



Maui Research & Technology Park-Today...

- 22 companies
 - 4 new in the last year
 - A good number are hiring
- Apx 400 people work in Park
- An estimated \$150 Million/yr flows through park projects
- 5 buildings, 180K SF
- ~\$3 Million in construction this year
- Sustainability
 - 2 solar projects deployed
 - New county recycled water connection, 35-40 MGY
- New website-MauiTechPark.com
 - News and master plan progress





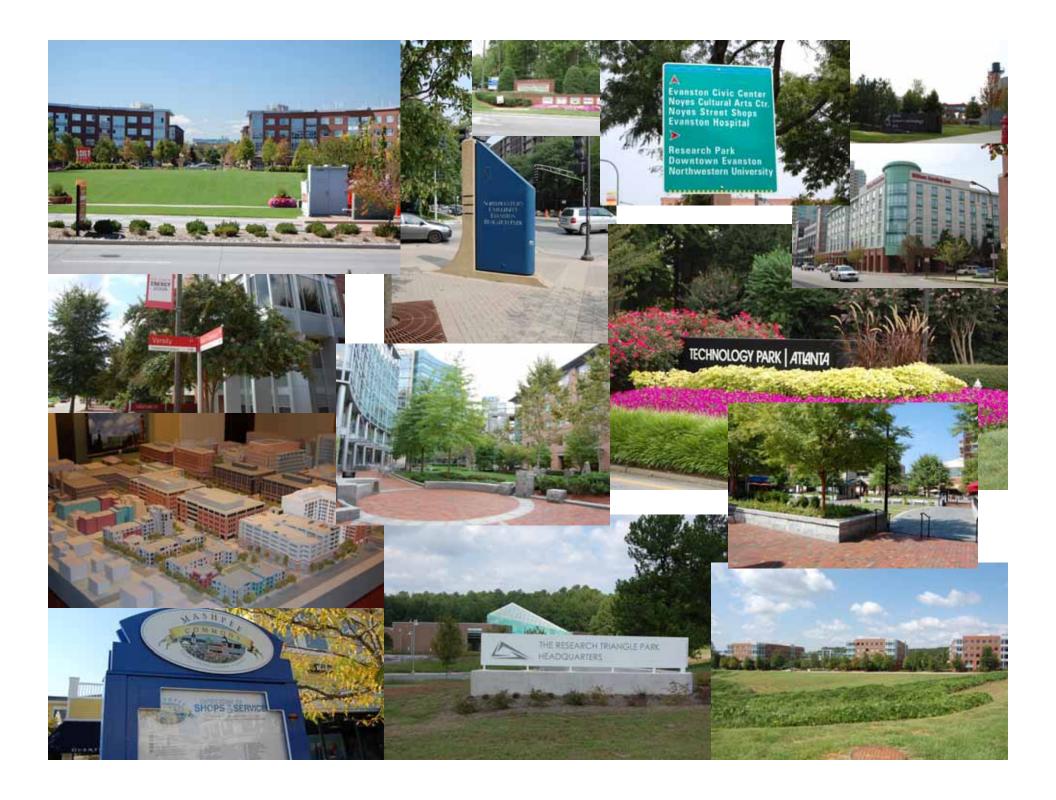


Maui R&T Park-Today...

- 10% build-out in past 20 years
 - 40 out of 400 acres
- Large minimum lot size
 - 2 Acre minimum lots
- Narrow acceptable uses-MCC 19.33
- Most all employees must drive to work
- No on-site amenities
- Very limited demand for this type of development on Maui
- Construction is very expensive
 - Passed through to buyers and tenants









National Research Park and Employment Center Trends

- The recognized trend and future of employment centers and research/technology parks is moving towards mixing of uses in complete communities including R&D/Tech use
- The Association of University Research Parks—the industry group for these types of developments has called it the "the power of place"
 - "A strategy to cluster research and incubator facilities (along with housing and amenities) in innovation zones is an important aspect of our future U.S. technological and ecological competitiveness."
- MRTP master plan update aligns well with draft Maui island plan, Community Plan, Kihei Community Association planning guidelines, and current planning trends nation-wide

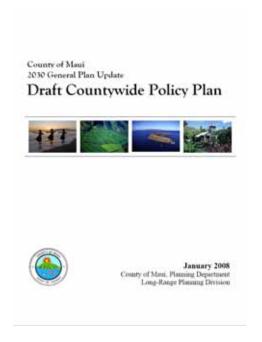


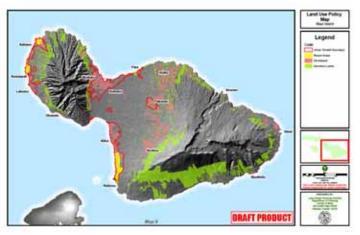




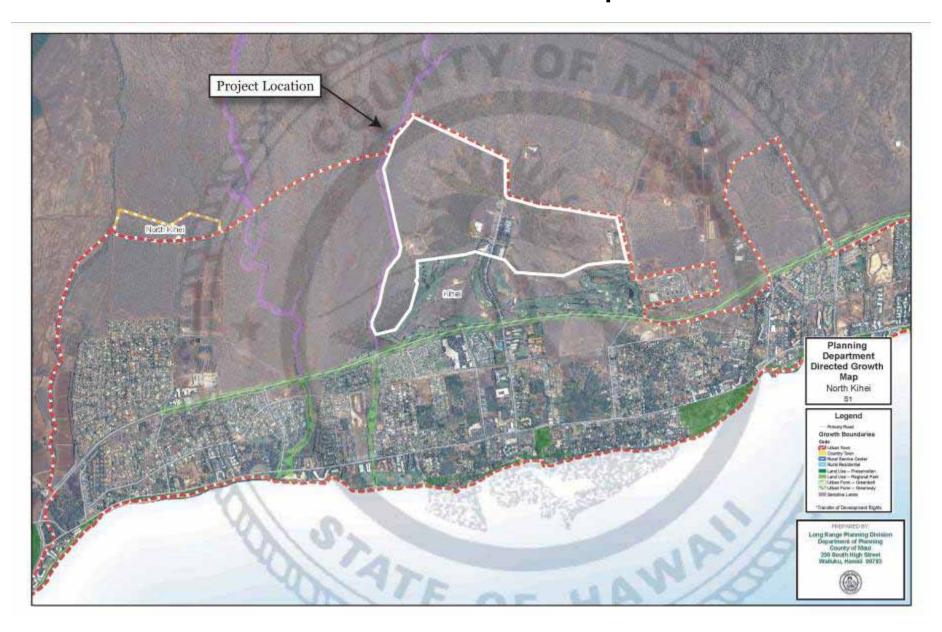
Stated Maui County Planning Goals

- Current county planning doctrine calls for:
 - Dense development walkable, on transit, less automobile use
 - A mix of commercial and residential uses
 - Sustainable development energy, water, waste water, building practices
 - Mixing housing types within neighborhoods—rental, owner occupied, multi-family, single family, market and affordable, life-cycle/disabled accessible
 - Integrated open space/parks

