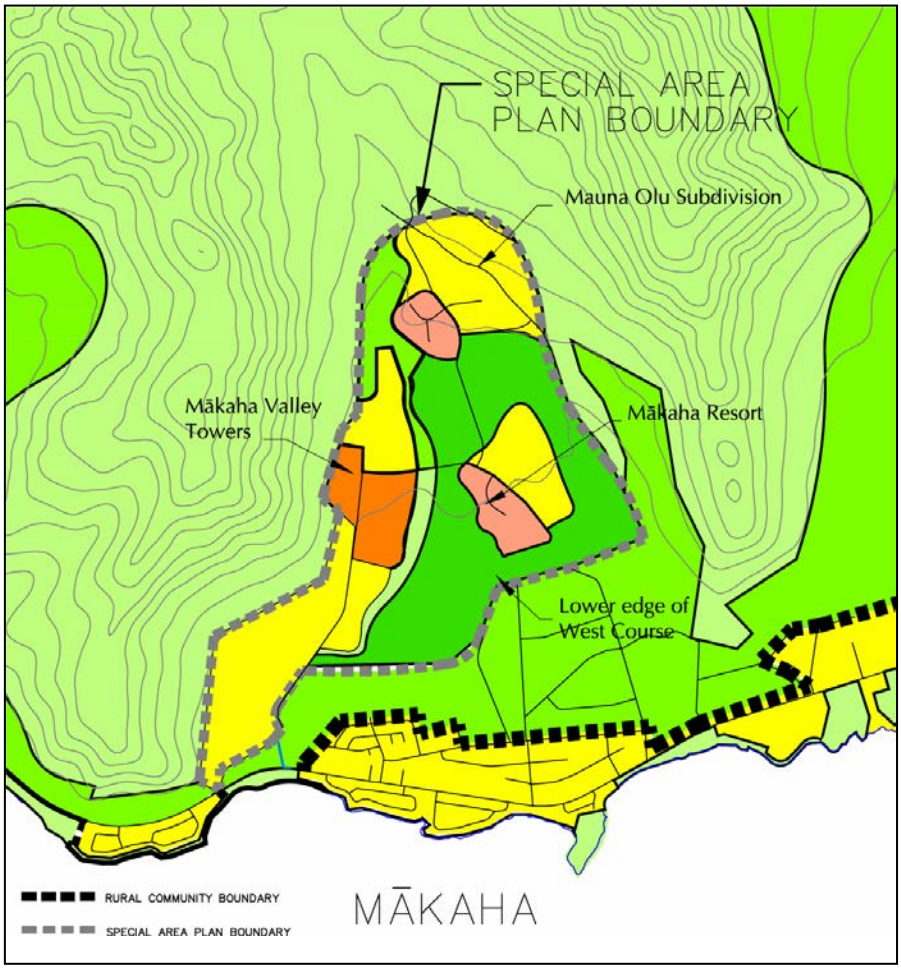
MĀKAHA SPECIAL AREA PLAN



Department of Planning and Permitting
City and County of Honolulu

March 2009

MĀKAHA SPECIAL AREA PLAN

Prepared for:

Department of Planning and Permitting
City and County of Honolulu

Prepared by:
Townscape, Inc.

March 2009

AUTHOR: Townscape, Inc.

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CONTENTS: Special Area Plans are generally intended to give communities the opportunity to define the identity, function, organization, and character of their specific neighborhoods in accordance with the general planning framework provided by their area's Development or Sustainable Communities plan.

NOTES: Prepared for: City and County of Honolulu Department of Planning and Permitting.

KEYWORDS: Land use + Community development + Regional planning + Makaha (Oahu) + Honolulu. Dept. of Planning and Permitting.

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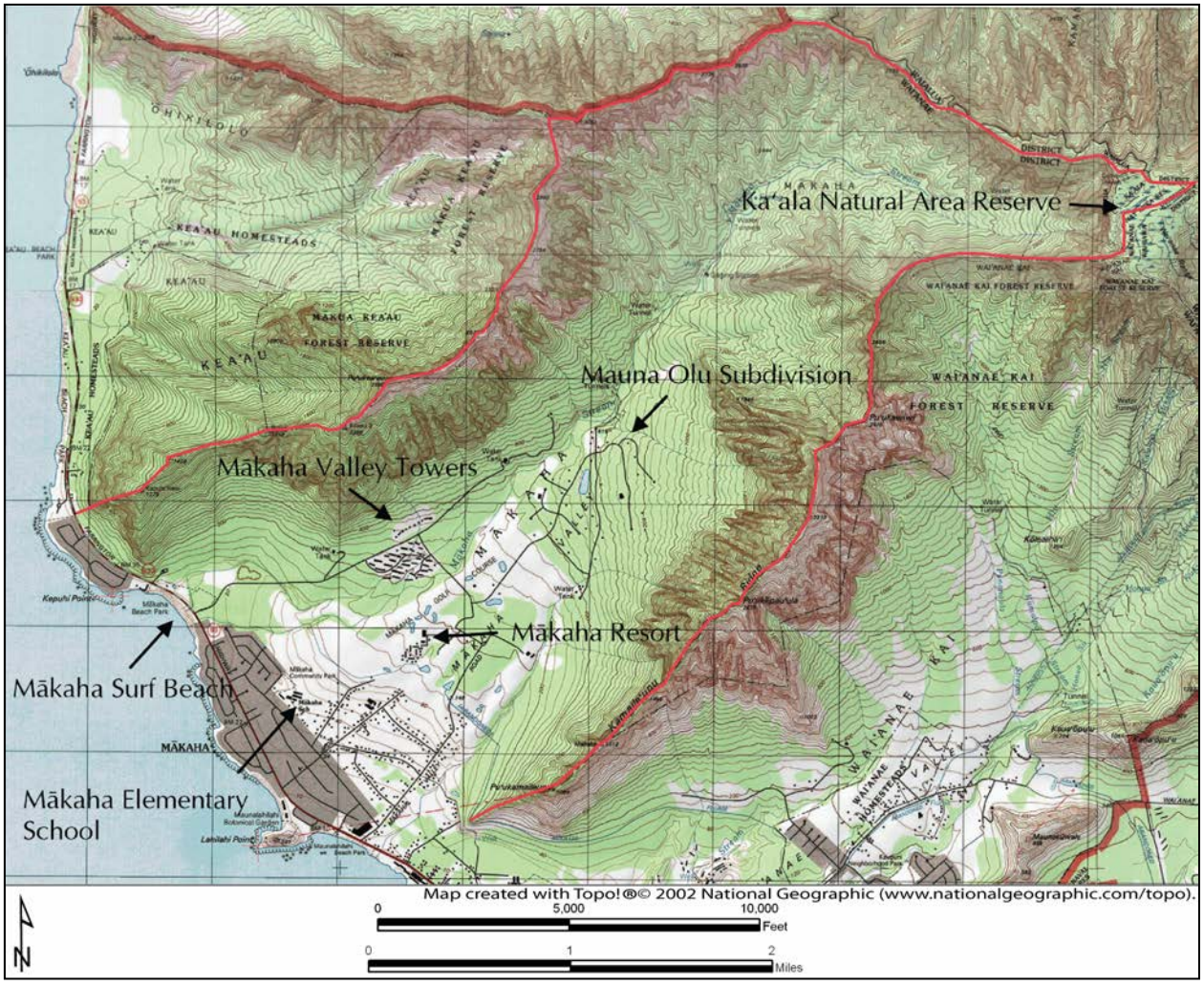
1. INTRODUCTION

Mākaha Valley, located on the west coast of Oʻahu, is one of five communities that make up the Waiʻanae District. The other communities are: Nānākuli, Māʻili, Lualualei, and Waiʻanae. The land development pattern in Waiʻanae is in some ways typical of Hawaii's rural coastal communities, where valleys are primarily devoted to agriculture and open space, and residential and commercial development is located in clusters along the coast.

FIGURE 1. MĀKAHA VALLEY



Source: USGS Topographic Maps

The Mākaha community is located just beyond Waiʻanae High School and extends about two miles until Keaʻau Beach Park to the north. Mākaha Valley contains approximately 5,949 acres and had a 2000 population of 8,229 and a 1990 population of 8,307, resulting in a decrease of 0.9 percent over 10 years. In 2000, there were 3,334 housing units in the valley. Most of the single-family residential lots are located immediately mauka and makai of Farrington Highway. There is an elementary school, a park, several beach parks and a few small commercial establishments in the area. The central part of the Valley contains the Mākaha Resort and Golf Course and the Mākaha Valley Country Club. The Mākaha Valley Towers condominium, the Mākaha Plantation Townhouses, and the Mauna Olu Estates gated community also share the central sections of the Valley. The Board of Water Supply owns approximately 4,000 acres of Conservation District lands extending to the upper ridges of Mākaha Valley. The State of Hawaiʻi owns the Kaʻala Natural Area Reserve located at the summit of Mākaha Valley. (See Figure 1)

1.1 OBJECTIVES OF THE MĀKAHA SPECIAL AREA PLAN

This Plan was prepared pursuant to recommendations in the Waiʻanae Sustainable Communities Plan (SCP). The Waiʻanae SCP is the overall long-range land use plan that provides for orderly growth for the District. (See Figure 2. Mākaha Special Area Plan Boundary)

Land Use Policy No. 3.8.2.4 in the Waiʻanae SCP states that:

> "Mākaha Valley needs a 'Special Area Plan' that will address cultural preservation issues, potential future uses of the now closed Resort facilities[1], and appropriate and feasible development options for the four parcels of residentially zoned, as yet undeveloped land. The central planning issue that should be addressed is how to balance economic development and existing and proposed residential and resort development in Mākaha Valley, with the overall vision for the Waiʻanae District that emphasizes the preservation of agriculture and open spaces."

Note that this policy has been deleted in the revised Waiʻanae SCP (2009), as the revised Waiʻanae SCP assumes that the Mākaha SAP has been completed.

[1] Note: The Mākaha Resort was closed when this Policy was written in 1999. The Resort has since been re-opened. This Policy will be revised in the updated Waiʻanae Sustainable Communities Plan to reflect conditions in 2009.

The Waiʻanae SCP recognized that:

- A large portion of the Valley has been designated "urban" under the State Land Use System.
- There are large parcels of undeveloped land in Mākaha Valley that are already zoned for urban Residential and Resort uses.
- The City, i.e. the Board of Water Supply (BWS), owns approximately 4,000 acres of land in the upper Valley and the steeper Valley walls.
- Mākaha Valley is an important resource area in terms of water resources, rare and endangered plants and animals, and cultural sites.

It should be noted that the Waiʻanae SCP, which was approved by the City Council in July 2000, will be reviewed and updated in the 2007-2009 timeframe. Some of the findings and recommendations of the Mākaha SAP should be considered in the SCP update process.

The objective of the Mākaha SAP is to balance preservation of the Valley's rural environment and character with the existing urban zoning. The Mākaha SAP will provide guidance to future projects and actions that will improve conditions and opportunities within Mākaha Valley. Further, and perhaps most challenging, will be the possibility of initiating a partnering process through which all stakeholders can formulate an agreement for further cooperative actions. These actions may be validated in a "Valley Partnership Memorandum of Understanding (MOU)." The MOU could serve as an important coordinating tool for the implementation of elements of the Special Area Plan.

1.2 MĀKAHA SPECIAL AREA PLANNING PROCESS

The plan process included the following steps: (1) defining plan goals and objectives, (2) inventory and analysis of existing conditions, (3) stakeholder consultations, (4) plan concept development, and (5) strategies for implementation.

The inventory and analysis of existing conditions included researching information on land use, natural resources, existing infrastructure, population, and housing. GIS-based mapping included zoning, land use, and infrastructure. The scope of the analysis also included some issues that were beyond the physical boundaries of the Mākaha SAP that were set in the Waiʻanae SCP.

Stakeholder meetings and interviews were conducted as a part of the goal to produce a community-based plan. Residents, landowners, business owners, and City and State agencies were contacted and/or interviewed. The purpose of these consultations was to explain the Mākaha SAP project and to gather input regarding issues that the Plan should address. Requests for information were also made to government agencies.

A preliminary draft of the Mākaha SAP was submitted to DPP in February 2006. DPP comments on the preliminary draft were received in April-May 2006.

Community residents discuss issues.

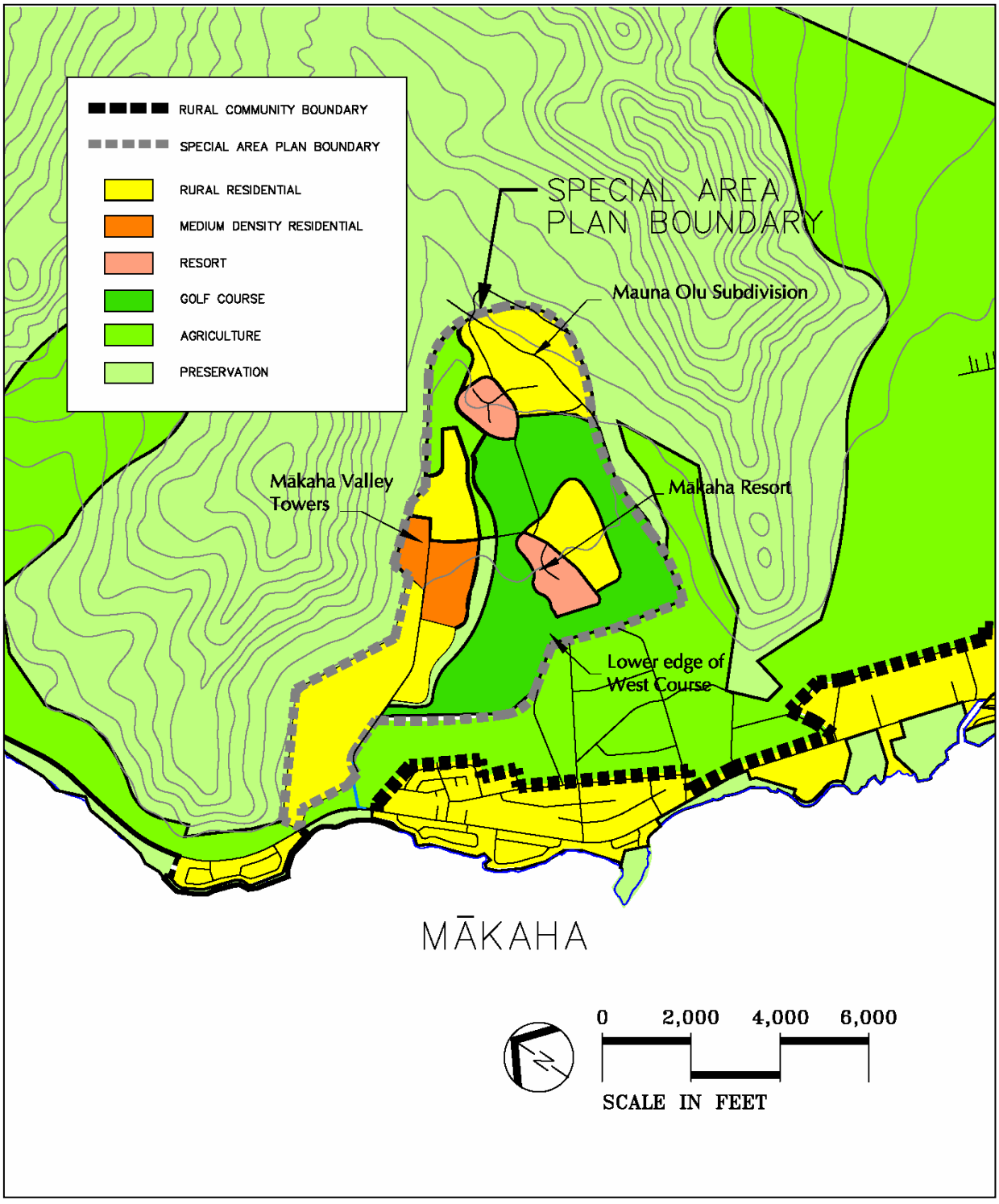
An initial meeting of key community and landowner representatives took place in August 2006. The Mākaha SAP "Public Review Draft" report was published in March 2007.

