FINAL

SEPTEMBER 2015

KAUA'I COUNTY GENERAL PLAN

KĀKOU

APPENDIX H - ISSUES AND OPPORTUNITIES

KAUA'I GENERAL PLAN UPDATE

PREPARED BY:

SSFM INTERNATIONAL, INC.
501 SUMNER STREET, SUITE 620 | HONOLULU, HI 96817

This page intentionally left blank.

TABLE OF CONTENTS

This page intentionally left blank.

PURPOSE AND HOW TO USE THIS PAPER

This Issues and Opportunities Paper is prepared under Phase 2 of the contract to update the Kaua'i General Plan (GP). This issue paper was prepared by SSFM International, Inc. under the guidance of the County of Kaua'i Planning Department. This paper incorporates data and information contained in the following technical reports prepared for the GP update:

- PBR Hawai'i & Associates, Inc. May 2015. *Final Land Use Buildout Analysis*.
- *County of Kaua'i Important Agriculture Land Study*. December 2014.
- University of Hawaii Sea Grant College Program. June 2014. *Kaua'i Climate Change and Coastal Hazard Assessment*.
- County of Kaua'i Built Environment Task Force. February 2015. *Evaluation of Public Health Policies in the General Plan 2000*.
- SMS Research & Marketing Services, Inc. February 2014. *Kaua'i General Plan Update: Socioeconomic Analysis and Forecasts.*
- R.M. Towill, 2015. *General Plan Update Kaua'i Infrastructure Analysis.*
- *Kaua'i Community Health Needs Assessment.* July 2013.
- *Kaua'i Community Health Improvement Plan.* June 2014.
- *County of Kaua'i, Infrastructure & Public Facilities Needs Assessment Study (Draft).* Group 70 International. August 2014.

Many other plans and documents were analyzed for the purpose of this paper. Such plans are listed in the "Resources" section within each topic area.

The Issues and Opportunities Paper addresses the key policy areas that fall within the scope of the Kaua'i General Plan. Its purpose is to identify overarching themes, issues, and opportunities under each policy topic to inform the planning and public engagement process.

The "Document Change Control Chart" below will track changes from draft to final versions. The issues and opportunities will be carried forth into the community engagement process for further vetting and discussion.

DOCUMENT CHANGE CONTROL CHART

Date	Version #	Author(s)	Revision Description
May 12, 2015	1.0	SSFM International	First Draft
July 14, 2015	2.0	SSFM International	Incorporated comments provided by the County Planning Department on June 22, 2015
August 27, 2015	3.0	SSFM International	Incorporated comments provided by the County Planning Department on August 17, 2015
September 10, 2015	**FINAL**	SSFM International	Incorporated final revisions provided by the County Planning Department on September 7, 2015

This page intentionally left blank.

GLOSSARY OF HAWAIIAN WORDS AND PHRASES

The following list provides Hawaiian words and phrases, and their corresponding definitions, used throughout this document. The translations are borrowed, and adapted as necessary, from ***Ulukau***, the Hawaiian Electronic Library, available online at http://wehewehe.org/.

Ahupua'a – Land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (ahu) of stones surmounted by an image of a pig (*Pua'a*), or because a pig or other tribute was laid on the altar as tax to the Chief

Aloha – affection, compassion for others

Kākou – we (inclusive, three or more), ours, promotes synergy when developing solutions and alternatives

Keiki – child/children

Kuleana – right, privilege, concern, responsibility

Kūpuna – elders

Lōkahi – collaboration or teamwork, unity, agreement

Mālama 'āina – to care for the land, stewardship of the land

Mālama pono – taking care

Pali - cliff

This page intentionally left blank.

ACRONYMS AND ABBREVIATIONS

The following list provides the acronyms, abbreviations, and their corresponding definitions used throughout this document and is formatted in alphabetical order.

ADA	Americans with Disabilities Act
ADC	Agribusiness Development Corporation
AMI	Area Median Income
B&B's	Bed & Breakfast
CEDS	Comprehensive Economic Development Strategy
CAC	Community Advisory Committee
CHII	Community Health Improvement Initiative
CHNA	Community Health Needs Assessment
CIP	Capital Improvement Program
CNG	Compressed Natural Gas
CWRM	Commission on Water Resource Management
CZM	Coastal Zone Management
CZO	Comprehensive Zoning Ordinance
DBEDT	Department of Business, Economic Development, and Tourism
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DOFAW	Division of Forestry and Wildlife
DOH	Department of Health
DOW	Department of Water
EA	Environmental Assessment
EIS	Environmental Impact Statement
ENSO	El Nino Southern Oscillation
EPA	Environmental Protection Agency
EPAC	Energy Plan Advisory Committee
GIS	Geographic Information System
GMO	Genetically Modified Organisms
GET	General Excise Tax
GP	General Plan
gpd	Gallons Per Day
gwh	Gigawatt Hour

THE	Housing, Transportation, Electricity
IAL	Important Agricultural Lands
ICAC	Interagency Climate Adaptation Committee
ICAP	Island Climate Adaptation Policy
IPCC	Intergovernmental Panel on Climate Change
ISWMP	Integrated Solid Waste Management Plan
ITS	Intelligent Transportation System
IWS	Individual Wastewater Systems
KEDB	Kaua'i Economic Development Board
KESRP	Kaua'i Endangered Seabird Recovery Project
KESP	Kaua'i Energy Sustainability Plan
KISC	Kaua'i Invasive Species Committee
KIUC	Kaua'i Island Utility Cooperative
KPAA	Kaua'i Planning and Action Alliance
KWA	Kaua'i Watershed Alliance
LRTP	Long Range Transportation Plan
MGD	Million Gallons per Day
MLTP	Kaua'i Multimodal Land Transportation Plan
NAICS	North American Industry Classification System
NOAA	National Oceanic and Atmospheric Administration
NETS	National Establishment Time Series
PDR	Purchase of Development Rights
PHEV	Plug-in Hybrid Electric Vehicle
SHPD	State Historic Preservation Division
SLR	Sea Level Rise
SMA	Special Management Area
SPA	Special Planning Areas
SVO	Straight Vegetable Oil
TDR	Transfer of Development Rights
USDA	United States Department of Agriculture
VDA	Visitor Destination Areas
VMT	Vehicle Miles Traveled

1.0 INTRODUCTION

This Issues and Opportunities Paper addresses the following policy areas outlined in the contract for the Update of the Kaua'i General Plan, which is the guiding policy document for the County that describes the vision and policy guidance for Kaua'i over the next 20 years. Each of these topics will be addressed in the public engagement process and in the resulting General Plan:

1) Kaua'i Kākou
2) Growth Management and Land Use
3) Economic Development
4) Agricultural Lands
5) Tourism
6) Open Space
7) Affordable and Workforce Housing
8) Climate Change and Natural Hazards
9) Infrastructure and Public Services
10) Multimodal Land Transportation
11) Energy
12) Public Health
13) Cultural and Heritage Resources
14) Natural Resource Management and Conservation
15) Parks and Recreation
16) Government Operations and Fiscal Management

For each policy area, this paper addresses the following questions:

- What are the primary issues?
- What opportunities exist for the General Plan to address these issues?
- How was this topic addressed in the 2000 General Plan?
- What are the implications for the General Plan planning process?
- What existing plans and policy documents address this topic?

"Issues" may take the form of gaps in existing policies or plans, conditions that pose a challenge to the General Plan vision, or matters that impact a variety of topics in complex ways.

"Opportunities" are the strengths that Kaua'i has to build upon, and that may help in resolving "Issues." These may include physical assets; community capital; or potential access to new technologies, design, or resources.

"How this Topic was Addressed in the 2000 General Plan" describes how the topic was included and organized; whether the topic requires updating or is mostly intact; whether there is sufficient data available to draft the Chapter, and if not, where or how that information will be generated.

"Implications for the Planning Process" are those areas that the General Plan may seek to address within its scope. It includes an identification of gaps in available information and needs in order to address the topic in the GP update.

"Resources" reference existing plans and policy documents consulted on each topic.

Key overarching themes that were identified based on the literature review of the technical papers are described in Chapter 18, and related back to the sixteen topics in the GP contract.

This page intentionally left blank.

2.0 KAUA'I KĀKOU: SUSTAINABILITY, STEWARDSHIP, AND RESILIENCE

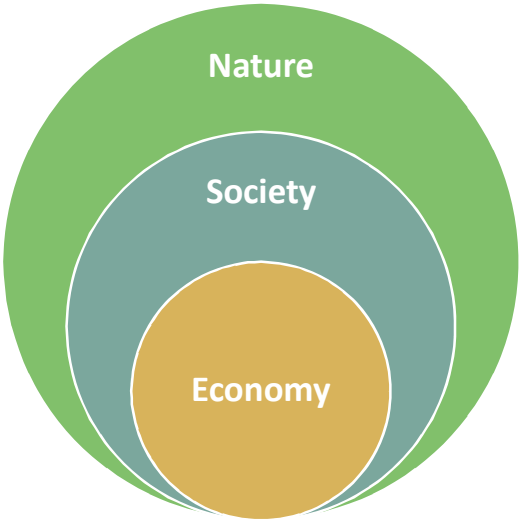
2.1 DEFINING THE ISSUES

Sustainability, stewardship of the environment, food self-sufficiency, and community resilience were the most prominent themes that emerged from the early stages of the community engagement process for the General Plan Update. For the purposes of this discussion, sustainability, food self-sufficiency, stewardship, and resilience are corollaries that fit together under the unifying theme of the General Plan Update: Kaua'i Kākou. Each is discussed in turn below.

Sustainability

The most important issue that Kaua'i residents identified during the GP Update process can be encapsulated in the term "sustainability."

Some models of sustainability posit that environmental, economic, and social well-being represent three equal legs of a stool, and that without one, the others cannot stand on their own. It was found during the community meetings for the GP Update that this model does not adequately capture Kaua'i's vision of sustainability. Rather, what was repeatedly mentioned was that the natural environment forms the all-important basis for social and economic well-being, to create a nested relationship (see diagram at right). Care for and access to public trust resources (water, beaches, coastal areas, special places) is a particular theme. Residents recognize that a sustainable economy requires increased self-reliance for food and energy and other basic resources. This means each individual taking the responsibility to reduce their ecological footprint in their own lifestyle and land use. It means making water use sustainable, and environmental protection effective. It means dealing with wastewater and solid waste issues and seeking to reduce, recycle and reuse. Hawaiian concepts of *kuleana* (responsibility by all), *malama pono* (taking care), and *aloha* (affection, compassion for others) add further meaning to the "triple bottom line" of environmental, societal, and economic well-being.



The environment provides the foundation for sustainable community, which supports a sustainable economy.

Sustainable development requires a commitment to social equity. This includes the fair distribution of, and access to, resources. Economic well-being begins with the individuals in a society being able to thrive, that is, it depends on safe and secure housing, and access to education and healthcare as well as to employment. As discussed in the Housing, Transportation, and Economic Development sections that follow later in this document, Kaua'i faces significant challenges in realizing these goals. These include:

- Lack of sufficient funding for infrastructure, community development and affordable housing
- Population growth and development sprawl
- Communities designed for car travel
- Inadequate bike and pedestrian facilities to make these realistic alternatives to driving
- High cost of living, especially the combined costs of housing, transportation and electricity
- Inflated land values

Environmental Stewardship

Kaua'i's natural environment is broadly recognized as its greatest asset, the source of the scenic beauty, fertile land, and rainfall that has earned Kaua'i its moniker as "The Garden Island." The concepts of malama 'āina and ahupua'a management are invoked as principles of proper environmental stewardship for the island. Yet, natural and biological resources are challenged by various forces including climate change, private interests, pollution, runoff, habitat alteration, and introduced and invasive species, overuse, among many others. Many organizations on Kaua'i are working toward preserving and restoring native habitats, protecting and stewarding water resources, and maintaining coastal areas. There are opportunities for the GP Update to include recommendations that harness and build upon these efforts.

Food Self-Sufficiency

Food self-sufficiency is a priority that has been identified in State and County level plans and policies, including the *Kaua'i Comprehensive Economic Development Strategy* (2010), and the *Aloha+ Challenge* (2014). Hawaii used to be an exporter of agricultural products, but now over 85 - 90% of food consumed locally is imported (Hollier, 2015; Leunga and Lokeb, 2008).

Based on a current population of approximately 70,000 people, about 21,158 acres of land in food production would be required to attain food self-sufficiency (Draft *Important Agricultural Lands Study*, 2014). Thirty-nine percent or 53,547 acres of Kaua'i's lands meet all the criteria of Act 183 (SLH 2008; HRS §205-41) Important Agricultural Lands. Suitable agricultural lands include those that:

- are capable of producing sustained high yields when treated and managed according to accepted farming methods and technology;
- contribute to the State's economic base and produce agricultural commodities for export or local consumption; and
- are needed to promote the expansion of agricultural activities and income for the future, even if currently not in production.

Kaua'i has enough suitable agricultural lands to meet its needs. How to incentivize farmers to utilize these lands to serve the local market is a consideration in reaching the ambitious goals for local food production set forth in the *Aloha+ Challenge*.

Community Resilience

Kaua'i's residents value independence and self-sufficiency, and have many community-oriented interests that bind them together. Regardless of where they came from or when they arrived, they come to appreciate Kaua'i's history and understand how it remains relevant in the 21st century. Hurricanes 'Iwa and 'Iniki loom large in the collective consciousness of the island, and there is an acute awareness that island residents need to continue to band together to protect what is most important and plan for future changes, whether environmental, social, or economic. This collective spirit is reflected in the words of

'Ōlelo No'eau 327: *E lauhoe mai na wa'a, i ke kā, i ka hoe; i ka hoe, i ke kā; pae aku i ka 'āina…* Everybody paddle the canoes together; bail and paddle, paddle and bail, and the shore is reached.

This sentiment continues to reveal itself today in both individual and collective decisions that emanate from Kaua'i and the overall commitment toward living in a more sustainable and self-sufficient manner. On Kaua'i, people take personal responsibility for the well-being of themselves and their extended family. Neighbors work together to ensure the safety of the streets they live on and collectively watch over neighborhood children. Food is grown in backyards and the *ahupua'a* continue to be harvested for the meat, fish, and fruits that keep families well-fed and healthy. Citizens join local organizations which, in turn, work with the public and private sectors to collectively make decisions for the well-being of all.

Kaua'i's independence and pride can be traced back in history … During the reign of King Kamehameha, the islands of Kaua'i and Ni'ihau were the last Hawaiian Islands to join his Kingdom of Hawai'i. Their ruler, Kaumuali'i, resisted Kamehameha for years. King Kamehameha twice prepared a huge armada of ships and canoes to take the islands by force, and twice failed- once due to a storm, and once due to an epidemic.

And yet, the people of Kaua'i have the humility to know, first, that they can't do everything themselves – there are times when outside assistance is desirable and necessary – and second, that their lifestyles impact resources both on the island and elsewhere. Thus, reconciling self-sufficiency with necessary outside connections remains a regular topic of discussion.

Summary of Key Issues

To summarize, the major issues in Sustainability, Stewardship, and Resilience include:

- How independence, self-sufficiency, and personal responsibility guide collective well-being. This means each individual taking the responsibility to reduce their ecological footprint in their own lifestyle and land use, and contributing to ones' community.
- How to foster a shared *kuleana* (responsibility by all) for planning for the future, preparing for future changes, and providing for the needs of people from *keiki* (children) to *kupuna* (elders)
- How Kaua'i can implement a model of environmental protection using principles of *ahupua'a* and *malama 'āina* as the basis for sustainable society, and in turn, sustainable economy.
- Ensuring Kaua'i's communities, infrastructure, businesses, and towns are resilient in the face of natural, economic and social challenges are a vital component for sustainability.

2.2 OPPORTUNITIES

The *2050 Hawai'i Sustainability Plan* defines sustainability for Hawai'i as follows: 1. Respects the culture, character, beauty and history of our state's island communities; 2. Strikes a balance between economic, social and community, and environmental priorities; and, 3. Meets the needs of the present without compromising the ability of future generations to meet their own needs.

While some suggest that there is competitive tension between the environment, economy and social equity, an alternative perspective has them supporting and strengthening one another. For example, improving the environment will strengthen the economy, and more equitable social programs will result a stronger workforce. Finding the balance between the factors, or so-called "triple bottom line", can be achieved through shared governance, or having the public sector, private sector and citizen-led groups and organizations actively participate in decisions that impact everybody. Luckily, this collaborative spirit already exists in Kaua'i and is a strength to build upon for the purposes of the GP.

Another recurring theme involves the island's existing limits to growth and what growth can be accommodated. Existing conditions that serve to limit growth on Kaua'i include: limited availability of Urban designated lands; high construction costs; State and County entitlement processes; as well as macroeconomic forces that affect supply and demand. The General Plan Update will need to identify growth policies, and the implementing actions that will encourage sustainable growth that is in keeping with given the values of environmental protection, social equity, infrastructure, and a sustainable economy.

Aloha+ Challenge 2030 Targets for Sustainability

1. Clean Energy: 70 percent clean energy – 40 percent from renewables and 30 percent from efficiency.

2. Local Food: At least double local food production – 20 to 30 percent of food consumed is grown locally.

3. Natural Resource Management: Reverse the trend of natural resource loss mauka to makai by increasing freshwater security, watershed protection, community---based marine management, invasive species control and native species restoration.

4. Waste Reduction: Reduce the solid waste stream prior to disposal by 70 percent through source reduction, recycling, bioconversion, and landfill diversion methods.

5. Smart Sustainable Communities: Increase livability and resilience in the built environment through planning and implementation at state and county levels.

6. Green Workforce & Education: Increase local green jobs and education to implement these targets.

The Aloha+ Challenge: A Culture of Sustainability, July 7, 2014

In 2014, the Mayors of each County in Hawai'i and community partners signed the *Aloha+ Challenge* (subsequently endorsed by the State Legislature with resolution SCR69 SD1), which outlines six targets for sustainability to be achieved by 2030. These are listed in the text box at right. The legislation calls for expanded partnerships between government agencies, non-profit organizations, the private sector and local communities to promote coordinated and integrated action. Counties are required to review and report progress annually. The commitments and recommendations in the Aloha+ Challenge can provide a valuable framework for identifying priorities and tracking progress on sustainability, stewardship, and resilience.

To summarize, the major opportunities in Kaua'i Kākou include:

- There are opportunities to work together with the many non-governmental organizations on Kaua'i that are dedicated to environmental protection, social equity, and economic well-being toward innovative and balanced solutions to community concerns.
- The *2050 Hawaii Sustainability Plan* and *Aloha+ Challenge* serve as a framework for policy and action.

2.3 HOW THE 2000 GENERAL PLAN TREATED KAUA'I KĀKOU

- The theme of Kaua'i's residents working together to achieve greater sustainability and stewardship are implicit, but not explicit, in the 2000 GP.
- Implementation of responsibilities were primarily with the public sector. The private sector's responsibility in implementation is not discussed in detail.
- The 2000 GP addresses environmental well-being and economic well-being in more detail than it does social equity. Discussion regarding trade-offs is limited.

2.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on Kaua'i Kākou to be conducted by the GP Team includes:

1) Utilize the Aloha+ Challenge targets as a framework for how Kaua'i's environmental resources are sustained, for example: the upper watershed areas which face degradation, floral and faunal biodiversity, riparian and aquatic resources, as well as broader topics such as greenhouse gas emissions reduction and the Kaua'i Energy Sustainability Plan goals.
2) Address economic well-being, in part, by sustaining tourism while creating opportunities to diversify the economy.
3) The concept of food sustainability needs to be articulated.
4) The GP chapters on health and housing will identify the disadvantaged sections of the population, but more information will needed to assess social equity.
5) Identify potential public-private partnerships, and opportunities for interdepartmental collaboration in implementing GP actions.

2.5 RESOURCES

Aloha+ Challenge Declaration. Signed by all County Mayors & Governor Neil Abercrombie on July 7, 2014.

Hollier, Dennis, Hawai'i Business Magazine. November 2014. *Can Hawai'i Feed Itself?* Retrieved on February, 2015. From http://www.Hawaiibusiness.com/can-Hawaii-feed-itself/

Leunga, PingSun and M. Lokeb. December 2008. *Economic Impacts of Increasing Hawai'i's Food Self-Sufficiency.* CTAHR Department of Molecular Biosciences and Bioengineering and Hawai'i Department of Agriculture.

State of Hawai'i. December 2014. *Aloha+ Challenge: Recommendations for Taking Action and Tracking Progress*.

State of Hawai'i Sustainable Task Force. January 2008. *Hawai'i 2050 Sustainability Plan: Charting a Course for Hawai'i's Sustainable Future*.

Social Sciences Public Policy Center, University of Hawai'i at Mānoa. January 2010. *Hawai'i 2050 Update: Report in Response to Act 225, 2008 Session Laws of Hawai'i Relating to Sustainability*.

This page intentionally left blank.

3.0 GROWTH MANAGEMENT AND LAND USE

3.1 DEFINING THE ISSUES

The total population for the County of Kaua'i is projected to increase from 67,091 in 2013 to 88,013 in 2035, according to the SMS *Socioeconomic Analysis and Forecasts* (2014) study prepared for the GP Update. That represents a total growth of 31.2% between 2010 and 2035, or about 1.10% per year. Over the past 15 years, natural increase and migration have equally contributed to population growth. The great majority of population growth is planned to occur in the Līhu'e and Kōloa-Po'ipū-Kalāheo regions. Action to address this are reflected in the recently updated Community Plans for both Districts.

POPULATION PROJECTIONS BY DISTRICT (1990-2035)

PLANNING DISTRICT	1990	2000	2010	2020	2030	2035
County of Kaua'i	**51,676**	**58,463**	**67,091**	**74,693**	**83,328**	**88,013**
Līhu'e	11,169	12,507	14,683	18,017	21,595	23,456
Kōloa-Po'ipū -Kalāheo	9,600	10,545	11,696	13,623	15,737	16,855
Hanapēpē - 'Ele'ele	3,873	4,362	6,157	6,463	6,860	7,094
Waimea	4,698	5,660	5,561	5,901	6,323	6,566
Hanalei (North Shore)	5,913	6,605	8,002	8,286	8,686	8,933
Kawaihau - Kapa'a (East Kaua'i)	16,192	18,784	20,992	22,403	24,128	25,110

Source: SMS Research Kaua'i General Plan Update: Socioeconomic Analysis and Forecasts (February 2014)

Existing County General Plan land use designations consist of Open, Agriculture, Park, Residential, Resort, Urban Center, and special designations for Transportation and Military. The Open District comprises over 70% of the island, followed by nearly 20% in the Agricultural District. The proportion of the other designations are Residential (3%), Urban Center (1%), Resort (1%), Military (1%), Park (<1%), and Transportation (<1%).

Residential Lands

According to the 2015 *Land Use Buildout Analysis* Technical Report, if all existing and projected residential dwellings were located entirely on Residential-zoned parcels, the supply of existing Residential-zoned parcels cannot accommodate the entire 2035 projected population. This is conservative, as it does not factor in allowable residential uses on existing Agriculture and Open zoned parcels. An analysis of vacant residential-zoned parcels indicates that these lands come close to accommodating the 2035 population, with possible shortages in the Līhu'e and East Kaua'i Districts. The

analysis notes that deficiencies could be made up through higher density mixed use areas in existing town centers.

The *2015-2020 Consolidated Plan* prepared by the Kaua'i Housing Agency suggests that more residential lands that can support low-income housing could be needed. According to the 2014 *Homeless Utilization Report*, Kaua'i's homeless populations are as follows: 39% or 248 individuals are newly homeless, and of the 248 total, 200 individuals are recently homeless. Also, Kaua'i has another 125 individuals who are chronically homeless. Perhaps even more disturbing is the data from the *2011 Hawai'i Housing Planning Study* (prepared by SMS for the Hawai'i Housing Finance and Development Corporation) that suggests that 36% of total households on Kaua'i are at-risk for homelessness as a result of factors that include high housing costs and low wages. Another key indicator of housing needs involves overcrowding. After the burden of cost, the most common housing problem is severely overcrowded conditions (>1.51 people per room), with overcrowding concentrated among extremely-low and very-low income households (based on annually updated HUD income categories). Overcrowding is a result of both housing supply and affordability. Increasing the supply of homes can result in lowering housing costs. At the same time, residents are concerned that new housing supply will simply increase housing options for the off-island market and not serve existing at-need households.

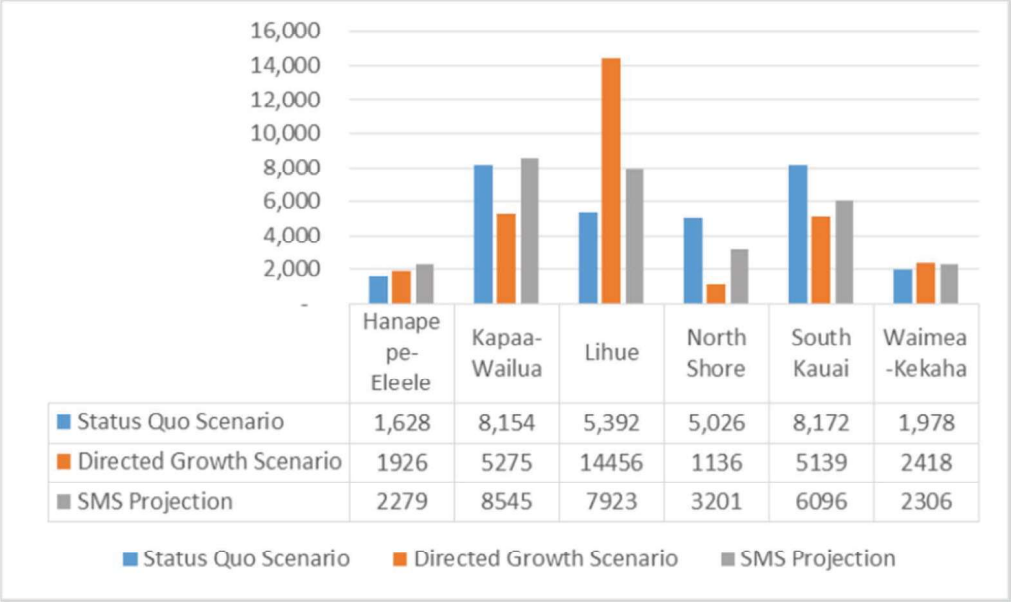
The 2015 *Land Use Buildout Analysis* conducted for the GP planning process examined two growth scenarios for the island - directed growth and status quo - and then factored in the SMS socioeconomic projections, by Planning Districts.

The "status quo" scenario assumes that growth will follow where residents presently live or the most affordable lands. Based on building permit data over 15 years (1995-2009), most new residential activity occurred in the North Shore, East Kaua'i, and South Kaua'i. The activity seemed to sprawl into the Agriculture and Open districts (combined 39%) and lower density residential districts of R-4 and R-2 (combined 29%). Only 17% occurred in the R-6 medium density zoning district, and less than 1% in multi-family zoning districts (e.g., R-15, R-20). If future growth occurs in the vicinity of existing development and on the most affordable lands (lowest assessed values), the status quo scenario is that 25% of the 2035 dwelling units would be in the Agriculture zoning district, 8% in the Open district, and the balance of 67% in the Residential districts.

The "Directed Growth" scenario assumes that future growth beyond the existing population will be encouraged in the Urban Centers, Town Centers, Residential-zoned land, and Ag Homestead areas, thereby leaving undeveloped as much agriculture and open zoned lands as possible.

The districts most impacted by the differing growth policies would be Līhu'e and the North Shore. Līhu'e, as the major Urban Center, would receive a significant proportion of the future growth under the Directed Growth Scenario, that is: focusing development on existing urban district lands and redevelopment at higher densities in Town Centers. Conversely, the agriculture and open zoning districts of the North Shore would receive more growth than projected by the SMS Study under the Status Quo Scenario, and significantly less growth under the Directed Growth Scenario. Kapa'a-Wailuā would receive growth comparable to the SMS projection under the Status Quo Scenario and less growth under the Directed Growth Scenario. The South Shore would receive growth comparable to the SMS projection under the Directed Growth Scenario and more growth under the Status Quo Scenario. The differences between the scenarios were negligible for both Hanapēpē-Ele'ele and Waimea-Kekaha. The County has already begun to implement the elements of the Directed Growth scenario to accomplish specific land use goals by way of the Līhu'e and South Kaua'i Community Plans.

ALTERNATE GROWTH SCENARIOS BY PLANNING DISTRICT



	Hanapepe-Eleele	Kapaa-Wailua	Lihue	North Shore	South Kauai	Waimea-Kekaha
Status Quo Scenario	1,628	8,154	5,392	5,026	8,172	1,978
Directed Growth Scenario	1926	5275	14456	1136	5139	2418
SMS Projection	2279	8545	7923	3201	6096	2306

Source: Kaua'i County General Plan Technical Study: Land Use Buildout Analysis, PBR Hawai'i 2015

Contributions to projected housing needs will also come from lands that are currently entitled or planned for development. According to County Planning Department records, projects that are partially or currently entitled for future development could add nearly 6,000 housing units to the Island during the GP Update's planning horizon. These projects are at various stages of approvals, land use re-designations, and construction, and are shown in the table on the following page.

ENTITLED RESIDENTIAL PROJECTS BY DISTRICT

District	Project Name	Housing Units
East Kaua'i	Piilani Mai He Kai (DHHL Anahola)	181
	Kulana	172
	Kapaa Highlands, Phase 2	769
	TOTAL	**1,122**
Eleele	A&B Eleele Residential	201
	Lima Ola (Affordable)	450
	TOTAL	**651**
Lihue	DHHL Wailua, Phase 1	188
	Kohea Loa - D.R. Horton	444
	Pikake Subdivision	146
	Grove Farm Wailani Residential	1,450
	Koamalu	220
	Waiola Phase I	47
	Waiola Phase II	56
	Waiola Phase II	93
	TOTAL	**2,644**
North Shore	Kolopua (Princeville Affordable)	44
	TOTAL	**44**
South Kaua'i	Brydeswood Ranch (A&B)	24
	Koloa Creekside	72
	Kukuiula Employee Housing	100
	Kukuiula	750
	The Village at Koloa Town	34
	Koloa Camp - Waihononu	50
	CIRI (CLDC) Subdivision	10
	TOTAL	**1,040**
Waimea	Kekaha lots	40
	Kikiaola Mauka	270
	Kikialoa - Field 14	56
	TOTAL	**366**
	ISLAND TOTAL	**5,867**

Source: Kaua'i County Planning Department.

Industrial Lands

Most (81%) of the island's industrial lands are within the Līhu'e District. That district is also home to the planned Ahukini Māka'i development, which will provide an additional 146 acres (approximately 6.4 million square feet) of industrial lands near Līhu'e airport. The new Industrial Designation included in the South Kaua'i Community Plan added another 160 acres around the Old Kōloa Mill site. While this amount of floor space theoretically meets the per capita need for industrial space as outlined in the 2015 *Land Use Buildout*, it is worth discussing whether the distribution of industrial lands island-wide and their associated zoning designations can accommodate the range of desired industrial uses.

