Lima Ola

Workforce Housing Development

Master Plan

Prepared for
County of Kaua'i
Housing Agency

Prepared by
Kimura International, Inc.

March 2012

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Exhibit 13-A

Bernard P. Carvalho, Jr.
Mayor

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MESSAGE FROM THE MAYOR

March 2012

Aloha!

Providing affordable housing options is a fundamental responsibility of local governments throughout our nation. In an isolated, rural community like Kauai, the importance of offering safe, adequate housing for all cannot be overstated.

The *Lima Ola Master Plan* is the first step for our island community toward realizing the dream of housing that is not just affordable, but also is environmentally responsible, encourages long-term intergenerational relationships, integrates with the surrounding community and promotes healthy living.

Lima Ola is one of 38 projects identified in our Holo Holo 2020 plan, which calls for all organizations, businesses, residents and visitors on Kaua'i to be part of creating an island that is sustainable, values our native culture, has a thriving and healthy economy, cares for all – keiki to kupuna, and has a responsible and user-friendly local government.

The *Lima Ola* project is an important part of that vision, and will be a showcase like no other for the varied concepts of sustainability. This future "green" community will provide much-needed housing for families on the west side of Kauai, many of whom work on the south shore, in the Eleele/Hanapepe area, or points further west such as Waimea, Kekaha, the Pacific Missile Range Facility and Kokee.

The Lima Ola Master Plan could not have been realized without grant funding from the Center for Disease Control's Communities Putting Prevention to Work (CPPW) program, via the Hawaii State Department of Health – Kauai District Health Office. I would also like to extend a warm Mahalo to the Kauai County Council, the Kauai County Housing Agency, R.M. Towill Corporation, Kimura International, the Lima Ola Community Advisory Committee, members of the public and numerous state and county agencies which participated in the dialogue as the plan was being developed.

Please join us in creating a new community on Kauai that will be a model of sustainability and healthy living for others to follow.

Mahalo nui loa,

Bernard P. Carvalho, Jr.
Mayor, County of Kauai

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INTRODUCTION

In February, 2010 the County of Kaua'i acquired 75 acres in 'Ele'ele, on the west side of the island (Figure 1). The land was acquired for the purpose of developing housing for the working people of Kaua'i. But more than creating a discrete residential development, County leaders see Lima Ola as an unprecedented opportunity to establish a model for affordable housing development that will shape the way residents relate to their environment.

Development of the Lima Ola site may take up to 30 years to complete. The community planned for Lima Ola will provide a real world example that integrates progressive objectives for residential living, environmental sustainability, and affordability at a significant scale of development. Lima Ola is guided by planning concepts of how residential development in a rural community can better encourage active and healthy lifestyles, offer viable options to walk and bike, and lower reliance on nonrenewable resources for transportation and home energy. Lima Ola is not a stand alone development, but one that will create linkages to surrounding neighborhoods. The influx of new residents is expected to bring greater economic vitality and civic energy to the area, and strengthen the region's sense of community.

*The words **Lima Ola** literally translate to "hand" and "life." Our hands are symbolic of work—this is true of Hawaiian culture and many other cultures. This housing development is being built as workforce housing for the working people of Kaua'i. The addition of the word "ola" speaks to how this work sustains you. The relationship between working hands and the sustenance of life is reflected in the 'olelo no'eau or proverb "Huli ka lima i lalo, maona ka opu" which means "When hands are turned down, the stomach is full." When hands are turned down toward the earth, they are working and, through this work, people are fed and thrive.*

Figure 1 Lima Ola, Aerial View

Goals and Objectives

Goals and objectives are statements that establish a framework for the master plan. Goals generally describe the desired outcomes or end states of the plan. Objectives are more concrete, attainable actions that contribute to goal achievement.

1 Goal: Design and develop a community that provides a range of affordable housing options.

a. Objective: Provide housing opportunities for Kaua'i households earning from 80 percent and below of the Kaua'i median household income to 140 percent of the Kaua'i median household income.

b. Objective: Provide a variety of housing types and occupancy that meet the lifestyle needs and preferences of people at different stages of life.

c. Objective: Design a community where income levels and household types are integrated, not segregated.

2 Goal: Design and develop a community that incorporates smart growth principles.

a. Objective: Create a compact neighborhood that is safe and convenient.

b. Objective: Provide a transportation infrastructure that enables residents to make meaningful choices to walk, ride a bicycle, take transit, or drive.

c. Objective: Design streets that are safe and inviting for all users—motorists, pedestrians, bicyclists, and transit users—including such means as appropriate speeds, widths, accommodations for pedestrians and bicycles, and traffic calming measures.

d. Objective: Design a circulation network with multiple entry points to distribute traffic and offer different routes for connecting one point to another.

3 Goal: Design and develop a community that fosters social interaction and a spirit of aloha.

a. Objective: Provide community spaces and amenities where people can get to know, and interact with their neighbors.

b. Objective: Incorporate design elements that create a distinctive sense of place and reflect local heritage.

c. Objective: Relate to the larger context so that the community fits into the regional fabric of today and the future.

4 Goal: Design and develop a community that supports healthy living initiatives.

a. Objective: Provide opportunities for public recreation and leisure where people can more easily incorporate physical activity into their daily lives.

b. Objective: Provide safe walking and bicycling routes to school.

c. Objective: Provide housing and community facilities that enable people to stay in the same neighborhood as they grow older, while remaining active, independent, and socially connected.

d. Objective: Design accessible facilities in compliance with the Americans with Disabilities Act (ADA).

e. Objective: Provide areas for community gardens and green spaces.

5 Goal: Design and develop a community that allows building "green" and is environmentally sustainable.

a. Objective: Design and develop units to take advantage of natural ventilation and cooling, solar water heating and other alternative energy systems, rainwater catchment for irrigation, and the use of recycled or recyclable materials.

b. Objective: Encourage walking and bicycling by providing safe and attractive facilities to reduce the community's carbon footprint.

c. Objective: Engineer the community with minimal land disturbance and proper placement and sizing of storm water runoff facilities.

d. Objective: Limit solar heat gain by providing shade trees, landscaping with appropriate native vegetation, and minimal road widths.

6 Goal: Design and develop a community that serves as a prudent public investment for Kaua'i.

a. Objective: Encourage community and stakeholder collaboration in development decisions.

b. Objective: Maximize the use of public resources by locating new development in an area where urban services can be extended cost effectively.

c. Objective: Consider the fiscal costs of providing public services and ongoing maintenance and repair in planning and designing public infrastructure and facilities.

Purpose of the Master Plan

The master plan is a statement of the County's goals for the site's development and defines the direction for development. It provides a framework to guide development of the parcel over the next several decades. The framework is intended to endure over many years and establish the context in which public and private investments can occur. The six stated goals and related objectives are the cornerstones in defining this framework. As such, they collectively represent a long-term vision for this project.

The master plan serves as a roadmap for early decision making regarding important components of the development program. It provides the project description that will be used for the environmental impact statement and applications to obtain entitlements and regulatory approvals required for development to proceed. The master plan identifies the general scale, character, density, and mix of land uses. At the same time, it is recognized that no plan can be definitive, especially for long-term development, and a reasonable amount of flexibility must be retained when community build-out will occur over many years. Specific parcel and building configurations will vary. At this stage, the master plan is primarily concerned with establishing the basic character of future development, the circulation system, public infrastructure, open spaces, and sites for public facilities.

BACKGROUND

History

In the mid 2000s, during the administration of Mayor Bryan Baptiste, the Kauaʻi housing market experienced a boom. There was a surge in private development activity, but little of the new housing inventory was affordable for many Kauaʻi residents. The County began looking for ways to bring relief. In 2004, working in collaboration with the County Council, an affordable housing resolution was passed to acquire land for affordable housing, as the County did not have extensive real estate under its jurisdiction for housing development. After researching options offered by landowners, Mayor Baptiste selected for purchase the 75-acre ʻEleʻele site at a cost of $2.5 million. Mayor Bernard Carvalho, who succeeded Bryan Baptiste as mayor, was director of the Housing Agency at that time.

The 75-acre parcel was purchased from McBryde Sugar Company with the stipulation that the site be used for affordable housing as defined by the County's Housing Policy Ordinance. The subject land has a long history in agricultural production—formerly planted in sugarcane and, more recently, in coffee. The County has a license agreement with Kauaʻi Coffee that it vacate the land only when housing development is about to occur.

Planning Process

The County Housing Agency began master planning the ʻEleʻele parcel in 2009 with a bond allocation from the general fund. Additional planning funds became available in Spring 2011 when the County received a federal grant from the Centers for Disease Control and Prevention under the Communities Putting Prevention to Work (CPPW) program. The grant, administered through the Hawaiʻi Department of Health, is aimed at local initiatives to reduce obesity and other chronic diseases by lowering risk factors, such as the lack of physical activity and poor nutrition.

The master planning team was assisted by a Citizen Advisory Committee (CAC) that included seven community members with long-standing ties to and knowledge of ʻEleʻele/Hanapēpē and the larger Westside region. The CAC met in August and October, 2011 to review three alternative site plans and subsequent revisions.

A public information meeting was held in September 2011, during which participants provided input on the preliminary alternatives.

The master planning team provided informal briefings to the Mayor and cabinet officials in July 2011. County Council members were also briefed in July.

Follow-up meetings were held with the following agencies to discuss future public facilities and services.

County of Kauaʻi

- Fire Department
- Department of Parks and Recreation
- Planning Department
- Department of Public Works
- Transportation Agency
- Department of Water

State of Hawaiʻi

- Department of Health
- Department of Transportation, Highways Division

PLANNING CONTEXT

This section reviews the major factors considered in preparing the plan, including demographic characteristics, housing demand and preferences, and site conditions.

Demographics

According to the U.S. Census Bureau, Kaua'i had a total population of 66,921 persons in 2010. Islandwide there was a net increase of 8,618 persons or 14.8 percent growth during the ten-year period from 2000 to 2010. The Kalāheo-'Ele'ele-Hanapēpē area[1] had a population of 12,174, and experienced a net increase of 1,295 (+11.9 percent) over the decade.

Expanding the geography to encompass all of West Kaua'i[2], the demographic story is one of slow growth through the 1990s, and even net population decline in the Waimea-Kekaha community, as the era of sugar production ended. The 2000s was a period of recovery as population growth in the region began to pick up, increasing by 9.4 percent. Although West Kaua'i is not expanding as quickly as other parts of the island, overall, the region still accounts for 35 percent of Kaua'i's total population.

In part, population growth depends on where new housing units are constructed. The Census reported that in 2010, the Kalāheo-'Ele'ele-Hanapēpē area contained 4,541 housing units, a net increase of 550 units (+13.8 percent) since 2000. The net increase in housing units for the West Kaua'i region was 652 units (+6.8 percent).

The pie charts below provide a comparison of where population growth is occurring relative to growth in housing units. In comparison to West Kaua'i's share of new residents, its share of new housing units is disproportionately low.

Chart 1

Share of Population Growth, 2000-2010

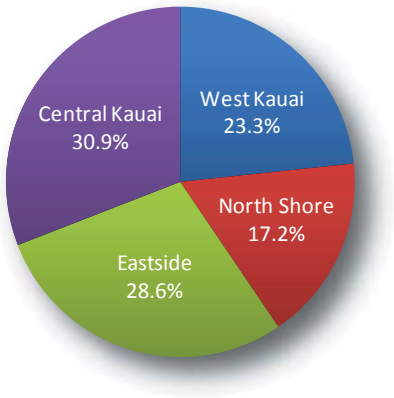
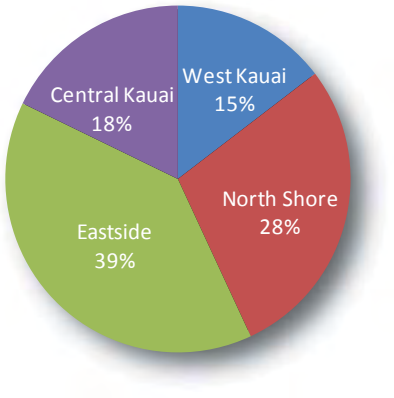


Chart 2

Share of Housing Unit Growth, 2000-2010



[1] This area includes Census Tract 407 (Kalāheo-'Ele'ele) and Census Tract 408 (Hanapēpē).

[2] The West Kaua'i region is defined as the entire area west of Līhu'e-Puhi, including Census Tracts 406 (Kōloa-Po'ipū), 407 (Kalāheo-'Ele'ele), 408 (Hanapēpē), and 409 (Waimea-Kekaha).

Age Profile of Households

In 2010, 34.4 percent or about one-third of West Kauaʻi households included one or more persons under 18 years old. This percentage closely matched the levels for Kauaʻi as a whole and the state. A greater percentage of households had one or more persons over 60 years old. In West Kauaʻi, the percentage of households with seniors was 44.1 percent compared to 43.5 percent among all Kauaʻi households and 41.0 percent among households across the state. The higher percentage in West Kauaʻi indicates a generally older population in the region, where only Central Kauaʻi (Līhuʻe area) had a higher percentage of senior households.