Comments on the Public Review Draft were received by DPP during the period April to September 2007. A second meeting of community and landowner representatives was held in August 2007. Additional community comments were received through 2007 and until early 2008. A "Final Draft" of the Mākaha SAP was submitted to DPP in September 2008. Final comments from DPP were received in November 2008. The Plan was finalized and published in January 2009.

1.3 MĀKAHA RURAL DEVELOPMENT CONCEPT

The central theme of the Mākaha Special Area Plan is the "Mākaha Rural Development Concept." The rural development concept addresses the issues of rural character, environmental protection, open space preservation, land use compatibility and circulation. This rural concept is intended to guide future projects and actions in Mākaha Valley by applying land use and policy recommendations to a **Rural Development Area**. The Mākaha Rural Development Area includes those lands located within the Mākaha Special Plan Area as outlined in the WSCP. (See Figure 2.)

FIGURE 2. MĀKAHA SPECIAL AREA PLAN BOUNDARY



1.4 SUMMARY OF ANALYSIS FINDINGS

The following is a summary of the community's perception of issues and concerns affecting Mākaha Valley.

1. Existing infrastructure in Mākaha is not sized to service future urban development.
    a. Roadways have primarily "private" or "various" ownerships, which result in inconsistent levels of maintenance and roadway construction that are below City standards.
    b. The rural-sized drainage systems are not adequate to handle major storm conditions if urban growth continues.
    c. The City sewer main that services areas beyond Pōka'ī Bay to Mākaha is operating at capacity and will need to be upgraded should development continue in Mākaha.
    d. Potable water is imported from the Pearl Harbor aquifer in order to meet the current demand for the Wai'anae District. While the community wants to be "self-sufficient" for water supply, this is not possible due to growth and watershed restoration goals
2. Residents report increased sedimentation, debris, and deteriorating stream banks at the lower reaches of Mākaha Stream. Nearby residential areas could experience greater flooding if these stream problems are left unchecked.
3. There is particular concern for the lack of truly affordable housing for local area residents and the siting, or mix, of luxury homes and existing residential housing.
4. The future development potential in Mākaha may significantly impact the rural character of the area.
5. All stakeholders, including the City, new large landowners, and community members do not have a clear understanding of the status and applicability of Unilateral Agreements executed between the City and former landowners. The Unilateral Agreements are dated and do not appear to be relevant to today's issues and conditions.

1.5 MĀKAHA RURAL DEVELOPMENT CONCEPT: GOALS AND OBJECTIVES

1.5.1 Goal

The goal of the Rural Development Concept is to provide patterns of land use and development that:

- Provide for clean air and water;
- Maintain important open spaces and view planes;
- Preserve natural stream banks and waterways;
- Encourage low-density or cluster development for future residential and resort development;
- Maintain lands for diversified agriculture;
- Encourage energy and water conservation;
- Provide additional park space;
- Provide pedestrian/ bicycle/ horse paths and trails;
- Provide limited opportunities for commercial and institutional uses within the Rural Development Area, such as neighborhood stores or community medical clinics;
- Provide opportunities for residents to live, work, and play in Mākaha.

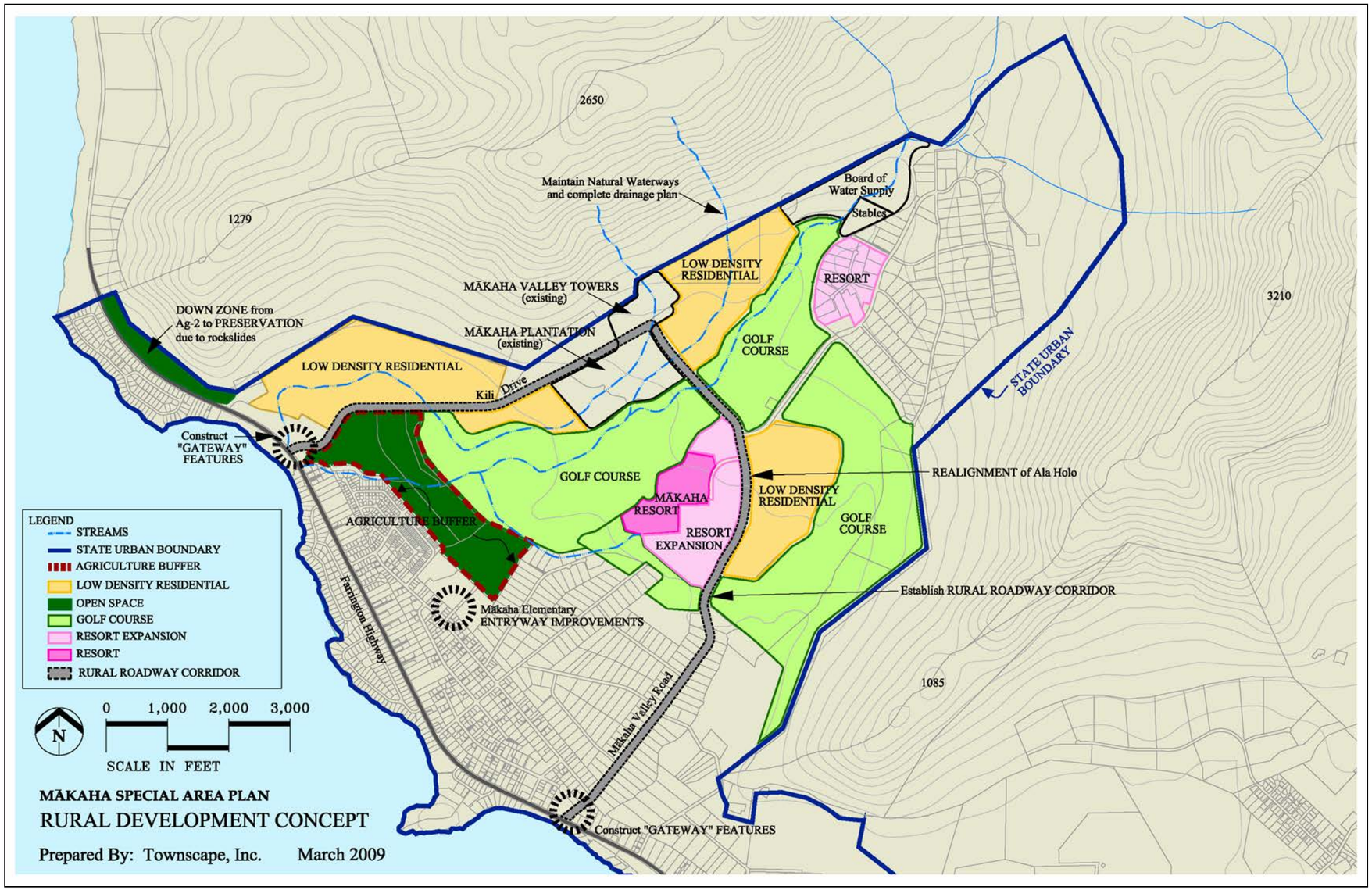
1.5.2 Objectives

1. Establish development guidelines that will coordinate the built environment in terms of aesthetics and function, including safety for people and protection of real property.
2. Develop a circulation concept for Mākaha Valley.
3. Determine how best to preserve what remains of the rural character of the Valley, including open spaces and view planes.
4. Investigate the feasibility of establishing a "Memorandum of Understanding" (MOU) among major area stakeholders as an implementation strategy for the Special Area Plan.

The Rural Development Concept is comprised of the land use elements and policy recommendations summarized below. See the "Rural Development Concept" Plan graphic on the following page.

ELEMENT	OBJECTIVE
Circulation Plan	Proposes a new "rural" roadway hierarchy that encourages flexible roadway types that maintain the rural character of the area and reduce development costs.
Open Space Plan	The Open Space Plan identifies important open space areas and encourages landowners to maintain open spaces and view planes.
Agricultural Plan	Identifies agricultural lands for protection and future use.
Park Development Alternatives	Identifies potential park areas under a low-density residential development alternative.
Watershed Protection	Suggests downzoning some urban designated acreage to conservation in order to protect the watershed.
Low-Density Residential and Resort Development	Suggests alternative low-density residential and resort development guidelines and policies.

FIGURE 3. RURAL DEVELOPMENT CONCEPT



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2. STAKEHOLDERS

2.1 STAKEHOLDER CONSULTATION PROCESS

During the period July 2005 through November 2005, representatives of the following organizations and agencies were contacted and/or interviewed for the purposes of explaining the Mākaha SAP and to gather their input regarding issues that the plan could address:

TABLE 1. ORGANIZATIONS AND AGENCIES CONTACTED

Organization/Agency
Board of Water Supply
Capital Investments, Corp.
City Department of Design and Construction
City Department of Design and Construction, Parks Plans Branch
City Department of Planning and Permitting
Hawai'i State Legislature, 21st Senatorial District
Hawai'i State Legislature, 45th Representative District
Hawaiian Electric Company
Honolulu City Council
HRT, Ltd.
Ka'ala Farm
Mākaha Ahupua'a Council
Mākaha Market Place
Mākaha Resort and Golf Course
Mākaha Valley Plantations
Mākaha Valley Towers
Mauna Olu Estate Association
Mohala I ka Wai
Sandwich Isles Communication
State Department of Transportation, Planning Branch
The Resort Group (West Honolulu Investors)

2.2 STAKEHOLDER ISSUES

Summarized here are key issues voiced by the various stakeholders in Mākaha Valley. Stakeholder issues and observations are presented by category:

2.2.1 Policy Issues

- The community feels that current zoning could result in high-density development which is inappropriate for Mākaha valley.
- Prohibit the development of new "gated communities" in Mākaha Valley.
- Prohibit development north of Kepuhi Point.
- Major owners should get together to review Unilateral Agreements.
- Provide access to mauka areas.

2.2.2 Rural Community

- In rural areas, people still walk in their neighborhoods, so safe pedestrian and jogging paths are needed.

Informal bus stop at Mākaha Surf Beach along Farrington Highway.

2.2.3 Design Standards/Ideas

- Design street improvements with greenery in mind. For example, have grass strips between roadway curb and sidewalk rather than building concrete sidewalks up to roadway pavement.
- Use xerophytic and native plants for landscaping.
- Provide adequate outdoor lighting; low-level lighting is preferred since this is a rural area.
- Put utilities underground.
- Encourage recycling at all levels – residential, resort, and agriculture.

- Use water efficient plumbing fixtures and appliances for new construction.
- Fit new residential developments with dual water systems so that recycled water can be used when it becomes available.
- Use solar energy in all future developments.
- Encourage active recycling; i.e., designate areas to receive recycled materials.

2.2.4 Infrastructure: Costs, Capacity, and Improvements

- Streets, such as Jade and Lāhaina, need improvements – sidewalks.
- There are capacity issues with the existing wastewater lines from the Wai'anae Wastewater Treatment Plant going in the Mākaha direction.
- Is there adequate roadway to accommodate growth, and if so, at what point do you develop?
- Some private roadways, such as Kili Drive and Huipū, are also used for public purposes.
- Portions of Kili Drive (a private roadway) are not rights-of-way, but rather, they are easements. The City does not allow the development of subdivisions off of easements.
- An unresolved issue is the roadway to the Mākaha Resort golf course; the City is concerned about the curvilinear alignment at Ala Holo, but the City cannot exercise authority over private roads. There is also a safety issue for owners with regard to resort visitors and residents who use the roads.
- There is a need to investigate adequacy of streets and sidewalks around the Mākaha Elementary School.
- In Mākaha, during periods of high surf, drainage outlets get clogged.
- Roads should be safe for pedestrians and vehicles.
- Maintenance of roads is an important issue that the Plan should address. One idea is for the City to accept ownership of certain roads, and to then charge "entities" in order to cover the cost of maintenance. Entities would be those with easements based on original Mākaha Valley Inc. agreements.
- There is poor maintenance of drainage ways, especially makai in the vicinity of Farrington Highway bridges.

- The Board of Water Supply Waiʻanae-Mākaha groundwater sources are operating near their sustainable capacities. Thus, existing and new large landscaped areas should use non-potable water, including recycled water, for irrigation.

2.2.5 Hazards

- Flooding occurs around Kepue and Water Streets.
- Address issues of rockslides, which are known to occur at north and south Valley walls.
- The whole of Mākaha suffers during heavy rains.

2.2.6 Growth Issues

- There are concerns as to availability of water supply for future uses in Mākaha.
- There have been recent inquiries to develop large parcels of unimproved lands with existing urban zoning.
- Previous to R-5 zoning, there were agricultural subdivisions with 1-acre lots and unpaved roads only. Now, R-5 zoning has been approved by the City, but roads were never upgraded.
- In general, traffic in the Mākaha area is light now. There are concerns about urban-classified parcels and how much traffic will be generated by new development.
- New resort type developments should develop their own clean burning power plants.
- Initial development plans for parcels of land zoned residential or resort could result in upwards of 1,300 new units of single-family housing, condo and hotels, or duplex units.
- Lower density developments are preferred for the Mākaha area.
- Recycled water for future use may increase costs significantly.

2.2.7 Community Improvement

- Provide more public facilities, such as parks.
- Plan for a community center.
- In order for businesses to contribute to the community, the businesses must first be successful.
- Existing facilities, such as the police station in Waiʻanae, are too small for existing conditions; the fire station will need to be enlarged if the population continues to grow.
- Develop incentives to implement community improvements.

2.2.8 Housing

- Affordable housing is an important issue.
- Set a standard for affordable housing, i.e., X percentage of developed units must be affordable.
- Waiʻanae residents should have priority to purchase affordable units built in the area.
- Deal with the issue of mixed housing, i.e., million-dollar homes are either gated or separated from affordable homes. How to create a healthy mix?

2.2.9 Environment

- Beach community – take care of the beaches, save the sand at beaches in Mākaha.
- The stream banks located at the bend in the south fork of Mākaha Stream, i.e., the section that flows through the west golf course, are deteriorating. If the banks fail, the houses in the area will be flooded.
- Sedimentation and soil deposits in parts of Mākaha Stream are getting worse and will eventually cause flooding.

Nānākuli brush fire in Summer 2005 (Honolulu Advertiser).

- Fires can destroy the few remaining native plants in Mākaha.

