIDELINES

The following guidelines are intended to implement the general policies and planning principles listed above.

- ***Architectural Character and Building Massing***
  —Reflect in the site plan a campus-like environment with a relatively low building coverage ratio and low profile, emphasize attractive landscaping, including water features where appropriate.
  —Vary the architectural character, depending on theme and purpose of the use. Portions of buildings that are adjacent to or readily visible from residential areas should reflect a more residential character; or be screened from view from such areas by landscaping.
  —Building heights should not exceed two to three stories or 40 feet, including the roof form. Height setback transitions should be provided from street frontages, the shoreline, and adjacent residential areas.

- ***Pedestrian, Bicycle, and Transit Facilities***
  —Provide street frontage improvements for bus stops, including a bus shelter and a pull-out off a traffic lane, along all abutting streets that have bus routes.
  —There should be a pedestrian pathway from the bus stop to an entrance to the main building of the institution. The pathway should be clearly indicated with special paving or markings.
  —Design and place bicycle racks to provide security and be visible from the main street or parking entry to the institution.

- ***Visual Screening, Lighting and Signage***
  —Buffer the noise and other adverse impacts from parking, loading, and service areas from adjacent residential areas by a combination of solid walls or berms and landscaped setbacks.
  —Plant a landscape screen, consisting of trees and hedges, along streets fronting parking lots or garages. Shade trees should be planted throughout parking lots.
  —Visually screen storage areas for vehicles, equipment, and supplies from the street and adjacent lots by privacy walls and buildings, fronted by landscaping used to soften the appearance of large solid walls.
  —Signage should be held to a minimum and nonilluminated or indirectly illuminated. Outdoor lighting should be shielded to avoid direct visibility from residential areas.

3.8.5 RELATION TO MAP A-2, LAND USE

The general locations of existing larger institutions, such as intermediate and high schools, colleges, hospitals and correctional facilities, are indicated in blue representing the general location, size and shape of the institutional campus and symbols representing the type of institution. Elementary schools, churches, child care centers, fire stations, and other public facility and utility uses serving the area are not specifically

designated on Map A-2, Land Use, but are allowed in all residential and commercial areas, subject to appropriate zoning controls to assure compatibility with surrounding uses.

3.9 MILITARY USES

3.9.1 OVERVIEW

Koolaupoko has two military installations: Marine Corps Base Hawaii, Kaneohe (MCBH), on Mokapu Peninsula; and the Bellows Air Force Station in Waimanalo. In 1994, all of the Marine Corps landholdings and installations were consolidated under a single command at MCBH. This was in part a result of the decision to close the Barbers Point Naval Air Station (BPNAS) in Ewa, whose functions MCBH will absorb. In 1998, the Navy announced that Bellows would also come under this command.

For safety and security reasons, public access to the MCBH is restricted. The beach area at Bellows, which has been put to considerably less intensive military use in recent years, is available for public recreation use on weekends and holidays through an agreement with the City's Department of Parks and Recreation. At present, Bellows serves as an occasional site for military exercises and training and a portion of the land near the shoreline is used as a recreation facility for military personnel. Native Hawaiians have lobbied for the return of Bellows to the State of Hawaii for the use of the Department of Hawaiian Home Lands. However, in 1998, the Hawaii Air National Guard announced plans to develop a 40-acre portion of Bellows for a training academy, in part a result of the closure of BPNAS.

3.9.2 GENERAL POLICIES

The following general policies are applicable to military uses:

- ***Continuation of Military Uses***. National defense objectives and budget priorities that are difficult to foresee determine the level of military presence. Nevertheless, the recent decision to consolidate the Marine Corps' operations in Hawaii at MCBH and place Bellows under this command indicates the likelihood of a long-term commitment to military presence in Koolaupoko. This plan therefore assumes that MCBH and Bellows will remain under military control. However, portions of Bellows may be available for greater civilian use.

- ***Release of Unused Lands to Civilian Use***. The State of Hawaii should continue to pursue the release of surplus federal lands, including those at Bellows, for civilian use. When it is released, beachfront area should be reserved permanently for recreational use. *Mauka* areas could also be used for recreational purposes or for other purposes. However, any residential or commercial uses should be limited and constitute a minor portion of the total site area and be located outside of flood hazard areas and adjacent to existing similar uses.

3.9.3 PLANNING PRINCIPLES

- ***Environmental Compatibility***. Encourage energy efficient features, such as the use of solar panels for heating water, and passive solar design such as the use of window recesses and overhangs and orientation of openings to allow natural cross-ventilation. Also, resource conservation measures such as water flow constrictors and facilities for the sorting of waste materials for recycling should be incorporated in the design of new development.

- ***Public Shoreline Access***. Seek expanded public access to shoreline areas for recreation. At Bellows, the objective is to secure continuous management control over the beachfront area and campgrounds. At Mokapu, the objective is to secure expansion of current limited public access to certain portions of the Base for recreational purposes.

3.9.4 GUIDELINES

- ***Architectural Character and Building Massing***

—When buildings and structures are visible from an adjacent civilian use, their scale and design character should reflect that of the adjacent civilian use or be screened from view from such areas by landscaping.

—Building heights should not exceed two to three stories or 40 feet, including the roof form, except to meet specific mission-critical design requirements. Height setback transitions should be provided from street frontages, the shoreline, and adjacent residential areas.

- ***Pedestrian, Bicycle, and Transit Facilities***

—Provide street frontage improvements for bus stops, including a bus shelter and a pull-out off a traffic lane, along all abutting streets that have bus routes.

—There should be a pedestrian pathway from the bus stop to the main entrance to base. The pathway should be clearly indicated with special paving or markings.

—Design and place bicycle racks to provide security and be visible from the main street or parking entry.

- ***Visual Screening, Lighting and Signage***

—Buffer the noise and other adverse impacts from parking, loading, and service areas from adjacent residential areas by a combination of solid walls or berms and landscaped setbacks.

—For parking lot lighting, full cutoff fixture and low pressure sodium lights should be encouraged.

—Plant a landscape screen, consisting of trees and hedges, along streets fronting parking lots or garages. Shade trees should be planted throughout parking lots.

—Visually screen storage areas for vehicles, equipment, and supplies from the street and adjacent lots by privacy walls and buildings, fronted by landscaping used to soften the appearance of large solid walls.

—Signage should be nonilluminated or indirectly illuminated. Lighting should be shielded to avoid direct visibility from residential areas.

3.9.5 RELATION TO MAP A-2, LAND USE

Portions of military lands that are occupied by identifiable urban uses, such as housing, commercial establishments and military buildings of an industrial character, are reflected on the map in the same way that comparable civilian uses are. Military lands used for training exercises, munitions storage or similar uses that have an open space character are represented in gray. Other lands under military control that have no specified use or that are designated as protected habitats are represented by the same color as Preservation areas under civilian control.

4. PUBLIC FACILITIES AND INFRASTRUCTURE POLICIES AND PRINCIPLES

The vision for Koolaupoko will be implemented in part through application of the general policies and principles for public facilities and infrastructure, which are presented in the following sections.

4.1 TRANSPORTATION SYSTEMS

This section describes the existing road, transit, bikeway and pedestrian network in Koolaupoko as well as plans for future improvements. These elements are shown in Map A-3, Public Facilities, in Appendix A. The section concludes with general policies and planning principles to guide future transportation system development in Koolaupoko.

4.1.1 ROADWAY NETWORK

The Koolaupoko *Sustainable* Communities Plan Area is served by several highways that provide access across the Koolau Mountain Range and other parts of the island:

- ***Likelike Highway, Pali Highway, and the H-3 Freeway*** traverse the Koolau Mountain Range and provide direct access between the windward and leeward sides of the island. The latter, a U.S. Interstate opened in 1997, begins at the Marine Corps Base Hawaii Kaneohe Bay and connects to H-1 and the Moanalua Freeway at Halawa.

- ***Kamehameha and Kahekili Highways*** connect to trans-Koolau highways and link Koolaupoko to other windward Oahu locations. In the mid-1990's, Kahekili Highway was widened to six lanes from Likelike Highway to Kahuhipa Street, and to five lanes from Kahuhipa Street to Haiku Road.

- ***Kalanianaole Highway*** links Koolaupoko to communities in East Honolulu and serves as a scenic, secondary route for travel between Kailua/Waimanalo and Honolulu.

The Oahu Regional Transportation Plan (ORTP) serves as a guide for the development of recommended major surface transportation facilities and programs. It identifies short- and long-term plans for major highway projects, transit improvements and transportation demand management (TDM) measures (e.g., park-and-ride lots and rideshare programs).

The highway widening and interchange projects cited in the 1995 revision of the ORTP (see **Table 4-1**) are intended to increase roadway capacity. This is inconsistent with the vision expressed in Chapter 2 of this Plan. Consequently, it recommended that none of those projects be implemented. Highway improvements should be limited to minor additions of turn lanes or stacking lanes, enhancements of landscaping and pedestrian and bicycle facilities, and traffic control features that improve safety and traffic flow and the aesthetic appearance of the right-of-way.

Table 4-1
Highway Projects Listed in the Oahu Regional Transportation Plan, 1995 Update
(Implementation of these projects is not recommended by this Plan)

Project	Time Period
Construct interchange on Pali Highway at Castle Junction	1995 - 2000
Construct interchange on Kahekili Highway at Likelike Highway	2001 - 2005
Widen Kalanianaole Highway to six lanes between Kailua Road and Castle Junction	2001 - 2005
Widen Kamehameha Highway to six lanes between Castle Junction and H-3	2001 - 2005
Widen Kamehameha Highway to four lanes between Haiku Road and Ipuka Street	2001 - 2005
Widen Kahekili Highway between Kahuhipa Street and Haiku Road from five to six lanes	2006 - 2020
Implement peak contraflow operation (i.e., four inbound and two outbound in AM) on Kahekili Highway between Likelike Highway and Haiku Road	2006 - 2020
Widen Kalanianaole Highway to six lanes between Keolu Drive and Kailua Road	2006 - 2020
Widen Kalanianaole Highway to four lanes between Waimanalo Beach Park and Saddle City	2006 - 2020
Widen Likelike Highway to six lanes between Kamehameha Highway and Kahekili Highway	2006 - 2020
Widen Kailua Road to four lanes between Hahani Street and Wanaao Road	2006 - 2020

Source: Kaku Associates and Parsons Brinckerhoff, for the Oahu Metropolitan Planning Organization, *2020 Oahu Regional Transportation Plan*, November 1995.

4.1.2 TRANSIT SYSTEM

TheBus system in Koolaupoko is organized in three service categories:

- ***Suburban trunk service***, which provides direct, multi-stop connections between suburban neighborhoods and activity centers within Koolaupoko;

- ***Suburban feeder service***, which provides suburban neighborhoods that are not directly served by trunk routes access to the transit system -- namely to express and trunk service routes; and

- ***Express service***, which provides direct non-stop connections between Koolaupoko and the major activity centers in the urban core of Honolulu.

Table 4-2 summarizes the routes and operational characteristics for bus services as of 1998. A 1993 study of bus operations recommended reducing and possibly eliminating service on the two suburban feeder Routes 70 and 77 due to high cost relative to ridership. As of 1998, service had been reduced only on Route 77 and there were no current plans to eliminate either route.

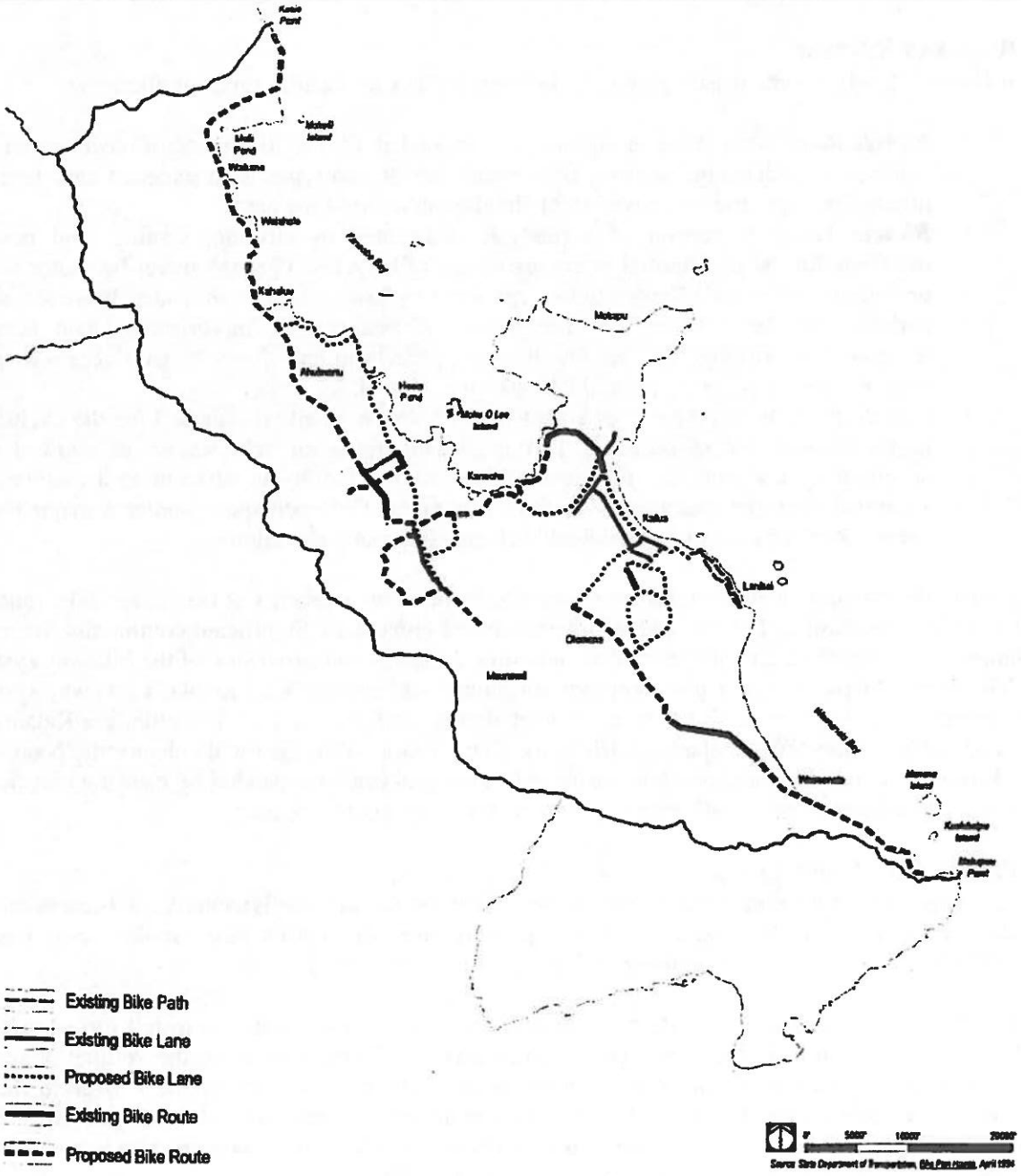
In workshops for the preparation of this *Sustainable* Communities Plan and the Oahu Trans 2K Plan, residents of Koolaupoko suggested using smaller-capacity buses or vans for short "circulator" routes within the region, especially in the communities of Kailua, Kaneohe and Waimanalo. This service could be used for shopping trips, connections to express buses and a variety of other purposes, and would support the transportation vision expressed in Chapter 2.2.4 of this *Sustainable* Communities Plan.