Chart 3

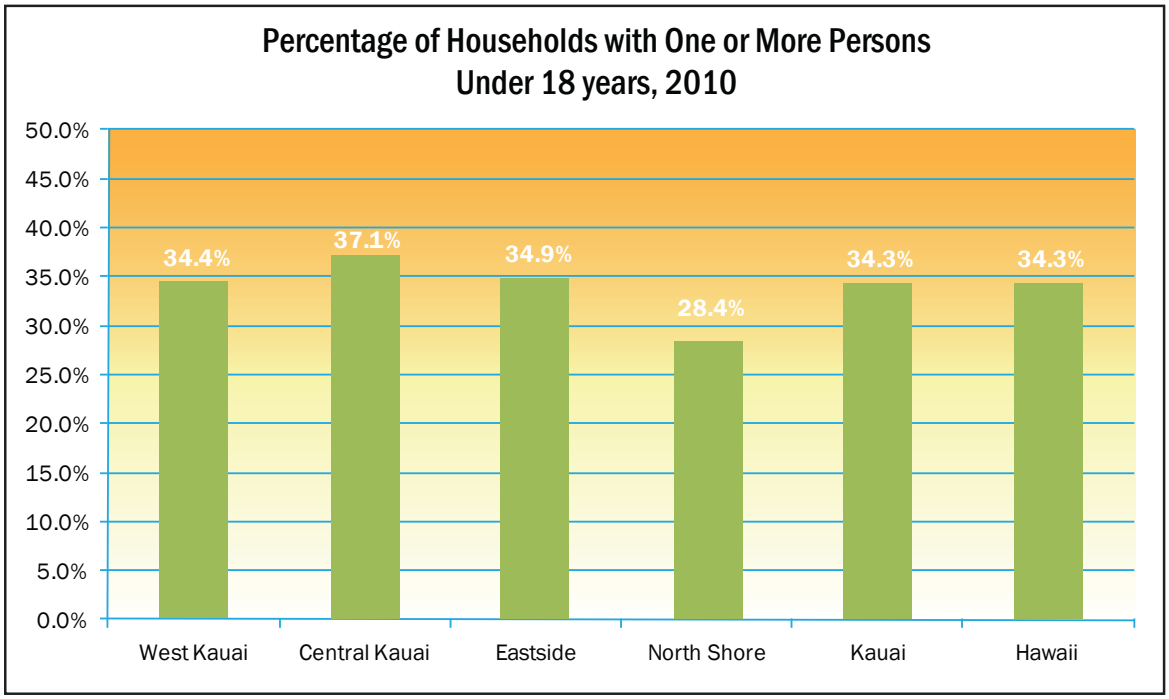
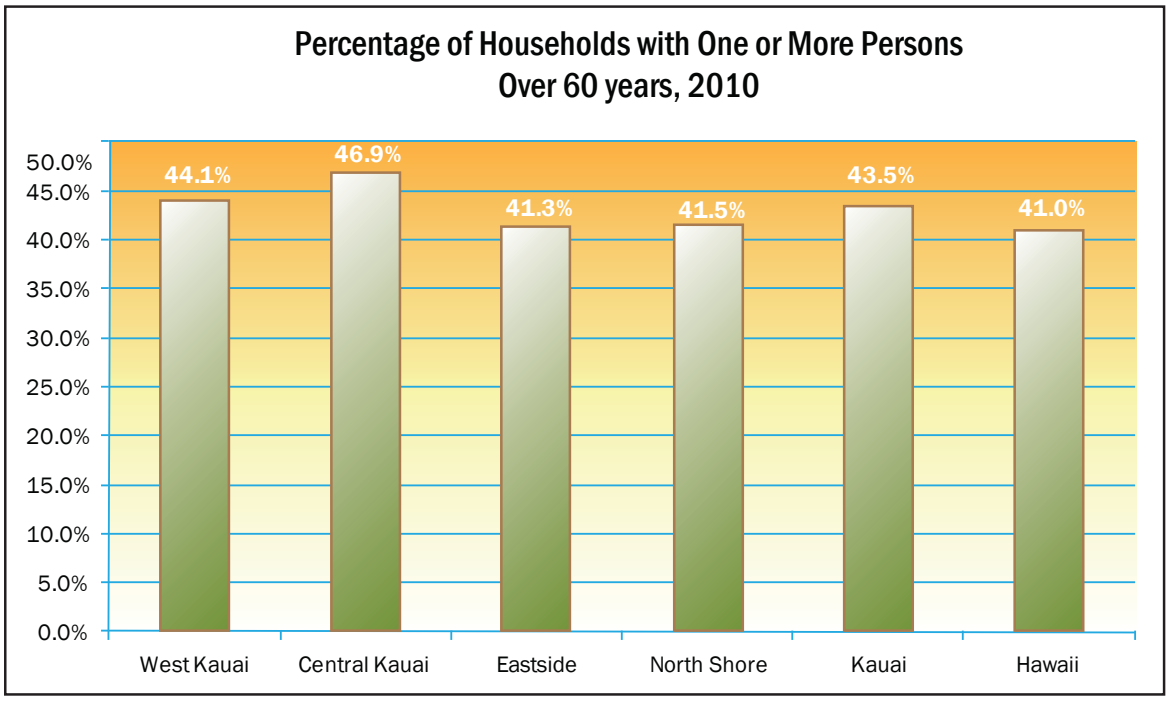


Chart 4

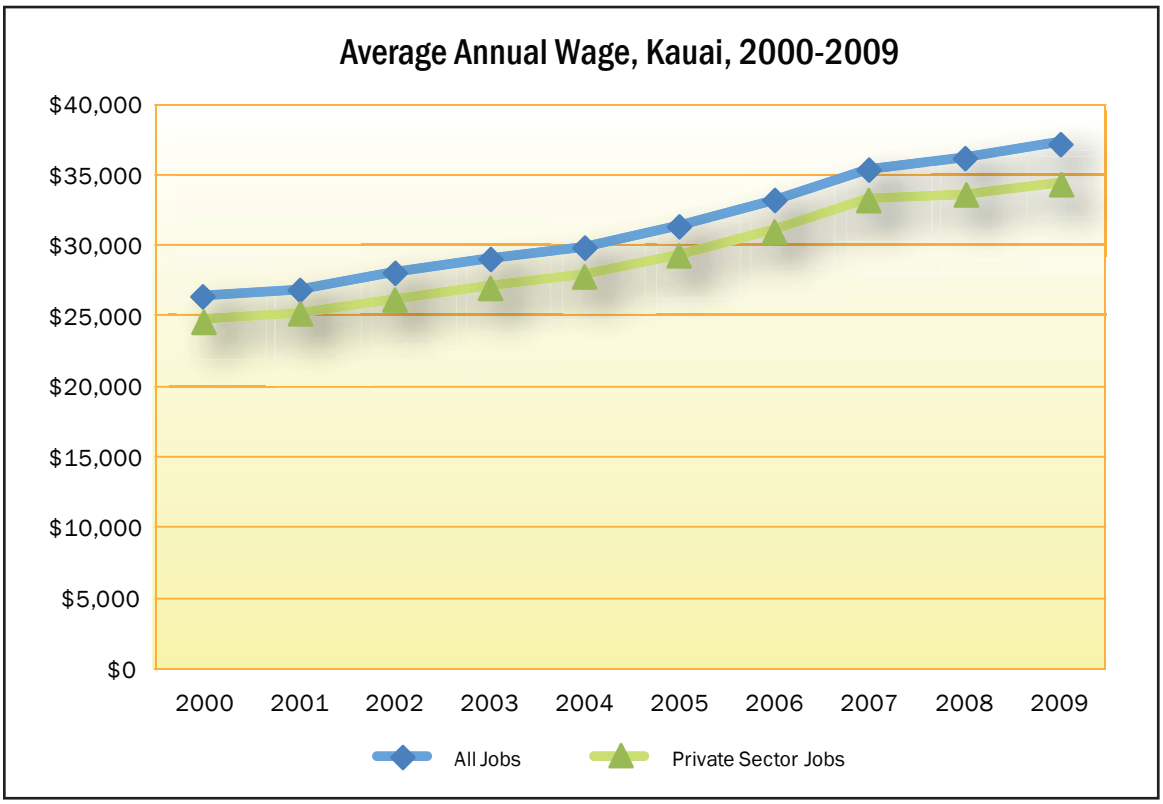


Employment and Income

Employment on Kaua'i peaked in 2007 with average annual employment of 30,820 according to the Hawai'i Department of Labor and Industrial Relations. In 2009, the latest year for which published data are available, total employment consisted of 28,291 jobs, of which 23,869 jobs (84.4 percent) were in the private sector and 4,422 jobs (15.6 percent) were in the government sector. During the mid 2000s, Kaua'i's unemployment rate dropped below 4 percent, but currently stands at over 8 percent.

As seen in the chart below, nominal average wage increased every year through the 2000s. But since 2007, there has been a noticeable flattening in the trend line. With annual inflation hovering at 3 percent in recent years, real growth in average household income has stagnated or declined slightly.

Chart 5



The following table shows the major employment sectors in Kaua'i's economy and average annual wage. Earning levels are modest for many working households. The Kaua'i Planning and Action Alliance conducted a telephone survey of 400 households in 2011. Fully 26 percent of respondents reported household members with multiple jobs.

Table 1

Employment in Major Sectors and Wages, Kaua'i, 2009

Industry	Average Employment*	Average Annual Wage
Construction	1,563	$56,685
Retail trade	3,832	$26,931
Transportation & warehousing	1,077	$31,668
Administrative services	1,844	$36,363
Health care & social assistance	2,256	$45,585
Hotel & food service	6,807	$26,621
All other private industries	6,490	n.a.
Government	4,422	$52,828
Total	**28,291**	**$37,269**

Source: State of Hawai'i, Department of Labor and Industrial Relations
* Includes workers covered by Hawai'i employment security law and unemployment compensation for federal employees

Housing Demand and Preferences

The Hawai'i Housing Planning Study (HHPS) is an ongoing effort to compile and analyze housing data at the state and county levels. The information in this master plan is from the November 2011 edition of the HHPS. One component of the HHPS is the Housing Demand Survey, a statewide telephone survey of more than 5,000 households to measure current housing conditions, relocation expectations, housing preferences, financial qualifications, and demographic characteristics. The HHPS also includes the Hawai'i housing model which forecasts housing unit needs by income group.

The U.S. Department of Housing and Urban Development (HUD) classifies households qualified for government-assisted housing by annual income that is pegged to the County's median annual income for households of a given size—a concept that is condensed into the acronym AMI (or area median income). HUD defines low income as households with incomes ≤80 percent of AMI. Workforce housing would be available to households with incomes from below 80 percent and up to 140 percent of AMI.

The HHPS forecasts that a total of 1,312 housing units are needed on Kaua'i from 2012 through 2016. Of this total, 925 units (70 percent) are needed by households with an annual income of ≤80 percent of AMI. A total of 212 units (16 percent) are needed by households with an annual income of 80 to 140 percent of AMI. Therefore, of the total units needed, 1,137 units or 86 percent would need to be affordable to some extent.

The HHPS breaks down total units needed into "owned units" and "rental units" based on information collected about financial qualifications. Of the 1,137 affordable units, there is a need for 319 owned units and 818 rental units. HHPS also estimates the demand for "single family (detached) units" and "multi-family (attached) units". Through 2016, there is a need for 521 single family units and 616 multi-family units.

Table 2

Total Units Needed, Kaua'i County, 2012 through 2016

	HUD Income Classification			
	< 30 to 80% of AMI	**80 to 140% of AMI**	**>140 % of AMI**	**Total**
Owned Units	**200**	**119**	**57**	**376**
Single family	138	114	52	304
Multi-family	62	5	5	72
Rental Units	**725**	**93**	**118**	**936**
Single family	247	22	19	288
Multi-family	478	71	99	648
All Units	**925**	**212**	**175**	**1,312**

Source: Hawai'i Housing Planning Study, November 2011

Affordability vs. Location

In the Housing Demand Survey, prospective Kaua'i home buyers were given a choice between a home located closer to work (shorter commute time) or a home costing $20,000 less, but requiring double the commute time. Fifty-nine percent chose the longer commute to save $20,000 on home price, while 30 percent chose the reduction in daily time travel. The proposed location in 'Ele'ele offers two advantages in this regard. It is near existing infrastructure that will reduce the cost of developable lots. It is also on transit routes with connections to employment centers on the South Shore and Westside.

Small Lot Single Family Dwelling vs. Multi-family Dwelling

Prospective Kaua'i home buyers were asked about their preference for a single family dwelling on a small lot or a multi-family dwelling. Eighty-five percent opted for the small lot single family dwelling. Almost 11 percent preferred the multi-family dwelling, and the remaining 4 percent were unsure.

Table 3

Acceptable Lot Sizes

Minimum Lot Size	Percent of Respondents (claiming acceptability)
6,000 SF	<40%
5,000 SF	18%
4,000 to 5,000 SF	26%
3,000 to 4,000 SF	9%
Unsure	9%

*Total exceeds 100% due to rounding error.

Those who preferred a small-lot home were then asked about minimum acceptable lot sizes as shown in the table. The proposed plan offers small lot housing options as well as multi-family options.

Units Needed for Elderly Housing

Elderly households are households with one or more persons 60 years of age or older, with no children under the age of 18, and no persons other than immediate family. Housing needs for elderly households are higher on Kaua‘i than in the other counties. Units needed to serve elderly households account for 11.4 percent of total needed units in all counties except Kaua‘i County, where they account for 19 percent of the need The number of housing units needed to accommodate low- and moderate-income elderly households in Kaua‘i County (under 80 percent of AMI) accounts for 82 percent of total elderly units needed or approximately 205 units. In other counties, elderly housing need for the same income range is 60-69 percent. The proposed plan offers elderly households the option to rent or purchase in an environment that is supportive of healthful aging in place.

Site Conditions

Surrounding Uses

Figure 2 provides a regional view of Lima Ola and surrounding land uses. The new development will be an extension of urban development to the west. A subdivision being developed by Habitat for Humanity lies immediately southwest of the site. Habitat recently began a new phase of development in which 107 units are planned for construction. ‘Ele‘ele Nani is an established community located across Kaumuali‘i Highway. Within this residential area are ‘Ele‘ele Elementary School and ‘Ele‘ele Nani Park.

Lands immediately northeast of the site, currently in coffee production, have been designated Important Agricultural Lands (IAL). The IAL boundary runs east to Wahiawa Gulch with the designation encompassing the gulch and lands mauka of Halewili Road. IAL means lands reserved for agricultural use in perpetuity, and a permanent greenbelt on Kaumuali‘i Highway separating ‘Ele‘ele and Kalāheo. Lands adjoining Lima Ola to the south and southeast are owned by A&B Properties, Inc. and are being planned for mixed-used development. While no specific plans have been announced, the parcel immediately south of Lima Ola has been identified as a future district park site.

‘Ele‘ele’s main commercial district is located at the intersection of Kaumuali‘i Highway and Waialo Road. The shopping area contains a supermarket, hardware store, specialty stores, and restaurants. The ‘Ele‘ele Post Office is located within the commercial district. Another commercial district is located in nearby Port Allen at the makai end of Waialo Road. The West Kaua‘i Health Clinic is located in the Port Allen commercial center.