2.3 INITIAL MEETING OF KEY STAKEHOLDERS

An initial meeting of key stakeholders was convened in August 2006, including representatives of the Department of Planning and Permitting, the Board of Water Supply, the Mākaha Ahupua'a Community Association, Mohala I Ka Wai, and several major landowners. The objective of this meeting was to share some of the preliminary findings of the Mākaha SAP, to discuss key issues from all points of view, and to explore the possibility of developing some form of cooperative agreement and action agenda involving City departments, community organizations, and landowners. The Unilateral Agreements that set various conditions for the development of rezoned parcels were discussed, and the consensus of the meeting participants was that these Agreements need to be re-evaluated and, if appropriate, could be amended so that infrastructure improvements become both more economically feasible and more compatible with the rural character of Mākaha Valley.

A second meeting of community and land owner representatives took place in August 2007, some 5 months after the publication of the "Mākaha Special Area Plan Public Review Draft." The Unilateral Agreements were discussed further at this meeting. However, no consensus was reached regarding possible changes to the Unilateral Agreements or to the development plans of the landowners.

3. INVENTORY OF EXISTING CONDITIONS

3.1 NATURAL RESOURCES

View of Mākaha Valley from Kili Drive.

The Waiʻanae Mountains are older than the neighboring Koʻolau Mountains. The plants and animals that became established in Waiʻanae had an evolutionary advantage of about 1.5 million years. The formation of the Koʻolau Mountains profoundly affected the Waiʻanae mountain range climate and microenvironments. Due to the prevailing trade winds, clouds rise and drop precipitation on the Koʻolau before reaching the Waiʻanae range, thus resulting in much less rainfall for Waiʻanae.

Mākaha Valley has a wide variation in elevation over short distances. From the lower Valley to the upper Valley, elevation rises from sea level to over 4,000 feet at Kaʻala in the course of a few miles. Precipitation results from typically northeasterly trade winds that are forced up the eastern flank of the Waiʻanae mountain range. Rising winds cool as the air is pushed up over the tops of the mountain ridges. Trades are weaker during the winter months, but westerly wind patterns bring winter storms along the coast and upper elevations that provide much of the District's rain.

Mount Kaʻala, the highest peak on Oʻahu, is a unique mountain bog habitat located at the summit of Mākaha Valley. The bog straddles the ridgeline that separates the Waiʻanae and Wahiawā districts. The summit is often covered in clouds and receives an average of 60 to 80 inches of rain annually. The bog is covered with lapalapa, ʻōhia, ferns, and mosses.

Mākaha Valley is a major watershed on the Waiʻanae Coast. Runoff from this watershed flows into Mākaha Stream. The receiving ocean waters of this drainage area form the oceanfront of Mākaha Valley. While the lower Valley is relatively dry, it can receive an average of 20 to 40 inches of rain per year; in contrast, the upper Valley receives an estimated 40 to 80 inches. Mākaha Stream is 6 miles in length and drains an area of

about 8 square miles. The average annual peak stream flow for Mākaha Stream is 411.0 cubic feet per second (cfs). The stream is perennial in the upper valley, but intermittent in the mid and lower valley reaches.

Wai'anae is typically hot and dry in the lower elevations. Near the coast, low temperatures range between 62 to 70 degrees Fahrenheit in the winter, and highs range between 80 to 88 degrees Fahrenheit in the summer. Upper elevations maintain cooler and wetter conditions.

With the exception of steep gully and summit areas, the upper Valley vegetation is dominated by invasive species that have migrated upward from the low-lying areas. Isolated native plant communities are located at higher elevations along the southern slopes of the upper Valley.

Habitat for rare and endangered endemic plants and animals is generally found in small enclaves along the ridgeline of the Wai'anae Mountains, including areas in the back of Mākaha Valley. The U.S. Fish and Wildlife Service has stated that high elevation habitats in the Wai'anae Mountains, generally above 1,600 feet, are crucial for the survival of the federally listed O'ahu tree snails of the genus *Achatinella,* and for the rare O'ahu 'elepaio and the endangered O'ahu creeper, if still extant.

3.2 HAZARDS

From Mākaha to Mā'ili Point, the overall hazard rating is high due to tsunami, stream flooding, high waves, and storms. Flash floods and stream floods, sometimes lasting two or three days, have occurred frequently along the Wai'anae Coast.

At the headlands of Lahilahi and Mā'ili Points, the overall hazard assessment rating is "moderate" due to moderately high tsunami threats and low erosion hazards. At Mākaha and Ulehawa Beach Parks, erosion is ranked high along the low-lying beach embayments on either side of Lahilahi Point.

A devastating landslide occurred in November 1996 behind the Mākaha Valley Towers. After six hours of heavy rain, two converging waterfalls sent rocks and mud down the mountainside and overwhelmed a 10-foot high rock retaining wall. Rocks and mud surged through the upper level parking lot, buried or swept away about 60 cars, and came to a stop against the second floor of the building. Officials estimated that in a two-hour period, the storms had generated millions of gallons of water that flowed down the

Drainage area behind Mākaha Valley Towers.

mountainside. Estimated damage to the Towers was $2 million. A smaller slide hit the building again in January 1997 (Honolulu Advertiser, 11/20/00).

There is very little scientific information regarding rockslides in Wai'anae. Careful study would be required to understand the degree to which rockslides may be a threat to people and property in Mākaha.

Fires are a major concern among area residents. A rash of fires in 2005, believed to have been maliciously set, burned thousands of acres in Wai'anae in the summer season alone. Fires have put pressure on Oahu's fire response teams. One community member stated that for the first time this year (2007), the Fire Department was unable to respond to a call immediately because they were fighting two other fires in other areas on the Wai'anae Coast.

3.3 CULTURAL BACKGROUND AND LAND USE HISTORY

Archaeological studies undertaken since the 1960's indicate that the main valleys of the Wai'anae Coast were first settled by native Hawaiians during the period 1000 to 1300 A.D. Wai'anae Valley and Mākaha Valley, which had the two best flowing streams in this dry region, supported the largest populations.

The pre-contact Mākaha Valley supported a complex of taro *lo'i* along the middle reaches of Mākaha Stream, just below the large *luakini Heiau "Kane'ākī,"* which was extensively restored in the 1980's. The lower valley supported dryland agricultural crops, including *'uala* and some permanent house sites. The forested upper valley provided wood products, medicinal plants, plant parts and products for various household and ceremonial uses, and some natural plant foods. A variety of fish and other ocean organisms were available as food sources in the nearshore waters.

Based on the limited research work completed to date for Mākaha Valley, archaeologists have estimated that this ahupua'a may have supported about 100 families, or about 600 people.

The arrival of European and American people in Hawai'i in the late 18th century resulted, within two or three generations, in the decimation of the native Hawaiian population throughout the Wai'anae Coast, including Mākaha Valley. By the late 19th century, most of the mid to lower Mākaha Valley lands were owned by the Holt family, who used the land for ranching and growing coffee. By the early 20th century, ranching in Mākaha had been replaced by sugarcane cultivation.

The Wai'anae Sugar Plantation continued to harvest sugarcane in Wai'anae and Mākaha Valleys until the business began to fail in the 1940s. The Plantation's operations included the construction of the first major water tunnels and aqueducts in Wai'anae and Mākaha Valleys. In 1947, the Plantation ceased operations, and the 9,100 acres of Plantation lands were purchased for the price of $1,250,000 by the young Chinese entrepreneur Chinn Ho.

Chinn Ho's vision for the Wai'anae and Mākaha lands that he had purchased included new homes, community centers, and a major tourist resort in Mākaha Valley. In 1969, the 200-room "Mākaha Inn," a luxury resort with two golf courses, opened for business.

From the time of Chinn Ho's purchase of the Wai'anae Sugar Plantation lands, residential development proceeded at a fairly rapid pace in the lower areas of Mākaha Valley, as well as in other areas of the Wai'anae Coast. Between 1950 and 1990, the Mākaha housing inventory grew from a few hundred to approximately 3,000 homes, and the population from less than 1,000 to some 8,800 people.

Since 1990, there has been little growth and development in Mākaha Valley.

4. EXISTING INFRASTRUCTURE

4.1 WATER SYSTEM

4.1.1 Potable Water

The delivery of potable water to Mākaha is made via private and public water systems. BWS services the majority of the potable water needs of the Waiʻanae Coast. The BWS estimated that the average daily water consumption for the Waiʻanae District for the year 2000 was 9.3 mgd (million gallons per day). The 2000 per capita demand was estimated at 223 gppd, i.e., gallons per person per day[2]. Actual draw from the Waiʻanae District potable water sources was 4.8 mgd in 2000. An additional import of 4.5 mgd was drawn from the Pearl Harbor Aquifer via the ʻEwa/Waipahu water system in order to meet demand.

Sources within the Waiʻanae water system include Kamaile Wells and Mākaha Shaft. Higher elevation sources include the Waiʻanae Tunnel and Mākaha Wells I, II, III, V, and VI. Mākaha and Waiʻanae sources are being withdrawn close to their safe yield levels. Additional water demand will be met with Pearl Harbor water imports. Desalinated water, recycled water, and advanced water conservation may also help to meet future needs.

Mākaha Well source.

Potable water is conveyed to users through a system of water mains that follow the major roads in the District. Pipelines that serve the Waiʻanae area are sized to meet maximum daily flows plus fire flows. A system of 24-inch mains conveys water along Farrington Highway to Lualualei, and on to Waiʻanae at the Kamaile interconnection. Mākaha water sources, comprised of the Mākaha Shaft and wells, convey water via 16-inch and 20-inch

[2] While this figure represents the highest average per capita demand island wide, it is recognized that approximately 20 percent is used for agriculture and or irrigation.

mains that connect to a 24-inch main in Farrington Highway, which continues on to the Kamaile Wells interconnection.

There is an existing storage capacity of 8 million gallons (mg) in the Wai'anae water system. The water storage facilities include reservoirs in Wai'anae (to be constructed), Mākaha, and Nānākuli. Based on BWS Fiscal Year 2004 data and a water system factor, the Wai'anae storage is considered by the BWS to be short approximately 2.88 mg. Based on BWS projections of increased demand of approximately 0.8 mg by 2025, an additional 1.2 mg of storage would be needed in addition to the existing shortage of 2.88 mg for a total of 4.08 mg of new storage.

4.1.2 Planned Improvements

The BWS 20-Year Capital Projects Plan identifies projects for water resources technical research, operations and maintenance, and capacity expansion. It includes the following Wai'anae projects:

- Replacement Waterline Projects ($19 million cost estimate) will target approximately 64,000 linear feet of replacement waterline projects along the Wai'anae Coast (2006-2011).
- Lualualei Line Booster Improvements ($1.35M) - The Booster station currently operates at a maximum capacity of 5 mgd to move water from Nānākuli to Wai'anae. Additional pumping capacity is needed to increase system reliability and allow for existing and future demands and emergencies such as wild land fires.
- Wai'anae water system, 4.0 mg Reservoir ($14 million cost estimate) will address water storage needs in the Wai'anae system.
- Nānākuli 2 MG Reservoir (under construction – completion 2008).

Artesian well in Mākaha.

4.1.3 Non-Potable Sources

The only BWS-supplied non-potable water source is Glover Tunnel. The Tunnel supplies water to the Mauna Olu Reservoir for use by the Mākaha Resort golf course. Currently, demand on the reservoir is approximately 0.4 mgd. The reservoir has a capacity of 6 mgd. Glover Tunnel water is close to potable quality, needing only disinfection treatment.

4.1.4 Private Water Sources

Numerous private water systems, shallow wells in particular, were constructed in Mākaha beginning in the late 19th century. In general, these water facilities were used for irrigation or domestic uses. Since then, owners of these facilities have either abandoned or closed the majority of their water sources for a variety of reasons, e.g., plantations closed, poor water quality, or decision to use more reliable City water service. The Mākaha Country Club golf course maintains two wells of equal pump capacity, at 0.288 mgd total.

4.1.5 Water Demand

The BWS estimated the average daily water consumption for the Wai'anae District for the year 2000 was 9.3 mgd. According to the 2006 Board of Water Supply's Draft Wai'anae Watershed Management Plan, the 2030 projected BWS-served population is estimated at 52,299, which represents an additional water demand of 2.9 mgd. Projected future demand in 2030 is thus estimated at 12.2 mgd[3]. The growth forecast is primarily based on future housing in Mākaha Valley, Wai'anae, Lualualei, Mā'ili, and Nānākuli.

The BWS is currently finalizing Watershed Management Plans (WMP) in Wai'anae and Ko'olauloa. The WMP will address watershed management issues and will provide a Water Use and Development Plan that will address future demand and infrastructure.

4.1.6 Applicable Wai'anae Sustainable Communities Plan (July 2000) Policies and Guidelines include:

- Affordable water service for small farmers.

[3] The projected future demand represents the policy figure based on per capita demand for the YR 2030 for only the BWS including Glover Tunnel water.

- Wise use of potable water resources.
- Determination of safe yield of aquifers when pumping ground water may affect stream flows.

4.2 WASTEWATER SYSTEM

Wastewater in the Wai'anae District is collected at the Wai'anae Waste Water Treatment Plant (WWTP). The plant is designed for average dry weather flows of 5.2 mgd with a peak flow of 13.8 mgd. This WWTP currently treats 3 to 3.5 mgd. The major sewer lines generally follow Farrington Highway and the major Valley roads. The WWTP was upgraded to secondary level treatment and the ocean outfall was also extended to a greater depth.

In Mākaha, various sized sewer mains and laterals service the lower residential areas and the developed portions of the central Valley to the west. City sewer connections generally follow Farrington Highway and service the residential areas zoned R-5 and portions of R-10. Sewer laterals that connect to the sewer main along Kili Drive service the Mauna Olu Estates subdivision, the Mākaha Valley Towers, and Mākaha Plantations.

The Mākaha Resort and Hotel is serviced by a City sewer connection and the golf course is serviced by cesspools. Wastewater for The Mākaha Valley Country Club is treated by a small "package" wastewater treatment plant (9,000 gpd).

According to staff of the City's Department of Environmental Services (ENV), the sewer main that runs along Farrington Highway from Mākaha Valley to the WWTP in Wai'anae Valley is "at capacity."

Approximately 1,480 linear feet of the 36-inch Mākaha Interceptor Sewer cannot carry any additional sewerage flows. City engineers have preliminarily scoped a CIP project called the "Mākaha Sewer Rehabilitation/Replacement" project, which is tentatively scheduled to be completed in 2010.

4.2.1 Applicable Waiʻanae SCP (July 2000) Polices and Guidelines to the Mākaha SAP include:

- Continue the phased program for replacement of old sewer lines.
- Examine the feasibility of expanding the City's reclaimed water program. Reclaimed water could be used for irrigating roadway landscaping, existing golf courses, parks, and certain types of crops.

4.3 DRAINAGE

Mākaha Valley is a major watershed on the Waiʻanae Coast. Runoff within this watershed flows into Mākaha Stream. The receiving waters of the drainage area are the near shore waters of Mākaha Valley. While the lower Valley is considered dry, it can receive an average of 20 to 40 inches of rain per year; in contrast, the upper Valley receives an estimated 40 to 80 inches. Mākaha Stream is six miles in length and drains an area of about 8 square miles. The average annual peak stream flow for Mākaha Stream is 411.0 cubic feet per second (cfs).

