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# Land Use Forecast

*Island of Maui*  
*Maui County General Plan 2030*

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*Prepared by*

*PlanPacific, Inc.*

*Prepared for*

*The County of Maui*



*Technical Resource Study*

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*November 2006*

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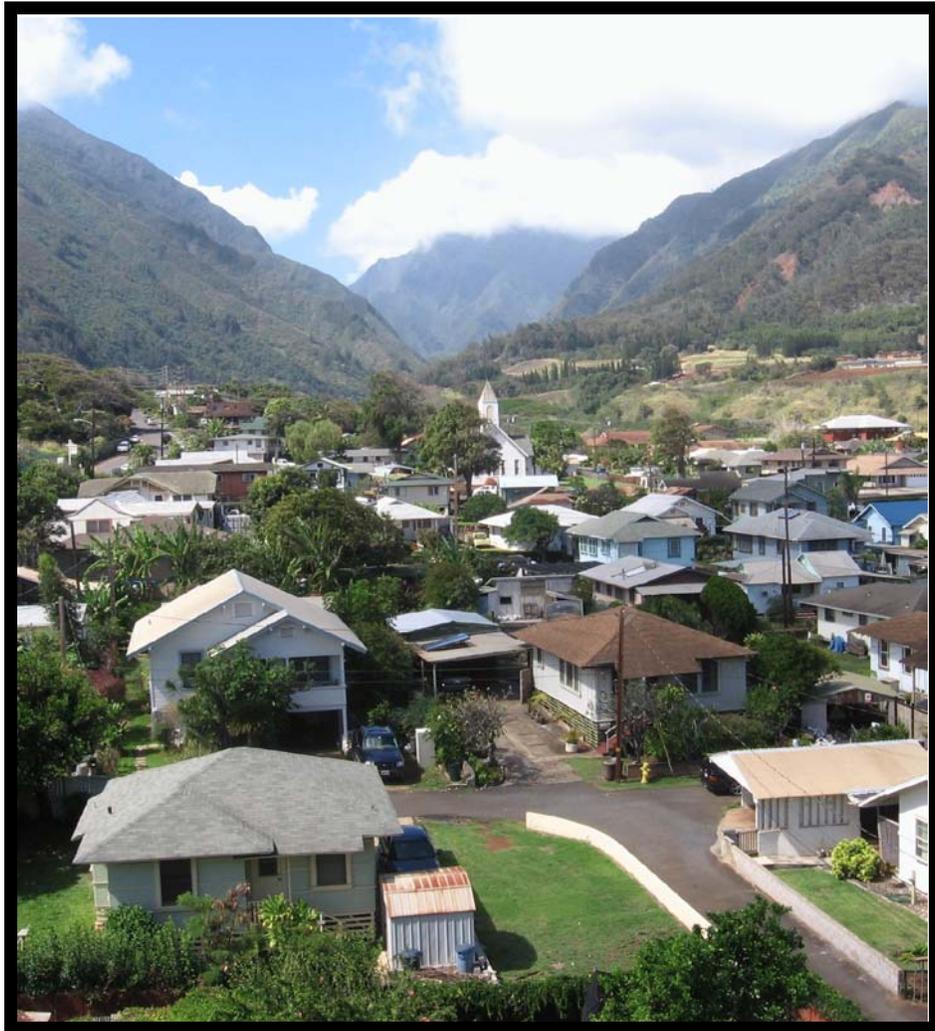
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# 1. INTRODUCTION

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# 1. Introduction

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The Maui Island Land Use Forecast is a technical study intended to support the formulation of the Maui Island Plan, a new regional element being prepared as part of the Maui County General Plan 2030. The Land Use Forecast compares the supply of land available for urban development to the demand for future land uses. The forecast of demand is based on the Maui County Socio-Economic Forecast Report, also a technical study supporting General Plan 2030. Both forecasts look to a 2030 planning horizon.

## **Purpose**

The purpose of the Land Use Forecast is to estimate the amount of additional urban-planned lands needed to accommodate the population and economic growth projected for Maui Island to the year 2030. The Land Use Forecast is an information tool. It presents “baseline” projections that assume the continuation of existing conditions at current rates, ratios, and densities.

The Land Use Forecast is not County policy, nor should it be used by itself to determine County policy. In fact, through the General Plan (GP) Update process, the County may choose to adopt land use policies that differ from the numbers presented in the Forecast. For example, the Island Plan may call for different densities for new development or different distributions among regions and between urban and rural areas.

## **Organization of the Report**

This Introduction chapter describes the components of the Land Use Forecast and the general methodology used to prepare it. It also describes Forecast outputs and the sources of information used.

Chapter 2 summarizes information from the Existing Land Use Database and briefly describes development of the prototype ELUD in 2005.

The final three chapters encompass the chief elements of the Forecast:

- Chapter 3 – Residential land uses.

- Chapter 4 – Resort land uses
- Chapter 5 – Commercial and Industrial land uses.

## 1.1 COMPONENTS OF THE LAND USE FORECAST

The best way to understand and use the Land Use Forecast is to understand its components. The components that make up the Land Use Forecast also reflect the “steps” that were used to arrive at Forecast results.

### Land Use Demand

The Land Use Forecast translates projections of growth in housing units, visitor units, and jobs into projections of land area needed to accommodate that growth. The underlying assumption is that we can use general factors to estimate “demand” for different land uses, for specific types of jobs and units. Based on the Socio-Economic Forecast, the Land Use Forecast projects how new land development will be distributed among the Community Plan (CP) regions, according to the projections in the Socio-Economic Forecast report.

The demand for land area to support different types of land use activities is called “Land Use Demand.” The Land Use Forecast identifies Land Use Demand for the urban land uses as shown in the table below. The table also indicates how the socio-economic projections are

<i>Growth in...</i>	<i>Creates demand for land in ...</i>
	Land Use Category
<b>Housing Units</b>	<b>-Single-Family Residential</b>
	<b>-Multi-Family Residential</b>
<b>Visitor Units</b>	<b>-Resort (includes hotels, resort condominiums and timeshares)</b>
<b>Jobs</b>	<b>-Commercial (office and retail) land uses</b>
	<b>-Industrial land uses</b>

linked to land use demand. For example, future projections in the number of housing units needed to support a growing population would result in a demand for single-family and multi-family residential units.

### **Land Supply**

The Land Use Forecast assesses the existing supply of land available to accommodate the demand for future land uses. It consists of lands that are already planned for urban development but have not yet been developed. Lands planned for urban development are those shown on the Community Plan maps, including Project Districts. Land supply numbers address the question: If no changes were made to the existing Community Plans, how much growth could be accommodated? Another name for this is “build-out.” It should be noted that the supply consists of lands that have Community Plan designation and that may or may not have requisite zoning.

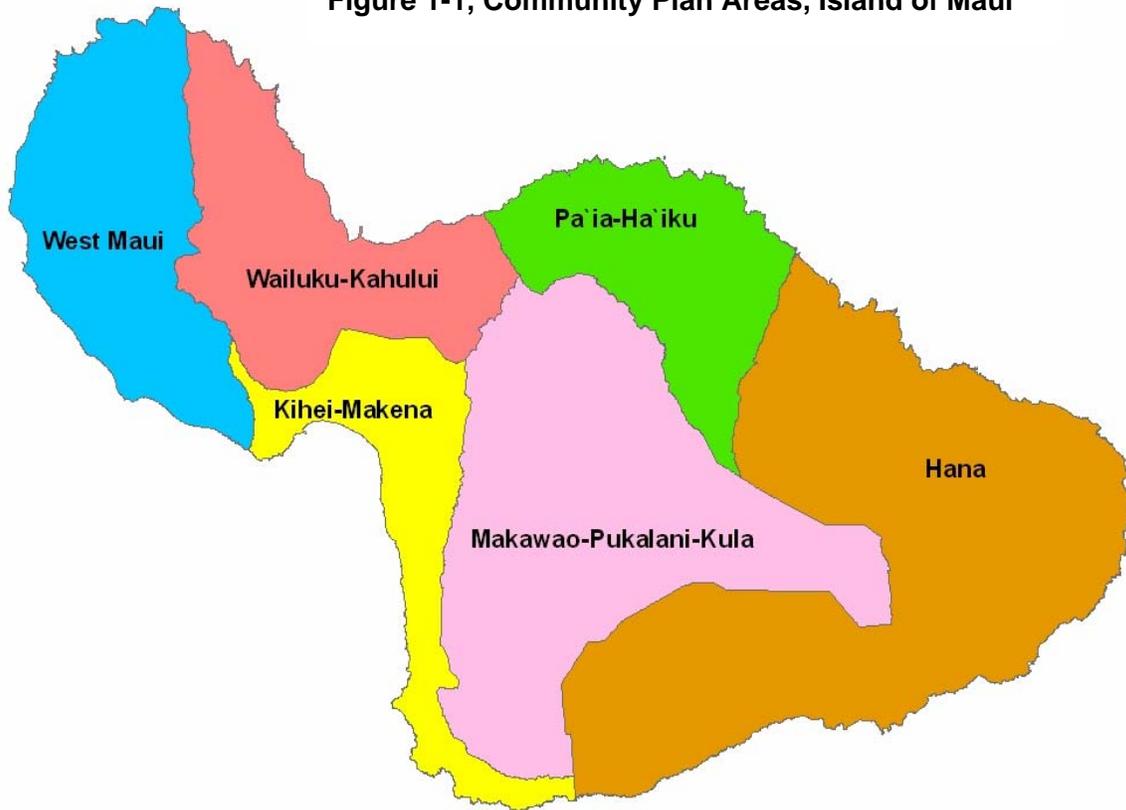
### **Comparing Supply to Demand**

The final step in the Land Use Forecast is the comparison of demand to the supply of developable lands. Comparing supply to demand indicates whether urban-planned lands are sufficient to meet demand over the planning period. If demand exceeds supply, the analysis indicates how much additional land is needed in each of the general land use categories.

Some land use forecast studies automatically increase the amount of additional land needed by a factor of 20 to 25 percent, for purposes of flexibility. The intent is to allow for “market unpredictability” – i.e., to recognize that some properties “planned” for urban development may not be developed for various reasons, such as unfavorable market conditions, utility or environmental issues, or change in the landowner’s plans. Mainland jurisdictions may experience market shifts caused by changes in other jurisdictions within the same region.

In forecasting land use needs for Maui, however, it is not appropriate to apply the “flexibility factor” for several reasons. First, the General Plan Ordinance (MCC 2.80B) mandates plan review along with new socio-economic projections every 10 years. With a plan horizon of 20-plus years, only about 50% of the land supply would be utilized before the next plan review. In effect, this provides a built-in flexibility factor of 50 percent. Second, Hawai`i’s long-term socio-economic

**Figure 1-1, Community Plan Areas, Island of Maui**



projections have become relatively reliable and provide a good basis for forecasting land needs. Moreover, island planning areas are less subject to influence from neighboring jurisdictions than their mainland counterparts.

## **1.2 OUTPUTS**

The results of the Land Use Forecast are expressed in terms of general land use categories, two time horizons, and regional location.

**Land Use Categories.** The Land Use Forecast classifies land supply and demand according to units and acres projected for the following categories of development:

- Residential (Single-Family and Multi-Family)
- Resort (includes hotels, resort condominiums and timeshares)
- Commercial (includes office and retail)
- Industrial

These are broad categories that are intended to yield gross acreages – to give an order-of-magnitude view of land needs. They do not address mixed uses or overlaps between

categories, though overlaps that are critical to land use policy are discussed in the narrative. Treating Single-Family and Multi-Family Residential together provides flexibility to vary assumptions about unit densities and about the future share of units belonging to each class.

**Time Horizons.** The Planning Department adopted 2015 and 2030 as time horizons for developing and presenting Land Use Forecast results. The mid- and end-points of the planning period were deemed the most informative and practical for use in developing policy. The practice of using five-year intervals – as in other forecasts – suggests a level of precision that is not justified.

**Community Plan Areas.** Forecast results are presented for the island as a whole and for the six CP Areas. The intent is to provide an appraisal of the planned land supply and projected demand for each area. The regional distribution of demand is based on the Baseline projection of the Socio-Economic Forecast.

### **1.3 SOURCES**

The Land Use Forecast was developed by combining information from several sources, which are described below. They include two new databases that have been formulated by the Planning Department – the Existing Land Use Database and the Development Projects Database.

**Maui County Socio-Economic Forecast.** This report is the primary source of demand projections for residential units, visitor units and jobs. The final version was developed in 2006 by the Maui Planning Department, based on substantial consultant work by SMS Research & Marketing Services, Inc., with later assistance from Belt Collins Hawai'i. The Forecast takes the State's official 2030 projections of population and employment for the County and develops projections for the Islands of Maui, Moloka'i and Lana'i, and the Community Plan regions.

**Development Projects Database.** In order to track land development proposals, the Planning Department has created the Development Projects Database (DPD) – a geographically-referenced compilation of known future projects. The Department gathered information from County planning and zoning files and pending permit applications, as well as from surveying major landowners about future development proposals. While the Planning

Department continually updates the DPD, the data used for the Land Use Forecast are current to October 2005. They include Project Districts and other large, master-planned projects. Since most master-planned projects build out over a 10-to 20-year period, the database includes project increments.

Projects in the Database are sorted into three categories, according to their current status under County land use plans and regulations.

- Planned/Committed projects are designated for development in the Community Plans AND have received the appropriate County zoning. Department of Hawaiian Homeland (DHHL) projects and projects that have been processed and approved pursuant to Hawai`i Revised Statutes (HRS) Chapter 201G are also included in this category because they are exempt from County Planning and Zoning requirements. These projects may need further permits, or they may actually be in development.
- Planned/Designated projects are designated for development in the Community Plans only. They have not received zoning entitlements.
- Proposed projects are developer proposals for sites that are NOT designated in the Community Plans.

The Land Use Forecast takes into account only those projects that are “Planned/Committed” and “Planned/Designated.” Regardless whether they are classified as “Committed” or “Designated,” these lands are officially planned for urban development on the CP maps and are considered part of the land supply.

**County GIS Database.** This is the primary map-based source of information concerning Community Plan designations and County zoning. It is used in preparing the Development Projects Database as well as the Land Use Forecast.

**County Real Property Tax Database.** The oldest of the databases, this is the source of Tax Map Key (TMK) parcel numbering and a large quantity of information concerning land area, improvements (buildings), valuation, ownership, and uses. To determine which CP-designated parcels are developed and which are “vacant,” the Planning Department links the GIS database with RPT data such as structure type and dollar value of improvements.

**Existing Land Use Database.** General Plan Update consultant PlanPacific developed the ELUD in 2005 to furnish improved information about existing physical development and use of land. It is primarily based on parcel, tax class, and structure data extracted from the RPT database. For this forecast, the ELUD provided an alternate set of data to compare with State and U.S. Census data. More important, data from the ELUD were used to develop factors for density of land uses and the distribution of commercial and industrial activities among the Maui CP Areas.

## **1.4 INVENTORYING LAND SUPPLY**

A basic function of a land use forecast is to inventory lands that are planned for urban use but not yet developed. “Planned” lands are those designated on the Maui Community Plan maps for residential, resort, commercial or industrial use. They include Project Districts and other lands that may yet lack the appropriate urban zoning. (Because “Rural” and “Agriculture” lands also have capacity for residential development, the Residential Lands forecast also factors in the development potential of vacant small Rural and Agriculture lots. See Section 3 below.) By applying per-acre development ratios, the forecaster can estimate the development potential of vacant lands, yielding results in terms of housing units or commercial floor area. This is the basic method used in most inventories of land supply.

For Residential and Resort lands, the Land Use Forecast employs a second, more specific method of quantifying development potential. The Development Projects Database (DPD) was used to identify the projected number of units as the build-out capacity of known projects (Planned projects only; Proposed projects were not included). This method is preferable to using gross acreages because it furnishes a more accurate picture of development capacity, especially for large Project Districts that do not have zoning. Where this method was used (Residential and Resort), the known project lands were subtracted from the vacant Planned land supply.