Figure 2 Regional View

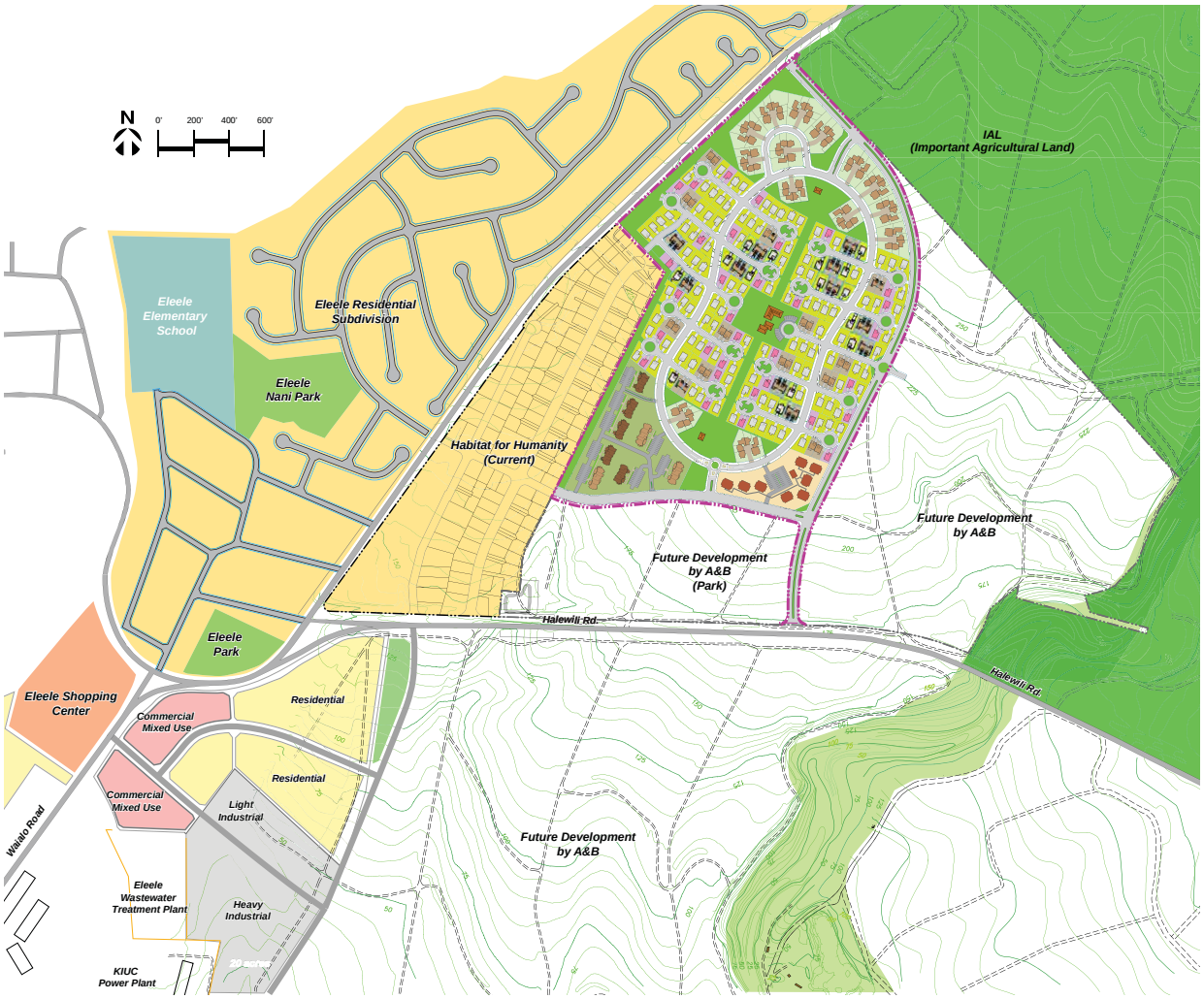


Figure 3 shows ¼- and ½-mile radii from key points within the Lima Ola development and surrounding area. These radii represent distances that are walkable within 15 to 30 minutes. The diagram indicates that places east of Kaumualiʻi Highway and portions of ʻEleʻele Nani are easily walkable from Lima Ola. Conversely, residents living in the Habitat and ʻEleʻele Nani neighborhoods and who wish to use public amenities at Lima Ola can readily reach them by walking.

Figure 3 Walking Radii

Figure 4 shows one-mile radii representing bicycling distance. Using a rough guide of 15-20 minutes of bicycling, 3 miles is often considered an average trip length. As seen in the diagram, even a one-mile radius will cover key community facilities in the ʻEleʻele/Port Allen area. Destinations such as the elementary school, grocery and hardware store, and post office are within bikeable distances of Lima Ola.

Figure 4 **Biking Radii**

Site Analysis

Figure 5 provides a graphic overview of site conditions. Analyzing these conditions is an important step so that future development can address and mitigate site constraints, and enhance site advantages.

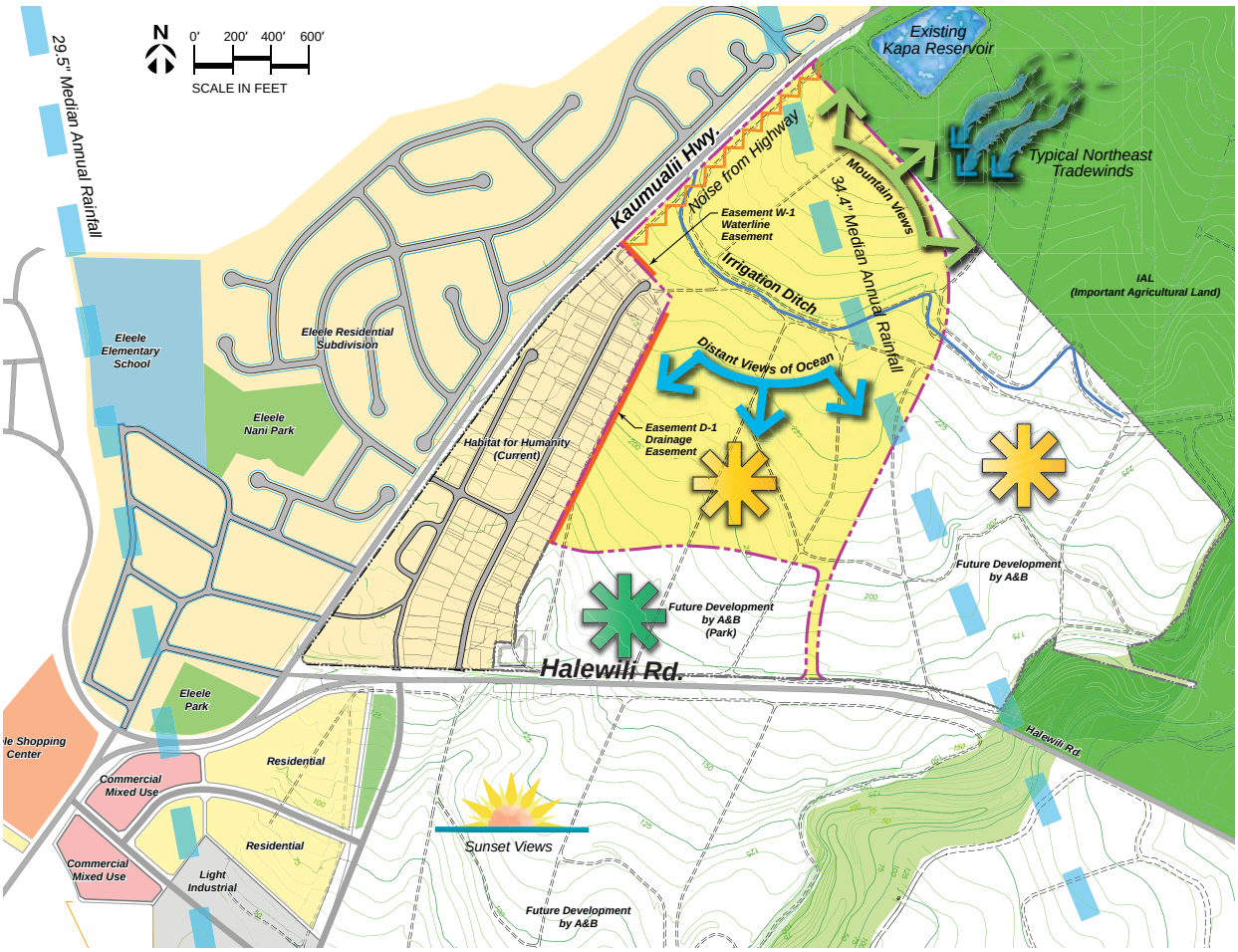
Lima Ola is located on the leeward side of the island which is generally characterized as dry and sunny. The site is located between isohyets where median annual rainfall ranges from 29.5 to 34.4 inches. Northeast tradewinds make up the predominant wind flow. Additional information related to climatic conditions can be found in Chapter 6.

The site has sufficient elevation to offer distant views of the ocean and sunsets over the western horizon, as well as mountain views to the north. Motorists traveling on Kaumualiʻi Highway are familiar with the ocean view as they drive toward ʻEleʻele. A mauka-makai view corridor through the community would help to preserve this valuable asset.

There are two constraints along the Kaumualiʻi Highway boundary: noise from passing vehicles and high-voltage overhead electrical lines. A setback and appropriate buffering can mitigate potential adverse impacts. Further makai, along the site's western

boundary are two utility easements: a 15-foot wide waterline easement and 10-foot wide drainage easement. Both are linear easements that must remain clear of surface encumbrances so that underground pipes can be maintained and repaired, as needed. An above ground irrigation ditch cuts across the site from west to east. The ditch is expected to remain until on-site agricultural operations cease. Kapa Reservoir, which also supports the agricultural irrigation system, lies approximately 300 feet mauka of the Lima Ola site. Disposition of the reservoir is unknown. With the designation of Important Agricultural Lands, ongoing agricultural operations will continue on surrounding lands into the future.

Figure 5 Site Analysis

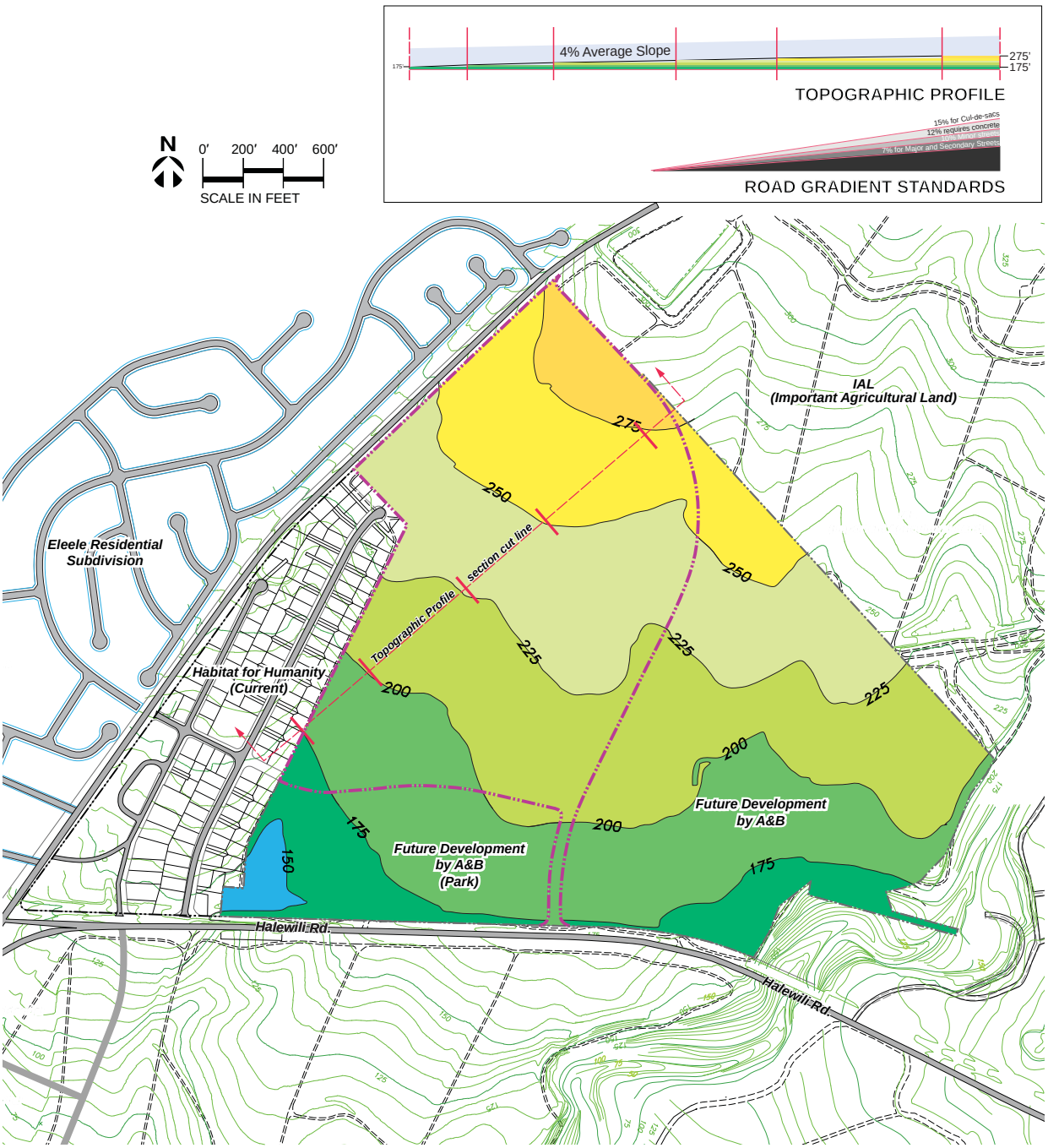


A portion of the Lima Ola site is currently used for coffee production

Topography

Lima Ola is located on a site that slopes gently in the makai direction. As seen in Figure 6, the highest elevation of approximately 275 feet mean sea level is located in the mauka area. The lowest elevation of approximately 175 feet mean sea level is located in the makai area adjacent to Habitat for Humanity. The parcel overall has an average slope of 4 percent. The Americans with Disabilities Act accessibility guidelines specify a maximum slope of 5 percent--higher slopes are allowed with additional accommodations, such as level rest areas and railings. For major and secondary roads, gradients should be 7 percent or less. The Lima Ola site will need to be graded to prepare level house lots, building sites, and road intersections; however, there are no significant topographic constraints.

