

Planning for Sustainable Tourism



Part I: Summary Report

April 2006

DBEDT
THE DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
STATE OF HAWAII

P.O. Box 2359 - Honolulu Hawaii 96804
Street Address: 250 South Hotel Street, 4th Floor

This report has been cataloged as follows:

Hawai`i. Dept. of Business, Economic Development and Tourism.

Planning for sustainable tourism; project summary report. Honolulu: 2006.

1. Tourism-Planning-Hawaii. 2. Tourism-Government policy-Hawaii. 3. Sustainable development-Hawaii.

G155.H3.H32.2005

TABLE OF CONTENTS

EXECUTIVE SUMMARY	6
Project Organization and Goals	6
Key Project Accomplishments.....	7
Major Findings about Tourism Impacts and Constraints on Tourism.....	8
Modelling Study	8
Socio-Cultural & Public Input Study	9
Infrastructure and Environmental Studies	11
Framework for Managing Tourism	12
Sustainable Tourism Framework vs. "Tourism Carrying Capacity".....	12
A Vision for Sustainable Tourism in Hawai'i	13
Proposal for a Sustainable Tourism Management System.....	13
Summary of Major Recommendations.....	14
INTRODUCTION	17
Focus on New Information & Policy Tools	17
Goals and Objectives	17
Project Components.....	18
Related Study.....	18
Study Area.....	18
Organization and Supervision	18
Timeline	18
Key Project Accomplishments.....	19
The Project Reports	20
PART I HOW TOURISM IMPACTS HAWAI'I.....	21
Size, Scope and Evolution of Tourism.....	21
Dominance of Tourism in Hawai'i's Economy.....	21
Projections for Tourism Growth.....	22
Tourism's Evolution	24
Tourist Towns vs. Planned Resorts	25
Emerging Tourism Trends.....	25
How Tourism Impacts the Economy and Infrastructure	26
Hawaii Sustainable Tourism Modeling System.....	26
Overall Economic Impacts of Tourism	26
The Impact of Visitor Expenditures	27
Tourism Impacts on the Infrastructure	29
Effects of the Visitor Mix.....	32
How the Economy Adjusts to Changes in Tourism	34
What if Visitor Growth Stopped? The Impacts of No Visitor Growth.....	34
What if We Cannot Supply Labor for Tourism Growth?.....	35
How Does Tourism Affect In-Migration?	36
Long-Range Growth Scenarios.....	38
Projection Caveats	38
Tourism Growth Rates and the Standard of Living	39
Long-Run Impact of Tourism on Infrastructure	40
Growth Impacts by County.....	41
County Infrastructure Capacities and Alternative Growth Scenarios.....	43
Water Resources.....	43
Solid Waste	44
Transportation	47
Highways.....	47
Air	48
Harbors.....	48
Growth Impacts on Accommodations	48

Impact of Tourism on Hawai`i’s Social and Cultural Resources49

- Historical Issues Regarding Tourism 50
- Contemporary and Emerging Socio-Cultural Issues 50
- Tourism and “Spillover Effects,” Crime, and Housing 52
- Tourism “Spill-Over” into Resident Daily Lives..... 52
- Tourism Effect on Crime in Hawai`i..... 52
- Tourism and Housing Costs 53
- Resident’s Attitudes and Concerns about Tourism 54
- Attitudes on Emerging Tourism Issues 54
- Visitor Industry Jobs and Tourists 54
- “Sustainability” and Product Quality 54
- Rating the Visitor Industry & Government 54
- Overall Attitudes on Visitor Industry Growth 55
- Tourism Overload 55
- Things Tourism Makes Better or Worse..... 57
- A Native Hawaiian Perspective on Tourism 57
- Historical Context in Which Native Hawaiians View Tourism 57
- Observed Impacts on Native Hawaiians 58

Tourism and Environmental Resources59

- Overall Environmental Assessment 60
- Population..... 60
- Beach and Near-shore Environment..... 60
- Terrestrial Environment..... 63
- Alien & Invasive Species 65
- Priority Site Inventory and Assessment 66
- Overall Evaluation of Identified Sites 66
- Priority Sites 68

PART II MANAGING THE FUTURE OF TOURISM 69

Finding a Framework: Carrying Capacity vs. Sustainable Tourism.....69

- The Notion of “Carrying Capacity” 69
- Difficulties of Applying Carrying Capacity to Tourism 69
- Alternatives to “Carrying Capacity” 70
- Sustainable Tourism Management Framework 70

Recommendations of the Sustainable Tourism Study Group71

- A Vision for Sustainable Tourism in Hawai`i 72
- Priority Action Recommendations 73
- Things the Group Felt Strongly About..... 74
- Study Group Document and Hawai`i Tourism Authority Strategic Plan..... 74
- Unresolved Topics..... 75

Proposal for a Sustainable Tourism Management System.....76

- Existing Models 77
- Possible Configurations of a Hawai`i Sustainable Tourism Management System 77
- What Groups Might Participate in a Hawai`i Sustainable Tourism System? 78

Comprehensive Recommendations79

- Modeling Consultants..... 79
- Socio-Cultural and Public Input Consultant..... 81
- Native Hawaiian Advisory Group 83
- Best Practices and Hopes for an Improving Industry..... 83
- Specific Recommendations..... 83
- Infrastructure Assessment Study Consultant..... 84
- HTA Natural Resource Assessment Consultant 86

Advisory Groups and Members90

List of Tables

Table 1: Overview of the Economy, 1997	21
Table 2: Visitor Forecast to 2030	23
Table 3: Projections of De Facto Population and Tourism Proportion by County to 2030.....	24
Table 4: Overview of the Economy, 1997 (\$ million and percent).....	27
Table 5: Economic Activity and Infrastructure Demand in Hawai'i, 1997	30
Table 6: Direct and Indirect Infrastructure Demand, 1997	31
Table 7: Average Daily Infrastructure Demand, 1997.....	31
Table 8: Increase in Infrastructure Use with \$ Million Increase in Visitor Spending.....	32
Table 9: Impact of \$1 Million Increase in Visitor Spending, by Visitor Type.....	33
Table 10: Labor Growth with No Visitor Growth (% change).....	35
Table 11: Visitor Expenditure Growth with No Labor Growth	36
Table 12: Visitor Expenditure Growth and Perfectly Elastic Labor Force Growth	37
Table 13: Visitor Expenditure Projections to 2030	38
Table 14: Employment Projections to 2030.....	38
Table 15: Hawai'i 2030: Low, Baseline, and High Visitor Growth Scenarios.....	39
Table 16: Projected Infrastructure Demand for Alternative Growth Scenarios.....	40
Table 17: County-Level Real Visitor Demand Projections	41
Table 17: County-Level Real Visitor Demand Projections (Cont.)	42
Table 18: Projected County Water Demand and Sustainable Yields	44
Table 19: Projected Generation of Solid Waste, Pounds Million	45
Table 20: Selected Island Differences, Tourism Impact Index	56
Table 21: Observed Impacts on Native Hawaiians	58
Table 22: Priority Site List.....	68

List Of Figures

Figure 1. The Impact of a \$1 Million Increase in Visitor Spending.....	28
Figure 2. Projected Regional Trigger Points for Solid Waste Disposal.....	46
Figure 3. Projected Occupancy Rates with Fixed Hotel Room Inventory.....	49
Figure 4. 2003 Survey Results – “tourism Impact Index”	56
Figure 5. General Conceptual Model for Data-Driven Sustainable Tourism.....	76

EXECUTIVE SUMMARY

Through Act 259 of the 2001 Legislature, the Department of Business, Economic Development and Tourism (DBEDT) secured funds to begin looking how to Hawai'i can better monitor and manage future growth in tourism. The Sustainable Tourism Project has been primarily a research study, designed to fill the gaps in our knowledge about the impacts of tourism and support discussion of better policies for long management of the activity. In particular, an important goal was to develop new analytical tools for assessing alternative tourism growth scenarios.

Project Organization and Goals

The project was divided into several separate studies, each under the responsibility of a major consultant. The studies included:

- **Infrastructure & Environmental Overview Study:** conducted by the firm Carter and Burgess, Inc., Pericles Manthos, project director.
- **Economic & Environmental Modeling Study:** conducted by the consulting firm of R.M. Towill (James Yamamoto, project director) and their modeling subcontractor, Progressive Analytics, Inc. (Drs. Denise Konan and Karl Kim), and with the assistance of the University of Hawai'i Economic Research Organization and University of Hawai'i Department of Urban and Regional Planning.
- **Socio-Cultural & Public Input Study:** conducted by the firm of John M. Knox and Associates, with assistance from Market Trends Pacific, Dr. Kem Lowry, Dr. Peter Adler, and Mr. Harvey Shapiro

Independent of the Sustainable Tourism Project, the Hawai'i Tourism Authority (HTA) conducted the **Natural Resource Assessment Study** under a separate contract with the planning firm, PBR Hawai'i (Vincent Shigekuni, project director). That study addressed environmental and public facilities impacts associated with tourism that were not part of the Sustainable Tourism Project scope of work, but which dovetailed with its purpose and goals. Therefore, excerpts from the findings and recommendations of that study are included in this report.

The study team established two major goals for the project:

1. Develop an analytical tool (specifically a system of computer models) to assess the impacts of tourism growth on the major economic sectors and infrastructure elements, in order to assist in proactive policy responses to the long-run growth of tourism.
2. With the models and other research means, examine the impact of visitors on the economy, the State's physical infrastructure, the natural environment, and on socio-cultural aspects of the community.

The project was conducted under the authority of the DBEDT Director, with the input and assistance of the HTA and the Office of Planning (OP). Several advisory groups also assisted in the project. The Infrastructure and Environmental Overview Study was conducted during 2002. The Socio-Cultural and Public Input Study was conducted between 2002 and 2004. The Economic Environmental and Modeling Study was also conducted between 2002 and 2004, however the final report was amended in late 2005 to clarify some results. The Project Summary Report was prepared in late 2005. Drafts and some final reports from the consultants were posted on a web site development for the project the DBEDT website at various intervals during the project for public comment. These materials served to generate feed back from stakeholders and to allow agencies and interest groups to act on the findings of the project on an ongoing basis.

In particular, it is important to note that information and recommendations in this summary and the project reports reflect the situation at the time of the consultants' research. In a number of cases agencies, in particularly the HTA, have addressed many of the recommendations and incorporated findings into recent plans and policies such as the HTA Tourism Strategic Plan. HTA has also completed an accommodations study and organized both a Hawaiian Cultural Advisory Council and Natural Resource Advisory Group, among other actions.

Key Project Accomplishments

The Sustainable Tourism Project achieved a priority goal through the development of a new modeling system to analyze the effects of alternative tourism growth scenarios. The development of the *Hawaii Sustainable Tourism Modeling System*, gives the State a new tool to translate tourism spending into impacts on a broad range of economic, infrastructure and natural resources. The heart of the modeling system is a new-generation, econometric model that can estimate the impact of various tourism growth scenarios on the supply-side of Hawai'i's economy – labor resources, price impacts and the load on key infrastructure and natural resources. In addition, a new geographic (spatial) distribution model can estimate how these impacts might be felt in nearly every community around the state, as well as at the higher, county levels. The Sustainable Tourism Impact Modeling System is a work in progress. It will need constant refinement and improvement to reach its maximum potential. However, even in its present form, it is able to address important policy questions, such as the impact that different tourism scenarios have on labor growth, average income and prices. In addition, it can look at the impacts on the economy and industry if labor or other resources are in short supply.

Another achievement of the project is consensus among a diverse group of stakeholders on principles, guidelines and measures for sustainable tourism. The six-point vision of the Sustainable Tourism Study Group supplemented by specific recommendations has already had a positive influence on tourism management, with a number of elements reflected in the new HTA Tourism Strategic Plan 2005 to 2015. The framework for sustainable tourism recommended by the Socio-Economic and Public Input consultant provides ideas on alternative structures for an ongoing sustainable tourism program. The report of the Native Hawaiian Advisory panel has added further perspective on how tourism can better serve the broader social and cultural interests of the state.

Other key results include:

- A benchmark survey of how Hawai'i's residents view the role and future of tourism in their lives and community was conducted. The survey underscored the difference in the way tourism is perceived between residents of Oahu and the Neighbor Islands.
- The first ever set of "trigger points" were identified for such infrastructure systems and resources as solid waste disposal, water use, and visitor accommodations.
- Recent and emerging trends in tourism were identified with more clarity, and analyses of tourism "spillover effects," and tourism's relationship to crime and housing issues have been explored.
- A statewide infrastructure assessment was completed that will help the state and counties better understand and address the gaps in information about our infrastructure, its use and its limitations that are so critical for well-manage future growth of tourism and the economy.

Many major state and county specific issues were addressed and there are an abundance of thoughts and recommendations coming out of this study that will take time to digest and address. The sustainable tourism framework, supported by the new modeling techniques developed in the

project, are potentially a significant leap forward in the management of tourism, not only in Hawai'i, but in other regions struggling with these same issues.

Major Findings about Tourism Impacts and Constraints on Tourism

Modeling Study

This study developed a new set of economic and geographic models (the *Hawaii Sustainable Tourism Modeling System*) that help show how tourism impacts the economy, labor force, major infrastructure and some key environmental resources. The models were used to perform an initial assessment of the major current and potential future impacts of tourism on the economy and infrastructure. Some of the more significant results of this assessment follow.

- **Tourism continues to be the state's dominant industry.** There are currently no comparable activities outside of tourism that would generate substitute levels of income and standard of living for Hawai'i's current population. Given this dependence, the incomes of all Hawai'i residents are tied more or less to the visitor industry.
- **Most sectors grow as tourism expands.** The sectors that see the greatest growth in job creation include retailing, restaurants, hotels, and air transport.
- **Not necessarily all sectors grow with tourism.** Some sectors that are sensitive to competitive prices and wages such as plantation agriculture and export manufacturing can apparently be impacted negatively by growth of tourism, according to modeling results. This is partly because tourism growth tends to create a high-cost environment in which Hawai'i's exports apart from tourism become less competitive. Tourism growth also attracts labor away from less competitive export sectors. Competitive pressures keep those less competitive industries from raising wages enough to keep workers. This result is one that deserves study in the future as the CGE model is further refined.
- **Residents have a larger overall impact on key infrastructure and resources than do tourists.** The direct and indirect demand for the infrastructure resources by individual tourists (at least for the resources of water, sewer, electricity, gas, highway gas and diesel addressed in the study) is greater than for individual residents on an average. But on a total basis, residential demand for these particular infrastructure services greatly exceeds that of not only tourists, but also total industrial demand. Thus, while this study was focused on the issues of tourism growth, it is clear that there are larger issues related to Hawai'i's overall patterns of growth and the resulting load on infrastructure that deserve attention.
- **Determining the relative advantages of the various geographical visitor markets for Hawai'i is not a simple task.** Different geographical visitor markets have different impacts. The modeling analyses revealed significant differences between various visitor groups and their spending patterns and their resulting impacts. But it found that there is no simple answer to which geographical visitor market is better for Hawaii. They each have their strengths and weaknesses. The various markets need constant monitoring to assess their impact on a current basis to allow good policy.
- **In model scenarios that forced the economy to adjust to changes in tourism it was found that some growth in tourism is necessary for Hawai'i to maintain its standard of living as measured by average income. But too much growth can lead to excessive demand for labor, which will also have a number of negative effects.**
 - If tourism fails to grow, average wages and, thus the standard of living, will edge down. On the other hand, a lower cost structure will help a number of Hawai'i's other export sectors become more competitive and exports from those other sectors will be stimulated. It is not clear if the growth in those other sectors would be sufficient to eventually

substitute for the loss of tourism growth and bring the standard of living back to earlier levels.

- In a scenario in which tourism grows and the workforce labor expands to accommodate that growth, GSP increased a bit, but the average income did not increase.
 - Finally, in a scenario which tourism is not able to expand the model predicts that a high-cost environment will develop, as a growing visitor industry offers higher pay to attract workers is willing to pay more for other inputs. Tourism output is able to grow under this scenario, but only by attracting workers and resources from other areas of the economy. This could be a potential scenario for Hawai'i in the future as the baby boom generation begins to leave the labor market here and elsewhere.
- **Long-run growth scenarios also tend to show that more measured growth in real visitor expenditures tends to promote a higher growth in average income for Hawai'i residents.** When scenarios for a low-, base (most likely) and high-growth, long-term visitor expenditure growth trends were evaluated by the model, it showed that the lower the growth rate in tourism the higher the real average income among workers and proprietors. This happens because tourism-generated growth tends to create relatively more low-paying jobs (under its present staffing and skill level characteristics). Faster growth also tends to accelerate inflation, which lowers real income.
 - **Higher visitor growth does generate higher overall GSP, however faster growth means increased strain on the infrastructure and resources.** The increased tourism growth supports a higher growth in resident population, more overall economic activity and as a result more demand for infrastructure and use of environmental resources. However, it is important to note that this impact of higher GSP would be a factor regardless of the source of economic growth, be it tourism, technology, defense, or agriculture. This underscores the importance of long-term infrastructure/resource planning and investment for the long-term economic future of the state and counties, regardless of the economic base.
 - **A county by county "trigger point" analysis performed by the modeling team for key infrastructure showed that slower long-term visitor growth would delay the onset of "critical" levels of demand.** However, as discussed above public infrastructure like water, sewers, solid waste, roads and public transportation are primarily linked to over all economic growth, not just tourism. Moreover, many emerging constraints are very region- and even community-specific and will need more focused, local study to identify limits and remedies. For instance, water resources around the state appear to be adequate for projected future growth for the counties as a whole. However, the costs and issues related to long-term development and distribution of water resources as well as providing for the treatment of the resulting sewerage, remain to be fully explored and resolved at local levels.
 - The major *private* infrastructure constraint impacted directly by the visitor industry is accommodations. **Kaua'i and Honolulu already face an impending shortage of hotel rooms, followed next by Maui and then the Big Island.** Based on analysis of the state's hotel room capacity it was determined that as occupancy rates reach more critical levels, visitors will increasingly seek alternatives to hotels including time-shares, condominiums, and other accommodations.

Socio-Cultural & Public Input Study

From the socio-cultural research and survey input, the following major findings emerged:

- **Tourism forced a number of significant changes in Hawai'i historically.** The development of tourism broke down some of Hawai'i's social isolation and exposed workers and communities to outside values and customs. While tourism may have preserved many

local communities, it changed their size and nature, and altered their social structure. In particular, communities like Lahaina, Kailua-Kona, and others have gradually become less residential communities and more “tourist towns.” In Waikīkī the multi-ethnic “local” resident population was largely replaced by Caucasian and/or Mainland-born residents. The issue of whether Waikīkī should be oriented solely to visitors or if a residential component should be nurtured more, is an ongoing debate.

- **Emerging tourism issues revolve around the consequences of relatively few new hotel developments expected in the foreseeable future.** The consensus of experts interviewed for the study is that new visitor accommodations in the foreseeable future will more likely take the form of cruise ships, timeshare, bed-and-breakfasts (B&Bs) and vacation rentals, as well as the continued development of recreational real estate (vacation and retirement homes). These options are raising new social, political, and cultural concerns, especially on the Neighbor Islands.
- **Tourism “Spill-Over” into Resident Daily Lives.** Tourists venturing out from the resort boundaries into the community can create a level of annoyance and intrusion for residents. But some types of “spill-over” are welcome, particularly visitor expenditures in local stores. Visitor spill-over activity into recreational/natural areas, coastal/marine areas and inland hiking or scenic areas is raising the cost of repairs and maintenance of visitor-stressed State parks and other environmentally sensitive areas. B&Bs and second homes outside resorts have the potential to become increasingly serious issues. They are continuing to evolve “under the radar screen” of good measurement and monitoring. Both of these contribute to concerns about tourism effects on residential housing prices.
- **Tourism Effect on Crime in Hawai`i.** This effort both reviewed past studies and also provided a new analysis of the statistical links between Hawai`i tourism and reported major crime in all four counties from 1975 to 2001. Past studies almost always turn up *some* relationship between crime and tourism, but the exact nature of the relationship varies from time to time or place to place. Some studies suggested visitors are more likely to be victimized in Hawai`i for larceny-theft. However, such studies do not necessarily say whether the greater likelihood of visitors to be victimized is a minor or major factor, whether it is large enough to make a real dent in crime statistics. This was the purpose of the new analysis. It found very little match between long-term crime trends and annual changes in the visitor population. In fact, some types of crime actually tended to decrease in years when tourism counts went up. Other potential explanations of crime – demographics, unemployment, law enforcement effectiveness – were almost always more powerful predictors than was tourism. Still, Hawai`i’s image as a safe destination is critical to the industry, so visitors’ greater likelihood of being victimized remains a concern.
- **Tourism and Housing Costs.** Periods of economic boom – whether generated by tourism growth or any other economic driver – will always tend to increase demand and thus housing values. The question is whether tourism has any *unique* effect on housing supply and costs. A survey of real estate specialists on this topic showed no consensus. Many real estate specialists contacted did feel that traditional resort hotel development and recreational real estate do have an effect on prices for ordinary residents, while price effects of B&Bs and vacation rentals are more concentrated in a limited number of (primarily oceanside) neighborhoods. However, others felt the residential housing market and tourism development are directed at separate markets and thus are not in direct competition.
- **Resident surveys show that on balance, residents are neither “pro-growth” nor “anti-growth” regarding tourism, but hold more complex attitudes.** They recognize the need to protect Hawai`i’s economic base, but also the need to protect environmental and social assets underlying that base. They tend to register fewer objections to growth if expressed as more

people (visitors or residents), but greater concern about more *hotels, development, traffic,* and especially about *depletion of fundamental assets* (water, environment, housing, etc.). They feel tourism brings more benefits than problems, but they also feel both the industry and government have not always done a good job in addressing the problems.

- **Neighbor Island and O`ahu residents differ markedly on their perceptions of tourism.** Concerns about tourism levels and growth are much higher on Maui, Kaua`i, and in West Hawai`i. This was clear from both public meetings and resident surveys. The difference is not only because low-density resorts on the Neighbor Islands absorb more land, but also because there is a much higher ratio of visitors to residents on the Neighbor Islands.
- **Concerns about tourism impact on cultural authenticity.** Residents of all islands voiced the need for the industry to encourage more Native Hawaiian participation in tourism as a way to promote cultural authenticity.
- **A Native Hawaiian Perspective on Tourism,** as expressed by a special advisory panel for this study, views tourism as based on the same Western business model tourism that characterized previously dominant economic sectors that eroded their rights and culture. Hawai`i's tourism industry is generally seen by many Native Hawaiians as having:
 - *“contributed to a degradation of their cultural values;*
 - *“compromised their cultural integrity in the global market place;*
 - *“diminished their presence in Hawai`i’s visitor centers;*
 - *“devalued their wahi-pana (sacred places); and*
 - *“seriously compromised a Native Hawaiian sense of place in places like Waikīkī.”*

Still, some examples of visitor industry activities that exemplify positive, non-exploitive approaches to Native Hawaiian culture have emerged, and represent steps towards improving the relationship between the visitor industry and the host culture.

Infrastructure and Environmental Studies

- Protection of Hawai`i's natural resources is essential for the health of the visitor industry, as well as quality of life for residents and the environment as a whole. As Hawai`i's population (both residents and visitors) continues to grow, the need to provide housing, infrastructure, resources, and recreational opportunities to this population will continue to exert pressure on the natural environment.
- Coastal and terrestrial ecosystems are the most prevalent components of the overall environment involving visitor activity. In general, the natural resources found within these ecosystems are in relatively good health. However, there are growing threats to their continued sustainability. The greatest pressures on Hawai`i's beach and marine ecosystems are erosion, pollution, loss of coral reefs, and loss of marine life.
- In Hawai`i's *mauka* or terrestrial areas, the deterioration of native forests and the loss of native flora and fauna within these habitats are the most critical environmental concerns.
- Alien (particularly, invasive) species pose a significant threat to all areas and aspects of Hawai`i's environment.

Framework for Managing Tourism

Although this project identified a number of “capacities” and limits for both tourism and resident activity around the state, it was not a goal to propose a *maximum* number of visitors that Hawai‘i can accommodate. The primary goal of the study was to develop new methods of understanding what the multitude of limits are and explore ways that tourism growth can be managed to stay within those limits.

Establishing an overall “capacity” for visitors to the state is much more complex and problematic than it may appear. The factors that enable or limit the ability to accommodate tourism are many and each part of the state has a different mix of capacities. The capacities of infrastructure and environmental resources are currently difficult to assess. The project’s Infrastructure and Environmental Study attempted to identify and measure the current use and capacity of more than 20 infrastructure elements and environmental resources at the county and sub-county levels and found serious data limitations regarding nearly all systems. Not only was it difficult to identify specific usage and capacity levels, almost no data was available to distinguish resident from tourist use of these resources.

However, through indirect estimate and modeling techniques by the modeling consultant, the project did identify the impact of tourism on a number of infrastructure and environmental resources as well as a number of specific “Trigger Points” by county that limit Hawai‘i’s ability to accommodate tourism.

Sustainable Tourism Framework vs. “Tourism Carrying Capacity”

Beyond identifying selected carrying capacities and limits, the project sought to identify a framework for the future management of tourism. However, the concept of “carrying capacity” fell short of providing such a framework.

The notion that there is an overall tourism “carrying capacity” was explored in a number of tourism regions in the 1980s and 1990s. The concept was adapted from the field of environmental studies that sought to identify the point at which relatively small, natural areas became over-used. However, research by the modeling and socio-cultural consultants found that it has been very difficult to apply the notion of “carrying capacity” developed for specific environmental areas, to the level of regional tourism.

There are several reasons why establishing a single measure for the “carrying capacity” of regional tourism is very difficult. First, as noted above, tourism “capacities” differ from community to community, and between the various infrastructure systems that serve visitors. Second, in most cases, both residents and tourists contribute to the strains on the economy, infrastructure and environmental resources. In Hawaii, the resident population is the major strain on many of the resources. Finally most “capacities” are temporary and expandable, making a given measure of capacity only a temporary constraint. Ultimately, the question is whether capacities that are at their limits should be expanded or if restrictions should be placed on the use of the resources or systems.

The notion of “Sustainable Tourism” has evolved as a better framework for understanding how future tourism growth can be better managed. Rather than looking only at numbers and limits, the focus of sustainable tourism development is on managing the balance between the costs and benefits of tourism – i.e., balancing resident v. tourist welfare, cultural and environmental interests v. economic interests, and current generations v. future generations. While there are a number of approaches to sustainable tourism its focus is twofold:

- (1) First and foremost, the *quality* of the industry – and, particularly, the assets on which it is based. Such assets include the uniqueness and appeal of the place itself, as determined by a sense of cultural authenticity, friendly workers and residents, well-maintained public

facilities, uncrowded natural and recreational areas, etc. Put another way, it is about preserving “sense of place” and/or “quality of the tourism product.”

- (2) Second, the *process* by which a given community achieves some degree of consensus on what those key underlying assets really are, as well as how to measure them and how to preserve them.

A Vision for Sustainable Tourism in Hawai`i

Using the Sustainable Tourism framework, a study group within the project composed of various interest groups crafted a Sustainable Tourism vision for Hawaii. The six major goals were:

- Sustainable tourism will reflect our own deepest values – *lōkahi* (harmony), *mālama`āina* (nourishing the land), *ho`okipa* (hospitality), *kuleana* (responsibility), and *aloha* (welcome)
- Sustainable tourism will provide good jobs, economic vitality, and diversity; provide opportunities for all sectors of the Hawai`i community; and retain as much of the benefit as possible within our own economy
- Sustainable tourism will operate in harmony with our ecosystems, enhancing natural beauty and protecting the islands’ natural resources
- Sustainable tourism will be part of a larger effort to perpetuate the customs and traditions of Hawai`i’s ethnic cultures, especially our Native Hawaiian host culture
- Sustainable tourism will reinforce Hawai`i’s heritage of tolerance, diversity, respect, and Aloha among our various ethnic and social groups, and among residents and visitors
- Sustainable tourism will be planned to protect communities’ sense of place for current and future generations

The study group supplemented each of these broad goals with more specific goals, indicators, and recommended actions to bring more teeth to the general vision. Many of these points have been subsequently incorporated into the Hawai`i Tourism Authority’s Strategic Plan for 2005 to 2015.

Proposal for a Sustainable Tourism Management System

Taking into account models developed elsewhere, the input of the project’s “Study Group” advisory body, a Native Hawaiian Advisory Committee, and socio-cultural research conducted during the project, the Knox team developed a preliminary proposal for an ongoing “Sustainable Tourism Management System.” (The proposal is explained in detail in the Socio-Cultural Report, and reflects principles developed by organizations such as the World Tourism Organization and the United Nations Environmental Program).

Knox suggests an ongoing, organized, public-private effort to maintain product quality and preserve Hawai`i’s key assets. Based on approaches elsewhere, the essential elements of the proposed system – some of them included in the HTA’s Strategic Plan adopted subsequent to his initial report – include:

- A focus on the entire, overall destination (“quality of the place”)
- Coordination by local government authority, in collaboration with working groups comprised of key industry and community stakeholders
- Development of consensus on long-term goals and actions
- Identification of indicators of success

- Adoption by an official agency with authority to implement, revise, and oversee the ongoing process.

The recommendation stresses the importance of ongoing involvement by the industry and other stakeholder groups in identifying and preserving the key assets that make Hawai'i desirable for visitors and residents alike.

Summary of Major Recommendations

The following recommendations are in an abbreviated format. They are presented in more detail near the end of this summary report.

Modeling Study

The primary mission of the modeling project was to develop a new system of models to identify relationships and suggest future limits on resources that can be the basis for policy discussions. The modeling team also provided numerous recommendations for the direction of future research and policy efforts, as summarized below.