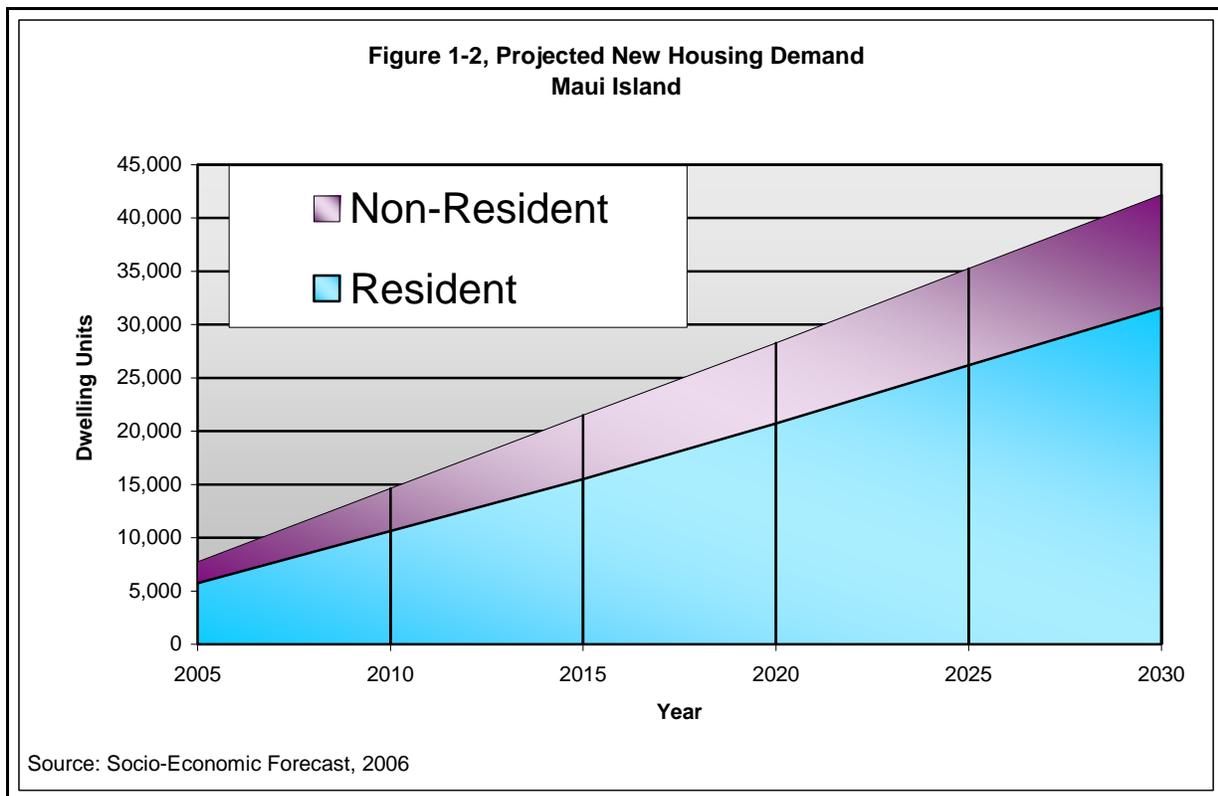
The primary means of identifying vacant Planned lands is to employ the Maui County GIS data layer that maps Community Plan designations. To determine which Planned lands are vacant, the CP map data are matched with information from the County’s Real Property Tax (RPT) database. The RPT parcel records show structures present (by type) and value of

building improvements. Parcels are considered undeveloped or “vacant” if they have no significant structure, or their improved value is less than \$10,000 per acre.

## 1.5 FORECASTING DEMAND

The Land Use Forecast utilizes different methods for different land use categories, based on the housing, visitor unit, and job projections provided in the Maui County Socio-Economic Forecast (June 2006). Like the Socio-Economic Forecast, the Land Use Forecast uses 2000 as the base year for its growth/demand projections. Distribution of land demand among the six CP areas generally follows the Socio-Economic Forecast projections. Following is a summary description of how demand is calculated for the three main land use categories.

Residential land demand is based on the projected demand for housing units, by CP Area, summed for the periods 2000-2015 and 2016-2030. The Socio-Economic Forecast projects the demand for resident housing as well as “non-resident” demand, as shown below in Figure 1-2. As a baseline, unit/acre densities and the split between single-family and multi-family units are assumed to follow current regional averages.



Resort land demand is based on the projected number of visitor units, as stated in the Socio-Economic Forecast. The projected visitor unit numbers are in turn based on DBEDT's statewide projections, and they generally apply to "formal" resort units – hotel rooms, timeshare units, and other condominium units used for visitor accommodation. The demand projections do not include "Bed-and-Breakfast" units or other transient vacation rentals, often located outside of resort destination areas.

Demand for Commercial and Industrial lands is based on the projected numbers of jobs in relevant sectors, or industries, as stated in the Socio-Economic Forecast. Job projections are translated into land needs, based on calculated ratios of jobs per acre.

## **1.6 LIMITATIONS**

The Land Use Forecast is oriented to calculating the need for urban lands. Consequently, it does not attempt to project future use of lands designated Rural, Agricultural, or Conservation. The sole exception is that Residential land supply includes undeveloped small Rural and Agricultural lots (five acres or smaller).

The Land Use Forecast does not attempt to project needs for Government facilities or land. Projecting future needs for government facilities is the subject of two separate technical studies prepared to support the General Plan Update: the Public Facilities Assessment and the Infrastructure Assessment.

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## 2. EXISTING LAND USE DATABASE

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## **2. Existing Land Use Database**

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One starting point for the Land Use Forecast was developing a database that could identify existing land uses, apart from Community Plan and Zoning designations. Previous Land Use Forecasts accounted for developed lands primarily on the basis of the “Pitt Code” assigned to each Tax Map Key (TMK) parcel. The Pitt Code is a land use classification system used by Maui County, as well as many other municipal governments. Designed to identify the “highest and best use,” the Pitt Code is generally based on the zoning of a parcel. The zoning, however, does not describe – and is sometimes very different from – the actual use of a parcel. Therefore, the Planning Department sought to create a more robust database of existing land uses for the Island of Maui.

Key to this effort was the wealth of real property data encoded in the County’s Real Property Tax (RPT) database. With the assistance of key personnel at the Real Property Tax Division, General Plan consultant PlanPacific identified and drew upon key datasets to develop the foundation for the prototype Existing Land Use Database (ELUD). To verify acreages and to enable future mapping, the RPT data was joined to the TMK parcel layer of the County’s Geographic Information Systems (GIS). The initial full version of the Existing Land Use Database was submitted to the Planning Department in October 2005.

This chapter provides a general description of the purpose and methodology under which the ELUD was developed. It also provides a summary table and discussion of the Maui Island data compiled for the 2005 ELUD.

### **2.1 GENERAL METHODOLOGY**

To establish the existing uses of the land on Maui island, an examination of the geography and a methodology of use classification were formulated. The following sections describe this formulation, database development, and data utilization.

#### **2.1.1 Purpose and Scope**

The ELUD was developed in order to quantify and map existing land uses for Tax Map Key (TMK) parcels on the Island of Maui by land use category, number of units (or amount of building floor area), and land area (parcel acreage). The identification of existing land uses

was intended to serve as a component of the Land Use Forecast for the Island of Maui. The requirements, or objectives, for identifying existing land uses were defined as follows:

- Identify *land uses in broad categories* which serve the purpose of informing the Land Use Forecast and the broader regional planning effort for Maui Island.
- Identify the *extent of each land use*, for instance, number of units, number of acres, or measurement of floor area.
- Focus attention on *urban land uses* which are the primary concern of County planning analysis; generalize data on conservation and agricultural lands, where structured uses are fewer and more dispersed and where parcel sizes vary widely.
- Aggregate and present data according to *different geographic units* as they relate to County planning. For example, existing uses are aggregated to the island level, Community Plan level, by Transportation Analysis Zone, individual island level, and at the County level.
- Integrate available technologies and in-house capabilities of County agencies to empower *ongoing collection, maintenance, and management of land use data*, in order to better inform land use planning and budgeting decisions.

### **2.1.2 Database Development**

The prototype ELUD was developed in 2005 utilizing Real Property Tax data from 2004. The presence and type of structures was used as a proxy for land use activity and as a means to assign one “primary land use” designation to each TMK parcel. In this way, the ELUD affords two different ways to look at land uses on each parcel. It identifies specific data for existing parcels, including the number and type of structures and the number of units or square footage of floor area. At the same time, the ELUD aggregates parcel data according to a set of primary land use categories. It is based on what exists on the parcel, regardless of what is zoned or planned for the parcel.

The first phase in the development of the ELUD sourced the RPT data to establish an inventory of existing structures, by TMK parcel. The second phase analyzed the data to aggregate them according to a set of “primary land use” categories. The categories were

designed to relate to Community Plan and zoning designations, and to inputs on projected land demands needed for the Land Use Forecast.

### **2.1.3 Utilization of Real Property Tax Data**

Maui County's Real Property Tax Division maintains current data on numerous attributes of each Tax Map Key parcel and any structure located on the parcel. The data are maintained annually and are subject to verification through an administrative review process where landowners may dispute RPT assessments. The data are arranged in a series of files, or tables. Data for the ELUD were drawn primarily from the Parcel Data file, the Commercial Building file, and the Residential Building file.

The ELUD adopted the Tax Map Key parcel as the fundamental unit by which structures and uses were counted. In other words, the database is arranged so that each row of data is keyed to a specific TMK parcel number. This allowed the ELUD to be linked to the GIS parcel database, which provided consistent data on parcel land area.

The Commercial Building file was used to identify existing commercial, industrial, and resort land uses. This database includes all "commercial structures," which may be broadly defined as all non-residential buildings as well as rental apartment buildings. The interpretation of specific data fields provided a means to identify buildings in terms of commercial, industrial, and hotel uses. Key fields include building type and amount of floor area in square feet. This file, however, does not include data on the number of units in a hotel or apartment structure.

The Residential Building file does count dwelling units, and it was utilized to identify residential land uses. For purposes of the ELUD, it was important to differentiate multi-family from single-family dwelling units. It was assumed that dwelling units under Condominium Property Regime (CPR) ownership were multi-family residential units. Conversely, all dwelling units not under CPR were categorized as single-family dwelling units. Further analysis identified rental apartment buildings among the non-CPR properties; these parcels and dwelling units were re-categorized as multi-family. Dwelling units were summed for each TMK parcel.

To obtain data on numbers of hotel units, additional research was conducted on parcels identified through the Commercial Building file as having hotel floor area. Hotel names were identified for each parcel, and unit numbers were determined by reference to the 2004 Visitor Plant Inventory (published by DBEDT).

In addition to identifying timeshare units, RPT files also provided a means for distinguishing multi-family units that were being used as visitor accommodations from those used as residences. The RPT Division requires condominium owners who have not filed as owner-occupants to complete a questionnaire stating whether a residential unit is used as a residence (lease term greater than six months), a transient rental (less than six months), or a timeshare. Units in the first category were identified as Multi-Family Residential units, and those in the second and third categories were identified as Multi-Family Resort units. Some condominium properties are 100% residential; some are 100% in resort use. Other condominiums have a mix of residential and resort use, as determined by the individual unit owner. Use in this last group tends to fluctuate depending on the economy. When the visitor industry is strong – i.e., vacancies low and rates high – the owner can make a better return renting to visitors. When the visitor industry has a poor year, owners tend to place more units on the long-term rental market.

The analysis identified certain limitations in using the RPT database for land planning. For example, it was difficult to distinguish and categorize government-owned lands and structures. In part, this was due to the diversity of government-owned facilities – ranging from parks to schools to harbors. In addition, because government facilities are not taxable, the RPT database accounts for them in different ways. For example, some government-owned facilities, such as Kahului Airport, lease space to taxable commercial and industrial businesses.

Another limitation of the RPT data involves an ongoing backlog in mapping new TMK plats and assigning TMK numbers to lots in new subdivisions. As a result of the delay in mapping, the RPT database would retain the original (pre-subdivision) TMK parcel number, when in fact the parcel had been subdivided and multiple single-family buildings had been built. This became particularly apparent in analyzing Project Districts that were actively being developed, such as Maui Lani.

#### **2.1.4 Definition of Principal Use Categories**

The data assembled from the RPT database were sorted and organized in order to provide information relevant to the Land Use Forecast and the General Plan Update. The analysis resulted in a classification of TMK parcels by “principal use.” The results are shown in Table 2-1: Summary of Existing Land Uses, and are discussed below in Section 2.2. It should be noted that this prototype ELUD represents one method of analyzing a complex set of data. Other approaches may be developed in the future, reordering the data to reveal new information.

The initial step was to segregate non-Urban lands from Urban lands. To this end, parcels designated in the RPT database as Tax Class 5 (Agriculture, also including lands zoned Rural) and Tax Class 6 (Conservation) were identified and organized as subsets. “Conservation” became a Principal Use Category. It includes not only lands in the State Conservation District, but also golf courses and other parcels set aside as park or permanent open space, like roadways, access corridors, and waterways.

The Agriculture/Rural lands were analyzed further with regard to parcel size and types of use. About 85% of single-family dwellings were found to be concentrated on parcels five acres or less in size. Therefore, the Agriculture/Rural class was divided into sets of “Small” (5 acres and less) and “Large” (over 5 acres) parcels. The Ag/Rural Small parcels were further divided between those that were primarily in single-family residential use (Ag/Rural-Small-SF) and a much smaller set that had various other uses (Ag/Rural-Small-Mix). Agriculture/Rural parcels of 5 acres or less with no significant structure on record were categorized as “Ag/Rural-Sm.”

The second step was to define categories of principal use prevalent in urban areas, based on analysis of all tax classes except Agriculture and Conservation. The categories reflect the primary categories used in planning and zoning: Single-Family Residential, Multi-Family Residential, Commercial, Industrial, and Hotel. Upon further analysis, additional categories were created in order to describe parcels that were of mixed use or that were under-utilized. Quantitative criteria were established to define the mixed and under-utilized categories. Category definitions may be found in Table 2-1. Remaining Urban parcels with no record of a significant structure were categorized as “No Structure.”

The original intent of the “Ag/Rural-Small” and the “No Structure” categories was to provide data on vacant, developable lands that could be used in the Land Use Forecast. Linkage with the GIS parcel data and visual inspection of parcel maps, however, revealed that both sets contained roads as well as other parcels whose use, location or configuration made them undevelopable. Planning Department staff actually completed a detailed analysis of the “Ag/Rural-Small” parcels, culling out undevelopable parcels. The unimprovable parcels and parcel remnants were also removed from the “No Structure” category.

## **2.2 SUMMARY OF EXISTING LAND USES**

This section discusses the information produced through the prototype 2005 Existing Land Use Database. Table 2-1 presents summary data on parcels categorized by primary or “Principal Use.” The legend defines each Principal Use Category. Columns to the right side contain numbers of acres, units and floor area for various types of structures. The last two rows capture dwelling units that are government-owned and various land uses within Project Districts. A few examples of the government-owned units from the database are M.C.C. and U.H. Astronomy student dorm units, hospital units, correctional center units, and park cabin units. Although these are not defined as Principal Use Categories, they are included in the interest of representing the total amounts of units and floor area. Government uses are omitted except for dwelling units.

### **2.2.1 Conservation and Agriculture/Rural**

The Conservation and Ag/Rural-Large categories account for 95% of the land ascribed to all Principal Uses and 88% of the island’s total land area (465,805 acres). Uses are various but small in relation to total acreage. It is likely that much of the industrial floor area is associated with agriculture (e.g., Pu`unene Sugar Mill) and special uses located in the Agriculture District.