Table 4-2
Bus Routes in Koolaupoko by Service Category

Route	Coverage	Frequency of Trips per Day
Express		
85	Keolu/Kailua/Aikahi to Honolulu/UH	14 (6 during AM peak; 8 during PM peak)
85A	Kaneohe to Honolulu	11 (5 during AM peak; 6 during PM peak)
86	Kailua/Aikahi to Pearl Harbor	3 (2 during AM peak; 1 during PM peak)
86A	Kaneohe/Kahaluu to Pearl Harbor	3 (2 during AM peak; 1 during PM peak)
88 & 88A	Kahaluu/Ahuimanu to Honolulu	7 (4 during AM peak; 3 during PM peak)
89	Waimanalo/Kailua to Honolulu	4 (2 each in AM and PM peak periods)
Suburban Trunk		
55/65	Circle Island (incl. Kaneohe/Honolulu)	8-30 minute headways; 4AM - 12AM
56	Kaneohe/Kailua to Honolulu	10-60 minute headways; 4AM – 10:30PM
57	Kailua/Waimanalo/ /Honolulu	10-60 minute headways; 5AM – 11:30PM
Suburban Feeder		
70	Lanikai to Maunawili	90 minute headways; 6:30AM to 7:30PM
77	Waimanalo to Kaneohe	50-60 minute headways; 6AM - 6PM

Source: Parsons Brinckerhoff, for the Honolulu Public Transit Authority, *Comprehensive Operations Analysis of TheBus System*, August 1993, as updated by fax memo from Mr. James Burke, Department of Transportation Services, May 1998.

Figure 4-1
Existing and Proposed Bideways in Koolaupoko



To support the express bus service for commuters, the ORTP proposes park-and-ride lots in Kailua and Kaneohe in the year 2001 to 2005 time frame, but does not identify specific sites. Park-and-ride lots are most likely to be located alongside a trans-Koolau highway and mauka of most residential neighborhoods so that commuters do not have to "double-back" their route to board the express bus. The Oahu Trans 2K Plan is to establish transit centers to function as collection or distribution hubs. These transit centers would best be located near trans-Koolau highways to properly perform the collection-distribution function for commuters.

4.1.3 BIKEWAY SYSTEM

Bike Plan Hawaii (1994), a State master plan for bikeways, defines the various types of bikeways:

- ***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 are 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).

In Koolaupoko, the existing bikeway system consists of discontinuous segments of bike lanes, bike routes and bike paths in Kaneohe, Kailua, Lanikai and Waimanalo (see **Figure 4-1**). Significant community interest has been communicated regarding completion of discontinuous segments and expansion of the bikeway system in general. The State's bikeway master plan proposes substantial additions to Koolaupoko's bikeway system to create an interconnected grid through the more populated areas and links to East Honolulu via Kalanianaole Highway and to Koolauloa via Kamehameha Highway. The creation of the grid will enhance the potential for bike travel for short commuting and incidental trips. Also, the grid can be expanded by marking bicycle lanes on local streets in residential neighborhoods as part of a "traffic calming" program.

4.1.4 PEDESTRIAN CIRCULATION

For the past several decades commercial developments and residential subdivisions have been required to install sidewalks along street frontages, but there are many areas throughout Koolaupoko where there are inadequate surfaces or clearances for walking within the road rights-of-way.

High costs and adverse environmental effects make it impractical and undesirable to install formal sidewalks along all roadways in rural and older, low-density suburban areas. In most sections, the volume or speed of vehicular traffic is low enough to allow pedestrians to share the road surface or move over to the road shoulder while a vehicle passes. In areas where there are conflicts between vehicular and pedestrian travel, safety should be improved by making relatively modest changes to the right-of-way to slow vehicular speed, enhance sight distances, and separate vehicular and pedestrian traffic.

Most street frontages in higher density residential areas and commercial districts have public sidewalks, but many are too narrow or too cluttered with utility and street light poles, signposts, traffic control boxes and other fixtures to accommodate comfortable and safe pedestrian movement. Even street trees may become obstacles rather than amenities for pedestrians when the sidewalk is too narrow or the trees are inappropriately placed.

An integrated approach to planning for pedestrians is needed in the areas where activity is more intensive. The Regional Town Centers of Kailua and Kaneohe—especially the latter—should be improved significantly

by designing and implementing a pedestrian circulation plan to provide a safe, convenient and attractive network of public walkways consisting of sidewalks, streamside paths and passageways through or along parking lots and buildings. The circulation plan should not only designate routes, but also provide detailed design guidelines for pavement width and material, rehabilitation of footpaths in older residential neighborhoods (including asphalt footpaths), street crosswalks, landscaping, signage, street fixtures, transit stops and other elements of the pedestrian environment.

4.1.5 GENERAL POLICIES

The following general policies support the vision for a multi-modal transportation system in Koolaupoko:

- Reduce reliance on the private passenger vehicle by promoting transportation system management and travel demand management measures for both commuting and local trips.

- Provide adequate and improved mobility between communities, shopping, and recreation centers, especially by enhancing pedestrian, bicycle and transit modes of travel.

- Maintain adequate person-carrying capacity for peak-period commuting to and from work in the Primary Urban Center.

4.1.6 PLANNING PRINCIPLES AND GUIDELINES

Commuter Travel

- For commuter trips, the objective is to minimize the impact of population growth on travel times. Adhering to the population guidelines of the General Plan will help.
- Provide improved services and facilities for express buses, such as more frequent, larger-capacity and more comfortable vehicles.
- Provide park-and-ride and bus transfer facilities as a joint or modified use of an existing parking area or adjacent to uses that are related to commuter trips, such as child-care centers and convenience stores. In addition, transit centers should be established to function as collector or distribution hubs which provide an interface between "circulator" shuttle and trunk bus routes.
- Promote ridesharing and vanpooling.
- Increase person-carrying capacity on trans-Koolau highways and Kalanianaole Highway for commuter travel without expanding rights-of-way or exacerbating delays in access to the highway from collector streets during peak periods.

Local Trips

- For local trips, the objective is to promote alternative modes of travel and less automobile travel and to remedy present traffic bottlenecks.
- Avoid street or right-of-way widening, except where necessary to improve pedestrian and bicycle safety or provide bus shelters and more efficient bus loading.
- Explore the feasibility of expanding local circulator transit service within the communities of Kailua and Kaneohe using small-capacity vans or buses under either public or private operation.
- Require new or expanded commercial uses in the Regional Town Centers (i.e., Kaneohe and Kailua) and Community Commercial Centers (i.e., shopping centers and their environs) to provide bicycle racks and a direct pedestrian connection between the public sidewalk or nearest transit stop and the entries to business establishments.
- Provide more convenient and attractive pedestrian paths within the Regional Town Centers of Kailua and Kaneohe. Establish a pedestrian network in the central commercial districts of Kaneohe and Kailua consisting of improved sidewalks and public pathways along streams and through blocks and parking lots. Modify rights-of-way design in selected areas—especially along designated bike lanes and routes, principal pedestrian routes and street crossings, and near bus stops—change travelway widths or curb radii, pavement width or texture, and introduce appropriate signage and more generous landscape planting.

- Improve sidewalks and landscaping along Kalanianaole Highway in Waimanalo between Flamingo Road and Inoaole Street and between Aloiloi Street and Nakini Street.
- Implement traffic calming measures in appropriate residential areas to reduce speeding and make vehicular routes less direct, thereby increasing safety and enjoyment for pedestrians and bicyclists.
- Expand the bikeway network by implementing the proposals in the State of Hawaii bikeway master plan and adding bike facilities along residential streets in conjunction with traffic calming initiatives for neighborhoods within Kailua, Kaneohe and Waimanalo.

4.2 WATER SYSTEMS DEVELOPMENT

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. This Code is implemented through the Hawaii Water Plan which addresses water conservation and supply issues on a statewide level by incorporating county water plans and water-related project plans.

The Oahu Water Management Plan (OWMP), signed into law in 1990, is the City and County of Honolulu's component of the Hawaii Water Plan. The OWMP sets forth strategies to guide the State Commission on Water Resource Management (CWRM) in planning and managing Oahu's water resources. To provide for future water demand, the OWMP calls for the development of groundwater, surface and brackish water; desalination; effluent water reuse; and water conservation programs.

The OWMP strategy also calls for maintaining Waiahole Ditch and tunnel system, which conveys surface water from the Windward side to the Leeward side of the Koolau Mountain Range to irrigate agricultural lands in Central Oahu and recharge the Pearl Harbor aquifer. In a 1997 decision, the CWRM returned almost 11.5 mgd flow from Waiahole Ditch to Koolaupoko's streams. Nearly half that amount (or 5.39 mgd) was designated "buffer flow" that could be diverted later if stream studies show that further reduction in stream flows will not significantly harm the stream environments.

The Board of Water Supply (BWS) is presently preparing an integrated water resources plan, whose scope includes all aspects of water use, recycling and conservation.

4.2.1 POTABLE WATER

In Koolaupoko, municipal water is supplied primarily by the BWS. In 1990, the region consumed 19.2 mgd of potable water, or about 12 percent of the islandwide total. According to the BWS, Koolaupoko will need a total of approximately 19.9 mgd of potable water by the year 2020, an increase of about 0.7 mgd from 1990, in order to accommodate future residential and commercial needs. One of the major sources of future potable water demand in Koolaupoko will be the development of residential lots in Waimanalo and Waiahole by the Department of Hawaiian Home Lands (DHHL).

In the long-range, BWS plans to develop new Windward water sources to serve Windward and East Honolulu users. This source development will allow redistribution of water presently pumped to East Honolulu from existing Pearl Harbor and Honolulu sources to accommodate future growth in the Primary Urban Center and other areas.

Some of BWS' proposed groundwater development projects are in the Koolaupoko and Waimanalo aquifers, which are located within the Koolaupoko *Sustainable* Communities Plan Area. In identifying potential well sites, BWS conducts test pumping to assure that development of the well will not adversely affect instream flows.

4.2.2 IRRIGATION WATER

Waiahole and Waikane

The State of Hawaii has developed a 1 mgd water system to supply the residents and farmers in the Waiahole Valley Agricultural Park. As of 1998, farmers used only about 0.1 mgd from this source since the valley is not fully planted, and they can draw free water from the McCandless pipeline, which can deliver 0.5 mgd.

Irrigation water for taro and other crops is also drawn from Waiahole Stream, whose flow has become more abundant since the CWRM's decision on the Waiahole Ditch matter.

Waimanalo

In Waimanalo, the State provides water to farmers from the Maunawili Ditch, which was built by Waimanalo Sugar Company. Its source is high-level water tunnels, springs, and streams in Maunawili and Waimanalo Valley. The system delivers an average of about 0.75 mgd of water.

Other Water Systems

Some farmers in the District rely on local springs, streams, groundwater wells, and rainfall. A few taro growers take advantage of ancient irrigation systems built by early Hawaiians. In many areas, farmers rely on relatively expensive water from the Board of Water Supply.

4.2.3 GENERAL POLICIES

General policies pertaining to Koolaupoko's potable and nonpotable water systems are as follows:

- Integrate management of all potable and nonpotable water sources, including groundwater, stream water, storm water, and water recycling, following State and City legislative mandates.

- To protect watersheds, retain existing acreage in the State Conservation District or within the area defined by the Preservation boundary or designated Preservation. In addition, important watershed areas which are within designated but unused or undeveloped portions of the State Agricultural or Urban Districts should be reclassified to the State Conservation District or designated Preservation, in consultation with affected landowners, lessees, and communities, and pertinent resource agencies.

- Where new reservoirs and other aboveground infrastructure is necessary, avoid impacts to significant scenic resources; where such impacts are unavoidable, appropriate mitigation measures should be implemented.

- Adopt and implement water conservation practices in the design of new developments and the modification of existing uses, including landscaped areas.

4.2.4 PLANNING PRINCIPLES AND GUIDELINES

Development and Allocation of Potable Water

While the State CWRM has final authority in all matters regarding administration of the State Water Code, the BWS should coordinate development of potable water sources and allocation of all potable water intended for urban use on Oahu. The BWS should certify that adequate potable and nonpotable water is available in order for a new residential or commercial development to be approved. State and private well development projects could then be integrated into and made consistent with City water source development plans.