Commercial Lands

According to the Comprehensive Zoning Ordinance (CZO), "'Commercial Use' means the purchase, sale or other transaction involving the handling or disposition of any article, substance or commodity for profit or a livelihood, including in addition, public garages, office buildings, offices of doctors and other professionals, public stables, recreational and amusement enterprises conducted for profit, shops for the sale of personal services, places where commodities or services are sold or are offered for sale, either by direct handling of merchandise or by agreements to furnish them but not including dumps and junk yards." Commercial uses are permitted in the General and Neighborhood Commercial zoning districts (C-G, C-N). Between 2015 and 2035, PBR projects a need for another 2,716,416 square feet of commercial space. Currently planned and entitled projects will contribute, as shown in the table below.

ENTITLED COMMERCIAL PROJECTS BY DISTRICT

District	Project Name	Commercial Square Footage
Koloa	Koloa Rum Company Store and Café	9,000
	TOTAL	**9,000**
Lihue	Hokulei Village	222,000
	Grove Farm Wailani Commercial	1,132,299
	Weinberg Foundation Renovation	24,250
	Kukui Grove Commercial Buildout	96,000
	Weinberg Foundation/Ahukini	20,000
	TOTAL	**1,494,549**
North Shore	Kilauea Crossings	6,070
	Kilauea Town Center	46,800
	Hanalei Halelea Office	2,000
	TOTAL	**54,870**
South Kaua'i	Village at Koloa Town	96,000
	Kukuiula ABC Store	21,000
	Koloa Marketplace	76,000
	Old Glass Warehouse	7,200
	TOTAL	**200,200**
	ISLAND TOTAL	**1,758,619**

Resort Lands

The *Land Use Buildout Analysis* used the Hawaii Tourism Authority's latest Visitor Plant Inventory (2012) to analyze resort lands. Kaua'i County had 8,289 transient accommodation units in 2012. This number includes 98 bed and breakfast units on 27 properties. All Planning Districts have Visitor Destination Areas (VDA), except Hanapēpē-'Ele'ele. The Planning District with the largest VDA in terms of acreage is South Kaua'i, followed by North Shore, Līhu'e, Kapa'a-Wailuā, and Waimea-Kekaha. In terms of units, South Kaua'i ranks first, however, the order changes with Kapa'a-Wailuā second, followed by North Shore, then Līhu'e. The needs of visitors are discussed in greater detail in the Tourism section of this Paper. The Buildout Analysis suggests that there is more than enough Resort zoned land to accommodate projected visitor growth.

Factoring in planned resort development, which amounts to approximately 4,500 new units (Source: *Hawai'i Tourism Authority, 2013 (Planned Additions and New Development, Table 10)*), all Planning Districts except the North Shore and Līhu'e are projected to have an excess visitor unit supply. Waimea-Kekaha will have the most excess followed by Kapa'a-Wailua and South Kaua'i. The North Shore has an extensive supply of potential single-family transient vacation rentals within the VDA that could respond to market demand.

The *Land Use Buildout Analysis* notes that "even if projections indicate a current excess of Resort-zoned land, there may be other reasons on a case by case basis to rezone to Resort such as aging of the resort infrastructure, vagaries in the occupancy rate, unpredictable global economy, or shifts in visitor accommodation preferences."

To summarize, the major issues in Growth Management and Land Use include:

- The population is expected to grow by 31.2% between 2010 and 2035.
- More land may be needed to accommodate residential growth; and generate affordable housing.
- Some growth will be needed in every district. The majority of the growth can be directed to existing town centers.
- Resort lands are adequate to meet demand.
- Commercial and Industrial lands may be adequate in acreage, but distribution may be an issue to explore further.

3.2 OPPORTUNITIES

Kaua'i currently uses a traditional model of zoning, i.e., one that segregates uses (commercial in one area, residential in another, etc.). Given the desire to preserve open spaces and agricultural lands and maintain the sense of place afforded by communities with distinct town centers or main streets, other models have been reviewed. The County has both historic and existing experience implementing other types of zoning– from the Kapa'a Special Planning Areas (SPAs) in the 1970s, to the Līhu'e Town Core Special Planning Areas, mixed use Special Planning Areas in the Līhu'e Community Plan, and form-based code areas established in the South Kaua'i Community Plan. An island-wide form-based zoning code that focuses on building size, type, and location, as opposed to uses, may serve Kaua'i's needs. "Smart Growth" concepts recognize that mixing uses (within buildings, and along streets) and dense living and working environments centered on functional and attractive public spaces makes for better living and attachment to place. A form-based code model is a natural extension of the existing mixed use districts and historic main street design. Form-based code, or a hybrid thereof, can include building and public space design components that preserve or improve community character and facilitates placemaking.

Other growth management tools include:

- Planned unit development – gives developers incentives to meet pre-determined land use goals (similar to CZO Article 10 Project Development);
- Floating zones – permits special uses within a jurisdiction in accordance with development criteria;
- Overlay zoning – identifies an area that requires more stringent regulations (e.g., an aquifer, watershed, or scenic viewshed) in addition to those regulations governing underlying uses (similar to SPAs and Special Treatment Districts in the CZO);
- Bonus or incentive zoning – provides developers with bonuses and incentives to achieve increased development density;
- Mixed-use zoning – allows a wide array of types of development aimed at reducing distances between homes and jobs;
- Land banking – allows the outright purchase of land by the public sector well in advance of any development to ensure appropriate land uses;
- Transfer or Purchase of Development Rights (TDR or PDR) – allows landowners to get development value on other areas if current holdings are placed in conservation or trust that limits development (TDR is also recommended in the 2014 Climate Change and Coastal Hazards Assessment); and
- Zoning or Building permit allocation – limits the number of zoning or building permits that are issued on an annual basis.

The *Līhu'e Community Plan* (2015) is the first Planning District on Kaua'i to recommend an Urban Edge Boundary to limit the extent of urban sprawl and delineate town edges. While the Plan drew such a boundary, it will require an ordinance to become implemented. The creation of an Urban Edge Boundary can help limit urban sprawl. It defines where higher density urban development should be contained. Areas outside the Urban Edge Boundary are intended for lower density land uses such as open space, conservation, and agriculture. Other planning areas may also benefit from an Urban Edge Boundary.

The GP planning process can set the groundwork for Community Plans to explore potential "areas of change", similar to those contained in the South Kaua'i and Līhu'e Community Plans. That is, areas that lend themselves to development or redevelopment. Some areas may require rezoning or changes to the State Land Use Classification, others may not because they are already zoned correctly. Infill development offers efficiencies in terms of proximity to existing infrastructure and can require fewer regulatory changes to zoning and land use designations. Identifying place types that can provide opportunities for infill development may be one of the GP's top priorities.

The PBR's 2015 *Land Use Buildout Analysis* suggests that if the island were allowed to build out to the full capacity allowed by zoning, significant growth would occur on lands in the agriculture and open zoning districts. In contrast, if redevelopment of the Urban and Town Centers were encouraged at higher densities, as much as 40% of the dwelling units could be accommodated within those existing areas, with negligible residential use of the agriculture and open zoning districts. As such, the General Plan might consider recommending more mixed use zoning or higher densities in the "Urban Center" designation in the General Plan and in town centers. The growth projections are modest, and aimed at the need to provide adequate workforce housing and satisfy affordable housing needs.

To summarize, the major opportunities in Growth Management and Land Use include:

- The two recently completed Community Plans for Līhu'e and South Kaua'i set a direction for how the directed growth policy can inform future growth on Kaua'i.

- Place typing can identify locations where growth should occur and with what regulatory mechanisms.
- Mixed-use zoning can respond to the need for residential capacity and result in more vibrant and walkable town centers and be used to ensure new greenfield development creates walkable communities with a diversity of housing types.
- Form-based codes can help guide the form of growth.
- Growth recommendations in the GP should be based on the best available data and consider tools such as Smart Growth and policies to balance growth with infrastructure needs.

3.3 HOW THE 2000 GENERAL PLAN TREATED GROWTH MANAGEMENT AND LAND USE

- "Growth Management and Land Use" is discussed in multiple sections of the 2000 GP. Grouped under "Preserving Kaua'i's Rural Character" are discussions pertaining to agricultural lands, open lands, urban lands, and scenic roadway corridors. Individual communities and opportunities for "Enhancing Towns and Commercial Areas" are discussed in Chapter 6 "Enhancing Towns and Communities and Providing for Growth".
- The 2000 GP includes several policies that support more compact development; however, Implementing Action 4.6.3 pertaining to land supply exemplifies the pressure the County faces when trying to support both compact development and business entrepreneurs that have locations outside of town centers in mind, i.e., "The County shall strive for a balance between meeting community shopping needs with new commercial development and supporting local small businesses in older business areas." In accordance with Smart Growth principles (see also the goal of "compactness" in the Multimodal Plan), infill development can maintain the community character, makes use of existing infrastructure, and has a smaller impact on natural resources and the environment.
- The majority of policies that promote compact centers surrounded by open and green spaces have not changed, but the terminology has changed to emphasize smart growth, walkability and multimodal transportation.
- Place-typing and form-based codes as a means to understand and preserve the best of Kaua'i's urban form are not mentioned in the 2000 GP. The GP does recognize the need to preserve the historic fabric of existing communities.
- Changes to the Open District were implemented, as a result of recommendations within the GP, to help protect natural resources and open spaces.
- The 2000 GP recommended revitalizing central Līhu'e and Kaua'i's small town commercial areas by upgrading sewer and water facilities, increasing the amount of public parking, and improving streets and sidewalks. Completed improvements in commercial core areas include the Kūhi'ō Highway Widening and Hardy Street (ongoing). Planning is underway for Rice Street; Po'ipū Road in Kōloa and Po'ipū; and, Hanapēpē Road. A parking audit was completed for the Līhu'e Town Core.
- The 2000 GP recommended a collaborative planning partnership among County agencies, community and business organizations, private entities, the State Highways Division to design highway and road improvements in a manner that supports commercial activity in Kaua'i's business areas. This is an on-going task that is being implemented, for example with the County's participation in the Kaua'i Federal-Aid Highways Plan and DOT Kapa'a Sub-Area Transportation Solutions Plan. Both these planning efforts had citizen advisory committees. Design charrettes and community design workshops were held for Poipu Road, Hanapēpē Road, Rice Street, and roadway sections for Kalaheo and Koloa as a part of the South Kaua'i Community Plan.

- As a means of protecting Town centers, the 2000 GP recommended placing a high priority on deterring strip development and urban sprawl when making strategic decisions on new commercial zoning or recommendations to the State Highways Division on highway development. The Planning Department is responding to this task with a "Street Frontage" bill.
- The 2000 GP includes a series of policies associated enhancing towns and commercial areas. They involve tasks associated with improving town centers through sidewalks or unpaved pedestrian pathways along main roads, passive parks, redevelopment of historic structures without new setbacks/parking requirements, parking in rear of store, town center parking lots, town design standards. Mechanisms for implementation include preparing amendments to the CZO providing design standards for commercial development in existing towns and new commercial projects. These efforts are underway.
- The 2000 GP recommended centralizing zoning regulations in a single chapter, and directed the Planning Department to prepare an ordinance transferring to Chapter 8, the CZO, those provisions of Chapter 10, the Special Development Plans, that modify or affect the CZO, and to make other revisions to Chapter 8 as may be necessary. Although not completed, the South Kaua'i Community Plan's Form Based Code (Appendix C) sets up the framework for insertion as a sub-chapter of Chapter 8.

3.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on growth management and land use to be conducted by the GP Team includes:

1) A growth policy can explain how the County's projected growth is allocated to the planning districts and serve as the basis for managing growth through the remaining community plans (for Waimea-Kekaha, Hanapēpē-Eleele, East Kaua'i and North Shore). Growth scenarios and population projections should be based on the *Socioeconomic Analysis and Forecasts* Technical Report. Table 1-1: Alternative Projections of Resident and Visitor Population on Kauaʻi 2020 from the 2000 GP can be updated with the discussion on pages 6 and 19-21 in the *Socioeconomic Analysis and Forecasts* Technical Report. Table 1-2: Kaua'i 2020 Projections in the 2000 GP can be updated with *Socioeconomic Analysis and Forecasts* Technical Report Tables 1 and 9.
2) Place typing will be integrated into the Kauaʻi General Plan Update, including the Land Use Map. Charrettes will be held to:
   - Identify attitudes toward change & intensity of desired change
   - Assign Place Types with boundaries
   - Confirm and evolve district visions
   - Identify features of value and desired elements of form and character to preserve/encourage
   - Educate about the GP process, place typing and how it informs GP
3) The land use maps from South Kauaʻi and Līhuʻe will be incorporated into the General Plan largely as is. Any modifications will be geared toward achieving consistency in land use categories and terminology. Changes will not be substantive. The GP has an opportunity to set guidelines for the use of consistent Land Use categorizations and to outline a process that can be followed for the remaining four Community Plan areas.
4) To account for planned or entitled developments that may result in additional place types or affect existing places, the County will conduct outreach to major landowners and request meetings with them to identify development plans over the GP horizon. This information may be factored into the charrette materials and discussion where appropriate. The County will also encourage landowners to attend the place typing charrettes.

5) The *Land Use Buildout Analysis* does not explicitly address planned or entitled development, except for resort areas. Mapping out entitled development will occur during the GP process to further the understanding of future residential and commercial land use needs.
6) The GP Update will require an update to the General Plan Land Use Maps, with explanations of which lands have been re-designated and a rationale for the change.
7) Areas targeted for rezoning will need to be identified and discussed with the Planning Department, CAC and community. The 2015 *Land Use Buildout Analysis* Technical Report provides data with which to facilitate some of these discussions.

3.5 RESOURCES

PBR Hawai'i & Associates, Inc. 2015. *Land Use Buildout Analysis.*

Industrial Lands Inventory [in process].

County of Kaua'i. September, 2014. *South Kaua'i Form-Based Code.*

County of Kaua'i Planning Department. July 2015. *South Kaua'i Community Plan.*

State of Hawai'i, Department of Land and Natural Resources. Commission on Water Resource Management. February 1990. *Kaua'i Water Use and Development Plan*.

State of Hawai'i, 2011. *Hawai'i Housing Planning Study 2011*.

SMS Research & Marketing Services, Inc. February 2014. *Kaua'i General Plan Update: Socioeconomic Analysis and Forecasts.*

County of Kaua'i Planning Department. June 2015. *Līhu'e Community Plan*.

Jung, Ian. April 30, 2015. Growth Management Issues for the General Plan Update.

County of Kaua'i, Kaua'i County Housing Agency. April 2015. *Consolidated Plan 2015-2020*.

4.0 ECONOMIC DEVELOPMENT

4.1 DEFINING THE ISSUES

Anchor Industries

The visitor industry and agricultural industry are the primary economic drivers on Kaua'i. Approximately 30% of Kaua'i's jobs are in tourism and 4% are in agriculture. While this provides a backbone for the local economy, both agriculture and tourism can also be vulnerable to events and factors that cannot be controlled, including global economic forces, natural disasters, and climate change. Consequently, a main focus of economic development on Kaua'i is diversification of industries (see vision at right). This has been approached through identification of promising economic clusters, as described in the following section.

Promising Economic Clusters

In the *Comprehensive Economic Development Strategy* (CEDS) for Kaua'i (last updated in 2010), the Kaua'i Economic Development Board and County of Kaua'i Office of Economic Development identified six industry clusters in Kaua'i that are "good investments" and that could strengthen tourism industry niche markets. An "industry cluster" is a group of related industries that share infrastructure, labor, customers, suppliers, or services. These industries often face common opportunities, challenges and threats. The clusters include: health and wellness; food and agriculture; culture and arts; sports and recreation; science and technology; and, sustainable technologies and practices. The idea behind investing in specific cluster is to create jobs, replace imports, and generate more products for both export and local consumption.

Kaua'i Economic Development Vision from the Comprehensive Economic Development Strategy (2010)

Economy is strong, stable, and diversified.

While the visitor industry still provides the largest number of jobs, new businesses in agriculture, health and wellness, sustainable technologies & practices, art & culture, science & technology, and sports & recreation provide an increasing proportion of total jobs.

There are many job opportunities with higher wages.

Wages allow people to comfortably support their families.

Unemployment is low (3-5%).

Kaua'i Island Utility Cooperative (KIUC) is robust and is a leader in promoting energy conservation and renewable energy.

We have decreased energy consumption and increased our use of renewable energy.

We have preserved Kaua'i's special environment and culture.

Locally-grown products are consumed locally and exported. We have become more food self-sufficient.

The Office of Economic Development is implementing several projects from the CEDS aimed at supporting the industry clusters. More projects have been added over time, notably as part of the County's Holo Holo 2020 Initiative. The 2010 CEDS is currently being updated, and its projections for population growth and employment, as well as the priority projects list, will reflect current trends and thinking.

For the GP Update, Collaborative Economics, Inc. conducted a preliminary regional business using 2011 data from the National Establishment Time Series (NETS) database.[1] The analysis identified growth opportunity clusters. These include industries in which Kaua'i's economy has a specialization in relation to the rest of the state and those which are export-oriented. Opportunity clusters help bring resources into the region from elsewhere and focus efforts on the sectors could help drive growth in the region. Opportunity clusters identified for Kaua'i include:

- Sub-categories of tourism including: amusement and recreation, visitor transportation, personal care and beauty;
- Food processing and distribution;
- Defense;
- Fashion and retail;
- Makers (small-scale manufacturers);
- Technical services (film and digital media, music, architecture, engineering and design); and,
- Manufacturing (commercial printing, metal fabrication, soap and detergent, pottery, hardware).

Identifying opportunity clusters helps the County by informing investment and policy decisions.

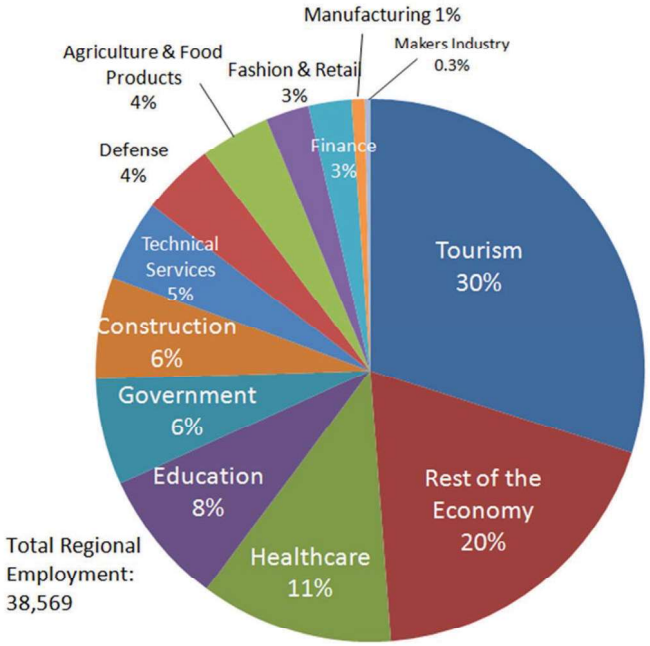
Employment Trends

The chart and table on the following page show 2011 employment in Kaua'i's anchor industries and opportunity cluster areas.

The tourism cluster employed 30%, or 11,026, of Kaua'i's workforce in 2011 (Collaborative Economics, 2015). The "rest of the economy" as labeled in the chart below employs 20% of the workforce and includes community services (e.g. supermarkets, stores, religious organizations, health care, education, family services, auto shops, etc.), other support services (which are unclassified companies), logistics, utilities, and non-tourism related real estate.

In 2011, the agriculture industry employed 1,613 people in Kaua'i (Collaborative Economics, 2015). Apart from jobs in distribution, the other sub-industries of agriculture – support, research and development, food processing, farming – declined between 2001 and 2011.

[1] National Establishment Time-Series (NETS) data provides information on every business establishment in the region. Clusters are identified based on NAICS code classifications and refined through further analysis and review of individual companies.



Sector	2011 Employment
Tourism	11,026
Rest of the Economy	7,308
Tourism	11,538
Healthcare	4.385
Education	3,102
Construction	2,335
Government	2,436
Technical Services	1,861
Defense	1,666
Agriculture & Food Products	1,592
Fashion & Retail	979
Finance	982
Manufacturing	298
Makers Industry	121

The Role of Cottage Industries

Employment statistics may not reflect the many informal jobs that Kaua'i's residents use to supplement their incomes and support their households. Cottage establishments can result from informal jobs or activities that become more formal over time. Cottage establishments are defined as business in residences with fewer than 3 employees. Thirteen percent of total Kaua'i's establishments were cottage industries in 2011, and those establishments filled 3% of Kaua'i's jobs.

Cottage industries and entrepreneurial development can be further nurtured on Kaua'i through resources such as incubators, co-working spaces with affordable workspace and shared equipment, mentoring and professional development, and policies that enable people to operate certain kinds of businesses out of their homes. The regulatory structure governing businesses and cottage industries warrants discussion during the GP planning process to ensure that innovation is nurtured and not inadvertently penalized.

The Kapa'a Business Association reports that the one of the biggest issues facing businesses on Kaua'i is the lack of affordable housing for their employees. Strong, vibrant town centers that include affordable housing above stores on bus routes or in walkable / bike-able distances from jobs can help keep costs down and help small businesses grow.

To summarize, the major Economic Development issues include:

- Kaua'i remains heavily dependent on tourism as the main anchor indusry.
- Industry and anchor clusters reveal sectors that can be nurtured. Anchor industries are growing.
- Kaua'i has areas of specialization, or industries that are highly concentrated (e.g. certain sub-categories of Tourism, Defense and Agriculture & Food Products).
- Creative Industries are small but emerging (e.g. Makers, Fashion & Retail, Film/Music/Media, Architecture/Design) and can help to create a diversified economy.

4.2 OPPORTUNITIES

The Kaua'i Economic Development Board (KEDB) and County of Kaua'i Office of Economic Development suggest that Kaua'i's economy can be guided by the following principles:

- Economic Diversification: strengthen selected industry clusters to minimize dependence on a single industry
- Economic Self-Sufficiency: minimize imports and promote import substitution
- Economic Opportunity for all: offer an appropriate K-20 education and adequate training opportunities to give workers choices and to promote living wages

These principles led to the development of five goals:

1. To assist new and existing businesses create new jobs.
2. To facilitate career planning for students.
3. To expand and train the workforce to meet the needs of employers.
4. To promote affordable housing.
5. To improve the skill level and work readiness of students to achieve career and college success.

There are several organizations and entities on Kaua'i that provide access to business planning assistance, career planning, entrepreneurial training, incubation, and assistance with permitting, licensing, and regulatory issues. Some facilitate access to start-up, micro-enterprise, and expansion capital funds.

The County Office of Economic Development is spearheading a Kaua'i Creative Technology Center in Līhu'e that will provide provide 30,000 square feet of multipurpose creative technology facilities. The mission is shown at right. Once completed, the Center is intended to operate as a community hub for arts, innovation, and creative technology.

Kaua'i Creative Technology Center Mission

The mission of the Kaua'i Creative Technology Center is to promote creativity and innovation through the use of technology.

It will manage a state-of-the-art facility that offers industry-grade equipment and technology-based programs that cultivate local talent and catalyze economic growth on Kaua'i.

The Center will serve students from elementary to middle and high school as well as the community college. It will be a venue for the performing arts community as well as for the professional media and film industry. It will provide education, job training, and business development opportunities.

Education is a critical component of supporting future economic opportunity. KEDB's Aloha 'Ike program partners with the Department of Education to enhance opportunities for Kaua'i's keiki in grades K-12, proving grants to projects that supplement academic programs in public, private, and charter school across the island. Its principles are shown in the text box.

Kaua'i Economic Development Board Aloha 'Ike Program Principles

Encourages teachers and administrators to expand the education enrichment opportunities for their students;

Facilitates the application of academic concepts through innovative project-based learning; and

Develops partnerships with participating companies, institutions of higher learning, and other members of the community.

Convergences between economic growth sectors can guide investment to facilitate overall growth. Investing in growth sectors with converging needs and interests, or "clusters of opportunity" may help diversify Kaua'i's economy. "Opportunity Industries" for Kaua'i as described in the preceding section include sub-categories of tourism, food processing and distribution, technical services, defense, manufacturing, fashion & retail, and makers. There are examples of cluster industry coalitions that have organized to identify and address common areas of need to support collective growth. This has occurred on the North Shore of O'ahu, as described in *Developing A Shared Agenda: For the North Shore of Oahu's Economic Vitality and Community Well-Being Draft Action Plan* (2013).

All industries can benefit from improved infrastructure and actions that protect infrastructure from the repercussions of climate change and sea-level rise. All businesses are threatened by roads that regularly flood or storms that shut down the harbor. Transportation networks and facilities for agricultural products and workers are critical from an economic perspective. Storage, processing and transfer sites in proximity to fields, airports and harbors could be improved to support not only greater export opportunities, but also local food independence and self-sufficiency.

To summarize, the major Economic Development opportunities include:

- The Economic Development Board has identified the principles of diversification, self-sufficiency, and economic opportunity to help guide new investment.
- Clusters of economic opportunity can help target investment and focus initiatives to support small businesses. There are models from other areas that may be emulated.
- Several organizations already provide some of the business assistance that Kaua'i needs and can build upon the findings of the soon-to-be-updated CEDS and the *Primary Regional Business Analysis* by Collaborative Economics.

4.3 HOW THE 2000 GENERAL PLAN TREATED ECONOMIC DEVELOPMENT

- Economic Development is addressed in "Supporting Businesses and Jobs for Kaua'i Residents", "High Technology", and "Land Supply for Commercial and Industrial Uses" in the 2000 GP.
- The text and data in the 2000 GP is limited on the topic of economic development. Many policies remain sound, but data is required to support recommendations.
- The 2000 GP recommends requiring that resorts and businesses seeking zoning and permits use the local labor force as a mechanism for creating jobs for the local workforce. This task is being implemented by the Planning Department, and has become a common condition in zoning and permit approvals.

4.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on economic development to be conducted by the GP Team includes:

1) Incorporate data from 2015 *Land Use Buildout* Technical Report in regards to land zoned or needed for commercial and industrial activities based on population projections.
2) Incorporate data about the workforce and clusters of opportunity generated by Collaborative Economics.
3) Update real estate-specific data will available information.
4) Review the updated CEDS for Kaua'i and incorporate relevant policy materials into the GP Update.
5) Update Table 4-5: Kaua'i Shopping Centers in the 2000 GP using research.
6) Use Table 15 in the *Land Use Buildout* Technical Report to address Commercial Floor Area by Planning District.
7) Update Table 4-6: Capacity of Vacant Commercial Zoned Lands in the 2000 GP using data from Table 16 in the *Land Use Buildout* Technical Report.
8) Update Table 4-7: Capacity of Vacant Industrial Zoned Lands in the 2000 GP with data from Table 17 in the *Land Use Buildout* Technical Report.
9) Consider how policies promoted in the updated CEDS relate to land use and infrastructure policies.
10) Include available data that addresses the impact of small businesses on the economy and the challenges they face.
11) Document the efforts of the Chamber of Commerce and other business associations, and their understanding of the business climate up to 2035.
12) Other thoughts for discussion may include economic incubators in each district, satellite educations/tech centers and resource guides to improve community-business connections.

4.5 RESOURCES

Collaborative Economics. June 30, 2015. *Preliminary Regional Business Analysis: Kaua'i's Economy*.

Collaborative Economics. November 2013. *Developing A Shared Agenda: For the North Shore of Oahu's Economic Vitality and Community Well-Being Draft Action Plan.*

Kapa'a Business Association website. 2015. http://www.kbaKaua'i.org/

County of Kaua'i Office of Economic Development and Kaua'i Economic Development Board. *Kaua'i's Comprehensive Economic Development Strategy (CEDS) Report 2005-2015*.

State of Hawai'i Enterprise Zone Maps. http://invest.hawaii.gov/business/ez/

U.S. Census. 2010. Kaua'i County, Hawai'i.

5.0 AGRICULTURAL LANDS

5.1 DEFINING THE ISSUES

Quantity and Quality of Agricultural Lands

A Draft *Important Agriculture Land Study* was prepared for the GP Update in 2014. According to the study, 144,000 acres of Kaua'i's lands are located in the State Land Use Agricultural District. Only 80,000 acres, or 41%, are located in the 2000 General Plan Agricultural District. Approximately 14% of the land in the North Shore Planning District is designated by the 2000 GP for agricultural purposes; 19% of Kapa'a-Wailuā is designated for agricultural purposes; 24% of Līhu'e; 19% of South Kaua'i; 8% of Hanapēpē-'Ele'ele; and, approximately 16% of Waimea-Kekaha is designated for agricultural purposes.

Community feedback received to date reflects a strong desire for a diversity of farm sizes and food crops to serve the local market, with limited exports. The economics of farming at a small scale for local consumption versus a larger scale for export needs to be explored in light of this priority. There are also concerns about the compatibility of certain agricultural uses with sensitive environments (such as the proposed dairy near Māhā'ulepū) and in proximity to schools and residential areas (evidenced by the concerns over pesticide use by seed corn companies in Waimea). An advantage to encouraging diversified agriculture that is compatible with surrounding uses is the continued existence of plantation infrastructure. It will need to be preserved, and in many cases, improved or upgraded to perform to today's standards. A larger concern is whether or not there is adequate water available to support the desired diversity of agricultural uses.

Water for Agricultural Purposes

Although Hawaii's sugar industry started during the 1860s, most of the plantation irrigation systems were developed around the turn of the twentieth century. Large quantities of surface water from perennial streams were diverted by intake structures into miles-long transmission ditches and tunnels, moving water from the windward side of the islands to the leeward plains, where abundant dry, fertile lands required irrigation to grow sugar cane. Generally, intake structures include a dam across the streambed, an inlet channel, control gates, trash screen, and a connecting tunnel or ditch into the main transmission structure—usually another tunnel or ditch. The physical characteristics of these irrigation systems were designed and constructed prior to the enactment of environmental and zoning statutes. It is now nearly impossible to plan, design, and construct similar irrigation systems without enormous effort and cost. The collapse of the sugar industry resulted in the abandonment of many plantation irrigation systems. With the lack of maintenance, ditches have been overgrown by vegetation, intake structures have been damaged or clogged, and siphons and flumes have deteriorated.

Beyond adequate infrastructure to channel it, the availability of water has emerged as an uncertainty that has hampered agricultural projects. An example is the Kīlauea Agricultural Park, which completed its environmental compliance in 2009 only to discover that there was no available water. The solution

nearly tripled the cost of the project ("*Kīlauea Farming Project Gets Legs*", The Garden Island, August 7, 2015).