- The difficulties in identifying limitations on tourism growth separate from the impacts and rate of overall population growth suggest that broader growth policies may be needed.
- Efforts to balance economic, environmental, and social goals need to be carefully designed and implemented to produce “win-win” solutions.
- Regardless of the number and type of tourists to Hawai'i, efforts should be made to better manage the negative, “spillover” effects associated with tourism, such as congestion, pollution, and environmental impacts. There are approaches to managing externalities that could help including tax policy, land use policy and infrastructure pricing.
- If tourism is to grow, even modestly, there is need to re-examine our policies with regard to the development of hotels and visitor accommodations, which are now constrained and creating spillover in the local housing market.
- Data and methods created in this project should be used as a basis for re-engineering the production of tourism in Hawai'i, such as more emphasis on water savings devices, smart buildings, energy-efficiency, and other new technologies that could reduce the environmental impacts of.
- There is need to develop more extensive measures of sustainable development that cut across different economic, environmental, and social domains. A plan to ensure the ongoing collection and updating of vital information related to the economy, environment, and society in Hawai'i should be developed.
- Different tourists have different impacts and additional research needs to be done in terms of identifying the optimal mix of visitors from key markets in terms of economic, environmental, and social benefits and costs

The Socio-Cultural and Public Input Study

- The State and counties should begin to define recreational real estate (vacation homes, etc.) as a separate economic activity, meriting both analysis and planning in its own right.
- The State should also expand its regular tourism research program to gather more information about two other emerging non-traditional forms of tourism in Hawai'i – timeshare and residential-area transient vacation rentals.
- To improve understanding of potential future tourism growth under existing land use permits, the State should work with counties to standardize reporting of “permitted but “unbuilt” visitor

units – including, if possible, residential units on resorts or in designated recreational real estate projects.

- The State and the HTA should focus some visitor research more specifically on the questions of satisfaction with key underlying natural and cultural assets, in order to determine the extent to which concerns about “unique sense of place” or “product quality” (vs. external factors or economics) are actually affecting likelihood of return to Hawai‘i.
- Counties should explore legalizing but more effectively regulating bed-and-breakfasts and vacation rentals.

Native Hawaiian Advisory Group Recommendations

- A voting seat on the Hawai‘i Tourism Authority for the *Office of Hawaiian Affairs* and the *Native Hawaiian Hospitality Association*.
- A voting seat on the Board of Land and Natural Resources for the *Office of Hawaiian Affairs*, in order to help assure culturally appropriate stewardship for natural resources impacted by tourism.
- Provide dedicated funding to the Native Hawaiian Information Alliance – a non-advertising driven media program that seeks to connect visitors and local people with genuine Native Hawaiian cultural experiences.
- Establish by statute a *Cultural Landscape land classification or zoning district* that would serve to protect important cultural landscape communities.
- Provide dedicated funding for the development of *community-based, day tourism* as an alternative economic development business model.
- Provide dedicated funding for a cultural resource *inventory grants program* that provides financial support to community organizations or State/City agencies to develop a statewide mapping data base of each community’s cultural resources.
- Amend the environmental processes that severely limit a community’s ability to restore ancient Hawaiian fishponds to useful productivity and provide some financial support for the planning of such projects.
- State settlement with OHA of the Ceded Lands Trust. This is critical for tourism because of links to airports and harbors.
- Assess effectiveness of cultural resources management plans and monitoring programs that have been developed for tourist resort areas.
- Promote the purchase of local agricultural and marine products and services.

Infrastructure Assessment Study

- A Statewide wastewater feasibility study is recommended.
- A Statewide effort is needed to address the issue of new landfill sites on each island.
- Continued monitoring of storm water, and tracing non-point source pollution and enforcement of health violations is needed.
- Improvements at nearly all Harbors needed especially to accommodate expanding cruise industry.
- State and county parks are in need of alternative sources of funding to improve, and maintain facilities.

- Additional power, especially on Hawai`i Island, is greatly needed.
- Invasive species are a great threat to Hawai`i. A critical need is for directed leadership and coordinated actions among all state/county agencies.

HTA Natural Resource Assessment Consultant

- Protection of the environment should drive the development of management strategies and the provision of access to natural areas.
- There is general consensus that improved management of recreational resources and facilities is critical to long-term sustainability of natural resource-based areas.
- The high demand for use of limited recreational resources can often lead to competition and conflict between users (residents and visitors) of facilities and outdoor areas.
- Develop Safety and Risk Assessments and pass laws to ensure the protection of private landowners as well as the state and counties from liability
- Constraints on public access to recreational facilities and resources remains a high-priority issue, particularly given the demand for activities within natural settings.
- The expansion and promotion of the ecotourism market must be balanced by management strategies that limit over-development of tour operations and their conflicts with residents or resource managers.

INTRODUCTION

Between 2003 and 2005 Hawai'i experienced a 15 percent growth in visitor arrivals, bringing the annual visitor count to a record 7.4 million. Similar strong growth in 2000 was the impetus for this project. After nearly a decade of relatively flat tourism, a surge of visitors in 2000 renewed concerns of earlier decades about the impact of increasing numbers of visitors on our environment, infrastructure and culture. This concern was shared by a wide range of groups in and out of the tourism industry. An over-used environment and infrastructure is a detriment to both residents and visitors. In 2001, the Legislature provided funds for the Department of Business, Economic Development and Tourism (DBEDT) to begin looking at how Hawai'i can better monitor and manage future growth in tourism.

Focus on New Information and Policy Tools

The Sustainable Tourism Project was primarily a research study, designed to fill the gaps in our knowledge about the impacts of tourism and to point the direction for future efforts of a more policy-oriented nature. The major priority of the study was to develop new research tools for estimating and understanding the impact of tourism on Hawai'i. A considerable amount of data on tourists are collected and used extensively to estimate the industry's overall economic impact. However, prior to this study, not much was known about how tourism used infrastructure resources such as water, sewerage, solid waste capacity, electricity, etc. Moreover, little systematic analysis had been conducted as to how tourism impacted the socio-cultural fabric of Hawai'i, especially Native Hawaiian culture and values. In addition, it was recognized that to manage future tourism, policy makers also need information about what actions might reduce undesirable impacts while maintaining the benefits that tourism as an economic activity can offer.

Goals and Objectives

The project had two primary goals.

1. Develop an analytical tool (specifically a system of computer models) to assess the impacts of tourism growth on the major economic sectors and infrastructure elements, in order to assist in proactive policy responses to the long-run growth of tourism.
2. With the models and other research means, examine the impact of visitors on the economy, the State's physical infrastructure, the natural environment, and on socio-cultural aspects of the community.

Within the sustainable tourism framework and utilizing elements of capacity measurement as appropriate, an ambitious set of objectives evolved during the study including:

- Developing a new computer model for assessing and projecting the outcomes of different tourism growth scenarios, and helping in the development of economic policy planning.
- Examining sustainable tourism development in Hawai'i based on the way various scenarios might affect residents and visitors.
- Developing input from residents and stakeholders on how tourism can be better managed.
- Identifying links and defining impacts and limiting factors among tourist/resident activity and the stress on infrastructure and environmental resources.
- Providing recommendations to help to ensure sustainable tourism development.

Project Components

The project was divided into three separate studies, each under the responsibility of a major consultant. The studies included:

- **Infrastructure & Environmental Overview Study:** designed to compile an inventory of selected public and private infrastructure. This component was conducted by the firm Carter and Burgess, Inc., Pericles Manthos, project director.
- **Economic & Environmental Modeling Study:** developed a computerized modeling of the impact of changes on the economy and infrastructure from various levels and compositions of tourism, both statewide and in various regions of the state. This study was contracted to the consulting firm of R.M. Towill (James Yamamoto, project manager) and conducted by a subcontractor, Progressive Analytics, Inc. (Drs. Denise Konan and Karl Kim, modelers). Also assisting were the University of Hawai'i Economic Research Organization (UHERO) and the University of Hawai'i Department of Urban and Regional Planning.
- **Socio-Cultural & Public Input Study:** a multi-purpose study designed to consider socio-cultural issues that would be difficult to include in a model and to gain public and interest group input into the project. This component was conducted by the firm of John M. Knox and Associates. Subcontractors included Market Trends Pacific, Dr. Kem Lowry, Dr. Peter Adler, and Harvey Shapiro.

Related Study

Independent of the Sustainable Tourism Project, the Hawai'i Tourism Authority (HTA) conducted the **Natural Resource Assessment Study** under a separate contract with the planning firm, PBR Hawai'i (Vincent Shigekuni, project director). That study focused on the environmental resources impacted by tourism and the vulnerability of those resources to tourism activity and over-use. The purpose was to prioritize special tourism funds set aside for improving natural resources related to tourism activity. While not part of the Sustainable Tourism Project, the focus of the HTA study was closely aligned with the issues addressed in this project. Therefore, excerpts from the findings and recommendations of that study are included in this report.

Study Area

The study was statewide in scope but also focused on the four major Hawaiian Islands, where the bulk of visitor activity occurs -- O`ahu, Hawai'i, Maui, and Kaua'i. The two other populated islands with a tourism component -- Lāna`i and Moloka`i -- were included to the degree that data permitted.

Organization and Supervision

The project was conducted under the authority of the DBEDT Director, in cooperation with the Hawai'i Tourism Authority (HTA) and the Office of Planning (OP). A project team composed of staff from DBEDT's Research and Economic Analysis Division (READ) supervised the consultants with input from selected OP and HTA staff. The project also benefited from a number of advisory and peer group committees, as well as from public meetings and other advisory groups developed by the Socio-Cultural and Public

Timeline

The Infrastructure and Environmental Overview Study was conducted during 2002. The Socio-Cultural and Public Input Study was conducted between 2002 and 2004. The Economic Environmental and Modeling Study was also conducted between 2002 and 2004, however the final

report was amended in late 2005 to clarify a number of results. The Project Summary Report was prepared in late 2005.

Key Project Accomplishments

The Sustainable Tourism Project achieved a high-priority goal through with the development of a new model system to analyze the effects of alternative tourism growth scenarios. The development of the *Hawaii Sustainable Tourism Modeling System* gives the State a new tool to translate tourism spending into impacts on a broad range of economic, infrastructure and natural resources. The heart of the modeling system is a new-generation, econometric model that can estimate the impact of various tourism growth scenarios on the supply-side of Hawai'i's economy – labor resources, price impacts and the load on key infrastructure and natural resources. In addition, a new geographic (spatial) distribution model can estimate how these impacts might be felt in nearly every community around the state, as well as at the higher, county levels. The Tourism Impact Modeling System is a work in progress. It will need constant refinement and improvement to reach its maximum potential. However, even in its present form, it is able to address important policy questions, such as the impact that different tourism scenarios have on labor growth, average income and prices. Alternately, it can look at the impacts on the economy and industry if labor growth is in short supply.

Another achievement of the project is consensus among a diverse group of stakeholders on principles, guidelines and measures for sustainable tourism. The six-point vision of the Sustainable Tourism Study Group supplemented by specific recommendations has already had a positive influence on tourism management, with a number of elements reflected in the new HTA Tourism Strategic Plan 2005 to 2015. The framework for sustainable tourism recommended by the Socio-Economic and Public Input consultant provides ideas on alternative structures for an ongoing sustainable tourism program. The report of the Native Hawaiian Advisory panel has added further perspective on how tourism can better serve the broader social and cultural interests of the state.

Other key results include:

- A benchmark survey of how Hawai'i's residents view the role and future of tourism in their lives and community was conducted. The survey underscored the difference in the way tourism is perceived between residents of Oahu and the Neighbor Islands.
- The first ever set of "trigger points" were identified for such infrastructure systems and resources as solid waste disposal, water use, and visitor accommodations.
- Recent and emerging trends in tourism were identified with more clarity, and analyses of tourism "spillover effects," and tourism's relationship to crime and housing issues have been explored.
- A statewide infrastructure assessment was completed that will help the state and counties better understand and address the gaps in information about our infrastructure, its use and its limitations that are so critical for well-manage future growth of tourism and the economy.

Few studies achieve all of the objectives they set out to accomplish and this study is not an exception to that rule. For instance, given data and funding limitations, it was not feasible to provide a comprehensive set of tourism capacity constrains for every area of the state. Many very site-specific bottlenecks such as traffic, airport capacity and environmentally sensitive areas, proved to be beyond the scope of the resources or information available.

Yet many major state and county specific issues were addressed and there are an abundance of thoughts and recommendations coming out of this study that will take time to digest and address. What the study team, consultants and advisory groups are most pleased about is the framework that

has been established for future work in this critical area. The sustainable tourism framework, supported by the new modeling techniques developed in the project, are potentially a significant leap forward in the management of tourism, not only in Hawai'i, but in other regions struggling with these same issues.

The Project Reports

This Part I report is a summary report of the results of studies completed by consultants identified above. In total the project contains four parts and 20 separate volumes (not counting the separate, HTA Natural Resource Assessment Study). Consequently this summary report is only an overview and road map to the rich information contained in all the reports. The reports of the project and additional reports are contained on the project's website at www.hawaiitourismstudy.com.

Drafts and some final reports from the consultants were periodically posted on the above web site for information and public comment from 2003 on. These materials served to generate feedback from stakeholders and to allow agencies and interest groups to act on the findings of the project on an ongoing basis.

The balance of this volume summarizes the research and major findings of the project consultants and their advisory groups, public input on tourism growth, and the recommendations offered to manage future tourism growth.

As discussed below, a major priority and accomplishment of this project was the development of the *Hawaii Sustainable Tourism Modeling System*. This project summary report does not discuss details of the development and scope of that modeling system. Rather, the focus of this summary is on the results achieved in applying the modeling system and what was learned that may be useful in managing tourism. Extensive information on the modeling system is contained in the Part III, Volume III Technical Report of the modeling consultant.

It is also important to note that information and recommendations in this summary report and the individual project studies, reflect the situation at the time of the respective consultants' research. In a number of cases agencies, in particularly the HTA, have already addressed a number of the recommendations and incorporated findings into recent plans and policies, such as the HTA's 2005-2015 Hawai'i Tourism Strategic Plan. HTA has also completed an accommodations study and organized both a Hawaiian Cultural Advisory Council and Natural Resource Advisory Group, among other actions.

PART I HOW TOURISM IMPACTS HAWAII

Size, Scope and Evolution of Tourism

Compared to other sectors, tourism is distinguished both by its size and share of the state’s economy and by the fact that there are few comparable opportunities for generating external sources of income for Hawai`i’s people. While federal and military expenditures are an important part of the local economy and there has been significant growth in the services sectors (finance, real estate, education, health, etc.), tourism is Hawai`i’s main export to the world. Although there are continued efforts to develop other areas of export (high tech, health care, bio-tech, entertainment media, trade, agriculture, etc.), without the visitor industry and federal spending, there would be far fewer jobs, opportunities and dollars in our economy.

The situation is complicated by the fact that tourism in Hawai`i is a mature industry. Unlike newer destinations in which tourism is rapidly expanding, Hawai`i’s tourism industry is more advanced, stable, and unlikely to see massive expansion. However, Hawai`i, with its worldwide reputation as a tourist destination, continues to experience a significant volume of visitor arrivals, visitor spending and visitor-related services.

Dominance of Tourism in Hawai`i’s Economy

As shown in Table 1, Hawai`i’s industries generated about \$59 billion in total output in 1997.

Table 1: Overview of the Economy, 1997
(\$ million)

Selected Industry	Output	Household expenditures	Visitor expenditures	Compensation of employees
ALL INDUSTRIES	58,732.5	19,934.2	9,493.4	21,626.2
Accommodations	12,475.7	5,381.4	3,487.1	1,676.7
Restaurants	2,274.7	1,017.1	1,126.2	806.6
Retail & Wholesale Trade	6,118.5	2,998.3	1,278.0	2,401.6
Entertainment	844.3	207.3	569.4	299.7
Golf courses	229.8	88.5	141.3	93.2
Transportation	3,587.5	744.3	2,091.5	898.2
Agriculture	823.4	122.0	18.5	286.3
Manufacturing	3,416.5	683.0	296.1	516.6
Construction	3,524.3	-	-	1,247.6
Other Services	15,181.1	7,832.1	439.8	5,879.6
Utilities	1,691.0	595.3	0.0	345.6
Government	8,565.8	264.9	45.6	7,174.8

Source: Department of Business, Economic Development & Tourism, 2002, *The Hawai`i Input-Output Study*, Research and Economic Analysis Division.

Residents (households), who account for about 87 percent of the average daily population in the Islands, spent about \$20 billion on goods and services. Visitors, on the other hand, represent about 13 percent of the daily population of the Islands but spent \$9.5 billion.

Tourism expenditures represent the single largest source of economic activity in Hawai`i. DBEDT researchers estimate that directly and indirectly tourism supports about 22 percent of all jobs in the State. By contrast, it is estimated that the next largest export industry, defense activity,

accounts for about 8 to 10 percent of jobs directly and indirectly. Export agriculture accounts for about 2 to 3 percent of jobs.

The level of dependency on tourism is higher on the Neighbor Islands than on O`ahu. On any given day there are about 180,000 tourists in the Islands, enjoying the beaches, attractions, food and natural beauty. On average about 13 percent of the State's daily population is accounted for by tourists. This ranges from 9 percent of the daily population on O`ahu to nearly 26 percent in Maui County. Like residents, the tourist population utilizes resources and infrastructure systems such as water, beaches, parks, highways, power, solid waste systems, etc.

Hawai`i's tourist population arrives here from all parts of the globe, but 90 percent come from four major market areas, the Western U.S. (39%), the Eastern U.S. (26%), Japan (21%) and Canada (3%).

In 2004, the average visitor stayed an average of 9.2 days in the Islands and spent about \$1,540 during his/her trip. This calculates to about \$165 per day. However, spending varies considerably by type of visitor and by the island visited. For instance, Canadian visitors spent the least of the major markets on a per-day basis (\$123), while, Japanese visitors spent the most per day (\$240). On the other hand, Japanese visitors stay an average of only 5.8 days in the Islands compared with an average 13.5 days for Canadian tourists.

An extensive array of visitor facilities has evolved to serve this diverse visitor population. In 2004, the State had 72,614 hotel, condo and other units serving the various tourist markets. These range from budget hotels and condo units to world-class resort facilities on nearly all islands. About 50 percent of all visitor rooms were on O`ahu in 2004. Maui County had 25 percent of all rooms, Hawai`i 14 percent and Kaua`i had 11 percent of all rooms in the State.

Despite the exceptional performance of the industry in 2004 and 2005, the last decade has been a very difficult one for Hawai`i tourism. A national recession in the early 1990s depressed Hawai`i's U.S. tourism markets and overall growth until about mid-decade. But just as Mainland tourism showed signs of recovery, the Japan market slumped significantly. Initially this decline was likely the result of economic pressures. But the travel scare stemming from the 9/11 tragedy and later the SARS epidemic in Asia prolonged the slump. Since O`ahu is much more dependent on Japanese visitors than the Neighbor Islands, the latter 1990s and early 2000s were a time of belt-tightening and sober reflection on the state of tourism in Honolulu.

Projections for Tourism Growth

Long-range economic projections are not growth targets. They are simply an extension of existing trends into the future, tempered by some knowledge of constraining or encouraging factors that we think might change or reinforce past trends. Projections are meant to provide general guidance to policy makers and planners about where economic forces appear to be taking us.

The State's current set of comprehensive projections expects tourism arrivals to reach 10.8 million by 2030 compared with about 7.4 million in 2005.

Table 2. Visitor Forecast to 2030

	2004 (Actual)	Projections				
		2010	2015	2020	2025	2030
Visitor arrivals (in thousands)						
Hawai'i County	1,281.2	1,420	1,570	1,700	1,830	1,980
Honolulu County	4,464.6	5,120	5,610	6,020	6,420	6,860
Kaua'i County	1,020.9	1,230	1,360	1,470	1,580	1,700
Maui County	2,207.8	2,590	2,860	3,090	3,330	3,570
State Total	6,991.9	7,810	8,620	9,290	10,010	10,780
Average Daily Visitor Census						
Hawai'i County	23,376	25,479	28,219	30,411	32,740	35,479
Honolulu County	83,718	98,356	107,808	115,616	123,288	131,781
Kaua'i County	18,869	21,233	23,562	25,479	27,397	29,452
Maui County	45,517	51,781	57,260	61,781	66,438	71,370
State Total	171,481	196,849	216,849	233,288	249,863	268,082
Visitor expenditures (\$ million)						
Hawai'i County	1,312.0	1,488.0	1,896.6	2,384.2	2,982.8	3,740.5
Honolulu County	5,478.2	9,733.0	12,195.8	15,075.2	18,551.0	22,888.6
Kaua'i County	1,112.4	847.8	1,067.4	1,325.7	1,639.0	2,031.8
Maui County	2,959.2	2,934.0	3,716.3	4,643.0	5,774.1	7,199.0
State Total	10,861.8	15,002.7	18,876.1	23,428.0	28,946.9	35,859.8
Visitor rooms*						
Hawai'i County	10,037	11,010	11,810	12,730	13,710	14,890
Honolulu County	35,987	38,080	41,480	44,350	47,410	50,690
Kaua'i County	8,105	7,580	8,070	8,700	9,270	9,990
Maui County	18,485	19,380	21,270	22,920	24,690	26,510
State Total	72,614	76,050	82,630	88,700	95,080	102,080

*These rooms would not necessarily need to be in hotel or other land-based facilities. To the extent that the increase is made up of cruise visitors, the need for land-based accommodations would be limited.

Source: DBEDT

This is roughly a 50 percent increase in arrivals over the next 25 years, or about 1.6 percent per year. Given assumptions about the length of stay, this translates to an average 268,000 visitors in the State on the average day in 2030, compared to about 171,500 per day in 2004. The Statewide average daily visitor census would increase by about 3,700 per year. Unfortunately, because of the long time horizon, long-range projects are less helpful in projecting the composition of the various geographical markets and travel segments in the total visitor counts.

Accommodating the projected increases from a visitor-room standpoint depends on the type of visitors. If they are all land-based visitors about 29,000 additional visitor rooms will be needed by 2030 or about 1,100 per year. A little more than half of those rooms would be needed on the Neighbor Islands. On the other hand, to the extent the projected increases are made up of cruise

visitors, a much smaller increase in land-based accommodations would be needed to accommodate the growth.

While roughly 13 percent of all people in the State on the average day during 2004 were tourists, this proportion ranged from just 9 percent on O`ahu to nearly 26 percent on Maui. Projected tourism growth will increase this proportion for all counties, but not dramatically. This is because both the visitor and resident populations will grow in the future. Consequently, between 2004 and 2030, the projections anticipate the proportion of tourists in the state on the average day will increase only a couple percentage points – from 12.5 percent of the population in 2004 to 14.6 percent in 2030. Likewise, each of the counties is expected to show only a couple of percentage point increases in the proportion of tourists in the population.

Table 3. Projections of De Facto Population and Tourism Proportion by County to 2030

	2004	Projections				
	(Actual)	2010	2015	2020	2025	2030
De Facto Population*						
Hawai`i County	180,226	196,500	212,250	226,800	241,800	257,700
Honolulu County	940,858	1,011,600	1,062,100	1,109,500	1,156,550	1,202,600
Kaua`i County	78,001	84,850	91,200	97,450	103,850	110,400
Maui County	177,755	197,550	213,850	229,700	246,400	263,500
State Total	1,376,840	1,490,500	1,579,400	1,663,450	1,748,600	1,834,200
Visitors as Percent of De Facto Population						
Hawai`i County	13.0	13.0	13.3	13.4	13.5	13.8
Honolulu County	8.9	9.7	10.2	10.4	10.7	11.0
Kaua`i County	24.2	25.0	25.8	26.1	26.4	26.7
Maui County	25.6	26.2	26.8	26.9	27.0	27.1
State Total	12.5	13.2	13.7	14.0	14.3	14.6

* De facto Population is the number of people actually present in a place on an average day of the year. It is calculated as: total residents, less residents temporarily absent, plus visitors present.

Tourism’s Evolution

Hawai`i tourism has come a long way since the pre World War II era when a Hawai`i vacation was primarily limited to those who could afford passage on a luxury ocean liner, according to the Knox Study. In those days Hawai`i tourism consisted primarily of scattered lodges and hotels catering to wealthy Americans or other world travelers.

But in the 1950s and early 1960s, the combination of faster, long-range aircraft and Statehood opened the door to mass tourism. This trend resulted in the construction of lower-priced hotels and the expansion of retail and entertainment clusters, tours and attractions. In 1972, tourism surpassed military spending to become the largest single source of economic activity in Hawai`i. In that year Hawai`i hosted 2.2 million tourists who spent about \$840 million in the Islands. By comparison, an estimated 7.4 million tourists visited the State in 2005 and spent about \$11.6 billion.

According to the Knox report, the growth of tourism coincided with a decline in plantation agriculture (sugar- and pineapple-growing and processing). In 1960, about 12.5 percent of labor income in Hawai`i came from farms, agricultural services, and/or food manufacturing; but by 2000, that had fallen to just 2 percent.

Knox observed that rural-area resorts often generated more jobs than were being lost in the immediate area in sugar or pineapple. As the modeling results will suggest, this was not likely a coincidence. The demand for labor and other resources generated by tourism probably put upward pressure on the cost structure of plantation agriculture, reducing its overseas competitiveness.

Tourist Towns vs. Planned Resorts

As tourism grew, market forces and land use policies tended to encourage concentration of tourism development into resort nodes ranging from “tourist towns” such as Waikīkī to self-contained “planned resorts” like Kā`anapali on Maui and North Kohala on the Big Island. Knox observed that for many years, the prevailing paradigm of Hawai`i tourism involved the idea that the great majority of visitors would spend most of their time in these resorts, venturing only occasionally in tour buses and rental cars to visit specific scenic or commercial attractions.

O`ahu has roughly 50 percent of the State’s visitor unit inventory, the vast majority of them in Waikīkī. Like the similar, though smaller tourist towns of Lahaina, Kailua-Kona, and Kapa`a, Waikīkī was the product of a variety of different landowners and developers pursuing their own projects. The results were a dense collection of independent hotels, condominiums, restaurants and nightclubs, shopping complexes, etc. Waikīkī attracts a range of types of visitor, from high-spending Japanese to budget-conscious Canadians.

Most Neighbor Islands and rural O`ahu tourism growth over the past several decades, on the other hand, has been through master-planned resorts, Knox said. These developments generally involved tracts of hundreds or thousands of acres developed by, or obtained from, Hawai`i’s large landowners, such as at the Kā`anapali Resort on Maui developed by the Amfac Corporation. These are low-density developments with a handful of hotels intermingled with upscale golf courses, recreational activities, as well as on-resort retail complexes and recreational real estate developments (condos or home lots). The Neighbor Island visitor market on average consists of relatively higher-spending North Americans. In contrast to tourist towns, Knox noted that planned resort developments are ultimately driven by sales of recreational real estate around the hotel component of the resort.

The real estate component is central to understanding master-planned resorts in Neighbor Islands and rural O`ahu, according to Knox. In some resorts with high site development costs, hotels may have been developed (at least initially) as loss leaders, to attract buyers for the resort’s real estate products. Knox reported that through the early 1980s, the resort real estate product often was a multi-unit condominium building. It was marketed to investors who would put the room into a visitor rental pool for some or all of the year. Changes in real estate tax credit laws, coupled with the emergence of several new millionaire classes in the 1980s and 1990s (the rise of dot.com companies, for instance) produced a switch to luxury low-density villa-style condominiums and higher-priced home lots more likely to be treated as second homes.

Emerging Tourism Trends

Knox identified six major trends driving Hawai`i tourism into the 21st Century. These are covered in more detail in a later section.

1. An end to, or at least a pause in, new hotel development.
2. Emergence of timeshare development
3. Cruise ships
4. Bed-and-Breakfasts (B&Bs) and Individual Vacation Unit (IVUs) rentals
5. Growing visitor use of outdoor natural resources
6. Boom in recreational real estate

The emerging trends suggest that the “visitor industry” is diversifying into a greater and greater variety of economic activities. These activities are still related to vacations and recreation, but no longer neatly packaged in the traditional tourism bundles.

How Tourism Impacts the Economy and the Infrastructure

A major objective of this study was to provide a more complete understanding of how tourism affects our economy, including the infrastructure, the environment and or socio-cultural fabric. That effort begins with a look at how tourism impacts the economy and the infrastructure, which is an important foundation for the economy.

Hawaii Sustainable Tourism Modeling System

To study the economic impacts of tourism, a system of new economic models called the *Hawaii Sustainable Tourism Modeling System* was developed for the state by the modeling team of Drs. Denise Konan and Karl Kim. The basic model is a *Computable General Equilibrium* (CGE) model. This type of model draws more heavily than most other models before it on economic theories of how firms and individuals interact in markets. In this way the CGE model can take existing data on the structure of the economy and “simulate” how the economy will respond to changes or “shocks” to the system from outside forces like tourism spending. The CGE model was also designed to translate the effects of outside shocks on the demand for the state’s major infrastructure and natural resources. A modification of the model was created to deal with long-term tourism impacts.

A second model called a *Spatial Allocation Model* (SAM) was developed to distribute the impacts shown by the CGE model to the various geographical areas of the state based on employment levels. In this way a change in visitor spending can be traced to its likely effect on the employment, income and infrastructure loads in all major regions of the state. The modeling reports of the Sustainable Tourism Study report the conceptual notions behind these models and how they were constructed in more detail. The results help quantify the relationship between visitor activity and the supply side elements of our economy.

These models depend on input from another model, the Hawaii Input-Output model, developed by DBEDT. Details on the development and application of the modeling system are contained in Project report Part III, Volume III.

Overall Economic Impact of Tourism

Businesses in Hawai`i produce goods and services for a variety of customers. As the top of Table 4 shows, the total value of the output of Hawai`i businesses in 1997 was nearly \$59 billion. (1997 was the latest year that a complete inventory of business activity was available to this study.) A large part of this output represented intermediate sales among businesses, as well as spending by residents, tourists and other sources of demand.