Numerous box culverts located along Farrington Highway convey storm water into the nearshore areas. City storm drainage systems consisting of drop inlets, storm water mains, and culverts are located primarily in the R-5 zoned areas along Manuku, Kupue, Nukea, and Water Streets. The residential areas makai of Farrington Highway located between Lahilahi and Upena Streets primarily have culverts and open ditch systems that drain into the nearby ocean. At Nukea Street, a 54-inch line and 60-inch outlets drain into an improved drainage section located at the south branch of Mākaha Stream.

Mākaha bridge drains mauka water into the near shore area.

Storm drain easements are located at Mākaha Valley Road and Lahaina Street extending to Jade Street. Kili Drive lines and culverts receive drainage from private systems. An outlet located along Kili Drive drains into the north branch of Mākaha Stream.

High flows in Mākaha stream are infrequent and relate to storm events. Culverts draining into the stream contribute to high peak flows and stream bank erosion.

4.3.1 Planned Improvements

The City Department of Design and Construction reports that there are no major drainage improvements planned for Mākaha. In the Lahilahi Street area, the City is conducting miscellaneous drain improvement projects but these improvements are to existing systems. During periods of high surf, drainage outlets located along the ocean front become clogged with sand. The City has hired a consultant to investigate alternative drain designs to reduce clogging.

4.3.2 Applicable Waiʻanae SCP Policies and Guidelines include:

- Develop a comprehensive plan for the correction of flooding and drainage problems.
- Implement a sedimentation control program.

4.4 Electrical Power and Communications

Oʻahu is served by a total of 1,669 megawatts (MW) of generation located at the Honolulu Power Plant (7%), the Waiau Power Plant (29%), the Kahe Power Plant (39%), and the Campbell Independent Power Producers (25%). Electrical lines in Mākaha include primarily 12-kilovolt (kV) and 7.2-kV lines that distribute power along major roadways down to residential service use levels. The WSCP reported in 1999 that the Waiʻanae District was adequately served by power and telephone, and cable TV systems. The Mauna Olu subdivision has underground electric service. The majority of the older neighborhoods have above-ground utility poles and lines.

Farrington Highway intersection with turn lanes and overhead electric.

4.4.1 Pending Developments

Sandwich Isles Communication (SIC) provides fiber optic installation for the Department of Hawaiian Home Lands (DHHL). SIC is responsible for providing fiber optic cable systems, via terrestrial and marine systems, to all DHHL properties. SIC anticipates a future marine cable landing at a site behind Mākaha Surf Beach across Farrington Highway. This marine cable will link O'ahu's grid to Kaua'i. The Phase II of their terrestrial fiber optic cable installation will involve a connection from Hakimo Road to Kili Drive.

4.4.2 Applicable Wai'anae SCP Policies include:

- Reduce the visual impact of power lines and utility poles, especially along Farrington Highway.

4.5 ROADWAYS

The State Department of Transportation (DOT) or the City maintains the roadway systems on O'ahu. The City Department of Facility Maintenance, Division of Road Maintenance, is responsible for maintaining City-owned streets, roads, bridges, and walkways. The City Department of Transportation Services (DTS) is responsible for locating, selecting, installing, and maintaining traffic control facilities and devices. Mākaha Valley, however, contains numerous roadways, collector streets, and local accesses that have "various" or private ownership.

Typical road section along Mākaha Valley Road.

4.5.1 Arterial Roads

The major roadway system providing access to Mākaha is Farrington Highway, a State-owned Highway that extends from Waiawa Interchange to Mākua. Farrington Highway, in the vicinity of

Mākaha Valley, has four travel lanes and a dedicated turn lane onto Mākaha Valley Road. It serves as the coastal road for trips within the Waiʻanae District and is the only community highway for trips outside of Waiʻanae. There are no Federal roadways in Mākaha.

4.5.2 Collector Streets

Mākaha Valley Road, Kili Drive, Huipu Drive, and Mauna Olu Street serve as collector streets in Mākaha Valley. Mākaha Valley Road and Kili Drive serve as connector streets to Farrington Highway. These roads carry traffic around the residential community. These roads have either "various" owners or are privately owned.

Mākaha Valley Road (MVR) has three owners along various sections of the roadway: Ko Olina Mākaha East, Mākaha Valley Farms, and Mākaha Valley Inc. (City Parcel Information, GIS). This collector street is subject to various commitments under several Unilateral Agreements. MVR has a right-of-way of 60 feet and for the majority of its alignment has scrub grass and dirt shoulders. Community members report the need for either the installation of, or maintenance of, existing streetlights and 4-way stop signs at several cross streets.

Kili Drive is a privately maintained roadway owned by HRT, Ltd. (City Parcel information confirms that portions of the roadway belong to TMKs owned by HRT, Ltd.) Kili Drive is a two-way roadway with an estimated 30-foot roadway pavement and connects directly to Farrington Highway. At the Farrington Highway/Kili Drive intersection, there are no traffic signals. Mākaha Surf Beach is visible from Kili Drive.

Section of Kili Drive.

Visitors and residents jog or walk along Kili Drive. Vehicular traffic, including City buses, utilize this roadway as well. Field observation indicated the roadway to be fairly well maintained. Portions of the roadway near Mākaha Valley Towers and Mākaha Plantation have curbs and sidewalks with an estimated 40-foot roadway pavement. In general, however, roadway conditions along Kili Drive are inconsistent, because the road was not constructed to City standards.

Huipu Drive provides an important link between Mākaha Valley Road (via Ala Holo Loop), Kili Drive, and Mauna Olu Street. Huipu is a two-way roadway with various levels of improvements. City parcel information (GIS) confirms that the entire length of Huipu Drive (including Ala Holo Loop) belongs to a parcel owned by Mākaha Valley, Inc. The Property Manager of the Mākaha Valley Towers, however, indicated that the Mākaha Valley Condo Association contributes to the maintenance of the Drive. Field observations indicate that the roadway is generally well maintained.

4.5.3 Sub-Collector Streets

Jade Street and Lahaina Street are the main sub-collectors for residential streets within the R-5, R-10, and Country zoned districts located at the makai end of Mākaha Valley. Lahaina Street is a City-owned street while Jade Street has "various" ownerships along the roadway. These two collector streets service relatively dense residential areas and have various levels of improvements.

4.5.4 Local Access Streets (Residential)

Typical local access street in Mākaha.

The remaining streets in Mākaha Valley serve the sole function of local access streets. Residential streets may be City-owned, privately owned, or maintained by various owners along the roadway. Field observations indicated that Manuku Street is a heavily used roadway. This street services a dense residential development (R-5) and maintains two-way traffic along an estimated 40-foot right-of-way. Heavy use of on-street parking and rubbish dumping make the roadway virtually impassable in some areas.

In general, however, local streets have ample roadway width for two-way traffic and contain generous shoulder width for off-street parking, which is commonly utilized by not only cars, but also boats and an occasional canoe. In a rural coastal community, these types of off-street uses should be expected.

4.5.5 Emergency Access Road

For years, the Waiʻanae community had called for the construction of an "Emergency Access Road" system that would provide people with a way to bypass blockages on Farrington Highway, and thus be able to enter or leave the Waiʻanae Coast.

Farrington Highway is the **one and only** public transportation link between Waiʻanae and the rest of Oʻahu. Blockages to Farrington Highway caused by major accidents, flooding, broken water mains, downed utility poles, or, in one memorable incident, a hostage/police emergency, often result in closure of the highway that lasts hours or even all day.

Policy 4.1.2.3 "Emergency Road" in the Waiʻanae SCP summarizes the need for this project. In 2001, the City's Department of Transportation Services (DTS) began planning and engineering work to construct a number of short bypass roadways that would link existing streets that intersect with Farrington Highway, and thus create a series of bypass routes that vehicles could use to avoid blockages. To date, the bypass roadway in Nānākuli has been completed, but the planned bypass in Mākaha in the vicinity of Kaulawaha Street has not been constructed, primarily because of strong opposition from area residents.

4.5.6 Planned Improvements

The Oahu Transportation Improvement Program (TIP) is the short-term, four-year implementation program for federally assisted surface transportation projects. The TIP, for FY 2004-2006, listed the Farrington Highway Bridge Replacement project -- Mākaha Bridges #3 and #3A. The project will replace timber bridges in the vicinity of Mākaha Beach Park. Estimated cost was $1,300,000 (in FY 2004). Environmental studies are currently being conducted.

According to the State Department of Transportation, the Farrington Highway Realignment around Mākaha Beach Park is not an active project. The "Oʻahu Regional Transportation Plan (ORTP) 2030" includes the following projects in the Waiʻanae District; none of which are scheduled to be implemented earlier than the year 2016.

TABLE 2. WAIʻANAE PROJECTS INCLUDED IN THE ORTP 2030

Category	Project Description	Estimated Cost (Millions in Year 2000 Dollars)
Congestion Relief	Farrington Highway widening from Hakimo Road to Kalaeloa Boulevard	$108.4
Safety and Operations	Farrington Highway safety improvements along the Waiʻanae Coast, from Kaena Point to Kahe Point; includes realignment around Mākaha Beach Park.	$69.7
Second Access	From Farrington Highway, in the vicinity of Maili, over Waiʻanae Mountain Range, to Kunia Road	$423.0

Source: Oahu Metropolitan Planning Organization.

4.5.7 Applicable Waiʻanae SCP Policies and Guidelines include:

- Farrington Highway safety improvements for pedestrians and motorists.
- Farrington Highway beautification including, placing overhead wires underground and elimination of utility poles, use of native or drought-tolerant shade trees, use of special design elements, e.g., lighting, planting, signage, paving, and street furniture. The objective should be to return at least parts of Farrington Highway to a more human and pedestrian-friendly scale.
- Establish an Emergency Access Road system.
- Other modes of transportation, including bikeways, pedestrian walkways, and paths.

4.6 PUBLIC SAFETY AND EDUCATIONAL FACILITIES

4.6.1 Police

The Honolulu Police Department, according to the WSCP, provides services to the Waiʻanae District from the Waiʻanae Police Substation, located in Waiʻanae, and from the Barber's Point Substation. There are between 14 to 17 officers who perform police duties in the area. The Waiʻanae Substation handles a large number of calls and a large number

of arrests: about 5,000 to 6,000 calls to 911 and about 500 to 600 arrests per month. There are not enough officers or adequate space to handle this substantial need for police services.

HFD responds to a brush fire on the Wai'anae Coast.

4.6.2 Fire

The Honolulu Fire Department maintains two stations in the Wai'anae District: in Nānākuli and Wai'anae. The Nānākuli Station has a 5-person engine and a 1-person tanker. The Wai'anae Station is equipped with a 5-person engine, a 5-person combination pumper/ladder truck, and a 1-person tanker. Fire stations located in Kapolei, Makakilo, 'Ewa and Waipahu provide back-up fire service. The District firefighters respond to a large number of brushfires, especially during dry summer months.

4.6.3 Emergency Ambulance Service

The WSCP reported that one emergency ambulance unit is located at the Wai'anae Fire Station. There is now a second ambulance stationed at the Kaiser Nanaikeola Clinic. District patients are taken to Hawai'i Medical Center West or to the Wai'anae Comprehensive Health Care Facility. Critical cases are flown via helicopter from Wai'anae to the Queen's Medical Center. The Wai'anae SCP notes that the community feels that a full-service hospital and a second ambulance are needed.

4.6.4 Schools

The Mākaha community has one elementary school. The Mākaha Elementary School is part of the Hawai'i State DOE Leeward School District. The school serves Mākaha Valley and the nearby coastal community. This primary school offers grades pre-kindergarten to 6th grade. According to the DOE, the school has a capacity of 776 students but services

only 595; therefore, the school is under capacity. Approximately 70 percent of the school student body is eligible for free lunch, a figure double that of the Hawai'i average of 35 percent.

Mākaha Elementary School.

According to the State DOE, there are improvements planned at Mākaha Elementary although funding has not yet been secured. Total estimated cost of improvements is $6.6 million.

1.	ADA Transition Accessibility	$300,000
2.	Telecommunication Up-Grade	$300,000
3.	Electric Up-Grade	$500,000
4.	Air Conditioning of School	$3.5 million
5.	Library Expansion	$2.0 million

4.6.5 Parks

The WSCP indicated that the Wai'anae District has ample beach parks but a shortage of active recreation parks and neighborhood parks. The Mākaha community contains the following parks:

TABLE 3. CITY PARK AND PARK FACILITIES

Mākaha Beach Park	1 comfort station, 1 lifeguard tower, pay phone	20.62 acres
Mauna Lahilahi Beach Park	1 comfort station, picnic facilities	8.74
Mākaha Community Park	1 medium recreation building (multi-purpose room, classroom, comfort station), 2 basketball courts (lighted), 1 softball field (with dugouts), 1 outdoor grass stage area, children's play apparatus, 12 parking stalls, 1 handicap stall.	4.32

The City standard for parks is 8 acres per 1,000 persons. Existing parks in Mākaha total 33.68 acres. The population in the area is 8,229. According to standards, there should be 64 acres of park space available in the area. There is thus a deficit of at least 30 acres of park land in Mākaha.

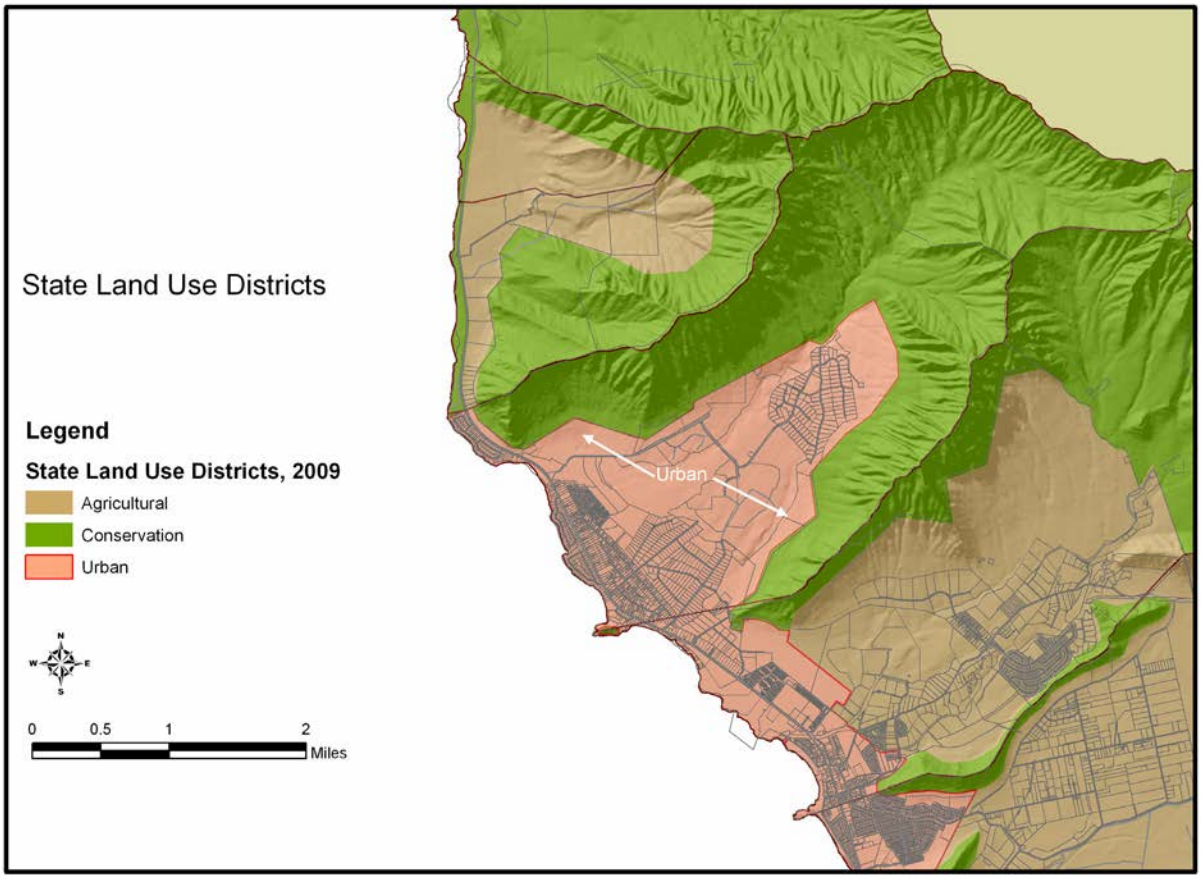
It should be noted that some of the acreage of Mākaha Beach Park --the approximately 13 acres mauka of Farrington Highway-- may not be useable for park purposes. The "deficit" for park acreage for the Mākaha community may therefore be more than 30 acres estimated above.