The County's Water Department is currently working with the Department of Agriculture and Agribusiness Development to develop agricultural water use projections. Their technical approach includes the selection of crops that can be irrigated with rainfall, whenever possible, rehabilitating and repairing existing and former irrigation systems, and maximizing use of lower quality water (reuse water, surface water, brackish water) whenever possible.

Crops for Fuel, Fiber, and Research

There is a movement to explore local production of crops for fuel and fiber, and to take a hard look at the potential impacts of cultivating genetically modified organisms (GMO), and genetically engineered (GE) crops.

Kaua'i's Chamber of Commerce estimated that the seed crop companies have a $220 million annual economic impact on Kaua'i (LaVentura, 2013). The Chamber of Commerce and College of Tropical Agriculture and Human Resources, University of Hawaii at Mānoa, credits the seed corn and coffee companies with diversifying the agriculture industry and keeping land in agriculture since the decline of sugar and pineapple. Kaua'i's Office of Economic Development estimates that the seed companies have contributed more than $1 million to maintain the irrigation systems on the west side.

Because GMO and GE practices can impact the soils of neighboring lands and air quality, the County Council has considered new regulatory requirements pertaining to the availability of documentation of such practices and notifications. Initial legislative acts were rejected by the Hawai'i Courts as lacking jurisdiction. Land use regulations involving GMOs may not violate the U.S. Constitution's Fifth Amendment "takings clause"; i.e., private property may not be taken for public uses without a public purpose and without just compensation. In other words, regulations may not be so stringent that a property owner is denied their entire ability to use their property.

Designation of Important Agricultural Lands

The draft *Important Agricultural Lands Study* includes five major recommendations. Recommendations #1 to #3 focus on establishing a County process for incentivizing and encouraging IAL designations. Recommendation #4 directs the County and encourages the State to use maps and tools developed during this study process when reviewing petitions for designation and when considering candidate lands for County or State-led petitions. Recommendation #5 acknowledges opportunities for reviewing, expanding, and integrating recommendations made in this study in the forthcoming General Plan update. Landowners of important agricultural lands and farmers are keenly interested in maintaining their property rights and ability to maximize the use of their land now and in the future. Designating land as Important Agricultural Lands in perpetuity provides tax relief and certain protections, but it may limit their ability to develop their property. So far, 16,263 acres of agricultural land have been designated by private landowners on Kaua'i. County-initiated IAL designations have been considered, but not submitted to the State Land Use Commission.

Agricultural Infrastructure

Agricultural production is supported by essential infrastructure for irrigation, storage, and distribution. This includes roads and transportation networks that are shared with non-commercial users. Maintenance of infrastructure in safe and working condition is crucial to support food production goals and manage the costs of producing and transporting crops on Kaua'i. The County's 2012 *Multimodal Land Transportation Plan* provides recommendations to support agricultural transportation needs, as listed in the text box at right.

The County's 2012 "Multimodal Land Transportation Plan" recommends that the County focus its agricultural transportation efforts in the following areas:

- *Reducing the cost of transporting and processing locally-grown farm products;*
- *Protecting against disruption of on-island transportation networks during storms and other emergencies;*
- *Improving access by residents and visitors to healthy foods, including locally-grown and raised fruits, vegetables, grass-fed beef, sea foods, and dairy products; and*
- *Ensuring agriculture workers have affordable and reliable access to their jobs.*

People who participated in the meetings associated with the preparation of the 2014 *Important Agriculture Land Study* were particularly concerned about the maintenance of reservoirs and new dam safety rules. The Ka Loko dam disaster and deaths caused by the dam breach remains top of mind. Participants also cited the need for a comprehensive update to the water inventory and management plan and raised concerns about the high cost of producing and transporting food on island.

To summarize, the major issues in Agriculture and Food Sustainability include:

- Agricultural land is well-distributed among all of the island's Planning Districts.
- The IAL concluded that Kaua'i has sufficient land with which to attain food self-sufficiency. Economic and other incentives are needed to encourage actualization of this goal.
- Crops for fuel and fiber can be explored to add to the diversity of products for Kaua'i.
- While many are wary of GMO's possible impact on the environment, others recognize that seed and coffee growers contribute to crop diversification and maintain agricultural land uses.
- Infrastructure needs include dam and reservoir maintenance, water for irrigation purposes, and efficient transportation networks for producing and transporting food.

5.2 OPPORTUNITIES

The County's farming industry is transitioning away from the single crop, large scale plantation model. Gay and Robinson harvested its last sugar crop in 2009. The Līhu'e Mill came down in 2012. New crops, new land uses, and technological advances are all presenting themselves as opportunities to be layered over historic and cultural relationships to the land. The seed industry, for example, has doubled its acreage, and the Kaua'i Coffee Company has one of the highest acreages of coffee grown in the nation. Small, organic family farms are proliferating on the North Shore. Additional interest in farming and healthy eating can be found in the emergence and/or increase in community gardens, food forests, farm-to-table restaurants, and sunshine markets.

The 2014 *Important Agriculture Land Study* states, "Agriculture is the history and lifeline of these Hawaiian Islands." This is especially true for Kaua'i where productive agricultural lands are critical to the economy and the production of healthy foods consumed locally. Agricultural activities also touch upon jobs, housing, transportation, and growing/processing of materials. Understanding the history associated with food production in Kaua'i is useful for very practical reasons, like the need to maintain

existing irrigation systems. Given the resurgence of interest in Hawaiian culture (as documented in the Kaua'i Planning and Action Alliance's 2012 *Measuring What Matters for Kaua'i* report), it is likely that more people will turn to farming to satisfy household and 'ohana needs, but also as an occupation. New niches are forming thanks to the "Kaua'i Made" brand. The schools and Kaua'i Community College are nurturing this interest and providing training.

To summarize, the major opportunities in Agricultural Lands include:

- New crops, new land uses, and new technologies are presenting themselves as the agricultural industry transitions from the single crop, plantation model.
- Small, organic enterprises – ranging from farms to retail to restaurants – are creating a need for agricultural lands.
- The resurgence in Hawaiian culture, healthy eating and a more self-sufficient lifestyle is generating more interest in agriculture.
- Schools and the community college are well-positioned to nurture this interest in agriculture and provide training.

5.3 HOW THE 2000 GENERAL PLAN TREATED AGRICULTURE

- The Agriculture section in the 2000 GP reflects older thinking. It will need to be rewritten to reflect recent changes to the industry and new regulations regarding the designation of Important Agricultural Lands. The IAL and 2015 *Land Use Buildout* Technical Report contain the majority of data needed to update this Chapter.
- The 2000 GP addresses aquaculture within the agriculture chapter.
- The 2000 GP included an Implementing Action (4-26) requesting the Planning Department to submit an amendment to the CZO that would eliminate the requirement to subdivide in order to grant a long-term lease for agricultural use only (no dwelling use). This revision was intended to encourage land owners to make land available to small farmers, and has not yet been initiated. Alternatively, an amendment may not be needed, if the existing "Agricultural Parks" process can be utilized more extensively.
- The 2000 GP included an Implementing Action (4-26) requesting the Planning Department to submit an amendment to the Subdivision Ordinance that would require preservation of viable irrigation systems. This revision was intended to maintain viable irrigation systems – both government- and privately-owned – and to support the supply of irrigation water to farmers at reasonable prices. This has not been initiated.
- The 2000 GP included an Implementing Action (5-6) requesting the Planning Department to amend the CZO to implement the policies for Agricultural lands in the GP. These included amendments to site planning standards and criteria for approving and Agricultural Community. The Planning Department attempted to amend the CZO accordingly and was unsuccessful. Controls on the subdivision of lands to prevent loss of agricultural potential and rural character are still needed.

5.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on agriculture and food sustainability to be conducted by the GP Team includes:

1) A significant amount of current research and collaborative thinking has gone into the 2014 *Important Agriculture Land Study*. The Study's findings and recommendations were vetted by a diversity of community leaders and outside experts, and should be introduced to the CAC for consideration. Recommendations articulated in the study should be evaluated for its incorporation in the General Plan policies.
2) In accordance with the recommendations contained in the *IAL Study*, the updated GP will need to help reconcile:
    a. Increasing access to water and water infrastructure improvement for agricultural irrigation.
    b. Increasing access to land (to lease or own) for farmers growing food and primary resources (timber, holistic medicines, etc.).
    c. Improving upon or redeveloping a system for local and export marketing of food and (primary) resources.
3) Table 4-4: Kaua'i's Agricultural Lands (acres) in the 2000 GP can be updated with the *Land Use Buildout* Technical Report and Table 2 and information on page 9, as well as the *IAL* Technical Report Table 4.
4) The GP Team will need to decide where to locate references to aquaculture in the GP – either in "Agriculture" or "Economic Development".
5) The zoning of agricultural lands needs closer attention in order to confirm that the Important Agricultural Lands are, in fact, zoned for agricultural uses, that residential uses on agricultural lands are appropriately scaled and clustered, and that these lands are physically accessible and have access to necessary water supplies.
6) Research conducted during the GP planning process may reveal that there are more land use conflicts between the Agriculture and Urban Districts than currently assumed or documented.
7) Given how the industry is changing, the GP Planning process may also consider rethinking how agriculture is regulated and incentivized. Agricultural zoning typically specifies the density of development and permitted uses. In many agricultural zoning ordinances, the density is controlled by setting a large minimum lot size for a residential structure, but densities may also vary depending upon the type of agricultural operation and proximity between other properties or uses.
8) Land use regulations are not the only way to impact agricultural activities. The County could consider financial incentives or programs to support maintaining and growing agricultural activities, such as purchase of development rights and conservation easements.
    a. Purchase of development rights (PDR). A program that allows property owners to voluntarily sell the development rights to their land at fair market value in return for deeding a permanent conservation easement held by a land trust or local government.
    b. Agricultural conservation easement. A voluntary (legally recorded) agreement between a landowner and a qualified conservation organization, often a land trust, which restricts land to agricultural and open space uses.
    c. Farmland mitigation programs. Can help preserve agricultural lands. They involve protecting farmland by providing equivalent farm acreage elsewhere when agricultural land is converted to other uses, or paying a fee when farmland is converted to other uses.

5.5 RESOURCES

County of Kaua'i Important Agriculture Land Study. December 2014.

State of Hawai'i, Department of Agriculture. December 2004. *Agricultural Water Use and Development Plan.*

LaVenture, Tom. The Garden Island. September 15, 2013. *GMO, by the numbers*.

Lyte, Brittany. The Garden Island. August 7, 2015. *Kīlauea Faming Project Gets Legs.*

6.0 TOURISM

6.1 DEFINING THE ISSUES

Kaua'i's tourism industry is the largest sector of the Island's economy. It regularly accounts for about 33% of the County's real income, generates more than a quarter of the jobs on Kaua'i, and contributes substantially to the county tax revenues (*Kaua'i Comprehensive Economic Development Strategy*, 2010). The tourism industry employed 11,029 of Kaua'i's residents in 2011 (Collaborative Economics, 2015).

In 2014, Kaua'i received 1,113,605 visitors, who stayed an average of 7.71 days and spent $171 per day. Of these, 70% were returning visitors while 30% were new. Three out of four were independent travelers. The average visitor count per day is 23,536. Visitors increase Kaua'i's population by as much as 22% on any given day. Direct visitor spending for an average year in the first decade of this century was about $1,087 million. DBEDT's visitor industry Input-Output model shows that the indirect and induced effects of visitor expenditures practically double the amount of direct expenditures.

Because tourism is sensitive to disruptions including economic downturns, climate events, and world geopolitical events, it has been the County's objective to diversify the local economy and thereby reduce its dominant effect on total economic output.

Tourism can have negative side effects. The Island's million-plus annual visitors place stress on local infrastructure and increase the demand for public services. Visitor impacts on natural resources and parks were identified as a concern in the 2000 GP, and remains a concern today. Major visitor destinations on Kaua'i – particularly Kē'ē Beach (Hā'ena State Park), Kalalau (Na Pali Coast State Wilderness Park), and the Waimea and Kōke'e State Parks - are underfunded and in need of improved maintenance.

Kaua'i Tourism Strategic Plan (2015) notes that a key issue is the significant fluctuation throughout the year in the number of visitors. When the daily visitor count is over approximately 25,000, the island's roads, beaches and other infrastructure are taxed, and the visitor experience and resident quality of life diminish. There is interest in managing the "peaks and valleys" in the visitor count. The peaks typically occur in the mid-June to August and during the winter holidays. In December 2014, the daily visitor count reached 26,170. Until there is improvement in the island's infrastructure, the desirable range of visitors per day is within the range of 23,000 to 25,000, thus ensuring valleys and peaks are evened out.

The parking situation at Kē'ē Beach is an example of the challenges. Hā'ena State Park lies at the "end of the road" on Kaua'i's north shore. Both visitors and locals appreciate the ancient sea caves, beach, opportunities for shore fishing, and viewing of the Nāpali Coast. The trailhead for the 11-mile Kalalau Trail begins in this park. The limited parking quickly fills up and results in a combination of illegal parking

and /or frustration for those who have driven far to enjoy the park or trail. There are high instances of theft and vandalism at this parking area, as well as many others around the island.

Several important visitor destinations have recently updated plans, or plans that are well underway. State Parks and the Ha'ena community are working together to refine and adopt a park master plan for Ha'ena State Park. Another issue associated with tourism is the proliferation of alternative visitor accommodation units such as Transient Vacation Rentals (TVRS) and Bed & Breakfast (B&B) operations, specifically outside of the designated visitor destination areas (VDA). The 2000 General Plan called for the County to recognize "alternative visitor accommodations," as well as enact clear standards and permit processes for regulating alternative visitor accommodations structures and operations in Residential, Agriculture, Open and Resort zoning districts. Although the TVR and Homestay ordinances have begun to implement the 2000 General Plan policy regarding the regulation of alternative visitor accommodations, there is still concern that such uses may have negative and adverse impacts on certain residential neighborhoods zoned outside of the visitor destination areas. In addition to altering the character of the community because of the constant turnover of different people, neighborhoods with TVRS decrease the affordable housing inventory for local residents. Illegal alternative accommodations outside of the visitor destination areas puts a strain on enforcement efforts with limited staff and resources.

To summarize, the major issues in Tourism include:

- Tourism is the largest sector in Kaua'i's economy, and one of Kaua'i's only basic industries.
- Tourism is sensitive to economic disruptions, major weather events, and geo-political issues.
- Tourism places high demands on infrastructure, services, and natural resources.
- A balance is needed to accommodate visitors and residents harmoniously.

6.2 OPPORTUNITIES

A strong tourism industry can honor the people, culture, and heritage of Kaua'i. It can support and enhance the quality of life for residents; add value and perpetuate the natural and cultural resources of Kaua'i. It can support a vibrant and sustainable economy, and provide a unique, memorable, and enriching visitor experience.

According to the 2005-2015 Kaua'i Comprehensive Economic Development Strategy (CEDS), leaders in the visitor industry on Kaua'i identified the needs that require immediate attention and action. These areas include:

- Improving the condition of State and County parks
- Addressing the issues of safety and security
- Improving directional signage
- Providing improved interpretive signage
- Creating more regional visitor/cultural centers around the Island
- Conduct a study of cruise ship social, economic, and physical impacts, infrastructure improvements required, and costs
- Create an educational program, beginning in middle school, on the importance of the visitor industry to Kaua`i's economy and the State as a whole

While the general areas for improvement included in the 2005-2015 remain important, the 2010 CEDS included a more specific list of infrastructure improvements (identified by industry leaders):

- Wailuā emergency bypass road (between Hanamā'ulu and Wailuā River)
- Līhu'e Airport runway expansion
- Puhi-Līhu'e-Hanamā'ulu water system
- Kūhiō Highway relief route (between Hanamā'ulu and Kealia)

Kaua'i's *Tourism Strategic Plan Update* was released in July 2015. It includes strategies and measures that work toward five key objectives, shown in the text box at right.

***Kaua'i Draft Tourism Strategic Plan Objectives* (2015)**

1. To make positive contributions to the quality of life for residents.
2. To increase the economic contribution of the visitor industry to Kaua'i.
3. To increase communications, interactions and understanding between stakeholder groups, especially between residents and the visitor industry.
4. To maintain and improve visitor satisfaction with their experience on Kaua'i.
5. To reinforce authentic Native Hawaiian culture and local Kaua'i culture, the foundations of our unique sense of place.

Visitor housing options continue to expand. Hotels and resorts are no longer the only option. The diversity of options can appeal to more people, and help grow the industryThe Buildout Analysis suggests that there is basically enough land Resort zoned land to accommodate visitor growth.

To summarize, the major opportunities in Tourism include:

- A strong tourism industry can honor Kaua'i's heritage, create jobs, generate revenue that can improve local services and facilities, and spread aloha beyond the Island.
- There is sufficient land zoned for resort facilities to accommodate visitor growth.
- Alternative visitor destinations can generate new revenue for property owners and offer visitors an option to staying in a resort.
- Alternative transportation such as airport shuttles, shuttles to popular destinations, and visitor use of bicycles and walking paths.

6.3 HOW THE 2000 GENERAL PLAN TREATED TOURISM

- The "Visitor Industry" chapter is one of the longer ones in the 2000 GP. Beginning with visitor projections, it includes data and discussion pertaining to the number, types, and locations of units needed to accommodate visitors.
- The 2000 GP addresses the impact of visitors on parks and natural resource areas, but does not discuss the impact of visitors on other infrastructure or transportation systems.
- The 2000 GP recommended amending the CZO to set development standards and permit process for alternative visitor accommodation structures. This has been implemented through Ordinances 987, 904, 876, and 864. Development standards now exist for B&Bs, vacation rentals, retreat centers and inns.

6.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on tourism to be conducted by the GP Team includes:

1) Update the analysis from the 2000 GP with data from the 2015 *Land Use Buildout* and *Socioeconomic Analysis and Forecasts* Technical Reports, *Tourism Strategic Plan,* and CEDS.

2) Update the area-specific discussion of trends in the 2000 GP with input from updated plans and agency representatives.
3) Update Table 4-1: Estimate of Overall Demand for Visitor Units in 2020 in the 2000 GP with Table 11 in the *Socioeconomic Analysis and Forecasts* Technical Report.
4) Update Table 4-2: Visitor Units by Area and Type, 1999 in the 2000 GP with the *Socioeconomic Analysis and Forecasts* Technical Report Table 12 (by area) and with the Hawai'i Tourism Authority "2014 Visitor Plant Inventory" (by area, property and unit type).
5) Update Table 4-3: Summary of Potential Visitor Units, by Status and Area in the 2000 GP with the *Land Use Buildout* Technical Report Table 20 Hawai'i Tourism Authority "2014 Visitor Plant Inventory" (planned additions and new developments).
6) Discuss means for the County and State to manage visitor-driven congestion, such as by integrating work conducted for the North Shore/South Shore Shuttle Study into the GP Tourism and Transportation sections.
7) The GP planning process could examine the list of tourism projects based on their impact on other policy areas in the GP. According to the 2015 *Land Use Buildout* Technical Report, in all Planning Districts except for the North Shore, the existing inventory - plus proposed new developments - exceed the projected need for tourist accommodations. Līhu'e had the most excess followed by Waimea-Kekaha, Kapa'a-Wailuā, and South Kaua'i. The Technical Report suggests that the projected deficit for the North Shore can be accommodated by the extensive supply of potential single-family transient vacation rentals within the Visitor Destination Areas. However, the GP planning process might generate alternative solutions.

6.5 RESOURCES

State of Hawai'i, Division of State Parks Department of Land and Natural Resources. June 2014. *Kōke'e and Waimea Canyon State Parks Master Plan.*

Hawai'i Tourism Authority. 2014. Visitor Plant Inventory. http://www.hawaiitourismauthority.org/default/assets/File/2014%20Visitor%20Plant%20Inventory%20Report%20(FINAL).pdf

County of Kaua'i Office of Economic Development and Kaua'i Economic Development Board. *Kaua'i's Comprehensive Economic Development Strategy (CEDS) Report 2005-2015.*

The Kaua'i County Tourism Strategic Plan: 2006-2015- partnership with the County, Industry, and the Kaua'i Visitor's Bureau.

County of Kaua'I Office of Economic Development, July 2015. *Kaua'I Tourism Strategic Plan Update 2016-2018.*

SMS Research & Marketing Services, Inc. February 2014 *Kaua'i General Plan Update: Socioeconomic Analysis and Forecasts.*

Azambuja, Léo. June 6, 2013. *Dahilig Outlines Plan for TVRs.* The Garden Island. http://thegardenisland.com/news/local/govt-and-politics/dahilig-outlines-plan-for-tvrs/article_170c980c-ce76-11e2-9c99-0019bb2963f4.html

PBR. Ha'ena State Park Master Plan. http://pbrhawaii.com/?project=Hā'ena-state-park-master-plan

7.0 OPEN SPACE

7.1 DEFINING THE ISSUES

What people perceive as "open space" in Kaua'i is either undeveloped land, agricultural land, or land that is regulated to limit development. Kaua'i limits development with the General Plan "Open" designation and the CZO's "Open District".

According to the 2015 *Land Use Buildout* Technical Report, the General Plan "Open" designation comprises over 70% of the island. The Open designation includes the State Conservation District and other open areas such as golf courses. Land designated as Open is distributed across the island as follows: Waimea-Kekaha (39%); North Shore (27%); Līhu'e (12%); Kapa'a-Wailuā (10%); Hanapēpē-Ele'ele (7%); and South Kaua'i (4%).

According to Section 5.3.1 of the 2000 GP, lands designated Open shall: "…remain predominantly free of development involving buildings, paving and other construction." With the exception of kuleanas and other small lots of record, any construction that is permitted shall be clearly incidental to the use and open character of the surrounding lands.

General Plan designated open spaces include important land forms such as mountains; coastal bluffs; cinder cones; stream valleys; native plant and wildlife habitat; areas of predominantly steep slopes; beaches and coastal areas susceptible to coastal erosion or hurricane, tsunami, or storm-wave inundation; wetlands and flood plains; important scenic resources; known natural, historic and archaeological resources; and, areas committed to outdoor recreation. During the GP Update community meetings, feedback indicated that emphasis should be added on preserving scenic qualities of open space, and specifying a preference for sustainable land uses and landscapes.

Lands designated as "Open" in the 2000 General Plan are typically designated as "Agricultural" or "Open" in the CZO. Kaua'i limits development in its Open and Agricultural Districts, which comprise much of the open space between towns. Under the CZO, single-family residences are allowed within the Open District. As a result of a stronger emphasis on preserving open lands, the County passed Ordinance 896 in 2010 to close a density "bonus" loophole in the CZO and further limit development in this District.

Open spaces between communities help reinforce community identity. A compact community can form a strong sense of place when it is surrounded by open space. A person knows when they are entering a community when the large expanses of open space ends. Kaua'i residents like this relationship between the built areas and open land, and want to keep it that way.

Open Space Acquisition

The County has established a framework for funding land acquisitions, with a focus on park expansion areas and shoreline access ways. The Public Access, Open Space, Natural Resources Preservation Fund was established by County Charter and receives a minimum of 1.5% of the County's annual certified real property taxes. The callout at right explains the intended application of the funds.

> The County Charter specifies that the Public Access, Open Space, Natural Resources Preservation Fund will be used *to "acquire lands or property entitlements for the following purposes: outdoor recreation and education, including access to beaches and mountains; preservation of historic or culturally important land areas and sites; protection of significant habitats or ecosystems, including buffer zones; preserving forests, beaches, coastal areas, and agricultural lands; protecting watershed lands to preserve water quality and water supply; conserving land in order to reduce erosion, floods, landslides, and runoff; improving disabled and public access to, and enjoyment of, public land and open space; and acquiring disabled and public access to public land and open space."*

Grants from the State's Land Conservation Fund are also available through the Legacy Land Conservation Program to State agencies, counties, and non-profit land conservation organizations seeking funding to acquire property that has value as a resource to Hawai'i. County agency or nonprofit land conservation organization grant recipients must provide matching funds of at least 25% of the total project costs. The Legacy Land Conservation Program provides grants to local organizations and agencies seeking to purchase and protect lands having cultural, natural, agricultural, historical, and recreational resources. There is a big difference between open spaces that are protected (in perpetuity) and those that are perceived as open, but are simply not yet developed. Community dissent arises when vacant lands people had cherished – and perceived as protected – are developed. Access to many traditional gathering places is now obstructed. There is competition for both access and use of areas that once were accessible for hunting, gathering, fishing, and recreation. The County may never have enough money to acquire all the land that needs protecting. Preventing the development of land has implications for the tax base and population growth that are worth exploring.

To summarize, the major issues in Open Space include:

- Open spaces contribute greatly to the public's perception that Kaua'i is "the Garden Island".
- Open spaces between towns help maintain and reinforce a community's identity.
- Open spaces protect natural resources.
- Defining the important qualities of open space will be informative in developing policy for the GP Update.
- The GP Update process may involve identifying open spaces that are in need of protection through re-zoning or addition to the Heritage Resources Maps.

7.2 OPPORTUNITIES

Much of the open space between towns (along the roadways) is zoned for agriculture or open space purposes. While traditional zoning districts can maintain uses to a certain extent, both agricultural and open space zoning districts allow for residential activity.

A scenic view plane ordinance was proposed in the 2000 GP to further protect open spaces. It called for preparation of a Scenic Roadways Report, which is not yet complete. Protecting scenic views should be revisited, in addition to exploring new tools to protect open spaces. An Urban Edge Boundary, as

discussed in the Land Uses and Growth Management section of this Paper, can help limit the extent of urban sprawl and delineate town edges and open spaces.

To summarize, the major opportunities in Open Space include:

- A scenic view plane ordinance can help protect open spaces with view planes.
- An urban edge boundary can limit the extent of sprawl, and protect open spaces.

7.3 HOW THE 2000 GENERAL PLAN TREATED OPEN SPACE

- The 2000 GP includes an "Open Lands" section. The delineation of "Open Lands" was revised in the 2000 GP to address the incorporation of Open-zoned lands in subdivisions of Agriculture land. Prior to revisions recommended by the 2000 GP, the number of lots that could be created under Open zoning were added to the number that could be created under Agriculture zoning, even though the actual lands designated as open may be undevelopable because they were located, as in the example of the Waipake subdivision, in a stream gulch. The 2000 GP suggested that the "density bonus" for Open lands contradicts the intent of the Open district and of the Agriculture district development standards. To correct this situation, the 2000 GP recommended that the CZO be amended. Open-zoned lands within Agriculture-zoned properties should be treated as "Agriculture" for purposes of determining the allowable number of residential lots. Counting all acreage as Agriculture gives the benefit of the additional land to the owner while observing the intent of the Agriculture district's density limitations.
- The 2000 GP recommended protecting scenic views with a new ordinance. This has not yet been done.
- The 2000 GP recommends reviewing of the zoning maps and the CZO provisions relating to the Open District and the Constraint Districts. This is an ongoing effort.

7.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on open space to be conducted by the GP Team includes:

1) Consider the impact of changes to the Open District.
2) Consider policies for a transfer of development rights (TDR) and/or Purchase of Development Rights (PDR) program on Kaua'i.
3) Update the description of the General Plan Open Designation to prevent confusion with the Open District and the concept of "Open Space". Consider calling the Open District the "Natural Infrastructure" or "Natural" District.
4) Examine how Līhu'e's recommended Urban Edge Boundary (from the adopted Līhu'e Community Plan) can, or should, be applied elsewhere. Explore other alternatives for protecting open spaces surrounding communities.
5) The CAC and County Planning Department may wish to include text that reflects upon the efficacy of the zone change in the 2000 General Plan. The section will need to include new text that describes the current Open zone.
6) In order to enact an ordinance protecting scenic views as recommended by the 2000 GP, a Scenic Roadways Report will need to be prepared that identifies important views. This is outside the scope of the GP Update and will need to be undertaken as a separate project.
7) County review of the zoning maps and the CZO provisions relating to the Open District and the Constraint Districts is ongoing, and may be helpful to inform the GP Update. The Constraint Districts, in particular, can be reviewed by the County to eliminate regulations that are no longer

relevant, to improve the effectiveness of relevant regulations, and to simplify zoning administration.

7.5 RESOURCES

County of Kaua'i Public Access, Open Space & Natural Resources Reservation Fund Commission. 2013. *2013 Report to the Kaua'i County Council and Mayor Bernard Carvalho, Jr.*

8.0 AFFORDABLE AND WORKFORCE HOUSING

8.1 DEFINING THE ISSUES

Housing on Kaua'i is expensive and homeownership is beyond the reach of many households. This is true for newly-formed families, for the elderly, for just about everyone. Sixty percent of the housing inventory is affordable to less than 25% of residents. According to HUD income limits, the majority of the existing housing supply can only be afforded by households earning over 180% of the average median income.

An analysis of housing needs conducted by the Kaua'i Housing Agency for the *2015-2020 Consolidated Plan* identified the following trends:

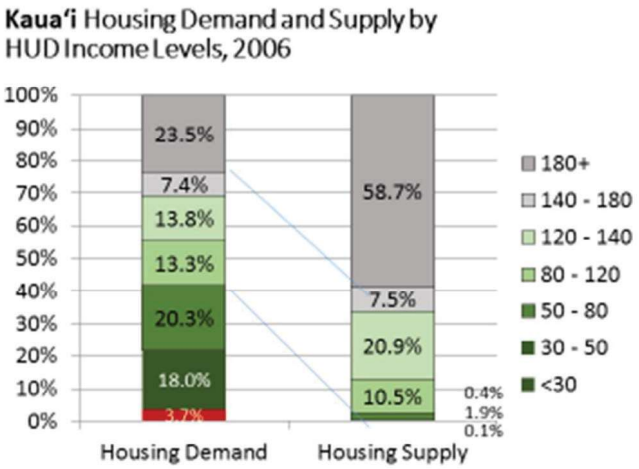
- Housing affordability is a problem. Renter and owner households below 30% of median, and between 30%-50% of median have the highest housing cost burden among households below 100% of AMI paying greater than 50% of their income on housing costs.
- Overcrowded housing is a problem. Renters experience a disproportionately higher incidence of severe overcrowding than owners.
- Substandard housing is a problem. Significantly more renters experience substandard housing (lacking complete plumbing or kitchen facilities) than owners with similar household incomes.

According to the 2014 *Socioeconomic Analysis and Forecasts* technical report prepared for the GP Update, average annual job growth for the County of Kaua'i is expected to equal 0.79% over the next few years. Between 2020 and 2030, job growth is expected to occur at an average annual rate of 0.66%. The rate is expected to dip again to 0.53% during the period between 2030 and 2035, adding less than 1,000 jobs. The idea behind investing in specific cluster industries (as discussed in the Economic Development section of this Paper) is to create jobs to pay for housing and other living costs. In the meantime, the cost of living continues to increase, with housing and transportation costs consuming a large portion of a household's income.