Table 4: Overview of the Economy, 1997 (\$ million and percent)

Industry	Total Output	Resident Households		Visitors	
		Expenditures	Percent of total output	Expenditures	Percent of total output
Total	58,732.5	19,934.2	33.9	9,493.4	16.2
Hotels	3,456.4	170.0	4.9	3,247.4	94.0
Real estate	9,019.3	5,211.4	57.8	239.7	2.7
Restaurants	2,274.7	1,017.1	44.7	1,126.2	49.5
Trade	6,118.5	2,998.3	49.0	1,278.0	20.9
Entertainment	844.3	207.3	24.6	569.4	67.4
Golf courses	229.8	88.5	38.5	141.3	61.5
Air transportation	2,044.1	338.0	16.5	1,555.2	76.1
Automobile rental	393.3	32.5	8.3	314.8	80.0
Transit	110.0	30.9	28.1	0.4	0.4
Other transp.	1,040.1	342.9	33.0	221.1	21.3
Agriculture	823.4	122.0	14.8	18.5	2.2
Manufacturing	3,416.5	683.0	20.0	296.1	8.7
Services	18,705.4	7,832.1	41.9	439.8	2.4
Utilities	1,691.0	595.3	35.2	0.0	0.0
Government	8,565.8	264.9	3.1	45.6	0.5

Note: Since "Output" represents total sales of most companies (except retailing) it double-counts much of the economic activity and is therefore much greater than GSP, which is corrected for double-counting. Only resident and visitor expenditures are shown here. Not shown are inter-business and government expenditures and exports.

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

About 16 percent of final output was sold directly to tourists visiting Hawai'i. For some industries like hotels, airlines and the entertainment industry, tourists represented the lion's share of sales. For others, like utilities, government and local transit services, tourists were minor customers, at least directly.

Resident expenditures represented about 34 percent of total output in 1997. These expenditures do not include spending on mortgages and other financial obligations. Nevertheless, it is impressive that the spending of tourists in Hawai'i in 1997 equaled nearly half of the consumer spending by Hawai'i's 1.2 million residents in the same year.

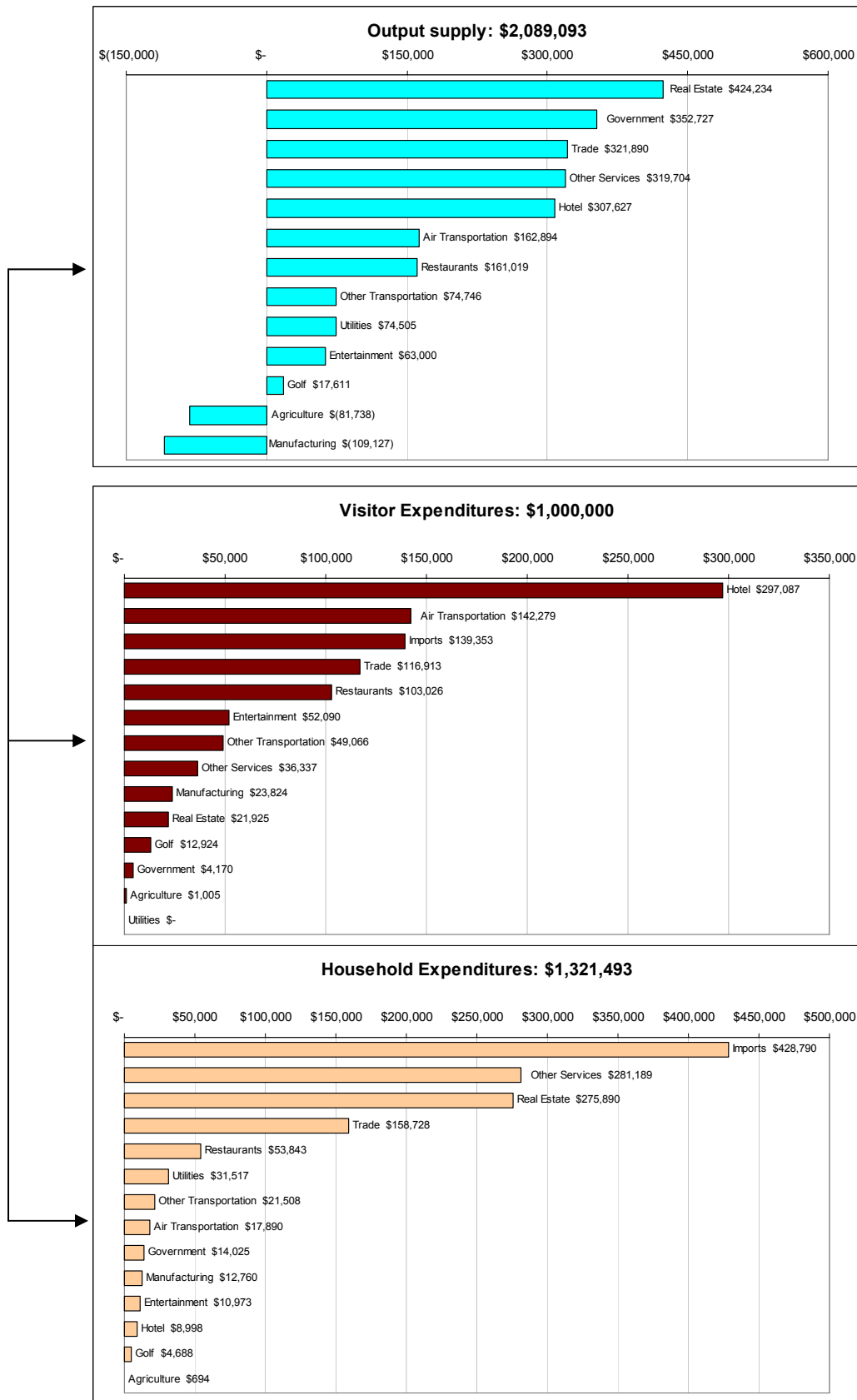
The Impact of Visitor Expenditures

What happens to the economy when tourism grows? To answer this question Drs. Konan and Kim configured the model to simulate the effects of a \$1 million increase in visitor spending.

This amount is large enough to trace through the effects on Hawai'i, but not so large so as to create major structural changes in the local economy, such as triggering a construction boom or causing major shortages of labor or other resources. Later scenarios will focus on larger changes in visitor spending in order to show how some structural changes in the economy might come about.

Figure 1 shows how \$1 million in additional visitor expenditures affect the economy.

Figure 1: The Impact of a \$1 Million Increase in Visitor Spending



As Figure 1 indicates, this million dollar increase in visitor spending will generate significant gains for traditional visitor industry sectors such as air transportation, hotels, trade, and restaurants. There is also significant growth in entertainment, golf, ground transportation, and sightseeing services. An increase in visitor spending produces an increase in Hawai'i's travel reservation business as well. Clearly there are many small businesses that benefit from increased visitor spending. These benefits include not just an increase in output, but also in employment levels, prices, and income.

More spending by visitors also results in more labor income because employment and wages increase. As the bottom of Figure 1 shows, the model would expect households to increase expenditures by \$1.3 million. This spending will be distributed over a much different range of goods and services than was the case with visitors. An increase in visitor spending generates increased household spending on golf, hotels, entertainment, and restaurants.

The combined effects of direct visitor spending, household spending and spending by industry and government will stimulate an increase in total output among Hawai'i's industries of approximately \$2.1 million (top of Figure 1).

Interestingly the sectors receiving the biggest boost from a \$1 million increase in visitor spending are real estate rentals and government. That real estate activity (mainly rentals) would be the biggest winner when visitor expenditures increase might seem surprising. But given the large renter population, many of whom are employed in the visitor industry or in supporting industries, the modelers concluded that a boost in visitor spending would lead to an increase in both the price and amount of real estate rentals. The fact that so much of Hawai'i's local economy is structured around services, trade, and government also shows up in terms of gains to those sectors.

The modelers found that a million dollar increase in visitor spending also leads to an increase in construction activity, primarily repair and maintenance of existing structures. There is also an increase in landscaping services, private waste management, trucking, water/sewer services, and electricity usage.

But even more interestingly, a couple of sectors – agriculture and manufacturing -- showed declines in output because of increased visitor spending. How can any sector lose sales as visitor activity increases? The modelers found that it can happen because the external dollars and foreign exchange brought into the economy by visitors tend to raise both income and business costs. Visitor-related industries can pay higher costs because their market is expanding and they can pass the costs along. But cost-sensitive industries that make goods, like manufacturing and agriculture, are not able to keep their market share as their costs rise. Thus, those industries' exports tend to be less competitive abroad resulting in lower sales and they also lose local sales to cheaper imports. Industries providing services, on the other hand, are not as cost sensitive since it is harder to substitute local services for imported services.

Thus, the modeling work found that while a million dollar increase in visitor spending translates into growth for most industries, it can actually result in a decline in some sectors due to the way economic growth affects competitive costs and prices. The ability to consider these cost-and-price factors is a key strength that the CGE modeling has over other techniques.

Tourism Impact on the Infrastructure

Infrastructure refers to the systems behind the scene that make the economy and modern living standards possible. The major systems include our water and sewage systems, power systems, solid waste disposal and highway systems. There are also many secondary systems such as communications, public transportation, as well as air and surface transportation.

Just as residents and visitors need these systems as part of daily life, industries need infrastructure services in order to produce goods and services. There is a relationship between the

demand placed on the infrastructure by residents, visitors, business and government, and the stress on the environment. Ultimately, there is a limited amount of fresh water resources and a limited capacity for wastewater treatment, solid waste disposal, electricity generation, and other crucial infrastructure services.

As part of this project the firm of Carter & Burgess, Inc. prepared a cataloging of various infrastructure and some natural resource systems across the state. The results of this effort are contained in a five-volume report available on the project’s web site. It was hoped that the results of this study would provide a data base of information for the modeling effort. However, readily available data on usage and capacities for the important infrastructure systems turned out to be insufficient for the modeling effort. Nevertheless, the infrastructure assessment provided a comprehensive review of the state’s infrastructure systems that will benefit state and county planning departments and it developed numerous recommendations for infrastructure improvements, listed later on in this report.

Unfortunately, most infrastructure managers do not have the tools or framework to predict with reasonable accuracy how different kinds of resident, visitor, business and government activity impact their systems. Thus, if we can predict future demand for infrastructure and identify the contributors to that demand, we can provide infrastructure planners and policy makers with an opportunity to respond to infrastructure needs before these systems reach a crisis point.

In order to synthesize the relationship between economic growth and infrastructure use, the modelers developed methods to translate *expenditures* on key infrastructure by industries and households into *physical quantities* of infrastructure services consumed in the state. It was then possible to use the CGE model to predict the demand for these infrastructure services as economic activity, particularly visitor activity increases over time.

The key infrastructure systems examined by the modeling project were water, sewage, electricity, gas/propane and solid waste. Other types of infrastructure were found to be much more complicated to model and must therefore be left to future studies. Among these is highway usage, which is not “purchased” for consumption and therefore not a part of the I-O framework. Other systems not possible to model at this time were air transportation, surface transportation, and communications, all of which are difficult to translate into physical measures from expenditure data. Still, the systems that were measured probably represent the most significant in terms of public sector policy and expenditures.

Table 5, summarizes the modeler’s estimates of the demand for water, sewer, electricity, propane, and solid waste disposal for the major users in the economy. The largest user of water, sewage and solid waste on an annual basis was the residential sector, followed by industry. On the other hand, industry makes the greatest use of electricity and gas. (The details of infrastructure use by individual industries can be found in the Modeling Study Report, Table 2, page 9).

Table 5: Economic Activity and Infrastructure Demand in Hawai‘i, 1997

Industry	Water (1,000 gal)	Sewer (1,000 gal)	Electric (GWh)	Utility Gas (mmBtu)	Solid Waste (lbs)
TOTAL DEMAND	100,368,585	58,341,864	10,009	3,706,734	3,198,245,360
Industry	40,244,458	21,928,174	5,337.0	2,355,737	1,488,270,906
Resident (households)	43,299,259	22,953,795	2,665	559,900	1,709,974,454
Visitors	--	--	--	--	--
State & Local Gov	4,305,626	3,444,501	729	359,377	--
Federal Gov	12,519,242	10,015,394	1,278	431,721	--

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

An obvious omission in Table 5 is any apparent use of infrastructure systems by visitors. This is because visitors do not purchase infrastructure services *directly*, but rather they buy those services *indirectly* as part of their purchases from hotels, restaurants, and attractions. Residents also have a considerable *indirect* impact on infrastructure demand by their purchases of goods and services through the industry sector.

Table 6, includes both the direct and indirect infrastructure demanded by residents and visitors. Use of highway transportation fuel has been added to this comparison. Directly and indirectly residents use approximately 61.4 billion gallons of water per year, about five times the 11.9 billion gallons purchased indirectly by visitors. In most cases, resident’s direct and indirect consumption of infrastructure exceed visitors use by several magnitudes. However, it turns out that the industry services demanded by visitors use more utility gas that the total use by residents.

Table 6: Direct and Indirect Infrastructure Demand, 1997

Source of Demand	Water (m gal)	Sewer (m gal)	Electric (GWh)	Utility Gas (mmBtu)	Solid Waste (m lbs)	Hwy Gas & Diesel (Mgals)
Direct Use by Residents	43,299	22,953	2,665	559,900	1,709.9	322.7
Direct Use by Visitors	-	-	-	-	-	21.6
Indirect Use by Residents	18,130	10,633	2,588	728,040	713.2	31.0
Indirect Use by Visitors	11,856	8,022	1,944	1,521,257	421.3	30.4
Total Use by Residents	61,429	33,587	5,253	1,287,940	2,423.2	353.7
Total Use by Visitors	11,856	8,022	1,944	1,521,257	421.3	52.1

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

When the infrastructure use by residents and visitors is converted to a per day basis, the results are quite different. As shown in Table 7, visitors use nearly twice as much water and sewer services per day than residents. They use nearly three times as much electricity per day. Only solid waste and transportation fuel are roughly comparable between residents and visitors on a per day basis. (Page 12 of the Modeling Report contains a detailed analysis of the visitor’s impact on motor fuel and emission levels.)

Table 7: Average Daily Infrastructure Demand, 1997

Source of Demand	Water (gallons)	Sewer (gallons)	Electric (KWh)	Utility Gas (mmBtu)	Solid Waste (lbs)	Hwy Gas & Diesel (gal)
Direct Use per Resident Day	97.9	51.9	6.0	0.001	3.9	0.73
Direct Use per Visitor Day	-	-	-	-	-	0.38
Indirect Use per Resident Day	41.0	24.0	5.9	0.002	1.6	0.07
Indirect Use per Visitor Day	206.7	139.8	33.9	0.027	7.3	0.53
Total Use per Resident Day	138.9	75.9	11.9	0.003	5.5	0.80
Total Use per Visitor Day	206.7	139.8	33.9	0.027	7.3	0.91

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

A key question at this point is how the demand for infrastructure increases as the visitor market grows. According to the modelers, the CGE Model answers that question by extending the earlier \$1 million visitor spending increase to show the effects on key infrastructure. The million dollar visitor expenditure increase generates three sources of infrastructure demand: 1) direct demand, 2) indirect demand, and 3) induced demand. Direct and indirect demands were discussed earlier. *Induced demand* occurs as tourism dollars generate income for local households, who use that income to buy more goods and services than they had before. This extra spending demand is “induced” by the increase in visitor spending.

As the results of the analysis in Table 8 show, added strain on water use is generated more by households than by visitors. For power consumption, solid waste and petroleum use, the strain is mainly through an increase in indirect visitor use.

Table 8: Increase in Infrastructure Use with \$ Million Increase in Visitor Spending

User	Total Water (gal)	Non-ag Water (gal)	Electric (MWh)	Utility Gas (mmBtu)	Solid Waste (lbs)	Petroleum (gal)
Total Use by Residents*	1,294,136	1,267,102	117.8	50.8	28,224	56,311
Total Use by Visitors**	991,417	969,937	174.1	138.5	35,385	77,339
Total Use by Export, Other#	(3,745,610)	(1,113,650)	(159.0)	(82.7)	(59,427)	(91,920)
Total	(1,460,057)	1,123,389	132.9	106.6	4,181	41,730

* Includes induced effects. ** Includes direct and indirect use. # includes government, investment, and other final demand.

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

Some factors, however, mitigate the strain on the infrastructure as visitor spending increases. The added demand for goods and services by visitors tends to reduce Hawai`i’s export competitiveness (by driving up wages and other costs). The added income also increases Hawai`i’s ability to import goods. Thus, the analysis shows infrastructure use being reduced in industries with a high content of export production. Because agriculture is one of these industries there is a net decline in water usage as agricultural production declines.

The modelers point out that the only source of outside demand that is allowed to change in this scenario is visitor expenditures. If other sources of outside (export) demand were allowed to grow normally as is the case in the real world, the results would not likely show these declines in export industries. In other words, including other growth would mask the true impact of a change in visitor spending.

The results in Table 8 are striking because they show that a small increase in visitor expenditures tends to raise costs in the agricultural sector (as workers wages rise) overall water use actually declines by 1.46 million gallons. However, municipal water use by non-agriculture sectors, notably restaurants, hotels, and golf, does rise by 1.1 million gallons.

Energy demands are significant, with electricity use expanding by 132.9 Megawatts. The sharp increase in restraint services boosts demand for utility gas by 106.6 million BTUs. The injection of a million tourist dollars leads to the generation of an additional 4,181 pounds of solid waste, and the increased consumption of 41,730 gallons of petroleum.

Effects of the Visitor Mix

Another key question about the impact of tourism investigated by the modelers is how much the visitor mix matters. In the recent past, declining Japanese visitor demand as well as expanding visitor

demand from the US and other major markets has spurred discussions about the optimal mix of visitors coming from different markets. It is therefore useful to look at the economic and infrastructure impacts of alternative visitor types.

Information on the amount and way that visitors spend in Hawai'i is available only by geographic origin. The major markets are US-West, US-East, Japanese, and Canadian visitors arriving in Hawai'i by air. Cruise ship and business visitors are growing markets, but spending patterns for these markets were not available for this study. There are also no spending profiles for such markets as eco-tourists or cultural tourism.

These basic four markets and the residual "other international" visitor market represent a useful mix of high-spending vs. low-spending and attractions-oriented vs. shopping-oriented visitors. For instance, Japanese visitors spend proportionately less on air transport, less on accommodations, but much more on retail and retail trade. Their purchases of imported goods are also much higher. Japanese spend almost double the volume in imports, mainly retail purchases, than other international visitors. Japanese spend more than any other market per visitor per day. However, nearly roughly 40 percent of their spending is on shopping, compared with around 20 percent by U.S. visitors. (Table 9 on page 34 of the Modelling Report examines expenditure patterns by the major markets in detail.)

Table 9 summarizes the impact on the economy and major infrastructure elements of a \$1 million increase in spending by the four major market groups as well as a composite international and overall average visitor.

Table 9: Impact of \$1 Million Increase in Visitor Spending, by Visitor Type

	US-West	US-East	Japan	Canada	Other	Average
Visitors						
Increase (no. of visitor days)	5,910	5,313	4,027	8,552	6,250	5,342
Increase in visitor arrivals*	619	518	694	653	607	581
Spending per visitor day	\$169	\$188	\$248	\$117	\$160	\$187
Economic Impact (increase)						
Gross State Product (\$mil)	\$1.65	\$1.64	\$1.37	\$1.67	\$1.58	\$1.58
Household Expenditures	\$1.38	\$1.37	\$1.15	\$1.39	\$1.32	\$1.32
Consumer Price Index	0.31%	0.31%	0.26%	0.32%	0.30%	0.30%
Total Environmental Impact (unit increase)						
Non-ag water (mil gal)	1.22	1.15	0.93	1.29	1.06	1.12
Electricity (MWH)	140.2	132.4	125.1	148.4	120.3	132.9
Utility gas (mmBtu)	117.1	105.5	91.1	139.8	96.8	106.6
Solid Waste (lbs)	5,088	3,685	5,118	(473)	1,617	4,181
Petroleum (gal)	38,026	49,094	34,880	37,806	47,705	41,730

*Estimate based on the 2004 average length of stay for each market.

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

Each Japanese visitor spent an average of \$248 on a given day in 1997, which was more than any other visitor type. The effect of a \$1 million increase in Japanese visitor spending is associated with approximately 4,027 new Japanese visitor days, which equates to about 694 additional arrivals, based on a 5.8-day length of stay. Canadians, tended to spend less per day, at approximately \$117, but their length of stay is much longer than the norm (13.1 days). Thus, a \$1 million increase in Canadian visitor spending required 8,552 more visitor days (twice as high as Japanese visitor days),

even though the arrivals associated with this number of visitor days was only 610, based on an average 14-day length of stay.

Japanese visitor spending contributes relatively less to the gross state product (\$1,373,783), household expenditures (\$1,146,014), and consumer price index (0.26%) than do other visitor types. One million dollars from Canadians contribute the most to the economy, although not by a significant margin. The gap between Japanese economic contributions and those of other visitor types is due to the significantly higher levels of direct and indirect import of non-Hawai'i goods and services associated with Japanese spending. The typical Japanese visitor spends a higher share of income on imports and less on non-tradable services including accommodations and restaurants.

Because Japanese visitors spend more per visitor day they tend on average to have a lower infrastructure impact per million dollars spent. Japanese visitor spending generates less water, petroleum, and electricity demand than most other visitors. Other international visitors generate a relatively lower impact in terms of water and electricity. Visitors differ greatly in terms of their impact on the generation of solid waste.

How the Economy Adjusts to Changes in Tourism

The role of tourism in the economy is illuminated further when the model is made to deal with significant changes to current growth patterns. This also allows policy makers to see where the costs and benefits of certain policy changes might lie.

When tourism or other sources of economic activity grow or decline, the competitive economy tries to bring back a balance or equilibrium in the supply and demand for the production goods & services, imports and exports, labor and other resources. The CGE model helps to simulate that process. If significant changes or "shocks" are made to the tourism patterns or other factors in the model, it will try to work out a new equilibrium or balance. This can help us anticipate what changes might occur in the real world if similar "shocks" occurred. In the following scenarios several "shocks" are imposed on the economic model to examine how the economy might adjust. Changes in "tourism" for these scenarios are in terms of expenditures not numbers of visitors. However numbers of visitors will be roughly proportional to the change in expenditures. Also the base year for the scenarios is 1997.

What if Visitor Growth Stopped? The Impacts of No Visitor Growth

Tourism growth could stop because of temporary market forces, external events, or because of policies specifically meant to limit its growth. The question is how such a condition might affect Hawai'i's economy. In particular, what would be the result if workers stayed in Hawai'i instead of leaving the state for better opportunity elsewhere?

Not surprisingly, the modelers found that Hawai'i's dependence on tourism would result in economic hardships among Hawai'i's households if tourism growth stopped. But interestingly, some other sectors would benefit from flat tourism by becoming more competitive. Assuming no immediate growth in other sources of outside income, Table 10 shows how the economy would adjust given no growth in current dollar visitor expenditures. Depending upon how many emerging new workers offer their services to the labor market, average wages and average prices will be driven down. This will cause a decline in real average labor compensation making Hawai'i households worse off on balance. Thus, an expanding labor force is not sustainable without a drop in the average income, and thus the standard of living, for Hawai'i residents unless tourism or alternative export sectors are growing at some minimum rate. On the other hand, lower prices will benefit visitors and actually increase their standard of living, because they will be getting more for their money.

Table 10: Labor Growth with No Visitor Growth (% change)

Scenario Parameters	Baseline	Labor Force Growth		
		1.0%	5.0%	10.0%
Labor Force (thousands)	594.7	600.6	624.4	654.1
Visitor Expenditures (\$ million)	10,931.0	10,931.0	10,931.0	10,931.0
Visitor Impacts				
Real Visitor Expenditures (\$ million 1997)	10,931.0	10,969.2	11,102.1	11,228.6
Hawai'i Visitor Price Index (1997 = 100)	100.0	99.7	98.5	97.4
Household Impacts				
Real Household Expenditures (\$ millions 1997)	24,962.0	25,141.9	25,608.9	26,848.9
Hawai'i Consumer Price Index (1997 = 100)	100.0	99.8	99.0	98.3
Real Average Household Expend (\$1997)	41,741.0	41,858.1	41,450.2	41,042.8
Real Compensation of Employees (\$ millions 1997)	21,626.2	21,668.5	21,850.5	22,102.9
Real Average Labor Comp (\$1997)	35,133.0	34,853.6	33,807.5	32,643.6
Real Proprietors Income (\$ millions 1997)	2,088.0	2,101.4	2,155.4	2,222.9
Real Average Proprietors Income (\$1997)	16,481.0	16,423.4	16,203.4	15,951.4
Production Impacts				
Real Gross State Product (\$ million 1997)	38,615.7	38,782.2	39,462.9	40,340.2
Real Total Output (\$ million 1997)	58,732.5	59,078.4	60,467.3	62,214.5

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

The modelers found some bright spots amid this general decline as the economy adjusts to a new balance among the economic factors. As labor force growth puts downward pressure on wages and prices, the *comparative advantage* of Hawai'i's other export activities such as clothing manufacturing (aloha shirts), agricultural goods, clothing, and exportable services will increase. These parts of the economy will become bigger at the new equilibrium, thus providing the economy with new outside income. Transportation, trade, finance, business, professional, health, and information services adjust to be roughly proportional to the bigger labor force. Visitor-related sectors including hotels, restaurants, retail, golf, and various visitor entertainment services tend to grow more slowly than the labor force. On Balance, real GSP would tend to increase modestly, despite the decline in average quality of life.

Again, this is an artificial example in which only tourism and the workforce change, so we can see what would happen if nothing else changes.

What if We Cannot Supply Labor for Tourism Growth?

Another scenario that has policy implications is one in which tourism grows but the supply of labor is tight. In fact for purposes of the example, the modelers allowed no growth in the workforce.

Table 11 shows how the economic model adjusts to higher levels of tourism in the face of a fixed labor supply.

Table 11: Visitor Expenditure Growth with No Labor Growth

Scenario Parameters	Baseline	Visitor Expenditure Growth		
		1.0%	5.0%	10.0%
Labor Force (thousands)	594.7	594.7	594.7	594.7
Visitor Expenditures (\$ million)	10,931.0	11,040.3	11,477.6	12,024.1
Visitor Impacts				
Real Visitor Expenditures (\$ million 1997)	10,931.0	11,003.8	11,282.3	11,602.1
Hawai'i Visitor Price Index (1997 = 100)	100.0	100.3	101.7	103.6
Household Impacts				
Real Household Expenditures (\$ million 1997)	24,962.0	25,108.1	25,294.5	25,664.3
Hawai'i Consumer Price Index (1997 = 100)	100.0	100.3	101.7	103.6
Real Average Household Expend (\$1997)	41,741.0	42,080.8	42,533.2	43,155.1
Real Compensation of Employees (\$ million 1997)	21,626.2	21,652.2	21,763.2	21,917.8
Real Average Labor Comp (\$ 1997)	35,133.0	35,175.6	35,356.0	35,607.1
Real Proprietors Income (\$ million 1997)	2,088.0	2,088.2	2,089.9	2,093.8
Real Average Proprietors Income (\$1997)	16,481.0	16,483.3	16,496.9	16,527.1
Production Impacts				
Real Gross State Product (\$ million 1997)	38,615.7	38,663.0	38,864.4	39,143.1
Real Total Output (\$ million 1997)	58,732.5	58,769.3	58,928.6	59,154.6

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

Interestingly, a fixed labor force does not choke off tourism growth, even if expenditures are 10 percent higher. However, higher inflation means that the *real* increase in visitor services is only around 6 percent higher. Higher inflation is also cutting in to labor gains so with average real compensation to employees only about 1.3 percent higher when tourism is 10 percent higher than before. It is likely that in the face of a fixed labor supply, tourism is bidding up wages under this scenario, attracting labor from other industries, which must then cut back production and output. The economy as a whole is able to expand by only 1.4 percent at a 10 percent increase in tourism expenditures.

The suggestion in this scenario is that a tightening labor supply will certainly raise wages, but that increase will be tempered by higher inflation and less competitiveness in industries that are not experiencing growing markets.

How Does Tourism Affect In-Migration?

Some criticism in the past has been directed more at the rapid growth in tourism rather than tourism as an activity in the Islands. It was argued that the economic boost from rapid tourism growth in the 1960s through the 1980s caused the economy to grow much faster than the local labor force could support, resulting in excessive in-migration of labor into the state to fill the gap. Indeed, periods of rapid growth did appear to coincide with periods of rapid in-migration.

To look at this issue, the modelers constructed a scenario that shows how the economy might respond to increasingly sharp increase in tourism. Labor was allowed to respond freely to increasingly higher levels of tourism demand to see how tourism's effect on the economy would impact overall labor demand. In order to further simulate how the economy might adjust to modest growth verses a tourism boom, restrictions were placed on how much goods and services the economy could simply import to fill needs. The scenario assumes only visitor expenditures grow. No growth in any other exports is introduced that would cloud the influence of tourism.

As shown in Table 12, the modelers found that the extra labor needed to accommodate a modest, 1 percent increase in current dollar visitor spending, was just a one-tenth-of-one-percent growth. The increase generates a 0.3 percent increase in both real GSP and real household spending. The visitor growth would add just a half percentage point to the inflation rate.

Table 12: Visitor Expenditure Growth and Perfectly Elastic Labor Force Growth

Scenario Parameters	Baseline	Visitor Expenditure Growth		
		1%	5%	10%
Labor Force Impacts				
Labor Force (thousands)	594.7	594.8	601.4	609.2
Visitor Impacts				
Real Visitor Expenditures (\$1997 millions)	10,931.0	10,985.6	11,193.3	11,390.1
Visitor Price Index (1997 = 100)	100.0	100.5	102.5	105.4
Household Impacts				
Consumer Price Index (1997 = 100)	100.0	100.5	102.7	105.8
Real Ave. Hshld Expenditures (\$1997)	41,741	41,866.2	42,492.3	43,285.4
Real Average Compensation of Employees (\$1997)	35,133.0	35,133.0	35,133.0	35,133.0
Production Impacts				
Real Gross State Product (\$1997 millions)	38,615.7	38,731.5	39,156.3	39,812.8

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

However, in order to adjust to a 5 percent increase in visitor spending, the economy would demand a 1.1 percent increase in workers. Inflation would rise to 2.5 percent. This would cut into real GSP which would show a modest 1.4 percent increase. Real average household expenditures would show a slightly higher, 1.8 percent increase.

Finally, a 10 percent increase in visitor expenditures would generate a 2.4 percent increase in demand for labor assuming real dollar wages stayed the same. Because most of the purchasing needs to satisfy this growth must be met with Hawai'i based production, inflation would accelerate to 5.4 percent. Real GSP would edge up to 3.1 percent.