5. LAND USE

5.1 STATE LAND USE AND CITY ZONING

State land use is divided into four broad categories: Urban, Rural, Agricultural, and Conservation. Much of the land in the Waiʻanae District is designated as Conservation and Mākaha Valley follows this pattern. The Waiʻanae District's Urban lands account for 13 percent of the land area in comparison to Mākaha where 24 percent of the land is classified Urban.

FIGURE 4. STATE LAND USE DISTRICTS



Source: State Land Use Commission.

TABLE 4. MĀKAHA VALLEY STATE LAND USE DESIGNATIONS

Urban	1,513 acres*	24% of the total
Conservation	4,772	76%
Total Acreage	6,285*	100%

*Total acreage in this table is larger than the Mākaha Valley acreage noted on page 2 (3,949 acres) due to overlap of urban areas beyond the project boundary. There are no State Ag-designated lands in Mākaha.

In Mākaha, lands that are classified as Urban occupy the lower and central sections of the Valley with the Mauna Olu Estate subdivision marking the upper boundary of the Urban designated lands. The remaining lands are Conservation. BWS owns the majority of the Conservation lands. The Kaʻala Natural Area Reserve, located at the summit of Mākaha Valley, is owned by the State of Hawaiʻi.

At the City level, the three largest zoning districts in Mākaha are Preservation, Residential, and Country. Resort zoning accounts for 2 percent of the City zoned acreage.

The City and County of Honolulu's General Plan's (GP) Economic Activity Objective B is to maintain the viability of Oʻahu's visitor industry. To this end, the GP's policy 6 states: "Permit development of secondary resort areas in West Beach, Kahuku, Mākaha, and Lāʻie."

FIGURE 5. CITY ZONING IN MĀKAHA

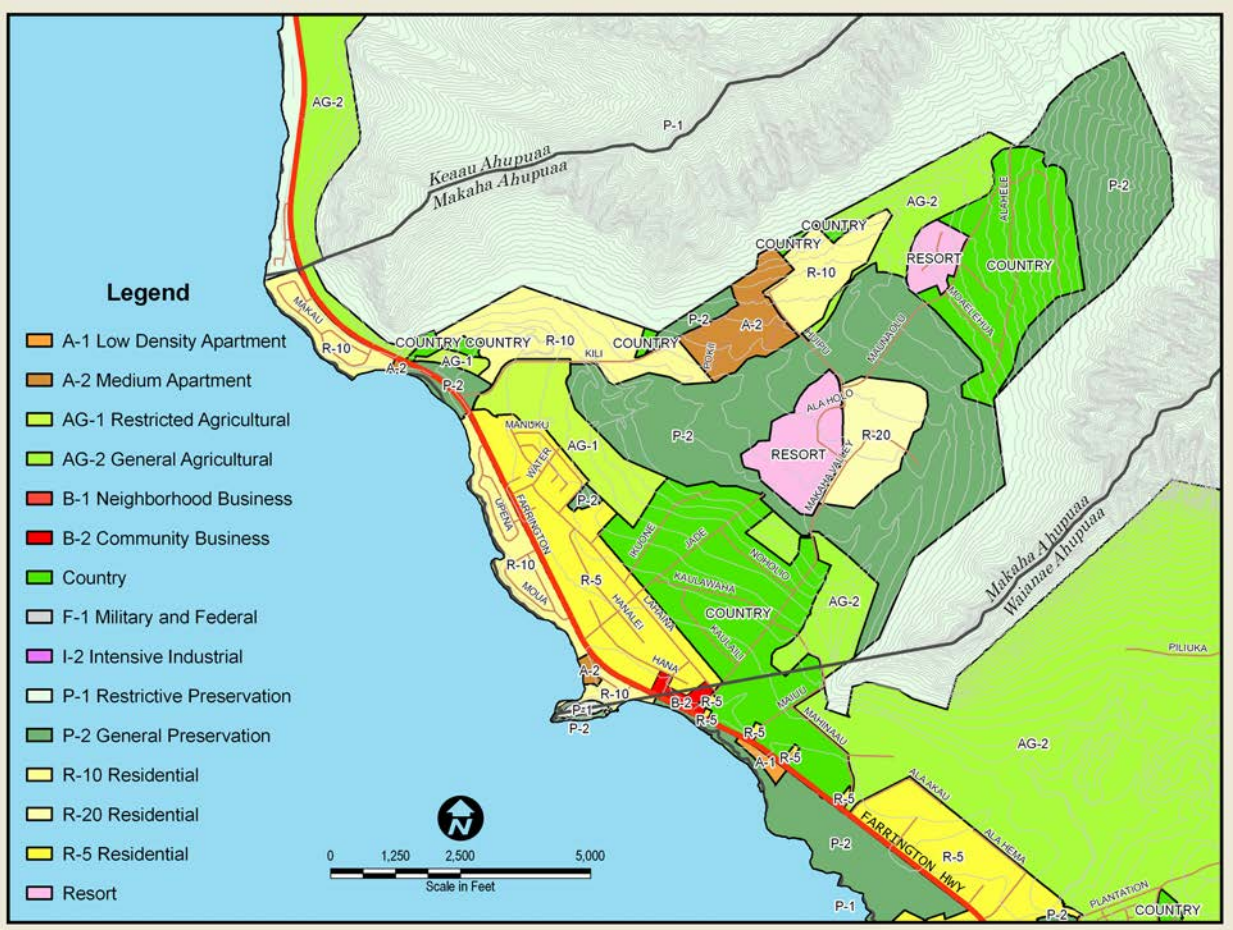


TABLE 5. CITY ZONING IN MĀKAHA

	Acres	Percent
Apartment	65	1%
Agriculture	264	4%
Business	10	0.164%
Country*	520	8%
Preservation	4,772	76%
Residential	556	9%
Resort	97	2%
TOTAL	6,285	100%

*Extends outside Mākaha.

5.2 LAND OWNERSHIP

There are five major landowners who together own approximately 4,746 acres, or 75 percent of the Valley. The landowners who hold more than 100 acres of either improved or unimproved parcels are: Board of Water Supply (4,000 acres), Fairmont Resort Properties, Ltd. (167 acres), Mākaha Valley Country Club (152 acres), HRT, Ltd. (275.2 acres), and West Honolulu Investors (151.67 acres).

Mauna Olu subdivision located at the mauka end of the valley contains one to two-acre parcels.

5.3 UNIMPROVED LANDS

There are several large parcels of undeveloped and partially developed State Urban designated lands in Mākaha. According to one recent conceptual planning study, as many as 1,832 new units could be added to the existing units in the area. There are 3,334 housing units in Mākaha. Additional development under the current zoning could thus raise the number of units to 5,166. Unit types under the existing zoning categories could allow for single-family and duplex units, condominium-hotel, club house, ranch/farms, additional golf courses, recreation, grocery stores, and group living facilities.

TABLE 6. LARGE UNDEVELOPED PARCELS IN MĀKAHA'S STATE URBAN DISTRICT

Owner	TMK	Acres (Approx.)	County Zoning
Aistar	840290: parcels 15-28, 30-32, 141, 143	26.03	Resort
BBP Makaha LLC	84002048	23.46	AG-1
BBP Makaha LLC	84002043	24.34	AG-1
BBP Makaha LLC	84002044	9.49	AG-1
BBP Makaha LLC	84002063	3.83	AG-1
HRT, Ltd	84002058	109.73	R-10
HRT, Ltd	84002060	68.76	R-10
HRT, Ltd	84002045	22.26	AG-1
HRT, Ltd	24002050	19.65	R-10
HRT, Ltd	84002062	14.98	P-2
HRT, Ltd	84002004	13.96	AG-2
Fairmont, Inc.	84002052	8.48	Resort
Towne Realty*	84002054	35.71	Resort
Honolulu Ltd and Koolina Makaha East LLC (formerly Nitto owned parcels)	84002007	66.90	R-20
TOTAL		**447.58**	

*Listed as belonging to the Makaha Resort in the City and County's GIS database.
Source: City and County of Honolulu GIS.
Note: several small road parcels owned by Mākaha Valley, Inc. and Mākaha Valley Farms are not included in this table or on Figure 6 because of their small size.

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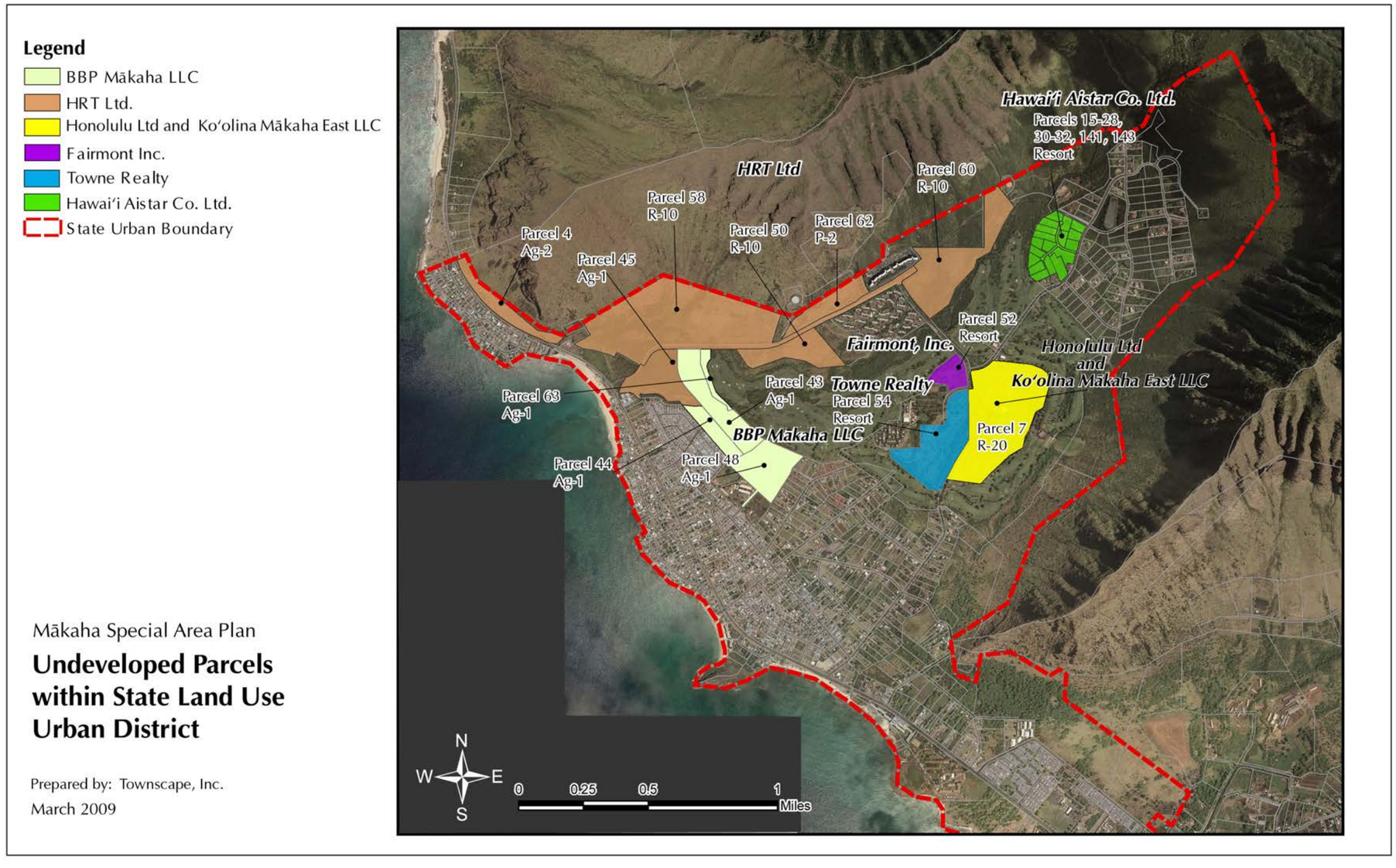
FIGURE 6. UNDEVELOPED PARCELS WITHIN STATE LAND USE URBAN DISTRICT



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5.4 UNILATERAL AGREEMENTS

There are at least three properties in Mākaha located in the State Land Use Urban District that are vacant and subject to Unilateral Agreements. Unilateral Agreements document various requirements and conditions that are attached to a zoning change. The following provides bullet points and a table that outline the requirements in the three Unilateral Agreements:

5.4.1 Ordinance No. 88-79 -- Rezones parcels from Country to Residential 10. This application was originally submitted by Mākaha Valley Inc. (MV) and became effective in 1988. Today, these parcels total 157.22 acres and are owned by HRT, Ltd.

- Submit Water Master Plan; must provide on-site water facilities at sole cost and expense.
- Construct on-site sewer facility at sole cost and expense.
- Convey to City lot 1606 (13 ac.), for park use.
- Construct or post bond for construction of sewer and pipes for R-5 density to service lot 1606.
- Comply with City ordinance regarding parks and playgrounds.
- Submit properties to a Horizontal Property Regime -- project should not be used by individuals 55 years or younger.
- Install left turn storage lanes with signal at Farrington Highway and Mākaha Valley Road and improve Mākaha Valley Road, subject to approval by State DOT and City DTS.
- Submit drainage report and construct or post bond for drainage improvements.
- Submit Data Recovery Plan and Mitigation Plan for preservation, enhancement, or recovery of significant archaeological sites. Provide reasonable access for persons desiring to visit sites.
- Submit report on sales and development schedules, traffic, and roadway conditions of Kili Drive and Farrington Highway.