Some housing is built far from commercial areas and community services, so residents must rely heavily on private vehicles to get around. Such reliance is bad for the environment, physical health, and contributes to traffic congestion. Many existing homes could benefit from renovation or expansion. As Kaua'i's population ages, homes may need to be retrofitted for greater accessibility, or expand to accommodate multi-generational households.

According to the *Hawai'i Housing Planning Study* (2011) and *Consolidated Plan (2015-2020)*, of the 1,312 housing units needed by year 2016, 376 units are for ownership and 936 units are for rental. Approximately 86% of rental units needed are for families below 80% of median income. Unit type needed by low-income families is mostly multi-family. Units that are needed to serve elderly households account for approximately 19 percent of total needed units by year 2016.

There is an insufficient amount of affordable housing for the disabled, elderly, homeless individuals and families, and young families. The lack of affordable housing, results in overcrowding, which in turn fuels the demand for illegal or substandard housing units. Due to the high cost of living, many families cannot save enough money for the requisite down payment and closing costs (which are the highest in the nation) needed to purchase a home. The cost of living is exacerbated by high transportation costs and energy costs, and leaves many families with little discretionary income.. As such, it is becoming more difficult for young couples to afford their first home, for the elderly to keep their homes, and for children to return to, or remain on, Kaua'i after graduating from college. Kaua'i's *2015-2020 Consolidated Plan* recommends strategies to remove or ameliorate the barriers to affordable housing, as shown in the text box below.



2015-2020 Consolidated Plan Strategies for Affordable Housing

Land Use Controls - The Housing Agency will support efforts that streamline the planning, zoning and permitting process through the administration of the county's 201-H policy and processing of development exemptions for eligible applicants that develop at least 51% of the total project units as affordable housing.

Affordable Housing Task Force - The Housing Agency will continue to assist private developers through the Affordable Housing Task Force. The Task Force consists of representative from county line review agencies and provides a private developer the opportunity to dialogue and receive feedback to help streamline project review time.

Expedited Permitting - The Housing Agency will continue to recommend expedited permitting for affordable housing projects. Projects so designated will be given preferential permitting by review agencies.

Fee and Charges - The Housing Agency will continue to administer requests for waivers of fees and charges allowed for affordable housing pursuant to Kaua'i County Code for building permits, sewer connection fees, environmental impact assessment fees, etc.

Growth Limits - Continue to support the development of comprehensive planning for the island's communities consistent with the General Plan update. Endorse planning principles that integrate reasonable growth principles.

Policies that Affect the Return on Residential Investment - The County will impose deed restrictions on the transfer of dwelling units according to the minimum requirements of Ordinance No. 860. This deed restriction requires owner occupancy of the units. If the owner wishes to sell their unit within a buyback period, the unit must be first offered to the County at a price determined by a prescribed formula.

It should be noted that the "buyback provision" included in the last strategy may require further analysis, given that the prescribed formula results in a price that is often beyond the County's ability to pay; thus, allowing the affordable unit to become a market-rate unit.

To summarize, the major issues in Affordable and Workforce Housing include:

- Much of Kaua'i's housing is not affordable – especially to the elderly, homeless, young families, and disabled - and households are spending too much of their incomes on housing costs.
- In response to the lack of affordability, people are living in crowded and sub-standard conditions.
- New homes are often built far from town centers, which means people need to rely on cars to get around. A heavy reliance on personal vehicles is expensive, bad for one's health and the environment.
- Kaua'i lacks a diversity of housing options. Multifamily housing stock is very limited. Large lot, single-family housing is not affordable for most of the resident population, yet most of Kaua'i's vacant residential land is zoned for large lot housing. Housing for residents will be an increasing challenge, particularly for aging households, whose numbers are rapidly increasing.

8.2 OPPORTUNITIES

Housing is expensive due to high land and materials costs and out-of-state demand. These factors are not easily controlled. The regulatory process and design standards are more easily adjusted to achieve policy objectives. For example, Kaua'i's Affordable Workforce Housing Ordinance recognizes that affordable housing is not produced at sufficient rates, and therefore requires developers to build affordable housing as a condition of market-rate housing approval. In response to concerns that the mandatory production of affordable housing was preventing development altogether, the percentage of required production was recently reduced. Changes to the Ordinance will hopefully result in the actual production of more affordable housing by the private sector.

While the Workforce Housing Ordinance targets specific households and addresses well-defined, critical needs, alone the Ordinance will not satisfy all outstanding housing issues. It is an important option along a continuum of potential solutions. Kaua'i's Housing Agency already implements a variety of programs designed to provide emergency shelter, promote homeownership, expedite the permitting of affordable housing production, offer loans to purchase or rehabilitate housing, among others. Sources of funds that are potentially available to address housing needs include: Low-Income Housing Tax Credits, Section 8 Housing Choice Vouchers, Economic Development Initiative, U.S. Department of Agriculture Rural Development programs, private foundations, State CIP funds, and County funds. Federal funds are very prescriptive in terms of households income categories served. In contrast, locally-established and funded programs can be customized to serve those who fall between the federal programs and market-rate units.

Land Use Policies for Housing Diversity and a Mix of Uses

The land use and building code regulations can be revised to facilitate the construction of a broad mix of housing. For example, the County could:

- Allow for more mixed-use zoning, so that more people may live close to town, near bus stops, and above shops, and thereby save on transportation costs.
- Allow for the construction of smaller dwelling units.
- Create a system similar to 201H that prioritizes, expedites review, and reduces fees for a greater variety of affordable housing projects.

- Reduce lot sizes and allow for more multi-family units in certain districts.
- Allow for increased heights in certain districts.
- Revise building codes to allow for the construction of a greater diversity of housing unit types, at lower costs.

Infill and/or redevelopment can produce more affordable housing without sprawl, and may be less expensive than "greenfield" development because it is closer to existing infrastructure. Both the Līhuʻe and South Kauaʻi Community Plans, adopted in 2015, call for housing, including affordable housing, in compact walkable communities.

There is also an opportunity to look at incorporating "Missing Middle" housing as infill or development in walkable town centers. Coined by Dan Parolek of Opticos Design Inc., the "Missing Middle" is characterized by small-scale, multi-unit housing types such as duplexes, fourplexes, bungalow courts, and mansion apartments that are not bigger than a large house, that are integrated throughout most walkable Pre-1940s neighborhoods, often integrated into blocks with primarily single-family homes, and provide diverse housing choices and generate enough density to support transit and locally-serving commercial amenities. Supporting the construction of the "Missing Middle" could result in the production of more diverse and affordable housing options.

Hawaiian Homelands Housing

The Department of Hawaiian Home Lands (DHHL) works to ensure that native Hawaiian families have homes and land to call their own. The 2004 DHHL *Kauaʻi Island Plan* designates three priority tracts for development. These are the residential areas of Wailuā, Hanapēpē, and Anahola/ Kamalomaloʻo. These priority areas reflect the Department's emphasis on developing large master-planned communities to provide as many houses as possible to beneficiaries, in the shortest amount of time and at the least cost. The DHHL has also longer-term plans to develop agricultural and pastoral homesteads; lands for community uses that include schools and park sites; a small amount of commercial and industrial sites; and, to encourage large scale agriculture or ranching on the 13,000 acres of land island-wide that are designated for General Agriculture.

Allocation of Residential Zoned Lands

If the GP includes recommendations to allow for more residential land uses (increasing the supply of housing) and more affordable housing types, the CZO could subsequently be revised to reflect such intentions. According to the 2015 *Land Use Buildout Analysis,*

> When considering alternatives to ensure that there is adequate zoning to accommodate the projected population, thought should be given to increase the supply of higher-density residential options especially within walkable town centers … Only Līhuʻe [currently] has R-8 zoning that could provide flexible higher density options in-between a typical single-family experience and a higher-density development. All districts have multi-family zoning, but could perhaps use more or integrate into mixed-use zoning categories that may emerge in the future, particularly Līhuʻe and East Kauaʻi.

The *2015-2020 Consolidated Plan* contains a current assessment of housing needs. The *2014 Kauaʻi Community Health Improvement Plan*, corroborates housing was a critical theme. Its findings are supported by the data contained in the 2011 *Hawai`i Housing Planning Study* and the 2015 *Land Use Buildout* Technical Report.

To summarize, the major opportunities in Affordable and Workforce Housing include:

- Regulatory means - like the Workforce Housing Ordinance, 201H, more mixed use zoning at higher densities, and the like - can expedite or force the production of housing, and create an environment that lowers the cost of construction.
- The Housing Agency can be further supported in its efforts to seek funds that supplement the County's budget in order to build affordable housing, and offer homeownership programs and rehabilitation loan programs.
- DHHL owns significant amounts of land on which affordable housing for native Hawaiian families can be built. A TDR Ordinance could facilitate the construction of DHHL homes closer to existing infrastructure and town centers.
- A more holistic approach to reducing the cost of living includes not only the production of affordable housing, but also reducing transportation and energy costs.

8.3 HOW THE 2000 GENERAL PLAN TREATED HOUSING

- The "Housing" section within the 2000 GP was based on information that is now outdated. It will require extensive updating. Information is largely available to accomplish that.
- Based on population projections of an annual growth rate of 3.8 % (between 1980 and 1990), the 2000 GP emphasized the need to produce housing, and integrated support services, for the elderly.
- The 2000 GP recommended revising the CZO, as necessary, to facilitate the development of assisted living units and continuing care communities serving the elderly. While the CZO has not yet been revised, the County has participated on State-Wide Assisted Living Facilities Task Force.

8.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on housing to be conducted by the GP Team includes:

1) Much of the needed data is readily available in the 2015-2020 Consolidated Plan, 2014 Rental Study, and 2014 *Socioeconomic Analysis and Forecasts* Technical Report.
2) Update the policies and actions contained in the 2000 General Plan from current sources.
3) The GP planning process can vet variety of regulatory, financial and programmatic recommendations that might be initiated by the Housing Agency or others.
4) Describe housing needs (including those of the elderly, special needs, young families, etc.) / goals / potential actions from 2016 to 2035.
5) Identify the regulations that can support affordable housing construction.
6) Obtain data indicating to what degree accessory dwelling units are satisfying affordable rental needs, if such data exists.
7) Determine how to expedite the leveraging of Low-Income Housing Tax Credits, Sec 8 Vouchers, Economic Development Initiatives, USDA Rural Dev, private foundations, State CIP, and County funds.
8) Identify affordable housing projects that will expire before 2035. Determine how the buy-back program can be improved.
9) Identify how the private sector can play a larger role in producing affordable housing.
10) Consider improvements to the Affordable Workforce Housing Ordinance.
11) Consider creating an index for Kaua'i called the HTE index ("Housing, Transportation, Electricity" that builds on the CNT's H+T Index) to illustrate how severe the cost of living problem is in Kaua'i.
12) Update Table 8-1: Household Composition using data from Table 7 pertaining to Housing Units in the Socioeconomic Technical Report.
13) Update Table 8-2: Kaua'i Income Distribution, using US Census data.

14) Update Table 8-3: Shelter-to-Income Ratios, using *Hawaii Housing Policy Study*, 2003, Table IV-A-7. Shelter-to-Income Ratios, August 23, 2003 and the 2011 *Hawaii Housing Planning Study*, Table 5: Shelter-to-Income Ratio.

8.5 RESOURCES

PBR Hawai'i & Associates, Inc. 2014. *Draft Land Use Buildout Analysis*.

County of Kaua'i Built Environment Task Force. February 2015. *Evaluation of Public Health Policies in the General Plan 2000*.

County of Kaua'i, Kaua'i County Housing Agency. April 2015. *Consolidated Plan 2015-2020*.

County of Kaua'i. in progress. *Affordable Housing Inventory*.

SMS Research & Marketing Services, Inc. November 2011. *Hawai`i Housing Planning Study, 2011 Prepared for the County of Kaua'i*.

9.0 NATURAL HAZARDS AND CLIMATE CHANGE

9.1 DEFINING THE ISSUES

Kaua'i is susceptible to a variety of natural hazards, including coastal storms, hurricanes, high wave events, flooding, coastal erosion, tsunamis, drought, wildfire, landslides and vog.

All of these hazards threaten lives, property, the natural environment, and the economy. While little can be done to prevent hazard events, their adverse impacts can be reduced through proper planning.

Climate change is an important public health and safety factor that needs to be considered when developing policies for the location and pattern of development. Existing hazards will be exacerbated by climate change and sea-level rise. Based on the best available science, a range of sea-level rise of 1 foot by 2050 and 3 feet by 2100 is a reasonable, and possibly even conservative, planning target for Kaua'i and other Hawaiian Islands. This is consistent with recommendations from the University of Hawai'i Sea Grant College Program Center for Island Climate Adaptation and Policy (ICAP) report titled *Sea- Level Rise and Coastal Land Use in Hawai'i: A Policy Tool Kit for State and Local Governments* and the *State of Hawai'i Ocean Resources Management Plan*.

It is important to note that scientific studies also suggest high end sea level rise scenarios upwards of 6 feet by 2100. The National Oceanic and Atmospheric Administration's high end scenario of 6.6 feet is based on projections that use a calculation of the maximum possible glacier and ice sheet loss by the end of the century. At this stage the greatest uncertainty surrounding projections of future global SLR is the rate and magnitude of ice sheet loss, primarily from Greenland and West Antarctica.

Given the range of uncertainty, NOAA and UH Sea Grant (through the Kaua'i Climate Change and Coastal Hazards Assessment) recommend a scenario-based planning approach, whereby planning decisions consider multiple future scenarios and response options, where the highest scenario should be considered in situations where there is little tolerance for risk (e.g. new infrastructure with a long anticipated life cycle such as a power plant), and the lowest scenario should be considered when there is a great tolerance for risk.

Climate change, and in particular sea-level rise, has the potential to adversely impact coastal communities, critical infrastructure, agricultural productivity, recreation and access to natural and human-made recreational facilities, cultural resources, natural habitats, tourism, and other economic sectors. It can potentially threaten the health and safety of residents and tourists. Twenty percent of Kaua'i's residents live near the shoreline. Low-lying roads, wastewater systems, energy facilities, stormwater systems, and docking facilities in harbors will be at risk of impaired function due to the collective hazards of climate change and sea-level rise.

Climate change and sea level rise will affect important natural habitats, many of which provide essential natural hazard buffers for communities, including beaches, dunes, wetlands, and rivers. Inundation and

erosion from SLR will reduce habitats and/or convert habitats from one type to another, including sandy beaches and rocky intertidal areas. While new wetlands may be created due to the rise in the groundwater table (if adequate land area is available), saltwater intrusion could occur in existing aquatic ecosystems, including wetlands, streams, and estuarine systems, changing their character and vastly affecting the species that depend on them. This calls for the need to identify and map environmental systems that protect development from natural hazards and examine existing habitat protection policies and strengthen them, if needed. See Chapter 15 of the *Kaua'i Climate Change and Coastal Hazards Assessment* for more information.

Kaua'i's landmark beaches are of great importance to residents and the visitor industry. Beaches are critical cultural and social gathering places. Beach erosion will increase as sea levels rise. Beach nourishment can be used to restore beaches and reduce property loss from erosion, but the high cost of these projects generally limits them to beaches of high economic importance.

Sea-level rise could also lead to an increase of flooding and inundation of low lying agricultural land, salt water intrusion into agricultural and potable drinking water supplies, and a decrease in the amount of freshwater available. In addition to the coastal hazards, agriculture will be affected by drought, possible increases in storm intensity, and changes in rainfall patterns.

Coastal Hazards

The *Kaua'i Climate Change and Coastal Hazards Assessment* was prepared in 2014 to support the GP Update. It identifies existing coastal hazards and climate change effects that are expected to increase on Kaua'i into the future, and suggests measures for adaptation, resiliency, and mitigation.

The key coastal hazard impacts to consider for Kaua'i are: (1) coastal flooding and wave inundation; (2) erosion; (3) inland (stream) flooding, and (4) wind. These impacts may be the result of one or more hazard events including storms, high surf, sea level rise, sediment (sand) budget deficits, etc. Proper planning and mitigation programs, however, should be designed around these key impacts and not just the event that causes them,

Coastal Flooding and Wave Inundation

Coastal flooding is the flooding of normally dry, low lying coastal land. It can be caused by elevated sea surfaces or large tidal fluctuations, seasonal high waves that push water inland, and surge from low pressure systems, tropical cyclones, and tsunamis.

The Atlas of Natural Hazards in the Hawaiian Coastal Zone and the *County of Kaua'i Hazard Mitigation Plan* identifies notable high wave events, not including tsunamis, from the early 1900s through the late 1990s, many of which caused beach erosion and overwash, and damaged structures. The largest wave events typically occur on the north shore due to strong storms in the North Pacific, but the south, east, and west shores also have significant wave events.

Hurricanes with large wave heights and storm surge have historically caused extensive erosion and property damage, including Hurricanes Nina (1957), Iwa (1982), and Iniki (1992). Surge from Iniki caused severe damage to the Po'ipū coast where the greatest inundation occurred.

The recorded history of Hawaiian tsunamis shows that 26 large tsunamis have made landfall within the islands and eight have had significant damaging effects on Kaua'i. There are many examples of tsunami inundation on Kaua'i that demonstrate the magnitude and variability of tsunami impact on the shoreline. During the 1946 tsunami on the north shore, Hā'ena had a runup height of 45 feet, while only a few miles away in Hanalei Bay, runup was 19 feet. Tsunami Evacuation Zone Maps that are based on historical

tsunami runup and hypothetical models of near and far source tsunami runup are available from the Kaua'i Civil Defense Agency.

Understanding how climate related changes will affect coastal flooding and wave inundation is an area of active research. In general, extreme water levels will occur when sea level rise combines with seasonal high tides, interannual and interdecadal sea level variations, and surge and/or high runup associated with storms and tsunamis.

To visualize future inundation from sea-level rise, data from the NOAA Digital Coast sea level rise viewer provides a "bathtub" model of sea level rise inundation for Kaua'i. There are mapped inundation scenarios for 0 to 6 feet of sea level rise. Some notable limitations of these maps are that increases in water levels from wave runup is not evaluated and they do not predict the potential for increased coastal erosion. These maps may be used in the general planning process as a preliminary screening tool for SLR inundation hazards to identify areas where future adaptation planning efforts should be focused, such as conducting detailed hazard, risk, and vulnerability assessments.

Coastal Erosion

Historical erosion studies using shoreline positions mapped from aerial photographs and survey charts show that beach erosion is a troubling trend leading to shoreline change on Kaua'i, overall. The *National Assessment of Shoreline Change: Historical Shoreline Change in the Hawaiian Islands* reports that 71% of beaches on Kaua'i are eroding, with nearly 4 miles of beach completely lost to erosion over the past century. On average, shorelines on Kaua'i retreated over 36 feet over the past century. Beaches on the north and east coasts of Kaua'i are experiencing the most erosion (76% and 78% of beaches, respectively). The majority of beaches are also eroding on the south and west coasts (63% and 64% of beaches, respectively). In addition to long-term or chronic erosion, Hawai'i beaches are also highly prone to erosion from seasonal high waves and storms.

The observed erosion trends can generally be explained by a combination of causes, including:

1. Human impacts to sand supply: In Hawai'i, human impacts that have notably contributed to erosion and/or beach loss include the practice of shoreline hardening (seawalls and revetments) to protect development built too close to the shoreline and sand mining.
2. Seasonal and storm waves and wave-driven currents that move sand, and
3. Sea-level rise forcing shoreline retreat.

Sea level has been rising globally and around the Hawaiian Islands over the last century or longer. Sea level has risen about 6 inches around Kaua'i over the past century. Rates of sea-level rise (SLR), globally and locally around Hawai'i, are expected to accelerate over this century. SLR leads to shoreline retreat through two processes: 1) by simply moving the water line up the coastal slope and 2) by increasing erosional effects of waves on the upper beach, dune, or cliff. Expected future increases in sea level will result in increases to historical erosion rates and will add pressure to already eroding beaches and beaches that were previously stable. Some predictions show that average erosion rates at Hawai'i beaches will double by the year 2050. Mapping of future shoreline position on Kaua'i under accelerated sea level rise scenarios is currently underway by researchers from the University of Hawai'i Coastal Geology Group.

Inland (Stream) Flooding

There are instances on Kaua'i of intense flooding associated with runoff, mudslides, bank failures, dam breaches, and erosion. Some have caused deaths and millions of dollars in property damages. The 2014 *Kaua'i Climate Change and Coastal Hazard Assessment* suggests that the primary challenge to mitigating

the hazard due to stream flooding is one of obtaining adequate warning in the case of flash floods and in improved planning of developments in areas of known flood history. The County of Kaua'i *Hazard Mitigation Plan* lists stream flooding events from the late 1800s through 2009.

Some future projections suggest that more frequent extreme rain events could lead to impacts from inland flooding including landslides and slope failure, coastal erosion, and runoff. In the future, the Intergovernmental Panel on Climate Change (IPCC) reports that climate changes in the Equatorial (Tropical) Pacific are expected to cause an increase in precipitation. However, Hawai'i falls at the northern edge of the tropic zone and may not experience the described trends. Historically, annual rainfall has decreased in Hawai'i and this is reflected in decreased groundwater discharge to streams. Also, all four major Hawaiian Islands have experienced more severe droughts since the 1950s. However, rainfall patterns in Hawai'i vary dramatically both temporally and spatially based on trade winds, topography, mid-latitude weather systems, storms and cyclones, the El Niño Southern Oscillation (ENSO) phases, and more. This natural variability along with future climate changes presents a challenge to predict future rainfall and runoff patterns.

Water supply faces threats both from rising groundwater and saltwater intrusion in wells, as well as decline in quality and quantity due to drought and downward trends in groundwater base flows. The water table rises as sea level rises, and it will eventually break the land surface creating and expanding wetlands, changing drainage patterns, saturating the soil, and causing increased flooding. This could cause problems with water supply infrastructure, including aquifer salinization and flooding of facilities. These will be costly to mitigate on an ongoing basis.

Wind

Strong winds throughout the Hawaiian Islands are associated with strong trade wind events, Kona storms, and tropical storms and hurricanes. Kaua'i in particular has a history of wind events associated hurricanes that have been exceptionally damaging, including Hurricanes Dot in August 1959, Iwa in November 1982, and Iniki in 199228. Hurricane Dot packed sustained winds of 75 mph with gusts of 165 mph as it passed directly over Kaua'i. While the storm-generated surf was not particularly damaging, the 2014 *Kaua'i Climate Change and Coastal Hazard Assessment* reports that winds and flooding led to $5.5-6 million in agricultural losses and hundreds of houses and trees were damaged. Hurricanes Iwa and Iniki both produced high waves ranging 20-30 ft. in addition to winds over 125 mph. Redevelopment in the same areas that were impacted by those events raises the risk of damage from future storms. The County of Kaua'i *Hazard Mitigation Plan* provides a table (Chapter 3, Table 3-2) of hurricane and strong wind events from the early 1900s through 2009. 9.2 Opportunities

The Hawaii State Planning Act (HRS Chapter 226) sets priority guidelines and requires that counties consider sea level rise in planning processes. In 2014, Hawaii adopted the Hawaii Climate Adaptation Initiative Act 83 (HRS §225P-3) to address the effects of climate change to protect the State's economy, health, environment, and way of life. The Act established an Interagency Climate Adaptation Committee (ICAC) comprised of key agency directors, legislators, and subject matter experts, of which Kaua'i County Planning Department is a part.

Addressing coastal hazards associated with climate change does not always require the adoption of brand new programs, ordinances, or statutes. Kaua'i County already has a broad regulatory and planning framework that can cover the four major hazard categories: (1) erosion; (2) wave inundation; (3) flooding; and (4) wind. The degree to which those hazards are addressed or factor in new scientific information such as SLR can be analyzed and adjusted. Opportunities for program adjustment include the Capital Improvement Program (CIP), CZO, Subdivision Ordinance, Special Management Area (SMA) Rules and

Regulations, Floodplain Management Ordinance, the building codes, and the Kaua'i Public Access, Open Space, and Natural Resources Preservation Fund.

Kaua'i has already begun working on planning for climate change. The Special Management Area permit process is a useful tool for coastal policies and design standards, but there are other ways by which vulnerable physical assets can be protected. The County's revised shoreline setback ordinance is an example of potential regulatory improvements. Ordinance 979 increased shoreline setbacks by 20 feet to account for episodic events, sea level rise, and other hazards.

The 2014 *Kaua'i Climate Change and Coastal Hazard Assessment* report includes six major recommendations, several of which speak to gathering more information and incorporating hazard planning into County policies and regulations. It offers recommendations for strengthening existing programs – including floodplain management, shoreline setback ordinance, the SMA process, environmental reviews, subdivision regulations, building codes, the Public Access Funds, and CIP. It recommends new programs such as tax incentives and transfer of development rights to help locate or relocate development outside of hazardous or sensitive areas. It recommends a comprehensive beach management strategy and financing plan for beach and dune maintenance.

The *Kaua'i Climate Change and Coastal Hazard Assessment* recommendations fall into six broad categories:

1. Support the development of improved climate related hazard planning information.
2. Conduct detailed coastal hazard, risk, and vulnerability assessments based on best available climate change science.
3. Include relevant background information and maps for climate change related coastal hazards in the General Plan.
4. Incorporate additional General Plan overarching goals/principles pertaining to planning for climate change related coastal hazards.
5. Use existing planning and regulatory programs to address climate change related coastal hazards.
6. Develop new programmatic strategies to address climate change related coastal hazards.

Section III of the *Kaua'i Climate Change and Coastal Hazards Assessment* identifies the gaps in planning information and guidance to adequately address climate change related hazards, protect health and safety of Hawai'i's communities, and protect coastal resources. This includes how accelerated SLR will affect erosion rates, how SLR and associated erosion will effect wave inundation, and how to address an Aleutian Island earthquake event and tsunami impacts. Therefore, the first recommendation of the *Kaua'i Climate Change and Coastal Hazards Assessment* is for the GP to acknowledge and support the generation of this information.

Fortunately, some of the above-mentioned research is underway at the University of Hawai'i and other research institutions.

To summarize, the major opportunities in Climate Change and Natural Hazards include:

- The State's Planning Act, HRS Chapter 226, and County's *Multi-Hazard Mitigation Plan* (2010) provide the framework for action; and, Kaua'i has already begun revising regulations, like the shoreline setback ordinance, to better protect its people, and natural and built environment.

- Kaua'i has the authority to implement change through its zoning code, subdivision regulations, SMA process, floodplain management, and building codes.
- Kaua'i can continue to use its CIP, Public Trust Funds, and other sources of money and financial incentives to prevent new construction near the shoreline or encourage construction elsewhere.
- The energies and political will of community watchdog groups can help further action to make Kaua'i more resilient.
- The continued generation of important planning information from research institutions, which can inform future Hazard, Risk, and Vulnerability Assessments.

The County is undertaking significant efforts to build Kaua'i's resilience against natural hazards. The *Multi-Hazard Mitigation Plan* for Kaua'i is currently being updated. The County of Kaua'i's Multi-Hazard Mitigation Plan was formally approved in December 2003 as one of the first county plans in the United States to receive approval in accordance with the Federal Disaster Mitigation Act of 2000, 44 CFR Part 201, Hazard Mitigation Planning, and was updated in 2010. The 2010 Multi-Hazard Mitigation Plan goals are to:

- Implement, refine, and revise the Multi-Hazard Mitigation Plan based on updates of the risk and vulnerability assessments.
- Engage in disaster public awareness activities that improve implementation of the plan, building on the network of the hazard mitigation community at local levels and throughout the State.
- Improve communications systems.
- Ensure that adequate shelter is available to all residents and visitors.
- Secure and maintain lifelines and access for medical assistance and transport of materials and fuel.
- Enhance and use the County's geographic information system (GIS) and data to improve planning, permitting, and building such that disaster risks are reduced.
- Harden essential and governmental facilities to maintain operations during a disaster and recovery operations.

The Multi-Hazard Mitigation Plan is being updated as this Issues and Opportunities Paper is being written. The 2015 draft update can be found at: http://www.hazards-climate-environment.org/Kaua'i

To summarize, the major issues in Hazard Preparedness and Climate Change Effects include:

- Natural hazards and their more frequent occurrences can be expected as a result of climate change and sea-level rise.
- Twenty percent of Kaua'i's residents live near the shoreline. Located on, or near, the shoreline are many of Kaua'i's critical heritage sites, natural resources, tourist facilities, and infrastructure.
- Climate change is an important public health and safety factor that needs to be considered when developing policies for the location and pattern of development.

In June of 2015, Mayor Bernard Carvalho signed an *Executive Order to Sustain the County of Kaua'i as a Disaster Resilient Community* through a comprehensive mitigation program against natural hazards. It calls for mitigation measures to be implemented that significantly reduce the vulnerabilities and risks associated with inland and coastal flooding, high winds and surf, drought, wildfires, tsunamis, and earthquakes. Fourteen measures are outlined to support hazard mitigation and resilience. These are summarized in the text box below.

Measures Identified in "*An Executive Order to Sustain Kaua'i County as Disaster Resilient Community*", Mayor Bernard Carvalho, June 19, 2015

1. Support and implementation of the Kauai County Hazard Mitigation and Resiliency Plan.

2. Countywide risk and vulnerability assessment, and assist communities to develop and implement community resiliency plans.

3. Partnerships with businesses to provide a public-private link for coordinated disaster mitigation, preparedness, response and recovery.

4. Support adoption of the latest version of the International Building Code (IBC) and relevant wind load and seismic provisions.

5. Address hazards and the risks they pose in county-level land-use decisions, including county-owned property development.

6. Maintain a county emergency response plan and develop a county post-disaster recovery and mitigation plan.

7. Compliance, participation, and improvement of current ratings in the National Flood Insurance Program, the Fire Suppression Rating System, the Building Code Effectiveness Grading

Schedule (BCEGS), and any other natural hazard-related rating or regulatory system.

8. Incorporate disaster protection into public and private lifelines, infrastructure and critical facilities.

9. Develop and support programs to increase the public's awareness of natural hazards and ways to reduce or prevent damage through a coordinated effort with multiple stakeholders.

10. Support incorporation of natural hazard awareness and reduction programs in school curricula.

11. Support mitigation training for planners, developers, architects, engineers and surveyors, and County personnel. Encourage participation of government, industry and professional organizations.

12. Identify existing incentives and disincentives for hazard loss reduction actions, and develop and implement new incentives and disincentives.

13. Support the requirement of continuing education of building officials and contractors.

14. Support consistency among projects, programs, and plans in the County that build resilience to the impacts of disasters and climate change, follow "no-regrets" approaches to risk reduction, and reduce risk for everyone, including the visitor populations, in the County.