Water Conservation Measures

Conserve water by implementing the following measures:

- Promote installation of low-flush toilets, flow constrictors, and other water conserving devices in commercial and residential developments.
- Utilize indigenous plant material and drip irrigation systems in landscaped areas.
- Use recycled (R-1 or R-2) water for the irrigation of golf courses, as well as for landscaping, and agricultural areas where this would not adversely affect potable groundwater supply or other aspects relating to public health.
- Investigate the feasibility of small-scale rain catchment systems in agricultural areas to use for irrigation, groundwater recharge and filtering of stormwater runoff sediments. (See related discussion in Section 4.6.2.)
- Investigate the feasibility of bulk-heading Waiahole Ditch to restore water in the natural dikes.

4.3 WASTEWATER TREATMENT

Koolaupoko is divided between two municipal wastewater service areas. The boundaries of the Kailua-Kaneohe-Kahaluu Service Area extend from Kaoio Point and Waikane Valley to the north, to Wailea Point and Lanikai/Keolu Hills to the south, and inland along the ridgeline of the Koolau Mountain Range. The Waimanalo Service Area is bounded by Keolu Hills to the northwest, Waimanalo Bay to the northeast, Makapuu Point to the east, and the Koolau Mountain Range ridgeline to the south. The Marine Corps Base Hawaii (MCBH) Kaneohe Bay on the Mokapu Peninsula has an independent sewage collection, treatment and disposal system under the control of the military.

4.3.1 KAILUA-KANEOHE-KAHALUU WASTEWATER SERVICE AREA

Most of the urbanized areas of Kailua, Kaneohe and Ahuimanu are served by the Kailua Regional Wastewater Treatment Plant (WWTP). The Kailua WWTP is a secondary treatment facility with an average design capacity of 15 million gallons per day (mgd) and a 1995 average flow of approximately 13 mgd. As part of a regional plan, former treatment plants at Kaneohe and Ahuimanu were converted to preliminary treatment facilities (screening and grit removal only) in late 1994 and connected to the Kailua WWTP, which was expanded to accommodate wastewater flows from Kaneohe and Ahuimanu. Treated effluent from the Kailua WWTP is discharged through the Mokapu Outfall into Kailua Bay.

Unsewered urbanized areas in the northern two thirds of Koolaupoko are primarily in Kahaluu. There are also some small pockets of unsewered areas in Kaneohe and Kailua. Sewer improvement districts have been identified and are being implemented for most of these areas.

The Kailua WWTP has been subject to serious "wet-weather surge" problems, i.e., flow volumes from rainwater and groundwater infiltration into the sewer system greatly exceeds the plant's capacity and have resulted in the spilling of untreated sewage into the ocean. Plans have been developed to remedy the problem by (1) repairing leaks in the sewerage system, (2) eliminating private rainwater connections to the sewer system and (3) providing wet-weather storage capacity in underground pipes. The plan, completed in late 1998, will require at least 5-years to implement. Collection systems in the low-lying areas along the coast are also subject to seawater and root intrusion.

The following measures are proposed to address these problems:

Kailua Regional WWTP

The Kailua Regional WWTP would be modified to provide secondary treatment of up to 35.6 mgd. Improvements include internal modifications to the influent pump station, headworks, and clarifiers. Various odor and noise control improvements would also be undertaken. In response to expressed community concerns, there will also be a continuing evaluation of the possibility of transitioning wastewater facilities from Aikahi to the Kapaa Industrial Park.

Kaneohe WWPTF

At the Kaneohe WWPTF, required improvements include a new odor control system, and a 8.5 mg flow equalization system.

Ahuimanu WWPTF

At the Ahuimanu WWPTF, required improvements will include a new preliminary treatment facility including new screening and grit removal facilities and a 0.9 mg flow equalization system.

Collection System

Improvements to the collection system include the provision of relief lines throughout the Kailua and Kaneohe basins, the replacement of deteriorating sewer lines, increasing pump station capacities, and adding storage capacity for wet-weather flows.

All Treatment Facilities

At each of the facilities, existing odor and noise abatement facilities will be modified as necessary and a strong emphasis placed on neighborhood involvement in planning for future plant improvements.

4.3.2 WAIMANALO WASTEWATER SERVICE AREA

Approximately 65 percent of residences in the Waimanalo Wastewater Service Area is served by a centralized wastewater collection, treatment, and disposal system.

Wastewater is collected by a network of gravity sewers, and is then treated at the Waimanalo Wastewater Treatment Plant (WWTP), which has a 1997 rated average design capacity of 0.7 million gallons per day (mgd) and average flow of approximately 0.6 mgd. The wastewater collection system, including the Kahawai WWPS, is owned by the State of Hawaii and operated and maintained by the City and County of Honolulu.

Homes in Waimanalo that are not connected to the public sewers are served by individual wastewater systems, which are generally either cesspools or septic tanks with leaching fields. The unsewered areas include certain portions of the low lying coastal areas and all of the inland agricultural lots. In addition, nearly 15 percent of the homes in sewered areas are connected to the sewer system and continue to use individual wastewater systems.

In the Waimanalo Wastewater Service Area, there are two key issues of concern:

Individual Wastewater Systems

There are water quality and public health concerns associated with the continued use of individual treatment systems (primarily cesspools) in the low-lying coastal areas. Algal blooms have occurred periodically in the nearshore waters of Waimanalo. It is uncertain whether nutrients from individual wastewater treatment systems, stormwater runoff, and/or treatment plant effluent are promoting such algal bloom.

Waimanalo Wastewater Treatment Plant (WWTP)

The plant has a record of unstable performance and periodic effluent quality violations. Treated effluent is currently disposed through the use of subsurface injection wells. The existing capacity of the disposal wells is marginally adequate due to clogging of the wells from excessive suspended solids in the effluent. These problems are believed to stem from increased loading on the plant and the use of outdated liquid stream treatment technology. The capacity of the Waimanalo WWTP needs to be increased to serve future needs. Also, the service area should be expanded to cover properties where individual wastewater systems are resulting in environmental and health hazards.

To address these concerns, the average design capacity of the Waimanalo WWTP will be increased from 0.7 mgd to 1.1 mgd.[12] The expansion will include a new secondary biological treatment process, an effluent filtration system, additional injection wells, new sludge thickening facilities, an upgraded electrical system, and added personnel and maintenance facilities. There will also be an ultraviolet disinfection system and effluent pumping facilities to allow the use of recycled water for irrigating selected agricultural lots and the Olomana Golf Links.

4.3.3 GENERAL POLICIES

The following general policies apply to wastewater treatment in Koolaupoko:

- Direct all wastewater produced within the Urban Community Boundary and Rural Community Boundary to municipal or military sewer service systems.

[12] Hawaii Pacific Engineers. *Waimanalo Wastewater Facilities Plan.* April 1997

- Treat and recycle, where feasible, wastewater effluent as a water conservation measure.

- Delay further sewer connections in Kailua, Kaneohe and Kahaluu, except for areas with existing cesspools or septic tanks that need to be sewered for public health reasons, until flow equalization/wet weather surge protection has been provided for the Kailua Regional WWTP, as outlined in the Preferred Alternative of the Kailua-Kaneohe-Kahaluu Facilities Plan (Final Plan, September 1998).

- Mitigate visual, noise, and odor impacts associated with wastewater collection and treatment systems, especially when they are located adjacent to residential designated areas.

4.3.4 PLANNING PRINCIPLES AND GUIDELINES

Recycling of Wastewater Effluent. Encourage or require, as feasible and appropriate, the use of recycled water from the WWTP as a source for irrigating golf courses and other uses compatible with the State's rules and guidelines for the treatment and use of recycled water.

Use of Buffer Zones and Landscape Elements. Adequate horizontal separations and landscape elements (e.g., berms and windrows) should be provided between wastewater facilities and adjacent residential designated areas. In order to mitigate negative impacts of the wastewater treatment plant, site-specific studies should be conducted to determine the width of the buffer zone and specific types of landscaping elements to use.

4.4 ELECTRICAL AND COMMUNICATIONS SYSTEMS

The increase in demand for electrical power in Koolaupoko is expected to be generally proportionate to the modest level of projected population growth. Hawaiian Electric Company is not planning to construct new trans-Koolau transmission lines, substations or power generating facilities in the Koolaupoko region. However, replacement or repair of components of the transmission and distributions system should be anticipated over the next couple of decades. Underground placement of overhead lines should be accomplished, especially where they are exposed to high winds or other conditions that cause power outages or where they detract from a high quality view of natural features, such as identified in **Figure 2-4**.

The growth in telecommunications systems is more likely to outpace population growth. The 1990's decade saw substantial development of the telecommunications infrastructure throughout the island, including Koolaupoko. Many new antennae and relay devices were installed throughout the region, usually at higher elevations to provide adequate line-of-sight or coverage. Competition between communications companies contributed to the proliferation of facilities, and often made cooperation in the collocation of communications devices a challenge.

Technological advances in fiber optics and insulation will probably make it more feasible to bury power and communications cables in the future, creating an opportunity to develop more reliable and less visually intrusive transmission and distribution systems.

4.4.1 GENERAL POLICIES

The following general policy pertains to electrical power and telecommunications infrastructure development in Koolaupoko:

- Design system elements and incrementally replace facilities such as substations, transmission lines and towers to avoid or mitigate any potential adverse impacts on scenic and natural resource values and to enhance system reliability.
- New utility distribution lines should be placed underground and a long-range program for systematically relocating existing overhead lines underground should be developed and implemented.

4.4.2 PLANNING PRINCIPLES AND GUIDELINES

Facility Routing and Siting Analysis. If any new or relocated substations, transmission lines or towers are necessary, the selection of the route or site of such facilities should avoid or mitigate any potential adverse

impacts on scenic and natural resources. Although these facilities are not shown on Map A-3, Public Facilities, their routes and sites are reviewed and permitted by administrative agencies of the City. Existing overhead lines should be placed underground wherever feasible; related project plans should be coordinated with other infrastructure improvement projects to take advantage of opportunities for shared trenching and to minimize construction-related disruptions.

Collocation of Facilities. Communications and power equipment and devices should be collocated with similar facilities in order to minimize the number of supporting structures and dispersal of sites.

4.5 SOLID WASTE HANDLING AND DISPOSAL

Solid waste collection, transport, and disposal operations on the island are provided by the City Department of Environmental Services, Refuse Division. Municipal refuse collection trucks provide curbside pickup for most single-family residences. Refuse collection for commercial and multi-family apartment uses is provided by private haulers. Individuals may deliver recyclable items to collection containers that are located at schools and parks throughout the region. They may also dispose of trash and large items that cannot be picked up by the municipal refuse truck at one of Koolaupoko's two refuse convenience centers, in Kapaa and Waimanalo.

Collected refuse is taken from the Kapaa Transfer Station to a recycling center, incinerator or a sanitary landfill. Incineration, accounting for approximately 50 percent of the island's waste disposal, is done at the H-POWER plant, located in the Ewa region. The City's sanitary landfill is at Waimanalo Gulch, also in the Ewa region. It has sufficient capacity through 2003, and the City has instituted recycling and other waste diversion programs in an effort to extend its useful life through 2017. [13]

Potential new landfill sites on Oahu are extremely limited because of stringent federal and state environmental requirements. Koolaupoko has not had a sanitary landfill since the closure of the Kapaa site in 1997.

4.5.1 GENERAL POLICIES

The following general policy applies to solid waste handling and disposal in Koolaupoko:

- Continue efforts to establish more efficient waste diversion and collection systems.
- Promote waste reduction, re-use and recycling.

4.5.2 PLANNING PRINCIPLES AND GUIDELINES

Recycling Programs and Facilities. Promote the recycling of waste materials by providing expanded collection facilities and services (taking care to prevent unwanted community eyesores), and public outreach and education programs.

Efficient Solid Waste Collection. Expand the use of automated refuse collection in residential areas, at the same time enforcing rules prohibiting the storage of automated containers in the public right-of-way.

Refuse Management. Refuse collection management should not be based upon policies that would result in illegal refuse disposal elsewhere on the landscape.

Reduction of Solid Waste. Develop programs for effective reduction of the production of solid waste.

Kahaluu Convenience Station. A convenience refuse transfer station is needed to serve Kahaluu. Such a center should be located close to the Kamehameha Highway in the area between Ahuimanu and Waikane where it can also be buffered from surrounding land uses. Coupling it with a green-waste drop-off site is also desirable.

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[13] STV/Lyon Associates, Inc., for the City and County of Honolulu Department of Public Works, *Solid Waste Integrated Management Plan Update*, March 1995.

4.6 DRAINAGE SYSTEMS

The *mauka* reaches of Koolaupoko are among the wettest areas of the island and the source of numerous perennial streams, which are listed in **Table 4-3**.

The water quality and riparian habitat of many of these streams has been adversely impacted by diversions, channel alterations and polluted stormwater runoff. These problems are generally more severe along stream segments that traverse highly urbanized areas, but irrigation systems, water well development and land use conditions in agricultural and conservation areas have also created impacts. Still, Koolaupoko contains significant stream segments of high resource value, and the quality of many other segments could be improved by restoring natural habitat and adopting stream corridor management practices.

All of Koolaupoko's major watersheds have urban and agricultural areas in regulatory flood zones (see **Figure 4-2**.) In the 1960's and 1970's, several large flood control projects were undertaken to remove or reduce the most frequent and severe threats of flooding. The most visible results of those flood projects are the Kawainui Marsh and flood berm, the Kahaluu lagoon, and the Hoomaluhia dam and stormwater detention basin. Following a major flood event in 1987, improvements were made to the design and maintenance of the Kawainui flood control project.