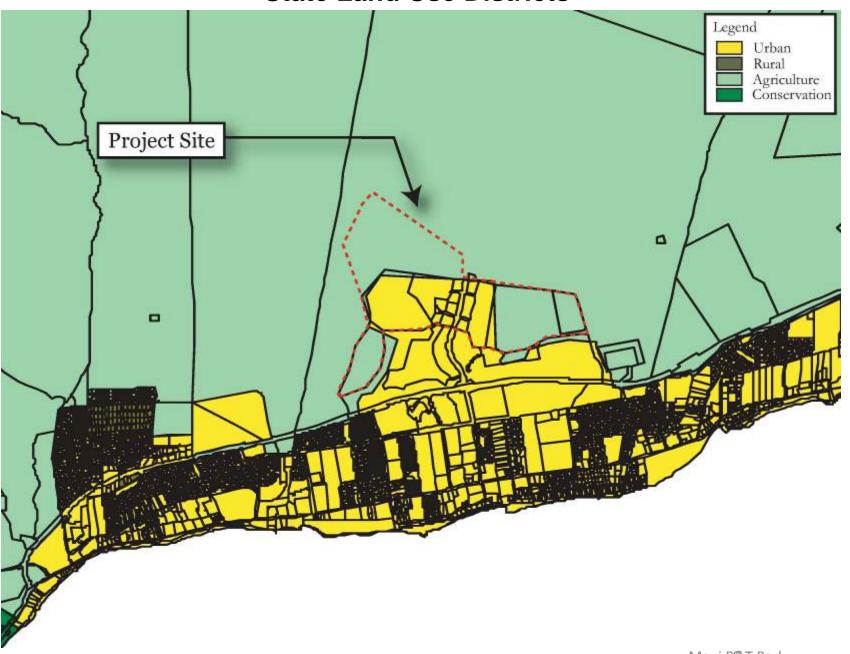




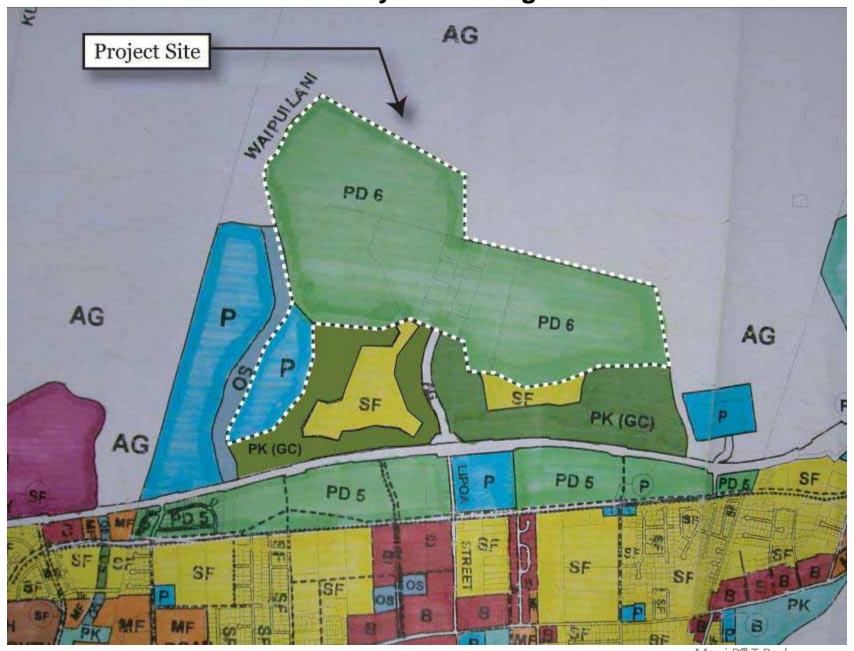
Directed Growth Map



State Land Use Districts



Community Plan Designations



Maui R&T Park

County Zoning Districts



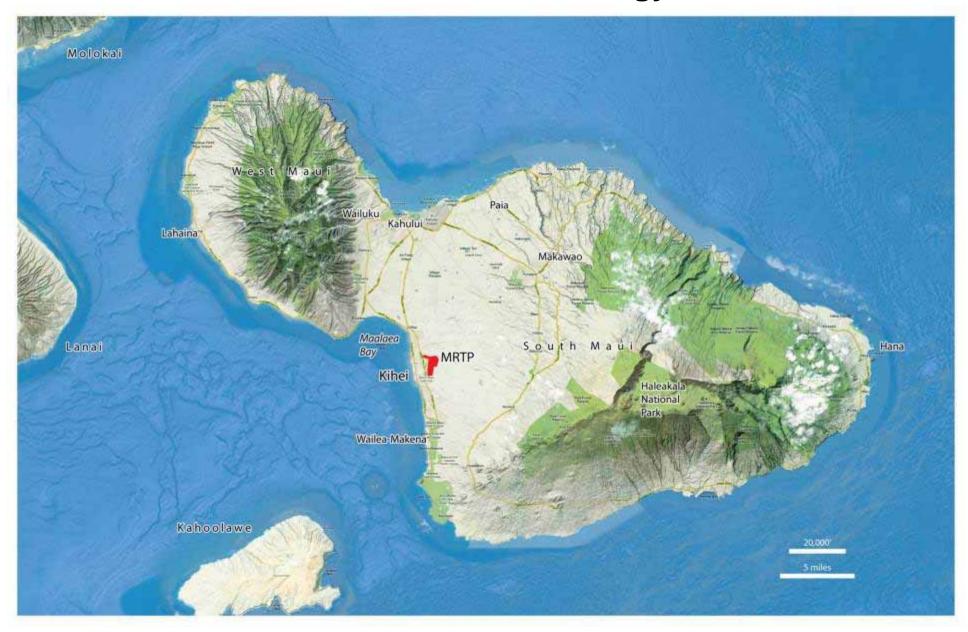


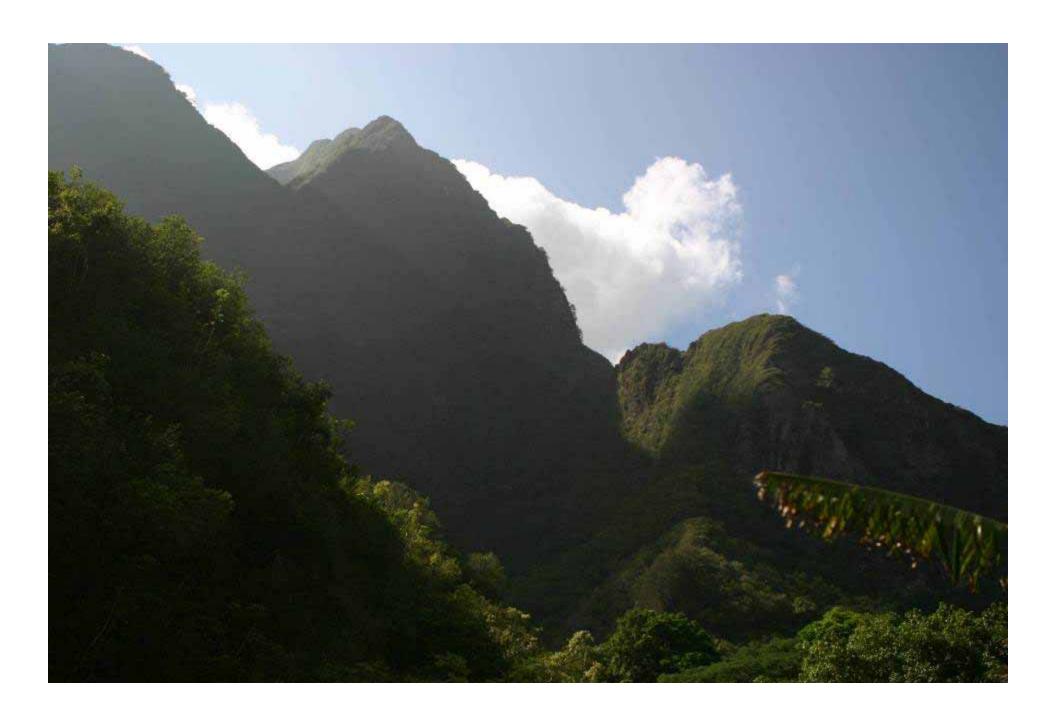
Maui R&T Park

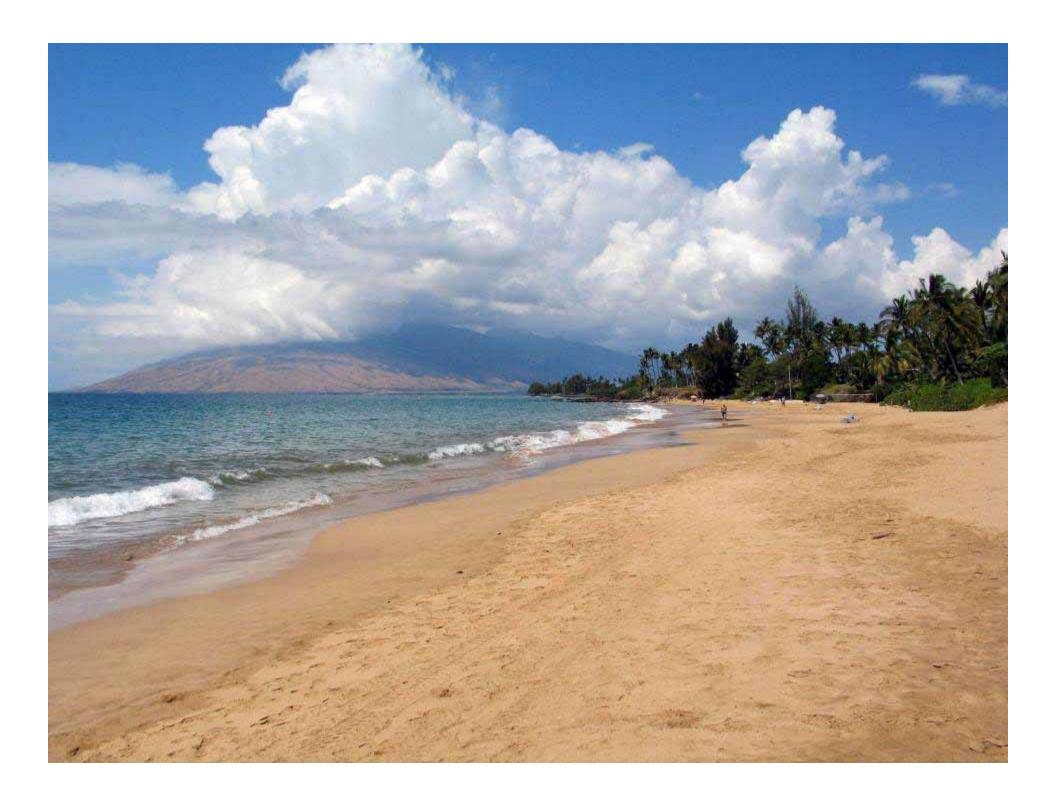
Maui Research & Technology Park

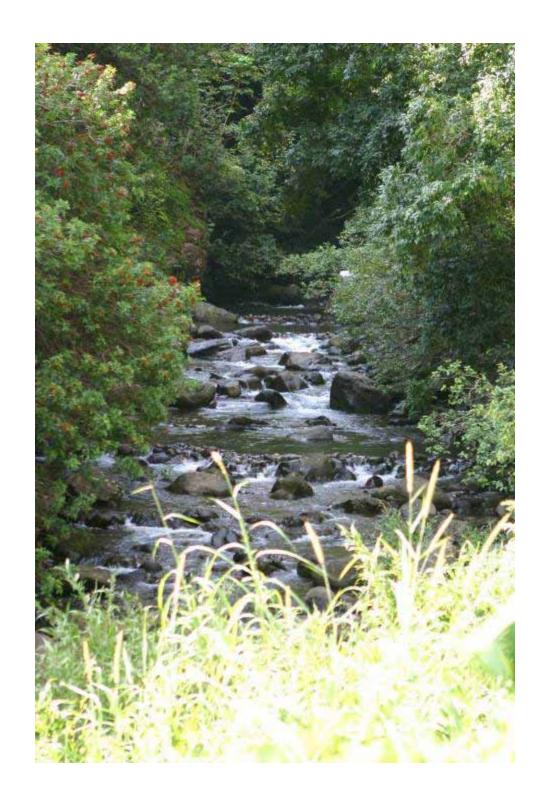


Maui Research & Technology Park





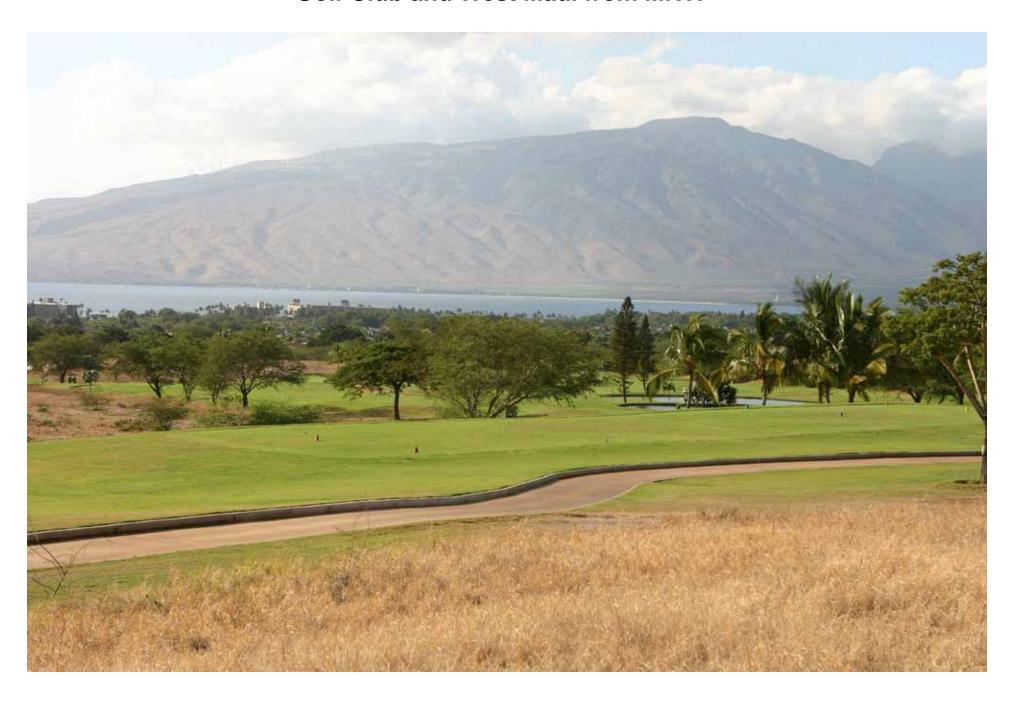








Golf Club and West Maui from MRTP