The draft *County of Kaua'i Multi-Hazard Mitigation and Resilience Plan, 2015 Update* aims to focus efforts on longer term goals of resiliency that ensure that the County will be able to withstand hazards and recover quickly when they occur. The Plan seeks to align with existing County-level plans and initiatives to further its goals, including the Mayor's *Holo Holo 2020* initiative and the General Plan Update. One of its objectives, with two associated measures, specifically reference the General Plan Update:

Objective 2.5: Align the General Plan update process with disaster risk reduction measures.

> Measure: General Plan acknowledges hazard risks and identifies growth and development in areas of least harm or potential disaster impact.
>
> Measure: Review of General Plan for risk reduction relevant plans, policies and measures and incorporation of actions and recommendations.

Given the interest in aligning County-level plans and policies to support resilience, there is an opportunity for the General Plan Update to benefit from this recent work and incorporate relevant information and recommendations into its policies.

9.3 HOW THE 2000 GENERAL PLAN TREATED CLIMATE CHANGE AND NATURAL HAZARDS

The topic of Climate Change and Natural Hazards was not raised in the 2000 GP. The primary source of data for the GP update will come from the County of Kaua'i's *Multi-Hazard Mitigation Plan* and 2014 *Kaua'i Climate Change and Coastal Hazard Assessment.* The 2014 *Kaua'i Climate Change and Coastal Hazard Assessment* report includes specific recommendations and policies that will require CAC and community input.

9.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on climate change and hazard preparedness to be conducted by the GP Team includes:

1) Discuss the 2014 *Kaua'i Climate Change and Coastal Hazard Assessment* report with the CAC, and determine how best to incorporate the findings and recommendations into the GP Update. Identify the 2014 *Kaua'i Climate Change and Coastal Hazard Assessment* implications on land use, housing, economic development, infrastructure, and natural resources. Discuss with the County Agencies and others.
2) Certain hazards, including tsunami evacuation and inundation areas, will be mapped and included in the GP.
3) The General Plan will incorporate information from the 2015 update of the *County of Kaua'i Multi-Hazard Mitigation and Resilience Plan* in its discussions and policies related to natural hazards.
4) Once the planning information is available, the *Kaua'i Climate Change and Coastal Hazards Assessment* recommends the County conduct detailed Hazard, Risk, and Vulnerability Assessments incorporating sea level rise impacts, as an adaptation planning step for vulnerable planning areas. Such assessment(s) are outside the scope of the GP Update. It is recommended to include:
    a) A hazard assessment that identifies the extent, magnitude, and frequency of the hazard. Hazards to consider include: erosion (and accelerated erosion due to SLR as the models become available), wave inundation, flooding (including SLR inundation and groundwater penetration), tsunami inundation and wind;
    b) A risk and vulnerability assessment that identifies priority community assets' exposure to the hazard, sensitivity to exposure, and ability to cope/adaptive capacity. Such assets should include at a minimum: critical infrastructure, transportation systems, utilities, existing population centers, water supplies and future growth areas. Other community assets to consider include important agricultural lands, sensitive ecosystems, public access/ recreation areas, and cultural resources. This assessment could also identify potential pollutant sources at risk of inundation due to SLR, including waste disposal sites, ocean outfalls and wastewater treatment facilities, as well as aquifers and wells at risk of saltwater intrusion;
    c) Identifying priority planning areas where resources and planning efforts need to be focused and identify how and where to use adaptation strategies such as accommodation, retreat, and protection;
    d) Encouraging strategic retreat and relocation to safer areas based on the results of the assessments above;
    e) Identifying lands/areas that may serve as buffer from coastal hazards; "growth boundaries" may be used to restrict development from hazard-prone areas.

9.5 RESOURCES

Anderson, Tiffany R., Fletcher, Charles H., Barbee, Matthew M., Frazer, Neil, Romine, Bradley M. 2015. *Doubling of coastal erosion under rising sea level by mid-century in Hawai'i.* In: Natural Hazards volume 76. ISSN 0921-030X.

County of Kaua'i. 2010. *Multi-Hazard Mitigation Plan, 2010 Update*.

County of Kaua'i. 2015. *County of Kaua'i Multi-Hazard Mitigation and Resilience Plan – DRAFT Review and Comment.* http://www.hazards-climate-environment.org/Kaua'i

University of Hawaii Sea Grant College Program. June 2014. *Kaua'i Climate Change and Coastal Hazard Assessment*.

State of Hawai'i Department of Defense. August 2013. *State of Hawai'i Multi- Hazard Mitigation Plan 2013 Update*.

Hawai'i Sea Level Rise Vulnerability and Adaptation Report (2017) [in process]

Fletcher, C.H., Grossman, E.E., Richmond, B.M., Gibbs, A.E., 2002. *Atlas of Natural Hazards in the Hawaiian Coastal Zone. U.S. Geological Survey Geologic Investigations Series I-2761.*

Codiga, D. and Wager, K. 2011. *Sea-Level Rise and Coastal Land Use in Hawai'i: A Policy Tool Kit for State and Local Governments. Center for Island Climate Adaptation and Policy. Honolulu, HI.* Available at http://icap.seagrant.soest.hawaii.edu/icap-publications.

Hawai'i Coastal Zone Management Program. 2013. *Hawai'i Ocean Resources Management Plan.* http://files.hawaii.gov/dbedt/op/czm/ormp/ormp_update_reports/final_ormp_2013.pdf

Romine, Bradley M., Fletcher, Charles H., Barbee, Matthew M., Anderson, Tiffany R., Frazer, L. Neil. 2013. *Are Beach Erosion Rates and Sea-Level Rise Related in Hawai'i?* In: Global and Planetary Change 108 (2013) 149-157.

This page intentionally left blank.

10.0 INFRASTRUCTURE AND PUBLIC SERVICES

This Chapter discusses four types of Infrastructure needed for development: Water, Wastewater, Solid Waste and Drainage. Transportation and Energy are typically included under Infrastructure, but they have their own Chapters in this Issues and Opportunities paper.

The 2000 GP was well organized in its discussion of infrastructure and easy to follow. Where available, it provides a description of the existing system, new facilities needed (by 2020), status of long range plans, policies, and implementing actions. This is an excellent format to continue in the update of the GP.

This Chapter of the *Issues and Opportunities* Paper is organized differently than the others in this paper. It looks at the four categories of infrastructure and discusses what was in the 2000 General Plan, what was additional or updated information from the 2015 technical study on *General Plan Update Kaua'i Infrastructure Analysis (2015)* prepared by R.M. Towill.

All subject areas are treated together for Implications for the General Plan Update. This includes discussion on funding sources, including user fees as presented in another technical study, *Infrastructure & Public Facilities Needs Assessment Study* by Group 70 International (August 2014)

The biggest piece of information that is missing is disaggregation of infrastructure data on demand and capacity according to the six planning districts. Potential growth areas need to be justified by the ability of current systems to support buildout together with opportunities for the system to expand to allow for additional growth. The General Plan will need to provide information on the following questions:

- What is the existing capacity in each Planning District?
- What is the demand forecast by Planning District based on population growth scenarios?
- What are the gaps in infrastructure and how might they be filled?
- What are the approaches to prioritizing infrastructure dollars and/or raising new revenues?

10.1 DESCRIPTION OF INFRASTRUCTURE ON KAUA'I

Water

The 2000 General Plan describes that water is supplied by both public and private entities. There are thirteen service areas, each served by a single system or linked sub-systems. The Department of Water, a semi-autonomous agency, supplies water for domestic use and sells water to 300 agriculture users (who independently own and operate their water systems). Private water systems include one in Princeville and one at the Pacific Missile Firing Range.

As of 1999, the Department of Water maintained 52 separate groundwater sources (wells, shafts, and tunnels). It had 46 storage tanks with a capacity of 18.5 million gallons. There were 16 booster pump stations. Average demand was 10.6 MGD with maximum or peak demand of 15.9 MGD. Even at that time (2000) many systems operated at or near capacity and most needed to be expanded. Therefore DOW

placed operational restrictions on requests for new service. Payment of a "Facility Reserve Charge" by a developer would obligate DOW to reserve capacity. One meter is the equivalent of 500 GPD supply, the amount of water needed for a single family dwelling.

The amount of recharge to Kaua'i aquifers was 652 MGD. There was little threat of exceeding sustainable yields. No area was declared a Ground Water Management Area by the State Commission on Water Resource Management (CWRM). The Table below from the 2000 General Plan shows municipal water systems as of 1998.

STATUS OF KAUA'I MUNICIPAL WATER SYSTEMS AS OF 1998

Water System or Sub-System	Water Source Availability[1]	Water Storage Availability[1]	Current Restrictions[2]
Kekaha	*Near Capacity*	Adequate	Large Projects
Waimea	AT CAPACITY	Adequate	1 Meter per Lot
Hanapēpē	AT CAPACITY	Adequate	Large Projects
'Ele'ele	Adequate	Adequate	Large Projects
Kalāheo	Adequate	Adequate	----
Lāwai-'Ōma'o	Adequate	AT CAPACITY	2 Meters per Lot
Kōloa	Adequate	Adequate	----
Pō'ipū	Adequate	AT CAPACITY	2 Meters per Lot
Puhi	AT CAPACITY	Adequate	1 Meter per Lot
Līhu'e-Hanamā'ulu	AT CAPACITY	Adequate	3 Meters per Lot
Wailuā Homesteads	*Near Capacity*	Adequate	----
Upper Wailuā	*Near Capacity*	*Near Capacity*	2 Meters per Lot
Wailuā-Kapa'a Hmstds.	Adequate	Adequate	----
Anahola	AT CAPACITY	AT CAPACITY	No Meters Available
Moloaa	AT CAPACITY	AT CAPACITY	No Meters Available
Kīlauea, East	*Near Capacity*	AT CAPACITY	1 Meter per Lot
Kīlauea-Kalihiwai	*Near Capacity*	AT CAPACITY	5 Meters per Lot
'Anini	AT CAPACITY	AT CAPACITY	1 Meter per Lot
Hanalei	*Near Capacity*	Adequate	---
Wainiha-Hā'ena	*Near Capacity*	AT CAPACITY	3 Meters per Lot

Līhu'e is the sole area constrained by lack of new groundwater sources. Developers such as Grove Farm have been required to provide water source, transmission and storage as a condition of zoning. Use of surface water would require treatment plants. Expansion in the North Shore requires development of new sources, and improvements to transmission and storage. Princeville Corporation was planning such improvements as of 2000.

Water Use and Development Plans are prepared by Counties as part of the Hawaii Water Plan (required under HRS Chapter 174c). The DOW prepared their Use and Development Plan and it was adopted by CWRM. Water planning mandate is broad and it was speculated in the 2000 General Plan that the County would need funding from the State to complete all required plans. In 1999, a 20-year Master Plan was underway addressing existing and future needs, CIP, capital rehabilitation and a rate study.

Policies and actions for water in the 2000 General Plan focus on completing a long range plan and coordinating it with the GP policies. Compact development was to be given priority along with established agriculture communities.

The latest Water Plan is the Water Plan 2020 (2001) completed shortly after the 2000 GP. It projects to 2050. Currently the DOW has 20,500 customers, 13 service areas. The two private systems at Princeville and the Pacific Missile Range still exist.

Waiahi Water Company, a division of Grove Farms along with DOW developed the Kapaia Reservoir as a water source. In 2005 they opened a water purification plant that draws water through Hanamā'ulu Ditch into a treatment system. The capacity is 3.0 MGD and it serves 15,000 customers. DOW purchases some of this water. Potential upgrades to expand capacity by 60% would cost $8.13 Million, or $31.7 Million if they double capacity.

Princeville system provides 1.18 MGD for nearly 1700 residents. This system includes three wells, vertical turbine pumps bringing water to multiple concrete reinforced tanks. It is a gravity-fed distribution system. An additional well and 1.2 MGD will accommodate future demands.

Pacific Missile Range Facility is owned and operated by the US Navy. That system has 0.42 MGD and 185 service connections, all located on base. It serves 1200 people as well as fire protection.

Overall source and storage deficiencies (as of 2006) are provided in the Infrastructure study (see table on the following page).

OVERALL SOURCE AND STORAGE DEFICIENCIES (AS OF 2006)

Water System	Existing Source	Existing Storage Deficiency
Kekaha-Waimea	Yes (143 gpm)	Yes
Hanapēpē-'Ele'ele	No	No
Kalāheo	No	Yes
Lāwa'i-'Ōma'o	No	Yes
Koloa-Po'ipū	No	Yes
Puhi-Līhu'e-Hanamā'ulu	No	No
Wailuā-Kapa'a	No	Yes
Anahola	Yes (111 gpm)	No
Moloa'a	N/A (no DOW-owned	Yes
Kilauea-Waipake- Kalihiwai	Yes (93 gpm)	Yes
'Anini	N/A (no DOW-owned	N/A (no DOW-owned storage)
Hanalei	Yes	Yes
Wainiha-Hā'ena	Yes (67 gpm)	Yes

Source: *General Plan Update Kaua'i Infrastructure Analysis* (2015). RM Towill.

Other issues include the transmission lines. Of the nearly 400 miles, 237 miles were installed between 1921 and 1980. They need replacement due to age, deterioration, or inadequate size. The DOW CIP lists 46 projects totaling $148 Million; these are broken down by service area. The CIP is 21% for source development, 23% for storage, and 20% for transmission deficiencies. Capacity increases are assumed to be addressed as deficiencies are replaced.

Part of the gap in information is in regard to the CIP Phases 1 and 2 are already in the past, but what happened? The DOW states it will prepare the 2040 Water Plan after the Kaua'i General Plan is updated, so it is unlikely that updated information will be available for this GP update.

Wastewater

Kaua'i has two types of wastewater service: County sewer and Individual Wastewater Systems (IWS) such as cesspools and septic tank systems. Both are regulated by the State Department of Health. The 2000 General Plan noted there were no environmental threats due to waste disposal. Those systems that fail or experience problems use commercial pumping.

The municipal system has existing capacity, but it is already reserved. See the table on the next page.

STATUS OF MUNICIPAL WASTEWATER SYSTEMS ON KAUA'I

Waimea	Waimea	Was .3 MGD/ Now .7 MGD	R-1	At full capacity Does not serve Kekaha
'Ele'ele	Hanapēpē, 'Ele'ele, Port Allen	.8 MGD	R-2	At half capacity Needs to expand to Hanapepe
Līhu'e	Properties along Kapule Highway, Kūhiō Highway, Ahukini Rd and Rice St.	2.5 MGD	R-1	At half capacity Funding needed for collection and transmission systems
Wailuā	Kapa'a, Palaloa, Waipouli, Wailua	1.5 MGD	R-2	At half capacity Needs collection system

There were over 300 private sewer treatment plants, many at hotels and for master planned communities. Some complexes operate package treatment plants. All other areas have IWSs. Department of Health regulations now require septic tank systems and treatment for any project over fifty units. The trend has been for developers to solve their wastewater needs, and not rely on the municipal systems.

The 1993 *Water Quality Management Plan* discusses the need for regional systems in Koloa Town and in Poipu to avoid ocean pollution. The DPW had no plans for future plant expansion. The 2000 GP provided an assessment of wastewater needs, area by area. Pursuit of strategic opportunities and priorities is recommended until a more comprehensive plan is prepared

Policies focus on collection to safeguard the public health; re-use of effluent for irrigation, and using graywater. The plan calls for addressing use of unused capacity by preparing a long range wastewater policy plan which is to be updated every five years.

Much has changed from the 2000 General Plan. The details of those changes are well described in the 2015 *Kaua'i Infrastructure Analysis*. The major caveat to that statement is that, the facility service plans only go to either year 2020 or 2025, not 2035, which is the forecast year for the update General Plan.

The four municipal wastewater systems were all constructed in the 1970s. They consist of gravity flow pipelines, manholes, pump stations, force mains and the treatment plant.

- The Waimea WWTP was recently upgraded to R-1 Moving Bed Biofilm Reactor facility with a design capacity of .7 MGD. Due to the upgrade, there are no major equipment deficiencies. The next phase of improvements will upgrade the distribution system and expand the Kekaha sewer system.
- Eleele WWTP utilizes an activated sludge process for the .6 MGD daily flow (capacity is .8 MGD). Plans are to modify and expand the facility by year 2025. The expansion would allow daily treatment flow to 1.2 MGD. Deficiencies include lack of a backup power generator, lack of explosion proof conduits, and other power needs.

- Lihue WWTP near the airport is operating at half capacity. Deficiencies include the need to replace the gas chlorination system, bio-filter re-circulation pump, and the aeration system. In addition, the Haleko Pump Station should be replaced and sewer lines added for Ulu Mahi/Pua Loke, for Nāwiliwili/Kupolo, and for Kapaia.
- Wailua WWTP has a design flow of 1.5 MGD but actual capacity is 1.0 MGD. The head works facility does not work properly and needs replacement. The Rapid Bloc Activated Sludge system does not work and needs replacement. A new pump station is needed and the collection system should be extended.

The four municipal WWTP each have service plans to the year 2020 or 2025. These will need to be updated following the General Plan completion and taken to 2035. The Planning District aggregation needs to be matched with development assumptions for growth.

Upgrade and renovation costs have been estimated for short term, mid term, and long term. They include:

Waimea: $36.8 Million for long term

'Ele'ele: $15.2 Million to expand to 1.2 MGD; or $26.2 Million to expand to 5.37 MGD and include Hawaiian Homelands areas

Wailuā: Mid Term $15.2 Million to expand to 1.5 MGD; $14.5 Million to expand to 2.0 OR $26 Million to add a second plant.

Līhu'e: Short term $$22.3 Million to upgrade to R-1; Mid Term $7.6 Million to replace Haleko pump station; Long Term $35.6 Million

There are five privately owned WWTP plants. The WWTP in large master planned communities are operating properly with a combined total capacity of over 4 MGD, nearly equaling the municipal capacity. They use a variety of treatment methods and often use the effluent for golf course irrigation.

- The Puhi Sewer and Water Company is owned by Grove Farm and provides wastewater treatment to Kukui Grove, Puakea, and Puhi, It has a single treatment plant of 1.0 MGD.
- Pacific Missile Range Facility has two wastewater treatment plants.
- Kaua'i Beach Resorts has one wastewater treatment plant
- Princeville has one to service the hotel, shopping, golf course, and residences
- Po'ipū has one, built in 1981 and expanded in 2004. Its effluent is used to irrigate Kiahuna Golf Course and Koloa Landing Resort.

WASTEWATER TREATMENT PLANTS ON KAUA'I

Treatment Plant	Ownership	Design Capacity	Effluent Quality
Puhi	Grove Farm	1.0 mgd	R-1
Pacific Missile Range Facility (PMRF)	U.S. Navy	North end: 7,500 gpd South end: 10,000 gpd	Secondary
Kaua'i Beach Resort Assoc. (KBRA)	KBRA	0.1 mgd	Secondary
Princeville	Princeville	1.5 mgd	R-2
Po'ipū	HOH Utilities, LLC	0.8 mgd	R-1

There are over 5,000 IWS/cesspools on Kaua'i and it is estimated that 12% are failing. The ultimate goal is to eliminate IWS and create connections to treatment plants. Wailuā-Kapa'a is an area of serious concern: approximately 4300 residences have cesspools which are no longer allowed by DOH. The recommendation is to expand the Wailua WWTP to 2.0 MGD. Beyond that, a second WWTP will be needed.

IWS AREAS

Kupolo (Lihue)
Ulu Mahi (Lihue)
Pockets of Lihue
Hanapēpē Heights
Portions of Kekaha
Portions of Kapa'a near Wailuā
Ag and rural mauka of 'Ele'ele
Wailuā to Kapa'a

Drainage

The 2000 General Plan lacks a discussion of the drainage system and does not evaluate what facilities will be needed by the 2020 projection year.

Drainage policies are included, and these are related to policies on watershed protection and water quality. The County managed urban stormwater runoff through Drainage Standards applied to new developments by DPW. They also must deal with upland runoff from conservation and agriculture lands. Flood hazards are managed by the Flood Control Ordinance based on FEMA maps. While the 1984 General Plan and the CZO both require a Drainage Master Plan, none existed by 2000. Unwritten policy is to avoid concrete-lined channels.

Drainage problems were described in Wailua-Kapa'a, Nāwiliwili, and Po'ipū. DPW planned to focus on specific areas rather than prepare a Master Plan. Polices call for limiting development on steep slopes or shoreline land in flood hazard areas, to focus on most heavily impacted urban watersheds, to use BMP to control nonpoint source pollution, and to follow certain principles for drainage improvement. Implementing actions called for the Planning Department to revise the Subdivision Ordinance and CZO and for DPW to identify critical watersheds for Drainage Plans.

The R.M. Towill *General Plan Update Kaua'i Infrastructure Analysis* (2015) provides updated information on drainage since the 2000 General Plan. FEMA has revised the Kaua'i County Flood Insurance Study (FIS) to update base flood elevations, floodways, special flood hazard areas, and zone designations. Tsunami inundation was re-studied for the entire coastline. FEMA studies flooding sources in eight watersheds

Flooding problems were of three types: stream overflow, tsunami, and hurricanes. Stream overflow is generally caused by debris, flash flooding, stream patterns, or inadequate or altered drainage facilities. Specific problem areas include:

Hanalei River: overflow onto Kūhiō Highway
Anahola Stream: which becomes restricted by a natural sandbar
Kapa'a Stream: tsunami and flooding (none documented since Moikeha and Waikea Canals were built)
Wailua: channel capacity exceeded
Lihue: Flooding on Pū'ali and Nāwiliwili Streams due in part to sand buildup and debris accumulation
Koloa: low lying topography, debris and overgrowth of Waikomo Stream
Hanapēpē: Low lying areas behind the levees are prone to flooding
West Kaua'i: Flooding aggravated by sand plugs
Wainiha: low lying areas, high surf and flash floods

Waimea: levee system improved the town area, but the low lying areas experiences more damage when the flood gates caused over-flow to the interior areas.

Kaua'i has few flood control structures. Those that exist are mostly levees built by the Corps of Engineers in Hanapēpē, Waimea and Kapa'a. Reservoirs are used for irrigation. These provide storage capacity, but do little to protect against flooding downstream. There is still no Drainage Master Plan for the island.

The 2006 County Code defines standards and requirements for new development storm drainage infrastructure. Guidelines are to:

Protect and preserve existing natural channels
Protect from flood hazards
Remove water without causing harm to the environment, property, or persons
Reduce Pollutants and sediments
Maintain peak runoff rates and volume at no more than current rates
Protect wetlands

Solid Waste

The County provides direct service island-wide by collecting solid waste and operating reuse and disposal facilities. This is administered by the Road Construction and Maintenance Division of DPW.

Kekaha Landfill Phase II opened in 1993 after Phase I reached capacity and closed. It handles 67,000 tons of solid waste. There are refuse transfer stations in Hanalei, Kapa'a, Līhu'e, and Hanapēpē. There are six drop-off recycling centers and three green waste diversion sites, plus several Neighborhood recycling programs. Waste generation was expected to grow 50% by 2020. Kekaha Phase II extended its lifespan by increasing to sixty feet and again in 2005 to 85 feet. A new landfill site needed to be located and developed. New transfer station was needed in Kapa'a.

The 1994 *Integrated Solid Waste Management Plan* (ISWMP) fulfills state requirements. Updates are required every five years. The focus is upon source reduction and reuse through recycling, education and public information. There was an identified need for a proactive process for siting and designing sanitary landfills and facilities.

The ISWMP was updated in 2004 and its principle features are described below. It is the policy document for program, activities and facilities for waste disposal. It is supported by complementary plans for a Central Composting Facility, Subside Recycling report, and the Kaua'i Resource Recovery Park Feasibility Study. The County is conducting site studies for the Resource Recovery Park. They have identified the Resource Recovery Park as critical to waste management strategies, a one-stop service center. This could be co-located with a new landfill.

Overall objectives are to maximize recovery and minimize waste going into landfills. The current diversion rate is approximately 31%. County resolution has a diversion goal of 70% by 2013. The County has a multipronged approach:

- Recycling and waste disposal for residents (who represent 45% of waste generation)
- Non-residential waste is handled using private contractors.
- Kaua'i Resource Center and eight decentralized recycling bins are operated and maintained by private contractors under contract to the County
- Kekaha Municipal Solid Waste Landfill is operated by Waste Management, Inc. under contract to the County
- Curbside collection to 31, 297 accounts. Waste from residents goes to the transfer stations where it is compacted and then sent to the landfill. Collection transitioned to automated in 2010.

- Green waste at four transfer stations (in 2011, came to 18,740 tons)
- Special wastes (tires and batteries, asbestos, white goods, medical waste, cooking oils, dead animals, construction materials, in general these are collected and shipped to Oahu or the mainland for disposal.
- Hazardous waste (paints, solvents) annual collection day done by contract
- Electronics preference is manufacturer take back programs; but will collect.

After two vertical expansions, in 2010 Kaua'i Landfill constructed a lateral expansion (Cell #1). Cell 2 is in the permitting process. The current peak waste is 75,000 tons of solid waste per year. Both lateral and vertical expansion of the three cells is needed. Once capacity is reached, the landfill will start to be close and capped, estimated to be within 7-10 years. Consequently, the County is in site selection and environmental review for a new Kaua'i Landfill and Resource Recovery Park, ideally in Lihue due to its central location. Site location has been challenging and the EA/EIS is underway. Currently, the highest ranked site is along Maalo Road. Alternate disposal technologies are being studied, including bio-refinery, landfill gas to energy, waste to energy, and waste to fuel.

As a matter of policy, reduction and re-use are encouraged in all aspects of local life. Home composting, re-use programs, education, recyclable bags and packaging are all employed. As of FY 2011, the Kaua'i Recyclable drop-in bin gathered 1.640 tons and the private collector an addition 1,080 tons. Since 2005 the HI-5 bottling redemption centers have been in operation, in FY 2011 they collected 2730 tons. Based on results of a 2011 pilot program, the County intends to move to island-wide recycling collection once a Resource Recovery Facility is available.

The ISWMP uses higher population projections than the SMS projections for the 2035 General Plan. This should not create any problem. Waste generation is fairly constant at 6.7 pounds per day per person. When applied to the 2035 de facto population this comes to 58,049 tons per year residents and an additional 131,953 tons for commercial, a 17% increase over 2020.

The R.M. Towill *General Plan Update Kaua'i Infrastructure Analysis* (2015) recommends three policies and five implementing actions for the General Plan. These will all be considered.

10.2 ISSUES AND OPPORTUNITIES

There is ample data in the technical studies for the General Plan to work with for Solid Waste and for Wastewater, although the forecast years for both fall short of what is needed. Infrastructure has the full attention of the administration and Council which is helpful but also generates disagreements about philosophy and approach.

The data needed for Water is insufficient to do what is needed in the General Plan. Same for Drainage which has little data to use for General Plan purposes.

Financing estimates for improvements is inconsistent and difficult to aggregate as a result. A methodology to help inform priorities in implementing actions needs to be devised. A separate technical paper was prepared by Group 70 International to identify existing sources of revenue for infrastructure and to explore the opportunities for new sources to provide upgrades, new facilities, and improvements.

Federal sources:

Coastal Zone Management
Certified Local Government
Discretionary grants
USDA: Community Facilities Development Grant for rural communities
USDA Rural Development
EPA Clean Water Revolving Fund (for septic wastewater projects
EPA Nonpoint source Section 319
US Economic Development Administration

State sources:

Grants

County sources:

County General Funds and Bond Finance
Real Property Tax
User Fees
Impact Fees

The County has retained EPS to assist in identifying strategies to incentivize infill development. Rather than converting agricultural lands and open spaces to suburban housing developments, infill can address affordability issues and preserve the natural character of the island. Strategies include infrastructure financing programs, incentive zoning, use of public properties, and other methods. EPS will evaluate the "Return on Investment" for various initiatives, and will provide a training session for County staff and officials regarding best practices and recommendations for applying those in Kaua'i's unique circumstances.

10.3 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

For now, there are many questions about infrastructure that go beyond the ability of the GP to fill the gaps. SSFM will prepare for the County consideration a proposal for how to fill the most pressing gaps so as to provide the best informed policy debate and means for setting priorities of scarce funding. The basic block for this will be to disaggregate it by Planning District and match it up with the demographic forecasts.

Disaggregation by Planning District

How do the service areas line up with the district service boundaries?
For water, Are rural areas to be served by wells only?
For wastewater, Are septic systems the only system to be expected in rural areas?

Deficiencies in the major systems. How this compares to forecasted growth by district.

Can the Facility Reserve Charge adequately support needs of the water system?
Is it realistic to assume all developers can provide source, storage, and transmission of water, and if not, does this give unfair advantage to the large landowners?

What are the issues related to siting a new landfill now that Kekaha II is at capacity?

In addition, there is inconsistent information about the costs of various upgrades, replacements and new facilities among the four infrastructure areas. This will make it difficult to have a complete assessment of the cost of growth or adherence to environmental goals. A process for reconciling this will have to be developed.

Policies

Define a process for setting priorities in public infrastructure investments.
Should there be growth allocation policies according to how infrastructure can support it, or vice versa.
Should infrastructure priorities be given if a project provides housing or jobs?
Define the requirements for privately provided infrastructure.
Do concurrency policies discourage infill? Do they unwittingly incentivize greenfields over in-fill?

Funding for Infrastructure

The Infrastructure and Public Facilities Needs Assessment Report provides information pertinent to an impact fee approach. But that does not cover all the needs, nor does it cover all users. Funding needs to be discussed in parallel with the above issues on disaggregation, deficiencies, and policies.

10.4 RESOURCES

R.M. Towill. 2015. *General Plan Update Kauaʻi Infrastructure Analysis*County of Kauaʻi Department of Water. March 2001. *Water Plan 2020*.

Bernard P. Carvalho, Jr. August 2012. *Holo 2020: Growing Kauaʻi Responsibly.* Presentation at Waimea, Kalāheo, Līhuʻe and Kīlauea Neighborhood Centers.

Hawai'i Institute for Public Affairs. June 2014. *Report on the State of Physical Infrastructure in Hawai'i Phase II: Final Report to the Economic Development Administration, U.S. Department of Commerce.*

Kauaʻi County Planning Department, Kauaʻi County CIP Manager. 2013. *County of Kauaʻi Six-Year Capital Improvements Program FY 2014/15 – 2019/20 Final Report.*

State of Hawai'i Department of Health, Office of Solid Waste Management. July 2000. *Integrated Solid Waste Management.*

State of Hawai'i, Department of Land and Natural Resources. Commission on Water Resource Management. February 1990. *Kauaʻi Water Use and Development Plan*.

State of Hawai'i, Office of Planning. 2010*. Hawai'i Statewide Comprehensive Economic Development Strategy (CEDS).*

\\Sanfilehnl02\proj\2014\2014_042.000 COK Kauaʻi General Plan Update\H Reports\00 REFERENCES\Water\Water Use & Dev Plan Update AUG2014-FINAL.pdf

This page intentionally left blank.