5.4.2 Ordinance No. 91-20 -- Rezones one parcel from Country to Resort. This application was originally submitted by ANA Hotels, Inc. and became effective in 1991. Today, these parcels are owned by Towne Realty and involve a total of 35.71 acres.

- Submit drainage report for review and approval prior to issuance of grading permit.
- Determine feasibility of an alternative source of water (shallow brackish water wells) for landscape irrigation with BWS approval and, to extent practicable, implement alternative source of water.
- In coordination with DOT, DTS, and all major land owners, a plan shall be developed to:
    - Provide signalization at Mākaha Valley Road and Farrington Highway;
    - Provide pavement widening for Mākaha Valley Road;
    - Install turning pockets at certain intersections along Mākaha Valley Road;
    - Realign Mākaha Valley Road near the entrance to the Mākaha Resort to provide direct transition to Huipu Drive;
    - Provide road surface improvements without sidewalk, curb, or gutter improvements;
    - Retain Mākaha Valley Road right-of-way;
    - Provide street lights along Noholio (Nahilo) Road, Kaulawaha Road, and Kaulaili Road.
- Submit phasing schedule for roadway improvements to DTS and DOT as needed.
- Provide information to DOT regarding intersection analysis for all cross streets along Mākaha Valley Road, capacity analysis of Farrington Highway as two- and four-lane facility, and evaluate level of service and traffic volume, including mitigation measures.
- Execute a binding agreement to participate in an affordable housing plan, which provides a unit count of residential units for households with incomes at or below 80 percent median income that is no less than 30 percent of the proposed 150 resort condominium units.
    - Requirement can be satisfied by providing rental dwelling units or by providing dwelling units for sale;

- Offer "ten-year buy back" and "first option and shared appreciation in value" provisions if the affordable housing through a rental program is not satisfied.

- At its own cost and in conformance with City standards, provide all necessary on-site and off-site wastewater improvements to support the project.
- Participate in the cost of widening Farrington Highway at Mākaha Valley Road.
- Comply with Fire Department requirements and provide a fire access road.
- Continue employment programs at Mākaha Resort.
- Accommodate persons with disabilities.
- Obtain all other approvals.
- Conform to State Historic Preservation laws.

5.4.3 Ordinance No. 89-124 -- Rezones parcels from Country to Resort. This application was originally submitted by Honvest Corp. It became effective in 1989. Today, these parcels are owned by Hawai'i Aistar Co., Ltd., for a total of 25.8 acres.

- Prior to issuance of building permit, all water and sewer lines must be installed or will be installed at sole cost.
- Post a bond to cover its portion of improvements at Farrington Highway and Mākaha Valley Road and to Mākaha Valley Road itself.
- Conduct archaeological surveys to be submitted for approval by DLNR.

During the period 1989-1990, the several companies with significant land holdings in Mākaha Valley discussed forming a corporation to fund and construct needed infrastructure improvements, including improvements to Mākaha Valley Road and new sewer, water, and drainage lines. These companies were:

- Mākaha Valley, Inc.
- Sekitei Kaihatsu Co., Ltd.
- ANA Hotels Hawai'i, Inc.
- All Nippon Airways

- Nitto Hawai'i Co., Ltd.
- HONVEST Corp.

This multi-company planning process was quite complex, and cannot be easily summarized here. Ultimately, these companies were not able to finalize an agreement for infrastructure improvements in Mākaha Valley. Since that time, no new cooperative or partnering process has been initiated.

A review of various memos and correspondence between the principal parties at that time indicate that the main impediment to finalizing the agreement was the inability of the principals to agree on the amount and timing of each company's share of the infrastructure costs.

A cooperative agreement among the companies that currently own most of the undeveloped, urban-classified land in Mākaha Valley may or may not be possible. However, there are now several factors that contribute to the odds for a possible positive agreement. These factors include:

- the ratio of land value to infrastructure costs may be more favorable today than it was in 1990, thus making investment in infrastructure more feasible;
- the Mākaha SAP suggests lower density development for some of the undeveloped, urban-classified parcels – which, if agreed to by the land owners, may reduce the size and cost of roads, water and sewer lines, and drainage systems.
- DPP has expressed a willingness to re-evaluate the original Unilateral Agreements, and this re-evaluation could include establishing road standards that would be less costly to implement.

These factors are discussed in more detail in "Section 7" of this Special Area Plan.

TABLE 7. SUMMARY OF REQUIREMENTS IN UNILATERAL AGREEMENTS

	INFRASTRUCTURE						HOUSING			PUBLIC FACILITY			ARCHAEOLOGICAL			REPORTS	
Applicant	Water Facility	Sewer Facility	Drainage Improvements	Roads			Affordable	Buy-Back Option to City	Elderly	Park	Employ	Fire	Data Recovery Plan	Arch Survey	Burials Procedure	Sales/Dev. Schedule	Traffic
				Farrington	MVR	Other											
Makaha Valley, Inc. (Current Owner: HRT, Ltd.)	X	X	X	X	X				X	X			X			X	X
ANA Hotels, Inc. (Current Owner: Towne Realty)	X*	X	X	X	X	X	X**	X			X	X			X	X	X
Honvest Corp. (Current Owner: Hawaii Aistar Co., Ltd.)	X#	X#		X	X									X			

Notations:
***Includes determining the feasibility of an alternative water (shallow brackish water wells) to meet future landscape irrigation with BWS approval**
****Prior to issuing building permit, execute a binding agreement to participate in affordable housing plan satisfied by rental dwellings or units for sale, for no less than 30% of proposed resort condo units.**
#Water and sewer lines must be installed or will be installed to City standard.

Applicant Details:
Mākaha Valley, Inc. (HRT, Ltd.): 249.19 acres Ag-1 and R-10 zoning; 497 developable units
ANA Hotels, Inc. (Towne Realty): 44.19 acres, Resort zoning, 300 condo hotel development units
Honvest Corp. (Hawai'i Aistar Co., Ltd.): 26.01 acres, Resort zoning; 200 condo hotel developable units.

5.5 PUBLIC AND PRIVATE DEVELOPMENT PLANS

The Mākaha Resort and Golf Course (MRGC), purchased by Fairmont Resort Properties, Ltd., of Canada in 2004, has been renovating the property and has increased room and golf bookings. The MRGC plans to build 344 timeshare units[4]. Once the necessary permits are approved, construction of the proposed three low-rise timeshare structures could start in 18 to 24 months.

The West Honolulu Investors, LLC, Jeffery Stone, President, recently purchased the Mākaha Valley Country Club. While there are no plans for development at this time, prior to purchasing the Mākaha Valley Country Club, a "Mākaha Valley Master Plan" for the Urban-classified lands in Mākaha Valley was prepared by Architects Hawai'i, Inc. The Master Plan concept includes single-family homes, golf course expansion, condominium hotel villas plus clubhouse, duplex units, stables and outdoor recreation. The Master Plan also realigns portions of Ala Holo and Huipu roadways. In total, the Master Plan accounted for approximately 1,832 new housing units.

5.6 POPULATION TRENDS AND HOUSING

Wai'anae's population in 1835 was estimated to be 1,600 people. Population declined to 800 by 1855. By 1950, Waianae's population had grown to 7,000, in large part due to the influence of the sugar industry and Chinn Ho's lot sales program in Mākaha. By 1990, the District's population had grown to 37,411. Census 2000 data estimated the District population at 42,259, representing 4.82 percent of O'ahu's overall population. The General Plan for the City and County of Honolulu calls for the Wai'anae District's proportional share of O'ahu's 2010 population to be between 3.8 and 4.2 percent.

Given the trends in Wai'anae, population growth and development over the past 40 years is more typical of a suburbanizing urban fringe community than that of a relatively stable rural community.

[4] Construction of timeshare units is subject to sewer system upgrades.

TABLE 8. POPULATION AND HOUSING, YEAR 2000

	Population	Housing Units	Persons per Household	Available Housing Vacancy Rate
Mākaha/Kaʻena	8,229	3,334	3.30	15.40%
Waiʻanae District	42,259	12,356	3.97	9.20%
Oʻahu Totals	876,156	315,988	2.95	4.90%
Waiʻanae % of Oʻahu	4.82%	3.91%	Not Applicable	Not Applicable

Interestingly, the Waiʻanae District communities grew between 1990 and 2000 with the exception of the Mākaha Valley, which experienced a 0.9 percent population decrease. Māʻili and Waiʻanae were the fastest growing communities during that period. Recent (2008) population projections developed by DPP show an increase for Mākaha of 996 people (12.1%) between 2000 and 2030.

Applicable Waiʻanae SCP Polices and Guidelines to the MSAP include:

- Open Space
  - For proposed projects, provide a detailed analysis of potential impacts on open space and scenic beauty;
  - No future urban/suburban development in areas where open space is of critical concern.
- Coastal Lands
  - No new development makai of Farrington Highway;
  - Shore armoring structures should be discouraged.
- Preservation of Mountain Forest Lands.
- Streams and Stream Floodplains
  - Establish Stream Conservation Corridors;
  - Establish minimum in-stream flow standards.
- Preserve and protect major concentrations of cultural sites.
- Agricultural lands
  - Establish a firm boundary for Important Agricultural Lands;
  - Define uses that are compatible with agricultural uses;
  - Provide zoning and tax incentives for people to farm the land.

- Residential Land Use
  - No increase in land designated for residential use;
  - Development encroachment on Agricultural Lands should not be permitted.
- Parks and Recreational Areas
  - Development of adequate public parks should be a top priority;

6. PLANNING IMPLICATIONS

This summary of planning implications is based on both stakeholder consultations and planning research and analysis. Planning implications are provided here as a way to frame plan policies and recommendations.

6.1 IMPLICATIONS OF PAST ZONING DECISIONS IN MĀKAHA VALLEY

- The Urban zoning designations in Mākaha represent an outdated development perspective that today must be tempered by concerns for environmental, cultural, and natural resource sustainability and preservation.
- Infrastructure has not kept pace with the zoning decisions made in the 1980's and as recently as 1991.

Mākaha Valley Towers on Kea'au side of the Valley.

6.2 INFRASTRUCTURE

- There will be increased demand for water. Drought conditions could reduce source amounts – need safety net with regard to supply. Wastewater reclamation and conservation are important tools for a sustainable future.
- Roadways are of rural standard and have various levels of ownership, which results in inconsistent levels of maintenance. Cost issues combined with the difficulty of

coordinating improvements among various owners have resulted in poorly maintained roadways.

- Future developments must address drainage capacity of existing systems.
- Existing sewer mains are operating at capacity.
- There will be an increased demand for ambulance, fire, and police services. A cash-strapped City budget cannot absorb the costs to improve these much-needed emergency services.

6.3 DESIGN STANDARDS

- Design standards for future developments should, as a goal, promote rural character.
- Green, clean, and recyclable principles should guide any new development.
- The mauka and makai view planes and general open space of the Valley should be preserved.
- Improve pedestrian mobility along major roadways in Mākaha.
- Place utilities underground where possible.

6.4 AFFORDABLE HOUSING

- The Mākaha population has actually decreased. The Waiʻanae Coast has a high percentage of low-income communities and one gated community already exists in Mākaha. Proposed Resort and Residential developments, including condominium-hotels, will not be affordable to local residents.
- Residential developments should produce a mix of affordable and market housing in a manner that enhances community cohesiveness and promotes rural character.

6.5 ENVIRONMENT

- Mākaha Stream provides an important drainage function in the valley. The stream must function properly in order to maintain a healthy environment and protect homes and people. Evaluate the conditions of Mākaha Stream with regard to bank stabilization at the lower reaches of the stream.

- Mākaha residents have a strong relationship with the ocean and ocean resources. Urban development increases the amount of impervious surfaces and the amount of pollutants entering near shore waters.
- Protect the beaches.
- Access points to the beach areas should be provided as required by law.

6.6 HAZARDS

- Siting of residential homes must consider the implications of wild fires. Proposed developments should be evaluated for fire responsiveness.
- The Federal Flood Insurance Rate Maps (FIRM) indicate that parcel 58, an undeveloped parcel with residential zoning, is in the 100-year flood zone.
- Rockslides from steep mauka slopes are a hazard for some of the undeveloped land in Mākaha Valley – especially Parcel 84002004, - a narrow 8.48-acre strip of land that is located at the foot of steep, rocky lands that separate Mākaha Valley from the adjacent ahupua'a of Kea'au.

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7. MĀKAHA RURAL DEVELOPMENT PLAN

7.1 MĀKAHA VISION

The vision of the Wai'anae community is clearly expressed in the Wai'anae Sustainable Communities Plan (WSCP, June 1999). The focus of the WSCP is the preservation of the rural landscape and of the country lifestyle:

> "Rural landscape and country lifestyle are exemplified by the hundreds of small farms in the District, the extensive open spaces and cultural resources, the rugged beauty of the Wai'anae Mountains, the many miles of sandy beaches, and the small town values of Wai'anae people."

Sunset at Mākaha Surfing Beach.

In a community survey conducted in the summer of 2004 by the Mākaha Ahupua'a Community Association, Mākaha residents expressed the characteristics that make Mākaha a special place in which to live:

"Mākaha has a sense of community, 'ohana feeling and interrelated community. The local people have aloha and are genuinely friendly. Mākaha is a great rural community that is marked by wonderful beaches and the beauty of the area is accented by the rugged mountains and sea. Mākaha is a good place to raise children. Area residents can access bus routes and there is still no traffic. The weather is good and there are lots of local activities, hiking, boating, diving and fishing. Mākaha has affordable housing and cost of living. This rural community has many social assets such as, churches, child-care, nursing

home, Hoa ʻĀina ʻo Mākaha, the Mākaha Canoe Club, a famous surfing beach, the Mākaha Resort, and golf courses."

The City's General Plan (GP) directs very little growth to the Waiʻanae District. The GP agricultural objectives are to maintain the viability of agriculture on Oʻahu, including the Waiʻanae Coast. Notably, while the General Plan allows resort development in Mākaha specifically, it also states that "*resort growth is to occur by respecting existing lifestyles, environment and providing public services without incurring substantial costs.*"

The WSCP observes that given land development and population trends, the growth policy will be difficult to implement without strong City policies and actions. The Mākaha SAP sets out to define those polices and actions that will "keep the Country-Country."

7.2 RURAL DEVELOPMENT CONCEPT

The Mākaha Rural Development Concept is intended to guide future projects and actions in Mākaha Valley by applying land use and policy recommendations to a Rural Development Area. The Mākaha **Rural Development Area** includes those lands located within the Mākaha Special Area Plan as outlined in the WSCP.