**Table 2-1 SUMMARY OF EXISTING LAND USES, ISLAND OF MAUI, 2004**

CATEGORIES OF LAND PARCELS (Based on Principal Use)		Acres	Land Uses - Units and Floor Area (Square Feet)					
			Single-Family Units	Multi-Family Resid. Units	Comm'l Floor Area (Sq. Ft.)	Ind'l Floor Area (Sq. Ft.)	Hotel Floor Area (Sq. Ft.)	Multi-Family Resort Units
Non-Urban	Conservation	180,933	17	1	139,449	22,836		
	Ag/Rural-Large	231,941	1,528	31	330,553	721,549		
	Ag/Rural-Small-SF	8,452	8,518		67,996	13,832		
	Ag/Rural-Small-Mix	95		39	62,628	6,720		3
Residential	SFR	4,208	22,568		25,583			
	SFR-Under	375	155					
	MFR	1,115	31	9,298	431,480	33,094	28,056	9,854
Comm'l and Ind'l	COM	564	133	38	7,529,829	10,661		31
	COM-Under	263			149,184			
	IND	406		1	48,584	5,173,774		
	COM/IND	145		3	515,646	584,403		
Resort	HOTEL	393	2	15	481,822		8,129,320	997
Project District 1/		n/a	1,254	15	443,959	69,322		
Government 1/		n/a		385				
<b>TOTALS:</b>			<b>34,206</b>	<b>9,826</b>	<b>10,226,713</b>	<b>6,636,191</b>	<b>8,157,376</b>	<b>10,885</b>

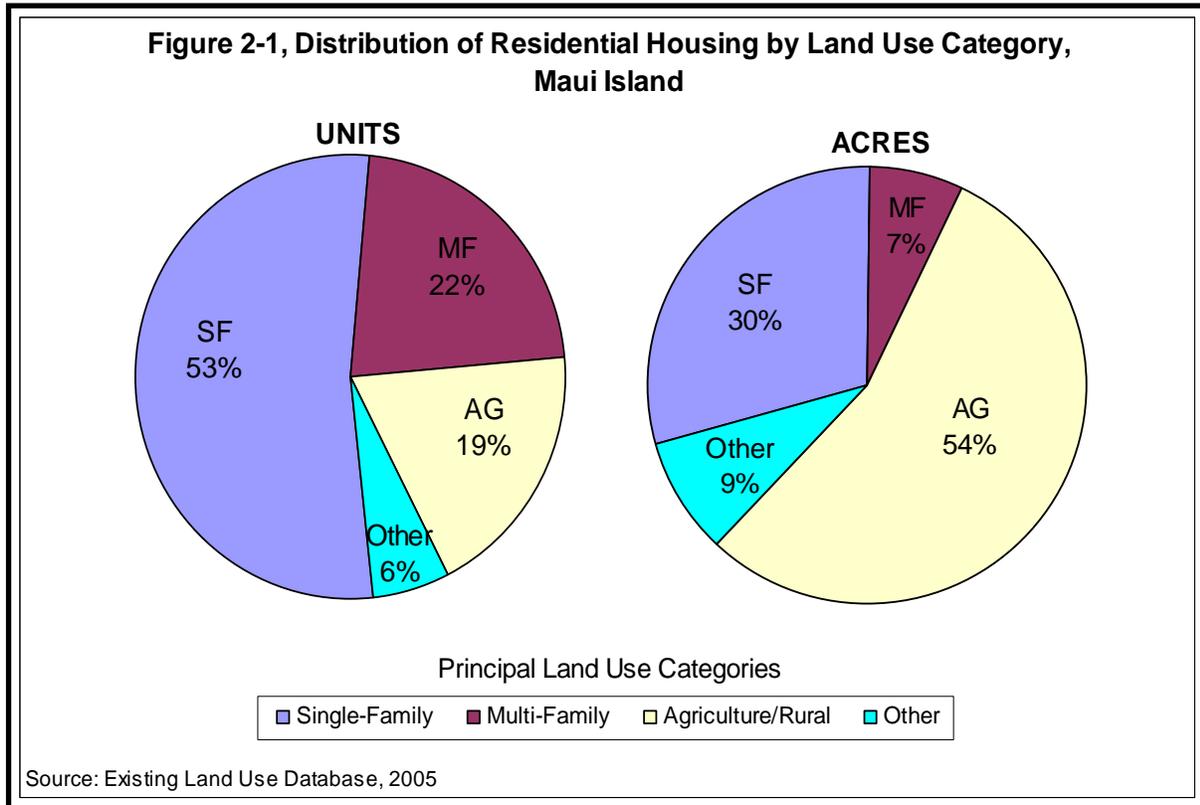
1/ Not a "principal use" category; included to account for dwelling units and floor area that would otherwise be missing from the totals.

Source: 2005 Existing Land Use Database, prepared by PlanPacific for the Planning Department, County of Maui (electronic file).

**CATEGORY DEFINITIONS:**

Conservation	Parcels in the Conservation tax class.
Ag/Rural-Large	Parcels in the Agriculture tax class, greater than 5 acres in size.
Ag/Rural-Small-SF	Parcels in the Agriculture tax class, 5 acres or less in size, having one or more single-family dwellings.
Ag/Rural-Small-Mix	Parcels in the Agriculture tax class, 5 acres or less in size, having uses other than single-family residential.
SFR	Parcels primarily in Single-Family Residential use, having one or more dwelling units.
SFR-Under	Parcels primarily in Single-Family Residential use, having less than one dwelling unit per acre (Under-utilized).
MFR	Parcels primarily in Multi-Family Residential use, including both resident and visitor dwelling units.
COM	Parcels primarily in Commercial use.
COM-Under	Parcels primarily in Commercial use, with a ratio of building floor to land Area of 0.05 or less (Under-utilized).
IND	Parcels primarily in Industrial use.
COM/IND	Parcels with a mixture of Commercial and Industrial use.
HOTEL	Parcels primarily in Hotel use.

The Ag/Rural-Small-SF category (parcels 5 acres and less) consists of 8,452 acres having 8,518 single-family dwellings – an average of one dwelling per acre. It includes lots zoned Rural as well as Agricultural lots. Many lots have more than one dwelling – on average, 1.4 dwellings per lot.



A large proportion of Maui’s housing stock is dispersed outside of urban areas. Adding together the single-family dwellings found in all Ag/Rural categories yields 10,046 units, equal to 30% of total single-family dwellings on Maui and 23% of total dwellings in residential use (i.e., single-family and multi-family, not including units in visitor use). This distribution of the habitable dwelling units warrants consideration in the Land Use Forecast and planning process. Figure 2-1 above illustrates the inefficient use of Maui’s agricultural land as significant acreage is consumed to house relatively few Maui residents.

### 2.2.2 Residential

According to the ELUD, Maui in 2004 had a total of 44,032 dwelling units in residential use – single-family and multi-family (columns 3 and 4 of Table 2-1). This total does not include the 10,902 multi-family dwellings that were reported to be in resort use (last column of Table

2-1). Of the total 54,394 dwelling units, 19.8% were being used as visitor accommodations. (Visitor accommodations are discussed in Section 2.2.3 below.)

The number of dwelling units in residential use is as many as 5,000 units lower than might be expected. Based on Exhibit R-1 of the Socio-Economic Forecast, Maui Island is projected to have 44,182 households by 2005. (Note: the Forecast's 2005 population projection for the County almost exactly matches the U.S. Census Population Estimate for 2005.) Moreover, the Socio-Economic Forecast projects the Resident Housing Demand for 2005 to be 47,868 units; adding Non-Resident Demand (i.e., second homes), the projected 2005 Total Housing Demand is 49,860 dwelling units (Exhibit R-11). Resident Housing Demand is predicated on 5% of units being vacant.

There are several factors that might explain the difference between the ELUD and the Socio-Economic Forecast. First, the 5% vacancy rate embodied in the Resident Demand represents an ideal more than it does the actual situation. The actual vacancy rate for housing on Maui is estimated to be 2 to 3%. Second, the RPT database may under-count dwelling units, particularly in single-family neighborhoods where second units are often created but may not be reflected in building permit records. Finally, the Non-Resident Housing Demand is an estimate only; it is not part of the State econometric model.

As calculated from Table 2-1, the SFR (Single-Family Residential) category had an average density of 5.3 dwelling units per acre. Note that this is net density and does not take into account the roads, parks and other facilities that are typically found in single-family neighborhoods. This category includes a nominal amount of commercial floor area, probably representing lots that have a storefront and a residence, model homes, or on-site construction and sales offices.

The "SFR-Under" category combines the tax class "Unimproved Residential" with other parcels having a density of one or fewer units per acre. For the purposes of the ELUD, these parcels – totaling 375 acres – are considered under-utilized. Although it would require detailed analysis to determine the full development potential of these lands, the category nevertheless represents a resource for future residential infill development. If the land in

SFR-Under category were developed to an average density of only two units per acre, that would provide about 600 additional dwellings.

The MFR (Multi-Family Residential) category primarily consists of condominium properties, but also includes rental apartments. As shown in Table 2-1, some MFR parcels also support other uses – primarily Commercial. Based on RPT data (see Sec. 2.1.3 above), dwelling units have been divided into two columns – Multi-Family Residential and Multi-Family Resort. The latter includes timeshare units. In 2004, the MFR category was split evenly between resident use (9,298 units) and resort use (9,854 units).

The average density in the Multi-Family category is about 18 dwelling units per acre. The density runs higher in the urban CP areas – Kihei, Wailuku and West Maui – and runs lower for the rural CP areas, which have less multi-family housing in lower height complexes.

### **2.2.3 Visitor Accommodations**

Counting the number of visitor units is difficult because of differences in definitions and methods of counting. The annual Visitor Plant Inventory (VPI), published by the State Department of Business, Economic Development and Tourism (DBEDT), is the most widely-used and the closest thing to an official count. DBEDT uses the VPI as a baseline for its projections of future visitor units, as does the Maui Socio-Economic Forecast.

As shown in Table 2-1, the Existing Land Use Database provides information on visitor accommodations in two ways: (1) the Resort/Hotel land category, which includes hotels and other uses; and (2) the two columns counting Hotel Units and Multi-Family Resort Units. The MF Resort Unit column consists of timeshare units; whole condominium facilities (also known as “condo-hotels”), and individual condominium units. Adding the Hotel and MF Resort columns yields a total of 19,617 visitor units.

To illustrate the difficulties of counting visitor units, Table 2-2 compares the ELUD with DBEDT’s Visitor Plant Inventory and a study prepared by the Kauaian Institute – all based on 2004 data. Each has its strengths and weaknesses. The hotel and timeshare counts are similar, though timeshare conversions presented problems in counting units in some hotel and resort-condo properties.

**Table 2-2 Comparison of Visitor Unit Counts**

Unit Types	2004 Visitor Units		
	Visitor Plant Inventory	Existing Land Use Dbase	Study by Kauaian Institute
Hotels	8,065	8,732	8,276
Condo's	7,085	9,446	7,502
Timeshares	1,512	1,439	1,458
Independent Vis. Units 1/	693	n/a	n/a
Transient Vac. Rentals 2/	n/a	n/a	1,095
Other 3/	462	n/a	n/a
<b>Total</b>	<b>17,817</b>	<b>19,617</b>	<b>18,331</b>

1/ Includes Visitor Plant Inventory categories: B&Bs and "Individual Vacation Units" (individual single-family and condo units).

2/ Category used by Kauaian Institute, includes single-family units and B&Bs only.

3/ Includes Visitor Plant Inventory categories: Other, Apt.-Hotels, Hostels.

Sources: 2004 Visitor Plant Inventory, Island of Maui; Dept. of Business, Econ. Dev. & Tourism, State of Hawaii; Existing Land Use Database, Island of Maui, PlanPacific, 2005; Transient Vacation Rentals on Maui, Kauaian Institute, 2005.

The ELUD count of condominiums in visitor use is substantially higher than the VPI and the Kauaian Institute. Employment of Maui Real Property Tax data influences the ELUD's count upwards in two ways. First, because Maui requires all condominium owners to report on transient rental use, the RPT-derived ELUD is more comprehensive and probably captures many individual units not counted by the VPI or the Kauaian Institute study. Second, Maui's definition of transient rental use is "less than six months," a much broader definition than the standard "30 days or less." Finally, the strong tourism market that prevailed in 2004 probably enticed many condo owners into the visitor rental market.

The Kauaian Institute study, entitled "Transient Vacation Rentals on Maui," is probably the most authoritative source on that sector. TVRs essentially consist of single-family dwellings used in whole or in part as visitor rentals (the Kauaian Institute specifically omits second homes). The ELUD count, on the other hand, does not include TVRs. Based on internet vacation rental surveys and research, the VPI typically under-counts TVR units.

#### **2.2.4 Commercial and Industrial Uses**

In 2004, Commercial floor area totaled 10.2 million square feet, and 6.6 million square feet of floor area were classified as Industrial. Though concentrated in their principal land use categories, Commercial and Industrial uses are present in almost every other category as well, including in Conservation and Agriculture/Rural.

Owing to Real Property Tax classification methods, the ELUD overstates the amount of floor area in Industrial use and correspondingly understates the amount of floor area in Commercial use. For example, the RPT database classifies “Big-Box” retail properties (such as Costco and Home Depot) as Industrial because of their warehouse-like buildings. In addition, many Commercial buildings and uses occupy Industrial-zoned land, which is allowed under the Maui zoning code. Both factors contribute to the ELUD’s under-stating Commercial floor area and (conversely) over-stating Industrial floor area by as much as 1.0-1.4 million square feet.

Agriculture/Rural lands support about 470,000 square feet of Commercial uses and 740,000 square feet of Industrial uses. The latter include agricultural processing mills, construction yards, and quarries. Some of the uses classified as Commercial or Industrial are nonconforming (pre-existing current zoning), and others have received use permits from the State and/or the County to operate in areas zoned for rural or agricultural use. Agriculture/Rural lands account for 13% of the adjusted total square feet in Industrial use.

## **2.3 LIMITATIONS**

The Existing Land Use Database is a work in progress. The 2005 prototype effort produced useful information, but the extent to which the information could be directly incorporated into the Land Use Forecast was limited by several factors. These limiting factors may be summarized as follows: (1) specific limitations of the RPT database; (2) limitations in the County’s GIS database for land use designations (State Land Use District, Community Plan designation, and County zoning); and (3) issues related to linking the ELUD and the land use designations in GIS format because of TMK splits, multiple structures with RPT uses on single TMKs, and multiple land uses on the same TMK parcel.

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## 3. RESIDENTIAL LAND USE

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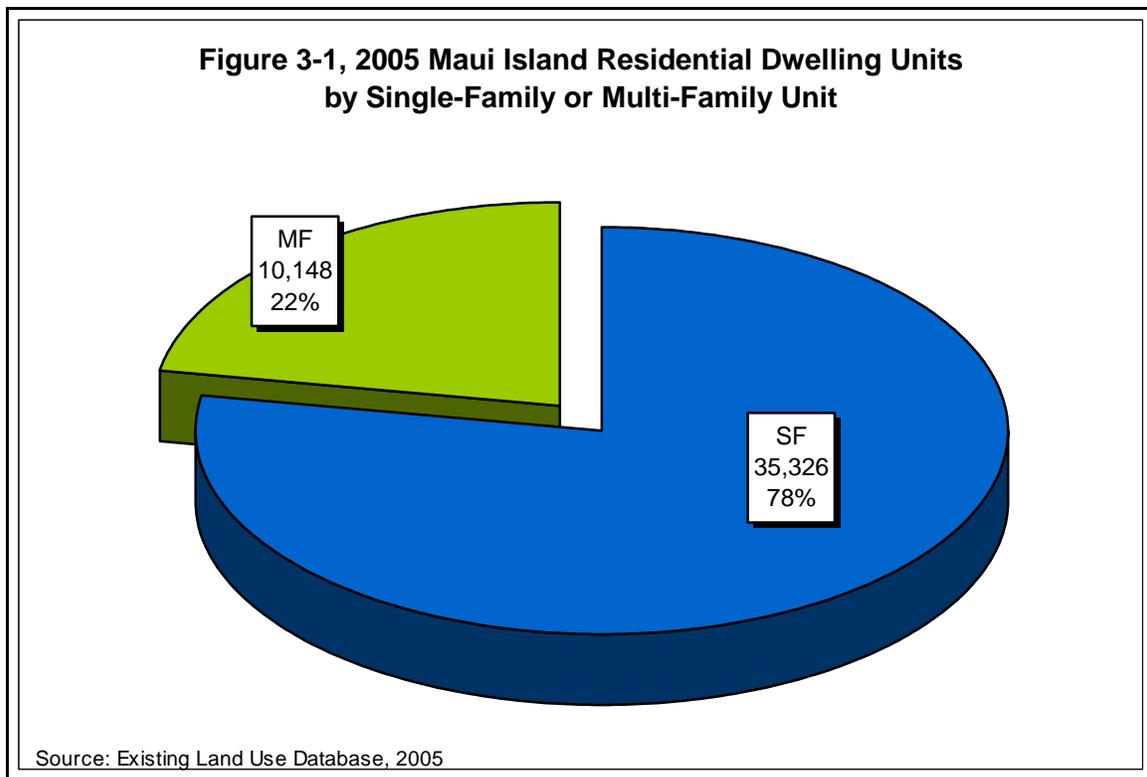
### 3. Residential Land Use

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This chapter provides a forecast of Residential land area requirements and describes the data and process used to develop the forecast. The Appendix to this report provides an alternative scenario based on restricting the land supply to those that are currently both planned and zoned Residential.