With an average increase in the "natural" population (births minus deaths) of about 0.75 percent per year in Hawai'i, the model suggests that an increase in visitor expenditures in excess of 3.5 percent could begin to stimulate labor in-migration, all other things equal. However, this scenario does not take into account how much other export activity might be growing besides tourism. Those industries would be competing in the same labor pool, adding additional demand for labor beyond tourism. Also, because the model is being asked to simply readjust a current supply and demand imbalance, it is not taking into account more structural factors, like construction booms that can be triggered by periods of excessive economic growth.

The amount of labor in-migration that tourism might generate also depends on what proportion of the natural population is of working age and a number of other factors. For instance, data assembled by the State Workforce Development Council (WDC) suggest that in-migration of labor may be needed to meet the demand for workers to fill new jobs and to replace workers expected to leave the labor force in the coming years. The WDC cites data showing an average of 22,000 openings per year in Hawai'i over the next seven years due to retirements and normal economic growth. On the other hand the total number of youth graduating from high school each year is only around 12,000. Assuming that other regions of the country are experiencing similar labor constraints, population will more likely become a limiting factor for tourism growth in the future than tourism unduly stimulating population growth.

Long-Range Growth Scenarios

An important step in planning for the visitor industry is an examination of how economic and infrastructure impacts accumulate over time. To study this, Drs. Konan and Kim adjusted the baseline CGE model to analyze various tourism growth scenarios over a 10, 20, and 30 year planning horizon. The CGE model, based on the 1997 Hawai'i economy, was adjusted to investigate the implications of long-range visitor expenditure and economic projections developed by the University of Hawai'i Economic Research Organization (UHERO), and shown in Tables 13 and 14.

Table 13. Visitor Expenditure Projections to 2030

	Low Projection		Base Projection		High Projection	
	\$ million	Cumulative % change from 1997	\$ million	Cumulative % change from 1997	\$ million	Cumulative % change from 1997
1997*	10,931		10,931		10,931	
2003	11,362		11,362		11,362	
2010	13,773	26.0	14,501	32.7	15,243	39.4
2020	17,948	64.2	20,138	84.2	22,541	106.2
2030	23,891	118.6	28,457	160.3	33,860	209.8

Source: UHERO Projections; *actual.

Table 14. Employment Projections to 2030

	Low Projection		Base Projection		High Projection	
	Jobs	% change	Jobs	% change	Jobs	% change
1997*	564,137		564,137		564,137	
2003*	591,800		591,800		591,800	
2010	609,043	8.0	637,941	13.1	651,503	15.5
2020	634,727	12.5	702,642	24.6	737,397	30.7
2030	656,669	16.4	753,448	33.6	814,709	44.4

Source: UHERO Projections; *actual. Details of the projections are described in the report on Data and Methods produced by the modelling team.

Three alternative levels of visitor expenditure growth were used to represent the plausible long-term impacts tourism growth, coupled with modest growth in other income generating activity. The “Base” scenario represents the most likely path for visitor growth, according to UHERO’s analysis. Plausible “low” and “high” visitor growth scenarios were also generated to see how sensitive the economy, infrastructure and resources might be to different rates of long-term visitor growth.

Projection Caveats

It is important to note that while plausible, these projections are hypothetical. They cannot fully foresee future events and constraints. The projections are very general and do not differentiate among a number of specific markets such as national, international, cruise or business travel. They also assume that the labor needs of tourism will be met, either by the growth in the local labor force or by in-migration of labor if necessary. This may not be the case given the aging and potential retirements among the baby-boom generation. The value of these projections is that they provide an illustration of how sensitive the economy and the income of residents will likely be to faster or slower tourism growth.

In addition to projections of state and county-level visitor expenditures, the UHERO model also projected some growth in Federal government expenditures, both military and civilian. This provides a more realistic expectation about potential infrastructure strains in the distant future. It also underscores the point that tourism is only one factor responsible for the strain on infrastructure.

On a state wide basis, the 33 year increase in visitor expenditures range from 119 percent under the low projection to a 210 percent increase in the high projection (Table 13). This equates to an average annual increase of 2.4 percent to 3.5 percent on the high end. The Base projection is a 160 percent increase in spending or about 2.9 percent per year over the period. Baseline projections indicate a 34% increase in the number of people employed in the 2030 labor force over 1997 levels. This is an annual rate of 0.9 percent. Employment would increase an average of 0.5 percent per year in the low projection and 1.1 percent per year in the high scenario.

The low visitor expenditure growth scenario might be considered as supporting the existing residential population with a natural level of growth over the 30-year time horizon. Baseline and high levels of visitor growth would require that workers migrate to the State from other locations.

Tourism Growth Rates and the Standard of Living

Table 15 shows some key output from the CGE model after processing the UHERO projections.

Table 15: Hawai'i 2030: Low, Baseline, and High Visitor Growth Scenarios

Indicator	1997	2030 Projections		
		Low	Base	High
Labor Force (thousands)*	594.7	692.2	794.3	858.8
Visitor Expenditures (\$ million)*	10,931.0	23,890.8	28,457.0	33,859.8
Real Visitor Expenditures (\$1997 million)	10,931.0	14,517.4	17,282.7	19,844.8
Consumer Price Index (1997 = 100)	100.0	154.2	156.0	162.1
Visitor Price Index (1997 = 100)	100.0	164.6	164.6	170.6
Household Expenditures (\$ million)	24,962.0	79,848.2	89,049.6	99,668.3
Real Household Expenditures (\$1997 million)	24,962.0	55,004.2	60,657.2	65,981.1
Real Ave. Household Expenditures (\$1997 thous.)	42.0	79.5	76.4	76.8
Compensation of Employees (\$ million)	21,626.2	59,436.8	63,846.8	69,558.2
Real Compensation of Employees (\$1997 million)	21,626.2	38,547.0	40,920.5	42,903.5
Real Ave. Comp of Employees (\$1997 thous.)	35.1	53.8	49.8	48.3
Proprietor's Income (\$ million)	2,088.0	5,115.6	5,618.3	6,213.1
Real Proprietors' Income (\$1997 million)	2,088.0	3,317.7	3,600.8	3,832.2
Real Average Proprietors' Income (\$1997 thous.)	16.5	22.5	21.3	20.9
Total Output (\$ million)	58,732.5	139,411.9	154,914.6	170,912.1
Real Total Output (\$1997 million)	58,732.5	90,413.6	98,826.1	105,418.6
Gross State Product (\$ million)	38,615.7	101,815.5	111,778.5	123,712.0
Real Gross State Product (\$1997 million)	38,615.7	66,031.0	71,640.9	76,305.5
Indicator	Percent change 1997 to 2030			
	Low	Base	High	
Labor Force*	16.4	33.6	44.4	
Visitor Expenditures*	118.6	160.3	209.8	
Real Visitor Expenditures	33.8	58.1	81.5	
Hawai'i CPI	54.2	56.0	62.1	
Hawai'i VPI	64.6	64.6	70.6	
Household Expenditures	219.9	256.7	299.3	
Real Household Expenditures	120.4	143.0	164.3	
Real Ave. Hshld Expenditures	89.3	81.9	83.0	
Real Compensation of Employees	78.2	89.2	98.4	
Real Average Compensation of Employees	53.1	41.7	37.4	
Proprietor's Income	145.0	169.1	197.6	
Real Proprietor's Income	58.9	72.5	83.5	
Real Average Proprietor's Income	36.5	29.1	27.1	

Table 15: 2030 Projections (Continued)

Indicator	Percent change 1997 to 2030		
Total Output (\$ million)	137.4	162.5	191.0
Real Total Output (\$1997 million)	53.9	68.3	79.5
Gross State Product (\$ million)	163.7	189.5	220.4
Real Gross State Product (\$1997 million)	71.0	85.5	97.6

Unless otherwise noted, projections are generated by the CGE model simulations.

* indicates exogenous shocks derived from the UHERO long-range growth forecasts.

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

Not surprisingly, the higher the visitor projection, the higher are values for total economic activity. Real GSP in 2030 ranges from \$66 billion in the lower projection to \$76 billion in the high projection. However, an interesting result from the model is that on an individual household basis, real average income (a measure of the standard of living) appears to be better with lower visitor growth. For instance, real average compensation of employees expands from \$35,100 in 1997 to \$53,800 under the low-growth projection. But under the base projection real compensation per worker rises to only \$49,800 in 2030 and to only under \$48,300 under the high growth scenario.

According to the modelers, two factors cause this result. First, in the baseline and high projections the migration of new workers to Hawai'i places downward pressure on wages and salaries. Faster growth in tourism will tend to increase the number of jobs that pay below the average wage. Second, higher visitor spending generates more inflation, which reduces the "real" value of wages. Over the 33 years, low visitor growth generates a consumer price index of 154 versus 162 for high visitor growth. The modelers note that the benefits of lower growth also appear to be realized by proprietors.

Long-Run Impact of Tourism on Infrastructure

Through the dynamic CGE model, it was also possible to trace the expected impact of alternative tourism growth projections on key infrastructure resources (Table 16).

Table 16: Projected Infrastructure Demand for Alternative Growth Scenarios

Low Visitor Growth	1997	2010	2020	2030
Water, gallons million	100,368.6	114,566.5	130,664.4	146,962.0
Non-ag Water, gallons million	86,156.2	106,307.8	124,096.6	141,934.6
Solid Waste, pounds million	3,198.2	3,438.6	3,655.8	3,846.1
Electricity, GWh	10,009.0	11,995.4	13,906.2	15,922.0
Utility gas, mmBtu	3,706,734.7	4,272,453.9	4,784,473.9	5,266,846.3
Petroleum, gallons million	2,030.9	2,449.4	2,948.1	3,545.7
Base Visitor Growth	1997	2010	2020	2030
Water, gallons million	100,368.6	118,074.4	139,198.6	159,616.5
Non-ag Water, gallons million	86,156.2	109,469.6	131,998.8	153,972.2
Solid Waste, pounds million	3,198.2	3,589.6	4,017.4	4,374.9
Electricity, GWh	10,009.0	12,387.8	14,891.3	17,445.9
Utility gas, mmBtu	3,706,734.7	4,452,278.1	5,242,408.7	5,985,536.8
Petroleum, gallons million	2,030.9	2,542.6	3,195.5	3,971.7
High Visitor Growth	1997	2010	2020	2030
Water, gallons million	100,368.6	119,665.6	143,448.1	167,272.6
Non-ag Water, gallons million	86,156.2	111,095.5	136,248.2	161,591.2
Solid Waste, pounds million	3,198.2	3,665.2	4,214.6	4,726.3
Electricity, GWh	10,009.0	12,606.5	15,476.8	18,507.7
Utility gas, mmBtu	3,706,734.7	4,562,786.6	5,536,680.4	6,518,953.6
Petroleum, gallons million	2,030.9	2,611.2	3,392.8	4,357.0

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

Not surprisingly, the higher the projection for visitor expenditures, the higher was the demand for infrastructure services. In comparing low and high growth scenarios, the impact on infrastructure appears to be most dramatic in terms of energy demand, with high growth increasing petroleum use to 4,357.0 million gallons and electricity use to 18,507.7 GWh compared to low growth demand increases of 3,545.7 million gallons and 15,922.0 GWh, respectively.

The modelers note that most of this demand will not be generated directly by visitors, but rather by the growth in the resident population that is made possible through tourism activity and other income generating activity. This is an important point because whatever is the mix of future economic activity in the state -- whether it is tourism-led or led by some combination new growth industries -- there will likely be growth in the resident population, making increased demand for resources in the future nearly inevitable. The question is how that demand for resources will be managed.

Growth Impacts by County

The statewide projections are useful for understanding how different tourism growth scenarios may impact the economy and demand for infrastructure over the next several decades. However, it is more useful for planners and policy makers to know how this use might be distributed around the state. Projected county demand for visitor spending through 2030 for the baseline scenario is shown in Table 17.

Table 17: County-Level Real Visitor Demand Projections

O'ahu	1997	2010		2020		2030	
	(\$m)	(\$m)	% chg from 1997	(\$m)	% chg from 1997	(\$m)	% chg from 1997
Ground transportation	34.15	35.11	2.8	41.31	21.0	46.62	36.5
Automobile rental	141.09	143.72	1.9	170.67	21.0	194.85	38.1
Performing arts	16.81	16.81	-0.0	19.09	13.5	20.84	24.0
Amusement	69.96	73.81	5.5	88.23	26.1	101.41	45.0
Recreation	45.79	46.86	2.3	54.44	18.9	60.62	32.4
Museums historical	20.85	21.31	2.2	24.69	18.4	27.41	31.4
Sightseeing transport	127.95	129.73	1.4	152.06	18.8	170.85	33.5
Golf courses	76.34	77.88	2.0	90.63	18.7	101.06	32.4
Hotels	1606.85	1618.37	0.7	1878.08	16.9	2090.28	30.1
Real estate	107.41	109.27	1.7	131.17	22.1	150.65	40.3
Restaurants	758.53	795.59	4.9	930.37	22.6	1045.41	37.8
Retail trade	565.13	571.07	1.0	659.03	16.6	728.18	28.8

Big Island	1997	2010		2020		2030	
	(\$m)	(\$m)	% chg from 1997	(\$m)	% chg from 1997	(\$m)	% chg from 1997
Ground transportation	11.02	12.64	14.7	15.32	39.0	17.90	62.4
Automobile rental	45.54	51.74	13.6	63.30	39.0	74.83	64.3
Performing arts	3.47	3.85	11.0	4.51	30.1	5.11	47.4
Amusement	14.43	16.89	17.1	20.85	44.6	24.87	72.4
Recreation	9.44	10.73	13.6	12.87	36.3	14.87	57.4
Museums historical	4.30	4.88	13.4	5.83	35.7	6.72	56.3
Sightseeing transport	41.30	46.71	13.1	56.40	36.6	65.61	58.9
Golf courses	15.74	17.82	13.2	21.42	36.1	24.78	57.4
Hotels	437.96	490.68	12.0	587.43	34.1	677.73	54.8
Real estate	34.67	39.34	13.5	48.65	40.3	57.85	66.9
Restaurants	82.81	95.71	15.6	115.92	40.0	135.52	63.7
Retail trade	153.65	172.49	12.3	205.49	33.7	235.51	53.3

Table 17: County-Level Real Visitor Demand Projections (Cont.)

Maui	1997	2010		2020		2030	
	(\$m)	(\$m)	% chg from 1997	(\$m)	% chg from 1997	(\$m)	% chg from 1997
Ground transportation	21.50	25.44	18.3	29.03	35.0	33.07	53.8
Automobile rental	88.81	104.12	17.2	119.95	35.1	138.21	55.6
Performing arts	8.32	9.41	13.1	10.40	25.1	11.47	37.9
Amusement	34.60	41.31	19.4	48.08	38.9	55.82	61.3
Recreation	22.65	26.23	15.8	29.67	31.0	33.37	47.3
Museums historical	10.31	11.92	15.6	13.45	30.4	15.09	46.3
Sightseeing transport	80.54	93.99	16.7	106.87	32.7	121.18	50.5
Golf courses	37.76	43.58	15.4	49.39	30.8	55.62	47.3
Hotels	948.30	1088.68	14.8	1228.20	29.5	1380.08	45.5
Real estate	67.61	79.16	17.1	92.19	36.4	106.85	58.0
Restaurants	198.39	230.81	16.3	263.99	33.1	300.08	51.3
Retail trade	258.87	296.81	14.6	333.35	28.8	371.97	43.7

Kaua'i	1997	2010		2020		2030	
	(\$m)	(\$m)	% chg from 1997	(\$m)	% chg from 1997	(\$m)	% chg from 1997
Ground transportation	9.53	11.79	23.7	14.04	47.3	16.13	69.2
Automobile rental	39.38	48.25	22.5	58.01	47.3	67.42	71.2
Performing arts	2.52	2.98	18.5	3.43	36.4	3.82	51.9
Amusement	10.47	13.09	25.0	15.87	51.6	18.60	77.6
Recreation	6.85	8.31	21.3	9.79	42.9	11.12	62.2
Museums historical	3.12	3.78	21.1	4.44	42.3	5.03	61.0
Sightseeing transport	35.71	43.55	22.0	51.68	44.7	59.11	65.5
Golf courses	11.43	13.81	20.9	16.30	42.7	18.53	62.2
Hotels	254.33	305.54	20.1	359.34	41.3	407.40	60.2
Real estate	29.98	36.68	22.4	44.59	48.7	52.12	73.9
Restaurants	86.45	105.59	22.1	125.54	45.2	144.07	66.6
Retail trade	110.00	132.06	20.0	154.54	40.5	174.01	58.2

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report, October 2005.*

To estimate impacts of tourism on the counties and even smaller areas within the counties, Drs. Konan and Kim developed a Geographical (Spatial) Allocation Model. This model distributed the statewide impacts of tourism to county and sub-county areas. A Geographical Information System (GIS) database was constructed to subdivide each county into very small grids ranging from 0.25 miles to 1 mile square. Data was collected and put into the GIS database on a range of geographic-specific factors. But the key input factor in the database was information on industry employment by census tract across the state. With this information, it was possible to distribute economic and infrastructure demand results from the statewide model to small areas of the state based on industry-specific employment in those areas. Thus, as the CGE model predicated future economic conditions based on the three visitor-growth scenarios, the geographical model used those results to predicted future economic conditions in county and sub county areas.

In addition to the caveats mentioned earlier, another caution about the results needs to be mentioned at this point. These projections reflect the spending patterns and mix of tourists in 1997. While the patterns of spending and mix of visitors among the different markets may not have changed much since 1997, by 2030 they could be significantly different than these projections indicate. For instance, tourists might shift some spending from retail purchases to performing arts and museums. Likewise, a higher proportion of cruise visitors in the 2030 mix would tend to reduce the amount spent on hotel and other land-based

accommodations. Thus, the projections should be seen as an illustration of plausible growth impacts rather than a confident forecast.

O`ahu stands out from the rest of the state in terms of the volume of visitor activity. By 2030, real visitor demand for hotel services alone is predicted to be approximately \$2.1 billion in real terms, and restaurant expenditures top \$1 billion. Waikīkī remains the dominant visitor destination for the foreseeable future.

Yet, visitor expenditure growth on O`ahu lags behind that of the other counties in key industries. Because of rising prices, the spending by tourists on hotel rooms will rise by only 30 percent over a thirty year time horizon. The projections show tourists turning increasingly to alternative accommodations as represented by tourist expenditures on real estate, which increase 40 percent from 1997 to 2030.

With the exception of amusement services, visitor participation in leisure sectors such as performing arts, museums, and golf courses grows rather slowly. Cumulative growth in various transportation sectors will require county planning.

By 2030, spending by visitors on transportation is projected to rise notably in automobile rentals (38%), ground transportation (36%), and sightseeing transportation (34%). This visitor growth, coupled with significant growth in resident and industrial demand for transportation services will require significant outlays in transportation infrastructure expenditures over the coming decades.

Hawai`i County will experience significant growth of the visitor industry over the coming. This will translate by 2030 into particularly rapid growth over 1997 levels in real visitor demand for amusement (72%), real estate (67%), automobile rentals (64%), restaurant services (64%), and ground transportation (62%).

Maui County projections for 2030 also reflect significant growth in real visitor expenditures though not quite at the level of growth on the Big Island. By 2030, demand for real estate expands by 58% and hotel rentals by 46%. Visitor transportation demand increases significantly by 2030, most notably in visitor automobile rentals (56%), ground transportation (54%), and sightseeing transportation (50%).

Kaua`i County is projected to experience the most significant rate of growth in the quantity of visitor demand. By 2030 real visitor expenditures on real estate is projected to jump (74%) and hotel room rental by 60%. Kaua`i will could show an accumulated growth in visitor spending on ground transportation (69%), automobile rental (71%), and sightseeing transportation (66%). Spending on meals by visitors in restaurants is projected to increase by 67 percent.

County Infrastructure Capacities and Alternative Growth Scenarios

By running all three visitor-growth scenarios through the CGE and geographical allocation model, the modelers developed predictions about how the basic infrastructure and resources in each county would be affected.

Water Resources

Table 18 indicates that compared to current knowledge about sustainable water yields, there appears to be adequate water resources on the four major islands to accommodate growth at all three scenario levels on an island wide basis through 2030. If the analysis were to look at each separate developed region on a particular island, however, the outcome would be different. Water sources are not evenly distributed over an island, but rather concentrated in certain areas. Thus, some communities may not have the water resources within their boundaries to support long-term

growth. The deciding factor as to whether any particular Island growth scenario can be supported by water resources depends on whether island wide water resources can be effectively distributed to areas experiencing growth. The transportation of water from wetter undeveloped regions to more arid, high-growth regions is a policy and cost issue for the counties. It not only means the extension of water infrastructure but also requires the development or expansion of wastewater treatment facilities.

Table 18: Projected County Water Demand and Sustainable Yields

County	Sustainable Yield (million gallons)	1997	2010		2020		2030	
		Million gals/year	Million gals/year	Cum. % from 1997 to 2010	Million gals/year	Cum. % from 1997 to 2020	Million gals/year	Cum. % from 1997 to 2030
Kaua`i	141,600							
High		11,140.1	9,886.2	(11%)	10,849.5	3%	11,773.9	6%
Base		11,140.1	9,790.1	(12%)	10,556.9	(5%)	11,240.2	1 %
Low		11,140.1	9,443.0	(15%)	9,798.3	(12%)	10,233.6	(8)%
O`ahu	162,800							
High		54,532.4	66,149.0	21 %	81,824.4	50 %	97,820.0	79 %
Base		54,532.4	64,993.3	19 %	78,751.7	44 %	92,330.1	69 %
Low		54,532.4	62,866.3	15 %	73,540.5	35 %	84,415.4	55 %
Maui	205,500							
High		10,670.8	12,881.0	21 %	15,922.0	49 %	19,000.1	78 %
Base		10,670.8	12,659.5	19 %	15,335.6	44 %	17,958.6	68 %
Low		10,670.8	12,247.6	15 %	14,331.0	34 %	16,441.7	54 %
Hawai`i	887,315							
High		7,199.6	8,902.2	24 %	11,096.4	54 %	13,323.8	85 %
Base		7,199.6	8,741.2	21 %	10,672.2	48 %	12,570.6	75 %
Low		7,199.6	8,455.7	17 %	9,969.2	38 %	11,497.7	60 %

Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

Solid Waste

Visitors and residents alike generate significant volumes of solid waste annually. Any growth in the number of people present on a daily basis – residents and tourists – will increase the quantity of waste generated. Key Hawai`i industries generate significant volumes of solid waste, most notably restaurants, construction, retail trade, health services, and business and professional services. Moreover, communities are highly reluctant to dedicate scarce land resources to the expansion of land fills. It is not surprising that among the most pressing infrastructure growth issues facing the Hawaiian Islands is the need to dispose of rubbish. Compared with the situation in water resources, solid waste disposal is more critical, especially on Kaua`i and O`ahu. Table 19 shows the modelling consultants' expectations for solid waste generation by region under the three growth scenarios over the 2003 to 2030 period compared with current landfill capacities.

Table 19: Projected Generation of Solid Waste, Pounds Million

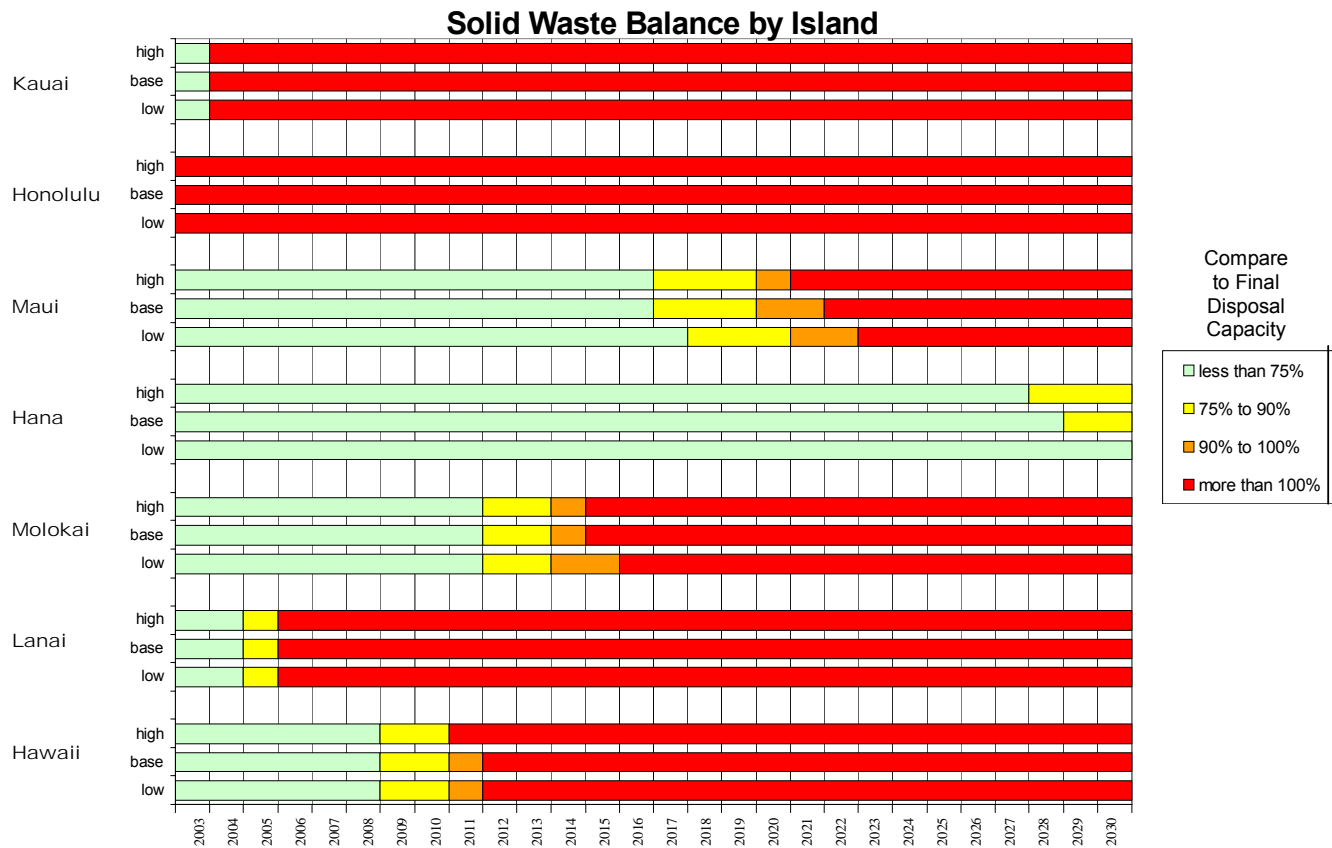
	100% Final Disposal Capacity (*)	2003	2010	2020	2030
Hawai`i	3,452				
High		363	2,969	6,884	11,016
Base		363	3,036	7,253	11,893
Low		363	3,070	7,443	12,391
Lanai	30				
High		7	61	142	229
Base		7	63	150	247
Low		7	63	154	258
Moloka`i	238				
High		17	143	332	534
Base		17	146	350	576
Low		17	148	360	602
Maui	7,290				
High		334	2,750	6,408	10,292
Base		334	2,813	6,753	11,116
Low		334	2,846	6,939	11,606
O`ahu	1,800				
High		2,401	19,665	45,679	73,192
Base		2,402	20,101	48,076	78,899
Low		2,402	20,319	49,312	82,153
Kaua`i	293				
High		156	1,281	2,983	4,788
Base		156	1,310	3,142	5,169
Low		156	1,325	3,227	5,391

(*) Based on calculation. Number showing available capacity starting 2003
 The Low, Base, and High are cumulative number, all units are in million lbs / year
 Source: *Planning for Sustainable Tourism in Hawaii, Modeling Study Report*, October 2005.

Nearly all areas hit disposal capacities within the next ten years. O`ahu appears to be presently at or exceeding capacity limits.

Figure 2 illustrates the projected solid waste disposal capacity in terms of a “trigger analysis” where four critical levels are identified by shaded bars. The first shade indicates Disposal capacities of below 75 percent. The darkest shade signals that present capacity limits have been reached or exceeded. Intermediate shades indicate capacity between 75 to 95 percent (“yellow”) and 90 to 100 percent (“orange”) capacity, respectively.

Figure 2: Projected Regional Trigger Points for Solid Waste Disposal



Even the lower growth scenarios offer little shelter in terms of delays in the trigger points.

O`ahu, according to the consultants, has approximately 5 years of life at the Waimanalo Gulch Landfill. During this period, the City must select and construct a new landfill. The City is also requesting proposals for new solid waste treatment facilities utilizing alternative treatment technologies for the solid waste that is not presently treated by the H-Power Incineration Facility. These alternative technologies will augment H-Power by reducing the refuse that will go into the new landfill. The intent is to divert 100 percent of the refuse collected on O`ahu that is not diverted through recycling programs to solid waste treatment facilities such as H-Power. While the cost of refuse disposal on O`ahu will increase due to the use of alternative treatment technologies, the new solid waste treatment facilities and H-Power will reduce the refuse volume by 80 to 90 percent prior to disposal at the new landfill. The intent is to extend the life of the new landfill so that a new landfill will not be required.

Kaua`i will soon run out of landfill space. The County is applying for a permit from the State Department of Health to extend the life of the Kekaha Landfill by allowing the County to increase the height of the landfill. The County is also searching for a new landfill site. The County of Kaua`i is presently bringing new systems on line.

Maui Island has a new Central Maui Landfill with adequate volume to accommodate the growth of Maui. Acceleration in growth could reduce the life expectancy of the landfill.

Hawai`i County has limited landfill capacity in Hilo and Kona. The County is planning to divert approximately 45 percent of the refuse collected through recycling and 35 percent through the use of alternative solid waste treatment technologies. The West Hawai`i landfill has capacity but will require long hauls for the refuse from Hilo and Kona. The proposed plans for refuse recycling and refuse treatment will limit the expensive long hauls to the West Hawai`i Landfill. The long hauling from Hilo is expected to cost approximately \$90,000 a month or a little over a million dollars a year.

Transportation

The models developed in this project are not suited to analyze the specifics of the transportation infrastructure and how tourism plays a role in the capacity of the various systems – roads, harbors and air transportation. But the broad range of consultant expertise assembled by the modeling contractor permitted an insightful analysis of the transportation sector and how it is impacted by visitors and residents alike.