Piilani Highway at Lipoa Parkway





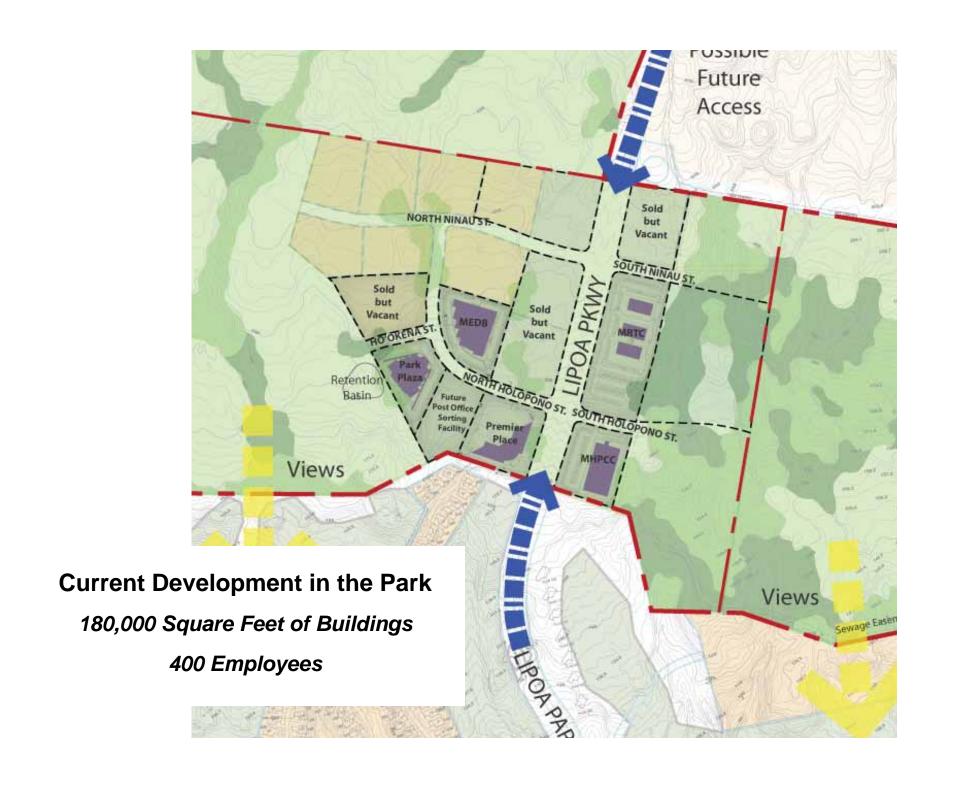


Piilani Highway Commercial





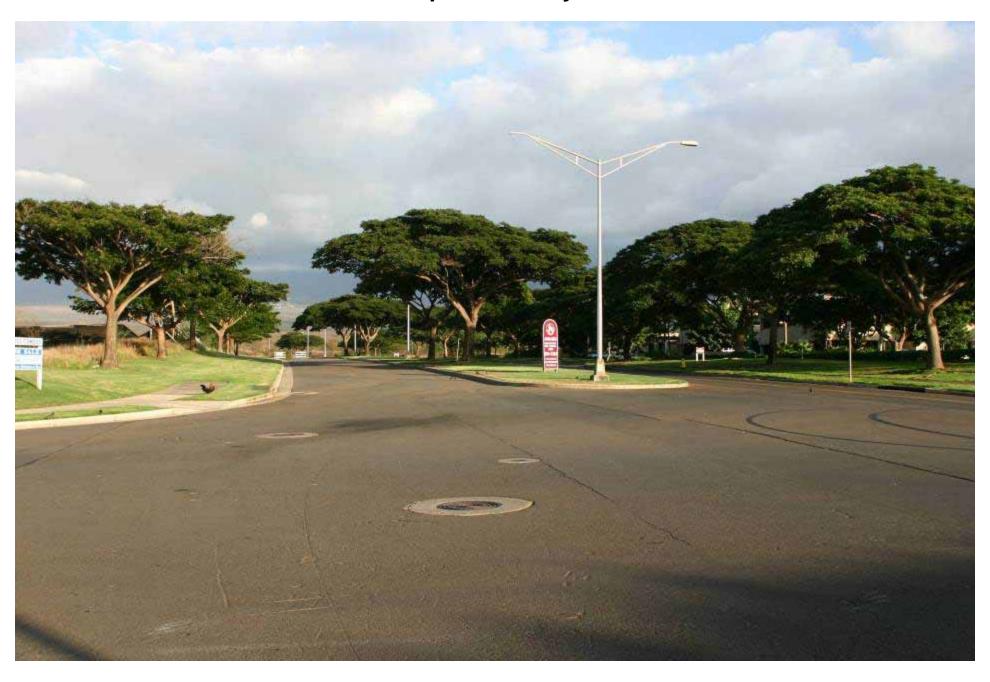


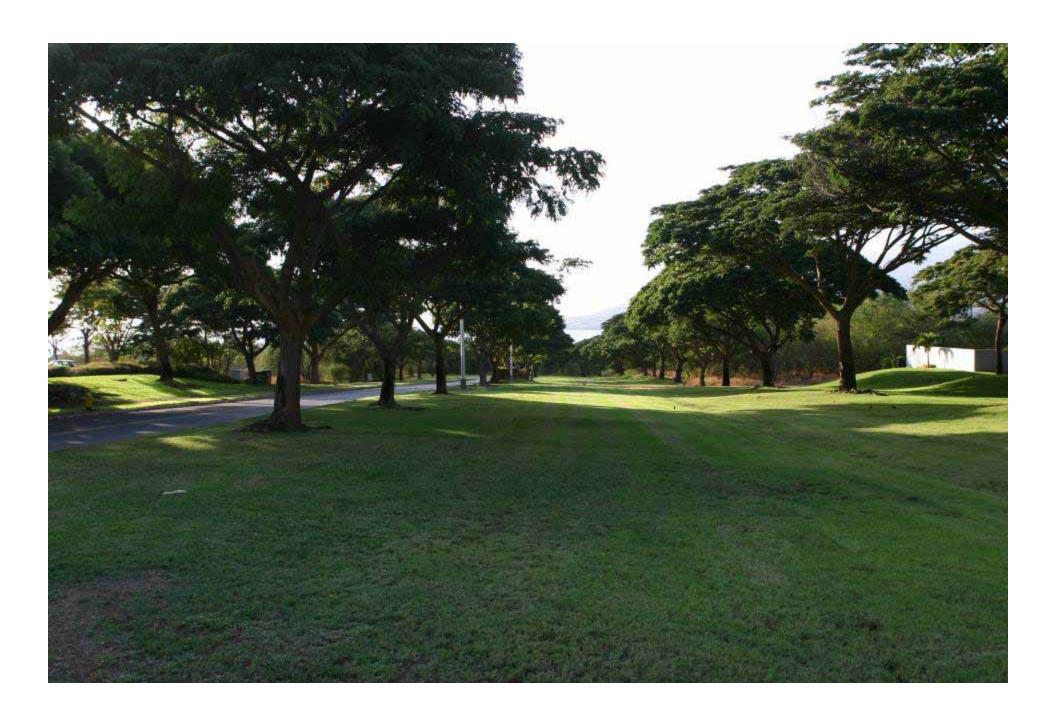


Lipoa Parkway Intersection in MRTP



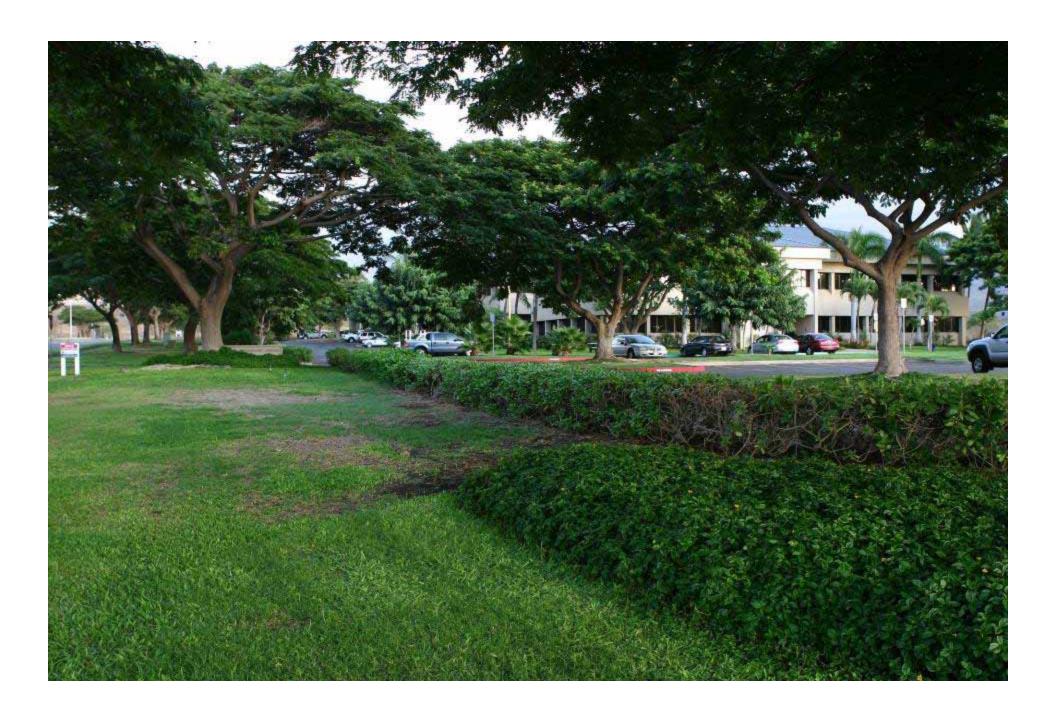
Lipoa Parkway











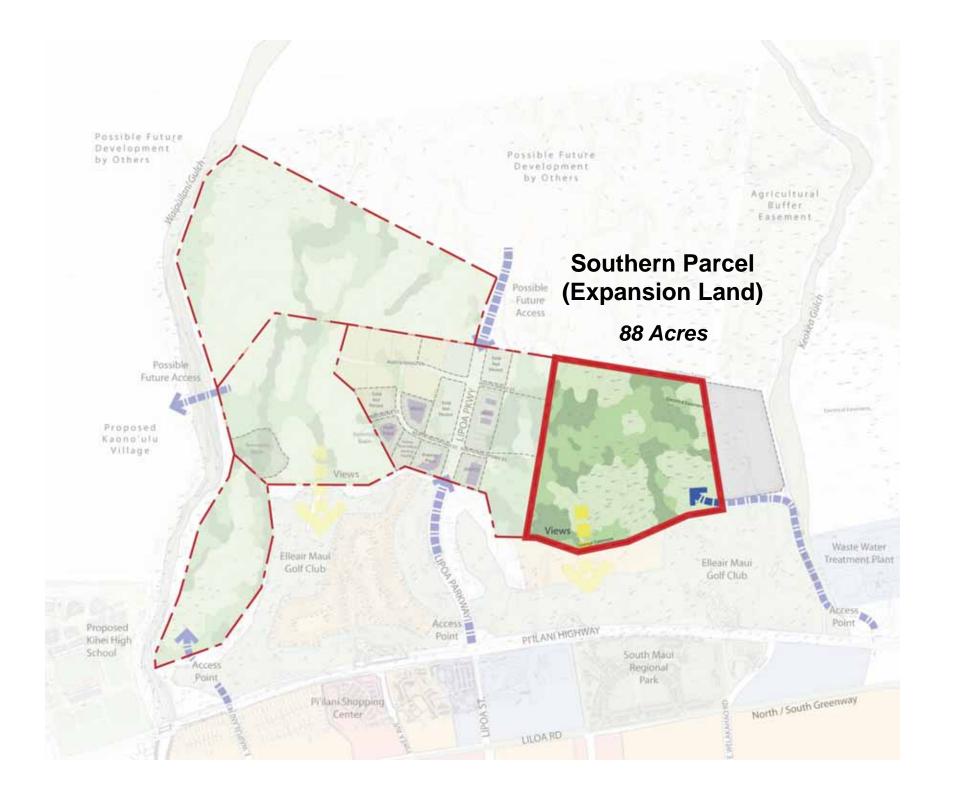






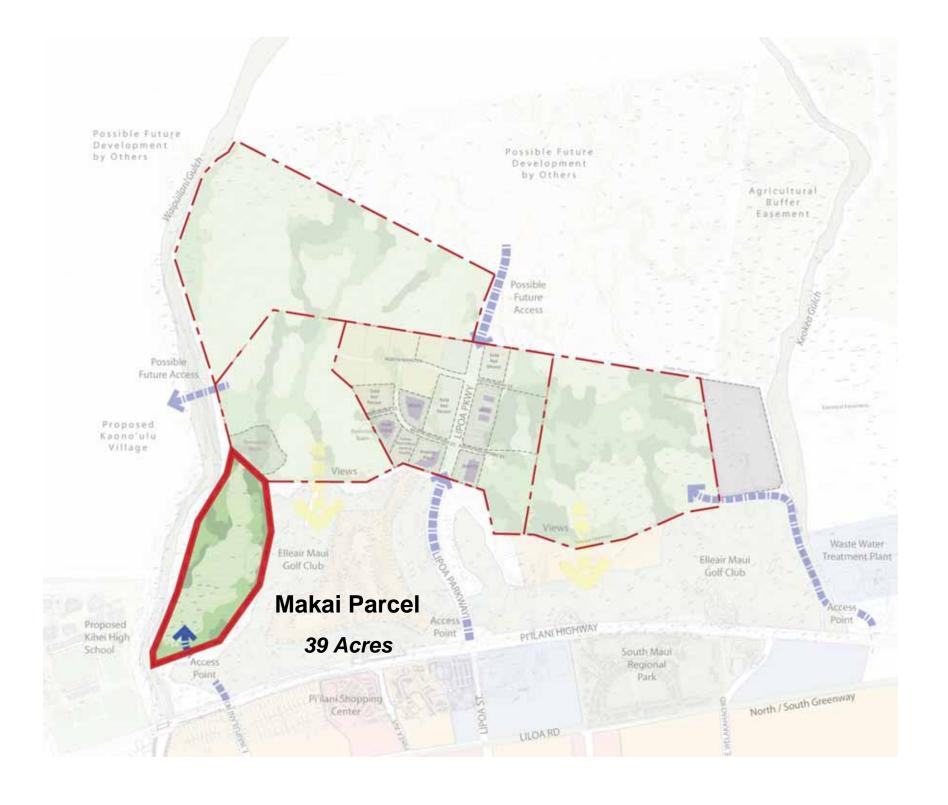






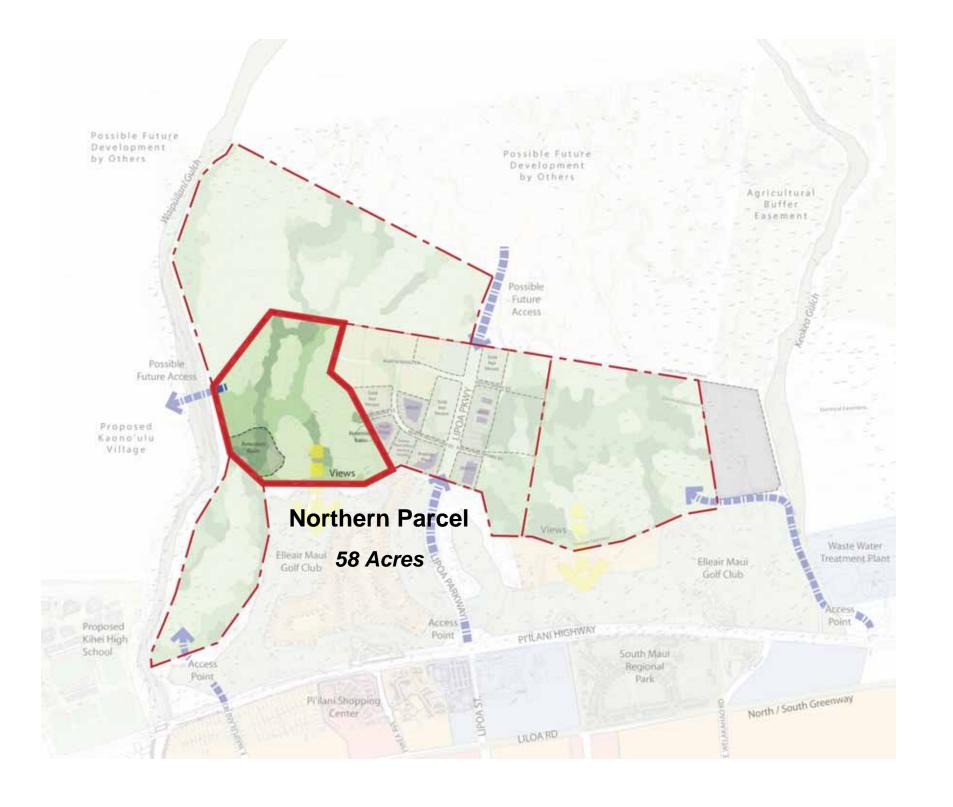










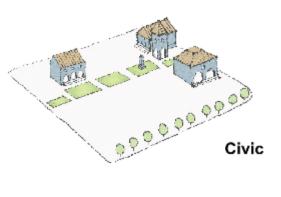


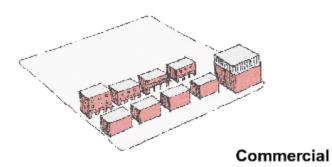
Retention Basin