Figure 6 **Slope Analysis**



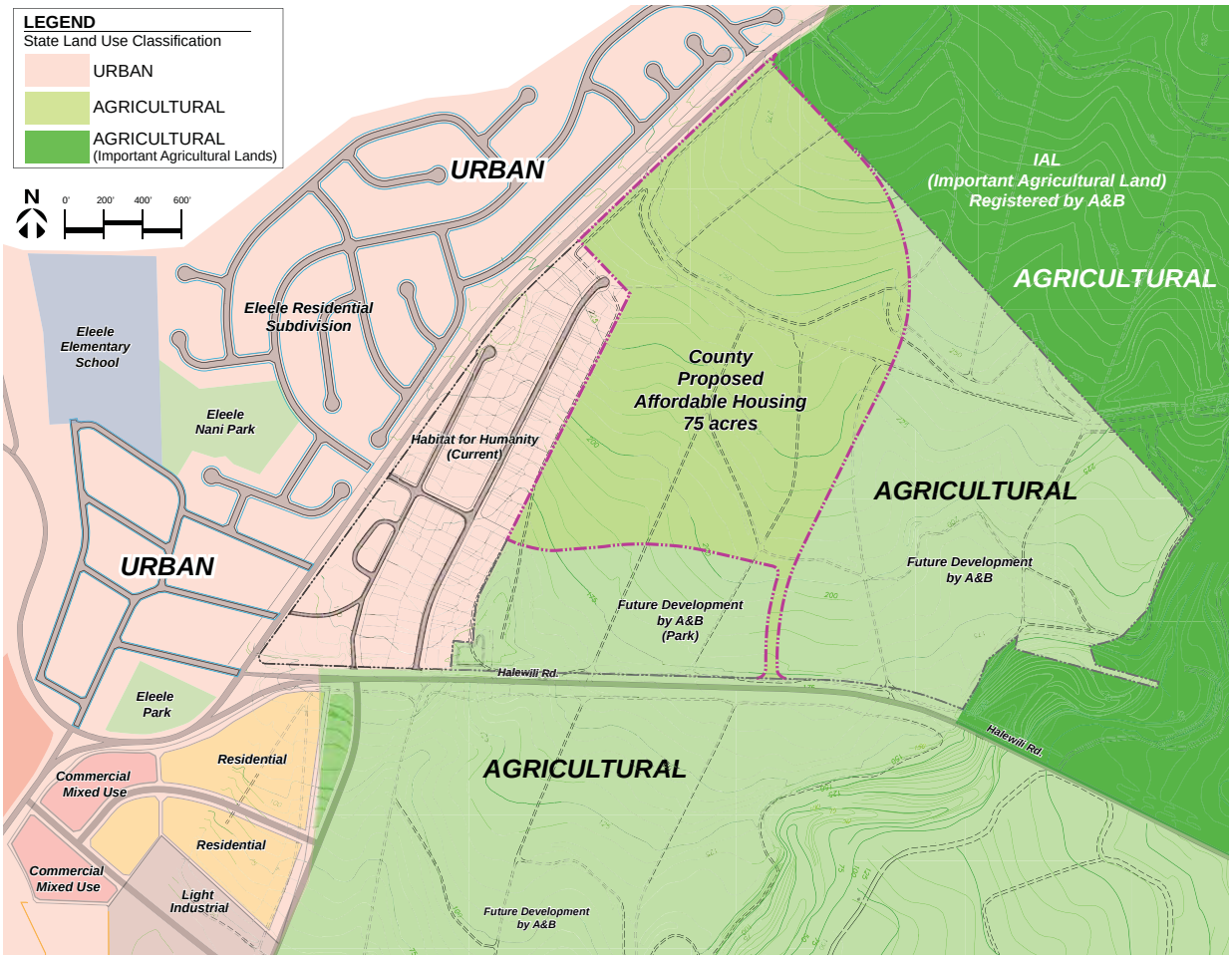
Land Use Controls

Before development can proceed, the Housing Agency must obtain development entitlements, including amendments to the County general plan and comprehensive zoning ordinance. These changes are processed by the Planning Department and require action by the Planning Commission and County Council.

Figure 7 shows State land use classifications. The Lima Ola site is classified in the Agricultural District, but its western boundary adjoins the Urban District. The Housing Agency must obtain a land use district change from Agricultural to Urban. This process is under the jurisdiction of the State Land Use Commission.

As an affordable housing project, Lima Ola qualifies for expedited processing of some discretionary permits as provided by Section 201H-38, Hawai'i Revised Statutes.

Figure 7 Land Use Controls



SITE PLAN

Vision

The plan is a direct response to the goals and objectives, and the site context described previously (Figure 8). Lima Ola will be a residential community supporting 400 households. A variety of attractive and affordable housing products are planned to meet the different needs and preferences of Kaua'i's working households. Respected and valued kūpuna are offered housing options ranging from smaller single family detached units to congregate rental units that maximize their capacity for independent living.

A permanent greenway system will extend throughout the development and interlace a series of cul-de-sac streets. A network of shared use paths, open play spaces, passive leisure parks, and community gardens will enable residents and visitors to integrate physical activity and enjoyment of the outdoors into their everyday life. The circulation system allows efficient vehicular movement, but recognizes the full spectrum of roadway users and incorporates complete street design principles. Children and elderly residents feel safe traveling throughout the community on paths and streets that are pedestrian- and bike-friendly. The centrally located community center provides a lively social hub for the community. With a site plan designed to draw people into the public realm, Lima Ola engenders in its residents a deeper sense of place and community.

Planning and Design Elements

Road Network and Road Profiles

Access to the regional highway system. The plan includes two connections to Kaumuali'i Highway and one connection to Halewili Road. Kaumuali'i Highway and Halewili Road are state highway facilities. All three intersections are expected to be signalized, although additional traffic analyses are needed to determine if signalization is warranted.

Along the makai boundary of Lima Ola, Mahea Road, which currently services the Habitat for Humanity 'Ele'ele Iluna subdivision, will be extended as a major access road for the new development. The intersection of Mahea Road and Kaumuali'i Highway is planned for signalization. The second signalized connection on Kaumuali'i Highway will be located at Lima Ola's mauka boundary, opposite the mauka end of Laulea Street (in the 'Ele'ele Nani subdivision). The perimeter road on the eastern boundary of Lima Ola will terminate with a connection to Halewili Road, which is also expected to be signalized.

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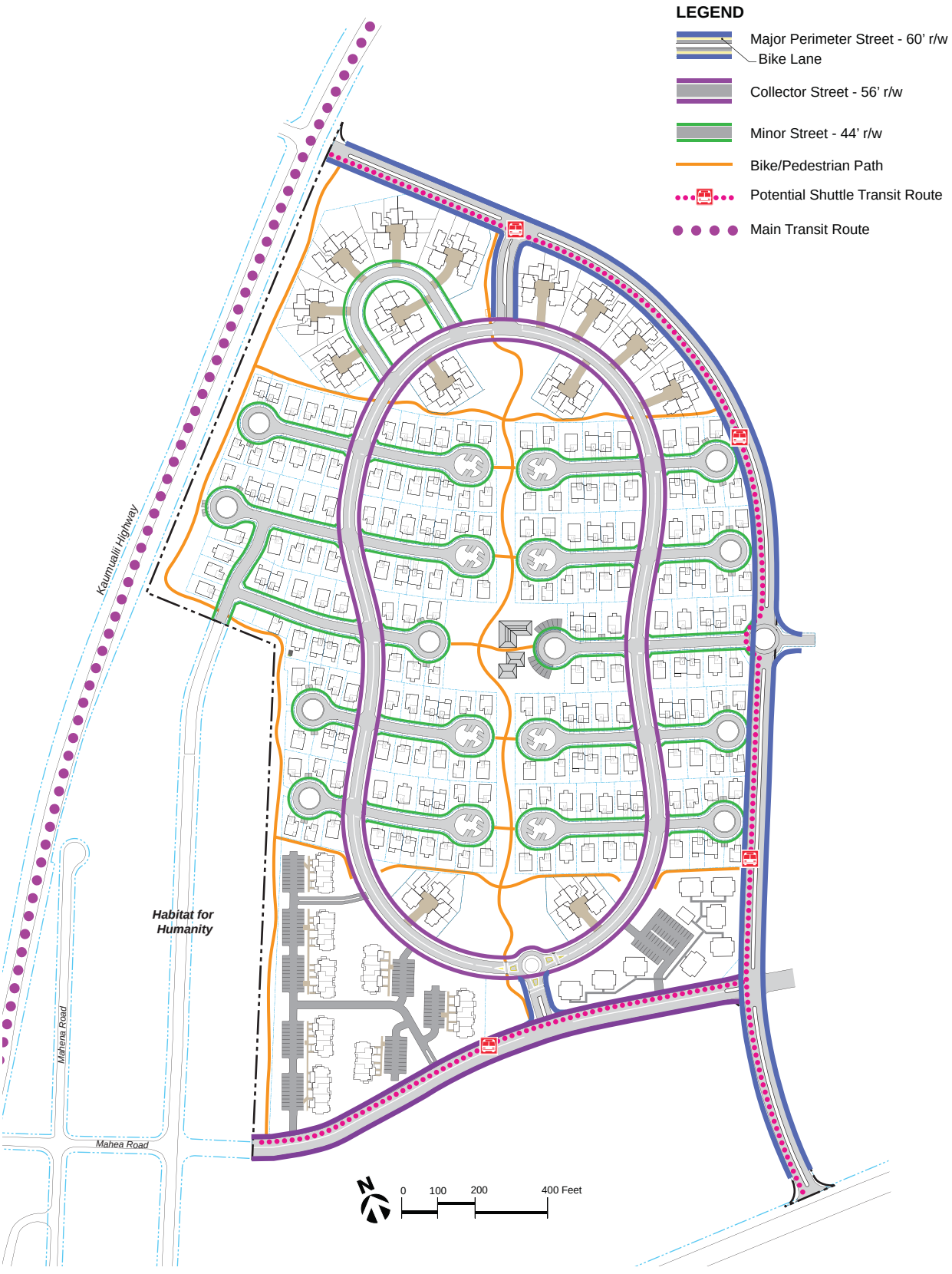
Figure 8 Network of Pedestrian and Bicycle Paths

Figure 9 shows the circulation system for the Lima Ola plan, which is based on a hierarchy of streets and consists of four levels of roads.

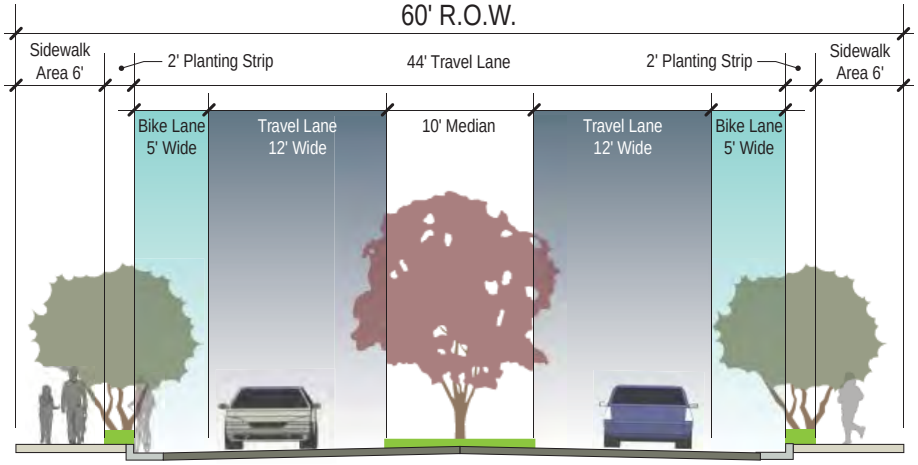
Figure 9 Street Hierarchy



Circulation patterns within Lima Ola will be critical for establishing a connected, healthy, and sustainable community. The network of streets and paths laid out in the master plan meets the transportation needs of future residents and maximizes their travel mode options. Through the subdivision process, the County will dedicate roadway lots that fix the street layout. Adhering to this layout would ensure that Lima Ola is well-connected regardless of changes in unit counts and product types over the years.

1. Major perimeter street. The road profile for the major perimeter street has a 60-foot wide right-of-way. It has 12-foot wide travel lanes—one lane in each direction—with 5-foot wide bike lanes. Six-foot wide sidewalks are provided on either side of the roadway, with a 2-foot wide planting strip between the bike lane and the sidewalk. A broader, 10-foot wide landscaped median separates the travel lanes. The stately boulevard character of this road profile makes it appropriate for the perimeter road along Lima Ola's mauka and eastern edge.

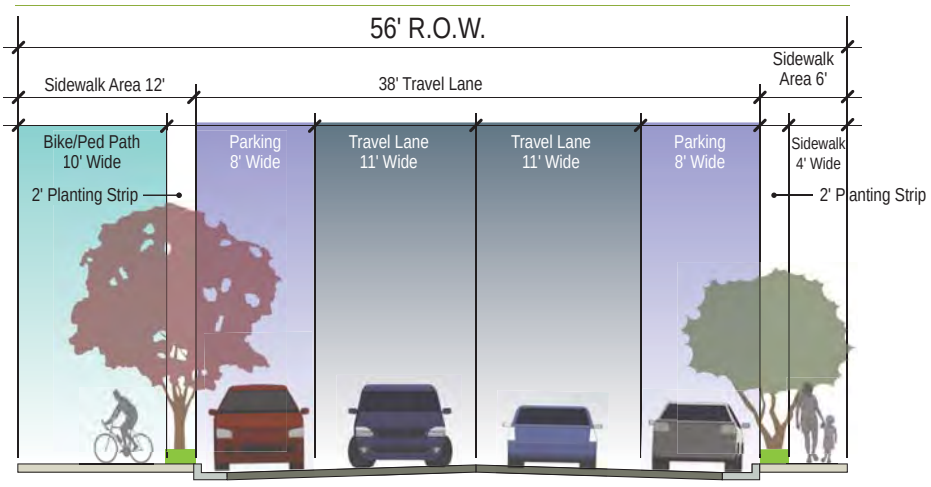
Major Perimeter Street **Figure 10**



Mauka entrance

2. Collector streets. The collector street has a 56-foot wide right-of-way. This street profile is used for the loop road and the extension of Mahea Road on Lima Ola's makai boundary. Travel lanes are 11 feet wide (one lane in each direction) with an 8-foot wide parking lane on one side of the street. A ten-foot wide shared use path is provided on the inside of the loop for use by pedestrians and bicyclists with an adjoining 2-foot wide planting strip. There is a 4-foot wide sidewalk on the outside of the loop. On the Mahea Road extension, a 10-foot wide shared use path is on the mauka side, and a 4-foot wide sidewalk is on the makai side.