#### 3.1 APPROACH

Residential land use refers to housing, or dwelling units, used primarily as places of residence. A “dwelling unit” is defined as an independent housekeeping unit having a kitchen. The forecast addresses both single-family and multi-family dwelling units, which currently exist in the proportion illustrated in Figure 3-1 below. A multi-family residential structure is one that has more than two dwelling units.



The Land Use Forecast uses the term “dwelling unit” or “housing unit” as a generic term to refer to a unit of either type.

A dwelling unit may be owned and occupied by a Maui resident household; it may be rented on a long-term basis and occupied by a Maui resident household; it may be owned by a non-resident and used as a vacation home; or it may be used at least a portion of the year as a transient rental. (“Transient” is defined in the Maui Zoning Code as occupancy of 180 days or less. Most transient occupants are vacationers who typically rent for 30 days or less.) For the purposes of the Land Use Forecast, a dwelling unit that is used as a transient rental or is registered as a timeshare is considered a visitor unit, not a housing unit. (The visitor and housing markets overlap. For further discussion, see Chapter 4, Resort Land Use.)

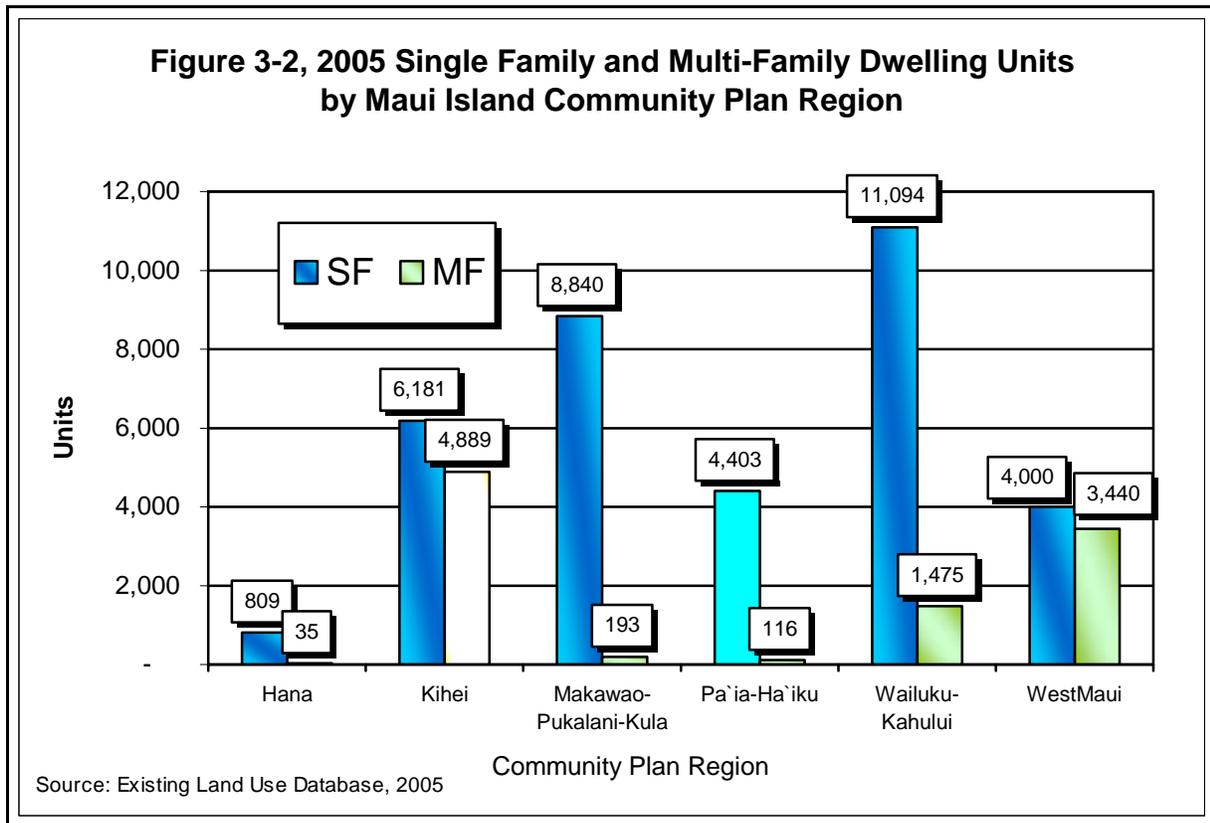
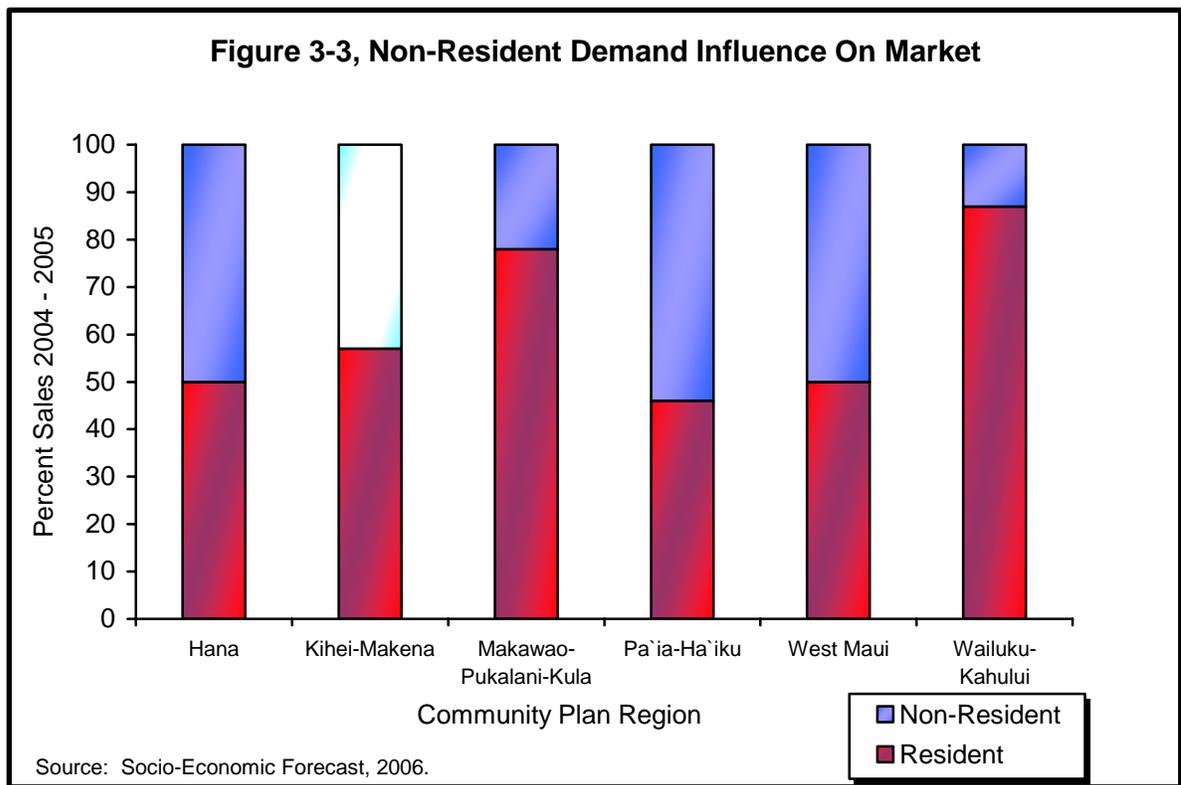


Figure 3-2 above illustrates the mix of single family and multi-family dwelling units in Maui’s Community Plan Regions. The CP Areas of Makawao-Pukalani-Kula, Pa’ia-Ha’iku, and Wailuku-Kahului offer limited multi-family residential housing opportunities compared to the number of single family homes. The demand side of the forecast for Residential Land Use is based directly on the Socio-Economic Forecast’s projections of “Housing Demand by Region” (Exhibit R-11). Previous forecasts projected only Resident Demand. The prevalence of non-resident buyers in the Maui market, however, has led the Planning

Department to add “Non-Resident Demand” as a second element of the 2006 Housing Demand forecast.

As the Socio-Economic Forecast Report states, “Housing demand is an analytic construct.” In other words, the housing demand projections entail making broad assumptions about the housing market and linking those to the economic and population projections. The Socio-Economic Forecast calculates Resident Demand by using the projected number of new households (population growth), and then adding five percent to account for vacant units. A five percent vacancy rate is generally accepted as representing a “normal” housing market.

Though acknowledged as a major force in housing markets across the State, Non-Resident Demand is not modeled in DBEDT’s 2030 series of economic and population projections. The project team for the Maui Socio-Economic Forecast quantified Non-Resident Demand using a ratio of non-resident to resident sales by region in 2004. Island-wide, 2004 sales to non-residents amounted to 37 percent of total sales of housing units. The proportion of sales to non-residents was greater in regions that have resorts, especially West Maui. Figure 3-3 below illustrates the penetration of non-resident buyers into Maui’s residential market.



For baseline counts of housing units, the Land Use Forecast uses the 2004 count from the Existing Land Use Database. As noted in Chapter 2, the 2004 ELUD may understate the number of existing housing units by as many as 5,000. To the extent that the count is understated, it will inflate the 2015 demand for housing units and the additional land supply required. The alternative is to use the 2000 Census as the baseline count; but doing so would further understate the number of existing housing units.

The method used for analyzing residential land needs is outlined below. The ensuing sections of this chapter follow the major steps listed:

- Determine the existing supply of lands planned for single-family and multi-family residential use. The supply is expressed in terms of potential housing units.
- Project the demand for additional housing units for the horizon years of 2015 and 2030, presenting both Resident demand and total demand – i.e. Resident and Non-Resident demand.
- Compare supply to demand and determine the balance of units needed in each region by 2030; then calculate acres of land needed, based on average densities of single-family and multi-family development. Again, the analysis is presented for both Resident demand only and total Resident and Non-Resident demand.

## **3.2 LAND SUPPLY**

The supply of residential land consists primarily of parcels designated Single-Family or Multi-Family Residential on the Community Plan maps that are vacant or under-utilized. This analysis also takes into consideration the potential development of small lots designated Agriculture and Rural. The results represent the ultimate “Build-Out” of the County’s current land use policy for all types of residential development on the Island of Maui.

Table 3-1 assesses Residential land supply in terms of “potential” housing units, using three different methodologies. First, the forecast utilized the Planning Department’s Development Project Database to identify units in “known projects.” The Development Projects Database lists planned projects and numbers of units on specific sites that are designated in the Community Plans for Single-Family or Multi-Family Residential use. Using the database affords more accurate data than simply the number of vacant acres. In fact, the projects

identified in the Development Projects Database account for almost two-thirds of the total supply of potential units.

**Table 3-1 Supply of Potential Housing Units on Vacant Lands Planned for Housing**

Community Plan Area	KNOWN PROJECTS (units) 1/	AG/RURAL SMALL LOTS 2/		SINGLE-FAMILY VACANT LANDS 3/		MULTI-FAMILY VACANT LANDS 4/		TOTAL Potential Units
		Lots	Units	Acres	Units	Acres	Units	
Hana	358	349	489	103	411	6	39	1,297
Kihei-Makena	8,176	143	200	497	1,987	97	1,950	12,313
Makawao-Pukalani-Kula	1,111	570	798	378	1,514	34	235	3,658
Pa'ia-Ha'iku	594	631	883	153	614	-	-	2,092
Wailuku-Kahului	8,590	174	244	180	718	2	34	9,587
West Maui	2,221	238	333	61	243	14	286	3,083
<b>Island Total:</b>	<b>21,050</b>	<b>2,105</b>	<b>2,947</b>	<b>1,372</b>	<b>5,487</b>	<b>153</b>	<b>2,545</b>	<b>32,029</b>

1/ Source: "Maui Island Development Projects Database," prepared by the Long-Range Division, Department of Planning, County of Maui, April 17, 2006. "Known Projects" consist of development proposals for identified sites that have appropriate Community Plan designations for housing development and include Project Districts, as well as Dept. of Hawaiian Homelands projects and approved 201G projects.

2/ Vacant lands designated "Agriculture" or "Rural" in the Community Plans, lots of 5 acres or less. Buildout of Ag/Rural Small lots estimated at 1.4 units per lot, based on average density of developed small Ag and Rural lots.

3/ Source: Maui County GIS Database, vacant lands by Community Plan Designations; includes Community Plan designations "Single-Family Residential" and "Service Business Residential". Average density assumed at 4 units per acre.

4/ Source: Maui County GIS Database, vacant lands with Community Plan designation "Multi-Family Residential". Density assumed at 20 units per acre for urban regions (Lahaina, Kihei, and Wailuku), and 7 units per acre for rural regions (Hana, Makawao, and Paia).

Based on the Existing Land Use Database, the average density of developed Single-Family (SF) lands is 5 units per acre. For purposes of projecting capacity of vacant lands, the density was discounted to four units per acre based on the assumption that 20 percent of land area would be required for roads and public facilities. Multi-Family housing units were calculated assuming a density of 20 units per acre for urban regions (Lahaina, Kihei, and Wailuku-Kahului), and 7 units per acre for rural regions (Hana, Makawao-Pukalani-Kula, and Pa'ia-Ha'iku).

The third step in the methodology was to compute potential units for Agriculture- and Rural-designated lands. In this case, it was decided to count small lots (five acres or less) on the assumption that they were likely to be developed with dwellings. Through the Existing Land Use Database, Agriculture- and Rural-designated lots of five acres or less (with no existing dwelling) were identified. The lots were reviewed using GIS-generated parcel maps, and those that were clearly undevelopable were culled out. To obtain potential units, an average density of 1.4 units per lot was applied. This is equal to the average density of lots identified

in the Existing Land Use Database as “Ag/Rural-Small-SF” – lots of five acres or less developed with one or more single-family dwellings. While addressing some potential development, this method does not account for potential dwellings that could be developed through future subdivisions of Agriculture lands.

As shown in Table 3-1, the existing supply of lands planned for Residential use has a total capacity of over 32,000 dwelling units. Note that the Wailuku-Kahului and Kihei-Makena CP Areas together contain nearly 70% of the island’s total capacity for new housing. The total includes Project Districts and other lands which are shown on the Community Plan maps for single-family or multi-family residential use but which have not yet obtained the appropriate zoning. Much of the infrastructure needed to support these potential units is lacking.

### **3.3 PROJECTED DEMAND FOR HOUSING UNITS**

This section presents the demand for additional housing units for the horizon years 2015 and 2030. Table 3-2 presents the demand for Resident housing units. Table 3-3 presents the demand for Resident and Non-Resident housing – in effect, total housing demand. As stated in Section 3.1, the housing demand projections are taken directly from Exhibit R-11, “Housing Demand by Region,” of the 2030 Socio-Economic Forecast. The tables are arranged to show the additional demand – or additional units needed – for the two periods 2004-2015 and 2015-2030. The last column in each table presents the total additional units needed through 2030.

**Table 3-2 Projected Demand for Resident Housing Units**

Community Plan Area	2015 RESIDENT HOUSING DEMAND			2030 RESIDENT HOUSING DEMAND			Sum of Additional Units Needed to 2030 5/
	2015 Housing Demand 1/	Existing Units 2/	2015 Need for Additional Units 3/	2030 Housing Demand 1/	2015 Housing Demand 1/	2030 Need for Additional Units 4/	
Hana	799	817	(18)	977	799	178	160
Kihei-Makena	13,003	10,719	2,284	16,734	13,003	3,731	6,015
Makawao-Pukalani-Kula	10,095	8,747	1,348	12,281	10,095	2,186	3,534
Pa'ia-Ha'iku	4,685	4,375	310	5,153	4,685	468	778
Wailuku-Kahului	20,238	12,170	8,068	27,216	20,238	6,978	15,046
West Maui	8,817	7,204	1,613	11,385	8,817	2,568	4,181
<b>Island Total:</b>	<b>57,636</b>	<b>44,032</b>	<b>13,605</b>	<b>73,746</b>	<b>57,636</b>	<b>16,109</b>	<b>29,714</b>

1/ Source: 2006 Maui County General Plan Update: Socio-Economic Forecast Report, Exhibit R-11.

2/ Source: Existing Land Use Database, 2004. Housing unit count excludes condo units used as visitor accommodations.