Figure 4-2
Flood Zones in Koolaupoko

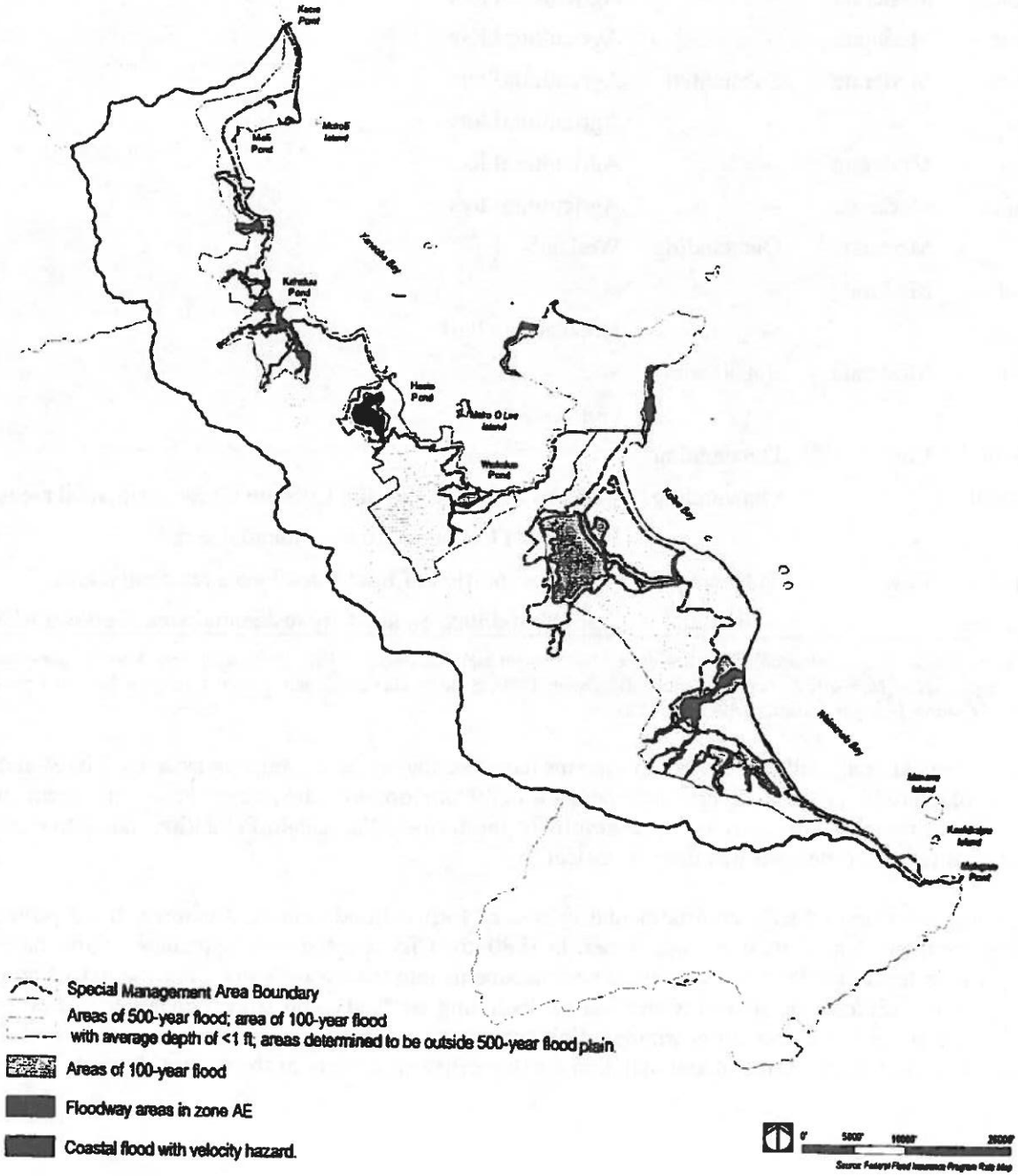


Table 4-3

Environmental Quality and Floods Zones of Perennial Streams in Koolaupoko

	Environmental Quality		
Stream	**Aquatic**	**Riparian**	**Areas in Flood Zone**
Hakipuu	Moderate	--	Agricultural lots
Waikane	Moderate	--	Agricultural lots
Waiahole	Moderate	Substantial	Agricultural lots
Waihee	--	--	Agricultural lots
Kaalaea	Moderate	--	Agricultural lots
Kahaluu	Moderate	--	Agricultural lots
Heeia	Moderate	Outstanding	Wetlands
Keaahala	Moderate	--	--
Kamooalii	--	--	Hoomaluhia Park
Kaneohe	Moderate	Substantial	--
Kawa	--	--	Golf Course
Kawainui	Low	Outstanding	--
Maunawili	--	Outstanding	Portions of Maunawili and Coconut Grove residential areas
Kapaa	--	--	Portions of Coconut Grove residential area
Kaelepulu	Low	Substantial	Wetlands; portion of Enchanted Lakes residential area
Waimanalo	--	Substantial	Agricultural lots; Saddle City residential area; Bellows AFS

Source: State of Hawaii Commission on Water Resource Management and The National Park Service, *Hawaii Stream Assessment: A preliminary Appraisal of Hawaii's Stream Resources*, December 1990; State of Hawaii Department of Land and Natural Resources, *General Flood Control Plan for Hawaii*, September 1983.

Some of Koolaupoko's agricultural irrigation systems have become *de facto* drainage systems. The Waiahole, Kailua and Maunawili Ditches divert some stormwater from downstream areas. Problems occur when abandoned irrigation structure, such as the reservoir for the former Waimanalo Plantation, fall into disrepair and the responsibility for their maintenance is unclear.

Due to the high cost and adverse environmental effects of formal flood control structures, flood protection measures have turned to nonstructural approaches. In 1980, the City adopted development standards based on the Federal Flood Insurance Program to prevent encroachments into floodways and reduce the risk of property damage. Periodic maintenance of stormwater basins, including wetlands, and stream channels and outlets is another element of the flood protection strategy. Soil conservation measures, especially in agricultural areas, are also important to reduce sediment and maintain the downstream capacity of the stream channel.

4.6.1 GENERAL POLICIES

General policies pertaining to Koolaupoko's drainage system are as follows:

- Promote drainage system design that emphasizes control and minimization of nonpoint source pollution and the retention of storm water on-site and in wetlands.
- A comprehensive study of local flooding and drainage problems should be developed and should include a phased plan for improvements.
- Modifications needed for flood protection should be designed and constructed to maintain habitat and aesthetic values, and avoid and/or mitigate degradation of stream, coastline and nearshore water quality.
- Planned drainageway improvements should be integrated into the regional open space network by providing access for pedestrians and bicyclists.
- View storm water as a potential irregular source of water that should be retained for recharge of the aquifer rather than quickly moved to coastal waters.
- Select natural and man-made vegetated drainageways and retention basins as the preferred solution to drainage problems wherever they can promote water recharge, help control nonpoint source pollutants, and provide passive recreation benefits.
- Keep drainageways clear of debris to avoid the flooding problems that have occurred in the past.

4.6.2 PLANNING PRINCIPLES

Principles to guide the maintenance and improvement of Koolaupoko's drainage systems include:

- ***Retention and Detention.*** Emphasize retaining or detaining storm water for gradual release into the ground as the preferred strategy for management of storm water. Also, large-capacity boulder and debris basins in upper valleys above urbanized areas should be properly maintained in order to prevent the blocking of downstream channels during major storm events.
- ***Stream Channel Improvements.*** Integrate planned improvements to the drainage system into the regional open space network by emphasizing the use of retention basins, creation of passive recreational areas, and recreational access for pedestrians and bicycles without jeopardizing public safety. In places where the hardening of stream channels is unavoidable or highly desirable to prevent significant loss of property or threat to public health and safety, the improvements should be designed and made in a manner which protects natural resource and aesthetic values of the stream, consistent with the guidelines expressed in Section 3.1.3.4.
- ***Channel and Basin Management.*** Emphasize periodic maintenance of stream channels and stormwater detention basins, including natural wetlands, to improve and retain their capacity for flood conditions. Abandoned irrigation ditches and reservoirs should be recognized as important elements of the flood control system and a government entity – e.g., the State of Hawaii Department of Land and Natural Resources – should assume responsibility for their maintenance.

4.7 SCHOOL AND LIBRARY FACILITIES

Public schools in the Koolaupoko *Sustainable* Communities Plan Area, listed in **Table 4-4**, are part of the Department of Education's (DOE) Windward District. Most recent enrollment figures show that the majority of schools in Koolaupoko are operating under capacity. Consequently, DOE does not plan to increase classroom capacity through new construction or expansion of existing facilities for at least the next six years. During this time period, however, other improvements are planned for a number of schools in the region. These include renovation of cafeterias and libraries, and construction of new administration buildings. Additional demand for classroom space generated by future residential developments can be absorbed by the

existing facilities. If necessary, school boundaries could be adjusted to allocate additional demand to schools that have the most available capacity.

Table 4-4
Public School Enrollment and Capacity (1999)

School	Enroll-ment	Capacity	Under/ (Over)	School	Enroll-ment	Capacity	Under/ (Over)
Elementary				***Elementary (cont'd)***			
Ahuimanu	610	516	(94)	Maunawili	409	571	162
Aikahi	634	618	(16)	Mokapu	885	940	55
Ben Parker	574	786	212	Pope	282	492	210
Enchanted Lake	516	687	171	Puohala	466	554	88
Heeia	736	757	21	Waiahole	131	276	145
Kaelepulu	170	294	124	Waimanalo[1]	649	871	222
Kahaluu	287	411	124	***Intermediate***			
Kailua	554	580	26	King	1,001	1182	181
Kainalu	562	913	351	Kailua	917	1329	412
Kaneohe	601	655	54	***High School***			
Kapunahala	613	585	(28)	Kalaheo	1,222	1224	2
Keolu	286	513	227	Kailua	1,032	1616	584
Lanikai	318	338	20	Castle	1,951	1983	32
				Olomana (HYCF)[1]	149	134	(15)

[1] Includes Intermediate School enrollment

Source: State of Hawaii, Department of Education, Facilities and Support Services Branch, May 1999.

Table 4-5
Private School Enrollment (1994)

School	Grades K-8	Grades 9-12	School	Grades K-8	Grades 9-12
Kailua Christian Academy	11	20	Saint John Vianney	274	0
Koolau Baptist Church Academy	132	38	Saint Mark Lutheran	207	0
Le Jardin Academy	333	0	Seagull Lab School	22	0
Redemption Academy	137	55	Trinity Christian	178	0
Saint Ann School	294	0	Windward Adventist	71	0
Saint Anthony	325	0	Windward Nazarene	156	0

Source: Department of Education, Public and Private School Enrollment, September 1994

Private schools have a relatively small presence in Koolaupoko. In 1994, Koolaupoko's 13 private schools had a combined enrollment of 2,368 (see **Table 4-5**). If enrollment increases in these private schools, it is likely that enrollment will decline in area public schools because most students are expected to be drawn from within the region rather than outside.

The DOE also administers three public libraries in Koolaupoko. The regional library is located in Kaneohe. The other two libraries are in Kailua and Waimanalo, the latter of which is incorporated in the Waimanalo Elementary and Intermediate School. No additional libraries are planned.

4.7.1 GENERAL POLICIES

General policies relating to school facilities are listed below:

- Approve new residential developments only after the State Department of Education certifies that adequate school facilities, either at existing schools or at new school sites, will be available when the development is completed.

- Have developers pay their fair share of costs to ensure provision of adequate school facilities.

- Consider schools as community resources for learning about specialized environmental, cultural and historic subjects related to Koolaupoko and each of its communities.

4.7.2 PLANNING PRINCIPLES AND GUIDELINES

The following principles and guidelines should be followed in planning and operating schools in Koolaupoko.

- ***Adaptive Reuse.*** While the demand for classroom space has been declining in some sections of Koolaupoko, needs could change significantly, even with a relatively slow rate of population growth. Therefore, the existing inventory of school facilities should be maintained. To make more efficient use of these facilities, as well as DOE fiscal resources, some of the unneeded classroom space could be converted for temporary use as administrative office space for DOE personnel. This reflects a strategy that DOE has already adopted.

- ***Shared Facilities.*** The Department of Parks and Recreation should coordinate with the DOE regarding the development and use of athletic facilities such as playgrounds, play fields and courts, swimming pools, and gymnasiums where the joint use of such facilities would maximize use and reduce duplication of function without compromising the schools' athletic programs (see also Section 3.3.3). Moreover, the DOE should coordinate the structural design of school buildings with the Civil Defense Agency so that these facilities may be used as public hurricane shelters.

- ***Fair Share Contribution.*** The City should support the DOE's requests for fair share contributions from developers to ensure that adequate school facilities are in place.

- ***New Facilities.*** If a new public or private school campus or a significant increase in enrollment capacity at one of the existing campuses is proposed, the guidelines for institutions presented in Section 3.8.4 should apply.

4.8 CIVIC AND PUBLIC SAFETY FACILITIES

Koolaupoko public safety facilities consist of police, fire and ambulance stations. Police substations are located in Kaneohe and Kailua, both of which are located within their respective Regional Town Centers. The Honolulu Fire Department (HFD) operates fire stations in Kailua, Kaneohe, Waimanalo and Kahaluu. The military maintains a fire station on the Marine Corps Base Hawaii, Kaneohe. To provide adequate response time throughout the region, a future fire station is planned at Kualoa. Ambulance service, staffed by the City's Emergency Medical Services Division, is provided from each of the HFD fire stations except Kahaluu, whose service area is covered from the Kaneohe station. An ambulance unit is planned in Kaaawa where an ambulance bay has been completed at the new Kaaawa fire station.