Highways

Tourists are becoming more of a traffic issue on Hawai`i roads. In 1999, 51 percent of new car registrations were for the rental inventory. The modeling consultants estimate continued growth between now and 2030 in the demand for automobile rentals in each county under the baseline forecast.

While the CGE and geographical distribution models can help identify the growth in demand for cars and trucks (be it by tourists, residents or businesses) it cannot predict the impact of that demand on the highway system in terms of congestion and commute times. However, the modeling consultants used their expertise in urban planning to assess how the counties are addressing the highway issues facing them.

O`ahu: The concentration of jobs and housing has contributed to roadway congestion as people travel to and from their homes and their employment locations. Congestion is particularly problematic during the peak travel hours in both the morning and afternoon/evening, especially along the Pearl City to Downtown to East Honolulu corridor. As the population continues to grow and spread to areas such as Ewa, Kapolei, and Mililani, the transportation congestion problems will continue to worsen.

This is primarily a problem of residential growth and the separation between home and work for residents, rather than an impact of visitor growth. However, many of the tourist destinations and attractions are within the urban core or involve passing through urban areas which certainly contributes to the congestion and traffic volume on nearby roadways.

County of Hawai`i: The DOT and the County are planning to widen the Queen Kaahumanu Highway and improve the transportation corridors through Kailua-Kona. The busy highway is congested in during the afternoon peak as workers travel home from work in the resorts along the North Kona and South Kohala Coast.

County of Maui: The DOT and Maui County are widening the Mokulele Highway. The busy highway has been congested during the afternoon peak, as workers at resorts in Kihei, Wailea and Makena travel home from work to Kahului.

County of Kaua`i: The DOT and Kaua`i County are planning to widen Kaumualii Highway from Lihue to Koloa and construct a By-Pass Road for Kuhio Highway through Kapaa Town.

These busy highways are especially congested in during the afternoon peak as workers travel home from work in Lihue.

Air

Honolulu International Airport: This facility will require additional gates and parking as air travel increases. The International Arrivals Building is near capacity and a new facility with additional gates and the space necessary to hold international visitors prior to processing by Immigrations and Customs will be required.

Hilo and Kona Airports: These facilities require special arrangements to fly in Immigrations and Customs officials from O`ahu to permit international arrival capabilities.

Maui Airport: The Maui Airport has no international arrival capabilities in which immigrations and customs processing are required. The runway will need to be extended if larger aircraft are required to land there.

Lihue Airport: The Lihue Airport has no international arrival capabilities in which immigrations and customs processing are required and will need to upgrade its baggage handling facilities, especially if the runway is extended to allow larger jets to land

Harbors

Hilo and Kawaihae Harbors: These facilities will require passenger handling facilities as cruise travel increases.

Kahului Harbor: This facility will require passenger handling facilities as cruise travel increases.

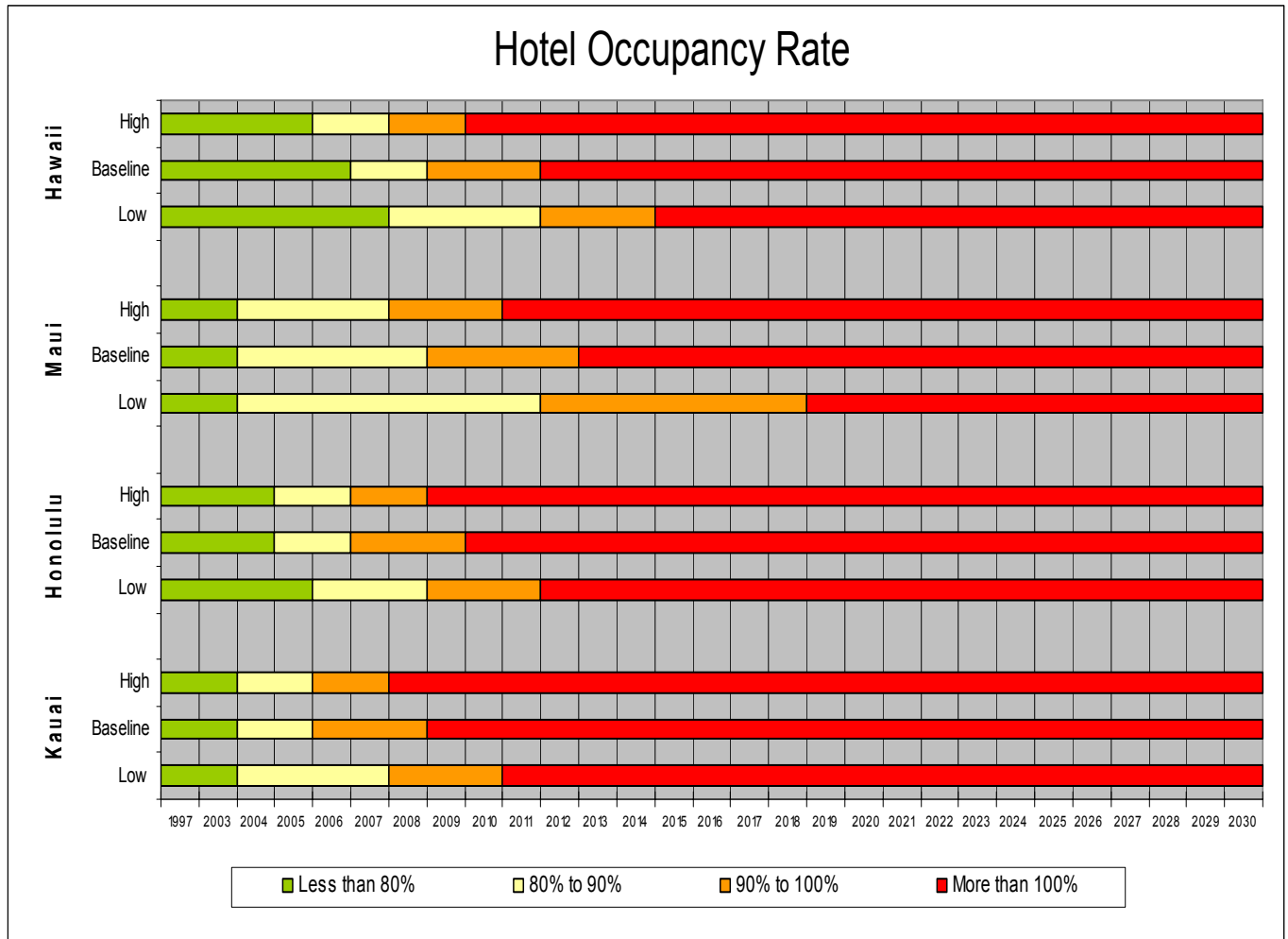
Nawiliwili Harbor: The facility will require passenger handling facilities as cruise travel increases.

Growth Impacts on Accommodations

In addition to public infrastructure, the modeling study also looked at how alternative projections of future tourism growth might impact the state's hotel room capacity. Figure 3 shows by county how the current inventory of visitor rooms will be progressively used up at the three hypothetical tourism growth rates. Each change in shading represents an occupancy range, with the darkest shade equal to more than 100 percent occupancy.

Kaua`i and Honolulu already face an impending shortage of hotel rooms, followed by Maui and the Big Island. Of course the hotels and condominiums represented in this room capacity do not account for all of the potential accommodations that visitors may utilize. There are thousands of bed-and-breakfast (B&B) units around the state as well as residential units in the transient rental market. As occupancy rates in traditional facilities reach more critical levels, visitors will increasingly seek out these alternatives.

Figure 3: Projected Occupancy Rates with Fixed Hotel Room Inventory



Impact of Tourism on Hawai`i’s Social and Cultural Resources

While data and modeling can tell us much about the relationship between tourism and economic/infrastructure issues, that approach is less helpful in the case of tourism’s relationship to the day-to-day life of Hawai`i residents and to the deeper cultural issues that are important to us.

The project’s socio-cultural and public input consultant, Dr. John Knox (John Knox & Associates) used a number of techniques to investigate:

- Tourism’s impacts and influences on social-cultural values over time.
- Tourism’s relationship to crime, housing costs, and the effects of tourism “spill-over” from resort areas into residential areas.
- Residents’ concerns about tourism and how it impacts them.
- A Hawaiian perspective on tourism.

Historical Issues Regarding Tourism

The Knox report stated that few of the long-term socio-cultural impacts of tourism have to do with tourists themselves. Most of the impacts have revolved around adjustments that residents must make as tourism replaces older economic activity, statewide growth issues compounded by tourism growth, and shifts in the tourism market mix that impose change.

Four broad, socio-cultural issues marked tourism's history:

- 1) **The development of tourism exposed residents and communities to more Mainland influences and workplace changes.** These including more female employment and a shift from plantation culture to a service economy culture.
- 2) **Major rural-area development and the replacement of the agricultural economy.** Tourism preserved many local communities but changed their size and nature. Growing populations strained the infrastructure, at least temporarily, and altered the social structure.
- 3) **Transformation of Small Communities to "Tourist Towns:"** Replicating the earlier experience of Waikīkī on smaller scales, communities like Lahaina, Kailua-Kona, and others have gradually become less residential communities than visitor retail and attraction centers.
- 4) **Change in the Character of Waikīkī in Recent Decades.** The extent to which Waikīkī should be oriented to visitors or retain a residential component.

Contemporary and Emerging Socio-Cultural Issues

- 1) **O`ahu vs. Neighbor Island Socio-Cultural Impacts:** Dr. Knox notes a distinct difference between the perception of tourism on the Neighbor Islands compared with perceptions on O`ahu. The difference is not only because low-density resorts in the former absorb more land, but also because there is a higher ratio of visitors to residents. The Neighbor Islands contain just 28% of Hawai`i's resident population, but 50% of its visitor units. On O`ahu there is roughly 1 tourist for every 9 residents. Even for the Big Island the relationship is about 1 tourist for every 7 residents (although that ratio is certainly higher in West Hawai`i). However, for Maui and Kaua`i there is about 1 visitor for every 3 residents. As a result, concerns about tourism levels and growth are much higher on those two Neighbor Islands and in West Hawai`i. This is apparent not only from public meetings held by the project, but also in resident surveys.
- 2) **Social Issues Emerging from the Public Meetings held by the Project**

Among other things, the 2002 and 2003 statewide public meetings for this project, organized by Dr. Knox' team, gave attendees the chance to make wide-ranging comments about issues related to tourism.

Frequent themes expressed were:

- **Tourism impact on cultural authenticity and "sense of place":** O`ahu attendees also voiced this concern, and residents of all islands encouraged more Native Hawaiian participation in the industry to counteract a perceived trend toward loss of uniqueness in Hawai`i's tourism product.
- **Jobs and quality of life issues:** Frequent questions about whether pay, regular hours, and the need on some islands to commute long distances to work are sufficient to assure a good quality of life for workers.

- **Need for more collaborative and proactive planning:** Need for better communication among State agencies involved in tourism and for collaborative actions with residents and small businesses.
- **Concern about emerging changes in the nature of tourism:** While Big Island attendees tended to celebrate the community economic benefits of bed-and-breakfasts and on-resort second homes, people on other islands were concerned about emerging new non-hotel form of tourism.

3) Emerging Tourism Issues

In Dr. Knox's research and discussions with industry and community sources of expertise, four emerging issues were highlighted.

- **Cruise Ships:** Most questions raised about additional cruise ship activity have to do with effects on the physical environment, rather than effects on the social, political, or cultural milieu. However, opposition on Moloka'i in particular has clearly included the familiar themes of *local control/identity* and *distribution of costs and benefits*. Moloka'i residents at the 2002 and 2003 public meetings worried that economic benefits may be channeled away from local businesses, and that the controlled nature of cruise ship visits may interfere with their ability to portray their island culture as they believe it should be presented.
- **Timeshare:** Because timeshare projects still usually look like hotels, they have been somewhat invisible to many residents, especially on O'ahu. However, Neighbor Island residents are more keenly aware that timeshare projects provide fewer on-site jobs. During the 2003 public meetings, several Neighbor Island attendees also talked about lower TAT revenues from timeshares than hotels; feared loss of higher-spending visitors and conferences if more high-end hotel rooms are converted to mid-range timeshares; more difficulty on the part of small tour/activities businesses connecting to timeshare visitors without hotel activity desks as intermediaries; and resident perceptions that timeshare properties are more resistant than hotels to granting resident access to coastal areas.
- **Bed and Breakfasts and/or Individual Vacation Rentals:** In addition to economic concerns about diversion of housing stock from residential uses, public discussion has generally focused on the *character of residential communities* (including local noise and traffic issues), the *potential for redistributing expenditures more directly to local small business*, the *chance for more personalized resident-visitor interaction*, and the question of an appropriate *balance point* (i.e., at what point do the annoyance to neighbors outweigh the positive aspects?).

Both public meetings for this project and survey results discussed in the next section suggest very mixed attitudes. B&Bs are often seen as a desirable form of community-based tourism, if they do not proliferate to the point where they "take over" neighborhoods. There is more concern about vacation rentals, because of the lack of on-site hosts to regulate guests' behaviors; feared consequences for property taxes if many sales in a neighborhood are based on the economics of "income properties;" and the idea that the housing stock for residents is being reduced.

- **Recreational Real Estate:** There has been economic benefit from recent construction of resort-residential homes, but also concerns about how to plan for upscale homes in "agricultural subdivisions." Such concerns were frequently voiced in the 2002 and 2003 public meetings for this project. There were questions raised in these meetings about maintaining traditional access rights, especially if gated communities are involved. There were also questions about the extent to which affluent part-time residents "give back" to the local community or take too intrusive a role in community affairs. This may be an

increasingly important issue on Neighbor Islands, where the attitudes and policies of developers may be critical in encouraging positive and balanced involvement in larger community affairs by people living in resort communities.

Tourism and “Spillover Effects,” Crime, and Housing

In addition to illuminating the range of issues noted above, Dr. Knox’ team was asked to explore in more depth, three topics that residents tended to feel are made “worse” by tourism when surveyed: (1) “Spill-over” effects – tourism activities that tend to intrude into residents’ everyday lives, such as traffic; (2) Tourism effect on crime; and (3) tourism effect on housing costs. The sources of information and expertise on these topics were limited. While the resulting research by the Knox team could not provide definitive conclusions, it helped frame the issues for residents, the industry and policy makers.

Tourism “Spill-Over” into Resident Daily Lives

Based on interviews with government agencies, and a review of past resident surveys for relevant results, Knox found that when tourists venture out from the resort boundaries into the community, there are both negative and positive results. Tourism spill-over can create a level of annoyance and intrusion for residents. But Knox found that some types of “spill-over” are welcome, particularly visitor expenditures in local stores. Moreover the spill-over effect seems to work both ways. Residents themselves often choose to spill over into resort areas. In the 2001 HTA survey, 50% of Hawai`i residents said they had stayed in a Hawai`i resort hotel or condo in the preceding 12 months. And 78% agreed, *“I generally feel welcome and comfortable in hotel areas.”*

Government is now most challenged by the impacts of visitor spill-over activity in recreational and/or natural areas, particularly coastal/marine areas, but also inland hiking or scenic areas. These issues are far more complex than can be readily summarized here. They have triggered legislative mandates to spend some TAT revenues on funding repairs or maintenance of visitor-stressed state parks and other environmentally sensitive areas. An assessment of visitor impact and needs within the state park system will be addressed shortly.

Two previously discussed spill-over issues – B&Bs and second homes outside resorts – have the potential to become increasingly important, because they are continuing to evolve “under the radar screen” of good measurement and monitoring. Both of these contribute to concerns about tourism effect on residential housing prices.

Tourism Effect on Crime in Hawai`i

The effort to shed light on this topic involved both a review of the academic literature about tourism-crime links, as well as original data analysis. Both the original research and most of the literature focus on “serious” crime. This is defined by national Uniform Crime Reporting (UCR) procedures to consist of seven offenses – larceny-theft, burglary, auto theft, robbery, aggravated assault, rape, and murder – for which reliable data are kept by law enforcement agencies. While tourism may well be linked with problems like drugs and prostitution, solid and reliable data are just not available for these types of crimes.

Knox found that past studies in Hawai`i and elsewhere have almost always turned up *some* relationship between crime and tourism, but the exact nature of the relationship varies from time to time or place to place. One study might find a statistical link between tourism and, say, robbery, but no link with larceny. Another study – in a different time or place – could find a statistical link between tourism and larceny, but no link with robbery.

One frequently-used technique has been to see if visitors are more likely to be *victimized* than are residents. Some past victimization studies and one limited effort for this study suggested visitors in fact probably *are* more likely to be victimized in Hawai`i, though more so for larceny-theft (i.e., “rip-

offs” at the beach or from cars) than any other crime. However, such studies do not necessarily say whether the greater likelihood of visitors to be victimized is a minor or major factor, whether it is large enough to make a real dent in crime statistics.

In addition to reviewing past studies, Knox conducted original research into this topic using recent data and statistical techniques to uncover any significant new understanding on this issue. His full report details the nature of that research. His conclusions were that while visitors probably do get victimized more often than residents, over time this effect is “drowned out” by more powerful forces, such as demographics or economics. The effect of the greater victimization is small enough that an upsurge in visitors will not usually produce a detectable upsurge in overall serious crime rates. Tourism’s effect on crime appears to be a matter of circumstance, not an inevitable outcome. However, it is important to remember that Knox’s research examined the effect of tourism on crime, not crime on tourism. Hawai‘i’s image as a safe destination is still important to the industry, so visitors’ greater likelihood of being victimized remains a concern.

Tourism and Housing Costs

Analysis of this topic involved some very limited research into a very large question: To what extent does tourism affect housing costs/values for ordinary residents? Periods of economic boom – whether generated by tourism growth or any other economic driver – will always tend to increase demand and thus housing values, but does tourism have any *unique* effects?

Given available time and resources, research on this topic was confined to a survey of about 40 very experienced realtors who had been identified by the various county real estate associations as being “particularly knowledgeable” about this topic. While this approach could not provide any final answers, it might help to better specify the issue and policy options for future applied research or conferences of policy makers.

Knox found that a number of tourism factors can affect housing values for ordinary Hawai‘i residents:

- **Traditional resort hotel development:** Nearly half of the sample of “knowledgeable realtors” thought this had a “large effect” on prices for ordinary residents. The key reasons were seen as exposure of the islands to repeat visitors who want to buy property here, plus constraints on building affordable housing supply close to hotels. The few realtors who saw “no real effect” argued that more systematic analysis would show little correlation between bursts of new hotel openings and changes in inflation-adjusted average housing costs.
- **Recreational real estate:** Realtors felt this tourism component also has significant effects on ordinary residential housing prices. Key reasons included “spill-over” effects of resort buyers into surrounding areas, as well as diversion of contractors into more profitable upscale housing projects. Dissenting voices stressed their belief that recreational real estate appeals to a separate market segment, that there is really little “spill-over” effect.
- **B&Bs and vacation rentals:** This was felt to have much less overall effect and to be confined to a limited number of (primarily oceanside) neighborhoods. To the extent that such development does have price implications for surrounding residents, realtors thought the key reason was the increase in prospective buyers willing to pay more for income/business properties.

Realtors also suggested a number of government policy responses in the Knox survey, although they were divided on whether the best approach is to enforce requirements on developers, provide incentives for the market to create more affordable housing supply, or plan proactively. One common theme was dissatisfaction with past government efforts. But there was also a tendency to see *county* rather than State government as the appropriate level to respond.

Resident's Attitudes and Concerns about Tourism

Between 1988 and 2002, four comprehensive resident attitude surveys were conducted as part of Hawai'i's tourism program. In addition, a new survey was conducted in late 2003 as part of this study's Public Input and Socio-Cultural Component.

Overall, these surveys suggest residents have complex attitudes about tourism. They are not, on balance, either "pro-growth" or "anti-growth." They recognize the need to protect Hawai'i's economic base, but also the need to protect environmental and social assets underlying that base. They tend to register fewer objections to growth if expressed as more *people* (visitors or residents) ... but greater concern about more *hotels, development, or traffic* ... and most concern of all about *depletion of fundamental assets* (water, environment, housing, etc.). They feel tourism brings more benefits than problems, but they also feel both the industry and government have not done a good job in addressing the problems.

Attitudes on Emerging Tourism Issues

The 2003 survey, conducted by the Knox study team, described some of the new trends in tourism, and asked Hawai'i residents if they thought each was "good" or "bad." Few people were willing to label any of them "bad," but residents were clearly more enthusiastic about some than others. Cruise ships and bed-and-breakfasts (B&Bs) attracted majority support. Vacation homes *inside* resorts and timeshare (hotel mixed-use scenario) had more middling figures. Residential-area vacation rentals and vacation homes *outside* resorts in agriculture subdivisions were actively welcomed only by minorities.

Statewide results are heavily determined by O`ahu attitudes. Residents of Maui and Kaua`i, the most heavily tourism-impacted of the major islands, had less positive attitudes about residential B&Bs (just 47% each "good" vs. 64% on O`ahu) and about vacation homes *inside* resorts (Maui 33%, Kaua`i 40%, Big Island 44%, O`ahu 53%). Kaua`i and, particularly, Maui residents tend to have more concerns about tourism and/or general population growth. By contrast, things like age, ethnicity, or even working in the visitor industry have little consistent effect on answers.

Visitor Industry Jobs and Tourists

A series of questions asked from 1988 to 2002 shows residents have a complex and divided picture of tourism jobs – large majorities appreciate the diversity of employment in the visitor industry and believe there is "pride and dignity" to be had in service employment. But about half also think that there is little opportunity to advance, that the best jobs go to outsiders, and that poor hours and/or poor pay characterize such work.

Another series of questions established that most residents enjoy interacting with visitors and believe tourists generally treat residents and workers well. Still, about half of Hawai'i residents worry that "Aloha Spirit" for visitors may be eroding.

"Sustainability" and Product Quality

One critical theme of "sustainable tourism" involves maintaining the quality of key assets underlying both resident and visitor satisfaction – i.e., infrastructure, natural resources, parks, cultural ambiance, etc. Past surveys have shown a consistent willingness to spend public funds to maintain this type of "product quality."

Rating the Visitor Industry & Government

The 2003 survey invited residents to rate both visitor industry and government success in achieving various goals that might, broadly speaking, have to do with maintaining product quality and/or key assets.

Rating the Visitor Industry: Hawai`i residents tend to believe the “Hospitality Industry” does a good job in being hospitable; that is, in providing quality experiences for both visitors and residents who patronize the facilities. Nearly 60% thought the industry does at least a fairly good job of “*Giving visitors a good sense of Hawai`i’s history and peoples.*” But where the industry ranks low, at least in public perception, is in environmental sensitivity (conservation and environmental protection), assuring wider economic benefit, and leadership in community problem solving.

Rating Government: The 2003 survey included a briefer list of ways that government might support tourism and/or deal with its effects on underlying assets. Government gets particularly *good* grades for tourism marketing and protecting beach access. It gets *poor* grades for balancing tourism economic benefits vs. problems and providing infrastructure to keep up with growth.

Nearly half of Hawai`i residents have consistently agreed from 1988 to 2002 that “*This island is being run for tourists at the expense of local people.*” Given that residents express generally positive feelings about visitor behavior, the implied resentment is more likely directed at those who make decisions about “running the island” than at tourists themselves.

Overall Attitudes on Visitor Industry Growth

Hawai`i residents on all islands show split and sometimes contradictory attitudes about tourism growth. There is little appetite for an immediate “no-growth” policy, but more support for the idea of eventual limits than for an open-ended growth strategy. One very clear message is that residents don’t like the idea of building any more *hotels*, even though they do welcome more tourism jobs and, to some extent, the resumption of growth in visitor numbers.

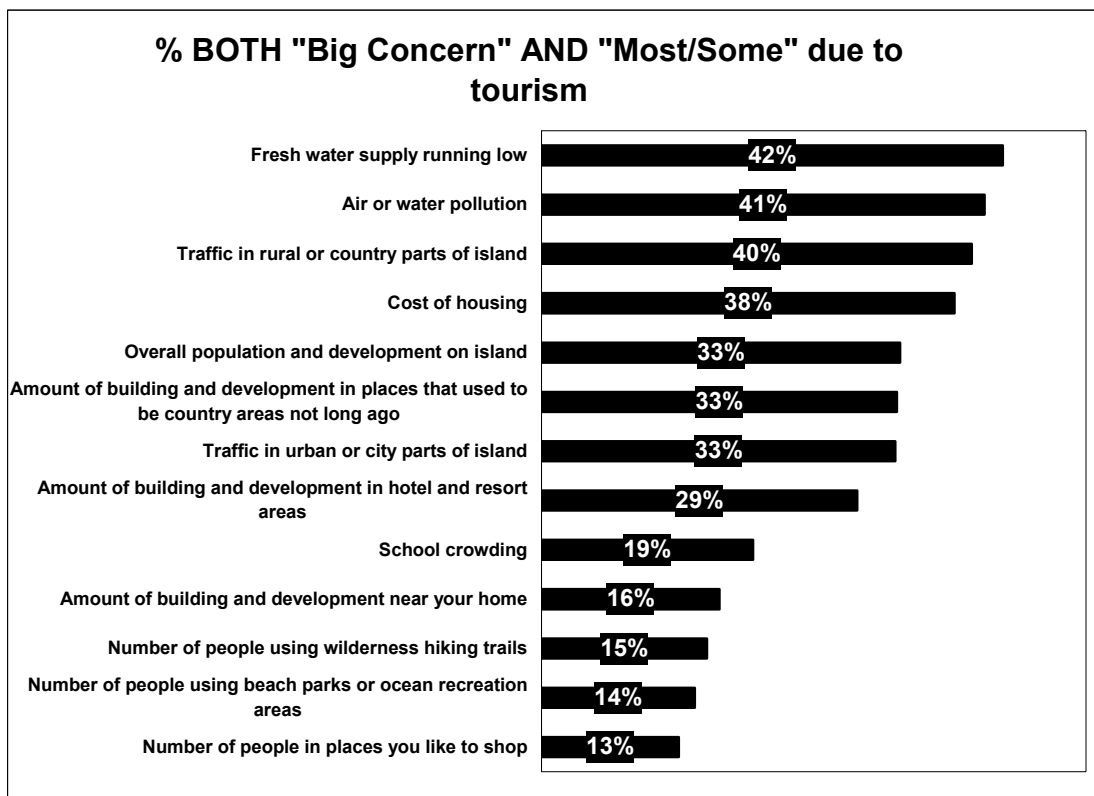
Because of Hawai`i’s history of infrastructure strains during times of rapid growth, the 2003 survey asked: “*When the number of residents and visitors begins to get too much for the infrastructure, do you believe it is generally better for the government to try to build more infrastructure or to try to limit economic and population growth?*” Opinions were split, but the tendency was to favor limiting growth at those times. Residents on all islands were somewhat more inclined to limit growth than to build more infrastructure, except on the Big Island, where each option was favored by an identical 42 percent.

Tourism Overload

The 2003 survey asked residents how concerned they were about various settings or natural assets where congestion or environmental overload might occur. People who said they were strongly concerned about a particular situation were then asked: “How much of that do you believe is happening because of too many tourists or too much tourism – most, some, a little, or none?”

There were no items for which a majority felt that tourism bore “most” of the responsibility, but there were many for which majorities thought tourism has at least “some” of the responsibility. Figure 4 shows a sort of “Tourism Impact Index,” combining percentages saying each situation was a big concern *and* feeling that concern could be attributed at least in part to tourism.

Figure 4: "Tourism Impact Index," 2003 Survey Results,



By this Index, the public is most concerned about "big picture" natural resources – water supply and environmental purity – as well as rural-area traffic congestion and housing costs. At the other extreme, the last three items in the chart – numbers of people in wilderness hiking trails, beach parks, and favorite shopping areas – were of great concern to small minorities (just 18% - 22%) of statewide respondents. But of those who *were* concerned with these things, large majorities (64% - 76%) thought at least some of the problems were due to tourism.

For most of these Tourism Impact Index items, Maui (and often Kaua`i) had higher combined percentages than other islands ... and O`ahu usually had the lowest percentages. That means that a "Neighbor Island only" version of Figure 4 would have higher overall percentages. Table 20 shows some examples where differences are apparent, all of which feature higher Maui than O`ahu results.

Table 20: Selected Island Differences, Tourism Impact Index

<i>(shading indicates results for Neighbor Islands significantly higher than O`ahu results)</i>	Island %'s for Selected Exhibit VI-10 Items			
	O`ahu	Big Island	Kaua`i	Maui
"Fresh water supply running Low"	42	40	32	55
"Traffic in rural parts of island"	29	34	46	55
"Traffic in urban parts of island"	35	36	53	55
"Cost of housing"	34	43	55	54
"Overall population and development on island"	29	35	42	53
"Number of people using beach parks/ocean recreation"	10	22	21	29
"Amount of bldg./development near your home"	14	20	21	26

Source: *Planning for Sustainable Tourism in Hawaii, Socio-Cultural and Public Input Study Summary Report*, July 2004.

Things Tourism Makes Better or Worse

In the four preceding statewide surveys (1988 to 2002), 70 to 75 percent of residents consistently agreed with the statement, “*Overall, tourism has brought more benefits than problems to this island.*”

However, when asked about more specific topics, they had very different reactions to different specific topics. Residents generally think tourism helps the economy and availability of amenities greatly, tends to have some positive social impacts as well, but has more negative effects on; the quality of air and water, prices – especially cost of housing, crime and traffic.

A Native Hawaiian Perspective on Tourism

An important phase of the Knox team’s socio-cultural impact study focused on the Native Hawaiian perspective on tourism. To provide that perspective, an independent panel was assembled to author a separate report within the project. Commissioned as the *Native Hawaiian Advisory Group*, the panel included:

- **Peter Apo** – Director, Hawai`i Hospitality Institute
- **Dennis “Bumpy” Kanahele** – Director, Kanaka Maoli Research & Development Corporation
- **Cherlyn Logan** – Vice Pres., Human Resources, Hilton Hotels Western Region
- **Dr. Davianna McGregor** – Associate Professor, University of Hawai`i Ethnic Studies Department

In its report, this group articulated what is perhaps the first comprehensive statement about the relationship between tourism and the host culture.