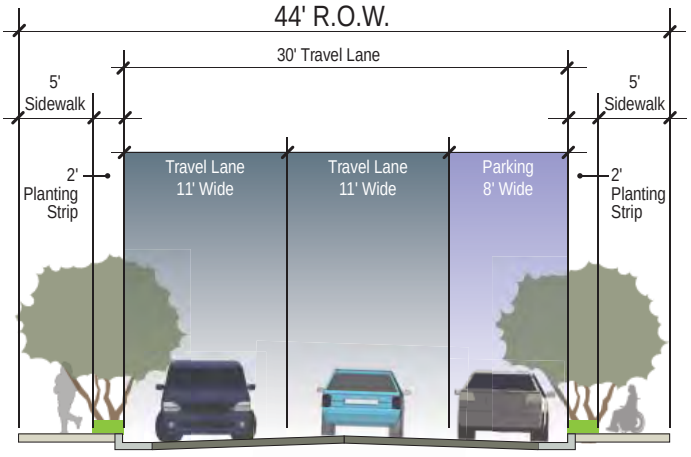
Collector Street — Figure 11



3. Minor streets. Minor streets are the residential streets and cul-de-sacs. They have a 44-foot wide right-of-way. Travel lanes are 11 feet wide (one lane in each direction) with an 8-foot wide parking lane on one side of the street. Five-foot wide sidewalks are provided on both sides of the street with adjoining 2-foot wide planting strips. Dedicated bicycle facilities are not provided on minor streets since vehicular volumes and speeds are low enough for shared use of the roadway, although younger bike riders may prefer to use the sidewalks.

Cul-de-sacs are an integral design component of Lima Ola. Unlike current County design standards, Lima Ola's cul-de-sacs have been designed with a 30-foot inside turning radius to accommodate automated refuse trucks and fire apparatus. The cul-de-sacs have a 20-foot pavement width which allows on-street parking. There is a center landscaped island with rolled curbs to minimize the amount of asphalt common to standard cul-de-sacs. The landscaped island doubles as a bioswale for filtering storm water runoff and, in one design variant, provides parking stalls.

Minor Street



The cul-de-sacs foster social interaction among neighbors, increase security, discourage fast-moving through traffic, and promote healthy living by providing direct connections to the central greenway.

Typical cul-de-sac

Pedestrian and Bicycle Facilities

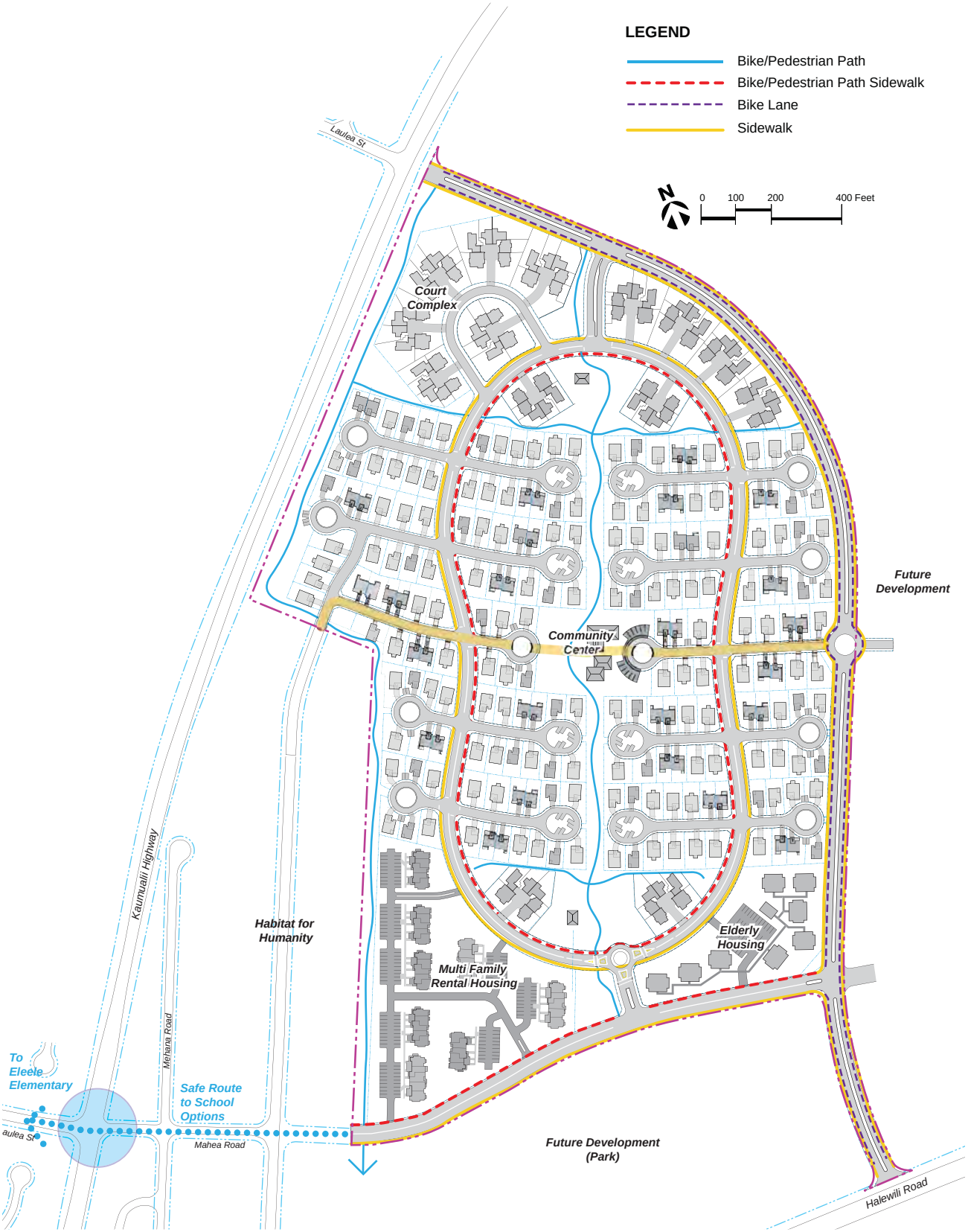
Lima Ola will provide a range of mobility options to residents and visitors. These options will deemphasize personal vehicles and allow for a significant reduction in the use of cars within the development. The combination of compact neighborhoods, links between homes and community facilities, an attractive pedestrian and bikeway system, and convenient transit route, not only expands transportation choices—but in time, residents are likely to find that it's faster and more enjoyable to move around the community on foot or bike!

1. Network of paths. The path network is a key component of a healthy, outdoor-oriented community. When places provide high-quality, dedicated pathways, people tend to use them. Physical separation between vulnerable pedestrians/bicyclists and motor vehicles, and appropriately designed junctions will get more people walking and bicycling. And the more people who walk and bicycle, the safer these activities become.

Figure 13 shows the network of pedestrian and bicycle paths, characterized by the following:

- Comprehensive, with connections throughout the community—to destinations, such as the community center, playgrounds, community gardens, friends' houses—and to connection points outside the neighborhood.
- Direct, without unnecessary circuitousness
- Sufficiently wide so the path is a social amenity where friends or parents and children can walk together and ride together

Figure 13 Network of Pedestrian and Bicycle Paths



2. Bike lanes and sidewalks on major and collector streets. In addition to the off-road paths, all roadways except minor residential streets and driveways would have bike lanes and sidewalks. On-street facilities, together with the off-road paths, offer pedestrians and bicyclists a fine-grained network of mobility linkages.

Greenway with path network

3. Safe route to school. To allow children to walk to school safely, Mahea Road was identified as a safe route from Lima Ola to ʻEleʻele Elementary School. A minimum 5-foot wide sidewalk should be provided on Mahea Road. The sidewalk should continue on Laulea Street to ʻEleʻele Nani Park, where students could use the park's internal path to reach the school.

Three options were proposed to cross Kaumualiʻi Highway: signalized crossing at grade, underground tunnel (underpass), and overhead bridge (overpass). The sidewalk and/or crossing improvements may require land acquisition.

Figure 14 **Signalized Crossing At-Grade**

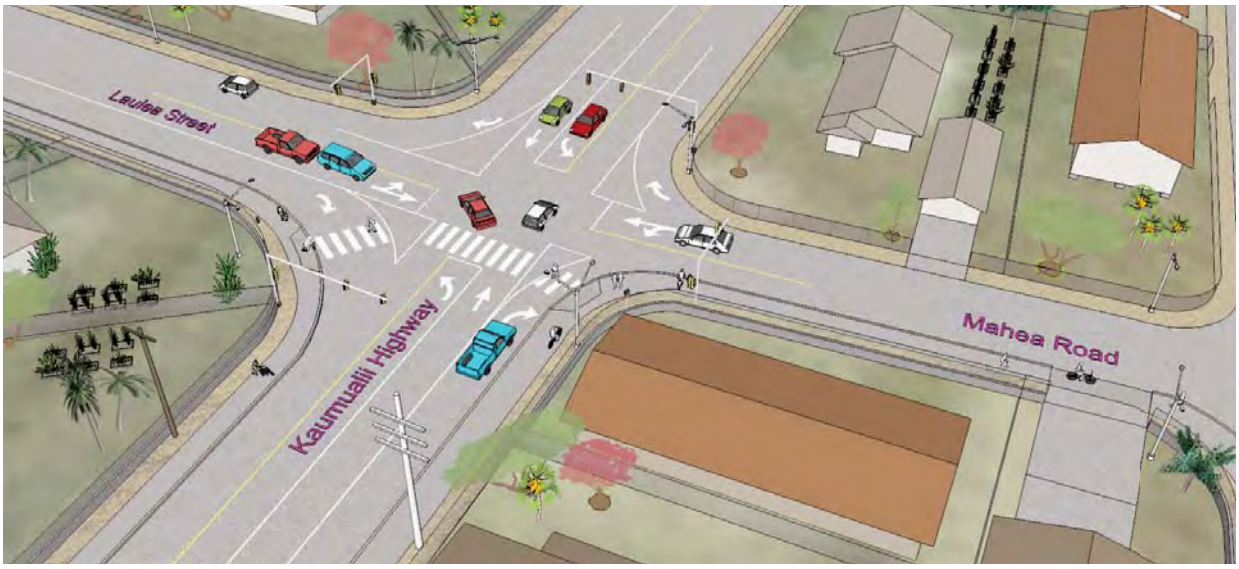


Figure 15 Underground Tunnel at Crossing

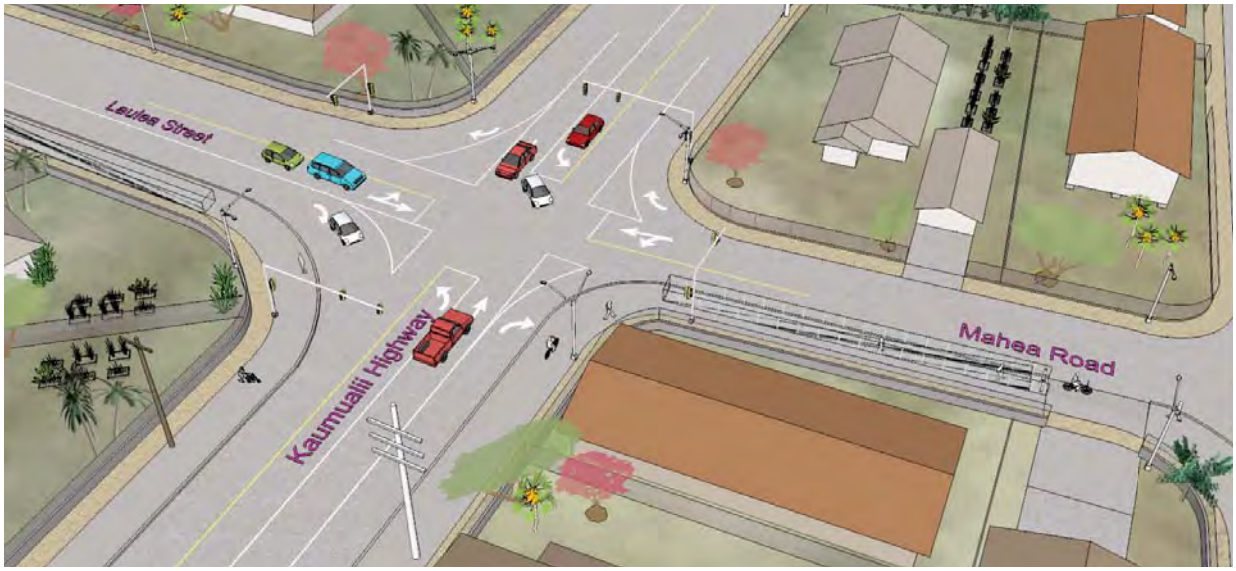
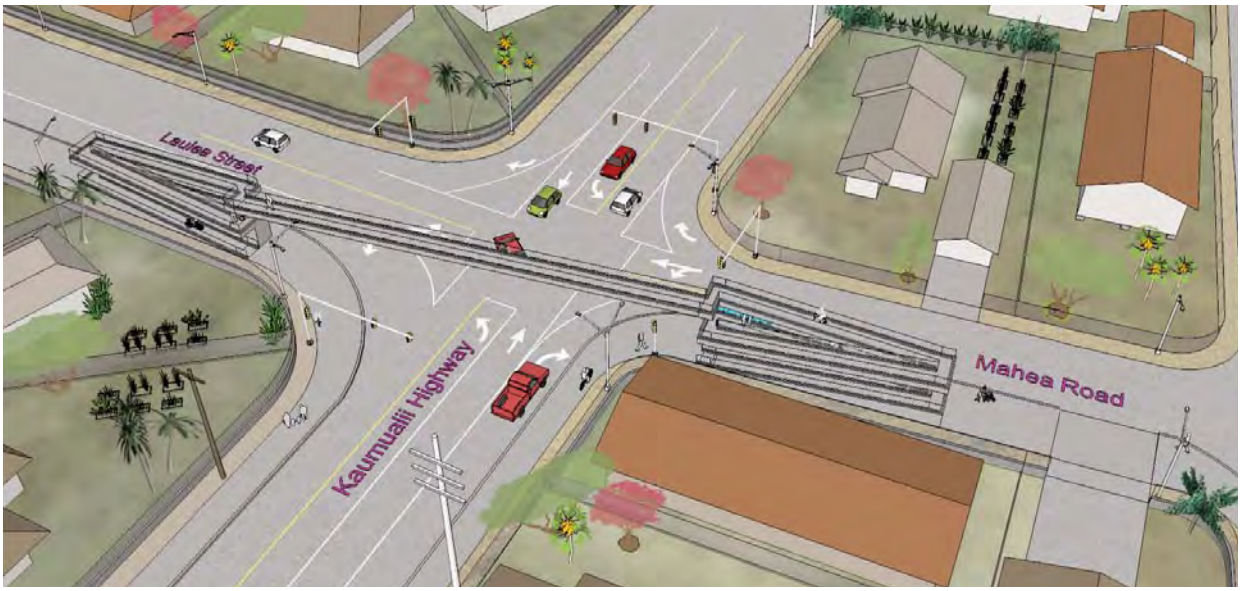


Figure 16 Overhead Bridge at Crossing



The at-grade and underpass options remain under study. The overpass option is not cost effective and has been eliminated from further consideration. Constructing the spiral ramp needed to meet minimum highway clearance at the 5-percent slope necessary to accommodate wheelchair users would result in a massive bridge structure that overwhelms adjacent residences. And, because walking distance would be vastly longer than the actual crossing distance, the overpass is not expected to be well used.