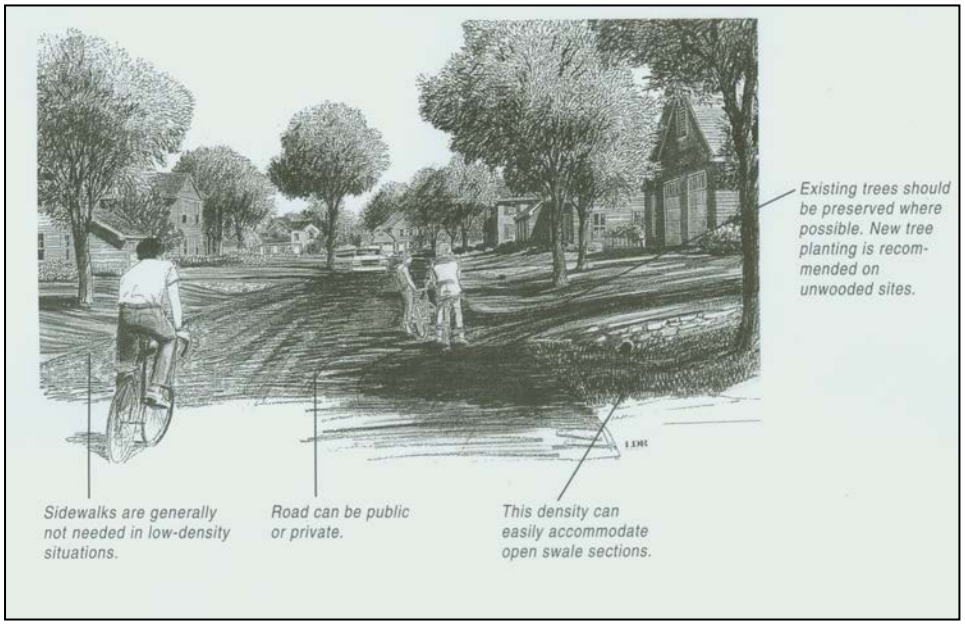
The issues of rural character, country lifestyle, environmental protection and residential compatibility with agricultural uses present unique challenges in an area like Mākaha. Given the current zoning, upwards of 1,800 new residential and resort units could be built. The rural community of Mākaha has an urban boundary that extends well into the upper areas of the Valley – a consequence of an outdated development perspective.

While the City zoning allows urban type development primarily in the form of resort and higher-priced residential development, the "on the ground" experience is much different in Mākaha. The rugged valley walls continue to dominate the mauka view planes with a deep blue ocean providing equally stunning makai views. In Mākaha's low-density neighborhoods, sidewalks are generally not needed, roadways can be public or private, and open swales can be used for drainage. Neighborhood children can still play outside or at the park. While the more developed portions of the Valley have sewer connections, agriculture and country zoned parcels are not connected to the City sewer system.

The policies and guidelines outlined in the Rural Development Concept are intended to preserve and enhance the rural character of Mākaha while allowing sustainable residential

growth and economic development pursuant to existing zoning. The resulting patterns of land use and development should:

- Provide for clean air and water.
- Maintain important open spaces and view planes.
- Preserve natural stream banks and waterways.
- Encourage low density or cluster development for future residential and resort parcels.
- Maintain lands for agriculture.
- Encourage energy and water conservation.
- Provide additional park space.
- Provide limited opportunities for commercial and institutional uses within the Rural Development Area, such as neighborhood stores or medical clinics.
- Provide opportunities for residents to live, work, and play in Mākaha.



Rural subdivision standard illustration.

Source: Jarvis. 1993.

The Mākaha Rural Development Plan is thus comprised of the following land use elements and policy recommendations:

- Rural Development Policy Framework

- Mākaha Rural Development Guidelines
  - General Policies
  - Low Density Residential and Resort Development
- Circulation Plan
  - Circulation Plan Elements
  - Rural Roadway Standards
  - Roadway Hierarchy
- Open Space Preservation
- Agricultural Buffers
- Drainage Plan
- Park Expansion

7.3 RURAL DEVELOPMENT POLICY FRAMEWORK

Guiding Principle:

> *Land located in the rural development area shall be compatible with, or provide protection for, the natural environment and shall be designed to integrate with the existing rural settlement patterns.*

The framework for the Mākaha Rural Development Concept supports the Waiʻanae Sustainable Communities Plan theme of "keeping the Country - Country" through the following policies:

- Future developments, i.e. resort and residential, should promote rural character in terms of scale and physical design, i.e., relatively low density, low building heights, informal landscaping, and lots of open space.
- Energy and water conservation measures should be applied to all future developments in Mākaha Valley.
- Preserve mauka and makai view planes and open space.
- Preserve natural stream banks and waterways.
- Provide opportunities for small-scale farming.

- A roadway circulation plan should address pedestrian safety and movement, especially in the existing residential areas.
- Private roadway maintenance should be enforced with City oversight.
- Some affordable housing should be provided in all future development proposals that involve residential housing.
- Some local small businesses should be provided for, as well as small-scale farming and possibly retirement residential units.

7.4 MĀKAHA VALLEY RURAL DEVELOPMENT GUIDELINES

The objective of the *Rural Development Guidelines* is to preserve and enhance the rural character of Mākaha by focusing primarily on: 1) Circulation and Rural Roadway Standards, 2) Open Space Preservation, 3) Rural and Agricultural Buffer Zones, and 4) a Unified Country Land Use Pattern. This section also addresses park expansion and drainage planning.

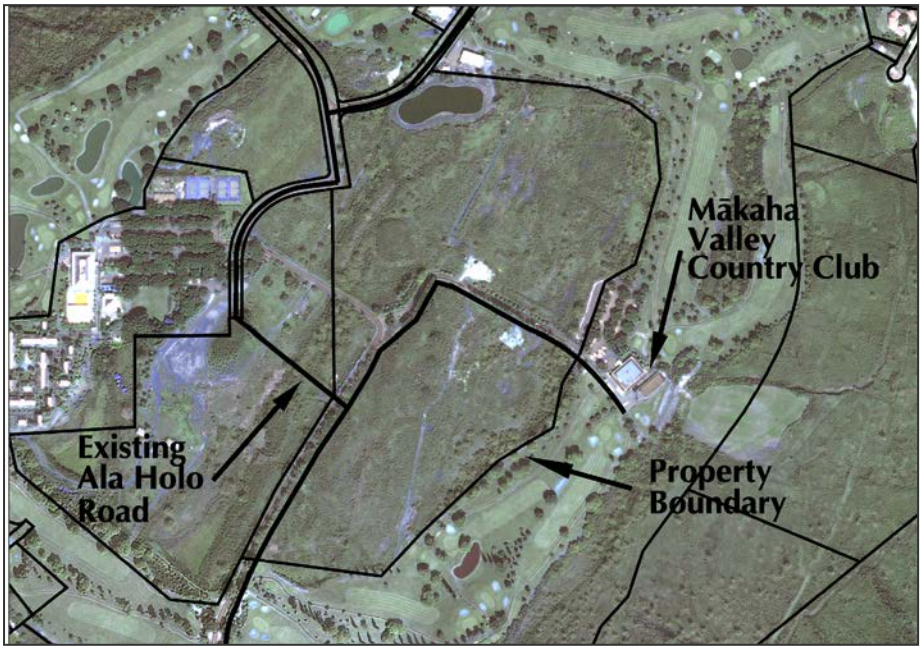
7.4.1 General Policies

- City and/or Board of Water Supply in conjunction with landowners and developers, shall coordinate the implementation of water conservation measures, to ensure sustainability of water resources in the area. The BWS Waiʻanae-Mākaha groundwater sources are operating near sustainable capacity, thus, existing and future golf course developments and large landscaped areas shall use nonpotable water such as recycled water for irrigation.
- Development proposals should ensure, to the maximum degree possible the preservation of significant natural features, including watercourses and ground water recharge areas.
- Sustainability is encouraged through the use of green technology for new developments in the rural development area.
- Limited opportunities for non-farm residences, commercial, and institutional uses within the Rural Development Area should be provided.

7.4.2 Low Density Residential and Resort Development Policies

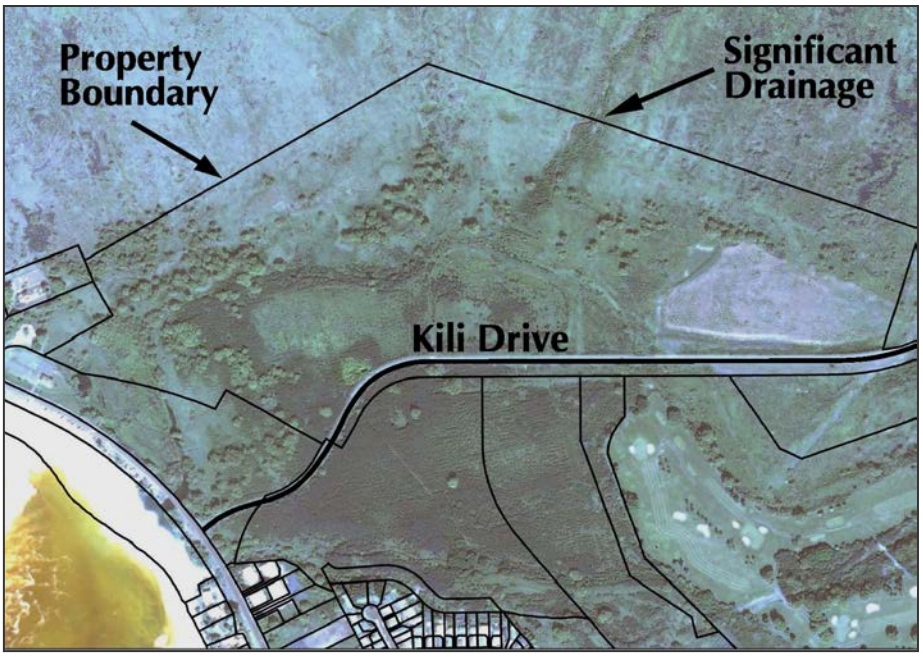
(See Alternative Low Density Development Concepts on following pages.)

- Future residential developments should include at least 30 percent of lots and/or homes to be made available at affordable prices.
- The City should provide incentives for the preservation of open space and view planes.
- Building heights should conform to the existing residential heights; these guidelines suggest no more than 25 to 30 feet.
- The clustering of residential units in favor of open space and view plane preservation is encouraged. Overall density should conform to the existing zoning.
- Future development proposals should address mitigation of hazards including integrating wildfire prevention methods or wildfire mitigation plans. Mitigation measures to protect residents from rockslides will also be needed.
- Enforce the WSCP policy that no more medium density development is to be allowed in the Waiʻanae District.
- Establish standards for permeable surfaces – perhaps a certain percentage of any building lot.
- Increase setbacks for side and front yards.
- Utilize grass-lined drainage channels rather than concrete channels.
- For "Resort Expansion" area, consider low density resort residential dwellings instead of higher density hotel development.

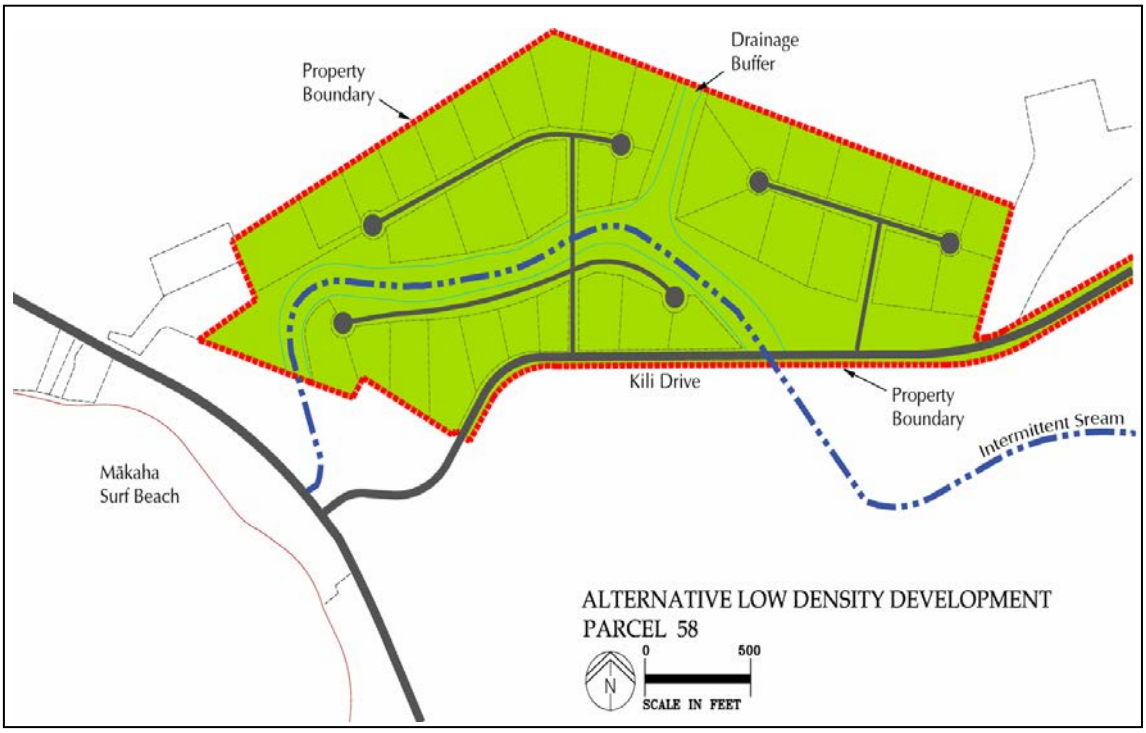


Aerial image of Parcel 7: R-20 zoning, 66.898 acres, owned by Honolulu Ltd and Koʻolina Mākaha East, LLC (formerly owned by Nitto). R-20 zoning would allow approximately 115 lots.

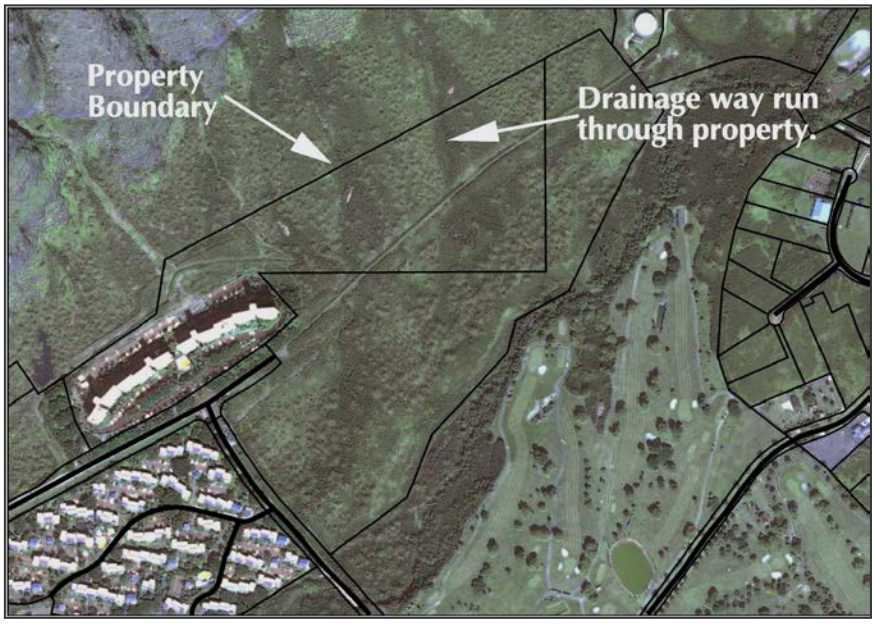
Low density residential alternative contains 1 and 2-acre lots with additional park space -- ±40 lots.