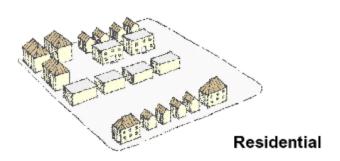


Diversity

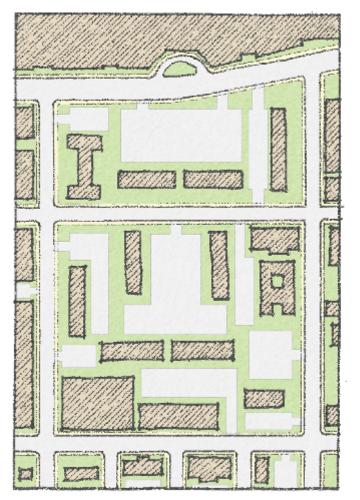




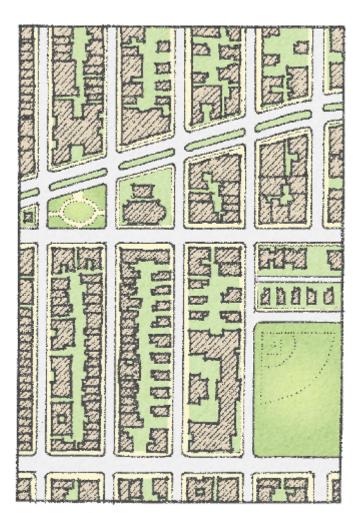




Human Scale

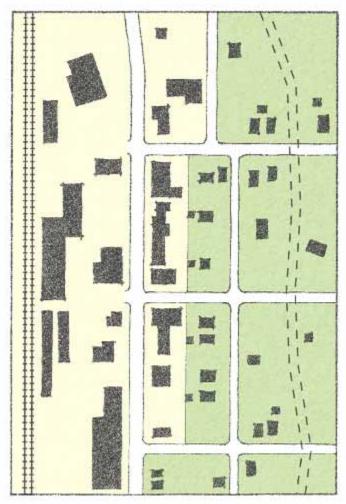


Auto - Scale

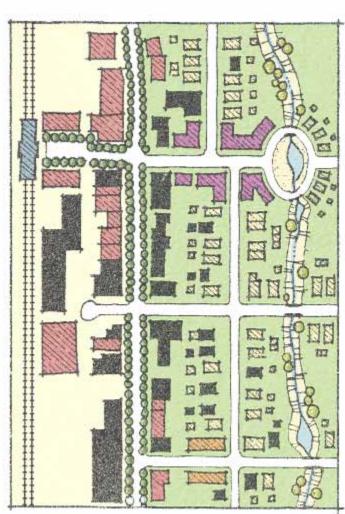


Pedestrian - Scale

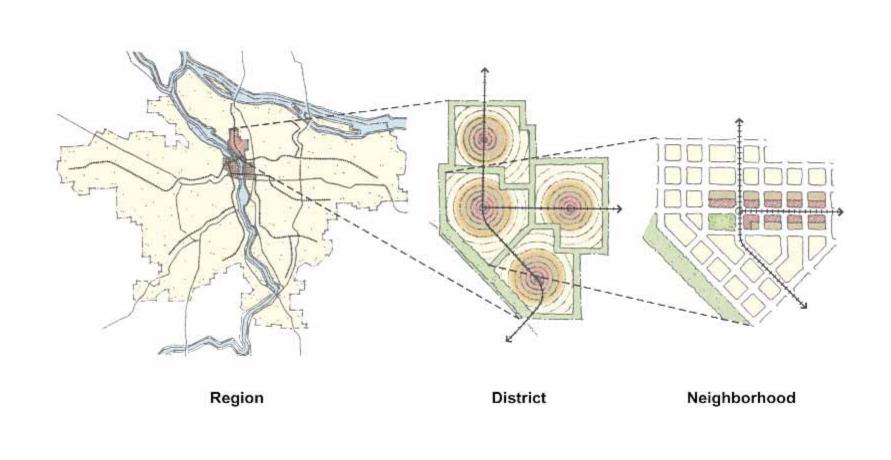
Conservation & Resoration

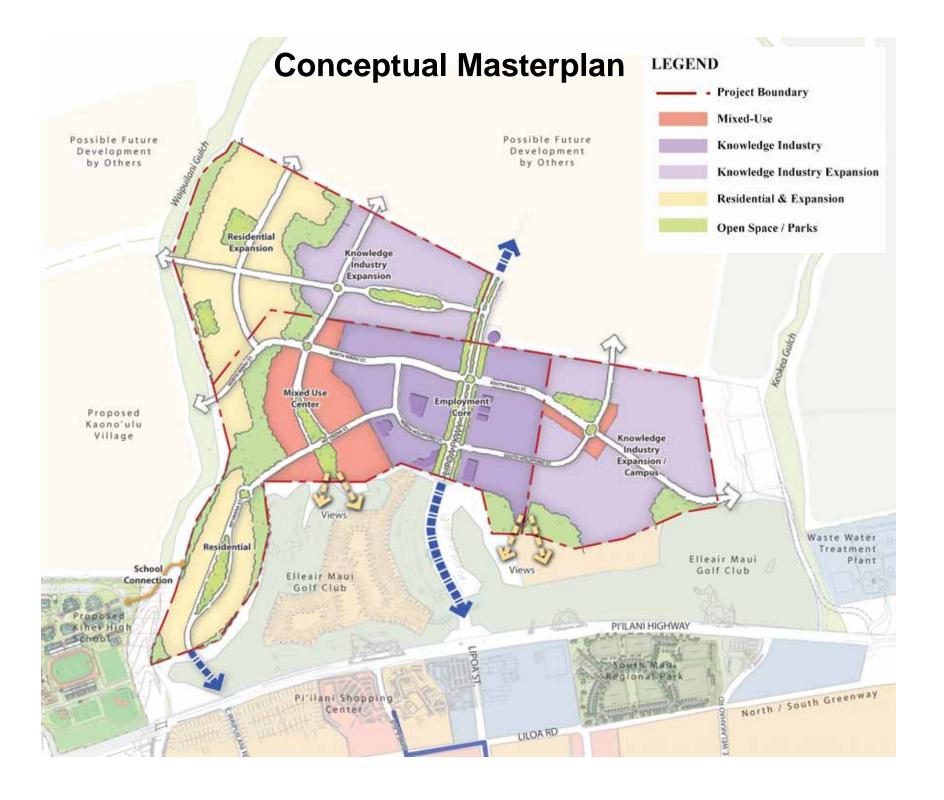


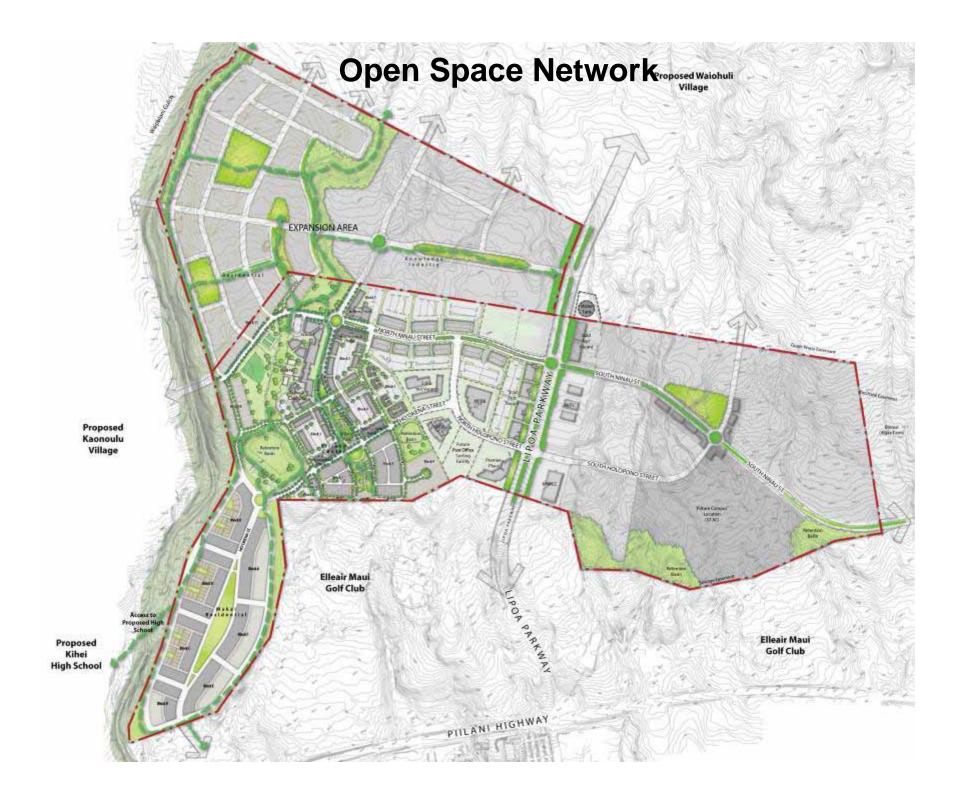


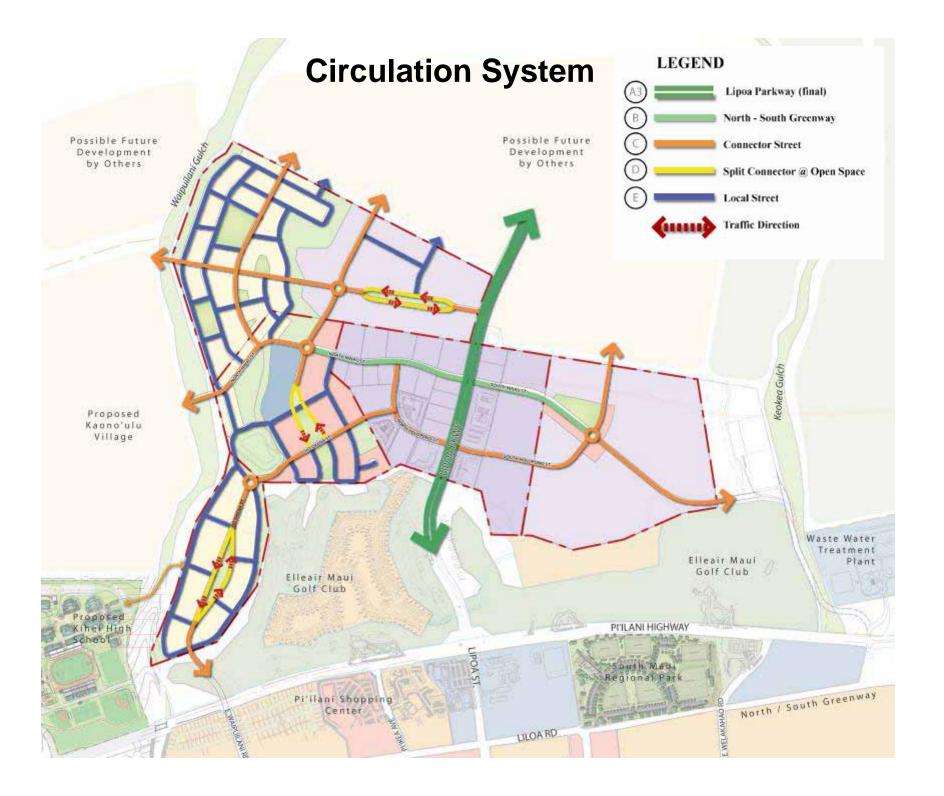


Connectivity











Maui Research & **Technology Park**

STREET TREE PALETTE

CIRCULATION LEGEND