Concept Cost Estimates for Kaumualiʻi Highway Crossing Options (at Mahea Road)

Traffic signal and at-grade improvements: $300,000

Underground tunnel: $1.3 million

Overhead bridge: $5.3 million

4. Transit route. The Kaua'i Transportation Agency operates the County's bus transit system. There is existing bus service on Kaumuali'i Highway, along the western boundary of Lima Ola. Figure 9 shows a possible supplemental or shuttle route along the Lima Ola perimeter street and Mahea Road, connecting to Halewili Road. This route would provide convenient service for bus riders from the elderly housing complex. Paratransit service for riders with special accessibility needs will be available for the entire development.

Traffic Calming

Traffic calming is a system of design and management strategies to balance traffic on streets with other uses. It is based on the idea that streets should help create and preserve a sense of place—for people to walk, stroll, and even play alongside cars, but not be dominated by them. Several roadway features are designed into the plan to ensure that vehicles travel at safe speeds, and extra efforts are not needed retroactively to slow traffic.

1. Roundabouts. Two roundabouts are provided in the roadway network—one at the makai entrance to Lima Ola and another at the intersection of the perimeter road and the street servicing the neighborhood center. Roundabouts are used in lieu of signalized intersections. Streets narrow as they approach the roundabout and cross walks are installed on these approaches. Oncoming vehicles must slow down to enter the roundabout and pedestrians are given a safe, obvious opportunity to cross. Properly designed, roundabouts reduce conflict points, which can lead to fewer collisions. A sloping ramp around the perimeter of the raised center island allows buses, trucks, and other large vehicles to maneuver the continuous curve while still maintaining the lowered speed. The island can be enhanced with landscaping, sculpture, or other public art to become a striking gateway for the community.

Makai Entrance

2. Multi-way stops. Stop signs at regular intervals mean that motorists cannot pick up excessive speed. Three- and four-way stops are shown at key intersections—for example, streets serving the community center and near higher density development. A related technique is to reduce the size of the intersection by constructing sidewalk bulb-outs, where the sidewalk pavement extends into the intersection. Bulb-outs improve safety for pedestrians and bicyclists by making the distance to cross the street shorter, thereby reducing the exposure to risk.

3. Curved roadways and visual cues. The major streets, including the perimeter streets and loop road, are designed with curves that help to slow driving speeds. The curved alignments are combined with on-street parking and street trees that enclose spaces and visually cue motorists to slow down.

4. Mid-block street crossings. Street crossings away from intersections are not optimal, but sometimes unavoidable for connectivity of the path network. The following traffic calming tools are available for mid-block crossings:

- Speed tables are road bumps that are flat on top. They are the same width as the street and rise to meet the grade of the path or sidewalk, providing safe and comfortable crossings for pedestrians, bicyclists, and wheelchairs.
- Rumble strip and other surface treatments provide visual and aural cues to alert drivers to areas requiring special attention. Materials with roughened surfaces will create vibration and sound changes that cue drivers to slow down.
- Chicanes are sidewalk extensions that create horizontal curves in the road that encourage motorists to drive more slowly and carefully. Chicanes can be designed so that pedestrians and bicyclists cross the street at an angle making them more aware of oncoming vehicles.

Land Use

The plan seeks to create neighborhoods that encourage and support diversity in age and income; neighborhoods that are inclusive and accessible. Figure 17 shows the distribution of residential lots by type. The plan includes six categories of residential lots with a total count of 400 units on 43.1 acres. Overall the density level is 5.33 units per gross acre.

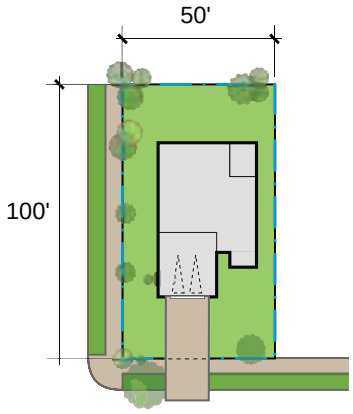
An important planning concept is the integration of single family detached, duplex, and elderly single family detached units. A traditional site plan would separate different types of housing products into distinct zones; however, the objective in Lima Ola is to build a community that celebrates the strengths and assets of diverse households.

LAND USE	Units	Acres
Single Family Detached	124	16.6
Duplex	48	5.0
Elderly Single Family Detached	32	3.4
Court Complex 6 units/Complex	84	8.6
Multi Family Rental Housing 10 units/Complex	80	6.7
Elderly Housing 4 units/Complex	32	2.9
Subtotal Housing	400	43.1
Green Space (Community Gardens, Bike and Pedestrian Paths, Mini Parks, Buffer)		11.0
Road Right of Way (Paved Area 13.0 acres)		20.9
Total	400	75.0


LEGEND
Single Family Detached
Duplex
Elderly Single Family Detached
Court Complex
Multi Family Rental Housing
Elderly Housing
Court Complex
Court Complex
Future Development
Habitat for Humanity
Multi Family Rental Housing
Elderly Housing
Future Development (Park)
Kaumualii Highway
Laulea St
Mehana Road
Mahea Road
Halewili Road
N
0
100
200
400 Feet

1. Single family detached. The plan contains 124 single family detached units. The lots are approximately 5,000 square feet. Dwellings may be one or two stories with front entrances oriented toward the street. All units assumed a two-car garage or carport with a minimum 20-foot driveway so that two additional vehicles could be parked in the driveway without blocking the sidewalk.

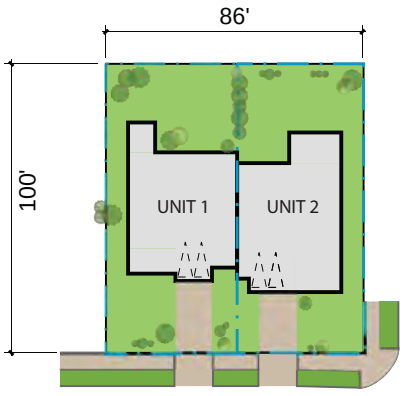
Single Family Detached



typical center-plot
100' L x 50' W lot
2 stories

2. Duplex. The plan contains 48 duplex units. Throughout this master plan, "duplex" is used to refer to unit types that could include two dwelling units with a shared side wall or single family attached units with zero lot line setback. Average lot size is 8,600 square feet for duplexes, and 4,300 square feet for single family attached units. Like the single family detached units, these units are intended for home ownership. Typically property title is structured to accommodate access to common structural elements for maintenance and repair purposes. Each duplex type unit would have its own driveway, front entrance, and private yard space.

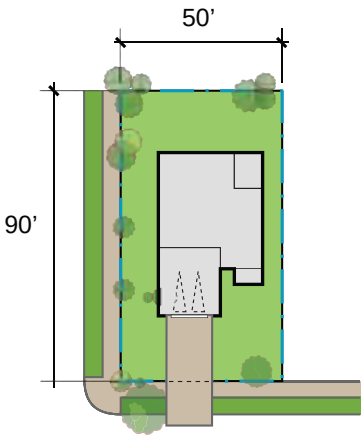
Duplex



typical duplex
100' L x 86' W
2 stories
2 units

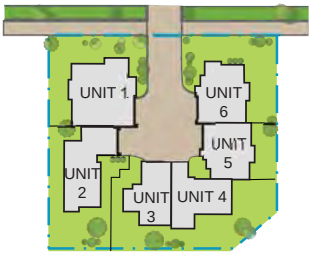
3. Elderly single family detached. The plan contains 32 elderly single family detached units, which are located on smaller parcels, 3,750-4,500 square feet that are intended for older homeowners or empty nesters who are capable of living independently, but require smaller, more affordable homes. The smaller lots target the growing number of seniors who wish to live in the community, but would otherwise find market housing to be "too much house"—both financially and physically in terms of maintenance and upkeep. The elderly single family lots are located throughout the development, again with the objective of integrating households at different stages in the lifecycle.

Elderly Single Family Detached



4. Court complex. There are 84 court complex housing units, depicted as a cluster of six units sharing a common driveway. The plan assumes a dwelling unit of 1200 - 1800 square feet (includes garage) in size. Each unit would have its owned attached garage, front entrance, and private yard space. The court complex housing units are located at the mauka end of the development and at the mauka and makai ends of the loop road. Units would be owned under a condominium regime because of common elements.

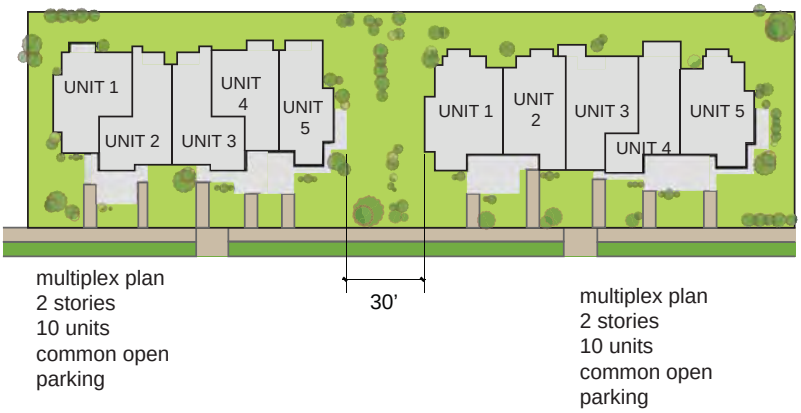
Court Complex



6-unit Cluster
2 stories
6 units

5. Multi family rental housing. The plan contains 80 multi family rental housing units. The building footprint shown in the plan is based on the Kālepa Village rental housing development in Hanamā'ulu where each two-story building consists of ten dwelling units. Similar to Kālepa Village, there is sufficient land in this sector to provide community facilities, such as a management office, meeting room, and playground. Because demand for rental housing is evident, these units were located at the makai end to facilitate development in an early phase. Higher density housing types are located at the periphery of the development for more efficient traffic management.

Multi Family Rental Housing



6. Elderly housing. The plan contains 32 elderly housing units. The building footprint shown in the plan is based on Hale Kupuna in Kalāheo where each building consists of four dwelling units. In contrast to the elderly single family detached units discussed above, these elderly housing units are rentals. Besides the residential buildings, the plan shows a community facility that might include a common kitchen, dining room, and recreation space. The elderly housing complex is located in the makai portion of Lima Ola to facilitate development in an early phase.

Elderly Housing


LEGEND
Green Space (Community Gardens, Bike and Pedestrian Paths, Mini Parks, Buffer)
Laulea St
Court Complex
Future Development
Community Center
Eleele Subdivision
Kaumualii Highway
Habitat for Humanity
Elderly Housing
Multi Family Rental Housing
Melana Road
Mahea Road
Future Development (Park)
Halewili Road
N
0 100 200 400 Feet

Green Spaces

Approximately 11 acres of Lima Ola are reserved for green space, including the mauka-makai greenway, perimeter buffer area, neighborhood park space, playgrounds, and pocket parks (Figure 18). The green space system is a defining element of the community and is completely integrated with residences. All portions of Lima Ola will have direct connection to the system. Moreover, it is multi-functional, addressing recreational and aesthetic purposes, as well as stormwater management, water quality improvement, irrigation, and other development requirements.

1. Mauka-makai greenway. The greenway is a signature element, extending the entire length of Lima Ola in the mauka-makai direction. It is centrally located, almost equidistant from homes on the east and west sides of the community. The greenway features a meandering shared use path in a landscaped setting. Except for the hardened path surface, the greenway will be permeable and can be designed to incorporate stormwater drainage features. The mauka-makai greenway is accessible to pedestrians, bicyclists, and wheelchair users through openings at the ends of the cul-de-sacs.

The greenway provides a view corridor from the mountains to the sea, thereby orienting the community within the larger environment. Narrower passageways alternate with broad clearings and open spaces that can be used as passive parks, informal ballfields, and playground areas.

2. Perimeter buffer. A green perimeter is planned along the west side of Lima Ola. In the mauka area, the green space serves as a noise buffer between the highway and provides a setback from high-voltage utility lines located along the highway. At the mauka and east boundaries with Habitat for Humanity, there are waterline and drainage easements, where the green space will accommodate utilities, as well as the perimeter path.

3. Remnant open spaces. Interspersed throughout the community are remnant spaces too small for a residential lot. These spaces are available for community gardens or orchards or pocket parks. In some cases, neighboring residents may choose to "adopt" small open areas that become a semi-public space which supports community life on a more intimate scale.

Community Spaces

The physical form of the community can be instrumental in fostering a strong sense of community. Figure 19 shows the numerous social and recreation places in Lima Ola where public life will be able to flourish.

Laura Carstensen of the Stanford Center on Longevity notes that people are happiest when they feel embedded in something bigger than themselves. In a physical sense, the bigger world lies outside the front door and fence posts of one's home—the block, the neighborhood, the community. For children, seniors, and others facing restricted mobility, the environs around the home are especially important. What activities does this environment enable? Without access to safe and pedestrian-friendly streets, elderly are at risk of becoming disengaged from society, and children below driving age are dependent on adults to chauffeur them from place to place. Streets are not merely conduits for moving vehicles. At the slower speed of non-motorized travel, streets are humanized, becoming places where community-building interactions occur daily.