3/ Need for Additional Units. = [2015 Housing Demand] - [Existing Housing Units]

4/ 2030 Need for Additional Units = [2030 Housing Demand] - [2015 Housing Demand]

5/ Sum of Additional Housing Units Needed in 2030 = [2015 Additional Units] + [2030 Additional Units]

**Table 3-3 Projected Demand for Resident and Non-Resident Housing Units**

Community Plan Area	2015 RESIDENT AND NON-RESIDENT HOUSING DEMAND			2030 RESIDENT AND NON-RESIDENT HOUSING DEMAND			Sum of Additional Units Needed to 2030 5/
	2015 Housing Demand 1/	Existing Units 2/	2015 Need for Additional Units 3/	2030 Housing Demand 1/	2015 Housing Demand	2030 Need for Additional Units 4/	
Hana	1,015	817	198	1,196	1,015	181	379
Kihei-Makena	15,058	10,719	4,339	20,454	15,058	5,396	9,735
Makawao-Pukalani-Kula	10,563	8,747	1,816	13,121	10,563	2,558	4,374
Pa'ia-Ha'iku	5,234	4,375	859	5,807	5,234	573	1,432
Wailuku-Kahului	21,384	12,170	9,214	28,719	21,384	7,335	16,549
West Maui	10,386	7,204	3,182	15,054	10,386	4,668	7,850
<b>Island Total:</b>	<b>63,640</b>	<b>44,032</b>	<b>19,608</b>	<b>84,351</b>	<b>63,640</b>	<b>20,711</b>	<b>40,319</b>

1/ Source: 2006 Maui County General Plan Update: Socio-Economic Forecast Report, Exhibit R-11.

2/ Source: Existing Land Use Database, 2004. Housing unit count excludes condo units used as visitor accommodations.

3/ Need for Additional Units. = [2015 Housing Demand] - [Existing Housing Units]

4/ 2030 Need for Additional Units = [2030 Housing Demand] - [2015 Housing Demand]

5/ Sum of Additional Housing Units Needed in 2030 = [2015 Additional Units] + [2030 Additional Units]

Demand from non-residents adds 10,606 units to the 2030 Housing Demand and the total Additional Units Needed to 2030. By these projections, Non-Resident Demand represents about 26% of the total Additional Units Needed to 2030.

In both tables, the largest demand is projected for the Wailuku-Kahului CP Area, which is forecast to add over 15,000 units of resident housing by 2030 (about 50% of total additional resident units) and 1,500 units of non-resident units (about 14% of total additional non-resident units). A much larger proportion of units forecast for Kihei-Makena and West Maui will be for the non-resident market. Kihei-Makena is forecast to capture over 6,000 units of resident housing by 2030 (about 20% of the total resident units) and 3,700 units of non-resident housing (35% of the total non-residents). West Maui is projected to receive about 4,200 units of resident housing (14% of total resident units) and about 3,700 units of non-resident housing (35% of the total non-residents).

### 3.4 COMPARISON OF SUPPLY AND DEMAND

Table 3-4 combines information from the preceding three tables, comparing the supply of potential housing units to the additional units needed through 2030. Furthermore, it compares the results for Resident Housing only and for Resident and Non-Resident Housing combined. As shown in Table 3-1, the supply of vacant land planned for housing today is equivalent to 32,029 potential housing units. This is substantially more than is needed to meet the 2015 projected demand of 19,068 units (Table 3-3, 2015 Resident and Non-Resident). Additional lands will only be needed in the 2016-2030 time period.

**Table 3-4 Comparison of Potential Supply vs. 2030 Demand**

Community Plan Area	Supply of Potential Housing Units 1/	RESIDENT HOUSING ONLY		RESIDENT & NON-RESIDENT HSG.	
		Sum of Additional Units Needed to 2030 2/	Surplus (Deficit) of Potential Housing Units	Sum of Additional Units Needed to 2030 3/	Surplus (Deficit) of Potential Housing Units
Hana	1,297	160	1,137	379	918
Kihei-Makena	12,313	6,015	6,298	9,735	2,578
Makawao-Pukalani-Kula	3,658	3,534	124	4,374	(716)
Pa'ia-Ha'iku	2,092	778	1,314	1,432	660
Wailuku-Kahului	9,587	15,046	(5,459)	16,549	(6,962)
West Maui	3,083	4,181	(1,098)	7,850	(4,767)
<b>Island Total:</b>	32,029	29,714	2,315	40,319	(8,290)

1/ From Table 3-1.

2/ From Table 3-2.

3/ From Table 3-3.

Table 3-4 compares the supply to the 2030 demand. Considering Resident Housing demand only, islandwide the forecast shows a surplus of 2,315 units. Considering Resident and Non-Resident Housing demand, the forecast shows a 2030 deficit of 8,290 units. Taking another

perspective, the existing supply of land would be sufficient to support about 80% of the additional units needed by 2030 (total Resident and Non-Resident demand).

In both cases, the Wailuku-Kahului CP Area is showing the largest deficit of supply – ranging from about 5,500 to 7,000 units. On the other hand, the supply of potential units for Kihei-Makena substantially exceeds the projected total demand for 2030. The surplus is about 6,300 units for Resident only and about 2,600 for Resident and Non-Resident demand. West Maui shows a deficit of 1,100 units, more than tripling to 4,700 when Non-Resident demand is added.

According to the forecast in Table 3.4, the rural CP areas have sufficient supply of potential units and Residential lands, except for Makawao-Pukalani-Kula. In that CP Area, a small surplus turns to a deficit of 700 units when Non-Resident demand is added. The Hana CP Area shows a significant surplus capacity under both scenarios.

### **3.5 LAND NEEDS**

The amount of land needed to accommodate the projected housing demand depends upon the type and density of housing constructed. Density is typically expressed in terms of number of housing units per acre of developed land. Multi-family housing consists of a wide variety of types, including townhouses, flats, and low- to mid-rise apartment buildings.

Tables 3-5 and 3-6 forecast the amount of land needed – in addition to the existing supply – to satisfy the projected demand for Resident Housing only and for both Resident and Non-Resident Housing. The forecast is based on the following assumptions: (a) the ratio of single-family and multi-family for each region will remain the same; (b) the average density for single-family development will be four units per acre; and (c) the average density for multi-family development will be 20 units/acre for the Wailuku-Kahului, West Maui and Kihei-Makena regions; and seven units/acre for the rural regions. The density for single-family lands was discounted from the existing average of five units/acre because the latter counts only the area of the existing single-family lots; whereas, about 20% of a new single-family tract is used for roads and other public facilities.

**Table 3-5 Additional Land Needed for Resident Housing Through 2030, Single-Family and Multi-Family**

Community Plan Area	Surplus/ (Deficit) of Potential Housing Units 1/	Additional Supply Needed (Units)	SINGLE-FAMILY LAND			MULTI-FAMILY LAND			Total Residential Acres Needed
			% Single-Family Residential 2/	Single-Family Units Needed 3/	Single Family Acres Needed 4/	% Multi-Family Residential 2/	Multi-Family Units Needed 5/	Multi-Family Acres Needed 6/	
Hana	1,137		96%	-	-	4%	-	-	-
Kihei-Makena	6,298		56%	-	-	44%	-	-	-
Makawao-Pukalani-Kula	124		98%	-	-	2%	-	-	-
Pa'ia-Ha'iku	1,314		97%	-	-	3%	-	-	-
Wailuku-Kahului	(5,459)	5,459	88%	4,818	1,205	12%	641	32	1,237
West Maui	(1,098)	1,098	54%	590	148	46%	508	25	173
<b>Island Total:</b>	<b>2,315</b>	<b>6,557</b>		<b>5,409</b>	<b>1,352</b>		<b>1,148</b>	<b>57</b>	<b>1,410</b>

1/ From Table 3-4, Resident Housing Only.

2/ Source: Existing Land Use Database, 2004. This is the ratio of Single-Family to Multi-Family housing units within each Community Plan area.

3/ [Housing Units Needed] x [% SF] = SF Units Needed.

4/ The average density of developed Single-Family (SF) lands is 5 units per acre. For purposes of projecting capacity of vacant lands, this density was discounted to 4 units per acre, based on the assumption that 20% of land area would be required for roads and public facilities.

5/ [Housing Units Needed] x [% MF] = MF Units Needed.

6/ Multi-Family (MF) housing units are calculated based on a ratio of 20 units per acre for urban regions (Kihei-Makena, Wailuku-Kahului, and West Maui), and 7 units per acre for rural regions (Hana, Makawao-Pukalani-Kula, and Pa'ia-Ha'iku).

**Table 3-6 Additional Land Needed for Resident and Non-Resident Housing to 2030, Single-Family and Multi-Family**

Community Plan Area	Surplus/ (Deficit) of Supply 1/	Additional Supply Needed (Units)	SINGLE-FAMILY LAND			MULTI-FAMILY LAND			Total Residential Acres Needed
			% Single-Family Residential 2/	Single-Family Units Needed 3/	Single Family Acres Needed 4/	% Multi-Family Residential 2/	Multi-Family Units Needed 5/	Multi-Family Acres Needed 6/	
Hana	918	-	96%	-	-	4%	-	-	-
Kihei-Makena	2,578	-	56%	-	-	44%	-	-	-
Makawao-Pukalani-Kula	(716)	716	98%	701	175	2%	15	2	177
Pa'ia-Ha'iku	660	-	97%	-	-	3%	-	-	-
Wailuku-Kahului	(6,962)	6,962	88%	6,145	1,536	12%	817	41	1,577
West Maui	(4,767)	4,767	54%	2,563	641	46%	2,204	110	751
<b>Island Total:</b>	<b>(8,290)</b>	<b>12,445</b>		<b>9,409</b>	<b>2,352</b>		<b>3,036</b>	<b>153</b>	<b>2,505</b>

1/ From Table 3-4, Resident and Non-Resident Housing.

2/ Source: Existing Land Use Database, 2004. The percentages represent the existing shares of Single-Family and Multi-Family units within each Community Plan area.

3/ [Housing Units Needed] x [% SF] = SF Units Needed.

4/ The average density of developed Single-Family (SF) lands is 5 units per acre. For purposes of projecting capacity of vacant lands, this density was discounted to 4 units per acre, based on the assumption that 20% of land area would be required for roads and public

5/ [Housing Units Needed] x [% MF] = MF Units Needed.

6/ Multi-Family (MF) land needed is calculated based on a ratio of 20 units per acre for urban regions (Kihei-Makena, Wailuku-Kahului and West Maui), and 7 units per acre for rural regions (Hana, Makawao-Pukalani-Kula, and Pa'ia-Ha'iku).

## **3.6 ISSUES**

The demand for residential use exerts the greatest pressure on Maui's land and infrastructure resources. There are two key issues with respect to residential demand and how it is accommodated: (1) non-resident demand; and (2) housing density. Both are key variables in the land use equation. They need to be carefully considered when framing growth management policy for Maui. Housing density can change the complexion of the residential land use patterns by affecting the amount and type of land needed to accommodate the community's housing needs.

### **3.6.1 Non-Resident Housing Demand**

Although poorly documented at this time, the demand for housing by non-residents is a powerful force in Maui's housing market. First and foremost, the non-resident demand comes from high-wealth households that are able to afford substantially higher prices than the great majority of Maui residents. These individuals and families possess the means to purchase a second home, which the owner uses part of the year. When it is not being used by the owner, the unit may be loaned or rented to visitors. The growth in the number of high-wealth households and their purchases of vacation properties is a national phenomenon related to the maturity of the large baby-boom generation, which is at the peak of its earning power and is benefiting from family inheritance as well.

The presence of affluent non-resident buyers influences the market in several ways, all of which put upward pressure on prices. First, non-residents can typically outbid residents for houses and apartments being resold. Second, in a strong market, developing higher-priced units generally produces greater profit per unit. Therefore a relatively large proportion of new residential units and lots is being developed for upper-end buyers. Finally, when the building industry is occupied with developing for the upper-end market, less capacity is available for developing affordable housing.

Property tax rates in Maui County and throughout the State are low relative to rates and supplementary fees charged by mainland municipalities, school districts, and public facility districts. (Many California property owners pay fees to water, sewer and parks districts, in addition to regular property taxes and school district taxes.) Relatively low property taxes

for single-family and multi-family residences make Maui properties more attractive to the offshore buyer.

### 3.6.2 Housing Density

The Land Use Forecast incorporates several assumptions that relate to the density and location of new residential development. First, while the Forecast recognizes that units will be built on small vacant lots designated Agriculture and Rural, it assumes that all other development will be directed to urban lands. Similar assumptions underlie the Socio-Economic Forecast regional growth projections. Second, the Residential Land Forecast assumes average densities of four units/acre for single-family and 20 units/acre for multi-family development (seven units/acre in rural regions). Third, the Forecast assumes that single-family and multi-family housing will be developed in the same proportions as exist today. This section reexamines those assumptions from the standpoint of the potential effects of increasing density.

At the island and regional scale, increasing the density of housing makes more efficient use of land; saves on linear miles of roads, water lines, and other utilities that need to be built and maintained; and preserves more land for agriculture and open space. At the project scale, increased density can reduce land and building costs and thereby result in more affordable sale and rental prices.

**Table 3-7 Alternative Densities and Land Needs to 2030, Wailuku-Kahului CP Area**

Alternatives	Additional Supply Needed (Units) /1	SINGLE-FAMILY LAND			MULTI-FAMILY LAND			Total Residential Acres Needed
		% Single-Family	Single-Family Units Needed	Single Family Acres Needed	% Multi-Family	Multi-Family Units Needed	Multi-Family Acres Needed	
Status quo: 12% M-F	6,962	88%	6,145	1,536	12%	817	41	1,577
<b>Alt. A: 50% M-F</b>		50%	3,481	870	50%	3,481	174	<b>1,044</b>
Status quo: 4 du/acre S-F		88%	6,145	1,536	12%	817	41	1,577
<b>Alt. B: 6 du/acre SF</b>		88%	6,145	1,024	12%	817	41	<b>1,065</b>
<b>Alts. A and B</b>		50%	3,481	580	50%	3,481	174	<b>753</b>

1/ From Table 3-6, Additional Land Needed for Resident and Non-Resident Housing to 2030, Single-Family and Multi-Family; column 2.

There are two general ways to increase density: (1) to develop a multi-family housing type rather than single-family; and (2) to increase the number of units per acre in either category.

Table 3-7 shows alternative assumptions for the Wailuku-Kahului CP Area, which is projected to need 6,962 more units by 2030 than can be provided with the existing land supply. Alternative A increases the proportion of units in multi-family housing to 50%, which reduces the amount of land needed by 533 acres – or about one-third. Alternative B increases the average density of single-family development from 4 to 6 units per acre. (This would provide lots averaging more than 5,000 square feet.) Alternative B also reduces the amount of land needed by about one-third. Combining A and B reduces the amount of additional residential land needed by more than 50 percent.

Conversely, the amount of land consumed is drastically increased when residential development occurs at rural or agricultural densities. Taking the Wailuku-Kahului example, suppose that one-quarter of the single-family units (22% of the 6,962 units) was to be developed under Rural zoning at an average density of 1 unit per acre. This would increase the land needed from 1,577 acres to 2,870 acres – 72% more than the baseline.

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## 4. RESORT LAND USE

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## 4. Resort Land Use

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This chapter provides a forecast of land area requirements for visitor accommodations. It is assumed that new visitor accommodations will be developed on lands designated “Hotel” on the Community Plan maps or lands within a Project District where visitor accommodations are specifically allowed. The term “Resort Land Use” refers generally to all types of formal visitor accommodations and their accessory facilities.

### 4.1 APPROACH

In addition to actual hotels, which consist of lodging units (no kitchen), visitor accommodations also include multi-family residential buildings having dwelling units (with kitchen). These apartment or townhouse buildings may be under timeshare, condominium or individual ownership.

The forecast for Resort Land Use is based directly on the Socio-Economic Forecast’s projections of “Total Visitor Units” for each Community Plan region (Exhibit R-21). The Socio-Economic Forecast based its projections on DBEDT’s 2030 projection of visitor units for Maui County. The DBEDT model assumes an overall occupancy rate of 82.5% as the threshold of demand for the development of more visitor units. The Socio-Economic Forecast based its allocation of projected visitor units according to the Planning Department’s analysis of vacant lands designated in the Community Plans for resort use (“Hotel” designation) and its database of resort projects in development or planned for the future.

