

SUSTAINABLE TOURISM PLANNING AND TRANSPORTATION IN TEXAS

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ABSTRACT

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EXECUTIVE SUMMARY

In an era when individuals have more disposable income and leisure time, and when transportation of all kinds has become more advanced and accessible, tourism is a rapidly growing industry. Texas is no exception.

One of the keys to better understand the relationship between tourism, transportation, and sustainable economic development on the state/local level is to examine these issues as they play out on different levels—local, regional, and statewide. By taking a closer look at the issues related to tourism, they become easier to understand and more real. These issues include: access versus preservation, the “right” of individuals to demand instant, complete access to protected and easily degradable resources, the tension between environmentalists and the tourism industry, the questions involving maintenance and new construction, choices between and among modes of transport to facilitate access and convenience while maintaining safety, encouraging economic development, and protecting resources, at various levels,

In the southwest region, and in Texas specifically, not only are there several national parks and forests, but also hundreds of state parks, wildlife refuges, historic landmarks, and other protected and unique resources. The same problems experienced at the national level are played out at the state and regional areas.

Fredericksburg, for example, can be viewed as one of the major “gateway communities” in the Hill Country. This is why, for a city such as Fredericksburg, planning for economic development, transportation, and tourism is such an important activity. It is important not only to the economic well-being of the city, but also for the economic well-being of the region.

Planners and policy professionals in the tourism and transportation fields learn much from the national level. They have learned that it is extremely important to create an institutional, political, and professional framework at the regional level for sustainable tourism, including a strategy for long-term and comprehensive policy and planning structures, natural resources/environmental planning, economic planning, and transportation planning. Cooperative planning goals may include:

- ▶ Protect the natural, historical, and cultural resource base central to the region's tourism success.
- ▶ Establish partnerships between tourism providers and host communities to build sustainable tourism practices and activities.
- ▶ Develop better "inventory" and monitoring systems for both the resource base and the activities of tourists.
- ▶ Use improved technology and design practices to minimize negative impact on the region as a whole and the destinations within the region.
- ▶ Take advantage of market opportunities for a "greener" tourism product by encouraging firms that pursue these strategies to operate within the region.
- ▶ Develop standards for the tourism industry and encourage collaboration (at all levels, from local to state to regional) in the development and implementation of effective regulatory mechanisms.

Together, these points can constitute a mandate and an agenda for the tourism industry in Texas and in the Southwest Region to build a more future-focused and sustainable industry through better planning, management, and cooperation to address tourism's common concerns—environmental and infrastructure planning.

Because transportation and its related infrastructure are important components of tourism, furnishing the primary means for the vast majority of travelers to get into, out of, and through a

destination, poor transportation planning and inadequate infrastructure can dramatically reduce the economic “utility” of tourism to a community. This suggests a need to develop transportation planning frameworks to address tourism development within the broader context of community, regional, or statewide economic development goals. It is the objective of this study:

- ▶ To examine and better understand tourism-related transportation flows and infrastructure development/planning in selected regions of Texas; and
- ▶ To examine and better understand the interrelationship between sustainable development, transportation, and tourism.

Three regions within Texas are examined as part of this study: the Hill Country/Fredericksburg, the Gulf Coast/Port Aransas, and the Big Bend area. Researchers chose to examine regions and sites separately based on the understanding that each destination displayed one or more distinct types of tourism that fell within the following matrix: Data was collected initially through literature reviews and the Internet. This information was combined with firsthand visual data and interview information to obtain a multi-faceted picture of the extent to which transportation services and infrastructure hinder and/or enhance the tourism experience, and the extent to which tourism supports community or regional efforts for sustainable economic development.

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CHAPTER 1: PROBLEM STATEMENT AND RESEARCH METHODOLOGY

DESCRIPTION OF PROBLEM

The diversity and complexity of the tourism/travel industry are both its strength and its weakness. On one hand, the economically broad-based nature of tourism allows a wide variety of economic sectors to benefit from travel expenditures. On the other hand, the broad economic base of tourism also makes it difficult to conduct economic evaluations of the effects of the industry, both positive and negative, on a state, region, or city. This also makes the industry vulnerable to both overly positive and overly negative value perceptions. Despite the difficulties in evaluating and predicting the effects of the tourism industry, many communities view tourism as a major component of sustainable economic development. Because transportation and its related infrastructure are important components of tourism, furnishing the primary means for the vast majority of travelers to get into, out of, and through a destination, poor transportation planning and inadequate infrastructure can dramatically reduce the economic “utility” of tourism to a community. This suggests a need to develop transportation planning frameworks to address tourism development within the broader context of community, regional, or statewide economic development goals.