LEGEND
Tot Lot
Community Gardens
Court Complex
Pavilion
Community Center
Pavilion
Future Development
Habitat for Humanity
Multi Family Rental Housing
Elderly Housing
Future Development (Park)
Laulea St
Kaumualii Highway
Mehana Road
Mahea Road
Halewili Road
0
100
200
400 Feet

The plan's focus on relatively short cul-de-sacs promotes sociability, safety, and healthy activity:

- **Sociability.** The advantages of cul-de-sacs are well-known. Through traffic is discouraged because there is no outlet, resulting in quieter streets. Homes oriented toward each other promote increased neighborliness.
- **Safety.** The term "eyes on the street" is shorthand for the concept of natural surveillance where the comings and goings of visitors can easily be seen. This can be accomplished by locating paths and other points of access where they are visible from adjacent building windows or within sight of heavily used areas and centers of activity.
- **Healthy activity.** Greenways interlaced between the cul-de-sacs allow direct access to paths for walking and bicycling. Opportunities for exercise—whether a substantial workout or a leisurely stroll—are literally steps away. The plan brings together a convenient physical space and a supportive social structure in which exercise is safe and accessible.

1. Community center. The community center is located at the physical center of the development and envisioned as the heart of community life. The center would be a place for community meetings, enrichment classes, and social gatherings. It is possible that a convenience retail outlet might be allowed within the development, in which case, co-location with the community center would be appropriate. Other potential activities include self-service postal services and a drop-off station for recyclables. The grounds of the community center are large enough for playground equipment and open play field.

2. Pavilions. Pavilions are located inside the loop at the mauka and makai ends of the greenway. The pavilions are conceived as open-sided picnic shelters or rest areas for people using the greenway path.

Pavilion at Kaumakani Park

3. Playgrounds or tot lots. Several playground areas or tot lots are distributed within the development. These are intended for use by households in the immediate area, therefore no comfort stations are provided. All playground locations are accessible via the path system.

4. Community gardens. Community gardens give people access to gardening space that might be lacking in their private residential environment. Gardening is seeing resurgent popularity as part of the local food movement, but it's also a social activity. Garden plots may vary in size from 100 to 400 square feet (SF). The plan shows community garden sites in five locations accessible via the path system.

Pavilion at Hanapēpē Cliffside Park

On O'ahu, the City and County of Honolulu administers ten community gardens under its Community Recreational Gardening Program—so named to acknowledge gardening as a social activity that can lift the spirit of community members.

Basic layout guidelines are minimal. Plants are typically grown in rows, so square or rectangular shapes work best. Paths are required so gardeners have access to their plots. Pathways between plots should be at least 3 to 4 feet wide to allow space for wheelbarrows. A simple irrigation system should provide one hose bib or faucet for every four plots. There should also be a gathering space with a community bulletin board where rules, meeting notices, and other important information can be posted. This area could also house a central storage space if there are shared tools and equipment. A bench or picnic table, preferably under shade, would allow gardeners to relax and take a break. Although a composting/recycling area is provided for the agricultural park as a whole, a designated area where gardeners can dispose of their green waste will help keep the gardens tidy.

Individual community garden plot

Community Gardens

Ala Wai Community Garden Association

Ala Wai Community Garden is one of ten sites in the City and County of Honolulu's Community Recreational Gardening Program. It is the third largest with 157 plots, each measuring 12 feet by 15 feet (180 SF).

A coordinator is employed by the City, but the facility is largely self-governed through an association and its elected officers. Members are required to follow a set of rules. Garden assignments are revoked after two warnings, issued for "knowingly and continuously breaking rules":

Produce is not to be sold or put to commercial use.

Four types of fruits or vegetables must be grown; no illegal plants.

Walkways are to be kept clean. Don't put trash in the common area or garden entrance until clean up day. Gardens must be tended regularly to keep from being overgrown with weeds.

No poisonous pesticides or herbicides are allowed.

Members must attend four meetings per year; one per quarter.

Storage area for shared gardening equipment

Members must participate in two garden cleaning parties per year (clean up days are scheduled on two days of each month)

Annual dues are $15.

Water bill is $18.

No excessive watering.

INFRASTRUCTURE

New development will require a significant investment in infrastructure. Construction of infrastructure and community facilities will occur in response to incremental development and housing build-out. In some cases, third-party residential developers who decide to satisfy affordable housing requirements at Lima Ola may be responsible for increments of infrastructure.

Approaches to community infrastructure will stress water reuse, energy and water conservation, renewable sources of energy supply and innovative stormwater management to maximize opportunities for on-site irrigation and water quality improvement.

Water System

The proposed development will require an estimated 0.265 million gallons per day (mgd). The existing water system, operated by the County of Kaua'i, Department of Water (DOW), does not have enough capacity to service Lima Ola. Therefore, off-site improvements to increase capacity will be required. Water will be provided to Lima Ola via connections to an existing 12-inch main on Kaumuali'i Highway. The on-site water system will be installed within the roads and/or the greenway and will be looped within the development as much as possible. The on-site water lines will be sized according to the current DOW standards.

Sewer System

The existing 'Ele'ele wastewater treatment plant has enough capacity to accommodate Lima Ola. However, the capacity is limited and may not be available when the development is ready to connect to the existing sewer system. The existing sewer connection point for Lima Ola is located on Halewili Road at Mahea Road. The Lima Ola on-site sewer system will consist of pipes and manholes which will convey wastewater from each unit by gravity to the existing connection point. The sewer system will be installed within the on-site roads and/or the greenway.

Stormwater Drain System

A stormwater drain system will be installed for Lima Ola consisting of underground pipes, manholes, catch basins, inlet boxes, and basins. The storm water runoff collected in the system will be routed through surface detention basins in order to limit the post-development discharge rate to the pre-development discharge rate. Low impact development and sustainable features, such as bioswales and rain gardens, will be incorporated into the design to provide stormwater treatment and reduce the quantity of runoff discharged from the site. The reduction in runoff generated on-site will help reduce the size of the stormwater drain system components. The drainage system will be designed in accordance with the County of Kaua'i, Department of Public Works Standards.

Roads

Road grades will be designed to provide accessible sidewalks throughout Lima Ola. Intersections will be flattened to provide ADA compliant ramps and walkways. Between intersections, road grades will not exceed 5 percent.

Solid Waste

Residential solid waste service will be provided by the County's Refuse Division in accordance with current collection policies. In addition, Lima Ola presents an opportunity to model a proactive waste minimization strategy. Possible actions include a recyclables collection station within the community and the conversion of green waste into mulch that is locally available for residents and community gardeners.

SUSTAINABLE DEVELOPMENT

One of the priorities of development at Lima Ola is to create a human environment that enhances the assets of land and climate, and conserves natural resources. Healthy living depends, in part, on a built environment that is in balance with the natural environment. The quality of life afforded by Lima Ola is not confined to the interior spaces of homes, but extends to active living out of doors. Taking a responsible development approach that minimizes cumulative environmental impacts will create a more durable and comfortable community that is sustainable from one generation to the next.

Planning for the long-term viability of Lima Ola involves a multi-faceted effort. Strategies in the following focus areas are intended to guide Lima Ola's development. They should be examined and refined as the community evolves.

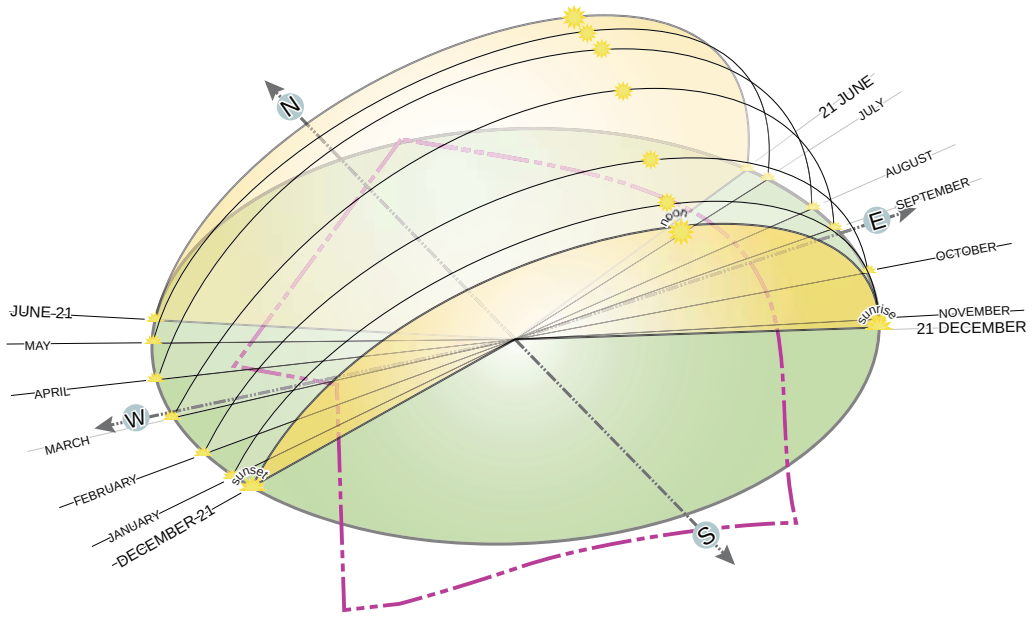
Permeable Surfaces and Drainage

- Design narrower streets that require less asphalt
- Consider use of porous pavement to facilitate on-site stormwater infiltration and groundwater recharge
- Promote a distributed system of managing stormwater, including landscaped swales, bio-retention, rain gardens, and other collection mechanisms
- Provide a stormwater system that controls erosion and reduces natural and urban pollutants at their source

Solar Orientation and Energy

- Orient roof surfaces to provide maximum exposure for solar water heating and photovoltaic (PV) systems
- Minimize surfaces facing east and west to control solar exposure and heating of interior spaces
- Provide overhangs and eaves that can offer effective shading and keep the sun's radiant heat from penetrating building walls and windows
- Incorporate skylights or solar tubes for natural day lighting
- Ensure light and air access for neighboring units
- Design outdoor lighting systems using fewer, but more effective lighting fixtures and that require the least amount of energy, including solar-powered lighting
- Encourage homeowners to operate energy efficient appliances to reduce power consumption—and utility bills

Figure 20 **Solar Path over Lima Ola**

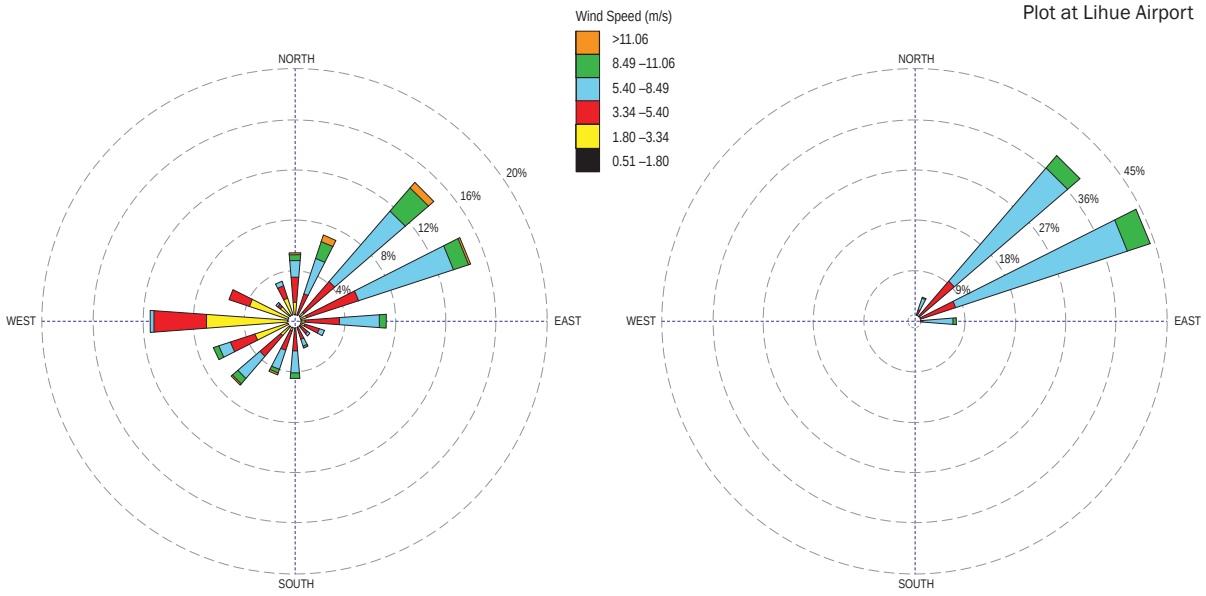


Natural Ventilation and Shade

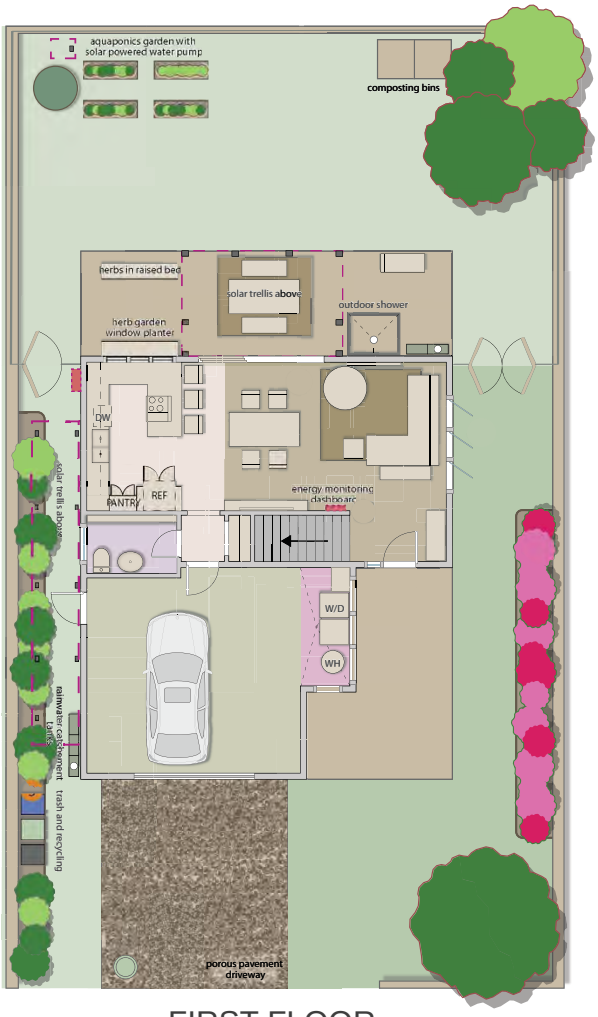
- Advocate construction practices that enable healthy indoor air quality
- Orient residential buildings to take advantage of prevailing tradewinds for best overall distribution of air movement within interior spaces
- Place windows for cross ventilation and select window shapes and types for efficient wind cooling
- Reduce attic temperature through improved ventilation, insulation, and radiant barrier technology
- Reduce heat islands by decreasing the amount of black top (asphalt) paving and by greening the landscape and planting shade trees