STREET TREE PALETTE

Local Street



MONKEY POD SHOWER TREE GOLD TREE

PINK TECOMA FERN TREE FIDDLE WOOD

GOLD TREE JOANNIS PALM SHOWER TREE

MILO PINK TECOMA TULIPWOOD ORCHID TREE

MONKEY POD HAWAHAN KOU NORFOLK PINE SHOWER TREE

MAUI RESEARCH & TECHNOLOGY PARK Kibei, Maui, Hawaii

November 10, 2010

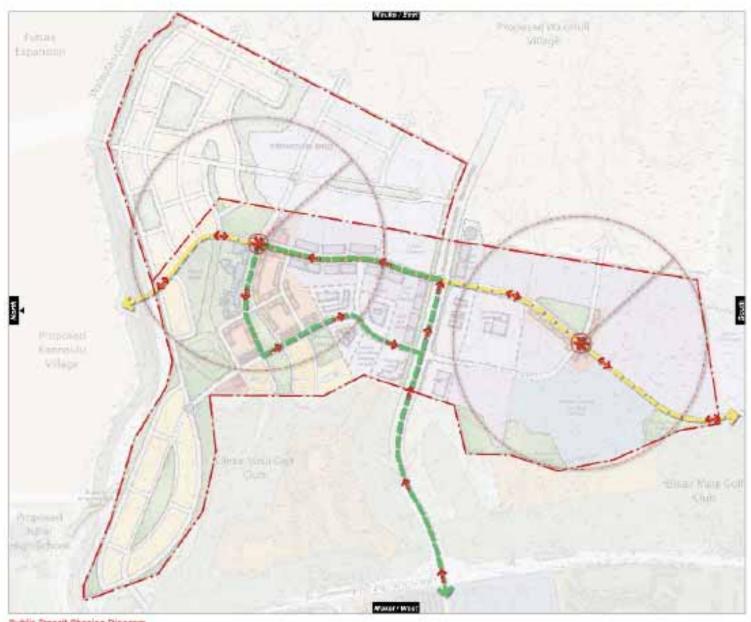






Mani R& TPartners, LLC

Calthorpe Associates Berkeley, California



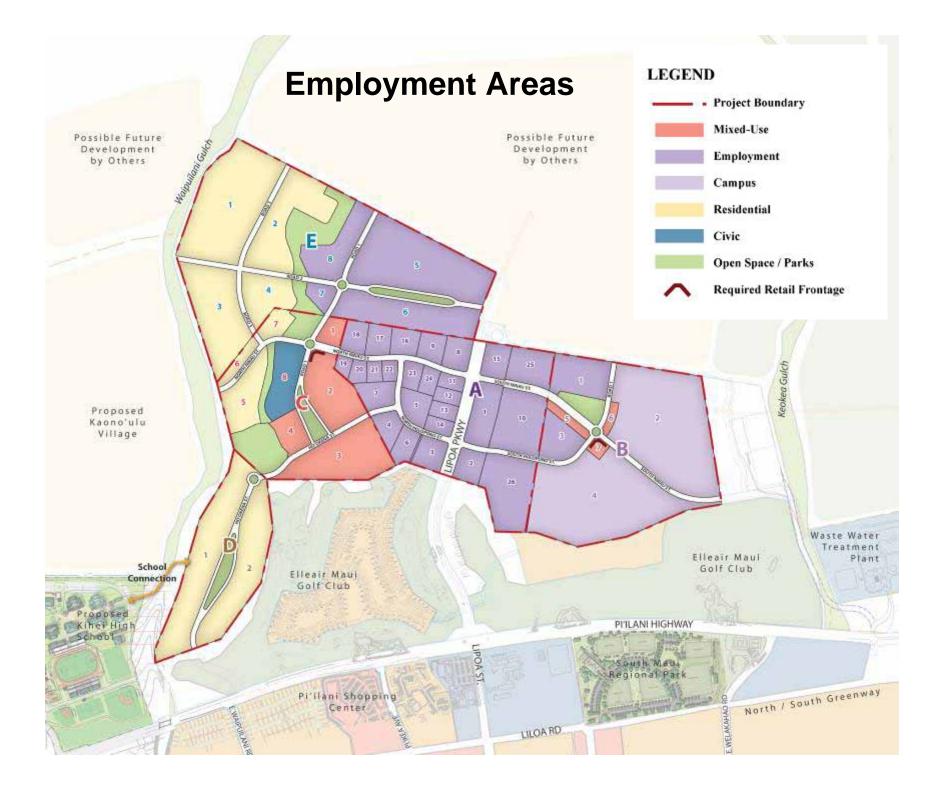
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Place 2 Install
Traffic Bircoles