Tourism affects a community’s economic development by bringing in revenues and creating employment. Buses, automobiles, trains, planes, and ships bring travelers to a destination. Travelers purchase a variety of products and services offered in the area by amusement, recreational and entertainment establishments, lodging establishments, restaurants, and retail outlets. These expenditures generate a variety of employment and business opportunities, and help to create and sustain local or regional economic development. Tourism, however, can also negatively impact a destination. For example, large numbers of tourists, especially if they arrive seasonally, or for one event, can create situations of intense congestion, in which tourists

compete for infrastructure space with permanent residents. Large numbers of tourists also increase strain on a variety of city services in addition to transportation infrastructure, such as police and fire services, sewage, water, and electricity. Tourism can also negatively impact the physical environment. Therefore, unplanned growth of tourism industries and related activities, especially transportation, can lead to a variety of detrimental impacts on communities (both urban and rural), their economic base, and their natural resources.

It is the objective of this study:

- ▶ To examine and better understand tourism-related transportation flows and infrastructure development/planning in selected regions of Texas; and
- ▶ To examine and better understand the interrelationship between sustainable development, transportation, and tourism.

RESEARCH METHODOLOGY

Three regions within Texas are examined as part of this study: the Hill Country/Fredericksburg, the Gulf Coast/Port Aransas, and the Big Bend area. Researchers chose to examine regions and sites separately based on the understanding that each destination displayed one or more distinct types of tourism that fell within the following matrix:

For example, the Hill Country displays a significant historical/cultural component in addition to its environmental attractions, and although it seems mostly rural in nature, urban sprawl is expanding further outward as cities, such as Austin and San Antonio, continue to grow. The Port Aransas case study focuses on the environmental aspect of tourism rather than the historical/cultural component, and explores some of the conflicts the community is experiencing as economic growth puts pressure on these environmental resources. The Big Bend case study focuses on the extremely rural and ecologically fragile nature of the region, and how this affects the use of tourism as a tool for economic development.

INFORMATION GATHERING EFFORTS

Data was collected initially through literature reviews and the Internet. This information was combined with firsthand visual data and interview information to obtain a multi-faceted picture of the extent to which transportation services and infrastructure hinder and/or enhance the tourism experience, and the extent to which tourism supports community or regional efforts for sustainable economic development.

Other general questions were also addressed as appropriate:

- ▶ In developing a site, or continuing to operate a site effectively, how does planning for transportation (enhancing mobility) to, from, and within the area occur?
- ▶ What are the positive and negative effects of various modes of transportation (passenger vehicles, public transit, tour buses, campers/RV's, bicyclists, pedestrians) on tourism sites and the surrounding area(s)?
- ▶ How do these various modes interact with each other, within the site, and with the surrounding community?

By looking at a sample of tourism planning efforts of various types and in various locations, researchers obtained a better idea of the kinds of strategies that have been successful (or unsuccessful) in tourism planning as applied to transportation and sustainable development.

RESEARCH METHODOLOGY FOR THE HILL COUNTRY

Within each region, researchers describe in various degrees of detail the physiographic, economic, and historical context of the destination in an effort to give the reader an idea of the setting within which the region and the communities within the region have developed over time. The analysis of the Hill Country specifically addresses the development of roads and other transportation patterns and infrastructure in their historic/economic context because these transportation patterns and roads are an integral part of the Hill Country tourism experience.

People travel to the Hill Country to enjoy natural beauty, environmental resources, and historical/cultural resources. Therefore, it would be important to the traveler that the transportation infrastructure enhance the experience of these resources as travelers move between destinations. For example, it would be important to have a minimum of visual clutter (such as advertising billboards) surrounding the roadway, obscuring or degrading scenes of natural beauty and cultural import.

The research methodology for the Hill Country region was therefore geared toward addressing the nature of the roadways as they affect the travel experience. This resulted in the development of a windshield scenic evaluation survey. Researchers drove the stretch of U.S. 290 from Austin to Fredericksburg and FM 964 from Fredericksburg to Enchanted Rock and, using this survey along with videotape and topographical maps, evaluated this popular and heavily traveled route. A detailed analysis of this survey is presented in Appendix A.