Figure 21 **Wind Rose**

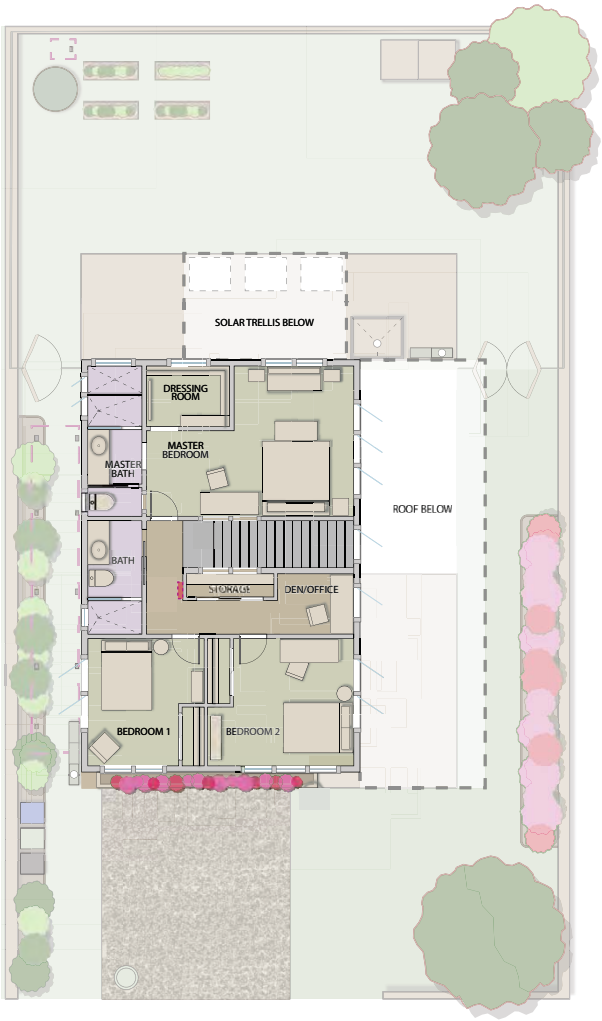
Plot at Lihue Airport



January 1—January 31 July 1—July 31



FIRST FLOOR



SECOND FLOOR

Modeling

The following are representative strategies that can be put together, as appropriate for the site and building type, to produce a home that uses less energy, has a smaller carbon footprint, and is more benign environmentally than typical construction.

1. Outdoor spaces screened and shaded with a solar trellis
2. Backyard garden
3. Recycling service and composting bins for use in edible gardens
4. Interior and exterior louvers for ventilation
5. Outdoor wash up area
6. Water catchment for irrigation

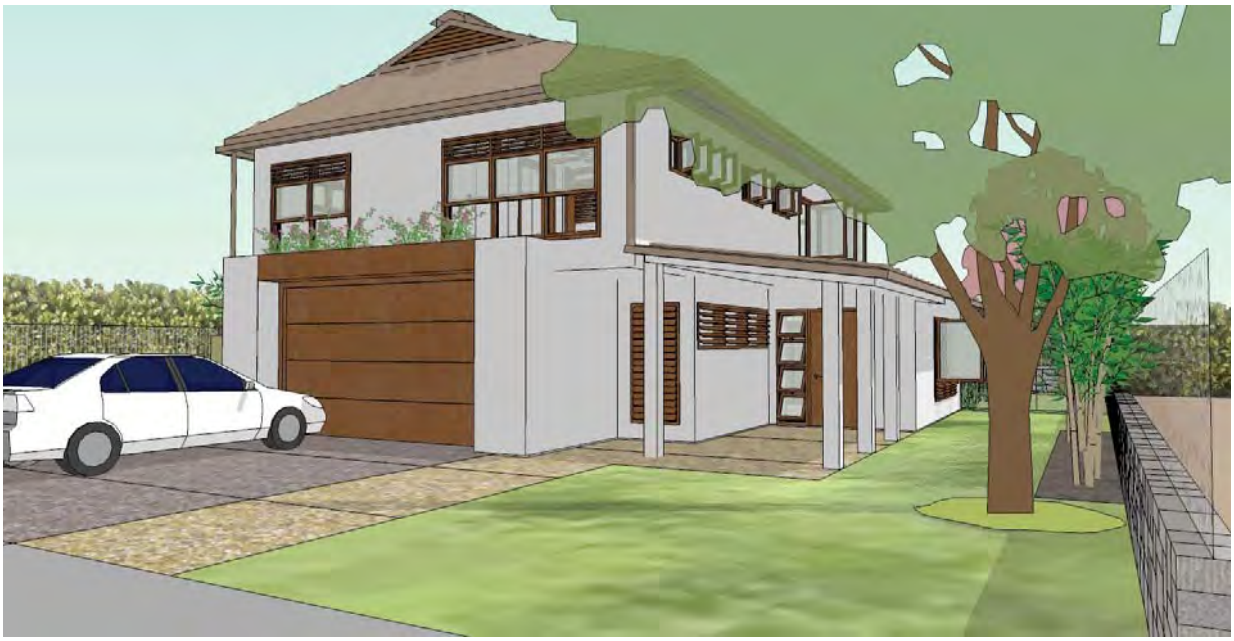
7. Design overhangs to shade house while keeping gutters free of leaves and debris

8. Open floor plan on first floor for air circulation throughout the house

9. Heat generating rooms (kitchen, bath) on leeward (west) side of house and well-ventilated

10. Control panel to monitor water and electricity use

11. Casement windows to let in prevailing winds



the Eco-House

Water Use

- Advocate construction practices that reduce water usage
- Consider water catchment to reuse water for irrigation
- Develop sustainable landscape design guidelines incorporating use of plant materials that are durable and appropriate to Lima Ola's leeward climate, while also being visually appealing and non-invasive

Solid Waste and Recycling

- Conduct ongoing education and community awareness programs to promote recycling as an important part of the community culture
- Convert green waste into mulch for landscape applications throughout the development
- Encourage on-site residential composting

Topography Sensitive Design

- Use topography to create continuous green space connectivity, integrating access to views
- Use differences in elevation to increase a sense of privacy between homes
- Ensure that roadway, sidewalk, and path gradients meet ADA access requirements

Urban Design

- Locate community facilities within walking or biking distance from homes to reduce unnecessary car use
- Design higher residential densities near potential transit stops and major streets
- Design community spaces for flexible use
- Face buildings toward the street to create inviting entrances
- Provide porches, stoops, lanais, and front yards that create a transition area between the public street and the private home—giving residents a place to enjoy the "spectacle of the street" and a space for social interaction

Sustainable Transportation

- Provide a safe route to school via the greenway to ensure safe walking commutes for children
- Integrate recreation areas into the greenway for easy access from homes
- Integrate paths and sidewalks to promote pedestrian-friendly walkways
- Incorporate bike paths and bike lanes into street design to promote alternative transportation

Mauka-Makai Views

- Preserve important natural vistas
- Use environmental reference points to reinforce a sense of place and connection to nature

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IMPLEMENTATION

Phasing Strategy

Full build-out of the Lima Ola site will likely span several decades. The exact sequence of events over this period cannot be predicted with precision. It will be important, however, to focus development activity in selected subareas and provide improvements and service extensions in a logical and efficient fashion.

Given a relatively large site, early development should occur in a limited number of locations, allowing for concentrations of investments in infrastructure and amenities, and avoiding the need to make expensive site improvements across a large area at one time. Each area of development should facilitate efficient extension of infrastructure and services, by taking advantage of opportunities to build on existing site improvements and utilities.

Early phases should contain a mix of uses and provide a balanced picture of the larger vision for full build-out of the site. These phases should respond to market opportunities and set a precedent for high quality development.

Property improvements made outside of an intended phasing sequence may be appropriate at times, but should not unduly limit future flexibility and should not trigger financial obligations that cannot be reasonably accommodated.

Land Banking

When the idea for a County-initiated residential development was conceived, policymakers envisioned a multi-pronged approach to development. Some elements would be developed by the County directly. However, other elements would be constructed by third-party developers meeting entitlement conditions for affordable housing. As a land bank, the Lima Ola site would provide land with appropriate zoning and infrastructure service to expedite housing production.

Phasing Plan

Figure 22 shows a preliminary phasing plan for Lima Ola, subject to change based on engineering recommendations. Primary development activities for each phase are described below.

Figure 22 Phasing Plan

Phase 1A

Land Area: 11.4 acs

Circulation

- Extend Mahea Road through Habitat for Humanity development
- Build road mauka of future park, entry drive with roundabout, portion of loop road with cul-de-sacs

Unit types

- Mixture of single family lots with single family dwellings, duplexes, and elderly single family lots, plus a six-plex court complex
- Unit counts:
  - Single family: 22
  - Duplex: 8
  - Elderly single family: 8
  - One six-plex court: 6

Amenities

- Pavilion
- Common open spaces for recreation and community gardens
- Bike and pedestrian path network

Phase 1B

Land Area: 7.8 acs

Circulation

- External roadway built in Phase 1A
- Internal circulation with parking

Unit types

- Rental multi-family attached units
- Unit counts:
  - Multi-family units: 80

Amenities

- Common open spaces for recreation and community gardens
- Connections to bike and pedestrian path network

Phase 2A

Land Area: 14.9 acs

Circulation

- Construct remaining portion of Mahea Road extension and connector to Halewili Road to provide secondary access
- Build loop road with cul-de-sacs

Unit types

- Mixture of single family lots with single family dwellings, duplexes, and elderly single family lots, plus a six-plex court complex
- Unit counts:
  - Single family: 34
  - Duplex: 16
  - Elderly single family: 8
  - One six-plex court: 6

Amenities

- Community center with adjacent park area
- Common open spaces for recreation and community gardens
- Bike and pedestrian path network

Phase 2B

Land Area: 3.0 acs

Circulation

- External roadway already built in Phase 2A
- Internal circulation with parking

Unit types

- Elderly housing development (attached units)
- Unit counts:
  - Attached units: 32
  - Administrative office/community room

Amenities

- Common open spaces for recreation and community gardens
- Connection to bike and pedestrian path network

Phase 3

Land Area: 7.6 acs

Circulation

- Extend loop road with cul-de-sacs

Unit types

- Mixture of single family lots with single family dwellings, duplexes, and elderly single family lots
- Unit counts:
  - Single family: 25
  - Duplex: 10
  - Elderly single family: 5

Amenities

- Connection to common open spaces for recreation and community gardens
- Bike and pedestrian path network

Phase 4

Land Area: 13.0 acs

Circulation

- Extend loop road with cul-de-sacs
- Connect to Iluna Road

Unit types

- Mixture of single family lots with single family dwellings, duplexes, and elderly single family lots
- Unit counts:
  - Single family: 43
  - Duplex: 14
  - Elderly single family: 11

Amenities

- Connection to common open spaces for recreation and community gardens
- Bike and pedestrian path network

Phase 5

Land Area: 13.4 acs

Circulation

- Extend loop road in Phase 5
- Build new mauka entry off Kaumualiʻi Highway and segment of perimeter road

Unit types

- Six-plex court complex
- Unit counts:
  - 12 court complexes: 72 units

Amenities

- Connection to common open spaces for recreation and community gardens
- Bike and pedestrian path network

Table 4

Summary of Acreage/Units Developed by Phase

Phase	Acres	Units
1A	11.4	44
1B	7.8	80
2A	14.9	64
2B	3.0	32
3	7.6	40
4	13.0	68
5	13.4	72

Phase 6

Complete perimeter road in conjunction with future area development

Future Action Items

Priorities for implementing future development at Lima Ola include the following.

Planning and Design

- Prepare development standards and design guidelines to ensure consistency in the procurement process and overall quality of phased outcomes. The standards and guidelines should be adopted for the entire project area through a process that includes provisions for review and amendment.
- Prepare plans for water source, transmission, and storage, in coordination with the Department of Water
- Initiate planning for intersection improvements at Kaumualiʻi Highway and Mahea Road, in coordination with the State Department of Transportaion

Environmental Review and Entitlements

- Complete necessary environmental studies and commence the environmental review process
- Amend County general plan
- Amend State land use district
- Adopt master rezoning ordinance
- Adopt subdivision plan

Financing

- Develop initial infrastructure funding mechanism

Management Structure

- Evaluate common area management strategies and potential landscape assessment
- Define character and role of possible community management association

Conclusion

This master plan presents an approach to community development that is new to Kaua'i, but within the capacity of the county to achieve. Lima Ola is foremost a planned residential community offering to Kaua'i's working and retired households a diverse range of housing types, including rental and ownership opportunities. Affordable housing typically means constraints on residential lot and yard sizes. However, at Lima Ola, smaller private space is balanced with ready access to safe and lively public spaces.

From community gardens to playgrounds and open green space, Lima Ola will offer a variety of public spaces that can accommodate a wide range of uses for personal enjoyment and socialization. The development has been planned with a design strategy that encourages residents to interact positively with their environment on a daily basis. Lima Ola will promote healthy living through a set of interrelated design features:

- New dwellings designed to be close to user-friendly pedestrian and bicycle paths to promote active lifestyles and avoid social isolation
- Compact neighborhoods with connectivity to key local destinations
- A legible street network that is clear and easy to navigate
- Open spaces that provide a range of shade, shelter, and seating
- Access to healthy foods through community gardening
- Building design that maximizes natural interaction and active street frontages
- Enriching public spaces that can promote neighborliness and a sense of community

APPENDIX B: COMMENTS RECEIVED AND RESPONSES