For baseline counts of visitor units, the DBEDT projections and the Socio-Economic Forecast rely on DBEDT’s Visitor Plant Inventory (VPI) for the year 2000. In order to be consistent with the Socio-Economic Forecast, the Land Use Forecast uses 2000 as the baseline year and adopts the Socio-Economic Forecast’s baseline count of visitor units.

Because many individual units go unreported, the VPI tends to under-count the number of visitor units – particularly single-family B&Bs and vacation rentals in rural areas. As stated in the Socio-Economic Forecast, the Planning Department decided to retain the DBEDT definition and count of visitor units for the purpose of forecasting. The Socio-Economic

Forecast’s projection of visitor units to 2030, therefore, captures the estimated 94% of visitor units located in designated resort areas. This matches the purpose of this forecast, which is to project the need for Hotel-designated land.

## 4.2 LAND SUPPLY

The supply of resort land is defined as parcels designated Hotel on the Community Plan maps that remain vacant or under-utilized. Instead of relying solely on acreages and assumed densities to arrive at land capacity in terms of visitor units, this forecast also utilizes the Planning Department’s Development Project Database to define the potential supply of new visitor units. The Development Projects Database lists planned projects and numbers of units on known Hotel-designated sites. Remaining Hotel-designated lands were screened for

**Table 4-1 Supply of Potential Resort Units**

Community Plan Area	Known Projects 1/ (units)	Vacant Lands 2/		Total Potential Units
		Acres	Units 3/	
Hana	-	-	-	-
Kihei-Makena	1,482	5	169	1,651
Makawao-Pukalani-Kula	-	8	168	168
Pa’ia-Ha’iku	-	-	-	-
Wailuku-Kahului	276	-	-	276
West Maui	2,090	-	-	2,090
<b>Island Total:</b>	<b>3,848</b>	<b>13</b>	<b>337</b>	<b>4,185</b>

1/ Source: Maui County Long-Range Planning Division's Land Availability Analysis referenced in the Socio-Economic Forecast Report. "Known Projects" consists of development proposals for identified sites that have appropriate Community Plan designations for resort development.

2/ Vacant lands designated "Hotel" in the Community Plans.

3/ Future resort units for West Maui, Kihei-Makena and Wailuku-Kahului based on density of 35 units/acre. All other community plan areas based on assumed density of 20 units/acre.

vacant properties. “Vacant lands” were defined as parcels with gross building values of less than \$10,000 (Real Property Tax database). The resulting information is described in terms of “potential resort units,” as shown in Table 4-1. This represents the best estimate of the development capacity of lands currently designated Hotel.

## 4.3 PROJECTED DEMAND FOR VISITOR UNITS 2015 AND 2030

The demand for additional visitor units for the horizon years 2015 and 2030 is calculated in Table 4-2. The 2015 and 2030 demand numbers are taken from the “Total Visitor Units” projections in the Socio-Economic Forecast, as are the unit numbers for the baseline year

2000. The 2015 Need for Additional Units is obtained by subtracting the number of Existing Units from the 2015 Projected Total Units. Similarly, the 2030 Need for Additional Units is obtained by subtracting the 2015 Projected Total Units from the 2030 Projected Total Units. The final column represents the cumulative total additional visitor units projected through 2030.

The projected total increase is 8,241 visitor units, of which only 36% are projected to be developed in the 2000-2015 period. In fact, the Socio-Economic Forecast projects no growth to 2005, which appears to be validated by the data available through 2004. This is due in part

**Table 4-2 Projected Demand for Resort Units**

Community Plan Area	2015 VISITOR UNIT DEMAND			2030 VISITOR UNIT DEMAND			Total Demand for Resort Units 2000-2030 1/
	2015 Projected Total Units	2000 Existing Units	Additional Units Needed 2000-2015 1/	2030 Projected Total Units	2015 Projected Total Units	Additional Units Needed 2015-2030 1/	
Hana	91	196	(105)	93	91	2	(103)
Kihei-Makena	9,282	6,789	2,493	12,500	9,282	3,218	5,711
Makawao-Pukalani-Kula	7	10	(3)	7	7	-	(3)
Pa'ia-Ha'iku	19	12	7	21	19	2	9
Wailuku-Kahului	461	807	(346)	544	461	83	(263)
West Maui	10,614	9,659	955	12,549	10,614	1,935	2,890
<b>Island Total:</b>	<b>20,474</b>	<b>17,473</b>	<b>3,001</b>	<b>25,714</b>	<b>20,474</b>	<b>5,240</b>	<b>8,241</b>

Source: 2006 Maui County General Plan Update: Socio-Economic Forecast, Exhibit R-21: Total Visitor Units.

1/ Negative numbers for some regions, particularly Hana and Wailuku, result from high counts in the baseline year 2000 (2000 Visitor Plant Inventory). A note to Socio-Economic Forecast Exhibit R-21 states that the projected regional distribution of units for the forecast years 2005-2030 was adjusted using the 2004 Visitor Plant Inventory.

to conversions of existing hotel rooms to a smaller number of timeshare units. In recent years, the loss of units from conversions appears to offset gains from new resort projects.

The largest gain is projected for the Kihei region, where the number of visitor units is forecast to increase by 5,700 between 2000 and 2030. The Socio-Economic Forecast calls for the West Maui region to receive 2,900 additional visitor units over the same period. By 2030, the two regions are projected to be even – each having about 12,500 visitor units.

## 4.4 COMPARISON OF SUPPLY AND DEMAND

Table 4-3 compares the supply of potential resort units, based on known projects and vacant lands, to the projected 2000-2030 demand for new visitor units. The table shows a significant deficit of potential units compared to projected demand. Islandwide, the deficit amounts to one-half of the projected demand. Both of Maui's major visitor destination areas – West

**Table 4-3 Comparison of Potential Supply vs. Demand for Visitor Units**

Community Plan Area	Supply of Potential Visitor Units	Total Demand for Resort Units 2000-2030	Surplus/(Deficit) of Potential Visitor Units	Additional Units Needed	Acres of "Hotel" Land Needed
Hana	-	(103)	103	-	-
Kihei-Makena	1,651	5,711	(4,060)	4,060	162
Makawao-Pukalani-Kula	168	(3)	171	-	-
Pa'ia-Ha'iku	-	9	(9)	9	1
Wailuku-Kahului	276	(263)	539	-	-
West Maui	2,090	2,890	(800)	800	32
<b>Island Total:</b>	<b>4,185</b>	<b>8,241</b>	<b>(4,056)</b>	<b>4,869</b>	<b>195</b>

Source: Tables 4-1 and 4-2.

Maui and Kihei-Makena – will need more land planned for resort use, if Maui is to meet the State's 2030 projections. The deficit is largest in Kihei-Makena, amounting to 4,060 units. (Note that only about one-third of future units at the Makena Resort are projected to be visitor accommodations as opposed to residential condo units.) Based on an average density of 35 units per acre, this translates to 162 acres of resort land needed – i.e., 162 acres of additional land designated Hotel on the Community Plan. The analysis shows a deficit of 800 visitor units in West Maui, which translates to 32 acres of additional land designated Hotel on the Community Plan. The remaining four Maui regions can accommodate an adequate number of visitor units to meet the projected demand.

## 4.5 ISSUES

This forecast raises two related issues: (1) the changing types of visitor units, their use characteristics, and how they are counted; (2) the disparity between the number of visitor units projected and the potential supply of land designated for such use.

#### **4.5.1 Trends in Visitor Accommodations**

The Resort Land Use Forecast presented herein is primarily focused on “formal” visitor accommodations located in areas designated for “Hotel” use. It does not address the spill-over of the visitor market into second-home purchases or into transient vacation rentals. These are addressed by a new element of the Socio-Economic Forecast called “Non-Resident Housing,” which is incorporated into the Residential Land Use forecast (Chapter 3 above).

Future resort development is being shaped by some emerging trends, which are probably not well-modeled in the projections. Some hotels are being converted to condominium or timeshare, and fewer of the new units being developed are in hotels. The increasing number of timeshare facilities affects occupancy patterns and the visitor accommodations inventory in several ways. Timeshares tend to attract larger parties and have higher occupancy rates than other accommodations. In terms of accommodating a larger volume of visitors, timeshares appear to be more efficient than hotels or resort condominiums. On the other side of the ledger, hotel-to-timeshare conversions typically result in fewer (though larger) visitor units.

A related trend is the development of fractional ownership clubs, which typically sell unit interests in intervals of one month or longer. This type of pre-paid accommodation fits somewhere between a timeshare unit and a second home.

Finally, an increasing proportion of visitors is attracted to B&Bs and single-family vacation rentals located outside of resorts. Many of these operate illegally at the present time, though there have been attempts to reformulate the zoning regulations. Legal status notwithstanding, the number of these “un-resort” units might well increase.

#### **4.5.2 2030 Visitor Projections and Land Capacity**

The forecast indicates that there will be a substantial deficit in lands planned for future resort use – i.e., lands designated “Hotel” on the Community Plans. This raises questions at several levels.

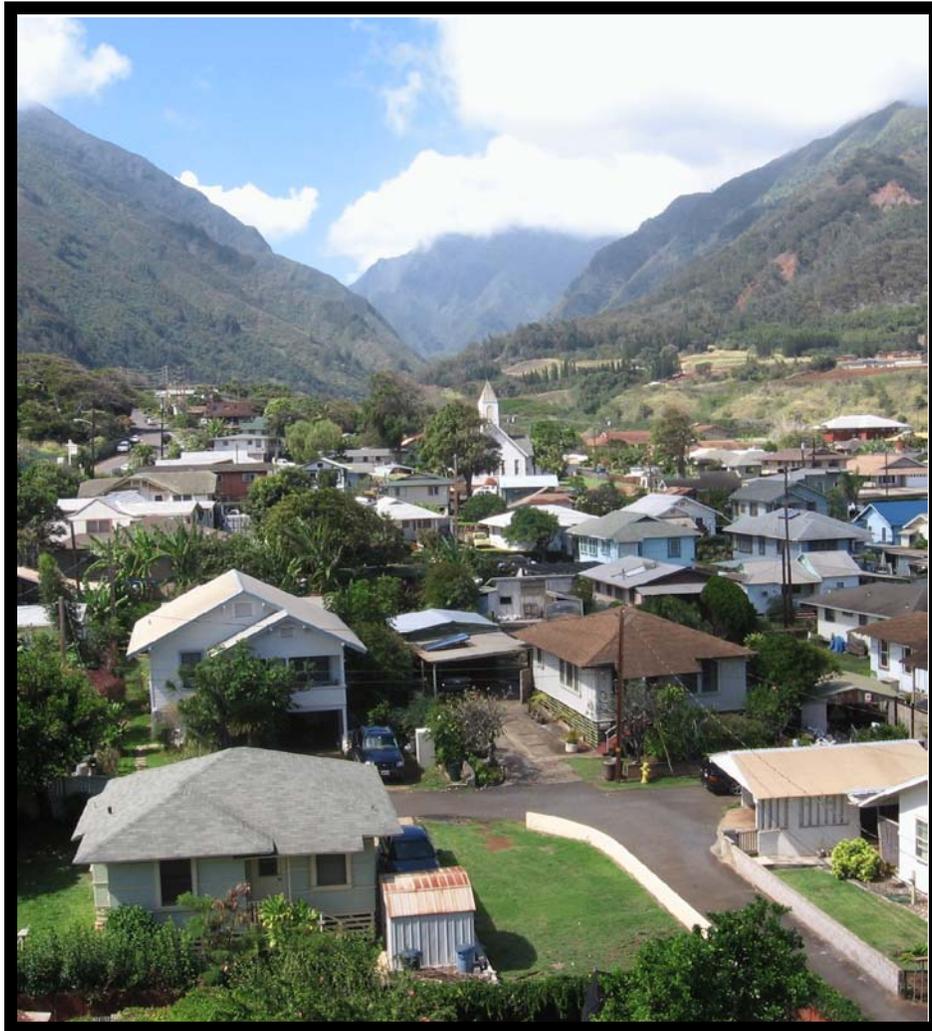
First, assuming that Maui County accepts the 2030 projections, where would the additional units be located? Will the high projected demand for visitor accommodations fuel further expansion of transient rentals into residential and agricultural communities?

A key question is whether Maui County wishes to adopt the State's visitor projections as a target, or whether there should be different goals for the Island of Maui. Many residents believe that the large tourist population already has too great an impact on Maui. The Hawai'i Tourism Authority today places emphasis on residents' attitudes, resource use and other impacts, and the overall sustainability of the industry. The Hawai'i Strategic Tourism Plan 2005-2015 encourages each county to set its own goals for tourism.

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## 5. COMMERCIAL AND INDUSTRIAL LAND USES

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# 5. Commercial and Industrial Land Uses

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This chapter provides a forecast of commercial and industrial land area requirements and describes the data and process used to develop the forecast.

## 5.1 APPROACH

Forecasting need for Commercial and Industrial lands requires more steps than forecasting for Residential and Resort lands. For the latter, the Socio-Economic Forecast predicts the number of housing units and visitor units needed. For Commercial and Industrial, the Socio-Economic Forecast provides only a forecast of jobs by industry. The approach used herein is based on the fundamental premise that adding jobs in certain industries (employment sectors) generates a demand for additional building area and land area in two broad classes – commercial and industrial.

Commercial uses involve jobs in retail trade, business and professional services, banking, insurance and real estate, and non-hotel services. (Hotel and hotel-related service jobs are excluded.) They primarily entail direct sales and services to the public and generally require substantial amounts of customer parking. Big-box stores such as Costco and Home Depot are considered as belonging to the retail trade sector. Commercial uses are generally found in Business zoning districts, though the Maui zoning code allows commercial uses in Industrial districts as well. This issue is addressed in the concluding Section 5.6.

Industrial uses involve jobs in wholesale trade, manufacturing, construction, and transportation, communication and utilities. They include such land-extensive uses as base yards (e.g., for transportation and construction companies), manufacturing plants, and warehouses. For purposes of estimating future land needs, the analysis does not include industrial-type facilities that are associated with agricultural uses (e.g., processing plants, storage buildings) or resource extraction uses (e.g., quarries). Such uses typically occur on large lots in Agriculture-zoned areas. The analysis is focused on the need for urban Industrial-zoned areas.

Commercial and Industrial land demand projections typically begin with employment forecasts. The forecasts are disaggregated by industry sector and then related to specific land

uses. For example, manufacturing jobs are typically allocated to industrial land use, and banking/finance jobs are typically allocated to commercial land use. Jobs can then be converted to land demand by using information about employees per acre. Square feet of building area per employee is also among the multipliers commonly used. There are various methods to forecast employment and land demand, and the availability of data is usually the determining factor.

For Maui's commercial and industrial land forecast, island-wide employment projections were taken from the Socio-Economic Forecast. The island-wide projections were then distributed regionally, using the percentage of commercial and industrial floor area existing in each Community Plan Area. With a regional breakdown of jobs, a simple multiplier of employees per acre was applied to the jobs in order to translate jobs into commercial and industrial land area requirements. Calculations are provided using historical data for the year 2000 as well as projections for the years 2015 and 2030. Demand figures for 2015 and 2030 were added together to get a total demand estimate which was then compared against supply to identify net demand. The net demand figures provide policy-makers with a gross number of acres, in each Community Plan area, that need to be designated, in addition to existing Community Plan designations, to accommodate demand projected to the year 2030.

The method used herein starts with the forecast of future jobs by sector, provided by the 2006 Maui County Socio-Economic Forecast. Following are the major steps:

1. Determine existing supplies of vacant land planned for Commercial and Industrial use.
2. Project total Commercial and Industrial jobs and net new jobs for the horizon years 2015 and 2030; estimate distribution of jobs by Community Plan Area.
3. Using ratios of jobs per acre, calculate land demand – i.e., acres needed to accommodate new Commercial and Industrial jobs.
4. Compare demand for Commercial and Industrial land use to the existing supplies of vacant Planned land.

This analysis yields a forecast of additional lands that need to be planned for Commercial and Industrial use, by CP Area. The ensuing sections follow the steps stated above. Each section describes assumptions and provides tabular calculations.

## 5.2 LAND SUPPLY

The supply of commercial and industrial land is defined as parcels with Community Plan designations related to commercial and industrial development that remain vacant or under-utilized. The Commercial land supply consists of the following Community Plan designations: Business/Commercial and Business/Multi-Family, as well as lands designated for Commercial Use within Project Districts. The Industrial land supply is drawn from CP designations of Business/Industrial, Light Industrial, Heavy Industrial, and Rural/Light Industrial, as well as lands designated for Industrial Use within Project Districts.