Branet Nap

552,862

Public Transit Phasing Diagram



Option Land

700,000 Square Feet of Buildings

1,600 Employees

by Othera

Additional Core Employment
700,000 Square Feet of Buildings
1,600 Employees

Waste Water
Treatment

Current Employment in the Park

180,000 Square Feet of Buildings

400 Employees

Expansion / Campus

1,000,000 Square Feet of Buildings

2,100 Employees

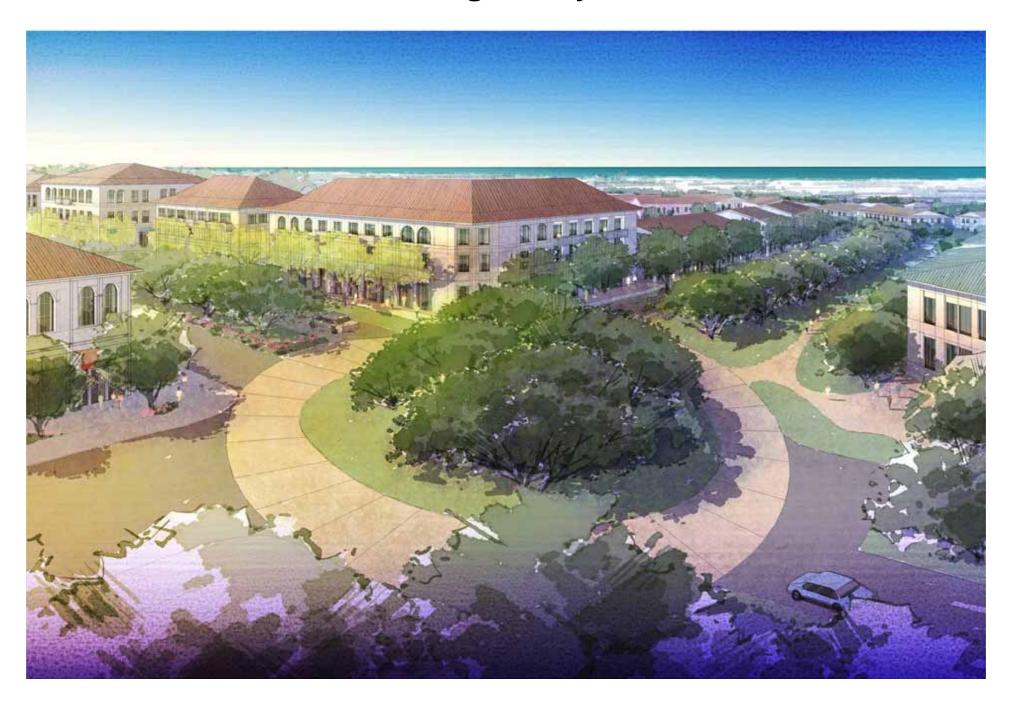
Research Park Expansion Area A



New Office Campus Center Area B



Village Entry

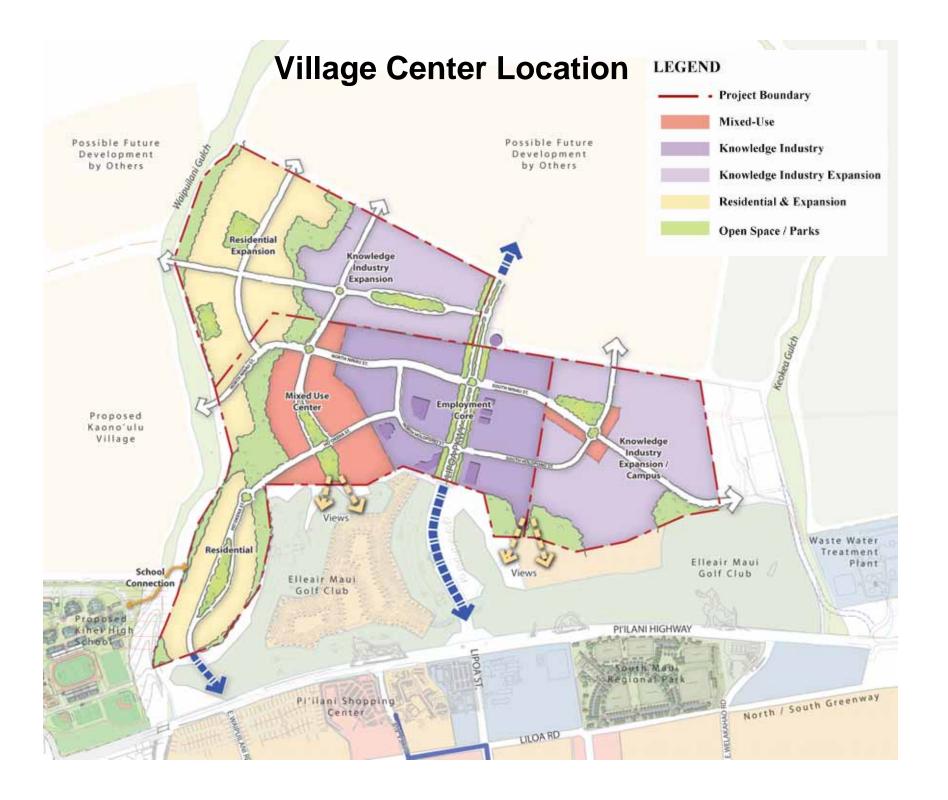




Business Hotel







Lahaina



Lahaina



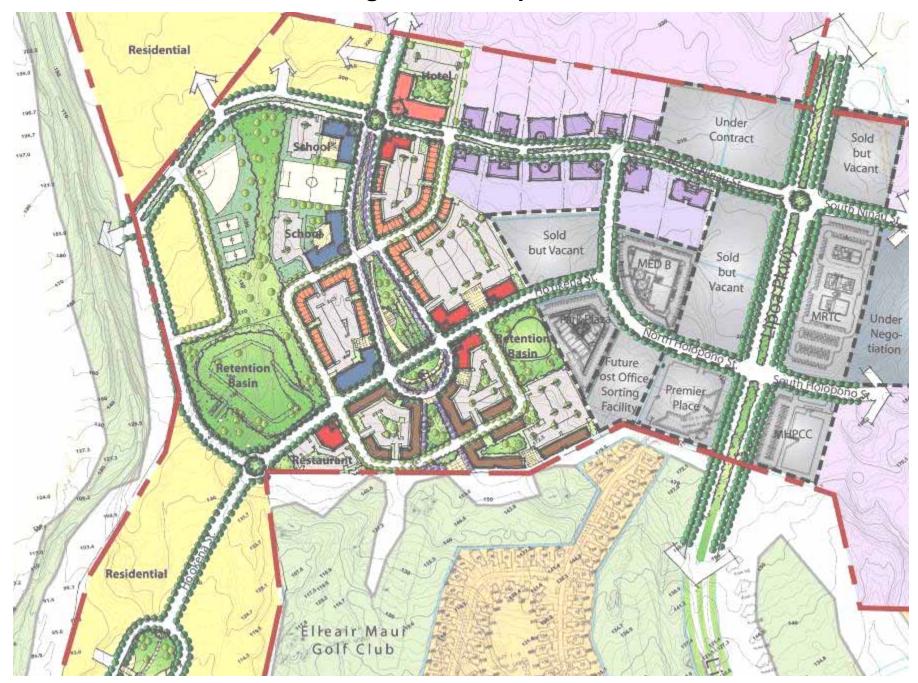
Lahaina



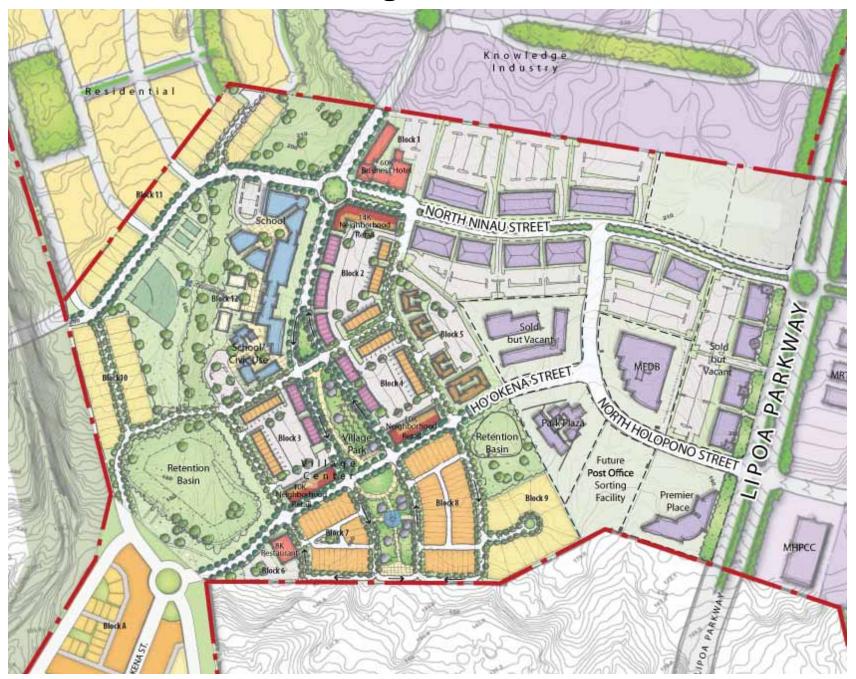
Village Center - Option A



Village Center - Option B



Village Center



Village Green





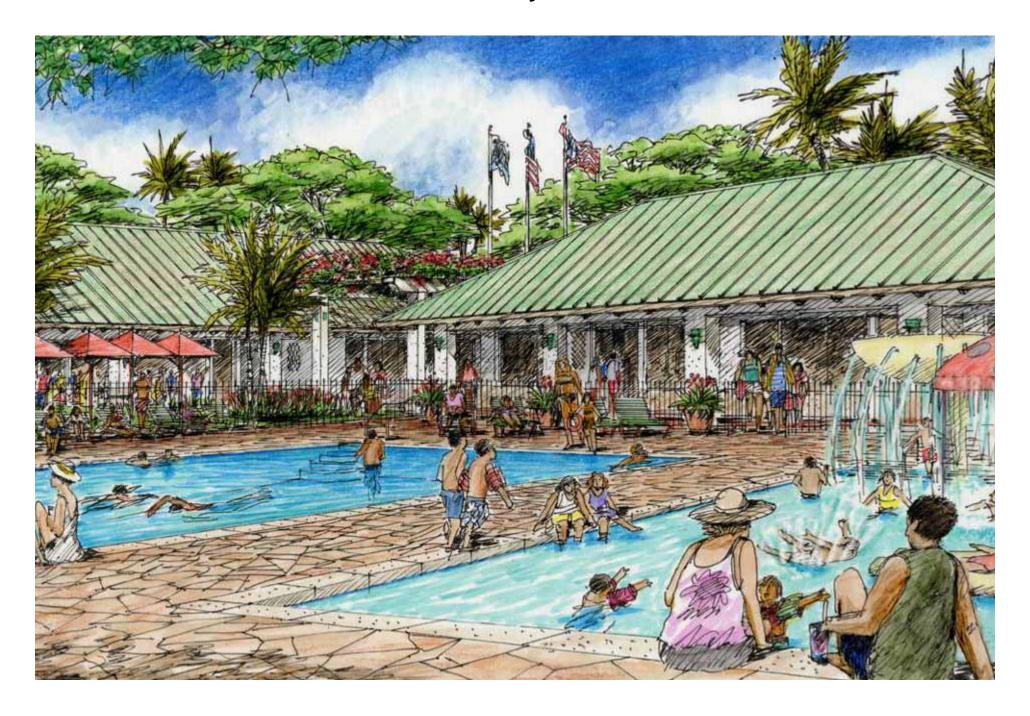
Village Center – Shops and Green



Village Center Shops and Restaurants



Community Center



Private and Charter Schools



Farmers Market









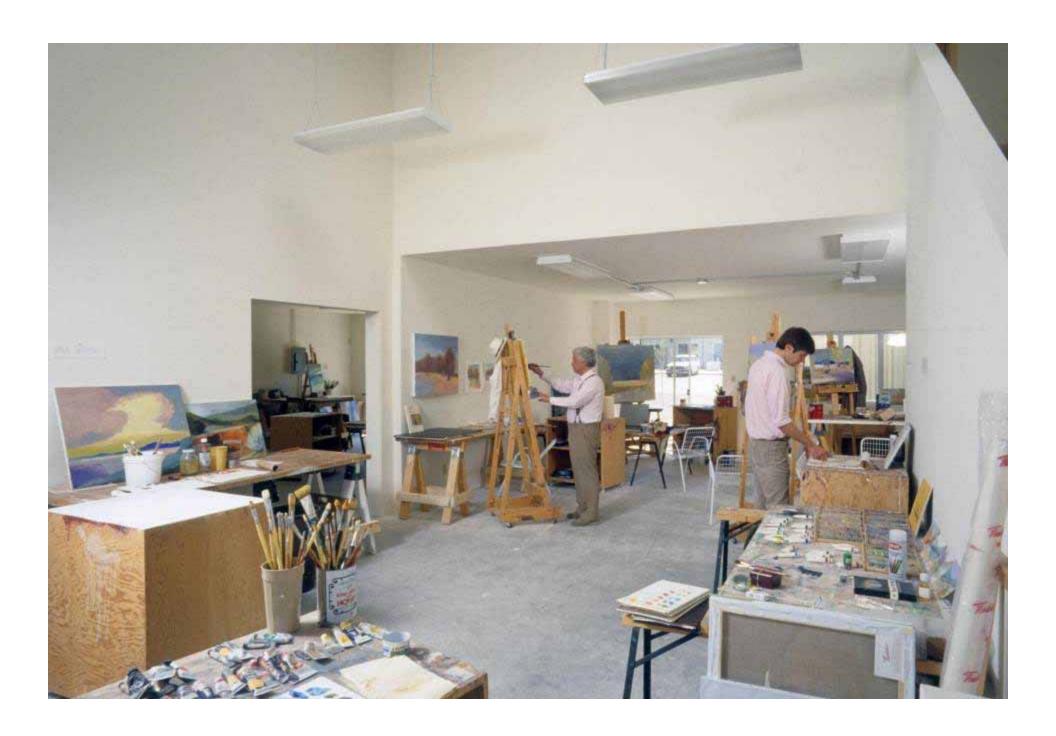
Kai Ani Village Mixed-use Development

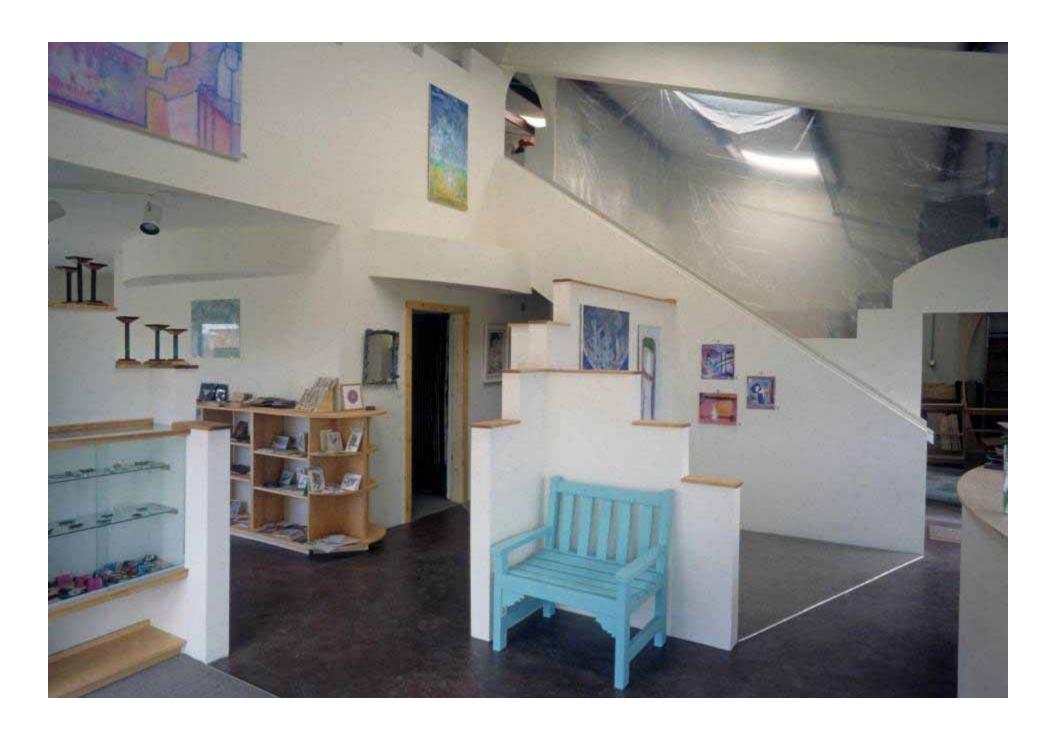


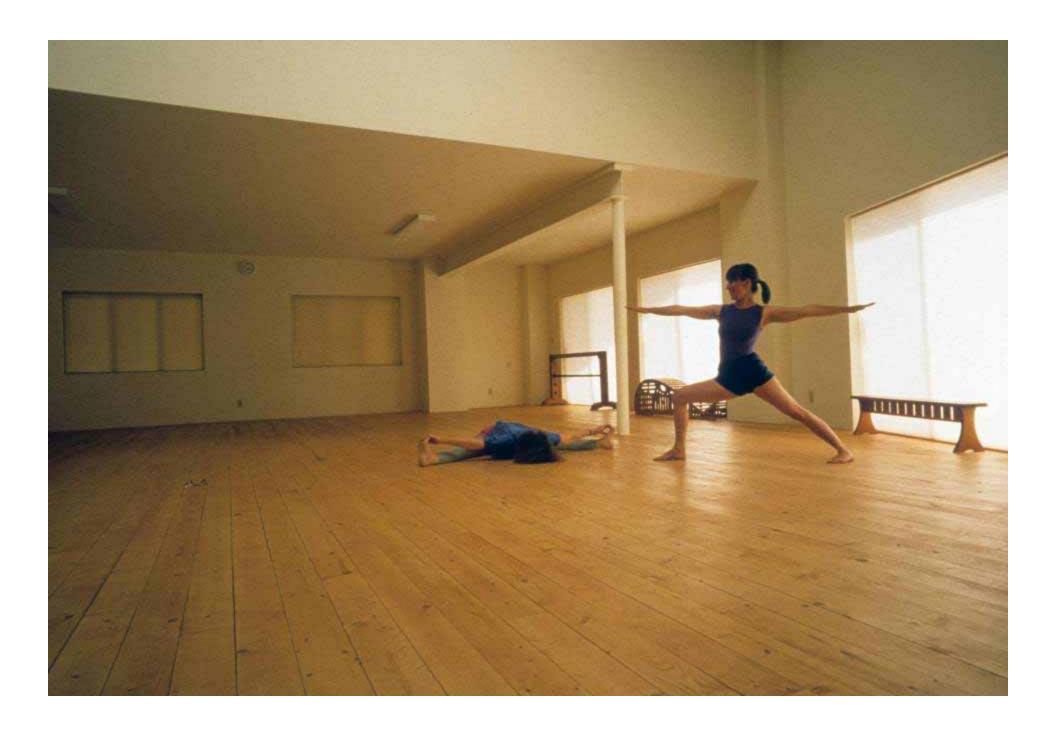
Live/Work Studios Santa Fe, NM



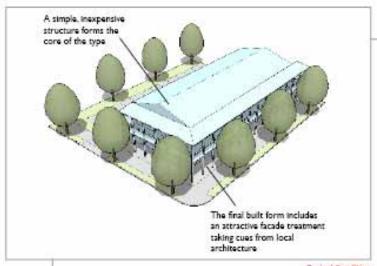








Flex Space

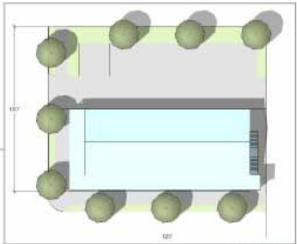


FLEX SPACE

Proposed Height (max.) 2 stories Total FAR (net) 0.5 - 0.8 Parking Access Rear drive