Another part of the research conducted in the Hill Country was an assessment of the nature of transportation, tourism, and economic planning efforts of Fredericksburg, the major gateway community in the region. Researchers interviewed several individuals from the city regarding the future of the city of Fredericksburg, efforts at transportation and tourism planning, and the role of tourism in Fredericksburg's future.

RESEARCH METHODOLOGY FOR THE GULF COAST/PORT ARANSAS

The role of transportation infrastructure in the Gulf Coast region, as it relates to tourism, is different from that of the Hill Country. Rather than conducting a visual evaluation of the scenic nature of the highways of the region, researchers decided to examine one city along the Gulf Coast that seemed to exemplify the problems and challenges many tourism-dependent communities, especially smaller communities, face with respect to transportation and tourism planning.

Researchers chose the island community of Port Aransas for their second case study. Its relatively small size and the relatively small extent of tourism development, compared to other Texas coastal communities, places Port Aransas at a critical juncture between diverse, and often conflicting, visions for planning and development. Researchers traveled to the community and interviewed stakeholders representing all sides of the tourism development issue. In addition, researchers traveled to the Aransas National Wildlife Refuge in order to gain a perspective on federal involvement in tourism efforts, and explore in more detail how such a sensitive environment may or may not be affected by tourism and transportation.

RESEARCH METHODOLOGY FOR THE BIG BEND AREA

The Big Bend Area of Texas is extremely rural. There are few towns, few rest stops, and little infrastructure to support large-scale travel for tourism. For example, if visitors want to go to Big Bend National Park, they may: 1) drive from their point of origin to the park (in many cases this trip can take 10 hours or more); or, 2) fly to either El Paso or Midland-Odessa and still drive hundreds of miles to the park. The question researchers sought to answer was: whether communities along the roadways leading to Big Bend, such as Alpine or Marathon, want to explore the economic development potential of the tourism industry by building infrastructure to support it, and it would it make sense from the standpoint of sustainability? Would residents in this area want to encourage more tourism? In addition, how would increasing the ease of access effect the ecological and archaeological integrity of the area?

Through a series of site visits and interviews with small business owners, National Parks Service personnel and Texas Parks and Wildlife Department (TPWD) personnel, researchers were able to get a balanced perspective of the challenges this area faces.

ORGANIZATION OF REPORT

Following this introductory chapter, this report is organized into five subsequent chapters. Chapter Two outlines the basic concepts of tourism and tourism planning. Chapter Three discusses the linkages between tourism, transportation, and sustainable development. Chapter Four presents the case study of the Texas Hill Country; Chapter Five presents the case study of Port Aransas, Texas, and Chapter Six discusses tourism and transportation in the Big Bend region of Texas.

Additional background information and field data are included in report appendices.

Appendix A includes the detailed results of the windshield scenic evaluation survey and a copy of the evaluation form. Appendix B presents a discussion of the conflict between access and preservation confronting national parks in the United States. Appendix C follows with a brief outline of TxDOT's responsibilities for state park roads. Appendix D includes statistics on travel in Texas. The final section, Appendix E, provides a brief overview of the various stakeholders in Texas tourism.

CHAPTER 2: TOURISM AND TRANSPORTATION PLANNING

TOURISM AND TRANSPORTATION

The tourism and travel industry is dynamic, complex, and diverse. The economically broad-based nature of tourism allows a wide variety of economic sectors to benefit from travel expenditures. This breadth also makes it difficult to conduct economic evaluations of the effects, both positive and negative, of the industry on a state, region, or city, and makes the industry vulnerable to both overly positive and overly negative perceptions of its value. However, despite the difficulties in evaluating and predicting the effects of the tourism industry, many communities view tourism as a major component of sustainable economic development efforts. Because transportation and its related infrastructure are such an important part of tourism, poor transportation planning and inadequate infrastructure can dramatically reduce the economic “utility” of tourism to a community. There is, therefore, a need to develop transportation planning frameworks to address tourism development within the broader context of community, regional, and/or statewide economic development and related transportation goals (Texas Department of Economic Development 1998a).