**Table 5-1 Supply of Commercial and Industrial Land**

Community Plan Area	Supply of Commercial Land (Acres)	Supply of Industrial Land (Acres)
Hana	-	-
Kihei-Makena 1/	269	420
Makawao-Pukalani-Kula	21	2
Pa'ia-Ha'iku	1	1
Wailuku-Kahului	58	309
West Maui	20	35
<b>Island Total:</b>	<b>369</b>	<b>766</b>

Source: Maui Island Development Projects Database and Maui Island Land Availability Analysis, prepared by the Long-Range Division, Maui Planning Department, October 25, 2006.  
 1/ In the Kihei-Makena CP Area, Project District 6 (the Maui Research & Technology Park) has 352 acres of vacant land planned for manufacturing, research, office, and auxiliary uses. The forecast allocates half to the Commercial land supply, half to Industrial -- 176 acres each.

Vacant lands were defined as parcels with gross building values of less than \$10,000 (Real Property Tax database) per acre, and that are not subject to development constraints including slopes in excess of 15%, lands subject to flooding or drainage, and lands accessory to a principal use such as parking lots, landscaping, and roadways. In addition, the Long Range Planning Division analyzed vacant parcels and deleted those that lacked sufficient

area or had dimensions that were infeasible for development (i.e., remnant configurations such as a sliver of land).

The results of the supply analysis are presented in Table 5-1. Island-wide, the supply of industrial lands is twice the supply of commercial lands. The Kihei-Makena CP Area stands out as having the largest land supply in both categories – 73% of the island’s commercial land supply and 55% of its industrial land supply. This is due in part to 352 acres of vacant land in the Maui Research & Technology Park (Project District 6), which for purposes of the forecast has been divided evenly between Commercial and Industrial – 176 acres each. Wailuku-Kahului also has a large supply of land planned for industrial use. This includes Phase II of the Maui Business Park, which totals 183 acres planned but not yet zoned Industrial. It also includes 67 acres planned for a future Maui Electric Company power plant in Pu`unene.

### **5.3 PROJECTION OF COMMERCIAL AND INDUSTRIAL JOBS**

The first step in calculating future demand for land is to allocate projected jobs to commercial and industrial land uses. The next step is to project the distribution of jobs by Community Plan Area.

#### **5.3.1 Allocation of Jobs to Commercial and Industrial Land Uses**

The Hawai`i Department of Business, Economic Development and Tourism (DBEDT) counts existing jobs and projects future jobs according to industry, or employment sector. Wage and salary jobs are classified according to the following sectors: Agriculture; Manufacturing; Construction; Transportation, Utilities and Communications; Trade; Banking and Finance; Services, with sub-categories “Hotel” and “Other Services”; and Government. DBEDT counts Self-Employed jobs based on tax filings. The 2006 Socio-Economic Forecast provides projections of jobs based on DBEDT’s statewide projections.

In defining job classes related to commercial land use, this forecast assumes that Banking and Finance jobs are office-based and typically occur in commercial districts. Service jobs include professional and blue-collar occupations; these also occur in commercial districts. Of the Trade category, 90% of the jobs are assumed to be associated with retail trade, a key

commercial land use. Finally, this forecast assumes that 20% of Self-Employed jobs were conducted from commercial buildings. (Since the count of self-employed jobs is induced from tax filings, including income from investments, this forecast assumes that the majority are conducted from home.)

The identification of job classes related to industrial land use was based on the following assumptions:

- All jobs in the Manufacturing and Transportation/Utilities sectors are industrial.
- 10% of Trade jobs are wholesale trade, occurring in industrial warehouses.
- 20% of Construction industry jobs are located in industrial baseyards and shops (the remaining 80% located at building sites).
- 10% of Self-Employed jobs are conducted from industrial premises.

The commercial and industrial allocations were then applied to year 2000 historical jobs data and to projections for 2015 and 2030, provided in the Socio-Economic Forecast (Exhibit I-14, Maui Island Jobs by Industry). Tables 5-2 and 5-3 present job projections according to commercial and industrial land use categories.

**Table 5-2 Projected Commercial Jobs**

Sector	Percent Comm'l 1/	2000 Jobs 2/	2000 Commercial Jobs	2015 Jobs 2/	2015 Commercial Jobs	2030 Jobs 2/	2030 Commercial Jobs
Trade	90%	16,250	14,625	19,525	17,573	23,746	21,371
Banking, Finance	100%	2,650	2,650	3,177	3,177	3,748	3,748
Other Services	100%	11,800	11,800	16,683	16,683	19,966	19,966
Self-employed Jobs	20%	16,787	3,357	22,033	4,407	28,478	5,696
<b>Island Total:</b>			32,432		41,839		50,781

1/ Assumed distribution; see Sec. 5.3.1.

2/ From Socio-Economic Forecast, Maui County General Plan 2030, Exhibit I-14, Maui County Jobs by Industry.

Total commercial jobs are projected to increase by 29% during the period 2000-2015, and by 21% during the period 2016-2030. For the entire forecast period 2000-2030, total commercial jobs increase by 56%. The largest increases come in the retail trade and services sectors.

**Table 5-3 Projected Industrial Jobs**

Sector	Percent Industrial 1/	2000 Jobs 2/	2000 Industrial Jobs	2015 Jobs 2/	2015 Industrial Jobs	2030 Jobs 2/	2030 Industrial Jobs
Manufacturing	100%	1,750	1,750	1,469	1,469	1,373	1,373
Construction	20%	2,500	500	3,394	679	3,526	705
Trans.,com.,util.	100%	4,350	4,350	3,350	3,350	3,864	3,864
Trade	10%	16,250	1,625	19,525	1,953	23,746	2,375
Self-employed Jobs	10%	16,787	1,679	22,033	2,203	28,478	2,848
<b>Island Total:</b>			9,904		9,654		11,165

1/ Assumed distribution; see Sec. 5.3.1.

2/ From Socio-Economic Forecast, Maui County General Plan 2030, Exhibit I-14, Maui County Jobs by Industry.

In contrast, total industrial jobs are projected to increase only 14% over the 30-year period. The forecast shows a decline in total industrial jobs for the 2000-2015 period, owing primarily to a sharp decrease in projected Transportation/Utilities jobs. Manufacturing jobs are also projected to decline gradually through 2030. In the 2016-2030 period, the forecast shows a recovery, with total industrial jobs increasing by 16%. While the projections are taken from the Socio-Economic Forecast, they can be traced to DBEDT's 2030 projections for Maui County; and they reflect the economic assumptions of the DBEDT model.

### 5.3.2 Regional Distribution of Jobs

To estimate the distribution of commercial and industrial jobs among the six Maui Community Plan Areas, the forecast assumes that the number of jobs was proportionate to the amount of floor area in commercial and industrial buildings. Using the Existing Land Use Database, floor areas of commercial and industrial buildings were summed for each CP Area and for the island. The results shown in Table 5-4 indicate the percentage of urban commercial and industrial activity found in the six Maui regions. The Wailuku-Kahului CP Area has by far the largest share of floor area in both commercial and industrial building categories.

**Table 5-4 Regional Distribution of Existing Commercial and Industrial Buildings**

Community Plan Areas	COMMERCIAL		INDUSTRIAL	
	Existing Building Area (Sq. Ft.)	Regional Distribution	Existing Building Area (Sq. Ft.)	Regional Distribution
Hana	119,937	1%	26,447	0%
Kihei-Makena	2,033,226	20%	293,685	4%
Makawao-Pukalani-Kula	655,162	6%	105,772	2%
Pa'ia-Ha'iku	273,181	3%	264,898	4%
Wailuku-Kahului	4,996,602	49%	5,341,991	80%
West Maui	2,148,605	21%	603,398	9%
<b>Island Total:</b>	<b>10,226,713</b>	<b>100%</b>	<b>6,636,191</b>	<b>100%</b>

Source: Existing Land Use Database (2004 Real Property Tax Division Data). Sums may not equal 100% due to rounding.

The percent distribution of commercial and industrial floor area was applied to 2015 and 2030 job projections to calculate the regional distribution of commercial and industrial jobs. This assumes that the distribution of commercial and industrial activities among the CP Areas will remain generally the same in the future. The results are presented in Table 5-5 and Table 5-6 below.

**Table 5-5 Regional Distribution of Commercial Jobs**

Community Plan Area	% of Commercial Bldg. Area 1/	2000 Commercial Jobs 2/	2015 Commercial Jobs 2/	2030 Commercial Jobs 2/
<b>Island Total:</b>	<b>100%</b>	<b>32,432</b>	<b>41,839</b>	<b>50,781</b>
Hana	1%	380	491	596
Kihei-Makena	20%	6,448	8,318	10,096
Makawao-Pukalani-Kula	6%	2,078	2,680	3,253
Pa'ia-Ha'iku	3%	866	1,118	1,356
Wailuku-Kahului	49%	15,846	20,442	24,811
West Maui	21%	6,814	8,790	10,669

1/ From Table 5-4.

2/ From Table 5-2.

**Table 5-6 Regional Distribution of Industrial Jobs**

Community Plan Area	% of Industrial Bldg. Area 1/	2000 Industrial Jobs 2/	2015 Industrial Jobs 2/	2030 Industrial Jobs 2/
<b>Island Total:</b>	<b>100%</b>	<b>9,904</b>	<b>9,654</b>	<b>11,165</b>
Hana	0%	39	38	44
Kihei-Makena	4%	438	427	494
Makawao-Pukalani-Kula	2%	158	154	178
Pa'ia-Ha'iku	4%	395	385	446
Wailuku-Kahului	80%	7,973	7,771	8,988
West Maui	9%	901	878	1,015

1/ From Table 5-4. Sum may not equal 100% due to rounding.

2/ From Table 5-3.

## 5.4 PROJECTED LAND DEMAND 2015 AND 2030

Utilizing a ratio of the number of employees per acre is a common method of converting job projections into land use projections. Commercial and industrial employee per acre ratios were estimated by comparing year 2000 commercial and industrial employment data with commercial and industrial land use data from the Existing Land Use Database. TMK parcels were identified through the ELUD as having primarily commercial or industrial land use. These parcels occur primarily in urban areas. TMK parcels in Agriculture-Rural ELUD categories were not considered because they tend to have multiple uses, and their land area tends to be much larger than the actual area occupied by the commercial or industrial use.

The commercial employees per acre ratio was determined by dividing the 32,432 commercial jobs existing in the year 2000, by the number of acres classified through the ELUD as having primary land use of commercial (564 acres). This yielded a ratio of 58 employees per acre of commercial land use.

The industrial employees per acre ratio was determined by dividing the 9,904 industrial jobs existing in the year 2000, by the number of acres classified as having primary land use of industrial (406 acres). This yielded a ratio of 24 employees per acre of industrial land use.

This step applies employment per acre ratios to changes in employment by sector for the forecasting period. The output of this analysis consists of projections of land demand for commercial and industrial uses, as presented in Tables 5-7 and 5-8. Note that these tables

represent demand only. Section 5.5 below compares demand to the existing supply of vacant lands.

**Table 5-7 Projected Demand for Commercial Land in Years 2015 and 2030**

Community Plan Area	2000 Commercial Jobs 1/	2015 DEMAND			2030 DEMAND			Additional Commercial Land Needed 2000-2030
		Commercial Jobs 1/	New Commercial Jobs 2/	Commercial Acres Needed 3/	Commercial Jobs 1/	New Commercial Jobs 4/	Commercial Acres Needed 3/	
Hana	380	490	110	2	595	105	2	4
Kihei-Makena	6,448	8,318	1,870	32	10,096	1,778	31	63
Makawao-Pukalani-Kula	2,078	2,680	603	10	3,253	573	10	20
Pa'ia-Ha'iku	867	1,118	251	4	1,357	239	4	8
Wailuku-Kahului	15,846	20,442	4,596	79	24,811	4,369	75	155
West Maui	6,814	8,791	1,976	34	10,669	1,879	32	66
<b>Island Total:</b>	<b>32,432</b>	<b>41,839</b>	<b>9,407</b>	<b>162</b>	<b>50,781</b>	<b>8,942</b>	<b>154</b>	<b>316</b>

1/ From Table 5-5.

2/ 2015 New Commercial Jobs = [2015 Commercial Jobs] - [2000 Commercial Jobs].

3/ Based on the ratio of commercial jobs to commercial acres. Commercial Acres Needed + [New Commercial Jobs] / 58 commercial jobs per acre.

4/ 2030 New Commercial Jobs = [2030 Commercial Jobs] - [2015 Commercial Jobs].

As shown in Table 5-7, commercial job growth is projected to induce a demand of 162 acres by 2015, and an additional 154 acres 2016-2030. The greatest demand comes in the urban areas of Central, South and West Maui. The demand projected in the rural areas is modest. Total commercial land demand to 2030 for the Wailuku-Kahului CP Area amounts to 155 acres, nearly half of the island total of 316 acres.

**Table 5-8 Projected Demand for Industrial Land in Years 2015 and 2030**

Community Plan Area	2000 Industrial Jobs 1/	2015 DEMAND			2015 DEMAND			Additional Industrial Land Needed 2000-2030
		Industrial Jobs 1/	New Industrial Jobs 2/	Industrial Acres Needed 3/	Industrial Jobs 1/	New Industrial Jobs 4/	Industrial Acres Needed 3/	
Hana	39	38	(1)	-	44	6	0	0
Kihei-Makena	438	427	(11)	-	494	67	3	3
Makawao-Pukalani-Kula	158	154	(4)	-	178	24	1	1
Pa'ia-Ha'iku	395	385	(10)	-	446	60	3	3
Wailuku-Kahului	7,973	7,771	(201)	-	8,988	1,216	51	51
West Maui	901	878	(23)	-	1,015	137	6	6
<b>Island Total:</b>	<b>9,904</b>	<b>9,654</b>	<b>(250)</b>	<b>-</b>	<b>11,165</b>	<b>1,511</b>	<b>64</b>	<b>64</b>

1/ From Table 5-6.

2/ 2015 New Industrial Jobs = [2015 Industrial Jobs] - [2000 Industrial Jobs].

3/ Based on the ratio of industrial jobs to industrial acres. Industrial Acres Needed = [New Industrial Jobs] / 24 industrial jobs per acre.

4/ 2030 New Industrial Jobs = [2030 Industrial Jobs] - [2015 Industrial Jobs].

Because industrial jobs are projected to decline slightly by 2015 (discussed above in Sec. 5.3.1), the forecast shows no demand for industrial land in that period. As shown in Table 5-8, demand for industrial land needed by 2030 amounts to 64 acres. Following the historical trend, the forecast allocates about 80% of the additional jobs and acreage to the Wailuku-Kahului CP Area. Note that the calculation of demand is based on general trends only; it does not reflect specific factors and circumstances such as the impending displacement of warehouse storage from government land at Kahului Harbor. This and other circumstances may increase the need for industrial lands.

## 5.5 COMPARISON OF LAND SUPPLY AND DEMAND

The final step is to compare land supply to demand. The results provide policy-makers with projected numbers of acres needed for commercial and industrial land uses, in order to meet the demands of increased economic activity through the year 2030. The projections are presented in Tables 5-9 and 5-10.

**Table 5-9 Surplus/Deficit in the Supply of Commercial Land vs. 2030 Demand**

Community Plan Area	Supply of Commercial Land 1/ (Acres)	Additional Commercial Land Needed 2000-2030 2/ (Acres)	Surplus/(Deficit) of Supply (Acres)	Net Commercial Acres Needed
Hana	-	4	(4)	4
Kihei-Makena	269	63	206	-
Makawao-Pukalani-Kula	21	20	1	-
Pa'ia-Ha'iku	1	8	(7)	7
Wailuku-Kahului	59	155	(96)	96
West Maui	20	66	(46)	46
<b>Island Totals</b>	<b>369</b>	<b>316</b>	<b>54</b>	<b>153</b>

1/ From Table 5-1.

2/ From Table 5-7.

Table 5-9 indicates that the Kihei-Makena CP Area has a large amount of land planned for commercial use at the present time and is projected to retain a surplus of almost 200 acres by 2030. As shown in Table 5-10, the forecast projects an even greater surplus of industrial land for Kihei-Makena – 417 acres. As discussed in Sec. 5.2 above, the 352 acres of undeveloped land belonging to the Maui Research & Technology Park (allocated half to the commercial supply, half to the industrial supply) accounts for a large portion of both surpluses.