Civic centers in Koolaupoko include three Satellite City Halls and several State of Hawaii facilities. Satellite City Halls offer many basic services for residents, including bus pass sales and bicycle registration. The Satellite City Hall in Kaneohe is within the Regional Town Center; in Kailua it is in the Enchanted Lake Shopping Center, a neighborhood center. There is also a mobile Satellite City Hall in Waimanalo that

operates once a week at the Waimanalo Town Center. The State of Hawaii operates regional or area service centers for unemployment insurance in the Regional Town Centers of Kailua and Kaneohe and a food stamp office near Windward City Shopping Center. The State's Windward Health Center is located adjacent to the Kaneohe State Hospital and Windward Community College.

The existing District Court for Koolaupoko-Koolauloa is located in a light industrial area on the edge of the Kaneohe Regional Town Center. Because its present building and site are too small, the State of Hawaii plans to relocate the courthouse to a new site adjacent to the Kaneohe District Park.

4.8.1 GENERAL POLICIES

The following general policies pertain to public safety facilities:

- Provide adequate staffing and facilities to ensure effective and efficient delivery of basic governmental service and protection of public safety.
- Locate regional civic facilities in the Regional Town Centers of Kaneohe and/or Kailua.

4.8.2 PLANNING PRINCIPLES AND GUIDELINES

These principles and guidelines are intended to carry out the above policies.

- ***Satellite City Halls.*** Locate permanent Satellite City Halls in the Regional Town Centers of Kaneohe and Kailua to reinforce these areas as a regional focal point or gathering spot for activities and services. Continue the mobile Satellite City Hall service to Waimanalo.
- ***Police and Fire/Ambulance Stations.*** Maintain present police and fire stations and develop a new fire station at Kualoa. The proposed Kaaawa fire station ambulance is intended to serve a portion of Koolaupoko.
- ***Adequate Police and Fire/Ambulance Protection.*** Approve new development only if adequate staffing and facilities for fire/ambulance and police protection will be provided.

4.9 URBAN DESIGN

4.9.1 GENERAL POLICIES

The term "urban design" is used here to mean the physical appearance, or "design" of appurtenances comprising the infrastructure of communities. To some extent, it is a misnomer since it is used to apply to appurtenances whether they occur in an "urban" area or a rural area.

Such appurtenances include streets (widths, paving materials and markings); sidewalks; curbs; gutters; median islands; manhole covers; traffic control boxes; traffic signals; traffic signs; street lights (poles, luminaires and light sources); parking lots; parking meters; street trees; fire hydrants; mail collection boxes; benches; litter containers; bus stops and bus stop shelters; newspaper dispensers; public telephones; utility substations and utility pumping stations - all of which, individually and collectively, impact and influence the physical appearance of the community where they are located.

Because of the ubiquitous nature of these appurtenances, they play a role in forming the aesthetic character of a community. By "design", predetermined styles, forms, materials and colors of these appurtenances can produce a desired and pleasing aesthetic character and together, contribute to a visual community identity.

4.9.2 PLANNING PRINCIPLES AND GUIDELINES

4.9.2.1 General:

- To enhance the natural environment in and around all communities within Koolaupoko, utility wires should be placed underground henceforth and existing overhead wires relocated underground.
- Design traffic control boxes to be screened to reduce visual impacts.
- Require and enforce requirements for shade trees in all parking lots.
- Include shade trees as desirable street trees.
- Keep street and highway signs to a minimum and then only for traffic control and direction (not to include permanent message boards).
- Incorporate medial planting strips in roadways wherever practical.
- Continue to prohibit "billboards" and other outdoor advertising devices.
- Supply litter containers for the street-outlet end of public beach right-of-ways.
- Encourage each individual community to formulate desired "design" guidelines for public and private projects.

4.9.2.2 Individual Communities:

Elements should include but not be limited to:

4.9.2.2.1 Kailua

- Begin the undergrounding of utility wires in the Town Center.
- Encourage the removal of fences between commercial properties in the Town Center to create greater pedestrian interchange.
- Install medial planting strips along the 4-lane section of Keolu Drive.
- Restrict the allowed number of driveway openings for a given street length in the Town Center.

4.9.2.2.2 Kaneohe

- Plant climbing vines on retaining walls along Kahekili Highway.
- Install median planting strips or islands in the center of Kahekili Highway wherever possible.
- Pursue the development of the Kaneohe Town Plan.

4.9.2.2.3 Waimanalo and Kahaluu

- Refrain from requiring wide streets with curbs and concrete gutters in rural areas.
- Refrain from requiring sidewalks in rural areas.
- Refrain from installing streetlights in rural areas unless requested by the community.
- Develop rural community standards compatible with these less intensively developed residential communities.

5. IMPLEMENTATION

Many counties, cities and other local jurisdictions on the U.S. mainland have instituted comprehensive planning programs that emphasize proactive, community-based planning and implementation processes. These local governments have sought to establish a strong link between planning policies and guidelines, and specific organization, funding and actions needed to implement a variety of public and private projects and programs. The following sections are intended to strengthen the linkage to implementation to realize the vision for the future and the policies, principles and guidelines articulated in this Plan.

Implementation of the Koolaupoko *Sustainable* Communities Plan will be accomplished by a variety of means, including:

- Initiating zoning map and development code amendments to achieve consistency with, and carry out the purposes of, the policies, principles, and guidelines of the *Sustainable* Communities Plan;

- Guiding public investment in infrastructure through functional planning activities in support of the vision and policies, principles and guidelines of the *Sustainable* Communities Plan;
- Recommending approval, approval with modifications or denial of developments seeking zoning and other development approvals based on how well they support, conform to and carry out the purposes of this plan;
- Incorporating *Sustainable* Communities Plan priorities through the Public Infrastructure Map and the City's annual budget process;
- Conforming City Administration and Council actions to the vision, policies, principles and guidelines of this plan;
- Advising the State government on the content of the Sustainable Communities Plan and seeking to conform State actions including those of DHHL to the vision, policies, principles and guidelines of this plan; and
- Conducting a review of the vision, policies, principles, guidelines, and CIP priority investments of the Koolaupoko *Sustainable* Communities Plan every five years and recommending revisions as necessary.

5.1 PUBLIC FACILITY INVESTMENT PRIORITIES

The vision for Koolaupoko requires the cooperation of both public and private agencies in planning, financing, and improving infrastructure. The City must take an active role in planning infrastructure improvements, such as land acquisition and site improvements for proposed parks, provision of adequate public access to the shoreline and mountain areas, provision of pedestrian, bicycle, and other transportation options, and improvements to wastewater and stormwater management systems and other proposals of this plan.

5.2 DEVELOPMENT PRIORITIES

Projects to receive priority in the approval process are those which:

- Involve land acquisition and improvements for public projects that are consistent with the *Sustainable* Communities Plan policies, principles and guidelines.
- Are appropriate to the boundary area(s) within which the proposed project site is located.
- Are within the Urban Community and Rural Community development boundaries delineated in this plan.
- Are already zoned on vacant land parcels and which further conform with the boundaries delineated in, and the policies, principles and guidelines of, this plan.
- Involve applications for zoning and other regulatory approvals which are consistent with the *Sustainable* Communities Plan vision, policies, principles, guidelines and boundaries delineated in this plan.
- Are located on vacant usable parcels or sites ready for redevelopment and conform to the *Sustainable* Communities Plan Map A-2, Land Use.
- Have adequate required infrastructure in place or are guaranteed to have required infrastructure in place upon completion of project.
- Conform to the population policies for Koolaupoko in the General Plan.
- Conform to the height policies set forth in this plan.

- Are not proposed for sites in hazardous areas such as flood and erosion zones, steep slopes and where unstable soils exist.
- Will not further impair and/or will promote reestablishment of soil percolation capacities.
- Do not adversely impact the existing character of residential areas or the enhancement thereof.

5.2.1 PUBLIC IMPROVEMENT PRIORITIES

A number of major projects have been advanced by this plan. It is recommended that those projects be implemented in accordance with the following priority schedule.

PRIORITY ONE

- Reconstruct and rehabilitate existing sewer system and connect areas with existing cesspools or septic tanks to the sewer system.
- Construct in-pipe sewage flow capacity for wet-weather flows.
- Eliminate noise and odor nuisances at the Kailua RWWTP.
- Expand inventory of community-based parks throughout the region.
- Begin establishment of the Koolau Greenbelt.
- Complete establishment of Haiku Valley Nature Preserve.
- Provide improvements to Haiku Valley and Waihee Nature Preserve.
- Begin undergrounding of overhead utility wires.
- Pursue acquisition of additional public shoreline access sites in Kaneohe.

PRIORITY TWO

- Continue to evaluate alternatives to relocate the Kailua RWWTP at Aikahi.
- Improve drainage and pedestrian facilities on Kailua Road between Hahani Street and Wanaao Road.
- Pursue acquisition of additional public shoreline access sites throughout Koolaupoko.
- Provide improvements to Waikane Nature Preserve.
- Provide a refuse convenience center in Kahaluu.

PRIORITY THREE

- Connect Heeia Kea boat harbor to the municipal sewerage system.
- Implement improvements to Keaahala Road.
- Expand Waimanalo WWTP and implement regional wastewater improvement projects.

PRIORITY FOUR

- Construct Kualoa fire station.

5.3 SPECIAL AREA PLANS

For areas requiring particular attention, Special Area Plans provide more detailed policies, principles, and guidelines than are provided by the *Sustainable* Communities Plan. The form and content of Special Area Plans depend on what characteristics and issues need to be addressed in greater detail in planning and guiding development or use of the Special Area.

Special Area Plans can be used to guide land use development and infrastructure investment in Special Districts, Redevelopment Districts, or Resource Areas. Plans for Special Districts provide guidance for development and infrastructure investment in areas with distinct historic or design character or significant public views. Plans for Redevelopment Districts provide strategies for the revitalization or redevelopment of an area. Plans for Resource Areas provide resource management strategies for areas with particular natural or cultural resource values.

In Koolaupoko, Special Area Plans should be prepared for the following locations and purposes:

- ***Kaneohe Regional Town Center.*** A plan to strengthen and revitalize the central business district and civic center by establishing municipal parking facilities, a transit center, a pedestrian circulation system, links from the town center to the bay, and improvements to the appearance of buildings, open spaces, and rights-of-way.

- ***Kailua Regional Town Center.*** A plan to improve pedestrian circulation, public transit service, landscaping and public open spaces, street fixtures and signage, and building appearance in the central commercial district and civic center.

- ***Waimanalo Village Center.*** A plan to improve pedestrian circulation, public transit service, landscaping and public open spaces, street fixtures and signage, and building appearance in the rural commercial/civic district, and to locate a possible private baseyard if appropriate.

- ***Koolau Greenbelt.*** A plan to restore, protect and maintain the area at the base of the Koolau Mountain Range through a variety of mechanisms that may include land trusts and tax incentives.

- ***Haiku Valley, Waihee and Waikane Nature Preserves, Kawainui Marsh, and Nuupia Fishponds.*** Plans for improved public access and preservation of these resources should be prepared.

Other Special Area Plan opportunities may be identified as the *Sustainable* Communities Plan is implemented.

5.4 FUNCTIONAL PLANNING

Functional planning is the process through which various City agencies determine needs, assign priorities, phase projects, and propose project financing to further implement the vision and policies, principles and guidelines articulated in the *Sustainable* Communities Plan. This process may take a variety of forms, depending upon the missions of the various agencies involved, as well as upon requirements imposed from outside the City structure, such as federal requirements for wastewater management planning. Typically, functional planning occurs as a continuous or iterative activity within each agency.

Through the functional planning process, City agencies responsible for developing and maintaining infrastructure and public facilities or for provision of City services review existing functional planning documents and programs. As a result of these reviews, the agencies then update, if required, existing plans or prepare new long-range functional planning documents that address facilities and service system needs. Updates of functional planning documents are also conducted to assure that agency plans will serve to further

implement the *Sustainable* Communities Plan as well as to provide adequate opportunity for coordination of plans and programs among the various agencies.

The number and types of functional planning documents will vary from agency to agency, as will the emphases and contents of those documents. A typical agency may develop a set of core documents such as:

- A resource-constrained long-range capital improvement program. A "resource-constrained" program is one that identifies the fiscal resources that can be reasonably expected to be available to finance the improvements.
- A long-range financing plan, with identification of necessary new revenue measures or opportunities.
- A development schedule with top priorities for areas designated for earliest development.
- Service and facility design standards, including level of service guidelines for determining adequacy.

Other documents may also be developed as part of an agency's functional planning activities, such as master plans for provision of services to a specific region of the island. In some cases, functional planning activities will be undertaken in cooperation with agencies outside the City structure, such as the transportation planning activities that are conducted in association with the Oahu Metropolitan Planning Organization.

Functional planning is intended to be a proactive public involvement process which provides public access to information about infrastructure and public facility needs assessments, alternatives evaluations, and financing. Outreach activities should involve Neighborhood Boards, community organizations, landowners, and others who may be significantly affected by the public facilities and infrastructure projects or programs to be developed to further implement the policies of the *Sustainable* Communities Plan.

The functional planning process should be characterized by opportunities for early and continuing involvement, timely public notice, public access to information used in the evaluation of priorities, and the opportunity to suggest alternatives and to express preferences. The functional planning process provides the technical background for Capital Improvement Program and public policy proposals that are subject to review and approval by the City Council. Consequently, any functional planning proposal which is inconsistent with, or varies from, the vision, policies, principles and guidelines of the Sustainable Communities Plan shall only be approved as an amendment to the Plan.

5.5 REVIEW OF ZONING AND OTHER DEVELOPMENT APPLICATIONS

A primary way in which the vision of the Koolaupoko *Sustainable* Communities Plan will guide land use will be through the review of applications for zone changes and other development approvals. Approval for all development projects will be based on the extent to which the project conforms to and carries out the purposes of the policies, principles, and guidelines of the *Sustainable* Communities Plan.