Historical Context in Which Hawaiians View Tourism

The Advisory Group felt strongly that Native Hawaiian perceptions of tourism and its impacts cannot be separated from the larger historical context:

“Tourism has to be considered as part of a larger landscape of historical conditions, circumstances, events, decisions, and attitudes that have resulted in a diminished status of Native Hawaiians as decision makers in Hawai`i’s economic future. In this context, Tourism rises as a present-day flashpoint on a long trail of historical disappointments.”

The advisory group identified the Great *Māhele* as a seminal event, and argued that what Westerners then regarded as a societal advance (i.e., a system of private property rights) is still considered by many Native Hawaiians as contrary to the traditional system of land “stewardship” that once provided “unlimited opportunities” for Native Hawaiians to access the land. This alienation of Native Hawaiians from the land occurred during the era of ranches and early agriculture. However, the authors contend that ensuing economies based on sugar, pineapple, and then tourism continued that alienation:

“Some might say it is unfair to connect this historical alienation to present-day tourism, since much of it occurred well before the visitor industry became a factor in Hawai`i’s economy. However, from a Native Hawaiian perspective, as a business model tourism embraces the same concepts and values as its predecessors.”

Although they saw recent improvements and hope for change, the Native Hawaiian Advisory Group authors believe that Hawai`i’s tourism industry is generally seen by many Native Hawaiians as having:

- “contributed to a degradation of their cultural values;
- “compromised their cultural integrity in the global market place;
- “diminished their presence in Hawai`i’s visitor centers;
- “devalued their wahi-pana (sacred places); and
- “seriously compromised a Native Hawaiian sense of place in places like Waikīkī.”

They particularly lament that Native Hawaiian musicians and dancers are made to feel “dispensable” because theirs are the first services to be terminated when the industry needs to tighten its economic belt.

The Advisory Group finds an irony in all this because “...the Native Hawaiian cultural model of ho`okipa or hospitality – the practice of greeting and welcoming strangers – ranks high as an important part of our cultural behavior system... Few societies, if any, are better at hospitality than Native Hawaiians.... In fact, another irony is that Native Hawaiians have long been asking the same fundamental question that prompts this study – Is Hawai`i’s prevailing tourism model sustainable?”

The Advisory Group identifies the fundamental problem to be the prevailing Hawai`i tourism business model. They believe that the tourism experience is actually comprised of three elements – the visitor population, the host population, and the place. They believe the prevailing “customer-first” business model elevates the visitor over the other two elements, resulting in distortions of Hawaiian culture and landscapes, in order to fulfill expectations of hula girls on sandy beaches. A business model based on Hawaiian values would give first priority to the place (not just the host population, as some other tourism critics might advocate). It would be driven by the underlying values of preserving Hawai`i’s “dignity and cultural landscape” as fundamental assets for both visitor and host populations.

Observed Impacts on Native Hawaiians

Table 21 summarizes of the observed impacts of tourism on native Hawaiians. The full report of the Native Hawaiian Advisory Group provides the basis for this assessment.

Table 21: Observed Impacts on Native Hawaiians

Property Development/Management; Tourism Operations and Programs
Change in natural cultural resources needed by Hawaiians who rely upon subsistence activities (i.e., preserving last vestiges of traditional lifestyles).
Change in condition and quality of (and access to) cultural use areas – places where cultural and historic sites and resources are located or which are associated with deities or historic figures or places to connect to spiritual forces.
Disruption of sacred sites, burials, and other places of high value in Native Hawaiian culture.
Loss of Hawaiian sense of place, particularly in valued coastal communities (e.g., Waikīkī 30 yr. ago, West Maui – places that were especially dear to Hawaiians now feel alien).
Disruption and dispersal of traditional Hawaiian `ohāna from communities where resorts have been developed.
Difficulty retaining ancestral kuleana lands due to increased property values and other financial pressures.
Purchase of ancestral lands by offshore landowners who do not interact with neighbors or the community.
Human Resources (Employer-to-Worker or Worker-to-Worker)
Hawaiians seem to be tracked into certain roles in the industry to give the industry the appearance of being “Hawaiian.”
In many hotels and tour companies, Hawaiian culture and local area history are misrepresented to tourists, because workers frequently lack education in these subjects. Native Hawaiians find this offensive.
Entertainment
Preservation of some outward forms, but also “commoditization” of authentic Hawaiian cultural values/practices. (That is, tourism selectively preserves certain traditions and art forms, but usually fails to

<i>explain and support “deep” values.)</i>
Hawaiian feeling that their contributions to the visitor industry – e.g., music, dance, art – are not sufficiently valued.

Table 21: Observed Impacts on Native Hawaiians (continued)

Economic Effects; Entrepreneurial Opportunities
Provides jobs and income for grass-roots Hawaiian people.
When it occurs, the purchase of local agricultural products and services is a positive impact for rural communities where Hawaiians make up a significant part of the population.
Limited Hawaiian involvement, success in tourism <u>business</u> (management or entrepreneurial activity).
Role of Government
Reliance on tourism undermines diversification of the economy on an island such as Moloka`i or a rural Hawaiian community like Hāna.
Development of infrastructure for tourism can undermine infrastructure for agriculture and raise property taxes for Hawaiian kuleana owners.
Planning Projections
Planning for an economy dominated by tourism undermines community-based planning by Hawaiian Homestead communities and rural Hawaiian communities.
Tourists, Offshore Landowners, In-Migrants
Helps to undermine Native Hawaiian efforts to regain greater sovereignty, political self-control.
Increase of challenges to existing Native Hawaiian status, rights, and entitlements (including traditional shoreline access, programs serving Native Hawaiians, etc.)
Growing sense of social distance between Hawaiians and <i>tourists as people</i> .
Growing sense of distance between Hawaiians and <i>tourism as an industry</i> .

Source: *Planning for Sustainable Tourism in Hawaii, Socio-Cultural and Public Input Study Summary Report*, July 2004.

That provides a discussion of “observed impacts” that also addresses (1) the extent to which each issue is related to broader economic changes (i.e., the “Westernization” of traditional Hawaiian culture) and not just tourism alone, and (2) possible methods to measure, to monitor, or to test the validity of the observed impacts. These additions provide important context and qualifications.

Despite the strong concerns apparent in the foregoing list of observed impacts, the Native Hawaiian Advisory Group authors were able to identify numerous examples of “visitor industry activities that exemplify positive, non-exploitive approaches to Native Hawaiian culture.” These “best practices” and steps towards improving the relationship between the visitor industry and the host culture will be discussed in Part II of this summary report regarding the future management of tourism.

Tourism and Environmental Resources

Hawai`i’s natural environment and the pressures put on it by a modern, tourism-driven economy generate important public policy issues. In an effort concurrent to the sustainable tourism project, the Hawai`i Tourism Authority commissioned a Natural Resource Assessment Study. The focus of the study was on both those environmental resources important to tourism, particularly those vulnerable to tourism activity or over use. The purpose was to provide a long term plan for the expenditure of monies set aside for improving natural resource sites frequented by tourists. The study was conducted by the planning firm of PBR Hawai`i.

PBR conducted an overall assessment of the current condition of Hawai`i’s frequently-visited natural resource sites, including the major factors of stress upon them. The firm then identified and inventoried 110 sites across the state in which tourist usage is high or growing. An onsite assessment was produced for each of these sites, which included the observed use and activities, facilities evaluation, accessibility, maintenance and safety hazards. From this evaluation a final list of

23 key sites was developed for more intensive study. This list represented sites with high use by visitors that had critical needs in one or more of the evaluation criteria and could generate economic benefits if the needs were to be addressed.

Overall Environmental Assessment

PBR looked in depth at four major environmental resources or factors acting on those resources including:

- Population Growth and Distribution
- Beaches and the Near Shore Environment
- Terrestrial Environment
- Alien Species

Population

PBR noted that Hawai'i has experienced significant growth in both resident and visitor population over the past half century. Accommodating this growth has meant an increase in the number and size of urban areas and a decrease in the extent of natural areas. During the past decade, population density increased approximately nine percent, from 172.5 persons per square mile in 1990 to 188.6 persons per square mile in 2000. Although O`ahu remains, by far the densest island within the state, population density is increasing much faster on the neighbor islands; density on Maui has risen 66 percent over the past decade.

Three major concerns were identified regarding the negative impact of population growth and expansion of urban areas on the quality of the natural environment. First, urban areas tend to produce concentrated pollution in all forms – air, water, and solid waste, particularly when necessary infrastructure to accommodate growth is not in place. Second, a spread in the number and size of urban areas will result in the further encroachment into natural areas. Third, an increase in the number of residents and visitors and a decrease in the size of accessible natural resource areas may result in overcrowding at remaining resource-based sites.

Due to Honolulu's high population density and Waikiki's continuing prominence as the primary visitor destination, the issue of overcrowding is particularly acute at O`ahu's most popular natural resource sites, including the trail to the summit of Diamond Head, Waikiki Beach, and Hanauma Bay Nature Preserve. As neighbor islands experience projected population growth – in terms of both visitors and residents – urbanization and overcrowding will become primary concerns.

Beach and Near Shore Environment

PBR noted that Hawai'i's world-famous beaches and marine waters are a primary component of the state's image as a desirable travel destination. In addition to resident use of beaches and near-shore resources, many visitors spend the majority of their vacations within Hawai'i's beach and near-shore environment. Beach and water sports, such as sunbathing, swimming, snorkeling, and scuba diving, are by far the most popular recreational activities among visitors. Beaches and coastal lookouts are also a major sightseeing attraction. Maintaining the quality of beaches, beach parks, and marine ecosystems is vital.

Beaches

Major components of coastal health include beach erosion and accretion, water quality, coral reefs, and marine life. In general, the quality of the beaches and coastal waters around Hawai'i is quite high, with relatively few beach closings and an abundance of marine life. However, there are considerable concerns about the future condition of Hawai'i's coastal ecosystem, particularly coastal

erosion and the health of coral reefs. The loss or damage of reefs and beaches would be detrimental to overall coastal health, as well as the visitor industry.

Beach and coastal erosion has drawn significant attention in recent years due to the impact on water quality and the loss of Hawai'i's most popular and recognizable beaches. Over the last half-century, nearly one-quarter of Hawai'i's beaches have been significantly degraded. Typical erosion rates throughout the state range between 0.5 and 1.0 feet per year. On O`ahu, nearly 17.1 miles (or 24 percent) of sandy shoreline has been narrowed (10.7 miles) or lost (6.4 miles) since the 1940s.

Waikīkī Beach is perhaps the most famous example of an eroding beach. It is estimated that some 100,000 cubic yards have receded into the Pacific since 1951 – filling in reefs, creating shallower water, and changing the way the surf breaks. Many of Maui's most popular and visible beaches have also suffered severe erosion. Over the past half century, the island has lost approximately one-third of its beaches. In Kīhei, which has grown in popularity as a prime tourist destination in the past three decades, 5,500 feet of shoreline has severely eroded, primarily due to severe weather and the construction of seawalls.

Beach and coastal erosion are actually components of the natural cycle of erosion and accretion. The most commonly implemented mitigation response to erosion has been the installation of structural barrier, such as a seawall or revetment. However, this shoreline "hardening" interferes with the natural cycle of beach erosion and accretion and increases the turbulence of near shore waters. This in turn decreases the water clarity that is particularly important for many water-based activities, such as snorkeling and scuba diving. Hardening also reduces coastal access, damages littoral ecosystems, destroyed coastal dunes

Beach replenishment has been a somewhat successful project on a portion of Lanikai Beach on O`ahu where the construction of seawalls to protect homes and property had resulted in erosion of nearly all of the one-and-a-half mile long beach. A replenishment project in 2000 added 10,000 to 12,000 cubic yards of sand to the beach. The restoration project marked an important transition in the way erosion is addressed by implementing an alternative solution to the construction of permanent shoreline structures.

Water Quality

In general, PBR found the quality of Hawai'i's marine waters to be very high, particularly during dry weather. However, numerous factors negatively impact the quality of streams and estuaries that drain into the ocean and near shore ocean waters. The most significant impacts on marine waters are caused by siltation, turbidity, nutrients, organic enrichment, and pathogens from non-point sources, including agriculture and urban runoff. Point source discharge into coastal waters by industrial facilities and wastewater treatment plants is also a serious concern.

Another threat to water-based recreational activities is leptospirosis, a disease that is spread by a parasite carried in the urine of introduced animals and is common in Hawai'i's stream and estuaries. If left unchecked, the above factors could significantly degrade the marine environment, as well as create serious health concerns, which would have a negative impact for residents and visitors.

Because there is relatively little manufacturing in Hawai'i, there are only a few point sources of industrial water. However, in 2001, the Department of Health reported 171 oil spills and 271 chemical spills. In 2002, there were 52 beach closings/advisories, 90 percent of which were made in response to known sewage leaks or spills. Hawai'i's coastal waters are particularly vulnerable to non-point pollution because of the sloping terrain and the proximity of the land to the ocean.

The occurrence and spread of algae or alga blooms has also had a significant impact on the overall quality of Hawai'i's beaches and near shore regions, particularly on O`ahu and Maui. The algae create foul smells along the beach and decrease water visibility, which is a particularly important issue for snorkelers and divers. Alga blooms also endanger marine life, especially those

near coral reefs. The algae often engulf the coral reefs, hindering fish from swimming among the reefs, and taking over the native-occurring, less aggressive marine algae.

Coral Reefs

Coral reefs are a particularly important feature of Hawai'i's underwater landscape by protecting beaches and serving as habitat to complex marine ecosystems. Coral reef ecosystems worldwide are deteriorating at alarming rates. Hawai'i's coral reefs constitute 84 percent of all the coral reefs under U.S. jurisdiction, which has made the protection of this important natural resource a priority not only for the state, but for the nation as well. Hawai'i's coral reefs are much healthier than reefs in many other regions. However, without improved protective measures and public awareness, Hawai'i's reefs are at risk of suffering the same massive decline that has occurred elsewhere.

The greatest threats to the health of reef ecosystems are pollution, alien and invasive species, near shore recreation, over-fishing, and climatic changes.

Pollution, which is often the result of insufficient sewage treatment and run-off from development and agriculture, changes the nutrient content of local waters, which stimulates algae growth that covers the corals and alters the community structure of reefs. Sediment in run-off, both from urban areas and from agriculture, also smothers corals, causing damage similar to invasive algae. For example, the occurrence of soil erosion from the grazing land on Moloka'i is believed to have contributed to areas of dead coral reef along the south Moloka'i coastline that are covered with silt and dirt. Large zones of damaged reef were also found in Kaneohe Bay, O'ahu. Over-fishing damages coral reefs by reducing species diversity.

Invasive algae overgrow and kill coral by smothering, shading, and abrasion; compete with native species of algae and coral; and change the physical structure of the reef.

Selective fishing can also remove herbivorous species that naturally control the rate of algae growth, thereby changing the space-competitive equilibrium between corals and algae. Uncontrolled use of sensitive reef areas, whether by tourism companies, residents, or commercial operations, also causes irreversible damage by physically destroying corals through trampling, contact with divers, and anchor damage.

Climatic changes, particularly global warming, also promote reef destruction through coral bleaching.

Marine Life

The health and presence of marine life in Hawai'i's waters is a major indicator of overall health of the marine environment and an important factor for resident and visitor enjoyment of Hawai'i's marine resources. There are approximately 550 species of reef and shore fishes in the waters off of Hawai'i. This number is relatively low in comparison to other locations due to Hawai'i's isolation in the Pacific. However, because of this isolation, many of the species are unique to Hawaiian waters. Approximately 20 to 30 percent of fish and coral species, 20 percent of mollusks, and 18 percent of marine algae are unique to Hawai'i. In addition to fish, other important marine animals include turtles, whales, dolphins, and monk seals. Many species found in Hawaiian waters are considered endangered species, including two species of turtle, two species of whales, and the Hawaiian monk seal.

One of the greatest threats to marine biodiversity is destruction of the coral reefs that serve as the habitat for many marine species. As discussed above, siltation and pollution both contribute to the degradation of these habitats to the point that they can no longer support marine life. Another significant threat is severe depletion and overexploitation of coastal fisheries. According to the Coral Reef Assessment and Monitoring Program, a decline in abundance, particularly around the more populated areas of the state, is likely the cumulative result of years of chronic over-fishing. Commercial, subsistence, and recreational fishermen all contribute to the problem of over-fishing.

Continued high levels of fishing are expected to affect the abundance and distribution of reef fishes, among others.

The concern with over-fishing by commercial, subsistence, and recreational fishermen is exacerbated by the collection of reef fish for the aquarium industry. To address this issue, Marine Life Conservation Districts (MLCDs) were established to conserve and replenish marine resources. They often include bays or coastal areas with coral reefs, both to protect the reefs themselves, as well as the large biodiversity of aquatic life for which the reefs often provide habitats. MLCDs are also very popular tourist destinations. There are currently ten statewide, with additional sites currently under consideration.

A model of how to protect marine life resources is the Hanauma Bay Nature Preserve, which is one of the most heavily used marine preserves in the world, currently drawing over one million visitors per year. The primary human impacts have been through fish feeding, trampling of corals, trash dropped, and the suntan lotion left on the bay's surface, which resulted in a preserve that was almost visited to death in the late 1980's. In 1989, Hawai'i Sea Grant joined county and state park administrators to establish the Hanauma Bay Educational Program (HBEP). At the new education center, which opened in August 2002, visitors are required to watch an educational video about coral reefs, geology, oceanography, fishes, and conservation before entering the water. A case study of the main economic effects of the HBEP has demonstrated an increase in visitor satisfaction, a positive fishery spill-over effect, an increase in biodiversity value derived from a healthier coral reef, and the so-called education spill-over effect, which indicates that educated users maintain the knowledge gained at HBEP and apply it to their visits to other marine areas.

Terrestrial Environment

Inland terrestrial ecosystems are an important component of the overall health of the environment. Healthy forests act like giant sponges that intercept rainfall and allow it to percolate into groundwater aquifers; nearly all of the fresh water needed for domestic consumption, businesses uses, and irrigation comes from forest watersheds.

But inland areas are gaining popularity with residents and visitors (particularly returning visitors) as a setting for recreational and sightseeing activities. As coastal areas become increasingly overcrowded and urban, residents and visitors seek more opportunities for recreational experiences within an undeveloped natural setting. This has led increasing numbers of people seeking such recreational opportunities as picnicking, camping, hiking, horseback riding, mountain biking, and wildlife viewing within the state's *mauka* regions. This increased demand for and use of Hawai'i's inland natural resources necessitates the establishment of resource management and recreational practices that promote a balance between providing opportunities for public enjoyment and protecting fragile land-based natural resources.

A total of 48 different native forest and woodland types are found in Hawai'i. These diverse ecosystems contain more than 10,000 species of plants and animals including 175 different species of native trees. Although forest reserves and much of the watershed within the conservation districts are in good hydrological condition, human impacts, including agriculture, grazing, logging, development, and the introduction of alien species, have significantly degraded the terrestrial environment. Since the arrival of humans, Hawai'i has lost nearly half of its native forest cover. In total, less than 10 percent of Hawai'i's dry forests remain, and most of the remaining forest has already been significantly degraded. Although mesic and wet forests have been less damaged, degradation has occurred there as well, primarily due to invasive species.

Flora and Fauna

The Hawaiian Islands are home to numerous species of plants, birds, mammals, invertebrates, and insects that are found nowhere else on the planet. These species exhibit an array of adaptations to life in their unique habitats away from predators. Many have lost their natural

defenses as they evolved within the protected environment of Hawai'i. Introduced alien species, which take advantage of their lack of defense, have decimated many native populations, making Hawai'i the endangered species capital of the world. With hundreds of plants and animals listed as endangered, threatened, or extinct, there are more endangered species per square mile on these islands than any other place on the planet. Of the United States' documented plant and bird extinctions, nearly 75 percent are from Hawai'i. Since the arrival of humans more than half of the original 140 native species are extinct. Of the remaining species, 32 are listed as endangered. Some of the species still classified as endangered have not been seen in over 30 years and may in fact be extinct. Of the 1,304 historically known native plant species, 106 are extinct, 264 are endangered, and 9 are threatened.

The two greatest factors in causing extinction and continuing to threaten native species are the destruction of native habitat and the introduction of alien species, which exposes native species to new disease, predators, and competition for habitat and food. Approximately 170 bird species have been introduced to the islands, one-third of which have established wild populations that interfere with native habitats and species. Native birds are also susceptible to avian diseases spread by introduced invertebrates.

Many federal and state agencies and private organizations are working together to develop plans and implement active programs to save species and communities at risk. Some of the efforts underway now include preventing the introduction of non-native weeds, fencing to remove feral animals, controlling noxious species that threaten native ecosystems, endangered species propagation, and reintroducing rare species into their native environments. Continued studies of these organisms and their habitats are essential to learn more about how to protect them.

Parks and Trails

Currently, the majority of *mauka* areas open to public access and recreational activities are within the State Parks system and the Na Ala Hele (NAH) Trails and Access Program. In general, Hawai'i's State Parks are in serious need of infrastructure and facility improvements. Because of their high visitation and prominence in tourism guides, many park areas suffer from overcrowding and overuse. The lack of adequate facility maintenance and management practices to protect sensitive resources has resulted in the degradation of not only the facilities, but the resources as well. At some sites, such high accessibility threatens the biological stability of the natural resources when users (including residents and visitors) unknowingly introduce invasive species.

As interest in hiking has continued to grow, the health and maintenance of Hawai'i's trails has become an increasing concern. In 1988, Chapter 198D, *Hawai'i Revised Statutes*, established Na Ala Hele (NAH) – the Hawai'i Statewide Trails and Access Program. In addition to trail construction and maintenance and conducting research and advocacy for access issues, NAH manages a commercial trail tour activity program, which authorizes tour operators to use certain trails and access roads determined appropriate for commercial use. With 97 trails and 85 access roads, totaling approximately 675 miles in the NAH system, and a limited amount of staff and funding, NAH has been hard-pressed to maintain trails.

The *Hawai'i Trail Analysis – Survey & Risk Management Data Profile* (March 2001) conducted visitor counts, surveys, and trail assessments to gauge trail user demographics and satisfaction, as well as trail conditions. Many hikers surveyed reported very positive comments about the trails, including the trail condition and the wide variety of trails within the NAH system. However, the study also cited numerous examples of areas that could be improved with increased financial resources.

NAH has reported a steady rise in visitors' interest in hiking, reflected in increased use of their website and requests for information on their trails. In addition to increases in use by individuals, there has been a corresponding growth of commercial group tours. To manage commercial demand, NAH has established a regulatory system that allows authorized commercial trail tour operators to

use certain trails and access roads determined appropriate for commercial use. Revenue from the fees collected from commercial trail tour activity was \$45,764 for FY02 (\$57,205 gross revenue less 20 percent to the Office of Hawaiian Affairs). This revenue was distributed in exact proportion back to the islands from which it was generated. NAH has also reported increased illegal commercial trail activity.

Alien & Invasive Species

Alien species are defined as non-native organisms brought into an ecosystem either intentionally or accidentally. Invasive species are alien species whose introduction causes or is likely to cause harm to the economy, environment, or human health. As indicated earlier, the introduction of alien species to the Hawaiian Islands has greatly impacted both the marine and terrestrial environment. Their presence in Hawai'i is so prevalent that it is difficult for many who are not experts to recognize the difference between native and alien, and often times, between what is benign and harmful. Some nature guides have reported that visitors' favorite "Hawaiian" plants are often species that are in fact alien to Hawai'i.

The impacts of alien species, particularly invasive species, are amplified in Hawai'i primarily because of the islands' isolation from other land areas. Prior to human habitation, new species were naturally established very slowly, so natives could adapt. Recent introductions by humans have been much faster and in greater volume than natural introductions, and have overwhelmed native species. In addition, native species evolved in absence of most disruptive species and diseases, so they did not develop natural defenses. Population sizes of native species are typically small; making them even more vulnerable to significant damage from stronger, more prolific introduced species. Hawai'i stands to lose much in terms of biodiversity of native species, and to gain even more harmful invasive species if this problem is not controlled.

Ungulates (large herbivores, such as cattle, sheep, goats, and pigs) and rats have caused some of the most significant damage to native terrestrial ecosystems. Their foraging and feeding habits have destroyed fragile native plants, decimated populations of native insects, snails, and birds, and caused significant soil erosion through trampling and the destruction of surface roots. This has also paved the way for opportunistic alien plants that overtake native ecosystems once native species have been significantly weakened or destroyed. Approximately 90 of the 900 plants introduced to Hawai'i pose a significant threat to native ecosystems. The most destructive of these plants include banana poka, strawberry guava, firetree, kahili ginger, Australian tree-fern, clidemia, and miconia. Alien invertebrates have also had a devastating impact on native species, decimating native invertebrates, plants, and birds.

Although invasive species are more commonly discussed as impacting the terrestrial environment, they are also prevalent in marine waters. The occurrence of marine "pests" is a significant concern to the abundance of marine life. According to a count conducted by the Hawai'i Biological Survey, there is a total of 343 marine and brackish water alien species in the Hawaiian Islands, including 287 invertebrates, 24 algae, 20 fish, and 12 flowering plants. Similar to terrestrial alien species, these species are difficult to eradicate since they have no natural predators. Additionally, their underwater location makes dealing with them even more difficult.

The occurrence of marine "pests" significantly impacts resident and visitor recreation by depleting marine resources that visitors travel here to see, degrading water quality, and posing a health risk to visitors and residents. One of the most critical of these marine "pests" to the visitor industry is alga blooms. Alga blooms negatively impact all aspects of the marine environment, especially those in or near coral reefs. The algae often overgrow the coral reefs, which hinders fish from swimming among the reefs, kills the coral, and out-competes less aggressive native algae. The loss of marine life and coral reefs would be devastating to the scuba and snorkel industries. When algae wash up on shore, its negative impacts on the visitor industry extend far beyond marine activity companies. Visitors have reportedly cut their stays short because of piles of green algae and the

associated foul odor on beaches. Resort businesses and dive have reported revenue losses due to alga blooms. The Embassy Vacation Resorts in Kaanapali estimated a five to 10 percent decrease in lunch and beach business from guests going elsewhere for activities during the day due to the alga blooms they experienced in July 2001.

Another marine “pest” that is particularly relevant to the visitor industry in terms of visitor safety and health is the box jellyfish. Box jellyfish, which are considered one of the most venomous marine creatures, often occur in areas highly visited by tourists along the southern coast of O`ahu from Waikīkī to Ala Moana. The jellyfish also commonly appear at Pōkaʻī Bay, Mākaha Beach, and Hanauma Bay.

The further spread of invasive species, both on land and in the water, will have far reaching impacts on residents and visitors. The most obvious way that alien species will affect the visitor industry is by drastically changing the native natural environment that visitors travel here to see. This will particularly impact visitors interested in wildlife viewing. If alien species continue to destroy native ecosystems, replacing endemic species of plants and animals, Hawai`i will lose its attraction as a place to view some of the world’s most ecologically unique flora and fauna.

Because of Guam’s experience with the brown tree snake and its impact on native species there, Hawai`i is particularly vigilant against this or any other nonnative snake establishing a population here. In addition, some individual invasive species are pests and nuisances that could affect visitor experience by creating unpleasant and even unhealthy conditions. For example, coqui frogs keep neighborhoods awake with lawnmower-volume screeching. On Maui, mosquitoes caused cases of dengue fever in October 2001. All of this threatens Hawai`i’s reputation as a safe and virtually pest-free place to visit.

Priority Site Inventory and Assessment

As the assessment above suggests, the stresses on the various resources of the environment are the result of resident economic and recreational activity as well as visitor activity. Because this study is primarily concerned with the sustainability of visitor activity it is helpful to narrow the focus of attention to those places that are sustaining a significant degree of visitor activity.

PBR Hawai`i identified for more intensive analysis 110 sites around the state that appeared to be particularly impacted by visitor usage. There were 30 sites on O`ahu , 19 on Maui, 5 on Moloka`i, 6 on Lanai, 27 on Kaua`i, and 23 on the Island of Hawai`i. A full list of the 110 sites and the onsite assessment reports prepared for each site are available in volume II of PBR Hawai`i’s *Natural Resources Assessment* report, available online at www.Hawaii tourismstudy.com. A list of 23 of these sites judged to be among the highest priority for attention is discussed in the next section of this report.

The 110 sites represent a range of activities, attractions, and natural and cultural resources, from scenic lookouts to active parks to wilderness areas. Approximately half of the sites are on State-owned property, many of these managed by divisions within the Department of Land and Natural Resources (DLNR). The remaining sites are primarily managed by the parks departments within the four counties. The managing agencies were consulted regarding existing plans and proposals for each site included in the assessment.

Overall Evaluation of Identified Sites

PBR Hawai`i’s general evaluation of the sites found most of them marked by aging facilities, deferred maintenance, vandalism, lack of parking, difficulty in finding and accessing the sites, and other issues. The assessments also revealed that the poor quality of facilities negatively impacted the natural resources as well.

But there were exceptions, for which the quality of the site and its facilities served to create an excellent visitor and resident experience while protecting the natural and/or cultural resources of the site. If existing quality is maintained, these sites will continue to showcase Hawai'i far into the future. Unfortunately, exemplary sites, such as Poipu on Kaua'i or Iao Valley State Monument on Maui, are exemptions rather than the rule.

Facilities

Generally facilities at most of the 23 priority sites were poorly maintained, according to PBR, and many had been vandalized. Graffiti, litter, and physical damage (due to both vandalism and deferred maintenance) were observed at the majority of the sites. Previous visitor surveys also reflect this observed disrepair of facilities. When asked to rate satisfaction with Hawai'i's parks and beaches, visitors from the U.S. mainland were overwhelmingly pleased, with 98 percent responding positively. Ninety-five percent of Japanese respondents were either "very satisfied" or "somewhat satisfied" with these natural areas, noting "facilities" as their greatest area of concern. At many sites, the disrepair (and in some cases, the complete lack of essential facilities) not only affects the visitor experience, but the resources as well in cases where visitors make their own "restrooms" in secluded areas within or on the perimeter of the site.