Parcel 58, owned by HRT, Ltd.; 109 acres, R-10 zoning. Portion of parcel is located in flood zone. (See Hazard map.) R-10 zoning would allow ±350 lots. Note that some acreage here is impacted by storm runoff and may not be developable.



Low density development alternative allowing for drainage, rural standard roadway, and 1 and 2 acre lots -- ±40 lots



Parcel 60, owned by HRT, Ltd.; 63 acres of R-10 zoned lands. Drainage way visible.

Parcel 60 with low density alternative design that integrates park space and accommodates drainage way.

7.4.3 Circulation Plan

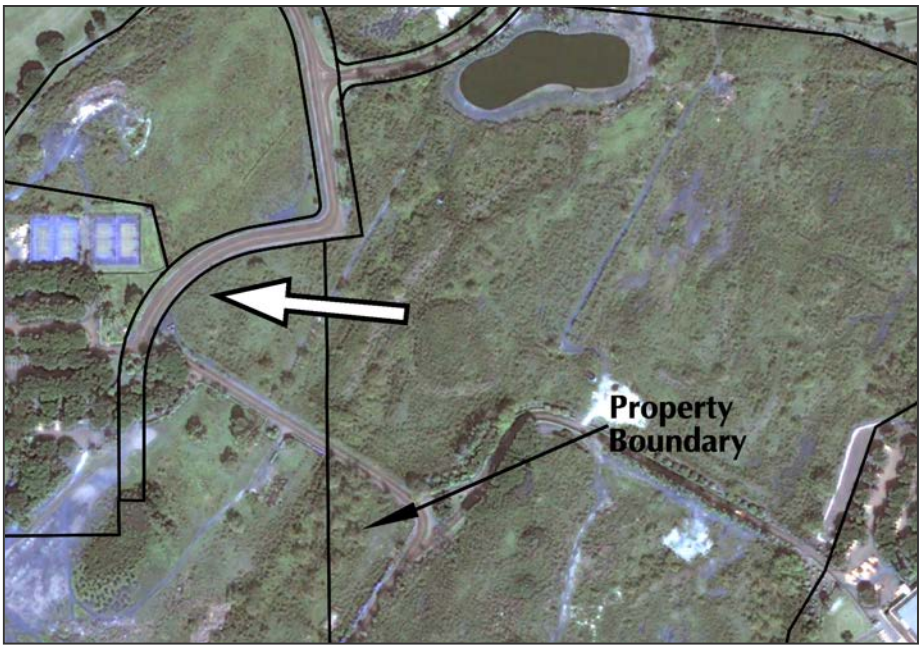
(See Circulation Plan on page 67.)

Primary Objective: To balance pedestrian safety and motor vehicle needs without compromising the rural character of Mākaha Valley.

Recommendations:

- City enforcement of Unilateral Agreement (Ordinance no. 91-20) to develop a "Circulation Plan" in coordination with DOT, DTS, and all major landowners.
- The City, based on the "Circulation Plan," would then negotiate with landowners to complete improvements and roadways to be dedicated to the City.
- Develop criteria that establish a level of maintenance sufficient to provide vehicular movement, pedestrian safety, and rural character.
- Establish a "Rural Corridor" roadway design along the main collectors; Mākaha Valley Road, Huipū Drive, and Kili Drive.
- Re-design Ala Holo and Hui Pū roadway alignment.
- "Gateway" Features are proposed at the intersections of Mākaha Valley Road and Kili Drive with Farrington Highway. These features could include appropriate signage, planting, and lighting, and would serve to orient people who may be visiting the Resort, the Heiau, or friends living in the area.
- Construct and/or regularly maintain sidewalks, curbs and gutters, stop signs and street markings at the entryway to Mākaha Elementary School.

Example of Gateway Feature



Ala Holo - Existing Alignment

Ala Holo – Proposed New Alignment

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FIGURE 7. MĀKAHA CIRCULATION PLAN

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7.4.4 Rural Roadway Standards

The application of city development standards to rural areas can result in over design and unnecessary costs.

The WSCP notes that the City should utilize more flexible and appropriate subdivision standards for roads and utilities in rural residential subdivisions. The WSCP recognizes that City subdivision rules and regulations require curb/gutter/sidewalk for most new subdivisions. These standards may not necessarily make sense for "country" or rural areas such as Mākaha, especially where lots are zoned either Ag, Country, R-20, or R-10.

Further, the purpose and intent of Section 1-1 of the Revised Subdivision Rules and Regulations Standards adopted by the Planning Commission and effective June 1, 2001, state that the intent of the updated standards is to promote greener and more people-oriented streets throughout the City, provide a greater variety of street types, and create more opportunities for trees within the City street rights-of-way and in future developments.

It is estimated that upwards of 1,800 new units could be built in Mākaha under the current zoning. The MSAP recommends rural residential subdivision standards for Mākaha in order to preserve the rural character of the area by encouraging grass swales and shoulders, more greenery along roadways, reduce the amount of runoff from impervious surfaces, and reduce the cost for the development of subdivisions, thus making more lots available at affordable prices.

A "rural" roadway hierarchy should be considered for Mākaha. The purpose of this hierarchy would be to create "rural" roadways that would be designed to an appropriate rural standard for Country (C), Ag (AG-1 and AG-2), and Residential (R-20 and R-10) zoned lands in the **Rural Development Area** in Mākaha.

Mauna Olu subdivision is an example of a rural roadway standard applicable in other areas in Mākaha.

The standard City and County of Honolulu "urban" road standards are not appropriate for rural communities like Mākaha. The City's urban road standards include:

- Concrete curb and gutter
- Catch basins and underground storm drain lines
- Concrete sidewalks
- 45-foot high street lights.

"Rural" street standards that may be more appropriate for Mākaha would be characterized by:

- Grass shoulders/swales (instead of curb, gutter, catch basins, drain lines)
- Asphalt or cinder pedestrian paths
- No street lights except at intersections.

There are, however, a number of important practical and functional issues that need to be addressed before the "best" street standards for Mākaha can be established. These issues include the following:

A. **Parking** – People will park their cars (and trucks and boats) on the grass shoulders, with resulting tracking, rutting, and general damage to these "soft" shoulder areas, especially when the ground is wet from showers or storms. If the pavement is widened to provide for parking on one or both sides of the street, the paved area will be at least 28-32 feet wide (parking one side) to 36-40 feet wide (parking both

sides), which will result in a more "urban" look. And even with widened pavements to provide for on-street parking, some people will still park their vehicles on/in the grass swale area. Also, for sidewalks less than 5-feet wide, ADA standards require a minimum of one 5-foot X 5-foot paved handicapped person access pad every 200 feet of street length. Thus, for grass shoulders/swales, this standard would require a 5-foot culvert to provide for drainage flows under the 5' X 5' paved area.

Possible standard for Mākaha: Grass shoulders/swales may still be the best choice for rural collector roads like Mākaha Valley Road and Kili Drive, and for lower density Agricultural and Rural residential subdivisions. Damage to the grass shoulders from parking can be lessened by specifying a relatively coarse (high sand content/low silt and clay content) soil mix for construction of these shoulder areas. For higher density residential areas – R7.5 or denser, including any Multi-Family zoned areas – City standard curb/gutter/catch basins/drain lines would be more appropriate. Note, however, that these higher residential densities are not recommended for Mākaha Valley.

B. **Maintenance and compliance with ADA** – The grass shoulders/swales will require regular maintenance, including periodic mowing, repair of ruts and damage caused by vehicular traffic, repair of erosion caused by heavy rains. Asphalt paths will also require periodic patching and repaving, and "soft" cinder paths will require periodic maintenance. Cinder paths may also not conform to the "Americans with Disabilities Act" standards, and would therefore have to be "private", not "public" paths.

Possible standard for Mākaha: Construct concrete sidewalks in areas where lots of pedestrian traffic is expected: near schools or neighborhood stores, for example. Use asphalt paths for collector streets like Mākaha Valley Road and Kili Drive, and cinder paths for lower density Agricultural and Rural residential areas. Asphalt paths would probably be more appropriate for R-10 residential subdivisions. Note that City engineers recommend the use of concrete for ADA-compliant paths.

C. **Lighting/Safety** – Urban street lighting may look "out of place" in a rural area like Mākaha, but the City's street lighting standards provide for safer night-time streets: for both drivers and pedestrians.

Possible standards for Mākaha: Install full cutoff City-standard street lights at all residential street/collector street intersections, and install reflectors along sections of unlighted streets that may be hazardous – e.g., sections of streets that may be adjacent to steep slopes, or that are sharply curving.

The issues relating to rural roadway standards, including maintenance issues, drainage, ADA requirements, and public safety, will need to be further addressed in the upcoming community-based 5-Year Review for the Waiʻanae SCP, and in the Development/Sustainable Communities Plans "Implementation Study." Note that, until such time as City infrastructure standards are officially amended, current standards must be applied to any new development that proposes to dedicate its infrastructure to the City.

7.4.5 Open Space Preservation

Objective: The objective of Open Space preservation is to encourage landowners to preserve view planes and open space in order to maintain and preserve the open and rural feel of Mākaha.

Artist's rendition of a "Rural Corridor" with open mountain views and agricultural uses.

Recommendations:

- The City should offer incentives to landowners to preserve open space through conservation easements, Land Trusts, or recommend boundary amendments from Urban to Conservation.
- All lands currently zoned Preservation should remain in Preservation.

Site Plan:

- The Ag-2 parcel, owned by HRT, Ltd. (Parcel 04) located along Farrington Highway should be down-zoned to Preservation due to threat of rock slides.

7.4.6 Agricultural Buffer Zones

Objective: Continue agricultural uses and maintain AG-1 zoning.

Recommendations:

- Maintain agricultural buffer lands mauka of Residential (R-5) zoned lands.
- Ag-zoned lands must be in legitimate agricultural use prior to issuance of any building permit for a "farm dwelling."

7.4.7 Drainage Plan

Objective: The objective of the drainage plan is to: 1) ensure that the Mākaha stream banks are stable in order to protect real property and ecological function of the stream, and 2) to assess the capacity of existing drainage systems.

Recommendations:

- Develop a comprehensive drainage plan including an assessment of Mākaha stream embankment and existing drainage infrastructure.
- Analyze roads and their effect on drainage.
- Assess old drainage infrastructure, e.g., settling ponds, etc.
- Design and construct "green drainageways" that provide for more water infiltration and less runoff.

7.4.8 Park Expansion

Objective: The objective is to provide more park space in Mākaha. The City standard for parks is 8 acres per 1,000 persons. There is a total of existing 33.68 acres park acreage in Mākaha. The population in the area is 8,229. According to standards, there should be 64 acres of park space available in the area; therefore, there is a deficit of 30 acres of park

land in Mākaha. As previously noted, the "parks deficit" could be even more than 30 acres.

Site Plan:

- Identify additional potential park lands.

7.4.9 Gathering Place

Policy 3.10.3.5 of the Waiʻanae SCP provides "Guidelines for Community Gathering Places." Several years after the publication of the Waiʻanae SCP, the local community group "Mohala I Ka Wai" began discussions with the Honolulu Board of Water Supply (BWS) concerning the possible use of BWS land for the creation of a Hawaiian cultural center/community gathering place. The lands in question are approximately 15 to 20 acres of stream terraces and floodplain along the middle reaches of Mākaha Stream, just downstream from the restored Kāneʻākī Heiau. By the end of 2006, Mohala and BWS had partnered to complete archaeological and topographic surveys of the site. The Mohala group plans to proceed with community dialogues and planning for this important gathering place.

7.4.10 Commercial Center

The Waiʻanae SCP recommended a "Village Center" for each of the major, populated ahupuaʻa of the Waiʻanae Coast, including Mākaha. The Waiʻanae SCP Land Use Map shows a "Rural Community Commercial Center" at the location of the existing Mākaha Shopping Center at Farrington Highway and Mākaha Valley Road. This small commercial center has had economic difficulties over the years, and there are currently no major "anchor" tenants, such as a super market or restaurant.

It has been suggested that a small commercial center (10,000 square feet) might be planned for a site somewhere in the midsection of Mākaha Valley, to provide convenience shopping for people who are currently living in the Mākaha Towers and Mākaha Plantation developments, and also for future residents who may live in as yet undeveloped, urban-classified areas. The economic viability of this kind of small-scale convenience commercial center is questionable. However, a convenience store or small center of several stores may be economically feasible if it is located at or near Mākaha Resort facilities. A convenience store located at or near the Resort would then cater to both Resort visitors and local residents. A small commercial center could possibly be established on land that is already zoned for resort use.

8. IMPLEMENTATION STRATEGY

The Mākaha Special Area Plan will be presented to the City Council for review and approval. The Mākaha SAP will be adopted through a City Council Resolution. Once adopted, the Mākaha SAP will provide land use, land development, and infrastructure development guidance to the Department of Planning and Permitting and to other City departments.

The Mākaha Special Area Plan may also provide an opportunity for landowners, community members, and City planners and engineers to work together toward the implementation of infrastructure improvements **that can serve new development in a manner that is consistent with the rural character and quality of the Mākaha ahupua'a.** A cooperative process involving the key stakeholders could eventually result in appropriately designed road improvements, drainage improvements, recycled water facilities, public parks, and both market rate and affordably priced homes. This cooperative process would include the following steps:

1. Review of this Mākaha Special Area Plan (MSAP) by City departments and by Mākaha landowners and community members;
2. DPP schedule and facilitate meetings of key stakeholders to discuss the findings and recommendations of the MSAP, and to discuss the details of the existing Unilateral Agreements and possible modifications to those Agreements;
3. A series of working meetings involving appropriate combinations of DPP and other City department staff, land owners, and community members to work out options, alternatives, and preferred design standards for the various elements of the Unilateral Agreements, including requirements for road improvements, drainage improvements, sewer and water infrastructure, parks and open space, and affordable housing;
4. One or more meetings involving all of the key stakeholders to discuss potential triggers to implement requirements of the Unilateral Agreements, to further discuss possible modifications to the Unilateral Agreements, and possibly to discuss and resolve a "Memorandum of Understanding (MOU) that could be signed by key stakeholders;
5. DPP can then draft an ordinance embodying these changes and submit the ordinance to County Council for review and approval.

6. DPP and community stakeholders can then work with landowners to ensure appropriate design and construction of infrastructure improvements.

Originally, it was hoped that the cooperative process authored above could be implemented as part of the MSAP process. However, with the recent turmoil in national financial institutions and the sharp downturn in the land development industry, it appears that Mākaha Valley land owners have little incentive to move forward with the City and the community. A cooperative agreement may be possible when financial and development dynamics become more positive. If and when conditions are more favorable, an Action Plan should be developed that will identify short, mid, and long term projects and programs, including:

- What needs to be done, and where the action should take place;
- Who should be the lead agency or organization;
- When the action should be implemented;
- How much the action will cost.

This Action Plan can be developed after: (1) infrastructure cost estimates have been developed, and (2) key stakeholders and City agencies have met to at least preliminarily work out a Memorandum of Understanding in regards to amendments of one or more of the Unilateral Agreements and a schedule for infrastructure improvements. An Action Plan for Mākaha cannot be realistically developed until a preliminary MOU has been worked out. Addressing required infrastructure improvements through an MOU must result in tangible community and public benefits.