For the Wailuku-Kahului CP Area, the analysis shows a net need (deficit) of 96 acres of Commercial-designated land by 2030, and a surplus of 258 acres of Industrial-designated land. Given that Maui zoning allows commercial uses in Industrial districts, the surplus of lands planned for industrial would be sufficient to cover the deficit in planned commercial lands.

According to the forecast, the West Maui CP Area also has a net need for Commercial-designated land (46 acres) and a net surplus of Industrial-designated land (29 acres). In this case, however, the surplus in planned industrial lands is 17 acres less than the deficit in planned commercial lands. West Maui will need more land planned for commercial use.

Based on the 2030 projections, the forecast shows little need for additional lands planned for industrial and commercial use in the rural CP Areas. The analysis projects a need for four

acres of commercial land in Hana, and a total net need of nine acres of commercial and industrial land in Pa`ia-Ha`iku.

**Table 5-10 Surplus/Deficit in the Supply of Industrial Land vs. 2030 Demand**

Community Plan Area	Supply of Industrial Land 1/ (Acres)	Additional Industrial Land Needed 2000-2030 2/ (Acres)	Surplus/(Deficit) of Supply (Acres)	Net Industrial Acres Needed
Hana	-	-	-	-
Kihei-Makena	420	3	417	-
Makawao-Pukalani-Kula	2	1	1	-
Pa`ia-Ha`iku	1	3	(2)	2
Wailuku-Kahului	309	51	258	-
West Maui	35	6	29	-
<b>Island Totals:</b>	<b>766</b>	<b>64</b>	<b>703</b>	<b>2</b>

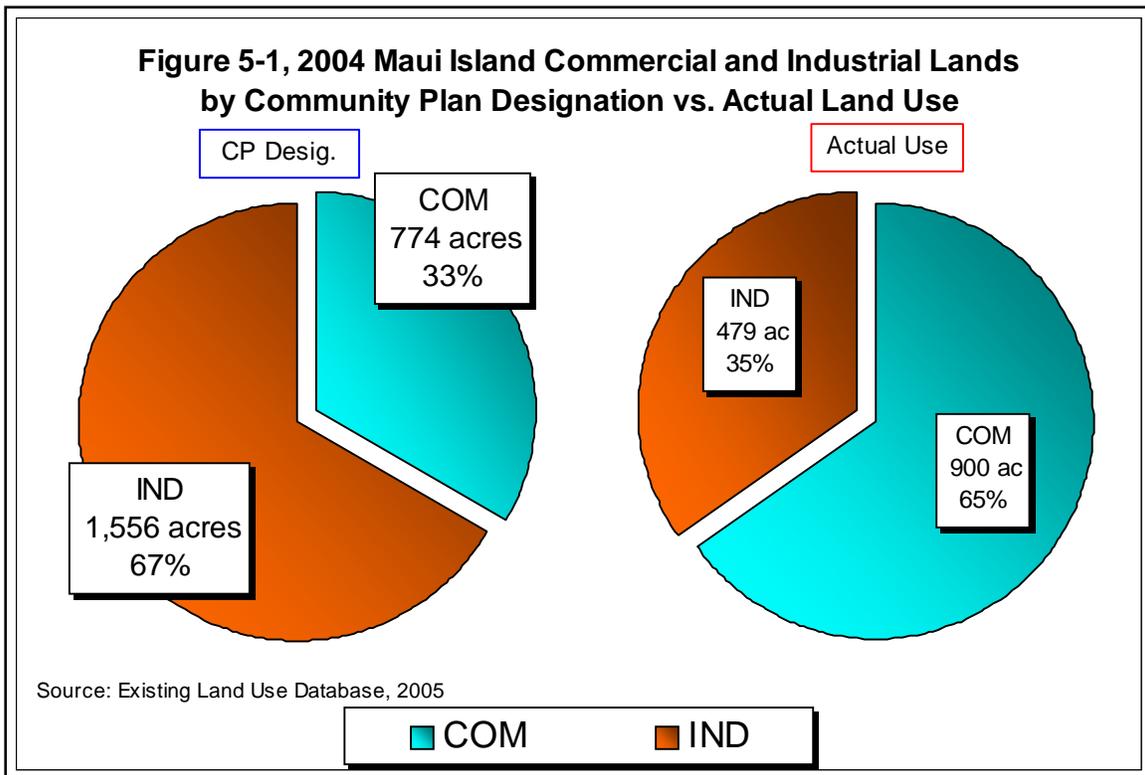
1/ From Table 5-1. In the Kihei-Makena Community Plan Area, Project District 6 (Maui Research & Technology Park) yields evenly divided Commercial and Industrial Vacant Lands of 176 acres planned commercial use, and 176 acres planned industrial use.

2/ From Table 5-8.

While commercial and industrial land uses have distinctly different characteristics in terms of employment, traffic and other impacts, on Maui they function within a land market and zoning regime that are not so well differentiated.

## 5.6 ISSUES

The forecast presented above is based on standard definitions and assumptions relating to commercial and industrial job types and structure types. Within its limitations, the forecast gives a relatively accurate picture of projected jobs and land needs in these two broad categories of use. Because the Maui zoning code allows commercial uses within industrial zones, however, the zoning of land and the spatial arrangement of commercial and industrial uses on the Island of Maui do not match the jobs and structures data.



The Maui zoning provisions effectively exclude industrial uses from Business zones, but allow commercial uses in both Business and Industrial zones. Because commercial enterprises generally pay higher lease rents and have fewer noxious impacts than industrial enterprises, the former will outbid the latter for use of available lands. Much land that is zoned Industrial is therefore occupied by commercial uses – typically retail and office. The land developer has an incentive to obtain Industrial zoning, and then to market subdivided lots to businesses that can pay the highest price. The net result is that, although substantial amounts of land are Community Plan Designated as Industrial use, such lands are rapidly consumed by commercial uses as illustrated above in Figure 5-1. This leaves industrial businesses at a serious disadvantage.

Maui is not unique in facing this problem of a shortage of land appropriately priced and located for industrial use. The City & County of Honolulu has struggled with this issue over the past 20 years. Honolulu’s Land Use Ordinance (its zoning code) restricts Industrial zoning districts to primarily industrial uses. However, it is difficult to monitor and police use

restrictions in the face of economic pressure. As a partial response, Honolulu has adopted new Industrial Mixed-Use zoning districts. Nevertheless, as central Honolulu gradually redevelops, industrial businesses are generally being forced out by higher land values and higher property taxes. Kaka`ako is a good example of a district in transition from industrial to commercial and residential uses.

A related issue is the Maui community's ability to plan the location of its major shopping districts. For example, the big-box stores in Kahului's Maui Business Park (Wal-Mart, Costco, Home Depot) attract large numbers of shoppers and automobile traffic. This has led to the development of shopping centers and strip commercial projects. As a result, this Industrial-planned and Industrial-zoned area has become the central shopping district for Wailuku-Kahului and perhaps for the whole island. Some maintain that big-box stores are indeed better suited to an Industrial zoning district than to a downtown.

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# APPENDIX: ALTERNATIVE FORECAST FOR RESIDENTIAL LANDS AND REFERENCES

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# Appendix:

## Alternative Forecast for Residential Lands

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This appendix provides an alternative forecast of Residential land area requirements, for comparison to the standard forecast presented in Chapter 3. The alternative forecast is based on a different definition of the Residential land supply. The difference is summarized below:

	<u>Definition of Land Supply</u>
Standard Forecast (Ch. 3)	Lands <u>planned</u> for Residential use (shown on the Community Plan Designation maps only – with or without conforming zoning)
Alternative Forecast	Lands <u>planned and zoned</u> for Residential use

Lands that have been zoned Residential in accordance with their CP designation are categorized as “Planned/Committed.” Lands that have been CP-designated Residential (or are part of a Project District that includes residential uses) but have not yet been zoned are considered “Planned/Designated.” (Much “Planned/Designated” land remains in Agricultural zoning.)

The purpose of providing the alternative forecast is to provide a basis for comparison and to generate options for changing the CP land use maps. Is too much land designated Residential in one CP Area, too little designated in another? Should CP designations for some lands be changed? A few Project Districts designated on the CP maps have never been proposed for rezoning. Should they be reevaluated? What other proposed projects or locations should be considered for Residential growth?

The tables below follow the same format as those in Chapter 3, but are titled and numbered differently. Tables 3.2 and 3.3 set forth the Projected Demand; since the numbers are identical for both scenarios, these tables have not been reproduced in the Appendix. Likewise, Table 3.7 does not change and is not reproduced.

**Table A.3-1 Supply of Potential Housing Units on Vacant Lands  
Planned and Zoned for Housing**

Community Plan Area	KNOWN PROJECTS (units) 1/	AG/RURAL SMALL LOTS 2/		SINGLE-FAMILY VACANT LANDS 3/		MULTI-FAMILY VACANT LANDS 4/		TOTAL Potential Units
		Lots	Units	Acres	Units	Acres	Units	
Hana	358	349	489	4	15	-	-	861
Kihei-Makena	5,026	143	200	261	1,042	64	1,274	7,542
Makawao-Pukalani-Kula	1,047	570	798	273	1,092	34	235	3,172
Pa'ia-Ha'iku	109	631	883	67	267	-	-	1,259
Wailuku-Kahului	8,590	174	244	70	280	2	34	9,149
West Maui	2,221	238	333	32	129	6	126	2,808
<b>Island Total:</b>	<b>17,351</b>	<b>2,105</b>	<b>2,947</b>	<b>706</b>	<b>2,824</b>	<b>105</b>	<b>1,670</b>	<b>24,792</b>

1/ Source: "Maui Island Development Projects Database," prepared by the Long-Range Division, Department of Planning, County of Maui, April 17, 2006. "Known Projects" consist of development proposals for identified sites that have appropriate Community Plan designations for housing development and include Project Districts, as well as Dept. of Hawaiian Homelands projects and approved 201G projects.

2/ Vacant lands designated "Agriculture" or "Rural" in the Community Plans, lots of 5 acres or less. Buildout of Ag/Rural Small lots estimated at 1.4 units per lot, based on average density of developed small Ag and Rural lots.

3/ Source: Maui County GIS Database, vacant lands by Community Plan Designations; includes Community Plan designations "Single-Family Residential" and "Service Business Residential". Average density assumed at 4 units per acre.

4/ Source: Maui County GIS Database, vacant lands with Community Plan designation "Multi-Family Residential". Density assumed at 20 units per acre for urban regions (Lahaina, Kihei, and Wailuku), and 7 units per acre for rural regions (Hana, Makawao, and Paia).

For projections of demand, see **Table 3.2** and **Table 3.3** in Chapter 3 of this report.

**Table A.3-4 Comparison of Potential Supply vs. 2030 Demand  
(Supply Limited to Vacant Lands Planned and Zoned for Housing)**

Community Plan Area	Supply of Potential Housing Units 1/	RESIDENT HOUSING ONLY		RESIDENT & NON-RESIDENT HSG.	
		Sum of Additional Units Needed to 2030 2/	Surplus (Deficit) of Potential Housing Units	Sum of Additional Units Needed to 2030 3/	Surplus (Deficit) of Potential Housing Units
Hana	861	160	701	379	482
Kihei-Makena	7,542	6,015	1,527	9,735	(2,193)
Makawao-Pukalani-Kula	3,172	3,534	(362)	4,374	(1,202)
Pa'ia-Ha'iku	1,259	778	481	1,432	(173)
Wailuku-Kahului	9,149	15,046	(5,897)	16,549	(7,400)
West Maui	2,809	4,181	(1,373)	7,850	(5,042)
<b>Island Total:</b>	<b>24,792</b>	<b>29,714</b>	<b>(4,922)</b>	<b>40,319</b>	<b>(15,527)</b>

1/ From Table A.3-1.

2/ From Table 3-2 (see Ch. 3)

3/ From Table 3-3 (see Ch. 3).

**Table A.3-5 Alternative Forecast: Additional Land Needed for Resident Housing Through 2030, Single-Family and Multi-Family**

Community Plan Area	Surplus/ (Deficit) of Potential Housing Units 1/	Additional Supply Needed (Units)	SINGLE-FAMILY LAND			MULTI-FAMILY LAND			Total Residential Acres Needed
			% Single-Family Residential 2/	Single-Family Units Needed 3/	Single Family Acres Needed 4/	% Multi-Family Residential 2/	Multi-Family Units Needed 5/	Multi-Family Acres Needed 6/	
Hana	701	-	96%	-	-	4%	-	-	-
Kihei-Makena	1,527	-	56%	-	-	44%	-	-	-
Makawao-Pukalani-Kula	(362)	362	98%	354	88	2%	8	1	90
Pa'ia-Ha'iku	481	-	97%	-	-	3%	-	-	-
Wailuku-Kahului	(5,897)	5,897	88%	5,205	1,301	12%	692	35	1,336
West Maui	(1,373)	1,373	54%	738	184	46%	635	32	216
<b>Island Total:</b>	<b>(4,921)</b>	<b>7,630</b>		<b>6,296</b>	<b>1,574</b>		<b>1,334</b>	<b>67</b>	<b>1,641</b>

1/ From Table A.3-4, Resident Housing Only. Note: Surplus/Deficit is based on existing supply limited to Vacant Lands Planned and Zoned for Housing.

2/ Source: Existing Land Use Database, 2004. This is the ratio of Single-Family to Multi-Family housing units within each Community Plan area.

3/ [Housing Units Needed] x [% SF] = SF Units Needed.

4/ The average density of developed Single-Family (SF) lands is 5 units per acre. For purposes of projecting capacity of vacant lands, this density was discounted to 4 units per acre, based on the assumption that 20% of land area would be required for roads and public facilities.

5/ [Housing Units Needed] x [% MF] = MF Units Needed.

6/ Multi-Family (MF) housing units are calculated based on a ratio of 20 units per acre for urban regions (Kihei-Makena, Wailuku-Kahului, and West Maui), and 7 units per acre for rural regions (Hana, Makawao-Pukalani-Kula, and Pa'ia-Ha'iku).

**Table A.3-6 Alternative Forecast: Additional Land Needed for Resident and Non-Resident Housing to 2030, Single-Family and Multi-Family**

Community Plan Area	Surplus/ (Deficit) of Potential Housing Units 1/	Additional Supply Needed (Units)	Single-Family Land			Multi-Family Land			Total Residential Acres Needed 7/
			% Single-Family Residential 2/	Single-Family Units Needed 3/	Single-Family Acres Needed 4/	% Multi-Family Residential 2/	Multi-Family Units Needed 5/	Multi-Family Acres Needed 6/	
Hana	482	-	96%	-	-	4%	-	-	-
Kihei-Makena	(2,193)	2,193	56%	1,224	306	44%	968	48	354
Makawao-Pukalani-Kula	(1,202)	1,202	98%	1,176	294	2%	26	4	298
Pa'ia-Ha'iku	(173)	173	97%	168	42	3%	4	1	43
Wailuku-Kahului	(7,400)	7,400	88%	6,532	1,633	12%	868	43	1,676
West Maui	(5,042)	5,042	54%	2,710	678	46%	2,331	117	794
<b>Island Total:</b>	<b>(15,527)</b>	<b>16,009</b>		<b>11,811</b>	<b>2,953</b>		<b>4,198</b>	<b>213</b>	<b>3,165</b>

1/ From Table A.3-4, Resident Housing Only. Note: Surplus/Deficit is based on existing supply limited to Vacant Lands Planned and Zoned for Housing.

2/ Source: Existing Land Use Database, 2004. The percentages represent the existing shares of Single-Family and Multi-Family housing units within each Community Plan area.

3/ [Housing Units Needed] x [% SF] = SF Units Needed.

4/ The average density of developed Single-Family (SF) lands is 5 units per acre. For purposes of projecting capacity of vacant lands, this density was discounted to 4 units per acre, based on the assumption that 20% of land area would be required for roads and public facilities.

5/ [Housing Units Needed] x [% MF] = MF Units Needed.

6/ Multi-Family (MF) land needed is calculated based on a ratio of 20 units per acre for urban regions (West Maui, Kihei-Makena, and Wailuku-Kahului), and 7 units per acre for rural regions (Hana, Makawao-Pukalani-Kula, and Pa'ia-Ha'iku).

7/ [SF Acres Needed] + [MF Acres Needed] = Total Residential Acres Needed.

# References

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