One cause of the disrepair is the lack of adequate funding and manpower to maintain all of the facilities under the jurisdiction of DLNR's Division of State Parks and the various county agencies. The continuing problem of vandalism exacerbates these shortages. One of the most recent solutions is to remove, but not replace, facilities damaged by vandalism. In addition, greater spending to repair vandalism detracts from other needed parks improvements that are easier to put off but would greatly enhance the quality of use at the sites, such as interpretive signage. The cost of addressing vandalism also detracts from the development of new parks.

Parking

Whether it is a lack of adequate space or poor surface quality of the lots, parking is a prevalent issue, particularly at the most popular sites. At some sites the main concern is the lack of adequate parking to accommodate the volume of visitor use, such as Honolua Bay on Maui and Ke'e Beach (within Haena State Park) on Kaua'i. At other sites, the proximity of unpaved parking lots to coastal areas is a concern because of the potential for siltation and run-off, such as at Black Pot Beach Park along Kaua'i's Hanalei Bay, where people park directly on the sand.

In general, existing directional or entry signs were of poor quality and were often difficult to spot from major roads. Some sites lacked any such signage, making them even more difficult to locate. Many visitors must rely on directions from guidebooks, which are often incorrect; such was the case with the Luahiwa Petroglyphs on Lanai and Kiholo Bay on Hawai'i Island.

Signage and Interpretive Displays

Many sites also lack adequate safety signage to warn visitors of potentially dangerous conditions, such as Lumahai Beach on Kaua'i. In terms of regulatory signage, most sites within designated resource protection areas (i.e. Natural Area Reserves or Marine Life Conservation Districts) had standard signs. However, these signs were often weather beaten and outdated, offering little interpretive information about appropriate activities within fragile resource areas and how visitors can help to protect the resources.

Despite the presence of important natural and cultural resources and interesting historical background, only a small handful of sites had adequate interpretive displays, explaining the significance of sites within Hawai'i's rich history. Without posted information regarding the natural and cultural resources present at sites and the traditional legends associated with many sites, visitors (as well as many residents) are missing an essential experience. Hawai'i's natural resource-based visitor attractions represent an opportunity to create a stronger "Hawaiian sense of place" that will distin-

guish Hawai'i as unique among tropical destinations and potentially instill a greater awareness and pride among residents.

Illegal activity

Another concern was the presence of drug use, homelessness, illegal tour operators, and poaching of protected resources. Non-recreational uses at some sites, including homelessness and drug use, place an even greater demand on park facilities and create a hostile environment for visitors to the site. As indicated above, the incessant damage of facilities by acts of vandalism greatly impacts both users and the resources themselves, and forces recreation and resource managers to further stretch already limited funding and manpower. Illegal tour operations crowd out self-guided residents and visitors and place additional strain on fragile natural resources.

Accessibility for the disabled

Despite their prominence as the most highly visited attractions within the state, very few of the observed sites were accessible for visitors with disabilities. Some sites claim to be accessible but clearly were not. However, despite the current lack of accessibility and misleading signage, it appeared that some sites have great potential to establish accessibility without extensive alternations.

Priority Sites

From the list of 110 sites important to, or impacted by visitor activity, PBR identified the following sites for priority attention, based on visitor use, safety risks, potential for ADA accessibility, impact on the health of the visitor industry, protection of the resource and potential for economic development.

Table 22 Priority Site List

Kaua'i	Häena Beach County Park (<i>and Maninihola Dry Cave</i>)
	Häena State Park
	Kalalau Lookout (Köke'e State Park)
	Öpaeka'a Falls (Wailua River State Park)
	Puu Hinahina Lookout (Waimea Canyon State Park)
O'ahu	Diamond Head Lighthouse Overlook
	Diamond Head State Monument
	Läie Point State Wayside
	Makapuu Point State Wayside
	Mänoa Falls
	Pü'pükea Beach Park
Moloka'i	Päläau State Park Lookout
Lanai	Luahiwa Petroglyphs
Maui	Ahihi-Kina'ü Natural Area Reserve
	Honolua Bay and Mokulëia Bay (Marine Life Conservation District)
	Kamaole III Beach Park
	Kaumahina State Wayside
	Waiänapanapa State Park
Hawai'i	Akaka Falls State Park
	Häpuna Beach State Recreation Area
	Kealakekua Bay State Cultural Park
	Punaluu Beach Park
	Waipio Lookout

PBR Hawai'i prepared a detailed assessment and remedial agenda for each of these sites. Those assessments are included in the PBR report cited above and available on the project website.

PART II

MANAGING THE FUTURE OF TOURISM

Finding a Framework: Carrying Capacity vs. Sustainable Tourism

Although this project identified a number of “capacities” and limits for both tourism and resident activity around the state, it was not a goal to propose a *maximum* number of visitors that Hawai'i can accommodate. The primary goal of the study was to develop new methods of understanding what the multitude of limits are and explore ways that tourism growth can be managed to stay within those limits.

The Notion of “Carrying Capacity”

Establishing an overall “carrying capacity” for visitors to the state is much a more complex, problematic and less “objective” task than it might appear. Both the modeling and socio-cultural consultants were asked to research and evaluate the concept of tourism carrying capacity as well as alternative management frameworks that this study could recommend. They found that the notion of carrying capacity was actually developed several decades ago as a wildlife management tool to help determine how much livestock a given range or pasture resource could support. This limited application lent itself to a scientific approach in which data on grass production vs. average livestock consumption of grass could be calculated with little or no value judgment involved.

In the 1980s the concept was adapted to determine over-use by human activity in environmentally sensitive areas. This application became problematic because some environmental features in an area are more “sensitive” than others which made the notion of “over-use” less clear. Moreover, there is a wide range of “human activity” that can occur in natural areas and individual humans differ in the intensity of impact they have. The most recent and extensive major application of ‘carrying capacity’ to a geographical area was a study of development capacity in the Florida Keys by the Army Corps of Engineers. The Keys cover an area of about 100 square miles (one-sixth the size of O`ahu). The study took more than five years to complete, was budgeted at \$6 million and apparently had mixed results.

Difficulties of Applying Carrying Capacity to Tourism

There have been a number of efforts to apply a “carrying capacity” concept to tourism. However, as a framework for making management decisions it has not been seen as effective for several reasons. First, areas in a region feel the pressures of visitor and resident growth differently. In Hawaii, even within individual counties, the impacts of visitors and residents differ by location and for different infrastructure and resource systems in the same location.

Second, many of the pressures that build up on infrastructure, roads, beaches, etc. are from population growth as a whole not just from visitors alone. While it may be possible to identify the visitor’s contribution to the impacts, there is no objective way to identify a “visitor capacity” separate from a total population capacity.

Third, there are really very few hard constraints on either visitor or resident activity. The negative impacts of increased visitor and resident activity produce gradual pressures that are felt as inconvenience, congestion, price increases, etc. The point at which these pressures become a

capacity constraint – that is move from annoyance to intolerable – is not only a judgment call, it is also a moving target. This is because many constraints are temporary and can be eliminated by adding capacity to the system or protecting particular resources from further impacts without setting overall limits on regional tourism. For instance roads can be improved, water and sewerage systems expanded, and more visitor accommodations can be added or converted from other uses.

In short, the project team and consultants found no reliable methodology or objective basis for identify a broad, meaningful “tourism carrying capacity” measure for the state or county levels. However desirable establishing such a number might be, it would be a value judgment, not the result of a scientific analysis.

This is not to say that identifying limits and constraints on tourism growth is not useful or that it was not a focus of the project. The project’s Infrastructure and Environmental Study attempted to identify and measure the use and capacity of more than 20 infrastructure elements and environmental resources at the county and sub-county levels, but found serious data limitations regarding nearly all systems. Not only was it difficult to identify specific usage and capacity levels, almost no data was available to distinguish resident from tourist use of these resources. However, through indirect estimate and modeling techniques by the modeling consultant, the project did identify the impact of tourism on a number of infrastructure and environmental resources as well as a number of specific capacities and trigger points by county that limit Hawai‘i’s ability to accommodate tourism.

Ultimately though, the question is whether capacity limits should be expanded or if restrictions should be placed on the use of the resource or system. Answering that question requires a management framework that can weigh the options.

Alternatives to “Carrying Capacity”

The consultants identified a number of alternative methods for establishing a framework for tourism management that have been tried elsewhere in an attempt to overcome the difficulties of the ‘carrying-capacity’ concept. These include, Limits of Acceptable Change (LAC), Visitor Impact Management (VIM), Tourism Optimization Management Modeling (TOMM) and others. These approaches are better because they try to establish a decision-making framework for tourism policy rather than arbitrary limits. But while these approaches address some of the weaknesses of carrying capacity, they are still small-area and mostly environmentally oriented. They also do not provide much help in addressing populated regional areas in which residential and tourism growth are both factors in the load on infrastructure and the environment.

Sustainable Tourism Management Framework

In order to responsibly obtain the best value for the limited funds available, it was felt that the emerging approach of *Sustainable Tourism* would provide the most productive framework for the study. The notion of “sustainable tourism” has been on a parallel track with capacity analysis, having also emerged in the 1980s as a byproduct of the *sustainable development* concept. But rather than looking only at numbers and limits, the focus of sustainable tourism development is on managing the balance between the costs and benefits of tourism – i.e., balancing resident v. tourist welfare, cultural and environmental interests v. economic interests, and current generations v. future generations. While there are a number of approaches to sustainable tourism its focus is twofold:

- (3) First and foremost, the *quality* of the industry – and, particularly, the assets on which it is based. Such assets include the uniqueness and appeal of the place itself, as determined by a sense of cultural authenticity, friendly workers and residents, well-maintained public facilities, uncrowded natural and recreational areas, etc. Put another way, it is about preserving “sense of place” and/or “quality of the tourism product.”

- (4) Second, the *process* by which a given community achieves some degree of consensus on what those key underlying assets really are, as well as how to measure them and how to preserve them.

The World Tourism Organization (WTO) offers the following definition of this approach:

“Sustainable tourism development meets the needs of present tourists and host regions while protecting and enhancing opportunities for the future. It is envisaged as leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems.”

The exact approach to sustainable tourism appears to be dependent on the particular region, its dependence on tourism and its existing visitor base. However, researchers often cite a number of principles for sustainable tourism to guide research and policy development. Those principles are:

1. Using resources sustainably
2. Reducing over-consumption and waste
3. Maintaining diversity
4. Integrating tourism into planning
5. Supporting local economies
6. Involving local communities
7. Consulting stakeholders and the public
8. Training staff
9. Marketing tourism responsibly
10. Undertaking research

The above principles provide a management framework that can be coupled with the new information about impacts and trade-offs learned in this project. That in turn, can lead to decisions about the future course of tourism from the state level down to the community level.

Recommendations of the Sustainable Tourism Study Group

A diverse group of stakeholders that reviewed a good deal of the information developed in the project made an effort to establish sustainable tourism principles and specific recommendations for Hawai`i.

The Sustainable Tourism “Study Group” was assembled by the Socio-Cultural consultant to explore how various interests view tourism and to see if it was possible for such a diverse group to agree on a set principles under which tourism could be managed for the benefit of all interests. Its final product, “Sustainable Tourism Principles,” reflects a general consensus among a broad-based group of stakeholders (visitor industry, environmental, Native Hawaiian, county planning, and other groups). It is a Vision for the future of tourism in Hawai`i with matching goals, recommendations, and indicators. That product can only be summarized in this report. Readers are urged to review the full report of the Study Group. (The 24 members of the Sustainable Tourism Study Group are listed at the end of this report along with their affiliations.

The driving concept of the Study Group effort was to see whether individuals and groups that often *disagree* about tourism development could find substantial areas of *agreement* on the topic of “Sustainable Tourism.” This was probably the first time that such a diverse group of stakeholders had been brought together to hash out their view and what they could agree upon for what they viewed as the best interests of Hawai`i. Some of the early meetings proved rocky as different philosophies were

aired. But the as the group searched for common ground they agreed to concentrate on the Goals and Indicators document, and worked very purposefully on that product. The final document in the Socio-Cultural Summary report consists of a Vision Statement and an explication of six “Broad Goal” areas as follows:

A Vision for Sustainable Tourism in Hawai`i:

Sustainable tourism would honor Hawai`i’s culture and history, protect our unique natural environment, engage the local community, support the economy, and please our visitors.

GOAL #1 - VALUES: **Sustainable tourism will reflect our own deepest values – *lōkahi* (harmony), *mālama`āina* (nourishing the land), *ho`okipa* (hospitality), *kuleana* (responsibility), and *aloha* (welcome)**

Our visitor industry must strive to incorporate key Native Hawaiian values (both concepts and practices) into the operating systems of its organizations and institutions. Above all, it must achieve *lōkahi* among economic, environmental, and socio-cultural outcomes. The industry must protect and preserve Hawai`i’s “sense of place,” even as businesses seek to understand and satisfy the customer.

GOAL #2 - ECONOMY: **Sustainable tourism will provide good jobs, economic vitality, and diversity; provide opportunities for all sectors of the Hawai`i community; and retain as much of the benefit as possible within our own economy**

Economic realities change over time, and investors expect a return, so some tourism revenue will always leave Hawai`i. But as much income as possible should remain here, and should flow through the economy in ways that benefit everyone, especially families who have been in the Islands for many generations and who have worked to lay the base for tourism’s success.

GOAL #3 - ENVIRONMENT: **Sustainable tourism will operate in harmony with our ecosystems, enhancing natural beauty and protecting the islands’ natural resources**

Like any economic activity, tourism implies a human population, a “built environment,” and some consumption of resources. An industry that relies on beauty and on the abundance of nature has a special responsibility to help protect the landscape and the natural resources of land and sea.

GOAL #4 - CULTURE: **Sustainable tourism will be part of a larger effort to perpetuate the customs and traditions of Hawai`i’s ethnic cultures, especially our Native Hawaiian host culture**

Although responsibility must be shared with the wider community, Hawai`i’s visitor industry should be a dynamic agent for respecting and enhancing Hawai`i’s cultural customs and traditions, especially those of the host culture, as an important and valuable segment of the visitor experience – and part of what makes these Islands special for those of us who call Hawai`i home.

GOAL #5 - SOCIAL **Sustainable tourism will reinforce Hawai`i’s heritage**
HARMONY of tolerance, diversity, respect, and Aloha among our various ethnic and social groups, and among residents and visitors

Hawai`i’s history of social change can lead to fears about dispossession and dominance by elites, but our overall social evolution has resulted in a relaxed, friendly, and partly blended “local” culture that is highly prized. Tourism must support this social fabric – including harmony between residents and visitors.

GOAL #6 - PLANNING: Sustainable tourism will be planned to protect communities' sense of place for current and future generations

Like any industry, tourism tends to change or grow in spurts, as economic conditions shift. Advance contingency planning is needed to assure that “opportunity” to some is not “overwhelm” to many when it does occur. Similarly, when tourism extends into residential or resident-oriented commercial or recreational areas, careful planning is required to balance benefits with possible problems.

Priority Action Recommendations

Within each of the six "Broad Goal" areas above, the full document includes various Specific Goals – each of which is assigned Indicators and Action Recommendations (with specified agencies or organizations considered responsible for each of the Action Recommendations). At the close of its work, Study Group members voted on “first-priority” Action Recommendations, with the following results.

Values: The Study Group urged that Sustainable Tourism in Hawai`i be grounded in a set of Native Hawaiian values noted above, and the “first-priority” action recommendations included:

- Develop a specific strategy for explaining and publicizing these values, and for measuring success. This strategy may be coordinated with programs to inform residents about benefits and costs of tourism in Hawai`i. (*Responsibility: HTA, spearheading a coalition of industry, community groups, and state/county governments.*)
- Develop an ongoing public awareness effort [to assure both resident and visitor awareness of these values]. (*HTA and coalition suggested above*)

Economy: This was an area with many action recommendations, and Study Group votes were particularly divided. Small clusters of “first-priority” votes went to:

- Periodically analyze the industry’s economic health vis-à-vis comparable destinations, and identify reasons for any problems. (*DBEDT*)
- Expand current management and interpretive training opportunities. (*The University of Hawai`i’s system*)
- [*To assure high quality in “alternative tourism” development ...*] Determine methods to identify and track numbers of unlicensed operators of small tourism businesses – e.g., bed-and-breakfasts (B&Bs), small tour vehicles, water sport tours, etc. (*Office of Planning, in coordination with DLNR and other agencies*)

Environment:

- [*To assure environmental protection through ongoing public-private collaboration ...*] Bring together a public-private partnership – including visitor industry associations, government agencies, and environmental groups – to explore (1) the feasibility of forming and funding a private nonprofit or coalition dedicated to identifying mutual goals, and (2) continuing this sort of partnership on an ongoing basis. (*HTA, DLNR*)
- Seek adequate state/federal funding for existing state/federal alien pest species task forces and action plans – with particular emphasis on preventing catastrophic invasive species such as the brown tree snake. (*Hawai`i Invasive Species Council*)

Culture:

- [*To assure accurate and respectful treatment of Island cultures in entertainment and education programs ...*] Assemble a group of key stakeholders (hotels, attractions, performers and unions, cultural groups) to produce a voluntary “code of standards” that

seeks to balance market realities, artistic freedom, and resident desires for cultural authenticity. Also determine feasibility of system for periodic “grading” of major venues relative to the code. (*Office of Hawaiian Affairs [OHA] with HTA and appropriate visitor industry organizations*)

- Expand existing tour guide certification processes, and add cultural component to ... new certification programs for eco-tour operators [recommended elsewhere]. (*Community colleges and other educational institutions*)

Social Harmony:

- The suggested, HTA-led coalition [see “Values” above] could also recommend and help implement ways to inform visitors and newcomers, including but not limited to (a) in-flight films and written materials; (b) various short articles appropriate for audiences such as second home purchasers, new industry workers, etc.; and (c) references to respected social histories available in Hawai‘i libraries. (*HTA to initiate discussions, with eventual implementation by groups such as County Visitors Bureaus [CVBs] or Chambers of Commerce*)
- Encourage various ways to “patrol” parks or scenic areas with high visitor counts – citizen volunteer groups, parking attendants, food vendors in daylight hours, etc. (*State and county parks departments, with HTA and CVBs*)

Things the Group Felt Strongly About

The Study Group was unanimous in beginning the document with an emphasis on *values*. Without a values-based framework, the group felt there was little hope of retaining the unique product or sense of place desired by both residents and visitors. And the group felt it most appropriate to express those values in Native Hawaiian terms. Thus, this document ties back to the Native Hawaiian Advisory Group’s emphasis on maintaining “sense of place” and a clear set of values for the visitor industry.

Additionally, the group felt that neither the Broad nor Specific goals should be prioritized. Members thought the entire package was needed to present its vision of a balanced and workable Sustainable Tourism framework. (As noted above, they did cast a sort of “straw vote” on priority *actions*, though only in the sense of what should be addressed first, not which were inherently more important.)

Finally, the group was concerned that any public report acknowledge that its action recommendations would require funding, and that it lacked the time and resources to estimate what those funding levels would have to be.

The *particular* indicators suggested in their document are initial best suggestions only. Members hoped statistical expertise will improve on those suggestions over time. They also hoped that any continuation of their efforts would include establishing target numbers (i.e., desirable levels) for each indicator. Similarly, in regard to “Responsibility” (public or private organizations who should take the actions or collect the indicator data), members were offering their initial best suggestions, not assuming a right to direct anyone to do anything. Their basic point was that a true, ongoing sustainable tourism system would have to assign such responsibility.

Study Group Document and Hawai‘i Tourism Authority Strategic Plan

A number of the concerns of the Study Group have been addressed in the HTA’s recent *Ke Kumu* Strategic Plan. The Study Group has proposed specific target actions and indicators of success. The Study Group’s issues extend to such topics as:

- Needed infrastructure improvements by State or county agencies – including overburdened parks (though the HTA is starting to address this), highways, resort-area water and sewage systems, etc.;
- Cultural authenticity of the industry product, and protection of place-specific cultural assets during the development phase;
- Industry working conditions, and economic opportunities for local businesses working with mainstream industry players;
- Better enforcing existing natural resource protection programs, preserving the environment from invasive alien species, and assuring that Hawai'i's visitor industry incorporates "best practices" in water- and energy-saving systems;
- Involving professional associations and industry groups in activities such as encouraging better design and sorting out conflicts over outdoor resources.

Unresolved Topics

Concerns About Implementation: Several Neighbor Island Study Group felt that the implementation of certain environmental and planning goals should be either *solely* or *primarily* driven by the counties rather than the State. These Study Group members said they did not want to go so far as dissenting or not concurring from the document, but they did want these provisos noted "for the record." Similarly, one of the Native Hawaiian members said he was willing to endorse the current version, although he would like in the future to see even stronger recognition of the importance of the "host culture" to sustainable tourism in Hawai'i. In particular, he would hope that sustainable tourism will help affirm and acknowledge Native Hawaiian rights to self-determination as pledged by the 1993 Congressional apology for American involvement in the overthrow of Queen Lili'uokalani.

Growth Limitation Policies: The Study Group early on recognized that this was an area on which consensus was unlikely, and decided to focus instead on topics where it seemed more possible for members to find common ground.

Defining "Sustainable Tourism" or "Sustainability:" Despite several fairly valiant attempts, the Study Group never did come to agreement on specific common definitions of what Sustainable Tourism *is*. However, in their Vision statement, they concurred on what Sustainable Tourism would *do*: "Sustainable tourism would honor Hawai'i's culture and history, protect our unique natural environment, engage the local community, support the economy, and please our visitors." And the articulations of the six Broad Goals in the Appendix further extend the group's operational definition.

Concern about the Project Process: Mr. Henry Curtis, executive director of Life of the Land, asked to submit the following Statement: *"Life of the Land testified in favor of the sustainable tourism legislation as it moved through the Legislature. DBEDT assured the environmental community that we would be on the overarching guiding body advising in the implementation of the study. Instead, DBEDT and the Tourism Industry plotted for a year on what the study would look at, eliminating the carrying capacity study, and removing community input from the UH model group. What resulted is typical of many studies: those who worked on it may like it. Like most studies it will gather dust. To plan for the future we need collective wisdom rather than limiting meaningful participation. Life of the Land cannot sign off on a study done without broad-based community input."*

The Sustainable Tourism Study team responds that it regrets any misunderstanding about the role of community interest groups in the implementation of the study. They appreciate and value the dedicated work and contribution by Mr. Curtis and his organization in both the Study Group discussions and within the project's Environmental Advisory Group. They point out that 12 public meetings were held on all islands during the course of the project, at which all consultants presented their research and invited comments. Two presentations by the modeling consultants were made to

the Study Group and to the project’s environmental advisory committee over the course of the project. They also note that the project was authorized under a brief budget proviso rather than specific legislation.

Proposal for a Sustainable Tourism Management System

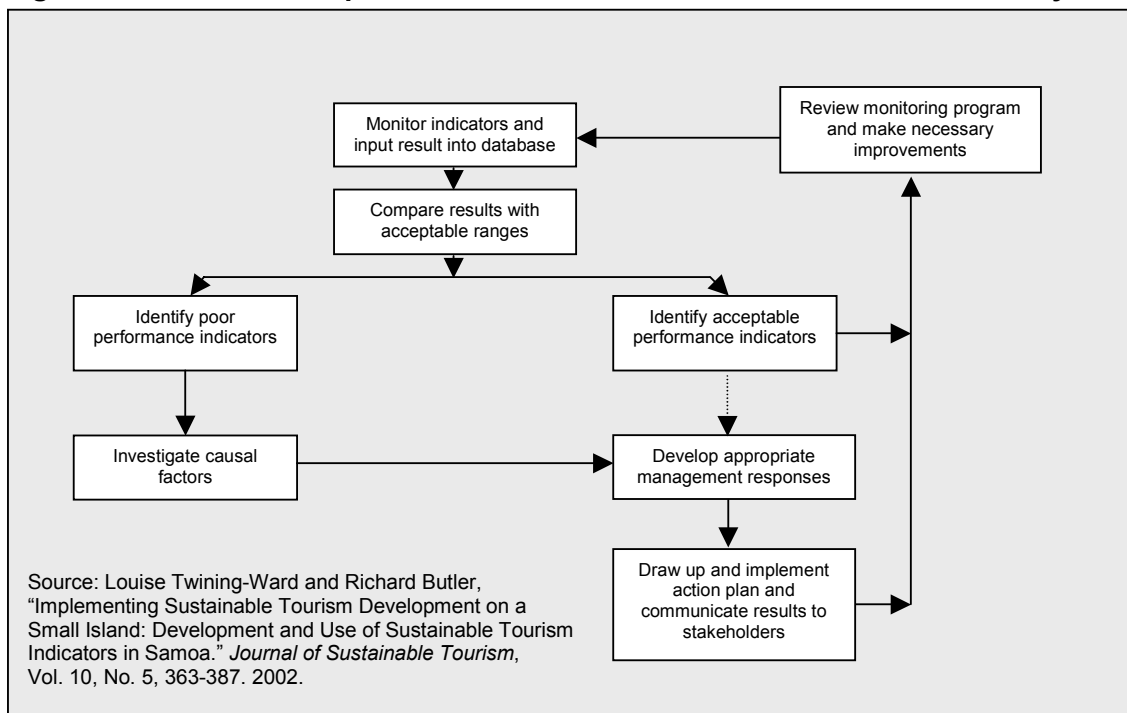
Taking into account models developed elsewhere, the Socio-Economic, the input of the project's Study Group and Native Hawaiian Advisory Committee, and its socio-cultural research, the Knox team developed a preliminary proposal for an ongoing “Sustainable Tourism Management System.” (The proposal is explained in detail in the Socio-Cultural Report, and reflects principles developed by organizations such as the World Tourism Organization and the United Nations Environmental Program).

Knox suggests an ongoing, organized, public-private effort to maintain product quality and preserve Hawai'i’s key assets. Based on approaches elsewhere, the essential elements of the proposed system – some of them included in the HTA's Strategic Plan adopted subsequent to his initial report – include:

- A focus on the entire, overall destination (“quality of the place)
- Coordination by local government authority, in collaboration with working groups comprised of key industry and community stakeholders
- Development of consensus on long-term goals and actions
- Identification of indicators of success
- Adoption by an official agency with authority to implement, revise, and oversee the ongoing process.

Figure 5 shows one approach, with emphasis on the monitoring of indicators and management response features.

Figure 5: General Conceptual Model for Data-Driven Sustainable Tourism System



While government usually plays a coordinating role, Knox notes that the Sustainable Tourism literature suggests the concept works well only if key stakeholder groups, including the industry, find ways to be partners in carrying out some of the activities. In Hawai'i, such a system might well be two-tiered, with a statewide umbrella providing support for coalitions of stakeholders on each island.

Existing Models

In various forms, Knox found such systems are beginning to be implemented elsewhere. The overall Summary Report for the Socio-Cultural and Public Input component notes variations that have been designed and/or applied in the United Kingdom, Australia, the nation of Samoa, Denmark, the French Caribbean, the Balearic Islands of Spain and others.

The United Kingdom – an island nation with multiple indigenous ethnic groups – has made “sustainability” a cornerstone of its integrated tourism marketing and product quality planning system. Its combination of a national strategy, linked to regional and local processes, is a potential general model for Hawai'i to explore. That is, it parallels a potential Hawai'i statewide system with local-island or community implementation.

Possible Configurations of a Hawai'i Sustainable Tourism Management System

A number of possible functions for a Sustainable Tourism System are suggested, not all of which may be feasible or appropriate for Hawai'i.

Goals, Action Plans, Implementation: This is a core function, and the Study Group's work provides an initial base. As previously noted, their scope of concerns was wider than current State tourism plans.

Convening/Collaborative Function: The various industry, environmental, Native Hawaiian and other community stakeholders need to be brought together periodically in an effective system. This could be done through multi-stakeholder committees like the Study Group assembled in this project; through periodic “Sustainable Tourism Congresses” with widespread participation; through web-based approaches, or combinations of these.

Measuring and Tracking Indicators: The Sustainable Tourism Study Group hopes that its preliminary list of indicators can be refined, and that targets (“success” and/or “acceptable change” levels) can be added. Reasons for tracking indicators are to (1) assure that performance goals are being met; and (2) feed into an action response management system if they are not.

Communication/Education: The visitor industry is already engaged in many efforts to support “best practices” in environmental and cultural areas, but often communicates these just to the rest of the industry. A well-maintained Sustainable Tourism website could communicate these to a much larger segment of the public. Programs to educate the public about the industry can be based on progress made toward economic, social, and environmental goals – rather than approaches based strictly on economic benefits.

Standards/Certifications Related to Culture and Environment: On an international basis, one of the most visible outcomes of the sustainable tourism movement has been development of voluntary certification and accreditation schemes, often based on environmental responsibility. The international market is growing accustomed to such quality assurance efforts – a 2001 study by the World Tourism Organization identified 60+ tourism certification programs. The Study Group noted substantial concern in Hawai'i about authentic cultural content in entertainment/education for visitors, as well as similar issues regarding need to certify eco-tourism guides. Solutions may prove challenging, but the need seems long established and growing rather than shrinking.

Industry “Quality” Efforts: To the extent that sustainable tourism in Hawai'i refers to the industry's “long-term survival or health,” overall service quality and customer satisfaction are also critical.

Hotels and restaurants are already subject to national ratings, so there may or may not be need for additional attention from a local sustainable tourism system. Still, an integrated approach to sustainable tourism might be incomplete without this.

Conflict Mediation: Conflicts can occur among the parts of the visitor industry and with non-industry stakeholders. A Sustainable Tourism System might provide skilled facilitators to see if at least a portion of these conflicts can be resolved before they move into the more adversarial judicial or legislative/regulatory systems.

Support for Island or Industry Segment-Specific Sustainability Systems: A statewide system could very possibly serve as an initial phase or umbrella organization, with each island developing its own system. Or smaller systems could focus on particular aspects of tourism, such as the cruise ship industry.

What Groups Might Participate in a Hawai`i Sustainable Tourism System?

Specific organizational structures and responsibilities would most properly be decided among the State and counties with the input of non-governmental stakeholders, if the basic idea of a Sustainable Tourism System for Hawai`i receives widespread support.

However, some of the likely interested parties in such a system might include:

- The Hawai`i Tourism Authority.
- Governor's Tourism Liaison/DBEDT.
- Other State and County Administration Agencies.
- University-Based Researchers/Trainers.
- Visitor Industry Associations and Business Organizations.
- Environmental, Native Hawaiian and Other Community Stakeholders.
- Non-profit Sector.
- Education & Training Agencies.