Tourism affects a community’s economic situation by bringing in revenues and creating employment. After travelers arrive, they typically use more than one mode of transportation, compared to residents, if alternatives are available in the area (Gunn 1994). Travelers can then purchase a variety of products and services offered in the area by amusement, recreational and entertainment establishments, lodging establishments, restaurants, and retail outlets. These expenditures generate a variety of employment and business opportunities, and help to create and sustain local and regional economic development. Tourism, however, can also negatively impact a destination. For example, large numbers of tourists, especially if they arrive seasonally or for one event, can create situations of intense congestion, in which tourists compete for infrastructure space with residents and their own vehicles. Large numbers of tourists also increase strain on a

variety of city services in addition to transportation infrastructure, such as police and fire services, sewage, water, and electricity. Tourism can also negatively impact the physical environment. Therefore, unplanned growth of tourism industries and related activities, especially transportation, can lead to a variety of detrimental impacts on communities, their economic base, and their natural resources.

This chapter outlines and defines important concepts related to tourism, in general, and tourism planning in particular. The concluding section discusses sustainable tourism development.

WHAT IS TOURISM?

Tourism can be defined broadly as the temporary movement of persons to a variety of destinations that are outside their normal travel patterns, such as commuting to work, or going shopping for groceries. The concept of “tourism” also includes the activities undertaken while traveling to and from and staying within a destination, as well as the infrastructure created to support these activities. A tourist can be any individual who visits a destination, consumes local services, and spends money locally, whether this individual is traveling for leisure or for business. Defined in this general manner, tourism can involve almost any discretionary travel movements and the spending that accompanies those movements. In many instances, “travel” and “tourism” are used interchangeably (Gunn 1994).

Another definition of “tourism” specifically focuses on travel comprising a night away from home or a day trip which is 50 or more miles one way, where the basic unit of measurement is a “person-day.”¹ Within this definition, further distinctions can be made:

¹For those who evaluate this information professionally, the basic unit of measure for an economic survey of travel is the “Person-Day.” The number of person-days takes into account the number of people on a trip and the length of stay, assuming that each person on a trip does not spend the same amount of time at a destination, and these cause the amount of revenue and other economic impacts generated by the stay to differ.

- ▶ business versus leisure travel;
- ▶ inter-state travel (such as non-Texans traveling to/in Texas); and
- ▶ intra-state travel (such as Texans traveling within Texas).

This more narrow and technical definition helps travel professionals and economists to better evaluate the nature of travel and tourism in a location, and to pinpoint the revenues and employment (as well as costs and other factors) that arise from the industry. Trips that are traditionally excluded from a definition of tourism include, commuting to work, student trips to and from schools, and trips for operating crews of airlines, boats, or trucks (Inskeep 1991).

The tourism industry generally encompasses and impacts many economic sectors, including:

- ▶ amusement and recreational services;
- ▶ resorts, hotels, motels, and other transient lodging facilities;
- ▶ retail trade establishments, including gift shops and eating/drinking establishments, including roadside rest stops, and gas stations;
- ▶ airlines and airports;
- ▶ automobiles and highway infrastructure;
- ▶ buses and other modes of public or quasi-public transportation, such as rental cars, taxis, tour buses, ferries, or ships;
- ▶ and other, more local businesses and activities which can be either partially or totally dependent on tourism dollars, such as:
 - convention centers and conference facilities;
 - stadiums, arenas, and other sporting facilities;
 - museums, science centers, aquariums, and zoos;
 - theme parks and amusement parks;
 - beaches;
 - campgrounds;

- casinos;
- ski slopes;
- historic districts and buildings;
- performing arts centers;
- visitors' centers;
- convention and visitor's bureaus;
- chambers of commerce;
- producers of travel guide books and maps; and
- special events, such as athletic, cultural, or festive gatherings that play a part in attracting visitors to a community.

Included as components of the tourism industry are federal, state, and local policies, and political climates. Regulations, controls, and other standards, such as speed limits, or laws regarding the treatment or management of protected lands, are included as these control the nature, safety, and quality of the travel or tourism experience, and by extension, whether the experience will encourage travel to and through a destination. Regulations, controls and standards, and the political climate, are all crucial to the role of transportation within the tourism industry (Wong 1996).