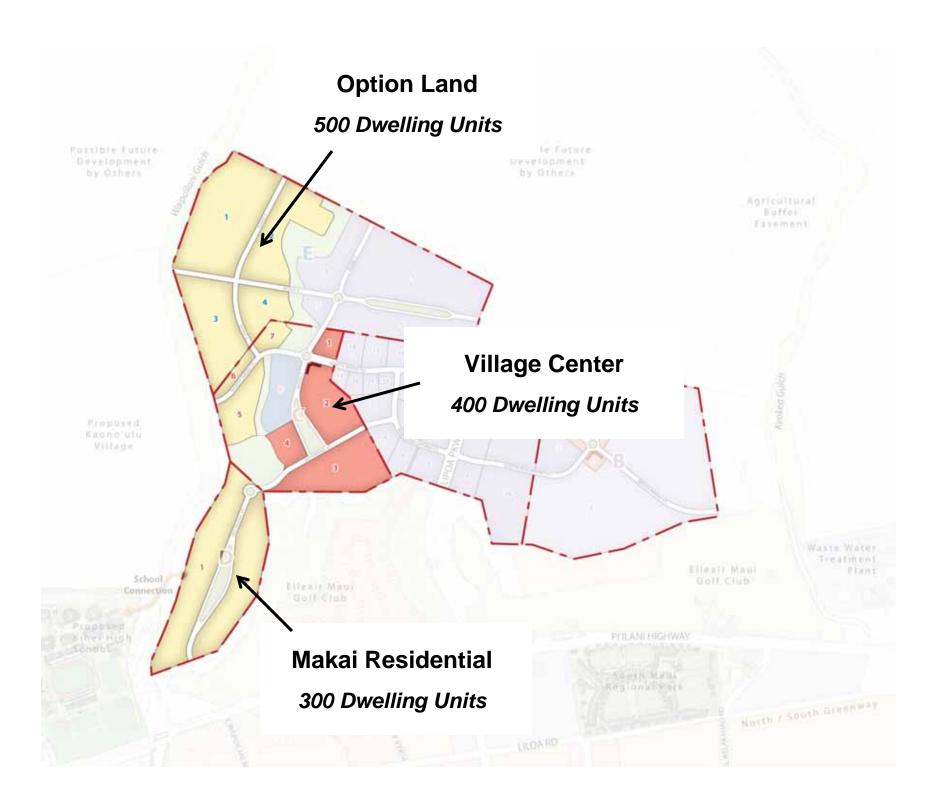




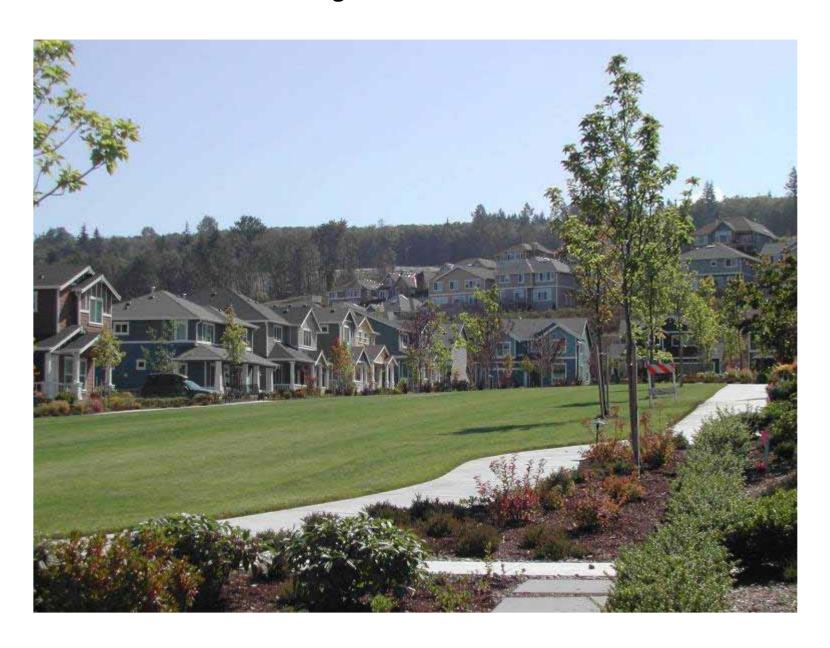


Typical Condition





Neighborhood Parks



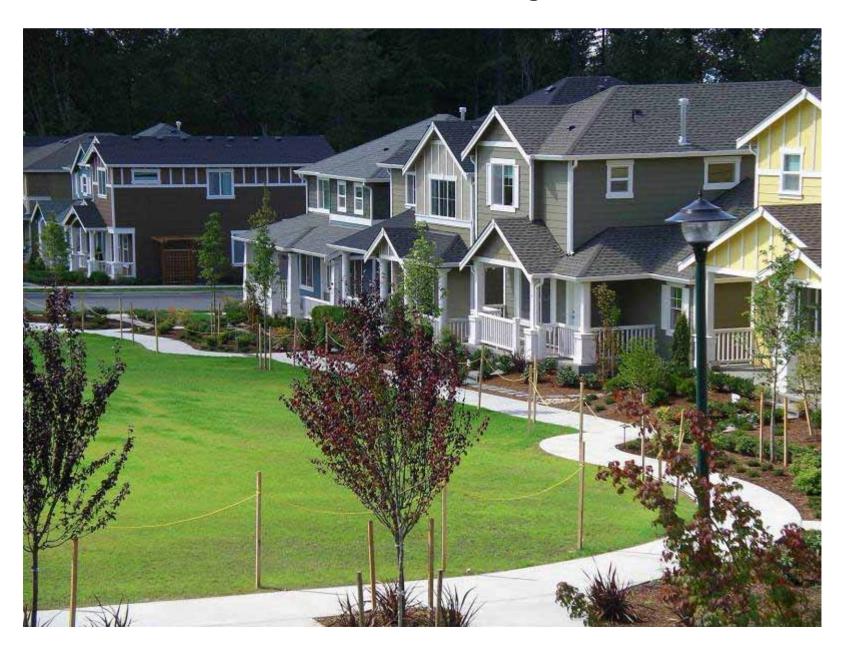
Pocket Parks



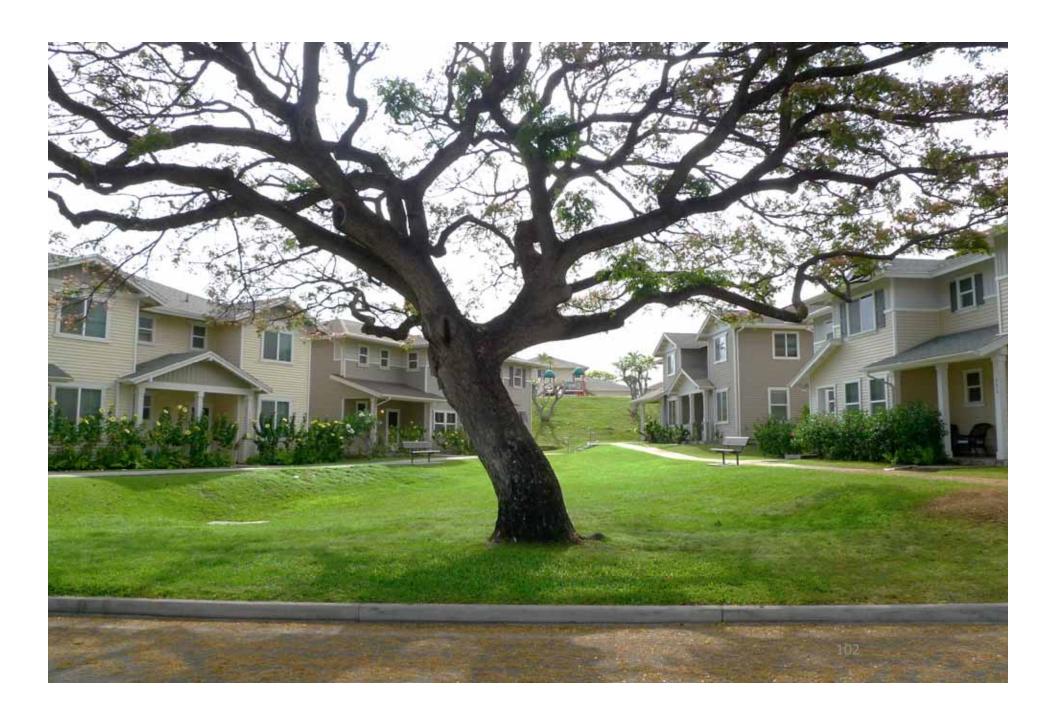
Hillside Green Court Housing



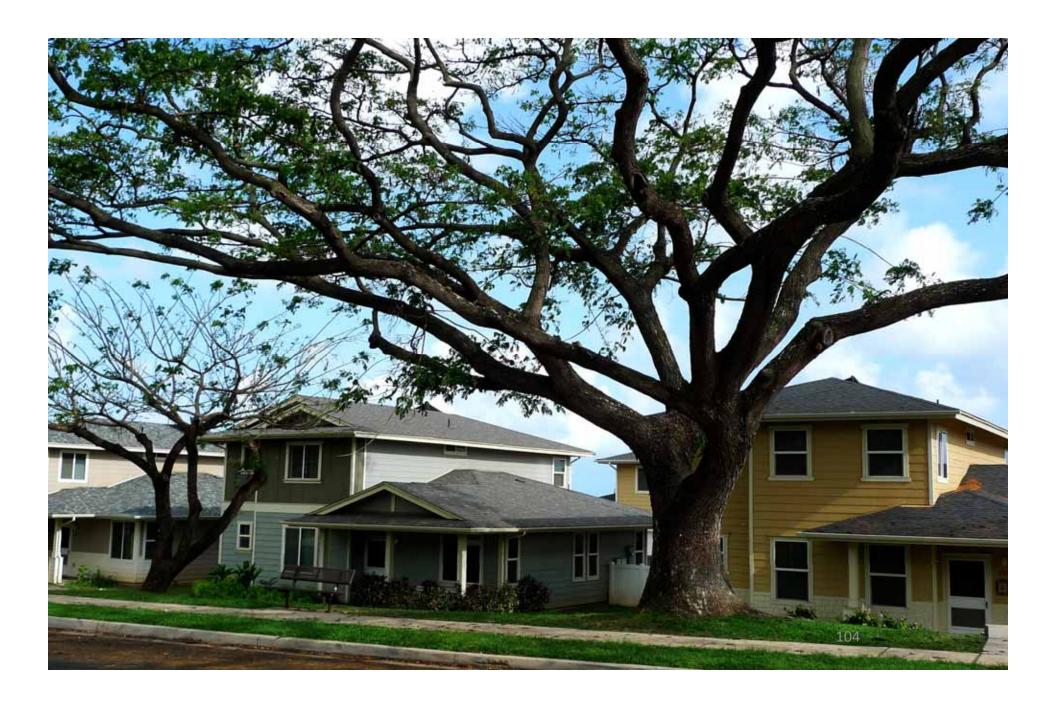
Green Court Housing







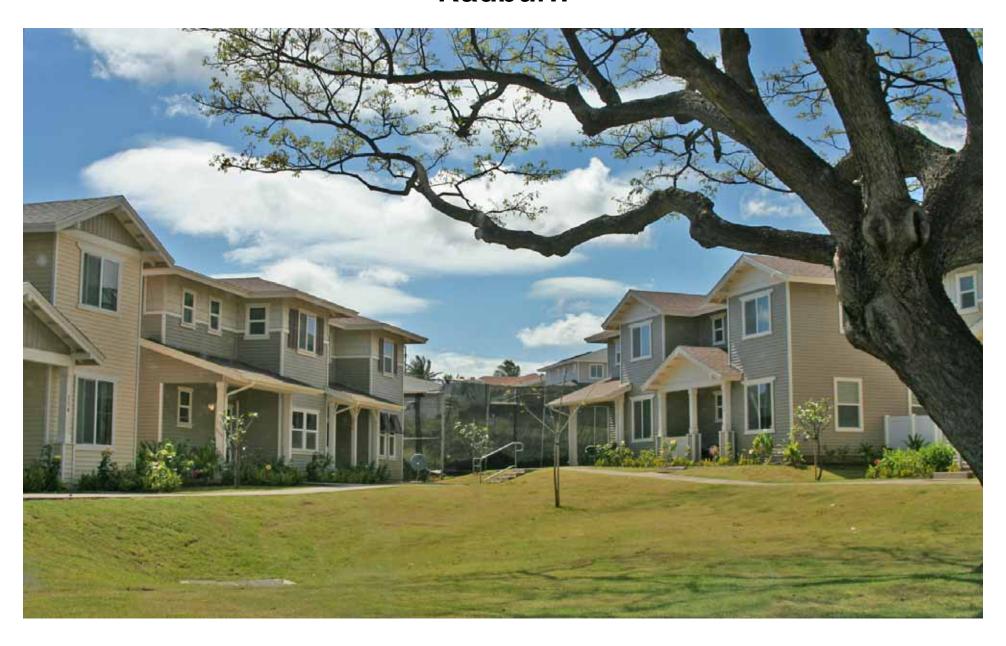




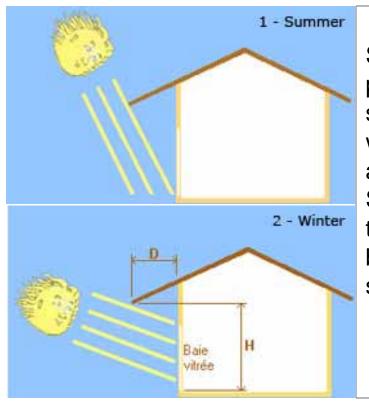
Radburn



Radburn



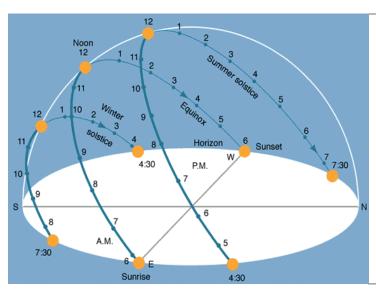
EXTERNAL SHADING



Shading shall be provided to block direct sunlight on all non-North windows between 9am and 3pm April to August. Shade length shall equal the distance from bottom window sill to shade top surface

Properly sized shading blocks direct light during the cooling season resulting in reduced cooling energy consumption and equipment size. During the heating the sun is low and will not be blocked.

LIMIT WEST FACING GLASS



Limit West Facing Glass

West facing glazing shall be limited to 20% of the total West facing wall area (assumes that 10% of West facing glass goes to North wall)

Late afternoon sun is still intense and also at a lower angle which will penetrate West facing rooms and add to air conditioning loads.
Reducing West facing glazing will reduce energy consumption and demand

DISTRIBUTED RENEWABLES - PV



Goal:

Provide roof mounted PV system equal to 100kW providing power to apartment building. (equal to approximately 9000 sqft) Offsets of carbon from centrally produced power (Saudi Arabia uses both oil and gas to produce power). Very visible statement of sustainability. Tried and tested technology with little maintenance required

DISTRIBUTED RENEWABLES – SOLAR WATER



Goal:

Each residence to be provided with a solar thermal heating system sized to offset 50% of the annual domestic hot water energy requirements (this is equivalent to a 4'x8' flat plate collector)

Well developed technology. Cost includes additional storage tank, collector, fitting and pipework. Offers carbon savings vs centrally produced power. Will reduce size and cost of water heater. Will reduce the size of gas or electricity infrastructure



Water Efficient Fixtures

- Achieve up to 20% reductions in water demand through installation of highly efficient water fixtures including
 - · Low flush toilets
 - Waterless and low flush urinals
 - Low flow showerheads and faucets
 - Efficient washing machines and dishwashers



Stormwater Treatment and Infiltration

- Polluted stormwater is captured, treated, and infiltrated on-site using Low Impact Development (LID) approaches including
 - Swales
 - Raingardens
 - · Sand filters, and
 - · Infiltration trenches
- Polluted stormwater is never discharged to the Arabian Canal
- Improves groundwater replenishment

TANKLESS WATER HEATER



Tankless Water Heater
- Install tankless water
heater for each residential
unit.

Reduces water consumption, spatial requirement for a normal water heater tank, and reduces energy consumption

RECYCLED WASTE WATER CONNECTION



All homes with exterior irrigation spaces shall be provided witha a connection to the recycled wastewater distribution system.

-All recycled wastewater shall be clearly marked in colored pipes.

-Recycled wastewater shall only be used in combination with sub-surface microirrigation in residential applications

Reduce irrigation demands in residential applications

6 - FORM BASED CODE

BUILDING SCALE

Building Scale Design Goals	X
Building Typologies	X
Relationships of Buildings to the Street	X
Relationships of Buildings to Neighbors	×
Vehicle Access & Storage	X
Architectural Guidelines	х
Universal Design	X
Green Building Standards	X

BUILDING TYPOLOGIES



Building typologies are used in this plan to set parameters for development on the private parcels. The typologies which follow show a wide variety of building types, including many different land uses. All of these types have in common the treatment of the public space as a valued and important realm. Rather than allowing buildings to be hidden behind parking lots or large garages, the intent is to present a human face to the street. Such buildings create a more lively and vital common space, and make an area safer with "eyes on the street." All buildings will have prominent entrances to the street, allowing easy access from street side parking and for pedestrians, bicyclists and transit users.

These typologies are generalized massing diagrams. Final architecture should be culturally and climatically appropriate to Maui, and should fulfill the intent of these guidelines to create a high quality public realm.