11.0 MULTIMODAL LAND TRANSPORTATION

11.1 DEFINING THE ISSUES

Kaua'i is at a crossroads for its future transportation. Traffic congestion is one of the community's most frequently expressed concerns, and it impacts nearly everyone on the island. The County has undertaken planning efforts and identified projects to reduce the demand pressure on the island's roadways, however, the reality is that the list of potential projects far exceeds the potential sources of funding. The island has had to make tough choices that sometimes result in a scaling back of projects that support multimodal transportation. These planning efforts and challenges are further elaborated upon in this section.

Building on the vision found in the 2000 GP and with the adoption of the *Kaua'i Multimodal Land Transportation Plan* (MLTP) in 2012, all land modes are in consideration – motor vehicle travel, transit, bicycle, and pedestrian. The multimodal plan reviews existing conditions and trends and examines forecasts and future scenarios. It also discusses how land use relates to transportation.

Quoting from the 2000 General Plan, the concept even then was for:

> "Multi Modal Options. Safe bicycle and pedestrian routes have been provided. State and county agencies have adopted 'flexible highway design,' in order to enhance scenic and historic qualities and to strike a balance flow of automobile traffic and safe facilities for buses, bicycles and pedestrians. Increased public parking and pedestrian friendly improvements to sidewalks and streets have been implemented in Līhu'e and Kaua'i's other historic small towns."

This simple but profound concept (having walkable and bike-able compact communities; helping historic towns retain their small friendly character) remains valid and was incorporated into the work of both the Līhu'e and South Kaua'i Community Plans which were updated and adopted in 2015.

The MLTP has eight goals for 2020 and 2035, along with over forty objectives. They address balance, flexibility, choice in the system along with good design, improvements to public health, less dependence on imported petroleum for fuel, and keeping the system in good repair. But the most ambitious are embedded in the "preferred scenario assumptions":

Preferred Scenario Mode Shares (from MLTP)

	2010	2020	2030
Single occupant	54.4%	49.2%	39.4%
Multiple occupant	38.7%	38.3%	37.9%
Transit	0.4%	1.3%	3.6%
Walk	4.5%	7.6%	11.5%
Bicycle	2.0%	3.6%	7.6%

- Total island-wide VMT will remain at 2010 levels
- Fatality rates from vehicle collision reduced by 10% by 2020 and 15% by 2035
- Increase physical activity levels by 14% by 2020 and 31% by 2035.

This translates to VMT at 771.5 thousand vehicle miles travelled through 2035, despite population increases. This is proposed to be accomplished through "mode shift", or shifting some trips from single occupancy vehicle to transit, bicycle and pedestrian trips. Statistics for the last several years show that county-wide VMT increasing between 2011 and 2013, but then decreasing substantially from 2013 to 2014. This trend is mirrored at the State level. Several factors that may contribute to continued decrease or stabilization of VMT include several bicycle and pedestrian infrastructure projects in design and construction, recent approval of the South Kaua'i and Līhu'e Community Plans, both of which encourage compact walkable neighborhoods). Nonetheless, it is clear that realizing the long-term goals of the plan will require significant infrastructure investment and changes to growth patterns supported by land use policies.

The Federal-Aid Highways 2035 Transportation Plan for the District of Kaua'i (LRTP) was completed by the State Department of Transportation Highways Division in July 2014. The LRTP takes a different approach than the MLTP. Rather than considering mode shift, the plan assumes that current mode split will remain constant through 2035, so that VMT will grow proportionally with population. The results of this approach are numerous capacity projects to address existing and projected future congestion. One problem with this approach is that demand for additional lane miles far exceeds anticipated financial resources to pay for construction and long-term maintenance of an expanded roadway system. Based on historical funding and projected cost estimates, the LRTP proposes $3.1 billion in projects but anticipates only $630 million in funding over the life of the plan. Given that the list of potential transportation projects far exceeds potential funding, it is critical that Kaua'i establish priorities and make smart transportation investments. The LRTP makes it clear that while new roadway projects may be part of the future, it will not be feasible to build our way out of future growth and congestion. Based on similar findings and limited funding nationwide, it is both a national and state trend to shift the focus of transportation projects to congestion reduction and system preservation instead of major capacity projects.

The MLTP is a policy-level document. While there are specific implementation steps, it does not identify specific infrastructure projects. At this time, it is not known what specific set of investments would create what amount of mode shift over what period of time. The Transportation Agency has been tasked with identifying a program for advancing its operations in a logical and cost effective manner.

Cost Estimates by Funding Program for Kaua'i Projects (from LRTP)

System Preservation	$315 Million
Safety	$595 Million
Capacity (non-constrained)	$2.1 Billion
Congestion	$57 Million
Other	$10 Million
TOTAL	$3.1 Billion

Kaua'i adopted a Complete Streets ordinance in 2010. Since then, the first complete streets project was constructed on Hardy Street. It adds sidewalks, bike lanes, landscaping, and an urban roundabout in the heart of Līhu'e. Additional complete streets projects and Safe Routes to School projects are advancing.

Kaua'i Bus is operated by the County Transportation Agency. It is funded in part by the Federal Transit Agency (for capital expenditures such as vehicles and maintenance facility), from $2.00 fares (14% fare box recovery), and from County subsidy (64% of total cost). There are eight fixed-route lines plus paratransit service. Mainline routes provide regional trips while shuttles provide localized trips. In 2012, there were 2,500 daily riders (75,000 monthly). The fleet was 43 buses, all wheelchair accessible and with bicycle racks. The total budget in 2012 was $7.4 million.

The county has been regularly installing passenger amenities such as bus shelters at stops, adding wi-fi, transit tracker and information, increased frequencies and hours of service, park and ride lots and purchasing larger buses.

Separate from the Kaua'i Bus, the Office of Economic Development initiated a pilot North Shore shuttle project connecting from Princeville to Kē'ē Beach, with the intent of reducing traffic and parking demand, especially in the vicinity of Hā'ena State Park. The pilot began in 2014 and ended in 2015. While the pilot was focused on visitors, nearly half of the riders were local residents. The Po'ipū Beach Resort Association also initiated a pilot shuttle in Po'ipū, funded entirely by resort association members. Both pilots were ended due to a lack of long-term funding streams. The County has initiated a study of north shore/south shore/east side shuttle and transit services to determine a long-term, sustainable approach to expand transit service with local circulators. The traffic along the highway throughout Kapa'a is one of the community's biggest concerns. The 2000 GP included assumptions regarding the permanent relief route that are no longer valid. The Kapa'a Transportation Solutions study is intended to provide relief to the traffic congestion. The sources of funding and operations system are not yet known.

11.2 OPPORTUNITIES

Set priorities. The County of Kaua'i has a clearer focus than other municipalities for what it wants to accomplish, for example for bike facility projects and certain roadway improvements that support land use goals and smart growth principles such as complete streets. When discretionary Federal funds come available (such as Tiger Grants) or Federal funds released from other projects, then Kaua'i can act quickly to put together their applications with supporting materials. The County is also well-positioned to incorporate multi-modal facilities into traditional roadway resurfacing and reconstruction projects funded with both County and Federal funds.

Transit studies in progress (The North Shore/South Shore Transit Feasibility Study and a Short-Range Transit Plan) provide ongoing analysis, review and potential justification for setting priorities, and for preparing requisite transportation and environmental impact documents that are part of project delivery. Both the Līhu'e and South Kaua'i Community Plans include lists of bicycle, pedestrian, and transit improvements that meet the aims of each Planning District and support walkable towns and neighborhoods. These can be implemented individually or in groups.

New funding sources. The County has a window of opportunity to raise funds from the general excise tax for funding transportation projects. This relatively unrestricted source was made possible by the 2015 State Legislature when it extended the GET surtax for Honolulu's rail system with a provision that re-opened the opportunity for other counties to also use the GET surtax. The window is short, and must be enacted by ordinance before June 2016.

The LRTP also lists a dozen other new sources of revenue for the County (or State) to consider for transportation projects. Any tax is a battle, but if the County is to realize any of its ambitious goals for mode shift, then it is likely that one or more must be seriously considered.

The 2014 *(Draft) Infrastructure & Public Facilities Needs Assessment Study* prepared as a technical study for the General Plan calculates daily trip generation using ITS Land Use definitions and trip factors. The bottom line conclusion from that study is that there will continue to be increases in volumes with resulting increases in congestion. The study suggests that impact fees could be collected for multimodal facilities as shown in the table on the next page.

Project	Total Estimated Construction Cost	Impact Fee Eligible
Līhu'e Civic Center Site Improvements*	$20,150,000	Yes
Lima Ola Workforce Housing Development – Offsite Infrastructure*	$3,766,000	Yes
Puhi Road Resurfacing	$1,217,000	Maybe
Kawaihau Road Safety Improvements	$5,000,000	Yes
Pu'u Road Safety Improvements	$400,000	Maybe
Kanaele Road Repairs	$2,500,000	Maybe
'Ōpaeka'a Bridge	$6,000,000	Maybe
Pu'u'opae Bridge	$5,000,000	Maybe
Hanapēpē Road Resurfacing*	$2,500,000	Yes
Kōloa Guard Rails	$1,070,000	Maybe
Kapahi Bridge	$5,600,000	Maybe
Līhu'e-Hanamā'ulu Mauka Bypass Road	$40,000,000	Yes
'Anini Bridge Replacement	$1,500,000	Maybe
Northerly Leg Western Bypass Road	$19,550,000	Yes
Bus Stop Improvements*	$1,200,000	Yes
Pouli Road*	$6,000,000	Yes
Kīlauea Town Bypass Road*	$6,000,000	Yes
Total	**$131,953,000**	**$104,166,000****

Source: Kaua'i County Six-Year Capital Improvements Program (CIP), FY 2013/14 – 2018/19
*The County indicated these projects are not yet in the CIP, but will be added in the future.
**Total does not include projects listed as "Maybe"

11.3 HOW THE 2000 GENERAL PLAN TREATED MULTIMODAL LAND TRANSPORTATION

Transportation discussions in the 2000 GP were based on the high end projections; that is, they assumed a 74,300 resident population (by 2020) and a daily visitor census of 28,000. These numbers are not that far off from the numbers now being projected for 2035 in the GP update underway. Thus, whether one is speaking of vehicle trips or person trips, the demand is in a range of about 10-15% of what it was fifteen years ago. What has changed is how one considers those trips. In particular, what is needed for longer trips to be taken in buses, and for shorter trips to be taken on foot or by bicycle.

Highways and Roads, Bus Transit, and Bikeways were handled under "Building Public Facilities and Services." There was no discussion of the Walk Mode. This, in itself is a significant change to current

thinking which focuses on compact, walkable communities and a conscious shift in mode to non-vehicular alternatives.

Highways were described as two-lane roads connecting major developed areas. Kaumuali'i Highway (Route 50) runs south and west, while Kūhiō Highway runs north to east; Līhu'e is the hub where these connect. Kūhiō, Kaumuali'i, and Kapule Highways (built as a Līhu'e Bypass) were congested especially at peak times, and the State Department of Transportation was trending towards 4 lane divided highways or three lane sections. A temporary bypass mauka of Kūhiō Highway was built in 1995 using private cane haul roads.

Road conditions were described as level D, E, or F for average daily traffic. Poor conditions in Kapa'a Town and in parts of Līhu'e were noted. Calls for curing deficiencies included widening Kaumuali'i from Līhu'e to Maluhia and a permanent Kapa'a Bypass. The twenty year list of capacity improvements exceeded $300 Million.

Bus transit at the time included six routes (there are now eight) and a paratransit system from Hanalei to Kekaha. This involved 30 buses (versus current 43) averaging 18,120 riders per month (there has been a four-fold increase). The transit policy was to increase ridership and expand service **subject to the availability of funds** (emphasis added).

The Bike section describes having 3.8 miles consisting of bikeways along Kapule Highway in Līhu'e and a bike path along the coast fronting Kapa'a Beach Park. The State Bike Plan (1994) proposed another 173 miles of bikeways island-wide, about two-thirds to be completed by the State and the balance by the County. Total costs were projected at $40 million. The bicycle policy was to support development of a bikeway system to provide an alternative means of transportation, recreation, and visitor activities. A check of the current system shows little has changed (unfortunately).

11.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROECESS

Work on transportation to be conducted by the GP Team includes:

1) Update current use data on bicycles and vehicles.
2) Incorporate the policies from the MLTP into the appropriate section(s) of the updated General Plan.
3) Incorporate data from studies currently in progress that calculate the amount of tax that would be derived from a GET surcharge and provide policy guidance for types of projects to receive priority for this new source of revenue for transportation.
4) Review tracking results for the goals of the MLTP. Identify and add discussions for what would it take to achieve them. Determine how these goals support (or not) other goals in the General Plan. For example, how do the walk and bicycle goals fit with the land use and compact community goals; and also, how do mobility goals fit with tourism goals.
5) Meet with the Kaua'i Transportation Agency to determine what was completed from the immediate (1-3 years) implementation phase of the MLTP as well as the likelihood for those in the mid-Range (through 2020), or any re-direction identified.
6) Update the latest measures for VMT and mode share. Engage Jim Charlier, transportation subconsultant and author of the MLTP, in a discussion on recommendations for how to handle policy coordination and eliminating discrepancies in the General Plan transportation policies.
7) Review the Land Use Program recommendations in the MLTP to identify how the General Plan policies can support and complement them and therefore help to guide future Community Plans, including transportation components that should be included in future Community Plans.

8) Identify future plans/studies that should be completed, such as an islandwide bicycle/pedestrian plan.
9) With limited funding for transportation projects, identify the need to establish transportation priorities based on goals.

11.5 RESOURCES

County of Kaua'i. September 2012. *Kaua'i Multimodal Land Transportation Plan*.

Get Fit Kaua'i Built Environment Task Force and County of Kaua'i. 2014. *Complete Streets Indicators*.

Smart Growth America, National Complete Streets Coalition. February 2015. *The Best Complete Streets Policies of 2014*.

State of Hawai'i Department of Transportation. 2003. *Bike Plan Hawai'i*.

State of Hawai'i Department of Transportation Harbors Division. September 2001. *Kaua'i Commercial Harbors 2025 Master Plan*.

State of Hawai'i Department of Transportation Highways Division. May 2013. *Statewide Pedestrian Master Plan*.

County of Kaua'i. 2015. *Līhu'e Community Plan*.

Group 70 International. 2014. (Draft) *Infrastructure & Public Facilities Needs Assessment Study*

12.0 ENERGY

12.1 DEFINING THE ISSUES

In 2013, Kaua'i's residents and businesses spent $92 million on imported oil, accounting for 85% of Kaua'i's electricity use. The high cost of energy negatively impacts average household budgets, and contributes to the high cost of living on Kaua'i. Use of imported fossil fuels for energy results in an outflow of money from the local economy. Furthermore, the burning of fossil fuels degrades air quality and contributes to environmental and social problems on a global scale.

The majority of Kaua'i's electricity is generated at the diesel-fired power plant located at Port Allen. As reported in 2013, 15% of Kaua'i's electricity comes from renewable resources (primarily hydropower and solar resources). Renewables continue to demonstrate increasingly better financial and environmental returns, and their use is growing rapidly.

Kaua'i Island Utility Cooperative Board of Directors adopted an ambitious goal to use renewable resources to generate at least 50% of Kaua'i's energy by 2023. This goal exceeds the requirements established by Act 234, the 2007 law establishing the framework to reduce greenhouse gas emissions emitted in 2020 to the 1990 emission level. It also surpasses the requirements set by Act 73 in 2010, the Hawai'i Clean Energy Initiative, which calls for 70% clean energy by 2030, with 40% of that amount coming from renewable sources and the remaining 30 percent from energy efficiency improvements. KIUC is making rapid progress toward its goal, with renewables accounting for 15% of sales today, up from 5% in 2008. By 2015, renewable generation is projected to be at 42%, with a mix that includes solar, biomass and hydropower (KIUC *2013-2015 Strategic Plan*).

Kaua'i has several projects that have been identified as "Hawaii's Clean Energy Leaders" by the Department of Business, Economic Development and Tourism's State Energy Office (last updated in 2012). These projects include:

- Green Energy Agricultural Biomass-to-Energy Facility / Green Energy Team, LLC (Biomass) Locally grown eucalyptus, albizia, and other agricultural waste will be used as biomass fuel to generate enough renewable electricity to power 8,500 Kaua'i households. 6.7 MW
- Port Allen Solar Facility / A&B, McBryde, KIUC (Photovoltaic) This PV array is built on 20 acres of industrial land adjacent to KIUC's Port Allen Station Power Plant. The facility is integrated into a planned battery storage system installed by KIUC. Partners include Hoku Solar and Helix Electric. 6 MW
- Po'ipū Solar / AES, KIUC, Knudsen Trust (Photovoltaic) This PV array to be built on Knudsen Trust Land will power 800 homes on Kaua'i. The facility will be connected to a battery storage system at the point of interconnection to the KIUC grid. 3 MW
- Anahola Solar / Homestead Community Development Corporation, REC Solar, KIUC (Photovoltaic) Developed by REC Solar, the project was undertaken by the Homestead

Community Development Corporation in partnership with KIUC on 53 acres of land owned by the Department of Hawaiian Home Lands. 12 MW

- Kālepa Water Project / KIUC (Hydroelectric) A dual purpose irrigation and hydroelectric project with a capacity of 4.0 MW and an estimated annual production of 15.2 GWh. The proposed project would utilize water from the existing Wailuā Reservoir and the South Fork Wailuā River. 4 MW
- Puu Opae Water Project / KIUC (Hydroelectric) A dual purpose irrigation and hydroelectric project with a capacity of 8.3 MW and an estimated annual production of 40 GWh. The proposed project would utilize water from the existing Kokee Ditch Irrigation System, provide irrigation water for DHHL lands and ADC lands, and integrate with existing irrigation users. 8.3 MW
- Hanalei River Hydroelectric Project / KIUC (Hydroelectric) A small run-of-river hydroelectric project with a capacity of 3.0 MW and an estimated annual production of 14.5 GWh. The proposed project would involve diverting water from the Hanalei River to a new powerhouse located about 3.5 miles upstream of the Hanalei Bridge. 3 MW
- Puu Lua Hydropower Project /Pacific Light & Power, Konohiki Hydro Power (Hydroelectric) The Kokee Ditch will serve as the source for a modern, efficient pressurized irrigation system that will service over 6,000 acres of agricultural lands. Power generated at the Upper and Lower Puu Lua hydro plants will be sold to the Kekaha Agricultural Association and its members, with excess made available to the island of Kaua'i. 5.3 MW
- Kekaha Menehune Water Project /KIUC (Hydroelectric) A dual purpose irrigation and hydroelectric project with a capacity of 1.5 MW and an estimated annual production of 6.5 GWh. The proposed project would utilize water from the existing Kekaha Ditch Irrigation System for generation and to provide water and repairs for the Menehune Ditch. 1.5 MW
- Anahola Water Project / KIUC (Hydroelectric) A dual purpose irrigation and hydro project with a capacity of 300 kWh and an estimated annual production of 1.25 GWh. The proposed project would utilize the existing Upper Anahola Diversion and a rehabilitated reservoir, and provide irrigation water for DHHL lands in Anahola. 300 kW
- Olokele River Hydroelectric Project /Gay & Robinson, KIUC (Hydroelectric) The proposed Olokele River Hydropower Project will have a 6 MW capacity. 6 MW

Energy use and supply are linked to strategies and policies for land uses, development, building sizes, architectural design, transportation planning, environmental protection, air quality and economic development. Land use and permitting implications for particular renewables are as follows:

- Solar-electric: Building code regulations govern the location of panels on buildings and on the ground; ability to connect into the electrical grid and compensation for electricity generated. Smart grid technologies, including new meters that can be read and adjusted remotely, help KIUC manage and monitor its grid more efficiently. The intelligent grid and improved connections between energy generators and users.
- Wind: Land use codes govern the installation of wind turbines. While wind resources are plentiful and wind developers have explored opportunities on the island, their development is limited due to the risk of impacts to endangered and threatened species. The risk of violations under the Endangered Species Act have outweighed wind energy's potential returns on Kaua'i. Kaua'i has a high number of protected seabirds that are sensitive to lights and collisions with above ground structures. There has also been community opposition to noise and visual impacts associated with wind. Consequently, KIUC's and the *Kaua'i Energy Sustainability Plan's* stated position is that wind energy is not viable for Kaua'i at this time.

- Hydropower: On the west side are the two projects that are most viable for future KIUC hydro development. Both are on state land, with one using water from the Kōke'e Ditch and Pu'u Opae Reservoir, and the second using water from the Kekaha Ditch. A 4-megawatt project on the Wailuā River is also feasible technically and financially. While hydro energy is capital intensive, it is the lowest cost of power – 25 percent cheaper than solar/PV and about 30 percent cheaper all in than the cost of fossil fuel generation. Hydro energy requires Federal approvals to minimize and mitigate potential aesthetic impacts, cultural impacts and interests pertaining to maintaining waterways for agricultural, fishing, hunting, recreational, and tourism purposes.
- Pumped storage: Pumped storage is essentially a huge battery that stores water instead of electrons. It can use solar power to inexpensively pump water uphill to a storage pond during the day, then reuse the same water at night to turn a turbine and create electricity. KIUC is in discussions with the state Department of Land and Natural Resources (DLNR), the state Agribusiness Development Corporation (ADC) and the Department of Hawaiian Home Lands, which manage the two areas under consideration for pumped storage projects on the west side.
- Ocean energy: Ocean energy projects would be initiated by the State, and would require NEPA and SMA permits, at minimum.
- Biomass: Plants require sufficient quantities of land which are zoned or used for agricultural purposes and have water. The biomass-to-energy facility near Kōloa is fueled by biomass from several sources, including short-rotation trees grown on about 2,000 acres and cleared invasive tree species.
- Landfill Biogas: The County has allocated funds in its FY 2016 budget for construction of a biogas collection system at the Kekaha Landfill. Assuming the captured methane meets quality and quantity benchmarks, the next phase will be to construct a system to refine the methane into Compressed Natural Gas (CNG) that can be used to power Kaua'i County's public bus fleet. Previously completed studies have indicated that selling the gas to the Pacific Missile Range Facility for cogeneration could be economically viable for both the County and the Navy. Another possibility is power generation from the methane and selling the power to KIUC.

As Kaua'i's population expands to 82,000 people by 2035, so will its energy needs and the infrastructure to meet those needs. According to the *Kaua'i Energy Sustainability Plan,* KIUC is projecting a 2.3% annual increase in energy requirements, rising from 515 GWh of generation in 2009 to 789 GWh in 2028. These increases respond to projected increased demand. They also take into account technological and efficiency advantages gained from installing new equipment and systems.

The *Kaua'i Energy Sustainability Plan* recognizes the need to develop energy infrastructure while protecting natural scenery, wildlife, and habitats of endangered species. There is a need to in turn balance these divergent needs with fiscal constraints. The KESP recommended a 2% tax levy on gasoline and diesel from imported oil to build the proposed "Alternative Ground Transportation Modes & Fuels Fund". The KESP suggested that such a levy could fund:

- An improved public bus system.
- Incentives for efficient Hybrid Electric Vehicles (HEVs) that could cost Kaua`i citizens 40% less to operate than conventional internal combustion vehicles.
- A rental vehicle program for the visitor industry which would take rented vehicles off the road while improving the Aloha Spirit shared with visitors.
- Inexpensive conversion kits that would turn conventional gasoline engines into Flex Fuel engines capable of using either gasoline or ethanol to support local ethanol production.
- Purchase of vegetable oil presses that would allow local small farmers to produce Straight Vegetable Oil (SVO) for off-road vehicles, and potentially public buses.

- Incentives for efficient Plug-in Hybrid Electric Vehicles (PHEVs), residential chargers, and KIUC Smart Grid enhancements to enable night-time charging of the vehicles with a 220-Volt charger at people's homes.
- A 5% fee for the administration of the "Alternative Ground Transportation Modes & Fuels Fund", community outreach and education activities.

Technology advancements have been lowering the cost of renewables and increasing their viability. Individual households and businesses can now afford and utilize certain systems that were previously out of reach, such as photovoltaics. Larger energy producers and distributers are already adapting their business models to accommodate changes. Changes to land uses and zoning can reduce energy consumption. The 2010 KESP suggested reducing the miles traveled between work and home with smart growth policies. A survey conducted for the 2010 KESP reveals that 76.5% of people surveyed support "smart growth or sustainable communities policies" as a means toward reducing energy consumption.

The *Hawai'i Clean Energy Initiative 2011 Roadmap,* led by the State Energy Office and U.S. Department of Energy (with input from Counties, utilities, and private sector stakeholders), calls for Kaua'i to:

- Introduce multiple biomass facilities for electricity and biofuels production;
- Develop 15 MW of new hydroelectric generation;
- Develop a 10 to 15 MW solar thermal facility;
- Generate 1.5-3 MW from the Kaua'i County landfill gas system; and, generate approximately 350 KW of solar power. The Kaua'i Island Utility Cooperative reported that in 2013 renewable energy projects combined generated a total of 13.3 MW.

Households and businesses have a role by conserving energy.

To summarize, the major issues in Energy include:

- Kaua'i remains overly dependent on fossil fuels that are expensive and pollute the environment.
- Viable renewable energy is available in many forms, and there are plans and targets in place to support its expansion. Continued investment in a diverse renewable energy portfolio and energy efficiency measures will be necessary to switch over from fossil fuels.
- The need for expanded energy infrastructure will need to be balanced with protecting natural scenery, wildlife, and habitats of endangered species, as well as fiscal constraints.
- Diverse, integrated alternate solutions are preferable to single purpose projects or activities.

The isolation of Kaua'i and its dependence on imported oil was never more apparent as the global economic recession took hold in late 2007. This dependence exposed Kaua'i Island Utility Cooperative and its members to a record surge in the price of oil at the same time the economic free-fall battered the budgets of island businesses and families. (Source: Kaua'i Island Utility Cooperative. 2013-2015 Strategic Plan.)

12.2 OPPORTUNITIES

The Energy Plan Advisory Committee, or EPAC, is a group of government and community members convened by the County Office of Economic Development who have guided the development of the *2010-2030 Kaua'i Energy Sustainability Plan* (KESP). The EPAC consists of participants from Kaua'i County, Kaua'i Island Utility Cooperative, representatives of several community organizations as well as individual community members. The purpose of the KESP is to ensure maximum energy efficiency and conservation

while facilitating Kaua'i's production and use of local, sustainable energy resources in place of imported oil by the year 2030. The document includes specific goals, actions and timelines for implementation.

The focus of County energy policy moving forward would be to encourage and support projects that offer integrated solutions and ancillary benefits. The KIUC west side water projects exemplify an integrated project development approach that both returns water the natural environment and generates water for energy and agriculture production. KIUC is in a position to add value to the existing water system by integrating a pumped storage hydro project. This project could help provide revenues needed to more efficiently manage water resources; and manage competing needs by eliminating waste. At the same time, the project would provide major benefits to all Island residents in the form of more affordable clean energy.

To summarize, the major opportunities in Clean Energy Transformation include:

The Energy Plan Advisory Committee in collaboration with KIUC has set ambitious goals and is making headway toward achieving these goals.

12.3 HOW THE 2000 GENERAL PLAN TREATED ENERGY

- The Energy section of the GP will require significant updating from what it was in the 2000 GP. KIUC and the State Energy Office have readily available data that will allow the GP to be updated.
- The 2000 GP primarily documented the status of Kaua'i's electrical system and the degree to which the system satisfies the Planning Districts. The 2000 GP recognized that renewables and a new "Service Center" could decentralize the existing system. The 2000 GP text did not discuss the variety of renewable energy sources or how wind, solar, ocean, hydro, etc. might be used to supplement or replace fossil fuels.
- The 2000 GP recommended that the County work with the electric power public utility companies to (a) site and design power generation plants and transmission facilities to blend with the natural landscape and to avoid impacts to important historic sites and viewplanes. Solutions, include constructing underground facilities when economically feasible, and (b) develop a proactive process for siting and designing power generation plants and transmission lines that incorporates early and detailed consultation and negotiation among the utility, the County government, community stakeholders, and the general public.
- Policies are recommended to promote renewable energies, but targets for energy production are not specified.

12.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROECESS

Work on energy to be conducted by the GP Team includes:

1) Update the Energy section of the General Plan to reflect current energy alternatives (renewables) and advanced technologies (power grid).
2) The GP planning process can support KIUC's energy goals by examining land use policies and their impacts on energy production.
3) The GP planning process could consider policies to encourage and support renewable energy projects that add value to other activities and are compatible with or beneficial to underlying land uses.
4) Confirm that KIUC projections reflect population projections within the *Socioeconomic Analysis and Forecasts* Technical Report.
5) Confirm that KIUC projections support land use, infrastructure and economic development policies in the updated GP.

6) Energy policy will be reviewed by the CAC and presented at the next round of Community Meetings.

12.5 RESOURCES

Energy Plan Advisory Committee. February 2013. *Kaua'i Energy Sustainability Plan EPAC Recommendations 2012.*

Hawai'i Clean Energy Initiative. 2011. *HCEI Road Map 2011 Edition.*

Hawai'i Natural Energy Institute. January 2014. *Characterizing Commercial Sites Selected for Energy Efficiency Monitoring.*

Kaua'i Island Utility Cooperative. 2013. *2013-2015 Strategic Plan.*

National Renewable Energy Laboratory. March 2012. *Hawai'i Clean Energy Initiative Scenario Analysis: Quantitative Estimates Used to Facilitate Working Group Discussions (2008-2010).*

Sentech Hawai'i, LLC. April 2010. *The Kaua'i Energy Sustainability Plan Final Report.*

State of Hawai'i, Department of Business, Economic Development and Tourism, Hawaii State Energy Office. 2012. *Renewable Energy Projects in Hawaii – October 2012* http://energy.hawaii.gov/renewable-energy-projects-in-hawaii

13.0 COMMUNITY HEALTH

14.1 DEFINING THE ISSUES

A coalition of health care providers and related agencies was formed in 2013 under the auspices of the Kaua'i Community Health Improvement Initiative (CHII). The CHII built on the work of Get Fit Kaua'i, a local organization whose mission is to improve the quality of life of the residents and visitors of Kaua`i County by working to promote opportunities for physical activity and access to healthy foods. The CHII expands the concept of health. Traditionally, "health" has been perceived as going to the doctor and reducing or curing disease. But in the context of the CHII and the GP, the relationships of the built environment, including affordable housing, walkable communities, active transportation choices, and access to healthy foods, all contribute to both community and individual health. This much broader concept of "health" can be incorporated into the GP.

An individual's health is inherently tied to the health of the community in which he or she lives. According to the World Health Organization, a healthy city is one that is continually creating and improving those physical and social environments and expanding those community resources which enable people to mutually support each other in performing all the functions of life and developing to their maximum potential. (Source: Community Health Improvement Initiative.)