Implementation of the Koolaupoko *Sustainable* Communities Plan may also involve introduction of the Industrial-Commercial Mixed Use District (IMX-1) to the region. This zoning district designation may be applied in the existing I-2 zoned areas within the Regional Town Centers of Kaneohe and Kailua. Development standards for the IMX districts should be upgraded so that the mix of uses is compatible with the character desired in Regional Town centers. This should include reasonable density, setbacks, parking, and street width requirements. Also, the frontage of Hekili streets in Kailua should be rezoned to commercial from industrial.

A zone change shall be considered significant if it involves at least one of the following:

(1) Any change in zoning of 10 or more acres of land to any zoning district or combination of zoning districts, excluding preservation or agricultural zoning districts;

(2) Any change in zoning of more than five acres to an apartment, resort, commercial, industrial or mixed use zoning district; or

(3) Any development which would have a major social, environmental, or policy impact, or major cumulative impacts due to a series of applications in the same area.

Projects that do not involve significant zone changes will be reviewed by the Department of Planning and Permitting for conformance with the policies, principles, development priorities and guidelines of the Koolaupoko *Sustainable* Communities Plan and the population policies of the General Plan. Those projects requiring environmental assessments shall follow the provisions of Hawaii Revised Statutes, Chapter 343. Also, for any specific rezoning application for a change to BMX, the applicant should prepare an analysis of the projected population impacts of the change to verify that such impacts will not exceed the population policies of the General Plan as they apply to Koolaupoko.

Projects involving significant zone changes will require an Environmental Assessment. This is submitted to the Department of Planning and Permitting for review prior to initiation of the Zone Change Application.

5.5.1 ADEQUATE FACILITIES REQUIREMENT

All projects requesting zone changes shall be reviewed to determine if adequate public facilities and infrastructure will be available to meet the needs created as a result of the development. Level of Service Guidelines to define adequate public facilities and infrastructure requirements will be established during the Capital Improvement Program.

In order to guide development and growth in an orderly manner as required by the City's General Plan, zoning and other development approvals for new developments should be approved only if the responsible City and State agencies indicate that adequate public facilities and utilities will be available at the time of occupancy or if conditions the functional agency indicates are necessary to assure adequacy are otherwise sufficiently addressed.

The Department of Planning and Permitting, as part of its report on the consistency of the project with the Koolaupoko *Sustainable* Communities Plan vision, policies, principles and guidelines, will review and summarize any individual agency's findings regarding public facilities and utilities adequacy that are raised as part of the EA/EIS process. The Department of Planning and Permitting will address these findings and any additional agency comments submitted as part of the agency review of the zone change application and recommend conditions that will be included in the conditional zoning approval to insure adequacy of facilities.

5.6 FIVE-YEAR SUSTAINABLE COMMUNITIES PLAN REVIEW

The Department of Planning and Permitting shall conduct a comprehensive review of the Koolaupoko *Sustainable* Communities Plan and shall report its findings and recommended revisions to the Planning Commission and the City Council five years after adoption and every five years thereafter. It is intended the Urban Community, Rural Community, Agriculture and Preservation boundaries will remain fixed through the 2020 planning horizon.

In the Five-Year review, the Koolaupoko *Sustainable* Communities Plan will be evaluated to see if the regional vision, policies, principles, guidelines, and implementing actions are still appropriate, with particular attention to the issue of sustaining long-term agriculture.

5.7 TRANSITION FROM THE CURRENT SYSTEM

This section discusses the transition from the former Development Plan to this *Sustainable* Communities Plan, including its independence from Development Plan Common Provisions, its relationship to the General Plan policies, and the need for review and revision of development codes, standards, and regulations.

5.7.1 DEVELOPMENT PLAN COMMON PROVISIONS AND EXISTING LAND USE APPROVALS

This *Sustainable* Communities Plan will go into effect upon its adoption by ordinance. At that time, the Plan will become a self-contained document, not reliant on the Development Plan Common Provisions which formerly applied to the Koolaupoko Development Plan and the other Development Plans.

Land use approvals granted under existing zoning, Unilateral Agreements, and approved Urban Design Plans will remain in force and guide entitlement decisions until any zoning action to further implement the vision and policies, principles and guidelines of the Koolaupoko *Sustainable* Communities Plan is initiated. If an Environmental Assessment or Environmental Impact Statement (EA/EIS) was accepted in the course of a Development Plan land use approval for a project, it should be acceptable to meet the requirement for an initial project EA/EIS when zone change applications are submitted for subsequent phases of the project unless the project scope and land uses are being significantly changed from that described in the initial EA/EIS.

5.7.2 REVIEW AND REVISION OF DEVELOPMENT CODES

Upon completion of the Development Plan Revision Program, current regulatory codes and standards should be reviewed and revised, as necessary, to maintain their consistency and effectiveness as standards to guide attainment of the objectives and policies envisioned for all Development Plan or *Sustainable* Community Plan areas. At the time such reviews are conducted, the following regulatory codes and standards may warrant further review and revision to ensure achievement of the vision, policies, principles and guidelines for the Koolaupoko region, as identified in this plan, as well as consistency with the Koolaupoko *Sustainable* Communities Plan:

- ***Land Use Ordinance.*** (Chapter 21, Revised Ordinances of Honolulu). Zoning code standards and the zoning map for Koolaupoko need to be revised to implement the vision, policies, principles, and guidelines in the *Sustainable* Communities Plan.

- ***Subdivision Rules and Regulations.*** (Department of Planning and Permitting, pursuant to Chapter 22, Revised Ordinances of Honolulu). Public right-of-way standards used for subdivision and consolidation of land need to be revised to reflect transportation policies, principles, and guidelines in the *Sustainable* Communities Plan. Review and revise agricultural subdivision regulations as necessary to implement the plan.

- ***Traffic Standard Manual.*** (Department of Transportation Services, July 1976, as revised). Standards that are applied to local and most collector streets need to be revised to reflect transportation policies, principles, and guidelines in the *Sustainable* Communities Plan.

- ***State Highways Division Procedures Manual***, Vol. 8, Chapter 5, Section 4 (State Department of Transportation). These State highway standards need to be reviewed to identify provisions that may conflict with the transportation policies, principles, and guidelines in the *Sustainable* Communities Plan.

- ***Standard Details for Public Works Construction*** (Honolulu Department of Planning and Permitting with Kauai, Maui, and Hawaii County Departments of Public Works, September 1984). Engineering standards for the dedication of public works construction need to be revised to reflect *Sustainable* Communities Plan principles and guidelines.

- ***Rules Relating to Storm Drainage Standards*** (Department of Planning and Permitting, January 2000). Standards for the dedication of drainage systems need to be reviewed, revised and, as necessary, created to further implement the *Sustainable* Communities Plan policies, principles, and guidelines for open space.

- ***Wastewater Management Design Standards*** (Department of Design and Construction Design Standards, Volumes I and II) and the 1990 Revised Ordinances of Honolulu, Chapter 14 (relating to sewer services).

These standards and ordinances may require review to further implement *Sustainable* Communities Plan policies and guidelines.

5.7.3 RELATION TO GENERAL PLAN POLICIES

As required by Section 6-909 of the City Charter, this Sustainable Communities (Development) Plan implements and accomplishes the policies of the General Plan. Of particular note and interest to the Koolaupoko community are the population policies found in Objective C of the General Plan and the need for the Sustainable Communities Plan to implement and accomplish these objectives, i.e.:

> **Policy 4:** Distribution of Oahu's residential population in accordance with Koolaupoko's share of the 2010 population which currently accounts for 11.0 -12.2 percent of Oahu's total population.
>
> **Policy 3:** Manage physical growth and development in the urban-fringe and rural areas so that: (a) an undesirable spreading of development is prevented; and (b) their population densities are consistent with the character of development and environmental qualities desired for such areas.

APPENDIX A: SUSTAINABLE COMMUNITY MAPS

This appendix includes three maps used to graphically depict components of the plan for the future of Koolaupoko. The maps include:

- Map A-1: Open Space
- Map A-2: Land Use (4 sheets)
- Map A-3: Public Facilities

These maps show the long-range vision of the future of the plan area and the major land use, open space, and public facility policies that are articulated in the plan. In examining these maps the reader should keep in mind that:

1. These maps are intended to supplement the textual descriptions herein; and
2. They are intended to be illustrative of the plan's policy statements.

The maps are intended to complement the text. Both the text and the maps are to be considered in interpreting this plan.

Each of these three maps depicts the four boundary areas found in Koolaupoko. The intention and extent of each boundary are briefly described below, followed by capsulized descriptions of each of the three maps.

A.1 URBAN COMMUNITY BOUNDARY

The Urban Community Boundary (UCB) is intended to define and contain the extent of developed or "built-up" areas of Koolaupoko's urban fringe communities. Its purpose is to provide an adequate supply of land to support the region's established suburban communities while protecting lands outside the boundary for agricultural and open space preservation values. Areas within the UCB are generally characterized by extensive tracts of residential, commercial, industrial or mixed-use development clearly distinguishable from the undeveloped or more "natural" portions of the region.

In Koolaupoko, the UCB generally circumscribes the community areas of Kaneohe, Kailua, Olomana, Maunawili and Ahuimanu within the State Urban District Boundary.

- Areas within the residential, apartment, commercial, industrial and mixed-use districts;
- Areas in the country district at Haiku Plantations, adjacent to Kailua High School, and immediately adjoining the residential district;

- Areas currently in the inventory of Hawaiian Memorial Park and the Hawaii State Veterans' Memorial Cemetery;
- Public schools serving these communities;
- The campuses of Windward Community College and the Hawaii State Hospital;
- Bayview Golf Course, Mid-Pacific Country Club, and the Klipper Golf Course at MCBH;
- Lands developed for the beneficiaries of the Department of Hawaiian Home Lands;
- Correctional and detention facilities makai of Kalanianaole Highway; and
- The refuse convenience station and former sanitary landfill at Kapaa.

The Urban Community Boundary is intended to exclude the following areas:

- Undeveloped lands on the slopes of Kaiwa Ridge, Oneawa Hills and Puu o Ehu;
- Undeveloped lands within and directly adjacent to Kawainui Marsh, and the wetlands of Heeia and Kaelepulu;
- Most of Heeia Kea valley;
- The slopes of Olomana;
- Areas within the State Conservation District;
- Military lands, except those at MCBH developed with uses associated with the residential, apartment, commercial, industrial and mixed-use districts; and
- Portions of the slopes of Puu Maelieli and the valleys of Ahuimanu, Maunawili and Haiku where lots typically exceed one acre in size.

A.2 RURAL COMMUNITY BOUNDARY

The Rural Community Boundary (RCB) is intended to define, protect and contain established communities in areas the General Plan designates "rural" and that exhibit physical characteristics of rural lifestyles. This boundary is intended to provide adequate land to:

- Accommodate anticipated increases in population;
- To allow development of facilities needed to support these established communities;
- To protect such communities from the more intense land uses and patterns of development associated with more urbanized areas; and
- To protect areas outside the RCB for agriculture or other resource or open space values.

Communities defined by the RCB consist of smaller, more dispersed, less intensively developed residential communities and towns than those of Koolaupoko's urban fringe areas. Development character should be generally low-density, low-rise, small scale, and reflective of a "country" setting.

The RCB is intended to confine most new development to "infill" sites that are within or adjacent to existing developed areas. The RCB generally circumscribes the portions of Waimanalo, Kahaluu, Waiahole and Waikane that are within the State Urban District where there are clusters of parcels that are less than two acres in size occupied by dwellings or buildings used for community or commercial purposes other than agriculture. The RCB is intended to include the following:

- Areas in the residential, apartment, industrial and mixed-use districts;
- Areas developed or reserved for the beneficiaries of the Department of Hawaiian Home Lands;
- Public schools serving these communities;
- The campus of the Hawaii Job Corps; and
- Areas not designated as Agricultural Lands of Importance to the State of Hawaii that are directly adjacent to or surrounded by residential or other urban uses and are suitable for minor infill development for residential, community or commercial purposes.

The RCB excludes much of the State Urban District land in the vicinity of Kahaluu where a predominantly agricultural use pattern prevails.

A.3 AGRICULTURE BOUNDARY

The Agriculture Boundary is intended to protect important agricultural lands for their economic and open space values, and for their value in helping to give the region its identifiable rural character. Important agricultural lands include lands currently in agricultural uses and lands with high value for future agricultural use. They generally include agriculturally important lands designated "prime," "unique," or "other" on the Agricultural Lands of Importance to the State of Hawaii (ALISH) maps.

The primary use of all lands within the Agriculture Boundary should be agriculture or directly supportive of the agriculture industry. Exceptions include "institutional" uses, which should be developed and operated to maintain compatibility with agricultural uses, and other non-urban or non-rural uses such as waste disposal or quarry sites, which should also demonstrate such compatibility.

The Agriculture Boundary is intended to include the following:

- Areas in the agricultural districts, except areas in the inventory of Hawaiian Memorial Park and the Hawaii State Veterans' Memorial Cemetery, developed golf courses, and public nature preserves or nature parks;
- Areas in the country district, except those parcels immediately adjoining a residential district lying with the Urban Community Boundary; and
- The campus of Le Jardin Academy.

A.4 PRESERVATION BOUNDARY

The Preservation Boundary is established to protect undeveloped lands which form an important part of the region's open space fabric but that are not valued primarily for agricultural uses. Such lands include important wildlife habitat, archaeological or historic sites, significant landforms or landscapes over which significant views are available, and development-related hazard areas.