Building Typologies Summary Matrix

UILDING TYPE	OFFICE/ RESEARCH and DEVELOPMENT	OFFICE OWN RETAIL	RETAIL	FLEX SPACE	RESIDENTIAL over RETAIL	MULTI-FAMILY
	2222	343	3223		300403	0018
OVERALL ot Size (typical)	75,000 sf	70,000 sf	23,400 sf	12,000 sf	49,400 sf	38,250 sf
AR (net) min/max)	0.3 - 0.65	0.5 - 0.65	0.3 - 0.4	05-08	N/A	N/A
Init Size min./max.)	N/A	N/A	N/A	1,000 sf - 2000 sf	400 sf - 1000 sf	400 st-1,000 st
torius (max.)	3 stories	3 stories	2 stories	2 stories	3 stories	3 stories
Junsity (net) dw/sc] (min/max.)	N/A	N/A	N/A	15 - 20	18 - 30	28 - 40
nrking Access	Alley, side of front drive	Alley, side of front drive	Alley, side of front drive	Rear drive	Alley, side of front drive	Alley, side of front drive
ETBACKS				-		
ront Setback min./max.)	0-15	0-15	0-10	0-10	0-10	5-15 ft

Entrance Entries

OFFICE over RETAIL

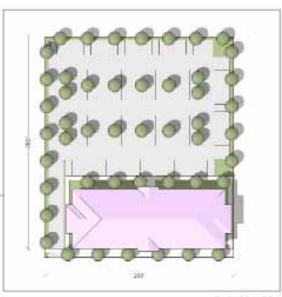
Proposed Height (max.) 3 stories Total FAR (net) 0.5 - 0.65

Parking Access Alley, side and front drive

Typical Condition

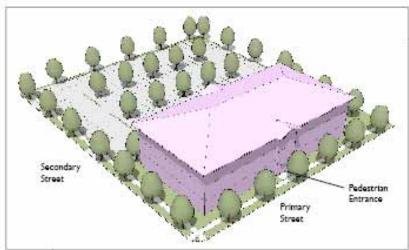






Typical Condition

Commercial



Typical Condition

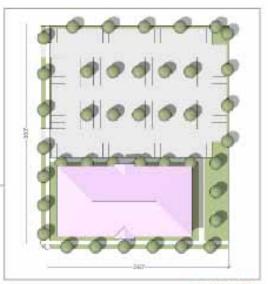
OFFICE / RESEARCH & DEVELOPMENT

Proposed Height (max.) 3 stories Total FAR (net) 0.3 - 0.65

Parking Access Alley, side and front drive







Typical Condition

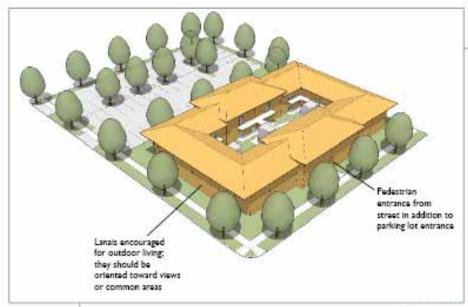
BUILDING TYPE	FOUR-PLEX	TRI-PLEX	TOWNHOME	SINGLE FAMILY GREEN COURT	SINGLE FAMILY SMALL LOT	SINGLE FAMILY LARGE LOT
			20	8		
VERALL et Size (typical)	3,000 sf	2,250 sf	2,160 sf	1,900 sf	4,050 sf	6,000sf
AR (net) min/max)	N/A	N/A	N/A	N/A	N/A	N/A
Init Size min./max.)	500 sf - 1,100 sf	500 sf - 1,100 sf	900 sf - 1,400 sf	800 sf - 1,400 sf	1,200 sf - 1,800 sf	1,400 sf - 2,000 sf
itories (max.)	3	3	3	2	2	3
Pensity (net) du/ac) (min./max.)	56 - 60	56-60	18-42	22 - 26	7-12	5 - 10
erking Access	Alley	Alley	Alley	Alley	Alley or side drive	Alley or side drive
ETBACKS						
rent Setbock min./max.)	5 ft - 12 ft	5 ft - 15 ft	5ft-11ft	5 ft - 10 ft	5 ft - 10 ft	5 ft - 15 ft

GREEN COURT TYPOLOGY



The green court is an arrangement of housing around a central green space. Individual home lots are relatively compact, with most open area in the shared area. Parking access is through alleys, leaving a large, quiet, and protected pedestrian zone. This typology has proven popular in many places and appeals to a wide range of people, from families with children to older people and professionals looking to minimize time spent on yard maintenance.

Residential



Typical Condition



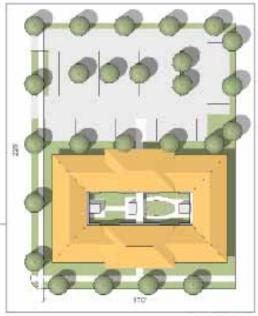


MULTIFAMILY

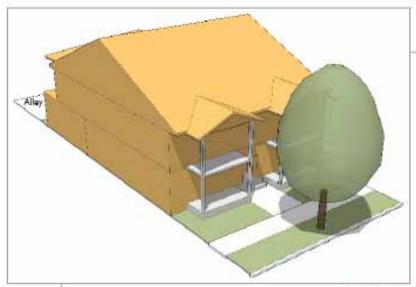
Proposed Height (max.) Density (min.-max.) Parking Access

3 stories 28 du/ac - 40 du/ac

Alley, side and front drive



Typical Condition



Proposed Height (max.) Density (min.-max.) Parking Access

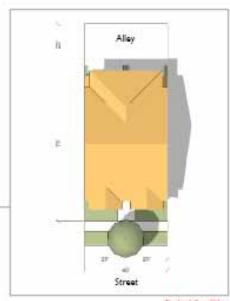
FOUR-PLEX

3 stories 40 du/ac - 60 du/ac Alley









Typical Condition

ARCHITECTURAL GUIDELINES

Commercial, mixed-use and residential buildings within the Maui Research and Technology Park will have architectural characteristics which are culturally and environmentally appropriate to Maui's traditional buildings and the project's climate. Inspiration should be taken from pedestrian-scaled areas in the island's historical towns such as Wailuku, Lahaina, and Paia. The intention for the architecture at the Park is to reflect but not duplicate this architectural tradition. Each project should bring architectural creativity that honors local architecture yet is unique in this urban setting.

Overall, buildings in the park should accommodate a mix of building types and architectural styles while creating a cohesive sense of place through building design that expresses the unique character and identity of the Park as a state of the art facility located in the Island's unique setting. Buildings should be in scale and character with pedestrian-oriented activities. Materials, especially for portions of buildings near the pedestrian realm, should use materials of quality, durability, and scale appropriate to pedestrian activity and contact. Buildings should serve as models of sustainability.







Stores in Holupion Town

Building Mass & Proportion







Multifamily building types



Example of scale for street level retail

Projects within the Park shall be characterized by a pedestrian emphasis in their scale, level of detail, and variety of materials. Monolithic forms should be avoided and the addition of scale-giving elements should be used to reduce the apparent scale of larger buildings. Building masses, especially larger commercial, mixed-use and multifamily buildings, should be articulated and organized with a variety of composite forms. While the physical scale of buildings will vary with building size, "user scale" should be consistently intimate.

While individual buildings are encouraged to differ significantly in form, color, and material, all buildings should emphasize common elements, such as consistent horizontal trim lines, roof forms, and awning heights. The design of elements such as awning locations and roof



Example of scale for street level retail

heights will be determined based upon the usage and requirements of each building type. Mixed-use buildings, multi-family and single-family buildings will be differentiated through the variation of these elements.

For larger multi-level buildings, emphasis should be placed on distinguishing three-part massing with distinctive base, body, and roof forms. The care of the building base design should be apparent, including the use of awnings, arcades, canopied entry ways, courtyards, and transparent panes of glass at the building base. Covered pedestrian walkways should be provided whenever possible to create an inviting place for people.

Facade Articulation



Example of appropriate articulation for a mixed-use building

Facades should meld the architectural characteristics of Maui's historic buildings with modern woods and sustainable design strategies. Facades should also reflect the life of the users and residents. Blank, expressionless facades are discouraged. Lively, animated facades are encouraged.

Project designers are encouraged to use a wide array of details, patterns, textures, and decorations to enhance the facades of their buildings, but must always keep in mind that buildings should not alienate themselves from the development as a whole.

Architectural details, such as balconies, pop-outs and window planters are encouraged. Integration of decorative bands will help to break down scale of larger buildings,



Example of using entry lands and balconles for bringing scale to large

as monolithic forms should be avoided. Details such as wood rafter ends, supporting members, columns, hand rails, ventilation grills, capitals and cornices provide a textural quality and charm.

Parking structures must have visually interesting facades, preferably similar to retail or office buildings. The parking structure facades should be of comparable detail and quality to adjoining buildings.







Different building prototypes shall have appropriate focade articulation to allow for a variety of architectural characters

Roofs



Parapet False-Fronts in Local Downtowns



Single-Pitched Hipped and Gabled Roof in Holualoa

Roofs should be reflective of traditional forms. They should generally be articulated rather than monolithic so as to provide richer roofscapes. A variety of roof shapes, forms, and sizes are encouraged in the Park.

Roof Forms

Roof forms of large buildings should be broken into smaller forms. Where possible, variations in roof profile and parapets shall be used to emphasize entries and create interest on building facades. Gable and hip roof forms on residences should be used in combination for articulation when feasible. Varied roof forms should also be used to provide variation along the streetscape when similar units are adjacent.





Multi-Family example with roof forms (above) and Flat Roof with Parapet Wall (below)

Roofs with false-front parapet walls have been historically used in commercial building in local towns and are appropriate for use on commercial and mixed-use buildings. Mansard roofs are appropriate especially on large multi-family, mixed-use and commercial buildings to reduce the height of roofs. The mansard roofs also provide flat roof areas for solar panels that can be screened by

The design of the roof form and other related elements such as roof material, color, trim and lighting should be an integral part of the architecture. Rooftop equipment shall be screened from view of public streets and open space by architecturally integrated screening elements.

Exterior Finishes



Variety of wall materials, textures and treatments used modernly



Traditional use of framing and wall material



Variety of colors and finishes break-down the scale of buildings

Exterior Wall Design

To reduce scale, exterior wall surfaces should be broken down by the use of different materials and treatments. Wall treatments such as changes in material, color, texture, and plane or parapet height shall be used to provide variety and break up large uninterrupted surfaces.

The use of horizontal or vertical wood siding, ship-lap, vertical board and batten siding or wood shingles is appropriate for the aesthetic of the Park. Plaster is also allowed. However, it should not be the dominant finish but instead used in contrast with other materials.

Fenestration including windows and doors shall be incorporated into facades facing public streets. At least 25% of the total building facade length facing a public street shall be fenestrated. Where spaces which do not



Variety of wall materials, textures and treatments used traditionally

allow fenestration occur at these locations, other forms of articulation which provide visual variety shall be incorporated at a minimum interval of 40'.

Ground-level retail in mixed-use building may be predominately store-front glass systems. Upper residential floors of mixed-use buildings should be clad with more traditional residential materials. Wall treatments for larger single family residences and multifamily buildings should be broken down where ground level walls might have a stucco-like character and upper levels may be typically more board and batten and wood-like. Within groupings of homes, a variety of wall materials, textures and treatments should be used to provide variety.

Lanais & Stoops



Stoop used for front entry to a local home

Lanais are a uniquely Hawaiian architectural form. Along with stoops - covered entryways that are either recessed into or protrude from facades - they should feature prominently in the residential areas of the Park. Not only can their design give a sense of individuality and variety to similar home plans, but they serve an important function as intermediate spaces between the public and private realms. Entry lanais are a place of receiving guests and meeting neighbors.

The steps and railings of lanais and stoops provide a physical separation and a psychological sense of protection, creating a comfortable place from which to view and interact in the street scene. As bridges between the inside and outside, they also provide shelter from the elements, offering a dry place to look for keys on rainy days, or a shaded place to sit on warm days. Residences should have lanai spaces off of the kitchen or family room fronting private yards when possible. Lanais should be large enough for outdoor sitting and dining.

Standards

All street-facing ground floor units in multifamily build-

ings shall have individual entries to the street. It is encouraged that ground floor units that do not face a street have individual entries to a walkway or court.

In general, all single-family homes shall have an entry lanai where possible.

Homes without lanais shall have stoops.

Homes on corner lots shall have lanais (wrap-around lanais are encouraged).

To differentiate home plans, lanais and stoops should vary in size, roof pitch, materials, and style.

Where possible, lanais should be elevated from grade to provide a physical transition between public, semipublic, and private zones.



Front entry lanal for siting with balcony



Trellis entrances for Mixed-Use buildings



Lisable, street-facing lanel

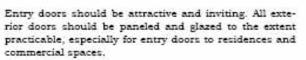


Stoop entrance for Multi-family building

Doors



Example of residential entry doors



Glazing on entry doors should utilize small light panes. Screened doors may be used for through ventilation especially on residences.

Doors should be painted colors that contrast with adjacent wall surfaces of the homes or buildings. Trims around doors should be broad and painted to contrast with adjacent wall surface.



Example of retail doors



High glass doors with metal frames in Mixed-Use building



Example of retail doors

Windows



Windows are to be traditional in shape and form. Double hung, casement and awning windows may be used, but jalousie windows are discouraged.

Broad "picture windows" are discouraged. Multiple windows should be used instead of large picture windows in areas such as living rooms where large penetrations are desirable.

Window shutters, eyebrows, sunshades and screens are encouraged. Detail elements, frames and exterior screens for windows must be appropriately colored.

Windows shall be shaded by some form of architectural treatment as appropriate based on their relative solar orientation. Shading on southeast to west facing facades is the highest priority. This can be accomplished with either added shading elements, deep overhangs, or re-



Example of local starefronts using double-hung windows

cessing windows into thickened exterior walls.

In retail buildings, glazing within a facade which adjoins a public street, pedestrian walk or bikeway shall be clear, untinted glass.

Mirrored glass is not permitted.



Trims highlighted with a bright white



Screenshodes

Decorative Elements & Details



Decorative Braces and Window Shades

Decorative elements and details which give projects individual character and human scale should be incorporated into the buildings. These details may range from exposed timber, trims, rafter tails, braces, or structural systems, to vents, exterior lights and sconces.

Decorative grills, patterns, trims, and other elements which reflect cultural or naturalistic patterns of the island are encouraged. Patterned grills in walls and roof vents are encouraged. Exterior hand railing that goes beyond vertical pickets is encouraged.





Variations in Ralling Design



High glass windows for lighting in Office building

Color





Corrugated red metal roof (above) and Green metal roof accents stone church in Holupion (below)

Wall Colors

A variety of color is encouraged within the range of earth tones while more vivid colors can be used in the mixeduse center. Traditionally, the vivid colors used in town centers ranged from deep brown, mustard and red to various greens and tans. An attractive, strong composition of compatible colors is encouraged.

Trims and Accent Colors

Typically, color is used to highlight and differentiate the trim from the building. The combination of several colors on individual facades is encouraged with the minimum requirement being that the exterior wall and trims be differentiated.





Earth Tones with Vivid Use of Color on Sunshades and Shutters. (above) and Vivid reds and greens used in local towns (below)

Roof Colors

Roofs are often colored if they are made of metal. Roof materials and colors shall complement the colors and materials of the structure to which they are attached. In general, roof colors should be earth tones in the medium range. Accent colors may be used.



Good combination of materials and colors for more attractive facades



Color palettes shall promote variety even within same building groups.

Maui Research & Technology Park