The CHII partners include the Wilcox Memorial Hospital; Kaua'i District Health Office, County of Kaua'i; Department of Education – Kaua'i Complex; University of Hawaii – Kaua'i Community College; and, the Governor's Office (Kaua'i). They, in turn, reached out to stakeholders and formed a Leadership and Oversight Committee representing 30 different state and local organizations from the public, private and non-profit sectors. While the bonds between many of these organizations already existed, the planning process nurtured relationships. The CHII's priority issues are listed in the text box below.

The CHII conducted a *Community Health Needs Assessment* (CHNA) for the County in 2014. This Assessment evaluated health outcomes (mortality and morbidity), and the physical environment, social and economic factors, clinical care, and behaviors that impact health outcomes.

The "community building" process proposed by the CHII parallels the efforts of the GP planning process. The five priority themes of the CHNA -Health and Wellness, Medical Care, Education and Lifelong Learning, Housing, and Community Design and Planning - can be supported with GP implementing actions. The CHIP included 2-5 year strategies to achieve the vision, including recommendations for policies, systems and environment. Five working groups were created to address Built Environment, Housing, Education and Lifelong Learning, Medical Care, and Health and Wellness.

Kaua'i's Community Health Improvement Initiative Priority Issues:

Health and Wellness (Upstream prevention): Easy, convenient access to affordable healthy food for busy families (concern about unhealthy fast food). Screening, early detection and management for breast cancer, cervical cancer, diabetes, cholesterol, hypertension, colorectal cancer, HIV, etc.

Medical Care: Available, accessible, affordable and integrated mental healthcare/substance abuse/developmentally disabled services and facilities. Available, accessible, affordable and integrated medical care – first to last breath.

Education and Lifelong Learning: Health education for keiki, kupuna, ohana, and school/work/church sites (health literacy and workplace wellness).

Housing: Transitional/homeless/affordable housing/senior housing.

Community Design and Planning: Walkable, bikeable, and safe communities to encourage and promote physical activities and social connectivity.

The table below illustrates health outcomes, the indicators used for each and whether Kaua'i residents are doing better or worse than the statewide average, *2020 Hawai'i Physical Activity and Nutrition Plan,* or nation. Other indicators are used to evaluate physical environment, social and economic factors, clinical care, and behaviors. A related issue is health equity, or ensuring that all people have access to the resources and infrastructure to support a healthy lifestyle. As recommended by the 2013 CHNA, equity of opportunity can be measured by "comprehensive non-discriminant policies, progressive tax structure, disparities in education, assistance in navigating through the healthcare system."

Health Outcomes (Mortality)	Kaua'i County Better (B) or Worse (W) than the State or HP 2020	Kaua'i County Better (B) or Worse (W) than the Nation
Premature Death	W	B
Cancer Mortality**	B	B
Heart Disease Mortality**	B	B
Stroke Mortality**	W	W
Suicide Rate**	W	W
Infant Mortality**	B	B

Health Outcomes (Morbidity)		
Poor General Health	W	Comparable (Not statistically significant)
Poor Physical Health Days*		
Poor Mental Health Days*	W	W
Low Birth Weight	B	B
Breast Cancer Incidence	B	B
Cervical Cancer Incidence**	W	W
Colon and Rectum Cancer Incidence	W	W
Diabetes Prevalence	B	B
Heart Disease Prevalence	W	B
HIV Prevalence	W	B
Poor Dental Health	B	B
Population with Any Disability	W	W

Source: Kaua'i's Community Health Needs Assessment (2013)
* Not a CHNA.ORG dashboard comparison
** Compared to HP 2020 Target, not the State

Kaua'i's population is continuing to grow older, the median age is shifting upward, and life expectancy is increasing. While these trends point to improved health and longevity, Kaua'i's built environment will need to be modified to serve an older population. Such an environment is often called "age-friendly", meaning that it can accommodate the abilities of the very young, very old, and everyone in between.

The prevalence of chronic disease, like diabetes, is increasing, even though many chronic diseases can be prevented or controlled through lifestyle changes. The CHNA reports that Kaua'i County's residents have better access to recreation and fitness facilities and healthy foods than others in the State. However, 46% of restaurants on Kaua'i are fast food restaurants, and the establishment rate of fast food restaurants on Kaua'i (107.32 establishments per 100,000) people is much higher than that of the nation as a whole (69.26 establishments per 100,000 people).

The GP planning process, to date, has revealed resident dissatisfaction with a lack of pedestrian and bicycle infrastructure. Speeding vehicles makes people feel unsafe. Poor intersection design, an incomplete network of sidewalks, crosswalks, bicycle facilities, and other important features are lacking from the public realm. The CHNA suggests that busy lifestyles and/or a lack of health education negatively impact families in Kaua'i. Tobacco use is still allowed in many venues. Not all residents participate in vaccination and cancer screening, and many people with chronic diseases are not managing them well. The lack of affordable housing creates stress for families that, in turn, affects health. Prevalence of teen pregnancy, STDs, suicide, domestic violence, bullying, and injuries is too high. To summarize, the major issues in Community Health include:

- Individual and community health are mutually dependent and require planning that accounts for improving health and wellness, medical care, education and lifelong learning, housing, and community design and planning in order to succeed.
- The population is living longer and requires an age-friendly, safe physical environment.
- Community design and infrastructure should support healthy living.

13.2 OPPORTUNITIES

There are good foundations for improving the health of Kaua'i's residents. Get Fit Kaua'i's Built Environment Task Force has become a policy leader in community health issues. The Task Force "recognizes that Kaua'i's land use system should support active, healthy lifestyles through human-scaled, rather than automobile-centered, development." The task force is helping the County make the necessary changes to its planning system in order to support healthy community design. Milestones include the Kaua'i County Complete Streets Indicators Report and updates, Rice Street Week and work on planning for healthy communities. Complete streets projects in mixed-use, vibrant town centers can satisfy many recommendations offered by the CHII.

Other State and County health policies include:

- *A New Day in Hawai'i* (State)
- *Hawai'i Healthcare Initiative* (State)
- *DOH Strategic Plan: Healthy People, Healthy Community, Healthy Islands* (State)
- *Holo Holo 2020* (County)

To summarize, the major opportunities in Community Health include:

- Utilizing the Community Health Improvement Initiative's work products to:
    - Provide a framework for public health as a component of the General Plan.
    - Identify land use and planning issues that affect health
    - Provide baseline data and measurable indicators
    - Provide health-related goals, policies and strategies that can be considered in the General Plan
- Harnessing the energy and expertise of the CHII's working groups for future initiatives and to implement the recommendations of the GP.
- Compact, walkable communities whose built environment and mix of uses support healthy lifestyles and enhance social interaction.
- Complete streets and multimodal transportation options can contribute to healthier communities. "Active transportation" is a means of getting around that is powered by human energy, primarily walking and bicycling. Active transportation becomes easier and safer when streets are designed to accommodate pedestrians and people on bicycles.
- A dedicated coalition of volunteers and industry leaders committed to improving public health.

13.3 HOW THE 2000 GENERAL PLAN TREATED PUBLIC HEALTH

- The 2000 GP did not include a chapter on Community Health, and so this will be a new chapter. The CHII and CHNA have data and policy recommendations that can be used to draft this new chapter.
- The current, broader definition of community health speaks to the environment in which people live, making linkages between health housing, transportation, and other elements of the built environment. The 2000 GP did not acknowledge these links.

13.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on Community Health to be conducted by the GP Team includes:

1) The 2014 *Kaua'i Community Health Improvement Plan* and the Built Environment Task Force *Evaluation of Public Health Policies in the General Plan 2000* present goals and recommendations that can be used to support public health policy adjustments in the General Plan. The connections between community health and other policy areas, including alternative transportation modes, recreational facilities, housing, public services, and characteristics of the built environment, can be emphasized in the GP planning process.
2) In order to sustain and improve community health, programs and policies can be assessed from an equity perspective.
3) The indicators used in the CHNA to assess community health can be considered as indicators to assess progress in implementing the GP.
4) Public Health policy will be reviewed by the CAC and may be presented at future Community Meetings.

13.5 RESOURCES

County of Kaua'i. June 2014. *Kaua'i Community Health Improvement Plan*.

County of Kaua'i. July 2013. *Kaua'i's Community Health Needs Assessment*

County of Kaua'i Built Environment Task Force. February 2015. *Evaluation of Public Health Policies in the General Plan 2000*.

Hawai'i State Department of Health. *Hawai'i Physical Activity and Nutrition Plan 2013-2020*.

Jeanne Anthony. January 8, 2015. *Creating Livable Communities for all Ages*.

Ricklin, A., et al. 2012. *Healthy Planning: An Evaluation of Comprehensive and Sustainability Plans Addressing Public Health*. Chicago: American Planning Association. Kaua'i Planning and Action Alliance.

Kaua'i Planning and Action Alliance. 2014. *Measuring What Matters for Kaua'i: Community Indicators Report 2014*.

This page intentionally left blank.

14.0 CULTURAL AND HERITAGE RESOURCES

14.1 DEFINING THE ISSUES

Kaua'i has thousands of archaeological sites and hundreds of historic buildings. Of these, approximately 60 historic buildings and complexes and 30 archaeological sites are listed on the National Register of Historic Places, the Hawai'i Register of Historic Places, or both. There are also listings for historic objects and historic structures, such as the Hanalei Pier. Native Hawaiian coastal burials, artifacts, and structures are particularly vulnerable to inundation and erosion.

The Hawaiian and Pacific Island cultures, however, are not simply of interest for historic purposes. These cultures, and those brought more recently by newcomers to Kaua'i, are alive and contributing to the shared values and aloha spirit that unites the Island.

The physical environment is closely linked to Kaua'i's cultural and heritage resources. There is great concern that development and the adverse impacts of sea-level rise will reduce access to traditional food sources and subsistence fishing. These activities, and others, help people sustain connections with a defined place and keep unique customs and practices alive.

Retention of Kaua'i's one lane bridges, especially on the North shore, helps preserve the character of the community. Similar bridges exist in Kōloa, Kekaha, and Waimea Districts. From time to time decisions balancing preservation and economic revitalization need to be made. It is critical that community desires drive such decisions.

To summarize, the major issues in Cultural and Heritage Resources include:

- Kaua'i's cultural and heritage resources contribute to maintaining a sense of place and belonging and provide a basis for properly caring for the land.
- Historic buildings and infrastructure may be more expensive to keep in good condition, but some are worth the investment.
- Heritage Resource maps have not been consistently or regularly updated.

Kahua O Kāneiolouma (pictured above) is a cultural site containing the remnants of an ancient Hawaiian village at Po'ipū. The 13-acre complex is under the jurisdiction of the County of Kaua'i and contains numerous habitation, cultivation, sporting or assembly, and religious structures dating to at least the mid-1400's.

The complex is largely intact but in need of rehabilitation. Under a Stewardship Agreement signed in August 2010, the County of Kaua'i granted formal custodianship of the Kāneiolouma complex to Hui Mālama O Kāneiolouma. The rehabilitation project was also included in Mayor Bernard P. Carvalho's *Holo Holo 2020* plan.

Following an outline developed by Native Hawaiian archaeological expert Henry E.P. Kekahuna, the Master Plan addresses a seven year horizon, with work in four overlapping phases. Work began in 2012.

- Important decisions need to be made as aging infrastructure reaches its life cycle age. These decisions must balance community character and wishes.

14.2 OPPORTUNITIES

Registration, or designation, on the State and National Registers of Historic Places may protect historic sites from demolition or inappropriate renovation; registered sites may also be eligible for restoration grants, tax incentives or assistance that leads to their upkeep.

Kaua'i's Historic Preservation Review Commission is a valuable organization of local experts. Given additional resources, this Commission can probably assist with promoting awareness of existing resources and implementing programs to expand and maintain Kaua'i's inventory of cultural and heritage resources.

To summarize, the major opportunities in Cultural and Heritage Resources include:

- Additional sites may be eligible for historic designation; listing them can prevent their demolition or inappropriate renovation.
- Mapped resources can be further protected with the County's Open District, or acquired with Public Access funds.
- The preservation of the Kaneiolouma site can serve as a model for County resource protection efforts.

14.3 HOW THE 2000 GENERAL PLAN TREATED CULTURAL AND HERITAGE RESOURCES

- The 2000 GP contains an extensive section titled "Caring for Land, Water and Culture". Several sub-sections, including "Overview", "Historic and Archeological Resources", and Native Hawaiian Rights" remain largely current and relevant today.
- The 2000 GP recommended providing a buffer area and pedestrian access for historic/archaeological sites, to incentivize rehabilitation of historic structures, and to establish an "historic district" overlay with design guidelines where needed. This task has not yet been initiated.
- To further protect historic properties, the 2000 GP recommended studying the market, costs, sources of funding, and operational feasibility of creating an island wide low-cost rehabilitation loan program for historic structures. This task has not yet been initiated.
- The GP recommended that the State Historic Preservation Division (SHPD) prepare "Archaeological Resource Potential Maps" for Kaua'i, with assistance and input from the Kaua'i Historic Preservation Review Commission, the Planning Department, and the Kaua'i Burials Council. However, SHPD did not concur, and it has not yet been initiated.
- The Heritage Resource Maps need updating; not all of the data is not readily available.

14.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on cultural and heritage resources to be conducted by the GP Team includes:

1) The 2000 GP called for the development of maps that identified the potential locations of archeological resources as a means of generating greater awareness of cultural resources and the need for their protection. This was not done.
2) The last local inventory of resources was conducted in 1990 (*County of Kaua'i Historic Resources Inventory and Management Plan*). This type of inventory can help determine what resources need maintenance or protection. However, updating this inventory is not within the scope of the GP Update.

3) The County's efforts to support the preservation/restoration of Kaneiolouma is a model for the preservation of other important cultural sites. The effort can be documented for inclusion in the GP during the meetings with agencies.
4) Heritage resources were mapped, as part of the South Kaua'i Community Plan. This can be repeated for the other Community Plan areas. The heritage maps included in the 2000 GP will serve as the basis for the maps included in the GP Update. Layers will be updated using existing data sources.
5) Kaua'i's rich cultural and heritage resources are a major attraction for both residents and tourists. A renewed interest in Hawaiian values and culture reveals itself in place names, art, fashion, and the increased number of Hawaiian schools for music, language, and dance, all of which contribute to the aloha spirit.

14.5 RESOURCES

State of Hawai'i Department of Hawaiian Home Lands. May 2004. *Kaua'i Island Plan*.

County of Kaua'i. 1990. *County of Kaua'i Historic Resources Inventory and Management Plan*.

This page intentionally left blank.

15.0 NATURAL RESOURCE MANAGEMENT AND CONSERVATION

15.1 DEFINING THE ISSUES

Kaua'i residents firmly believe that the natural environment provides the foundation for sustainability, which is the top priority in their communities. During the GP Update community meetings, the theme of "nature first" was reiterated over and over. The island's "natural capital" is seen as its greatest asset, and preserving it for current and future generations is of utmost importance. Care for and access to public trust resources (water, beaches, coastal areas, special places) was a particular theme.

Kaua'i's natural resources are bountiful, and include its public lands; above and underground inland waters; ocean waters; coastal areas; non-renewable resources such as fossil fuels and minerals; mountains and valleys; forests and fields; and the flora and fauna that depend on these areas. Natural resources have a critical role in the functioning ecosystem. They are equally important for their natural beauty and contribution to community health and well-being, including recreation and the economy.

Increases in population and visitors create demands and pressures on natural resources. Opinions vary on the degree to which Kaua'i's resources are currently managed and how will they be managed in the future. There is overall agreement that Kaua'i's natural resources are threatened, and that proper stewardship is an urgent matter that requires a holistic approach. This is everyone's kuleana, and includes individuals, businesses, and government taking measures to reduce their ecological footprint and increase efficiencies rather than use more limited resources. It includes devoting more resources to ensure that native ecosystems and organisms are not irreparably harmed, and finding a balance between human use and enjoyment of nature and its preservation for future generations. The concept of malama 'āina is an appropriate one to capture this intent. Many in the community have also invoked ahupua'a management as a model that is instructive for current and future environmental management. Watershed councils and environmental organizations exist throughout the island and are prominent voices in the stewardship and management of water and other resources.

Invasive species pose a huge threat to the environment, threaten our environment, economy, agriculture, human health, and/or quality of life. Invasive species generally reproduce quickly and are able to spread from their initial intended area.

Much of Kaua'i's natural resources are owned and managed by multiple Federal, State, and local entities. Kaua'i has twenty-four managed reserve, preserve or park areas, shown below:

Kaua'i Reserves	Management
Alakai Wilderness Preserve	DOFAW
Halelea Forest Reserve	DOFAW
Hono O Na Pali Natural Area Reserve	DOFAW
Kalepa Mountain Forest Reserve	DOFAW
Keālia Forest Reserve	DOFAW
Kuia Natural Area Reserve	DOFAW
Līhu'e-Kōloa Forest Reserve	DOFAW
Mānā Plains	DOFAW
Moloa'a Forest Reserve	DOFAW
Na Pali-Kona Forest Reserve	DOFAW
Nonou Forest Reserve	DOFAW
Puu Ka Pele Forest Reserve	DOFAW
Wailua Game Management Area	DOFAW
Hā'ena State Park	DOSP
Kokee State Park	DOSP
Na Pali Coast State Wilderness Park	DOSP
Polihale State Park	DOSP
Wailua River State Park	DOSP
Waimea Canyon State Park	DOSP
Kanaele Preserve	TNC
Wainiha Preserve	TNC
Hanalei National Wildlife Refuge	USFWS
Huleia National Wildlife Refuge	USFWS
Kīlauea Point National Wildlife Refuge	USFWS

All lands - even those that are inaccessible and designated as preservation lands by the State – need protection. Erosion, invasive species, air and water pollution have wide-reaching impacts. Government regulations include the Special Management Areas (SMA), State Conservation District, and County Open District. Regulations under the County's control can be modified to further protect natural resources.

Some properties that contain natural resources are privately-owned and subject to be developed. These privately-owned resources are the most vulnerable, especially when owned by people who are land rich and cash poor. There may be a mechanism for inventorying such lands and developing a long-term protection and stewardship strategy beyond targeted acquisition. Community members have expressed concern that property owners (particularly high-profile or wealthy buyers concerned with privacy) try to limit access to public areas such as beaches, trails, and coastal lands. Maintaining adequate access to these areas is a recurring theme of community feedback.

The State of Hawaii plays a major role in managing natural resources on Kaua'i. The Department of Land and Natural Resources (DLNR) controls and manages the forest reserves, natural area reserves, and state parks. The forested watersheds harbor rare and endangered plant and animal species, and in some areas, the native ecosystem remains relatively intact. The DLNR exercises regulatory authority over land use in

the State Conservation District, which covers 55 percent of the island's land area. Anyone wishing to build in the Conservation District receive approval. DLNR has responsibility of the Public Land Trust, including ceded lands and submerged lands.

Endangered Species

Terrestrial ecosystems have changed significantly since the arrival of Europeans in 1778. Although Kaua'i's first settlers cleared much of the low-lying forests for agriculture and dwelling sites, the higher elevations were left relatively undisturbed. Forests continue to be depleted of sandalwood trees. The introduction of cattle and goats requires grazing land. The need for fuel, ranching activities, and crop production results in deforestation. Fires ignited by humans destroy native forests, especially during dry periods. Coupled with these disturbances are threats to native birds, plants, and invertebrates.

About 90% of the native Hawaiian plant species can only be found in the Hawaiian archipelago. Kaua'i has the highest number – 495 – of endemic plant species in the Hawaiian Archipelago. Over 140 of them are listed as federally endangered, and of these, 70 are on the verge of extinction (U.S. Forest Service, 2011).

Kaua'i is home to more tropical bird species than any of the other islands. There are over 80 different species which nest on the island and 21 of them are exclusively native to Kaua'i. Several species, in particular, are endangered and need protection from predators, invasive species, and habitat destruction. Examples include the Hawaiian Petrel, Newell's Shearwater, and Nene. Recent additions to endangered species lists suggests that the management of the Alaka'i Wilderness Preserve is critical to protecting wildlife (*Draft Hawai'i's State Wildlife Action Plan*, 2015).

Puaiohi or Small Kaua'i thrush – State and Federally Listed Endangered Species

Several endangered species of animals find refuge on, or just off of, Kaua'i's shores. The Hawaiian Monk Seal and the Hawaiian Hoary Bat are just two of the native species on the endangered species list. These animals, as well as three of the seven endangered species of Sea Turtles in the world, make Kaua'i's vast stretch of shoreline their home. Endangered Humpback Whales are also found in the waters around Kaua'i.

Critical Habitats

There is approximately 188,500 acres of forest on Kaua'i, occupying 55% of the island. The native 'ohi'a is the predominant forest type with over 109,000 acres or 58% of the forest acreage. Of this forest area, less than half, or approximately 88,000 acres is in forest reserve land. The majority of these reserves, or 64%, are native 'ohi'a and koa forests. The great majority occur inland at high elevations or on steep topography unsuited to development. In developable, low-lying areas, only scattered remnants remain. The Alaka'i Swamp has the largest block of undisturbed native forest on the island. The Kōke'e area, on the western side of the island, has wet, native 'ohi'a forests at higher elevations and dry, scrub koa forests

at lower elevations. Native forests are also found along the *pali* (cliff) walls in the backs of many valleys. Kaua'i has over 134,000 acres (39% of the island) of cliffside or *pali* lands.

Over 36,000 acres of shrubs occur on the island; the dominant species is haole koa with over 13,000 acres. Over 122,000 acres are classified as non-forest with cultivated land and grassland comprising over 64,000 and 34,000 acres, respectively.

Watersheds and Streams

Watersheds collect rain and condensation that is funneled into stream beds that either join other stream beds or terminate at the edge of the sea. The presence and severity of erosion can be used as a measure of the quality of a watershed. An islandwide photographic sample (*The Multiresource Forest Inventory for Kaua'i*) indicated that 13% (45,100 acres) of the island had slight to moderate erosion and 6% (20,825 acres) had severe erosion. Eighty-four percent of the severely eroded land is in the *pali* land class. Most of the severely eroded area is in Waimea Canyon and along lower ridges on Kaua'i's west side. Although many of the steep *pali* lands are naturally erosive, other areas in the lower Kōke'e area could benefit from watershed rehabilitation efforts.

The 2008 *Atlas of Hawaiian Watersheds and Their Aquatic Resources* divides Kaua'i into five regions. The Hanalei region has 32 watersheds. The Līhu'e region has 12 watersheds. The Kōloa region has 8 watersheds. The Waimea region has 4 watersheds The Kekaha region has 10 watersheds. Priority watersheds for restoration in Kaua'i include: 1) Nāwiliwili Bay and coastal waters, including the three tributary watersheds of Nāwiliwili, Pū'ali, and Hulē'ia; 2) Waimea Bay and coastal waters, including the tributary watersheds of Waimea, Kapilimao, Waipao, A'akukui, and Mahinauli; and 3) Hanapēpē Bay and coastal waters, including the Hanapēpē River and watershed (*State of Hawaii Water Quality Monitoring and Assessment Report*, 2014).

Nonpoint source pollution, commonly called polluted runoff (*Hawaii's Implementation Plan for Polluted Runoff Control*, 2000), occurs when rainwater moves on the surface of the earth or through the ground and carrying the pollutants it encounters along the way. This polluted runoff flows to drainage systems and ends up impairing streams and nearshore coastal waters. Significant pollutant types include sediments, nutrients, toxins, floatables, and pathogens. In the simplest terms, nonpoint source pollution is any pollution that is not from a particular, or point, source. The consequences of nonpoint source pollution include: increased risk of disease from water recreation, algae blooms, fish kills, destroyed aquatic habitats, and turbid waters. Some polluted runoff is from natural sources, like soil eroding on steep slopes during heavy rain. Most, however, results from people's activities on the land.

There are 17 impaired inland freshwater bodies and 23 impaired marine/coastal water bodies in Kaua'i (*State of Hawaii Water Quality Monitoring and Assessment Report*, 2014). These numbers have increased significantly from the 1997 data included in the 2000 General Plan. In 1997, there were only four impaired bays and five perennial streams that were targeted for water pollution controls and management. Several streams are newly listed because the sampling data of conventional pollutants has increased, but others are included because their quality has decreased.

A key concern is the long-term organizational structure for watershed and stream management. Each restoration project must develop and draw upon a network of government and community- based organizations. Agencies or organizations must step forward to accept responsibility and be funded to coordinate restoration and management over the long term.

Ocean Resources

The most vulnerable resources are those threatened by climate change and sea-level rise. Recommendations for improved protection of these resources are summarized in the 2014 *Kaua'i Climate Change and Coastal Hazard Assessment*. The impact of climate change on the land, beaches and oceans could be severe and is a concern (see the Climate Change and Coastal Hazards section of this paper for more discussion). The 2014 *Kaua'i Climate Change and Coastal Hazard Assessment* reports that nearshore reefs and coastal ecosystems are already under great pressure from overfishing, land-based runoff, and other human impacts. Increasing temperatures, ocean acidification, and runoff with changing precipitation patterns will further destabilize nearshore ecosystems. On Kaua'i, approximately 70% of beaches are experiencing erosional trends.

Sea-level rise and related impacts such as increasing storm surge heights threaten to alter the physical setting and impacts for nearshore environments. Fish species that depend on shallow water or inter-tidal and sub-tidal plant communities will be at risk of habitat loss. Changing water depths could negatively affect species types and quantities. Future inundation of coastal lands with sea-level rise and changing precipitation and runoff patterns could further degrade coastal water quality, in addition to the existing threats to water quality from nonpoint source pollution, such as sediment, nutrients, pathogens, oil, toxins, and polluted runoff. Impacts of certain farming practices have been hotly debated on Kaua'i.

To summarize, the major issues in Natural Resource Management and Conservation include:

- Healthy natural resources are a key to sustainability and resilience.
- Native flora and fauna are threatened by a myriad of drivers, including habitat loss, invasive species, and climate change. Development contributes to these drivers, including the development of natural resources.
- Privately owned properties may have resources that are not protected, or whose resources are difficult to monitor.
- County and State parks are challenged to maintain facilities.
- Resource protection is a shared responsibility and duty.
- Sedimentation from rivers, streams, and other runoff is negatively impacting coastal areas.
- Beaches are being lost due to coastal erosion and human impacts to sand supply.

15.2 OPPORTUNITIES

Encouraging the formation of citizens groups to take responsibility for local natural resources and partnering with the State and non-profits for research purposes can lead to an improved environment, generate locate capacity and awareness, and potentially lead to funding for more environmental protection and conservation activities. Environmental leaders on Kaua'i include:

- The Nature Conservancy manages two critical habitat areas on Kaua'i via management agreements with the landowner: the Kanaele Bog and Wainiha Preserve.
- National Tropical Botanical Garden is dedicated to preserving tropical plant diversity and stemming this tide of extinction - through plant exploration, propagation, habitat restoration, scientific research, and education. NTBG's gardens and preserves are safe havens for at-risk species that otherwise might disappear forever.
- The Kaua'i Invasive Species Committee (KISC) is a voluntary partnership of government, private and non-profit organizations, and concerned individuals working to prevent, control, or eliminate the most threatening invasive plant and animal species in order to preserve Kaua'i's native biodiversity and minimize adverse ecological, economic and social impacts.

- The Kaua'i Endangered Seabird Recovery Project (KESRP) is a Division of Forestry and Wildlife (DOFAW) project, administered through the Pacific Studies Co-operative Unit of the University of Hawai'i. Formed in 2006, the project focuses on the Newell's Shearwater, Hawaiian Petrel and Band-rumped Storm-Petrel. KESRP identifies the breeding distribution of these rare seabirds, monitors their breeding colonies, undertakes research projects to understand their life histories and the various threats which they face, and works with partner projects and organizations to ensure their long-term conservation.
- Mālama Hulē'ia is a voluntary non-profit organization dedicated to improving key parts of the Nāwiliwili Bay Watershed on Kaua'i by eliminating the red mangrove - an alien and highly invasive plant species. Over the last 50 years, the red mangrove has been changing native wildlife habitats in and along the Hulē'ia River and destroying the 'Alekoko Fish Pond.
- The Surfrider Foundation, Kaua'i Chapter, is a non-profit environmental organization dedicated to the protection and enjoyment of the world's oceans, waves and beaches for all people, through conservation, activism, research and education.
- The Kaua'i Watershed Alliance partners (KWA) focus on protecting the uppermost watershed areas on Kaua'i from invasive alien plants, animals, and other threats. The Nature Conservancy is coordinating the implementation of an overall management strategy for the KWA to protect the 144,004 acres of partnership lands.
- Hanalei Watershed Hui is a non-profit environmental organization that strives to care for the Ahupua'a of Hanalei, Wai'oli, Waipā, and Waikoko. They are guided by Hawaiian and other principles of sustainability and stewardship, integrity and balance, cooperation and aloha, cultural equity and mutual respect.
- The Kaua'i Invasive Species Committee (KISC) is a voluntary partnership of government, private and non-profit organizations, and concerned individuals working to prevent, control, or eliminate the most threatening invasive plant and animal species in order to preserve Kaua'i's native biodiversity and minimize adverse ecological, economic and social impacts.
- Malama Mahaulepu is working to preserve, for future generations, the irreplaceable natural and cultural resources of Maha`ulepu.
- Sierra Club's mission is to explore, enjoy, and protect the wild places of the earth; practice and promote the responsible use of the earth's ecosystems and resources; educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives.
- Kaua'i Forest Bird Recovery Project aims to promote knowledge, appreciation, and conservation of Kaua'i's native forest birds. Its efforts focus primarily on three federally endangered species: the Puaiohi, 'Akikiki, and 'Akeke'e, with the goal of facilitating recovery of their populations in the wild.

The Department of Land and Natural Resources supports the formation of local groups to monitor environmental health and build community awareness. Makai Watch Groups are now active in Hanalei and Hā'ena. The State, working with the University and other non-profits, like the Nature Conservancy of Hawai'i, uses Kaua'i as a testing ground for environmental action. For example, the Aquatic Invasive Species Response Team is working on a method to eliminate snowflake coral from the pier at Kaua'i's Port Allen.

Regulations already exist to help manage and conserve natural resources. They include the Special Management Areas (SMA), State Conservation District, and County Open District. The SMA program helps ensure that permitted uses and activities are designed and carried out in compliance with the Hawaii Coastal Zone Management (CZM) program objectives and policies as set forth in Chapter 205A, Hawaii Revised Statutes. The SMA Permit system administered by the County regulates development within a geographically defined boundary that extends from the shoreline inland. Within each county, SMA boundaries may range from about 100 yards to several miles inland from the shoreline.

The County's Open District was established to ensure an adequate amount of open lands is provided for the recreational and aesthetic needs of the community and to provide for the effective functioning of land, air, water, plant and animal systems or communities. It is intended to preserve, maintain or improve the essential characteristics of land and water areas that are: (1) of significant value to the public as scenic or recreational resources; (2) important to the overall structure and organization of urban areas and which provide accessible and usable open areas for recreational and aesthetic purposes; (3) necessary to insulate or buffer the public and places of residence from undesirable environmental factors caused by, or related to, particular uses such as noise, dust, and visually offensive elements.