The Preservation Boundary generally circumscribes undeveloped lands that:

- Are necessary for protection of watersheds, water resources and water supplies;
- Are necessary for the conservation, preservation and enhancement of sites with scenic, historic, archaeological or ecological significance;
- Are necessary for providing and preserving park lands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, fish and wildlife, for forestry, and other activities related to these uses;
- Are located at an elevation below the maximum inland line of the zone of wave action, and marine waters, fishponds, and tidepools unless otherwise designated;
- Comprise offshore and outlying islands unless otherwise classified;
- Are generally characterized by topography, soils, climate or other related environmental factors that may not be normally adaptable or presently needed for urban community or agriculture use;
- Have general slopes of 20 percent or more that provide for open space amenities and/or scenic values;
- Are susceptible to floods and soil erosion, lands undergoing major erosion damage and requiring corrective attention, and lands necessary to the protection of the health, safety and welfare of the public by reason of soil instability or the land's susceptibility to landslides and/or inundation by tsunami and flooding;
- Are used for state or city parks outside the Urban Community and Rural Community boundaries; or
- Are suitable for growing commercial timber, grazing, hunting, and recreation uses, including facilities accessory to such uses when such facilities are compatible with the natural and physical environment.

The Preservation Boundary is intended to include the following:

- Areas within the State Conservation District and other areas within the preservation district but not located within the Urban Community, Rural Community or Agriculture Boundaries as described above;
- Public nature preserves and nature parks;
- Golf courses not located within the Urban Community and/or Agriculture Boundaries as described above;
- Military lands, except those at MCBH developed with uses associated with the residential, apartment, commercial, industrial and mixed-use districts;
- Correctional and detention facilities mauka of Kalanianaole Highway; and
- The campuses of the Oceanic Institute and Sea Life Park.

The Preservation Boundary excludes such features, sites or areas located within the Urban Community, Rural Community or Agriculture boundaries.

A.5 MAP A-1: OPEN SPACE

This map shows the region's major open space patterns and resources as outlined in Chapter 3. It highlights major open space elements and resources, including agricultural and preservation lands, major recreational parks and golf courses, important views, and important boundaries.

This map also indicates the general locations of community and neighborhood parks, public access points along the shoreline, and major trails providing mountain access.

A.6 MAP A-2: LAND USE

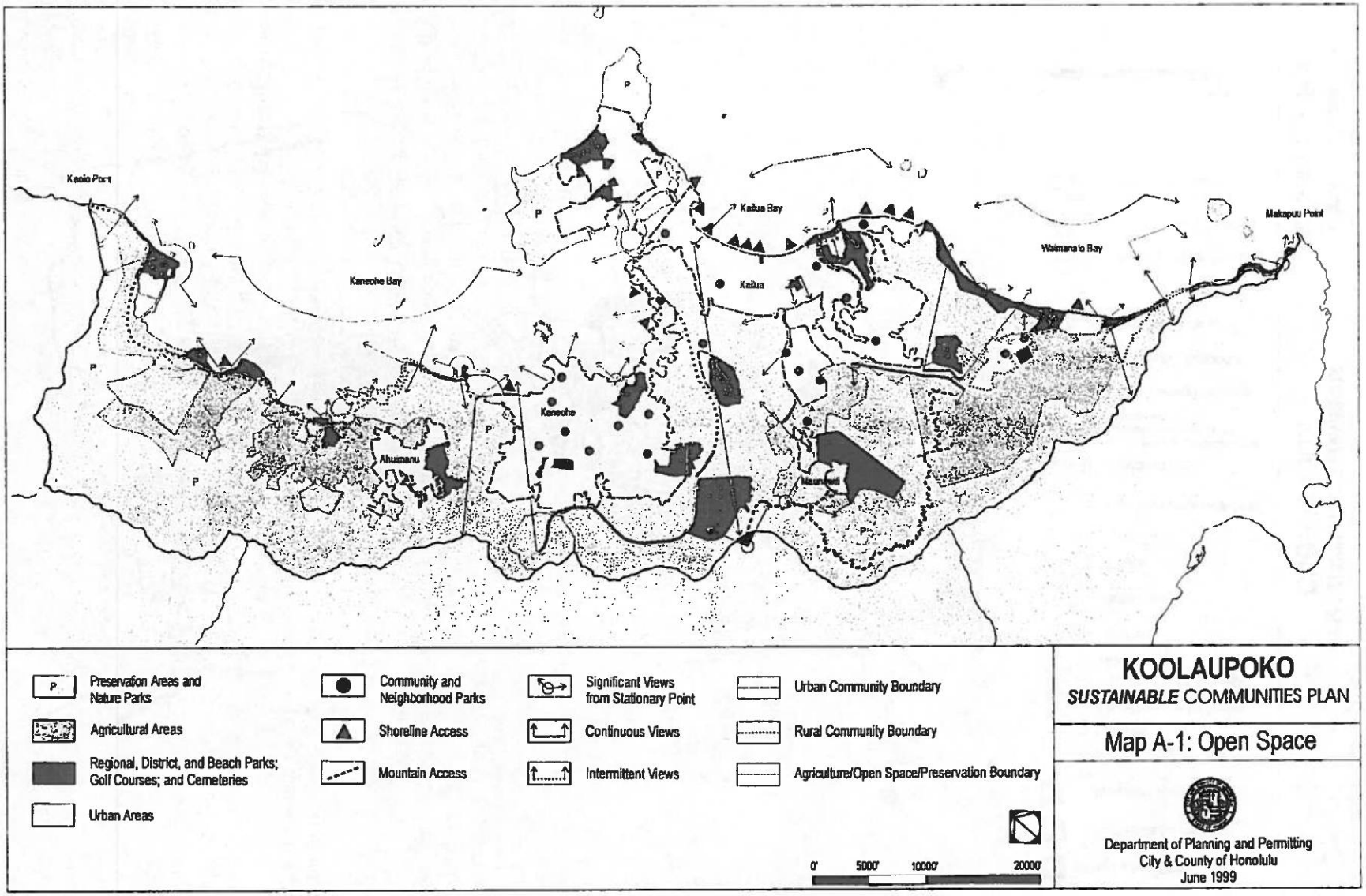
Map A-2 shows the desired long-range land use pattern for Koolaupoko, i.e., the land use pattern that will be realized through implementation of the Koolaupoko *Sustainable* Communities Plan. The map contains the following plan elements within the Urban Community Boundary:

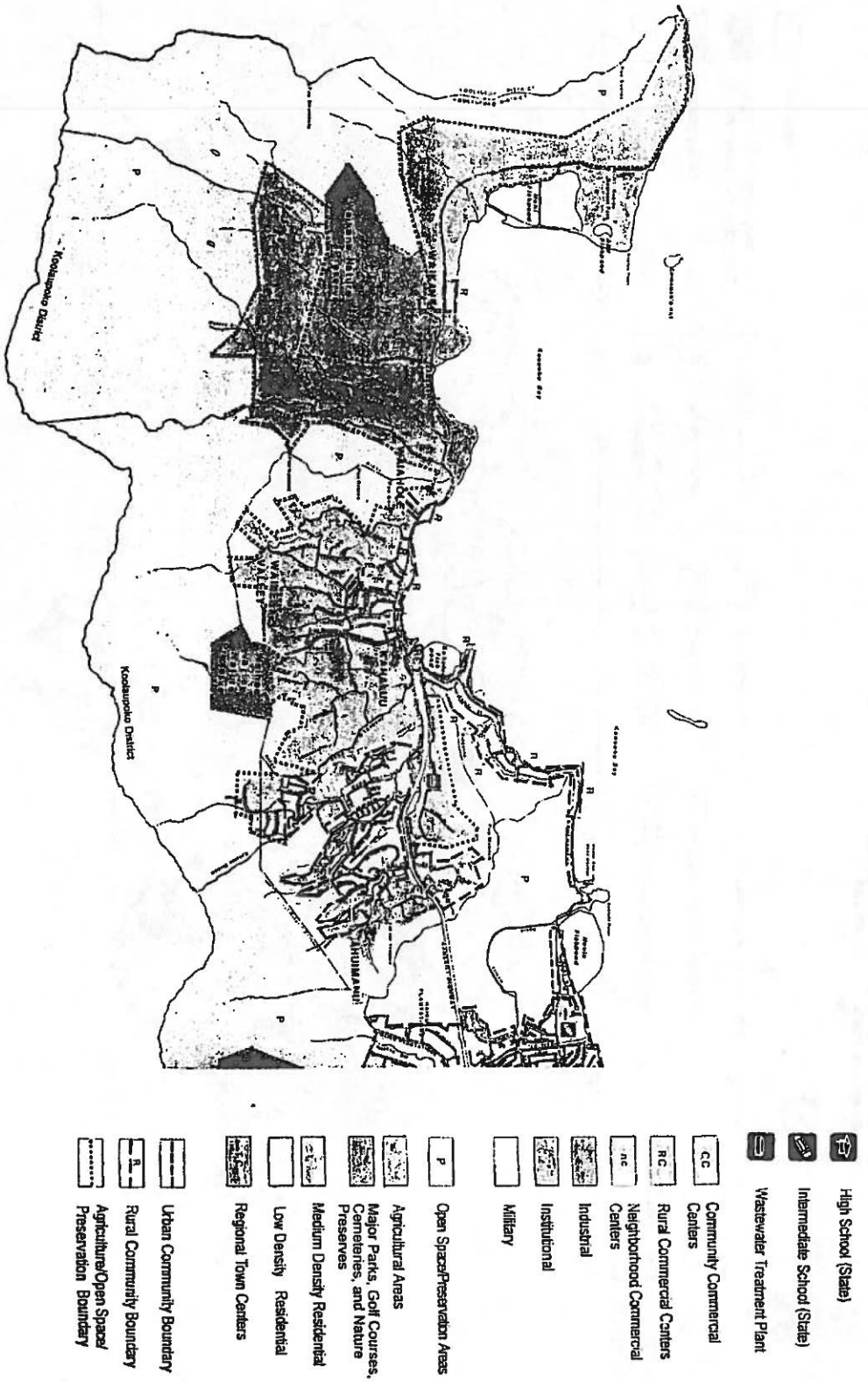
- *Residential.* These uses are depicted as a single yellow tone. Within the RCB, the "Rural" category consists of single-family homes in areas currently configured with relatively large lots, e.g., lots of one acre or more. Also within the RCB, the "Rural Residential" category consists of single-family homes in "country" settings, in areas with current lot sizes ranging from just less than one acre to about one-eighth acre (future subdivisions, if any, of "Rural Residential" areas are anticipated to have lots no smaller than about one-quarter acre). Within the UCB, the "Residential" category consists of single-family homes or townhouses with individual entries.
- *Low-Density Apartment.* These uses are depicted with brown shapes. "Low-density apartment" generally refers to low-density, low-rise multi-family residences, including townhouses, stacked flats and apartment buildings. Dwelling units in these buildings may share common exterior entries.
- *Rural Commercial Center.* These centers are depicted in red, with the designation "RC," and generally represent clusters of commercial establishments intended to service the surrounding rural community. Uses typically include grocery and sundry stores and other services and shops catering to common household convenience items, as well as establishments providing goods and services in support of agricultural activities.
- *Neighborhood Commercial Center.* These centers are depicted in red, with the designation "nc" and generally represent clusters of commercial establishments intended for neighborhood service. Uses typically include grocery and sundry stores and other services and shops catering to common household- or neighborhood-level convenience items.
- *Community Commercial Center.* These centers are depicted in red, with the designation "CC" and generally represent clusters of commercial establishments with a retail shopping center as a nucleus and encompassing up to 50 acres. In addition to the uses found in Neighborhood Commercial Centers, Community Commercial Centers may include offices, service industrial establishments, entertainment facilities and social centers.
- *Regional Town Center.* The Regional Town Centers for Koolaupoko are comprised of the main town areas of Kailua and Kaneohe. These centers are depicted in red, with the designation "TC." The Regional Town Centers may contain a wide variety of uses, including commercial establishments, civic services, mixed use commercial-residential areas, and mixed use industrial-commercial areas.

- *Industrial.* Industrial areas lying outside the Regional Town Centers are depicted as violet shapes. These areas are found at Kapaa and the MCBH.
- *Institutional.* Major institutional uses are depicted as light blue shapes. These include: the Oceanic Institute near Makapuu; the Job Corps campus in Waimanalo; the correctional and detention facilities and corporation yards adjacent to Mount Olomana and the Pohakupu neighborhood; Castle Medical Center; the windward campus of Hawaii Pacific University; and the combined campus areas of Windward Community College and the Hawaii State Hospital.
- *Military.* Gray shapes are used to depict the general areas of MCBH and Bellows that are used primarily for activities related to national defense. At MCBH, these areas are distinguished from other support areas used for housing, preservation, recreation, and commercial and industrial activities although it is recognized that those support areas will remain integral to the base.
- *Public Facilities.* The existing highways and major roads, the Kailua and Waimanalo wastewater water treatment plants, and public intermediate and high schools are depicted with appropriate symbols, and are shown primarily to provide points of orientation.