Comprehensive Recommendations

The following recommendations were generated by the Sustainable Tourism Project consultants, the Study Group and Hawaiian Advisory Committee, and the HTA's Natural Resources Assessment consultants. They cover a broad scope of issues for both immediate and long-term attention. Some of the consultant recommendations, contained in earlier drafts that were made public for comment, may have been implemented to some degree or superseded.

Modeling Consultants

The primary mission of the modeling project was to develop a new system of models to identify relationships and suggest future limits on resources that can be the basis for policy discussions. The modeling team also provided numerous recommendations for the direction of future research and policy efforts, as summarized below.

- **There remains a broader question of how much additional population growth and in-migration is desirable for our state.** This issue has emerged not only in terms of the increasing demand for labor in the visitor industry and in other businesses in Hawai'i, but also, more fundamentally because it is the resident population that creates the greatest strain on our environment. It has been demonstrated that while the daily average levels of water, sewer, electricity, propane, and solid waste generation are greater for visitors than residents, it is the residents who are most responsible for the strain on the environment. Coupled too with the larger questions regarding suburban expansion, the changes in the structure of our economy have definite implications in terms of the demand for labor and the pressures related to growth and development of our islands.
- **One of the major challenges in Hawai'i and in other locations where tourism is such a pervasive part of the economy is to develop appropriate policies that do not have unintended consequences.** Because so much of the economy depends on tourism and because so many people are either directly employed by the visitor industry or work in companies that provide crucial goods and services to visitor-related industries, there is hesitancy to introduce radical, sweeping change. It is, after all, the livelihoods and prosperity of companies, families, and individuals that are at stake. Hence, efforts to balance economic, environmental, and social goals need to be carefully designed and implemented to produce "win-win" solutions or, in the case of the "triple-bottom line" view of sustainability, "win-win-win."
- **Regardless of the number and type of tourists to Hawai'i, there may be reason to do a better job of managing the negative, "spillover" effects associated with tourism, such as congestion, pollution, and environmental impacts.** This is tricky because residents contribute even more to these negative results than both the visitor population and the industries directly supporting them. Nevertheless, there are three approaches to managing externalities that could help: tax policy, land use policy and infrastructure pricing.
 1. **Tax Policy** – this approach involves changing behavior of consumers and producers by imposing taxes that raise the costs of economic activity. Revenue generated from new taxes could be used to promote sustainable development or subsidize programs that are related to reducing the environmental impacts of tourism and development. In addition to the broadly based excise tax, Hawai'i currently levies a number of specific taxes directly affecting the visitor industry including the Transient Accommodations Tax (TAT) and rental motor vehicle and tour vehicle surcharge tax.
 2. **Land Use Policy** – this approach involves using development plans, zoning, and other land use controls to steer growth and development. Hawai'i, with its two-tiered system of zoning (state and county) has had long history of involvement in these strategies. Given

the finding that development pressures are currently much more related to suburban expansion and that valuable wildlife and natural resource areas (habitat, wetlands, etc.) are at risk, the development of coordinated land use policies designed to balance growth and the natural environment are needed.

3. **Infrastructure Pricing** – this approach involves changing the price of water, wastewater treatment, solid waste, energy and other infrastructure services as a way that influence demand and recover revenues that can be used to expand infrastructure services or develop sustainable tourism policies. Changing the price of water or other infrastructure goods and services may influence not just demand, but also production of goods and services over time.
- **If tourism is to grow, even modestly, there is need to re-examine our policies with regard to the development of hotels and visitor accommodations.** This is a concern across the state. As the number of visitors increases, more and more of the rental stock is being used for tourist accommodations (resort condos, time-share conversions, and rental units).
 - **Changing the Tourism Production Process.** As noted in this study, because tourists spend more, they tend to consume more water and other infrastructure services per person than residents. A strategy to reduce this load may involve using the data and methods created in this project as a basis for re-engineering the production of tourism in Hawai`i. Perhaps more emphasis could be directed towards water savings devices, smart buildings, energy-efficiency, and other new technologies that could reduce the environmental impacts of tourism in order to create a more economically, environmentally, and socially sustainable product.
 - **There is a need to expand the present state-of-knowledge with regard to modeling techniques and methods of assessing the impacts of sustainable development.** In addition to the CGE model, the use of input-output methods, GIS, and other techniques of regional analysis have been demonstrated. The work on simulating urban growth should also be expanded. Other potential models and algorithms could be incorporated to take advantage of the data that have been collected.
 - **Sustainable Development Indicators.** It is evident that there is need to develop more extensive indicators pertaining to sustainable development. While measures of economic success abound, there is need to go further in terms of capturing environmental quality and social vibrancy. Unfortunately, there is a tendency to monetize all of these values because of the difficulty of dealing with different measurement systems. Future work should go towards the development of appropriate measures of sustainable development that cut across different economic, environmental, and social domains.
 - **Sustainable Tourism Database.** In this project, a great amount of data has been collected from many different sources. Given the importance of tourism to Hawai`i's economy and community and the need to monitor and measure the impacts (both positive and negative) of changes in tourism, there is need to both continue and expand the work that has been initiated. A plan to ensure the ongoing collection and updating of vital information related to the economy, environment, and society in Hawai`i should be developed.
 - **An issue that has emerged relates to the differential impact of various types of visitors coming to Hawai`i.** On the one hand, tourists from Japan spend the most per day, yet much of that economic activity (retail purchases, etc.) leaks out of the state of Hawai`i. These visitors tend to spend less on non-tradable goods and services, so the benefits to our local economy are limited. A higher proportion of what they purchase and consume is imported. Tourists from Canada, however, spend proportionately more on restaurant meals, hotel

rooms, rental cars, gasoline, and stay longer than the typical Japanese visitor. Because it takes more lower-spending Canadians to achieve the same levels of output and production, the impact in terms of water use, wastewater, electricity, and other infrastructure services (with the exception of solid waste generation) is proportionately greater. Clearly additional research needs to be done in terms of identifying the optimal mix of visitors from key markets in terms of economic, environmental, and social benefits and costs. In addition to considering the differences between geographical markets, we might also consider changing the mix of business, honeymoon, convention, and other categories of tourists. Potential new mixes could include, “edu-tourists,” “health tourists” and other types of visitors to Hawai‘i.

Socio-Cultural and Public Input Consultant

- **The State and counties should begin to define recreational real estate (vacation homes, etc.) as a separate economic activity, meriting both analysis and planning in its own right.**
 - Modify the in-flight survey of visitors and returning residents to record vacation homeowners or their nonpaying guests. While the numbers in this category will be relatively small compared to traditional visitors, this will produce a database for follow-up research into issues such as occupancy levels, initial vs. subsequent expenditures, location (on- vs. off-resort), demographic characteristics, opinions and attitudes, etc.
 - In initial follow-up research, focus on learning about the extent to which part-time residents are making concentrated purchases in selected residential areas or, especially, “agricultural subdivisions” outside resorts. Such research should include likely future expansion of actual housing structures (as opposed to investment in unimproved land) in agricultural subdivisions for part-time residential use.
 - Use the State “Rural” land use classification and appropriate county zoning labels for purposeful designation of recreational real estate projects that lack hotels or other classic “Resort” characteristics. That is, because recreational real estate is a rising and enduring market reality, plan *for* it – not just screen *against* it – in agricultural or other non-resort areas where demand is likely to occur. There will be many places where such activity will not be desired, but there must also be mechanisms for determining where it should be allowed and encouraged.
 - Work with Realtor organizations that collect residential housing sale and value numbers on each island to explore the feasibility for separate reporting of data in areas where buyers are primarily full-time residents vs. areas where buyers are primarily part-time residents.
 - As any Sustainable Tourism Systems are developed at State or county levels, provide for inclusion of resort-residential developers, off-resort developers or Realtors specializing in vacation property, and relevant homeowners’ associations in collaborative planning bodies.
 - Petition the U.S. Bureau of the Census to gather future housing data in a way that provides more detailed information about the current category “held for seasonal, recreational, or occasional use” (SROU). This SROU category currently combines second homes, timeshare, and some other uses, and it would help Hawai‘i to have separate data on these various uses.
- **The State should also expand its regular tourism research program to gather more information about two other emerging non-traditional forms of tourism in Hawai‘i – timeshare and residential-area transient vacation rentals.**
 - The American Resort Development Association (ARDA) sponsored studies of Hawai‘i’s timeshare industry in 1997 and 2000, and these could provide a baseline – and potential

collaborator – for a regular (if not necessarily annual) time-series analysis of key timeshare statistics.

- Bed-and-breakfasts and vacation rentals in residential areas pose a difficult problem because they are largely illegal, though counties lack resources for enforcement. Available information exists primarily on the Web.
- **To improve understanding of potential future tourism growth under existing land use permits, the State should work with counties to standardize reporting of “permitted but unbuilt” visitor units – including, if possible, residential units on resorts or in designated recreational real estate projects.**
 - DBEDT’s annual *Visitor Plant Inventory* currently collects information from each county planning department about “Planned Additions and New Developments.” This is a useful project-by-project monitoring of expected short-term changes. However, different counties report by different levels of visitor units (e.g., Maui generally only tracks hotel or timeshare projects, while O`ahu reports condos and even B&B’s) ... and none currently appear to track resort-residential units.
- **The State and the HTA should focus some visitor research more specifically on the questions of satisfaction with key underlying natural and cultural assets, in order to determine the extent to which concerns about “unique sense of place” or “product quality” (vs. external factors or economics) are actually affecting likelihood of return to Hawai`i.**
 - Modify the current Visitor Satisfaction and Activity Survey, which now gathers only indirect information on this topic by asking only those who say they are unlikely to return why that is so. To provide a better “early warning system,” we need to be tracking general satisfaction on the part of a representative cross-section of *all* visitors in regard to satisfaction.
 - In research conducted in international markets, explicitly explore the importance of such factors, as well as the importance to foreign travelers of various emerging international certifications and standards for “nature tourism” that Hawai`i (along with much of the rest of the United States) may not yet have adopted.
- **Counties should explore legalizing, but more effectively regulating bed-and-breakfasts – and possibly also vacation rentals in certain residential areas, though probably with tighter standards because of the lack of on-site hosts. Key decisions to be made at county levels would need to include:**
 - Maximum number of structures/units permitted in a given residential area. Such a legal maximum would reassure residents their neighborhoods will not gradually evolve into a de facto hotel area, and give both existing operators and residents more freedom and incentive to report subsequent illegal operations.
 - Noise, parking, and other nuisance control factors. If these were spelled out in codes readily available to neighbors, residents could report violations (or informally discuss them with proprietors) without the sense that their report would result in the total elimination of a business depended upon by a close neighbor.
 - Funds for county enforcement of such standards could come from dedication of the Transient Accommodations Tax for such units (i.e., return to counties) and/or from higher property taxes applied to these units than to surrounding “purely residential” properties

Native Hawaiian Advisory Group

Best Practices and Hopes for an Improving Industry

The report of the Native Hawaiian Advisory Group recognized a long list of positive industry actions – in categories ranging from Historic Preservation to Performing Arts to Restaurants and Food Services. The Advisory Group also believe that Hawai'i's visitor industry is assigning a new economic value to Native Hawaiian culture that was largely absent during the period of rapid economic growth: *“Many institutions are embracing Native Hawaiian culture as good for their bottom line; are willing to properly compensate for services; but don't know how to access the services. This is a good problem.”*

The group is particularly pleased about the growing demand for visitor contact with authentic cultural practitioners and the consequent opportunity for Hawaiian entrepreneurs: *“One of these is the opportunity for Native Hawaiians to tell their own story, on their own terms, with dignity and honor.... Native Hawaiians would welcome culturally appropriate opportunities that tourism offers as a window to the world, because we believe we have something worthwhile to contribute to the betterment of conditions of mankind.”*

Specific Recommendations.

- A voting seat on the Hawai'i Tourism Authority for the *Office of Hawaiian Affairs*.
- A voting seat on the Hawai'i Tourism Authority for the *Native Hawaiian Hospitality Association*.
- A voting seat on the Board of Land and Natural Resources for the *Office of Hawaiian Affairs*, in order to help assure culturally appropriate stewardship for natural resources impacted by tourism.
- Provide dedicated funding to the Native Hawaiian Information Alliance – a non-advertising driven media program that seeks to connect visitors and local people with genuine Native Hawaiian cultural experiences.
- Establish by statute a *Cultural Landscape land classification or zoning district* that would serve to protect important cultural landscape communities with design codes, population density limits, historical preservation designations, and other processes that would prevent the obnoxious and inappropriate intrusions on the cultural and social landscape of so classified communities.
- Provide dedicated funding for the development of *community-based day tourism* as an alternative economic development business model.
- Provide dedicated funding for a cultural resource *inventory grants program* that provides financial support to community organizations or State/City agencies to develop a statewide mapping data base of each community's cultural resources that would include historical sites, important native landscapes, *wahi pana* (sacred places), historic buildings, trails, waterways, shoreline environments, and so forth. Any State training funds associated with such a program (e.g., Employment Training Fund) should be earmarked for cultural awareness or knowledge thereof.
- Amend the environmental processes that severely limit a community's ability to restore ancient Hawaiian fishponds to useful productivity and provide some financial support for the planning of such projects. This would help assure more of a “sense of Hawaiian place” for residents and visitors alike.
- State settlement with OHA of the Ceded Lands Trust. This is critical for tourism because of links to airports and harbors.

- Assess effectiveness of cultural resources management plans and monitoring programs that have been developed for tourist resort areas. For example, a resort on each island could be selected. For each site, the Environmental Impact Study, including the mitigation measures and the conditions imposed for a permit to be granted, could be examined to determine if the conditions were met and if the project impacts were accurately assessed.
- Promote the purchase of local agricultural and marine products and services.

Infrastructure Assessment Study Consultant

Carter and Burgess Statewide Recommendations

- A statewide waste water feasibility study is recommended
- A statewide effort is needed to address the issue new landfill sites on each island.
- Continued monitoring of storm water, & tracing non-point source pollution and enforcement of health violations is needed.
- Major effort needed to address growing traffic congestion.
- Priority for airports should be improved cargo facilities
- Improvements at nearly all Harbors needed especially to accommodate expanding cruise industry.
- State and county parks are in need of alternative sources of funding to improve, and maintain facilities.
- Better long-range planning for emergency response systems is needed.
- Need to ensure that growth in visitor facilities does not outpace infrastructure growth.
- Additional power, especially on Hawai`i Island, is greatly needed.
- Invasive species are a great threat to Hawai`i. A critical need is for directed leadership and coordinated actions among all state/county agencies.

C&C of Honolulu

Water Supply Quality and Quantity

- Reclamation, desalinization and other sources of potable water need to be identified and developed.

Roads

- Immediate need for coordination between state and city transportation departments.

Harbors

- Barbers Point Harbor should be improved to handle additional cargo ship arrivals and boat repair and maintenance facilities.

Parks

- Needs assessment and detailed plans for each district are needed to identify resource areas with recreational value and to develop these areas.

Visitor Accommodations

- Generally development has been slow outside of Waikīkī. Within Waikīkī emphasis is on renovation of existing inventory.

Energy Systems

- Emphasis should be placed on demand side energy conservation programs as well as developing alternative sources of energy.

County of Hawai`i**Water Supply Quality and Quantity**

- West Hawai`i's dry conditions & low recharge rate is a potential constraint for the visitor industry and other development.

Sewage

- Many areas outside Hilo and Kailua-Kona depend on on-site wastewater disposal systems and cesspools, which in most cases do not satisfactorily treat the wastewater. A wastewater feasibility study is recommended.

Solid Waste Disposal

- Illegal dumping of solid waste continues to be a problem. Development of a solid waste options plan is recommended.

Roads

- Recommended that alternative funding sources be identified for future maintenance and new infrastructure. .

Airports

- Improved cargo facilities on East Hawai`i needed.

Energy Systems

- Strong opposition to power plant sites on West Hawai`i a possible constraint to the visitor industry.

County of Maui**Water Supply Quality and Quantity**

- A comprehensive water management strategy must be developed
- Sewage
- The wastewater treatment facilities for Maui County are approaching their design capacity.

Solid Waste Disposal

- Recommend convenient centers within the individual communities for recycling and reuse of solid waste.

Roads

- An alternative route is needed for north-south moving traffic and a Lahaina bypass are needed.

Harbors

- An upgrade at the Lahaina dock for visitors arriving by cruise ship is recommended.

Parks

- Improvement and expansion of park facilities in the region have not kept pace with resident population growth.

Count of Kaua`i***Water Supply Quality and Quantity***

- Aging and remotely located transmission and service lines make it difficult to keep up with the necessary repairs.

Sewage

- The County of Kaua`i should develop a master plan for wastewater treatment focusing on strategic issues and funding priorities.

Solid Waste Disposal

- Therefore, a new landfill site will be needed within six years.

Harbors

- Berthing facilities and port infrastructure are priority needs at Nawiliwili and Port Allen.

Parks

- Current trend of ecotourism will divert more visitors towards the under-maintained parks and beaches of Kaua`i.

Police, Fire and Emergency Services

- Outdated fire equipment and facilities and DOW water supplying infrastructure problems compromise the abilities of the Kaua`i fire department.

HTA Natural Resource Assessment Consultant**Vision for Visitor Intensive Natural Resource Sites**

In its report, PBR Hawai`i identified overall issues and recommended vision statements for the improvement and sustainability of natural resources important to both resident and visitor activity.

Natural Resource Protection

Visitors and residents enjoy participating in activities within a natural setting. However, there is a growing awareness of potentially negative impacts from human interaction with fragile resources, whether for passive sightseeing or active recreation. While visitors and residents hope to continue these activities, and possibly expand access to Hawai`i's natural areas, protection of the environment should drive the development of management strategies and the provision of access to natural areas. Within this emerging ethic of resource protection, consideration of the impact of the visitor industry and resident recreation on the integrity of natural and cultural resources should be foremost. Recreation programming should include the interpretation of cultural and historic resources to better inform visitors and residents about resource protection.

A Vision for Resource Protection:

- Effective management strategies and interpretive programs have been developed, implemented, and enforced to protect and sustain natural and cultural resources sites frequented by visitors.

- Visitors and residents within natural areas do not compromise the integrity of the natural resources and they gain greater awareness of the fragility of Hawai'i's unique natural environment.
- Visitors and residents do not adversely affect cultural archaeological resources, and stronger cultural awareness has been developed through the preservation of cultural landscapes and view corridors, and the implementation of interpretative programs.
- There is increased awareness about the fragility of natural and cultural resources and the importance of protecting these resources through interpretive programs and stewardship.

Resource and Facilities Management

There is general consensus that improved management of recreational resources and facilities is critical to long-term sustainability of natural resource-based areas. The pressure on resource managers and recreation providers to resolve management issues, despite cuts in funding, manpower, and equipment, has increased as maintenance problems, vandalism, and violations of rules regulating use of recreational resources continue. Deferred maintenance and lack of enforcement of parks rules has brought safety concerns, the potential for liability, and the threat of park closures to the forefront of recreational resource management discussions.

A Vision for Resource and Facilities Management

- Natural resources frequented by visitors are safe and well maintained through the implementation of management strategies and practices that improve the quality of recreational resources and facilities and protect them from future degradation.
- State and county park facilities currently in disrepair have been rehabilitated, and alternative strategies have been developed to offset reductions in manpower and equipment in order to ensure timely maintenance of facilities in the future.
- Vandalism and other illegal activities, such as illegal camping or unauthorized commercial activities, have been significantly reduced.
- All of the natural resource areas that are frequented by visitors and naturally accessible are safe for recreational use, such as sightseeing, picnicking, swimming, and hiking.
- There are minimal conflicts between multiple activities and groups utilizing the same recreational resources, including conflicts between visitors and residents or between various trail users.
- Where appropriate, various recreational agencies are generating revenues (through fees, licenses and concessions, etc.) in addition to those appropriated by the Legislature to assist with the maintenance of natural resource sites frequented by visitors.

Conflicts Among Users

Residents and visitors participate in a wide variety of activities within natural areas, requiring a range of resources and facilities, from beach parks and boat ramps to hunting grounds and trails. Visitors to specific sites also represent broad demographic characteristics and present a range of ever-changing special needs and interests. The high demand for use of limited recreational resources can often lead to competition and conflict between users of the same facilities and outdoor areas.

A Vision for Resolved Conflicts

- Visitors and residents are offered a wide range of natural resources and facilities, and conflicts between users competing for the same natural and recreational resources are minimal.

- The number and range of resources and facilities to support expanded participation in ocean and shoreline recreational activities by both visitors and residents have increased, and the number of conflicts between different recreation users of the same resources is minimal.
- There are a number, and a variety, of resources and facilities to support and expand recreational opportunities in mauka and natural areas, and the number of conflicts between different uses of the same trails and upland areas is minimal.
- Opportunities for walking, jogging, and bicycling as physical activities and transportation have significantly increased through the development of a comprehensive network of safe and well-maintained linear paths and lanes.
- Alternative sources for funding recreational programs and resources have been developed and non-monetary mechanisms (such as “adopt-a-park,” “adopt-a-beach,” and “adopt-a-trail”) are employed for supporting recreation and resource management agencies.

Safety and Risk Assessment

In light of recent litigation regarding personal injury during use of recreational resources, private landowners are more reluctant than ever to allow public access through their property. County and state recreation agencies have also expressed reluctance in developing additional park facilities because of liability concerns for potential injuries. This has raised the need for a risk assessment of state and county facilities and resources in order to ensure public safety and better protect the departments from litigation. Agencies and recreation users have also identified the need for legislative support for increased protection of private landowners and government resource managers.

A Vision for Safety and Risk

- The appropriate state and county agencies have developed risk assessment and management programs to identify potential safety hazards and prevent injuries.
- The Legislature has passed laws to ensure the protection of private landowners as well as the state and counties from liability.

Public Access

Constraint on public access to recreational facilities and resources remains a high-priority issue, particularly given the demand for activities within natural settings. In some areas, private land ownership and development significantly restrict access to natural areas that are otherwise desirable and appropriate for public use. Since the events of September 11, 2001, increased security on federal lands has also reduced the availability of certain recreational facilities and natural areas. The lack of resources meeting the standards set by the Americans with Disabilities Act restricts recreational opportunities for visitors and residents with physical disabilities.

A Vision for Public Access:

- There are only a few constraints to recreational access, and effective management strategies expand, rather than limit, recreational opportunities for nearly all types of resource users.
- Access to shorelines and public forest areas is ensured by the protection of existing accesses and by the reestablishment of access to areas that are currently blocked or restricted by private landownership and/or development.
- Public use of military recreational facilities prior to September 11, 2001 has been restored and surplus federal land is gradually being returned to the state or counties for development as recreational resources (parks or open space).

- Physical barriers that prevent individuals with disabilities from enjoying natural resource areas (where feasible) have been removed.

Growth in Ecotourism

PBR suggests that the expansion of ecotourism with environmentally friendly operations is a way to diversify the tourism market. But it also notes that the promotion of commercial eco-tours presents additional challenges for recreation providers and resource managers by creating the potential for overuse/overcrowding of facilities, resource degradation, and conflicts between visitors, residents, and tour operators competing for use of the same resources.

A Vision for Ecotourism Development:

- Strategies to expand the “nature-based” sector of the travel market have been developed while following management practices that protect resources from overuse and degradation and limit conflicts between tour operators, visitors, and residents.
- Overuse, overcrowding, and resource degradation at beach parks and recreation areas popular with both visitors (including those brought in by commercial tour operators) and residents is minimal, and management strategies that neither limit use by residents nor discourage use by visitors have been developed and are being implemented.
- The ecotourism market is being promoted and expanded while management strategies that limit over-development of tour operations are implemented with minimal conflicts to residents or resource managers.

Advisory Groups and Members

Final Sustainable Tourism Study Group Members

<u>Name</u>	<u>Affiliation</u>	<u>Island of Residence</u>
Peter Apo	Hawai'i Hospitality Institute	O`ahu
Ian Costa	Kaua`i Planning Department Director	Kaua`i
Dee Crowell	Initially Kaua`i Planning Director; now Sandwich Isles Communication	Kaua`i
Henry Curtis	Life of the Land	O`ahu
Susan Au Doyle	Aloha United Way	O`ahu
Michael Fitzgerald	Enterprise Honolulu	O`ahu
Guy Fujimura	ILWU	O`ahu
Frank Haas	Hawai'i Tourism Authority	O`ahu
Annette Kaohelaulii	Hawai'i Ecotourism Association	O`ahu
Alice Kawaha (representing Planning Director)	Hawai'i County Planning Department	Big Island
Millie Kim	Millicent Kim, Inc. (Big Island community)	Big Island
Leslie A. Kuloloio	Cultural Native Resource Specialist (Maui community)	Maui
Lynn McCrory	PAHIO Resorts/DLNR Board (Kaua`i community)	Kaua`i
Bob McNatt	Hawai'i Resort Developers Conference/Maui Land and Pineapple	Maui
Jeff Mikulina	Sierra Club	O`ahu
Brian Miskae (representing Planning Director)	Maui County Planning Department	Maui
Rev. Kaleo Patterson	Pacific Justice and Reconciliation Center	O`ahu
Carol Pregill	Retail Merchants of Hawai`i	O`ahu
Dr. Pauline Sheldon	University of Hawai`i, School of Travel Industry Management	O`ahu
Kathy Sokugawa (representing Planning Director)	City & County of Honolulu, Department of Planning and Permitting	O`ahu
James W. Stanney	Initially KPMG, LLP; now Ko Olina Realty, LLC	O`ahu
Murray Towill	Hawai'i Hotel and Lodging Association	O`ahu
Donna Wong	Hawai`i's Thousand Friends	O`ahu
Marjorie Ziegler	Conservation Council for Hawai`i	O`ahu
<p>Note: The project is indebted to Ms. Lyn Anzai and Mr. Robert Taylor who were not able to serve the duration of this project. The project is also indebted to Dr. Peter Adler, and Dr. Kem Lowry who, along with Dr. Knox, guided the Study Group though its hard work on this important task.</p>		

Native Hawaiian Advisory Group

<u>Name</u>	<u>Affiliation</u>
Peter Apo	Hawai'i Hospitality Institute
Dennis "Bumby" Kanahale	Kanaka Maoli Research & Development Corporation
Cherlyn Logan	Hilton Hotels Western Region, Human Resources,
Dr. Davianna McGregor	University of Hawai`i Ethnic Studies Department

Environmental Advisory Group

Name	Affiliation
Ms. Alenka Remec	The Nature Conservancy of Hawaii
Mr. Jeff Mikulina	Sierra Club, Hawai'i Chapter
Dr. Jackie Miller	Environmental Center, University of Hawaii
Ms. Donna Wong	Hawai'i's Thousand Friends
Mr. Henry Curtis	Life of the Land
Mr. Alton Miyasaka	Department of Land and Natural Resources
Mr. Jeyan Thirugnanam	EOQC
Mr. Neil Reimer	Department of Agriculture – Plant Quarantine
Ms. Susan Miller	Office of Planning/CZM
Ms. Marjorie Ziegler	Earth Justice
Ms. Betty Wood	Department of Health (Health Hawaii)

Infrastructure Advisory Group

Name	Affiliation
Dan Quinn	State Parks Division, DLNR
Wayne Souza	Division of State Parks, DLNR
Francis Nakano	Division of State Parks, DLNR
Philip Ohta	Division of State Parks, DLNR
Glenn Taguchi	Division of State Parks, DLNR
Mike Buck	Forestry and Wildlife Division, DLNR
Edwin Petteys	Forestry and Wildlife Division, DLNR
Patrick Costales	Forestry and Wildlife Division, DLNR
Robert Hobdy	Forestry and Wildlife Division, DLNR
Jon Giffin	Forestry and Wildlife Division, DLNR
William Balfour Jr.	City and County of Honolulu, Parks and Recreation
Floyd Miyazono	County of Maui, Department of Parks and Recreation
Patricia Engelhard	County of Hawaii, Department of Parks and Recreation
Ian Costa	Office of Public Works

Modeling Advisory Group

Name	Affiliation
Dr. Paul Brewbaker	Bank of Hawaii
Dr. John Mapes	DBEDT
Dr. Khem Sharma	DBEDT
Dr. Eugene Tian	DBEDT
Lorene Maki	Office of Planning
Glenn Ifuku	DBEDT
Caroline Anderson	HTA
Robbie Kane	HTA
Robert Shore	DBEDT

Visitor Industry Advisory Group

<u>Name</u>	<u>Affiliation</u>
Stephen K. Yamashiro	Hawai`i Tourism Authority
Toni Marie Davis	Activity Owners Association of Hawaii/ Hawai`i Attractions Association (merged organizations)
John Thatcher	Airlines Committee of Hawaii
Mary Lou Lewis Wendy Goodenow	American Society of Travel Agents - Hawai`i Chapter
George Applegate	Big Island Visitors Bureau-Hilo
Sharon R. Weiner	Business Development, Public Affairs and Consumer Marketing DFS Pacific Group
Waynette Ho-kwon	Destination Lanai
Katsumi Tanaka	Hawai`i Activities and Tours Associations
Annette Kaohelaulii	Hawai`i Ecotourism Association
Murray Towill	Hawai`i Hotel Association
Michele Van Hesem	Hawai`i Restaurant Association
Rex Johnson	Hawai`i Tourism Authority
Tony Vericella	Hawai`i Visitors & Convention Bureau
Sue Kanohe	Kauai Visitors Bureau
Terryl Venci	Maui Hotel Association
Marsha Wienert	Maui Visitors Bureau/Tourism Liaison
Sandy Beddow	Moloka`i Visitors Association
Douglas K. Chang	Native Hawaiian Tourism & Hospitality Association
Nadine Nakamura	NKN Project Planning
Les Enderton	Oahu Visitors Bureau
Carol Pregill	Retail Merchants of Hawaii
David H. Gleason	The Dunes at Maui Lanai
Rika Ikeda	Visitor Aloha Society of Hawaii
Rick Egged	Waikiki Improvement Association



Department of Business, Economic Development & Tourism

P.O. Box 2359

Honolulu, Hawaii 96804

Street Address: 250 South Hotel Street

www.hawaii.gov/dbedt