The State Conservation District is comprised primarily of lands in existing forest and water reserve zones and includes areas necessary for protecting watersheds and water sources, scenic and historic areas, parks, wilderness, open space, recreational areas, habitats of endemic plants, fish and wildlife, and all submerged lands seaward of the shoreline. The Conservation District is administrated by the State Board of Land and Natural Resources and uses are governed by rules promulgated by the State Department of Land and Natural Resources.

While these regulatory programs provide a significant measure of protection, they can be complemented and strengthened by adopting smart growth policies that seek to contain urban development within compact, walkable town cores. Urban edge boundaries and zoning requirements can also be implemented to direct the extent and character of development.

To summarize, the major opportunities in Natural Resource Management and Conservation include:

- Several regulatory mechanisms are in place to protect or conserve natural resources.
- Many local groups are working as environmental stewards.

15.3 HOW THE 2000 GENERAL PLAN TREATED NATURAL RESOURCE MANAGEMENT AND CONSERVATION

- The 2000 GP contains an extensive section titled "Caring for Land, Water and Culture". Several sub-sections, including "Watersheds, Streams and Water Quality", "Coastal Lands", and "Scenic Views" remain largely current and relevant today.
- The 2000 GP recommended revising the CZO to better protect natural resources by revising the Drainage Way Constraint District and/or creating an overlay zone for streams, wetlands, and flood plains. The policies governing Natural Resource Management and Conservation are mostly intact.

15.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on natural resource management to be conducted by the GP Team includes:

1) Meet with SMA regulators to determine whether additional direction or recommendations in the GP would support resource protection.
2) Introduce data and information from the climate change study conducted for the GP Update.
3) Extract appropriate policy material from recent master planning for the County parks.
4) Update Table 3-1: Water Bodies with Impaired Water Quality, Island of Kaua'i, 1997 (in the 2000 GP) with currently available data from the Hawaii Department of Health *2014 State of Hawaii Water Quality Monitoring And Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117)*.
5) Develop current data and maps on drainage issues. However, this is outside the scope of the GP Update.
6) During community workshops, seek input on non-profit organizations on natural resource protection, and determine how and whether these organizations can play a larger role in implementing resource protection actions in the updated GP.
7) Add descriptions of the role of the County, State and Federal Government in resource protection.

15.5 RESOURCES

Buck, Michael G., Bream Jeanine M., Stormont, William T. United State Department of Agriculture, Forest Services. August 1988. *The Multiresource Forest Inventory for Kaua'i*. Resource Bulletin PNW-RB-156.

Cannarella, R.J. 2010. *Statewide Assessment of Forest Conditions and Resource Strategy*. Honolulu, HI: Hawaii Department of Land and Natural Resources. 271 p. http://dlnr.hawaii.gov/forestry/ info/fap/. (17 March 2014).

Kaua'i Watershed Alliance. April 2005. *Kaua'i Watershed Alliance Management Plan*.

State of Hawai'i Department of Health. 2014. *Draft State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117)*.

State of Hawai'i, Department of Health. July 2000. *Hawaii's Implementation Plan for Polluted Runoff Control*.

State of Hawai'I Department of Land and Natural Resources. October 1, 2015. *Hawai'i's State Wildlife Action Plan*. Draft for Public Review.

State of Hawai'i, Department of Land and Natural Resources. *The Rain Follows the Forest (DLNR State Watershed Initiative)* http://dlnr.hawaii.gov/rain/

State of Hawaii Division of Aquatic Resources and Bishop Museum. 2008. *Atlas of Hawaiian Watersheds & Their Aquatic Resources*.

State of Hawai'i Office of Planning. July 2013. *Hawai'i Ocean Resources Management Plan*.

Stein Susan M., Carr, Mary A., Liknes, Greg C., and Comas, Sara J. USDA Forest Service. August 2014. *Islands on the Edge: Housing Development and Other Threats to America's Pacific and Caribbean Island Forests*. General Technical Report NRS-137

U.S. Forest Service. 2011. *FHP [Forest Health Program] in Hawaii*. Hilo, HI: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, State and Private Forestry. http://www.fs.fed.us/r5/spf/fhp/hawaii/index.shtml. (6 June 2011).

This page intentionally left blank.

16.0 PARKS AND RECREATION

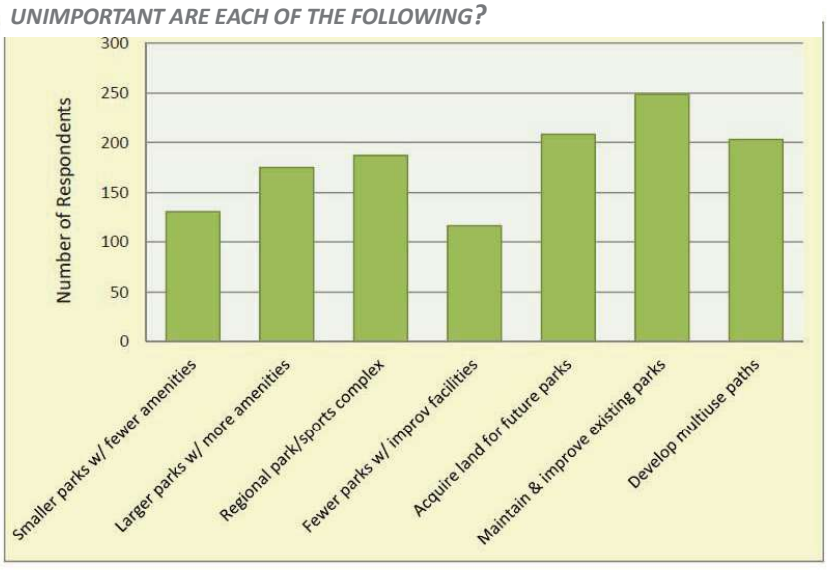
16.1 DEFINING THE ISSUES

The County of Kaua'i has an extensive park system that includes 85 park properties. They range in size from the small 0.2-acre Horner Park to the anticipated 138-acre Ahukini Coastal Park and are spread all over the island. In addition to the park lands, the County maintains Kaua'i's public 18-hole Wailuā Golf Course and two cultural preserves – Ka Ulu A Paoa and Ke Aku A Laka in Hā'ena and Kaneiolouma in Po'ipū.

Kaua'i is also fortunate to have State parks, the Na Ala Hele Trails, and federally protected areas, such as the Kīlauea Point National Refuge. The Kōke'e and Waimea Canyon State Parks are adjoining parks located on the west side of Kaua'i. Officially established in 1952, the parks occupy 6,182.4 acres of land. Their combined acreage is approximately 1.75 percent of the total land area on the island, and 40 percent of the State Parks acreage on Kaua'i. The two parks have significant cultural, historic, natural and scenic resources, and thus, are very popular. These Parks are called out because the challenges they face are recently documented (the Kōke'e and Waimea Canyon State Parks Master Plan was completed in 2014) and are representative of maintenance and capacity issues other parks on Kaua'i elsewhere.

Given that people are living longer, the recreation needs of seniors will increase over time; and yet, planning to meet the needs of youth remains important because youth have more limited leisure-time choices. The County's Department of Parks and Recreation continues to work on providing the programming and facilities to meet the diversity of recreational needs. A survey conducted as part of the 2013 parks and recreation planning process revealed community priorities, which are illustrated in the graph at right.

SURVEY QUESTION 13: THE COUNTY IS ESTABLISHING A SERIES OF PRIORITIES TO DIRECT FUTURE DEPARTMENT ACTIONS. HOW IMPORTANT OR UNIMPORTANT ARE EACH OF THE FOLLOWING?



Source: 2013 Parks and Recreation Master Plan

The pace of park improvements may not be keeping up with demand. The Department of Parks and Recreation survey also found that residents already perceive that the biggest challenges facing County parks are maintenance, lack of amenities, and lack of facilities desired by users. The diversity of facilities and programs offered, coupled with the distance between properties and their varied sizes

means that staff spend a lot of time driving from facility to facility and a great variety of equipment is needed to maintain the properties.

From a maintenance and resource perspective, it is more efficient to manage large parks, or "super parks", as opposed to smaller parks or gathering places. However, smaller neighborhood parks play an important role in fostering healthy communities. Neighborhood parks can often be reached by foot or bicycle and, thus, contribute to a healthy lifestyle and cleaner environment. Such parks or local gathering places also contribute to healthy communities – they facilitate neighbor interaction and participation in community decision-making. Such places, also called "civic spaces," are where people can get to know one another and discuss neighborhood matters. Attractive communities generally have a diversity of parks – large and small – that meet the needs of its people.

The desire for additional park facilities will need to be balanced with preserving the intent of the Open district. As an example of how this balance can be met, the CZO was amended in 2012 to exclude public shared use paths greater than 10 feet in width from the lot coverage provision. In the case of shared use paths wider than 10 feet, the Planning Director's approval is required to exceed the standard.

Accessibility to parks is a key priority that relates to community health and social equity. Parks should be accessible for people of all ages and abilities, including persons with disabilities. A pedestrian and bicycle network that connects parks with town centers and complies with ADA requirements is key to accomplishing this. When private lands are involved, it can be difficult to negotiate adequate access to shoreline and inland recreational areas. Adequate access means (at minimum) providing parking and means for the general public to access the area on foot.

To summarize, the major issues in Parks and Recreation include:

- The State and County Parks are heavily used and require more maintenance and facility upgrades than they are currently receiving. Many existing park facilities require improvement.
- Improving and maintaining existing park facilities is more important than building new facilities.
- Facilities and programs need to accommodate a population that is aging and living longer.
- The County needs both small and large parks to accommodate the diversity of user needs.
- Certain zoning regulations define how future parks production or improvement can be accomplished.

16.2 OPPORTUNITIES

In 2006, Kaua'i voters approved a Charter amendment that created the Department of Parks and Recreation. As a result there is now greater capacity to manage and improve the parks system and facilities.

The County's Department of Parks and Recreation developed and adopted its *Master Plan* in 2013. The Plan is aligned with the 1978 *Parks and Recreation Master Plan*, 2000 *General Plan*, and 2009 *Statewide Comprehensive Outdoor Recreation Plan*. It contains four primary goals that build on previous planning work and address the needs of current and future park and open space users. These are listed on the following page.

There are programs that encourage the community to participate in creating and helping maintain parks. These include: the County's community-based program for park improvements called Ho'olokahi, "Adopt-a-Park", and partnerships with other local departments or schools and non-profits. Other mechanisms for collaborating can be explored.

Sometimes the Department may collect a fee for a facility's use. Adjusting fees and improving the deposit program to better match public demand and expenses would help to recapture a portion of the costs for facility maintenance and upkeep.

Goals of the 2013 Parks and Recreation Master Plan

1. Parks and Recreation Facilities – to provide outstanding support and services for a variety of park and recreation experiences;
2. Physical and Cultural Resources – to ensure stewardship of the natural, historic, and cultural environments for long-term recreational use and enjoyment;
3. Recreation Programs – to provide recreation programs that reflect the interests on Kaua'i citizens and improve their quality of life and well-being; and,
4. Planning, Coordination, and Implementation - to promote implementation of the Master Plan.

While the preservation and public access to natural and cultural resources has always been critical, Kaua'i has a new tool with which to implement its goals. The Public Access, Open Space, and Natural Resources Preservation Fund (Fund), was established in 2002. The Fund receives a minimum of 0.5% of Kaua'i's annual certified real property taxes. Ordinance No. 936, enacted in 2012, increased the set aside to 1.5% of real property taxes. The Fund may be used to acquire land or property entitlements for: public outdoor recreation and education; preservation of historic or culturally important land areas or sites; protection of significant habitats or ecosystems; preserving forests, beaches, coastal areas and agricultural lands; conserving land to reduce erosion, floods, landslides and runoff; improving or acquiring public access for all people to public land and open space; and, conserving land for scenic views. Shared use paths – one of the top priorities identified in the Parks and Recreation master planning process – could be targeted for acquisition (or extension / improvement) using the Public Access Fund.

The Public Access, Open Space, and Natural Resources Preservation Fund Commission (aka "Open Space Commission") was formed in 2004 to solicit public input and work with the Planning Department to develop an annual list of priority projects to be considered for funding. Other funding opportunities include Hawai'i's Legacy Land Conservation Program and the Land and Water Conservation Fund administered by the U.S. Department of the Interior.

The 2014 *Draft Infrastructure & Public Facilities Needs Assessment Study* suggests that the park dedication fee assessed at the time of subdivision approval is too low and does not capture the true costs of facilities and land needed to meet the requirements of a growing population. The Needs Assessment Study recommends that the park dedication fee be replaced with a Park Land and Facilities Impact Fee.

To summarize, the major opportunities in Parks and Recreation include:

- The Public Access Fund and Parks Trust provide funds for acquisition, access and improvements of land beyond the annual County budget.
- User fees can be adjusted to better reflect costs of maintenance, or be instituted to generate funds for improvements.
- Research on impact fees reveals that the park dedication fee could be revised and updated.

- Partnerships with other entities can expand the Department of Parks and Recreation's ability to keep facilities clean and functioning properly, as well as instill a sense of ownership in the contributing public.

16.3 HOW THE 2000 GENERAL PLAN TREATED PARKS AND RECREATION

- The Parks and Recreation section in Chapter 8 of the 2000 GP addresses County parks. State parks are addressed in greater detail in Chapter 3 titled "Caring for Land, Water and Culture" and Chapter 4 "Developing Jobs and Businesses" (primarily within the "Visitor Impacts on Parks and Natural Resources" sub-heading).
- The 2000 GP recognized the regulatory constraints that parks face in certain zoning districts. The 2000 GP recommended simplifying the zoning and permitting procedures for the operation of outdoor recreation activities on private lands. It also suggested clarifying the definition of outdoor recreation to include, but not be limited to, bicycle and horseback riding, hiking, off-road sightseeing, fishing, tent-camping, and other such uses, which are dependent on open lands. These recommendations remain valid, but have not yet been initiated.
- The 2000 GP recommended amending the State Land Use District boundaries to remove Wailuā Golf Course and Kukuiolono Park from the Conservation District and place them in either the Urban or the Agriculture District. The Conservation District is inappropriate zoning for actively-used recreation facilities that serve urban communities. In addition, the Conservation District Rules prohibit golf courses, which makes it extremely difficult and costly to carry out planned improvements. It is recommended that a strip of land along the Wailuā beach be retained in the Conservation District, consistent with other coastal areas through the Island. This task has not yet been initiated.

16.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on parks and recreation to be conducted by the GP Team includes:

1) The data within the 2000 GP pertaining to existing park sizes, categories and locations can be updated with the recently completed Parks Master Plan.
2) The GP could consider social equity issues. Do all communities have access to parks with a range of activities for children and the elderly?
3) Community centers may be considered for multiple purposes. For example, more centers with certified kitchens can serve as incubators. Community centers could also be used as satellite educational centers.
4) Update Table 8-9: County Parks, by District and Type from the 2000 GP with data from the 2013 *Parks and Recreation Master Plan.*
5) Discuss the goals and objectives in the *Parks and Recreation Master Plan* with the CAC, Planning Department and community.
6) The *Master Plan* includes district-specific priorities and implementation time frames that can serve as the basis for additional discussion regarding public health and multimodal land transportation initiatives.
7) Better understand the regulatory constraints that face park production and improvement.
8) The GP planning process can promote a discussion that goes beyond "how to maintain" parks, to "what kinds of places help create vibrant, healthy communities?"

16.5 RESOURCES

County of Kaua'i Department of Parks & Recreation. 2013. *Kaua'i Parks & Recreation Master Plan*.

17.0 GOVERNMENT OPERATIONS AND FISCAL MANAGEMENT

17.1 DEFINING THE ISSUES

The County's tax base is small compared to its land mass. The limited road network and distances between communities means that providing public services is expensive. Visitors need almost all the same services that residents receive. The government staff is already stretched thin, and yet the Island's population grows and their needs and expectations continue to increase. As a world-class tourist destination, Kaua'i is expected to have not only beautiful scenery, but the cleanest public facilities and most modern and attractive amenities. To do this requires working with the State, Federal entities and other counties.

While Kaua'i is managing its responsibilities, and continues to introduce new mechanisms that promote accountability and transparency, new regulations and reporting requirements are adding to the workload. Certain plans, as documented in this Paper, are outdated. Information and data gaps make decision-making difficult. Until 2002, Kaua'i County did not have a GIS database to assist in planning and relied on paper maps, but such systems, albeit useful, require regular updating. The collective proposed actions contained within the recently prepared technical reports and planning documents are likely more than the County (and its tax base) can afford or manage within the next 20 years.

To summarize, the major issues in Government Operations and Fiscal Management include:

- The GP planning process will need to prioritize actions because the government staff and resources are limited. Several recommended actions included in the 2000 GP have not yet been implemented.
- The technical reports prepared to date, already contain more recommendations than the government may be able to reasonably implement.
- Residents seek transparency in government, including but not limited to accessible performance measures.

17.2 OPPORTUNITIES

Systems that facilitate operations and fiscal management are in place. These include a streamlined government structure, management policies, and processes that assist with developing operating funds and capital improvement planning. Kaua'i has embraced a transparent reporting system and performance measures with the assistance of the Kaua'i Planning and Action Alliance. *Measuring What Matters for Kaua'i* includes critical community indicators that, in turn, facilitate decisions about the economy and the `aina. It includes qualitative and quantitative information

***Holo Holo 2020**: A plan that focuses on engaging organizations, businesses, residents and visitors to be part of creating an island that is sustainable, values our native culture, has a thriving and healthy economy, cares for all keiki to kupuna, and has a responsibility and user-friendly local government.*

on significant aspects of Kaua'i to assess the current status and to identify trends over time. For the GP Update, they can be helpful in determining if the island is moving in desired directions. And if not, the indicators help to suggest where changes in policies, programs or resource allocations are needed to correct the course. In 2012, KPAA examined 49 indicators to assess the status of:

1. Economic and Business Climate
2. Public Education
3. Community Health and Well-Being
4. Civic Engagement
5. Natural Environment
6. Land Use and Rural Character
7. Culture and Arts

These progress reports are a step in the right direction, and more can be done to improve how the County government communicates with the public and uses data in its decision-making processes.

The Planning Department has developed a systematic method to work with other departments to organize capital improvement and service priorities by providing guidance on setting priorities. This has helped establish the basis for the six-year Capital Improvement Program and County appropriations. The Planning Department's efforts to evaluate departmental proposals and align them with the GP prior to submission to County Council has contributed to a more orderly and comprehensive decision-making. A more robust grant and foundation seeking effort, plus more partnerships with other governmental agencies will supplement the County's budget.

Hawaii's impact fee legislation (Chapter 46, Part VIII of Hawaii Revised Statues Section 46-141 through 148 adopted in 1992) authorizes counties to adopt impact fees for any "types of public facility capital improvements specifically identified in a county comprehensive plan or a facility needs assessment study". Impact fees can be instituted to cover some of the costs of increasing public infrastructure and facility capacity in anticipation of population growth. According to the *Draft Infrastructure & Public Facilities Needs Assessment Study,* "Essentially, impact fees require that each developer of a new residential or commercial project pay its pro-rata share of the cost of new infrastructure facilities required to serve that development." The study recommends assessing uniform county-wide fees for transportation, parks (park and facilities or just facilities), fire, police and solid waste.

Depending on the type of land use – single family, multi-family, hotel/motel, commercial, industrial – the one-time fees range from approximately $8,000 to $20,500 per unit (i.e., dwelling, room, or 1,000 square feet) and could be collected at the building permit (or certificate of occupancy) stage. If such fees are adopted, the County would need to develop the administrative capacity to collect, account for, expend in a timely manner, and update regularly the fees. In addition to deciding whether to recommend the adoption of impact fees in the GP, other considerations will be necessary. For example, impact fees may be perceived as increasing the cost of living on Kaua'i.

To summarize, the major opportunities in Government Operations and Fiscal Management include:

- Under the theme of Kaua'i Kākou, the public sector, private sector and non-profits can assist with implementation of the GP actions.
- Methods to better document GP implementation progress can be included in the GP. Develop indicators of progress where they do not exist.
- Impact fees may be called for to assist with infrastructure capacity in anticipation of population growth.

17.3 HOW THE 2000 GENERAL PLAN TREATED GOVERNMENT OPERATIONS AND FISCAL MANAGEMENT

- The Government Operations and Fiscal Management topic will require significant attention because the 2000 GP text is quite limited. It was limited because of "Implementation", public facility plans, and financing, the production of development plans for communities, and what the Planning Department's role is in GP implementation, necessary zone changes, and GP monitoring and review.
- A role that the private sector or non-profits can play in helping implement particular components of the GP was not addressed in 2000 GP. As directed by the 2000 GP, the Planning Department has begun collaborating with community organizations to develop indicators and benchmarks to measure progress relative to the GP and to other community goals, as evidenced by KPAA Annual Community Indicators Report, Complete Streets Indicators Report, and collaborative work with the CHII.
- The Mayor's various initiatives toward more transparency and improved governance are readily available and can be incorporated into the updated GP.

17.4 IMPLICATIONS FOR THE GENERAL PLAN UPDATE PROCESS

Work on government operations and fiscal management to be conducted by the GP Team includes:

1) Specify actions the government can take to implement the recommendations contained in the GP.
2) Identify how the government can work more effectively with the State to accomplish actions recommended in the GP.
3) Consider technological advancements and best design practices that offer cost-effective opportunities for implementation of GP actions.
4) Discuss public / private/ non-profit partnerships to implement actions in the General Plan and to increase participatory governance and Kaua'i's self-sufficiency.
5) Consider a policy on impact fees and gather community feedback on it.

17.5 RESOURCES

County of Kaua'i. July 2013. Kaua'i's Community Health Needs Assessment

Holo Holo 2020. *Annual Report 2013-2014, County of Kaua'i*.

Kaua'i Planning and Action Alliance. January 2014. *Measuring What Matters for Kaua'i: Community Indicators Report 2014*.

Group 70 International. August 1, 2014. *County of Kaua'i, Infrastructure & Public Facilities Needs Assessment Study (Draft).*

This page intentionally left blank.

18.0 OVERARCHING THEMES

The policy areas listed in this paper do not exist in isolation. They are inherently linked to one another. The General Plan includes all of these policy areas precisely because they are related. Actions in one policy area impact other policy areas. This paper attempts to capture the complexity of these links. The GP planning process will bring greater clarity to these issues, acknowledge the tension that sometimes exists among policy areas, and identify actions that can lead to the realization of the Vision for Kauaʻi.

Below is a summary of the overarching themes that emerged from the review of policy areas. These themes reflect what has been heard from the public, County staff, and CAC to date, as well as the information contained in the technical reports and other planning documents.

KAUAʻI KĀKOU: SUSTAINABILITY AND STEWARDSHIP

- Kauaʻi has a finite ecological and financial carrying capacity. That is, its environmental systems (resources used and waste generated) and tax base (ability of the tax base to finance improvements) are not unlimited. Thus, they may limit or set directions for future growth. The General Plan will be governed by the overarching theme of Kauaʻi Kākou: We're moving forward together to collectively plan for a more sustainable Kauaʻi, in the spirit of malama ʻāina (stewardship of the land). Coupled with the value of "Lōkahi", or collaboration and teamwork, "Kākou" promotes synergy when developing solutions and alternatives. A corollary to this is transparency and accountability starting with a honest look of where Kauaʻi is in achieving the Vision laid out in the 2000 GP. The GP Update can provide a vision and tools for allowing for growth, positive change, and vibrancy within the context of preserving the rural and historic character and natural resources for today's population and future generations. Achieving a more healthy and resilient way of living involves the collective stewardship of resources.

INFRASTRUCTURE AND GROWTH MANAGEMENT

- Infrastructure systems - water, sewer, solid waste, roads- are close to or exceeding existing capacity. Unless expanded or improved, these infrastructure systems will limit development, job opportunities, and housing growth. Given Kauaʻi's commitment to sustainable development, alternatives such as green infrastructure (systems and practices that use or mimic natural processes to manage wastewater and stormwater), complete streets design, and decentralized/distributed systems for electricity, water, wastewater treatment, and other services may be viable compared to traditional methods of providing such services. The extension of water and sewer lines often results in new development in a linear manner along the line; whereas, decentralized systems and green infrastructure can provide service in very specific areas. Regardless of how services are provided, decisions regarding growth and where growth occurs, including the infrastructure required by growth, must be directed by the GP, and not the availability or unavailability of infrastructure.

DISASTER-RESILIENT ASSETS

- Kauaʻi's physical assets include components of the built and natural environment without which the entire island would suffer. Physical assets can be assessed in terms of their vulnerability to climate change and the like. Kauaʻi has approximately 90 miles of coastline and 60 beaches, with more beach shoreline than any other Hawaiian island. Flooding and related hazards will be exacerbated by climate change and sea-level rise. Without actions that result in greater resiliency and the ability to adapt to existing and future hazards, the natural and built

environment are and will both be threatened. Roads and infrastructure close to the shore, including Kaua'i's landmark beaches, will be affected. Climate change and sea-level rise will negatively impact Kaua'i's major industries - agriculture and tourism. Land uses and design along the coast and some mauka areas will need policies for protection.

FUTURE USES OF AGRICULTURAL LANDS

- A large amount of land is zoned for agricultural purposes at a time when the industry is in transition. This includes 144,000 acres in the State Land Use Agricultural District, within which 80,000 acres, or 41%, are located in the 2000 General Plan Agricultural District. Concern regarding GMO-type crops and availability of water for irrigation purposes have opened discussions on what kinds of agricultural uses are needed and where. "What to do with agricultural lands" is a food security and resilience issue. Pressure to open lands for housing, as well as the desire to maintain open spaces, a workforce familiar with farming practices, and interest in locally produced food for both local consumption and export, may support growth boundaries and the maintenance of agricultural lands.

COST OF LIVING

- The cost of living continues to increase. Housing costs are extremely high, and the pace of production of affordable housing is inadequate to serve the need. In February 2015 the *Honolulu Star-Advertiser* reported that the median sale price for single-family houses on Kaua'i was $730,000. Sixty percent of the housing inventory is affordable to less than 25% of residents, contributing to the concern that parts of Kaua'i are becoming places for only the wealthy. According to HUD income limits, the majority of the existing housing supply can only be afforded by households earning over 180% of the average median income. Kaua'i households spend an average of 62% of their income on housing and transportation. Kaua'i's utility rates, especially electricity, are some of the highest in the United States. Kaua'i residents are creatively managing the high cost of living by supplementing groceries with backyard food production, recycling, bartering, second and third jobs, bicycling/car-pooling to work, and turning living rooms into bedrooms for long-term guests and extended family. However, there is evidence that these solutions aren't enough. The number of homeless individuals and families is increasing. Youth are leaving rural communities or the Island to find better opportunities, leading to a deterioration in the community fabric. There are certain contributing factors, like shipping costs, that Kaua'i cannot control; but opportunities for the public/private/non-profit sector production and maintenance of affordable housing and reduction of transportation costs (the other large household cost) are available.

NEED FOR A MORE DIVERSE AND VIBRANT ECONOMY

- Both the existing 2000 General Plan and in the Comprehensive Economic Development Strategy (2010) for Kaua'i identify the need to encourage diverse economic growth opportunities that will provide living-wage employment to Kaua'i residents. This includes identifying convergences between smaller economic clusters with high growth potential, supporting entrepreneurs, small businesses, and increasing economic opportunity for all ages. By implementing policies and programs that meet shared needs with growth clusters, the GP has an opportunity to strengthen the island's economic base, and therefore also strengthen the County's ability to implement the GP vision.

PUBLIC, PRIVATE AND NON-PROFIT SECTORS PULLING TOGETHER IN THE SAME DIRECTION

- Many non-profit organizations and citizen groups are committed to Kaua'i's improvement over time. The 2000 General Plan focused predominantly on government services and actions paid for with tax revenue. Given the independent nature of Kaua'i's residents and desire for greater self-sufficiency, the energy of existing non-governmental entities can be harnessed to implement actions proposed in the General Plan. An option worth examining, given the limitations of the existing tax base and the GP Update's over-arching theme of Kaua'i Kākou, involves more County partnerships with non-profits and the private sector, as well as fee for service programs and privatization of services for more inclusive stewardship.

VIBRANT, WALKABLE TOWNS AND HEALTHY COMMUNITIES

- Kaua'i's historic, walkable towns surrounded by open spaces are the backbone of future development. They not only draw visitors, but serve as gathering places for residents. The idea is to preserve and improve the existing urban fabric with appropriate infill and age-friendly public spaces to promote safe and pleasant multi-generational communities. Complete streets are needed such that people can walk and bike to and within town centers. Mixed-use, dense communities where people shop, live affordably, work and play contribute to healthy communities.

SUMMARY

The table below shows how the overarching themes capture the various policy areas in the GP contract.

Overarching Themes	Policy Areas
1. **SUSTAINABILITY AND STEWARDSHIP: How to protect the environment and quality of life for today's population and future generations?**	• Sustainable Kaua'i • Land Uses & Growth Management • Tourism • Economic Development • *all the rest!*
2. **INFRASTRUCTURE AND GROWTH MANAGEMENT: Infrastructure systems are close to or exceeding existing capacity, thus limiting development and, in turn, job growth.**	• Infrastructure & Services • Land Uses & Growth Management • Public Health • Renewable Energy • Economic Development
3. **DISASTER-RESILIENT ASSETS: The impact of sea-level rise and climate change on agriculture, tourism, and infrastructure.**	• Economic Development • Climate Change & Hazards • Natural Resource Management • Cultural & Heritage Resources • Parks & Recreation
4. **AGRICULTURAL LANDS: How much, whether to designate, how to protect?**	• Agricultural Lands • Open Space & Access • Affordable Housing • Cultural & Heritage Resources • Public Health • Economic Development
5. **COST OF LIVING: Maintain / produce affordable housing and reduce transportation costs.**	• Affordable Housing • Multimodal Transportation • Government Operations & Financing • Coordination with the State • Coordination with DHHL
6. **NEED FOR MORE JOBS AND A DIVERSE ECONOMY: How to diversify?**	• Economic Development • Infrastructure • Multimodal Transportation
7. **KAUA'I KĀKOU: PUBLIC, PRIVATE AND NON-PROFIT SECTORS PULLING TOGETHER IN THE SAME DIRECTION: How to harness the energy of existing non-governmental entities as a means of implementing GP actions.**	• Government Operations & Financing • Coordination with the State
8. **VIBRANT, WALKABLE TOWNS AND HEALTHY COMMUNITIES How to maintain and improve the compact urban fabric?**	• Sustainable Kaua'i • Land Uses & Growth Management • Public Health