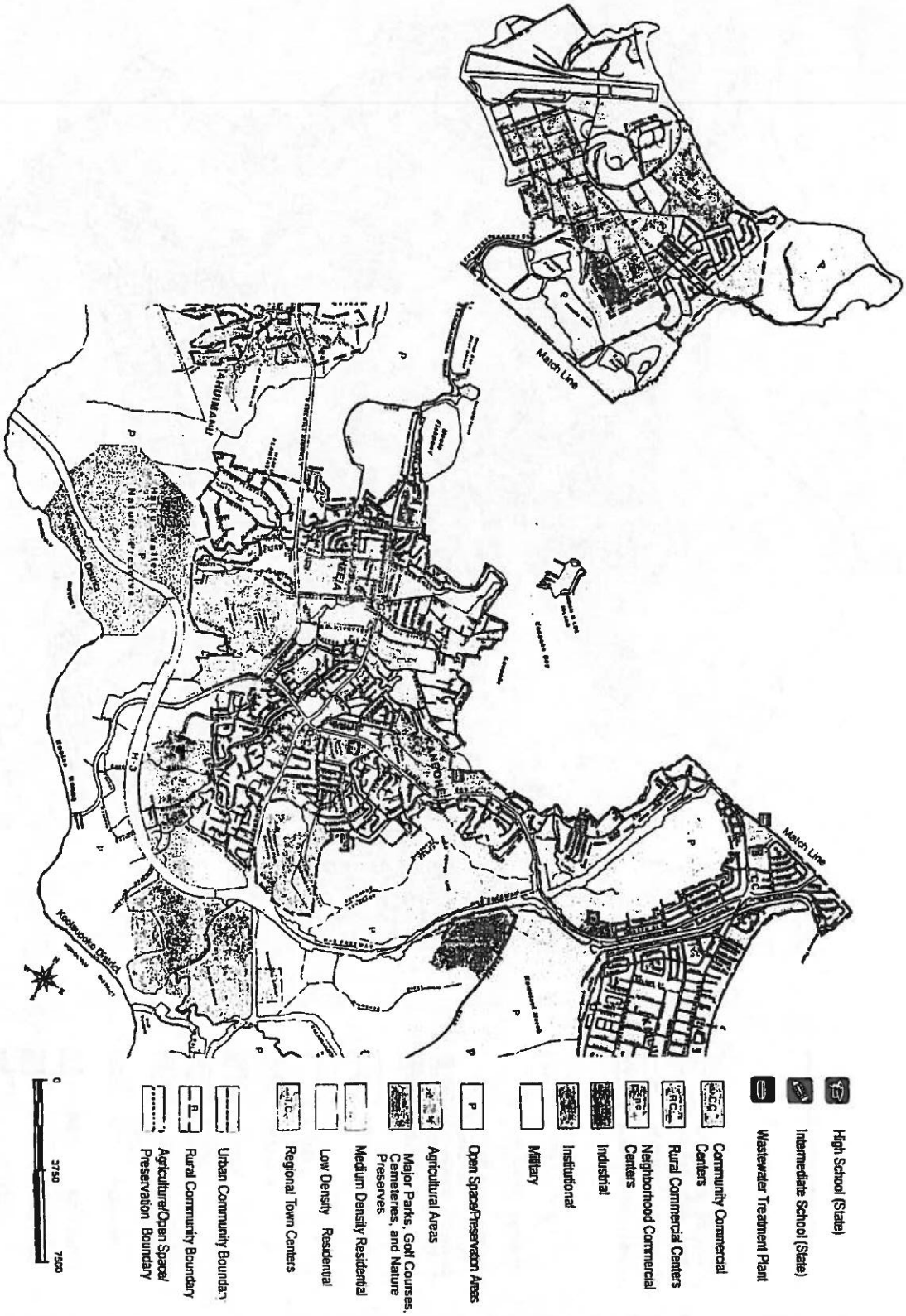
A.7 MAP A-3: PUBLIC FACILITIES

Map A-3 illustrates major existing and future public facilities and major privately-owned facilities including golf courses. Its purpose is to display the public resources or assets available within the region. It also depicts general locations of future transit centers; the general extents of areas for which it is anticipated municipal sewer service will be provided in the future; and future bike facilities.


Kaelo Point
Kaneohe Bay
Kaneohe
Ahuimanu
Kailua Bay
Kailua
Waimanalo Bay
Makapuu Point
Preservation Areas and Nature Parks
Agricultural Areas
Regional, District, and Beach Parks; Golf Courses; and Cemeteries
Urban Areas
Community and Neighborhood Parks
Shoreline Access
Mountain Access
Significant Views from Stationary Point
Continuous Views
Intermittent Views
Urban Community Boundary
Rural Community Boundary
Agriculture/Open Space/Preservation Boundary
0' 5000' 10000' 20000'
KOOLAUPOKO
SUSTAINABLE COMMUNITIES PLAN
Map A-1: Open Space
Department of Planning and Permitting
City & County of Honolulu
June 1999

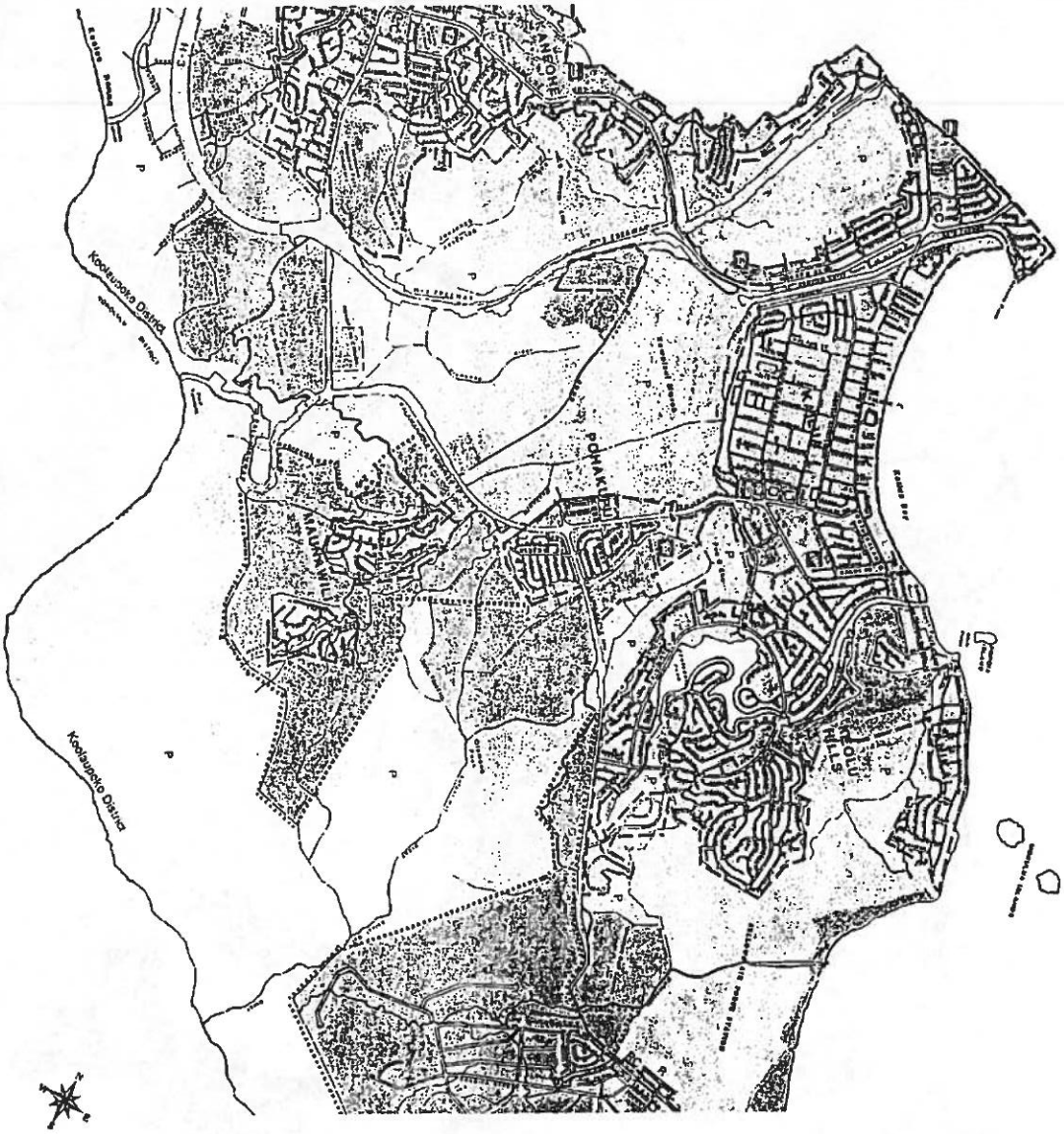


Map A-2: Land Use Section 1: Kahaluu	KOOLAUPOKO *SUSTAINABLE* COMMUNITIES PLAN	



Map A-2: Land Use
Section 2: Kahalu'u & Mokapu

KOOLAUPOKO
SUSTAINABLE COMMUNITIES PLAN



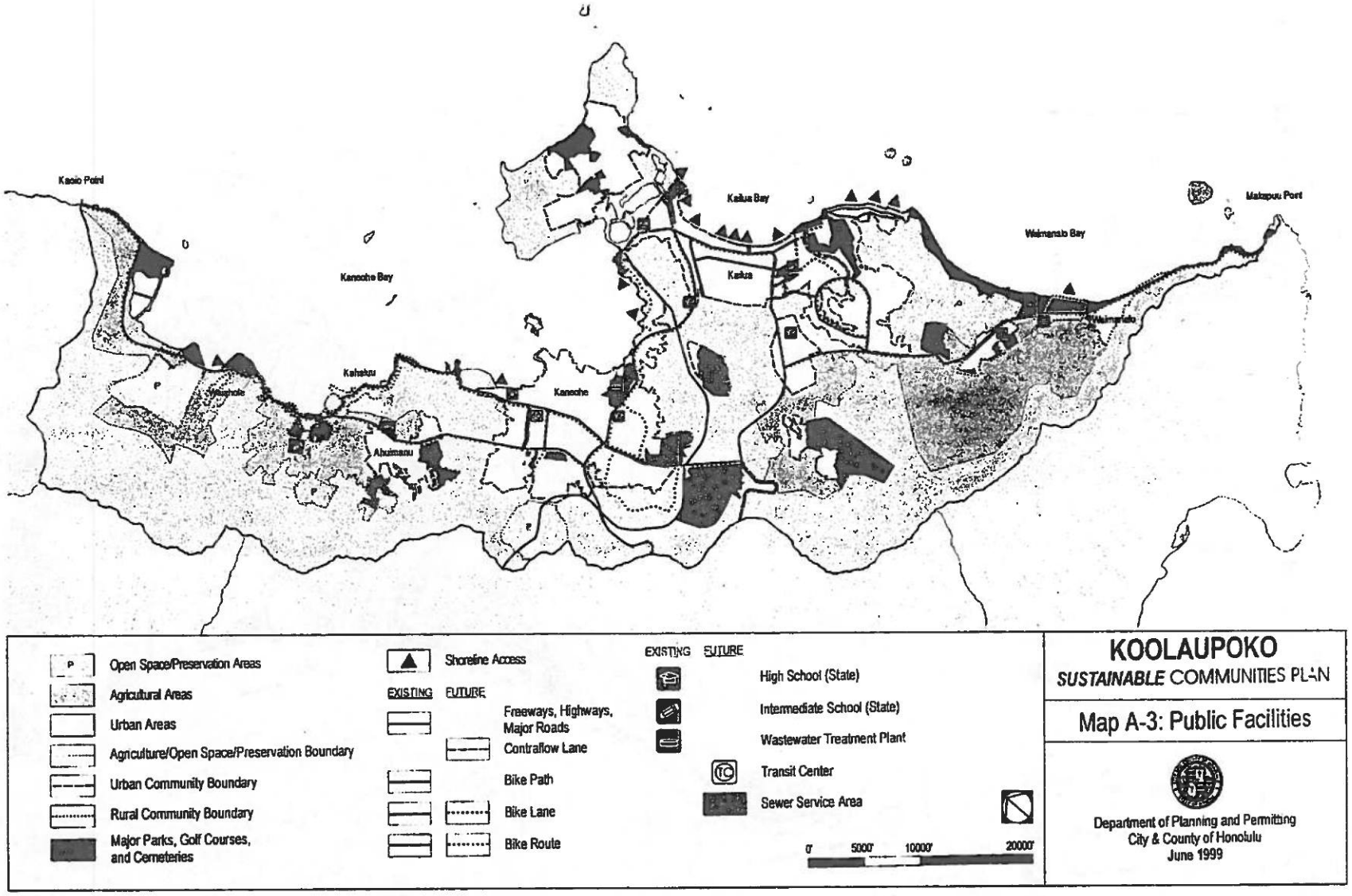
High School (State)
Intermediate School (State)
Wastewater Treatment Plant
Community Commercial Centers
Rural Commercial Centers
Neighborhood Commercial Centers
Industrial
Institutional
Military
Open Space/Preservation Areas
Agricultural Areas
Major Parks, Golf Courses, Cemeteries, and Nature Preserves
Medium Density Residential
Low Density Residential
Regional Town Centers
Urban Community Boundary
Rural Community Boundary
Agriculture/Open Space/ Preservation Boundary

0 3750 7500

Map A-2: Land Use Section 3: Kailua	KOOLAUPOKO *SUSTAINABLE* COMMUNITIES PLAN	

Map A-2: Land Use
Section 4: Waikanaloa

KOOLAUPOKO
SUSTAINABLE COMMUNITIES PLAN


Kaelo Point
Kaneohe Bay
Kailua Bay
Waimanalo Bay
Makapuu Point
Kailua
Kaneohe
Kahaluu
Waiahole
Ahuimanu
Waimanalo
Open Space/Preservation Areas
Agricultural Areas
Urban Areas
Agriculture/Open Space/Preservation Boundary
Urban Community Boundary
Rural Community Boundary
Major Parks, Golf Courses, and Cemeteries
Shoreline Access
EXISTING FUTURE
Freeways, Highways, Major Roads
Contraflow Lane
Bike Path
Bike Lane
Bike Route
EXISTING FUTURE
High School (State)
Intermediate School (State)
Wastewater Treatment Plant
Transit Center
Sewer Service Area
0 5000' 10000' 20000'
KOOLAUPOKO
SUSTAINABLE COMMUNITIES PLAN
Map A-3: Public Facilities
Department of Planning and Permitting
City & County of Honolulu
June 1999