THE SUPPLY SIDE (DEVELOPERS) AND THE DEMAND SIDE (TRAVELERS) OF TOURISM

Tourism is often defined as a “system” consisting of two sides: supply and demand (Gunn 1994; Inskeep 1991). The supply side includes three types of tourism developers: governments, nonprofit organizations, and commercial/private enterprises. These stakeholders make decisions based on its specific role in the larger tourism picture, and each provides a certain resource or service to a traveler. Collectively, these independent decisions produce tourism development on the supply side by providing land, buildings, transportation, public infrastructure, and facilities,

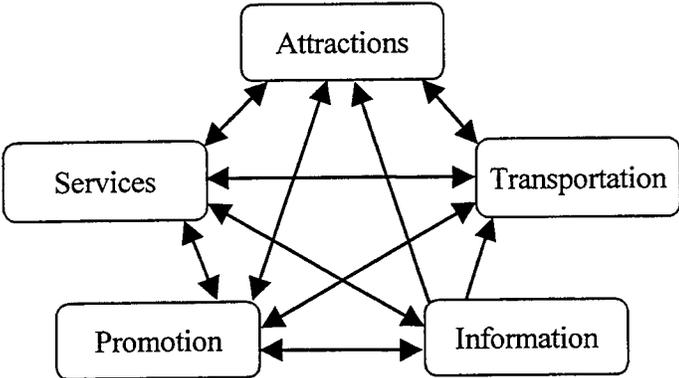
as well as management skills and development knowledge. The components of the supply side are illustrated in Figure 1.



Adapted from Gunn (1994).

Figure 1. Demand-Supply Balance

Gunn (1994) identifies four significant implications from the supply side perspective. First, all of the supply side components are interdependent as each relies and is affected by decisions the other components make. Second, the overall tourist system is a dynamic system, as changes develop within and between each component and between the supply side and the demand side. Third, the dynamic nature of the system and the large number of stakeholders makes this a very difficult system to manage. Finally, all system components rely on the vagaries of the market and the demands of the tourists. The mobility of the tourist underscores this implication as tourists may seek new destinations for any number of reasons beyond the control of supply-side stakeholders. External factors that can affect the tourism system are shown in Figure 2.



Adapted from Gunn (1994).

Figure 2. Functioning Components of Supply Side

Every tourist interacts with these supply-side development decisions, yet the demand side, the tourists themselves, rarely consider the variety of supply-side tourism-related issues, such as who built the site and related infrastructure, who manages it, who owns the land, what regulations apply, or what the working conditions are for the employees. The supply side provides the product of the tourism system, which is often referred to as a “satisfying visitor experience” (Gunn 1994). To the tourist, whose experience is a flow from place to place where various activities occur, many of the supply-side issues are irrelevant, as long as the visitor has a positive experience. As long as the consumer gets the product paid for, concerns over what is behind the creation or management of the “product” are often secondary.

There may arise a disconnect between the supplier of the experience and the individual “consuming” the experience, however, which can lead to the eventual degradation, and even destruction, of the very resources upon which the tourism industry depends (Gunn 1994). Linking the supply side and the demand side of tourism effectively requires tourism and development planning. Difficulties with the tourism experience often result from ineffective or nonexistent planning. On the supply side, for example, a hotel manager is primarily concerned with creating a hotel, hiring staff, and managing the operation of the facility, not with issues of community or regional “planning.” On the demand side, the tourist is primarily concerned with the facility in which he or she is staying, and also about many other factors unrelated to or outside the facility, such as the proximity to the attractions they wish to see, price, ease and comfort of access, and relationship to other needs, such as transportation, shopping, banking, or dining options. Tourism system planning issues are not typically on the tourist’s agenda.

Those caught between the two competing sides of tourism supply and demand also need to be consistently aware of and concerned about planning issues. The residents of a community, for example, need to be concerned about the traffic tourism brings, increasing levels of congestion, increased noise levels and related disturbances, negative impacts on the environment, the

development of sprawl, the aesthetic appearance of tourism-related retail establishments, conflict within the communities and between residents and tourists. Environmentalists, also caught between the supply and demand sides of tourism, need to explore the impact of tourism on natural, cultural, and historical resources. Government representatives also need to be concerned with issues such as zoning, public works, budgetary resources, the direction of economic development, and the values and needs of the community. Proper tourism planning may help to avoid or minimize many of these problems and conflicts (Gunn 1994).

Inskip (1991) classifies the components of tourism development as follows:

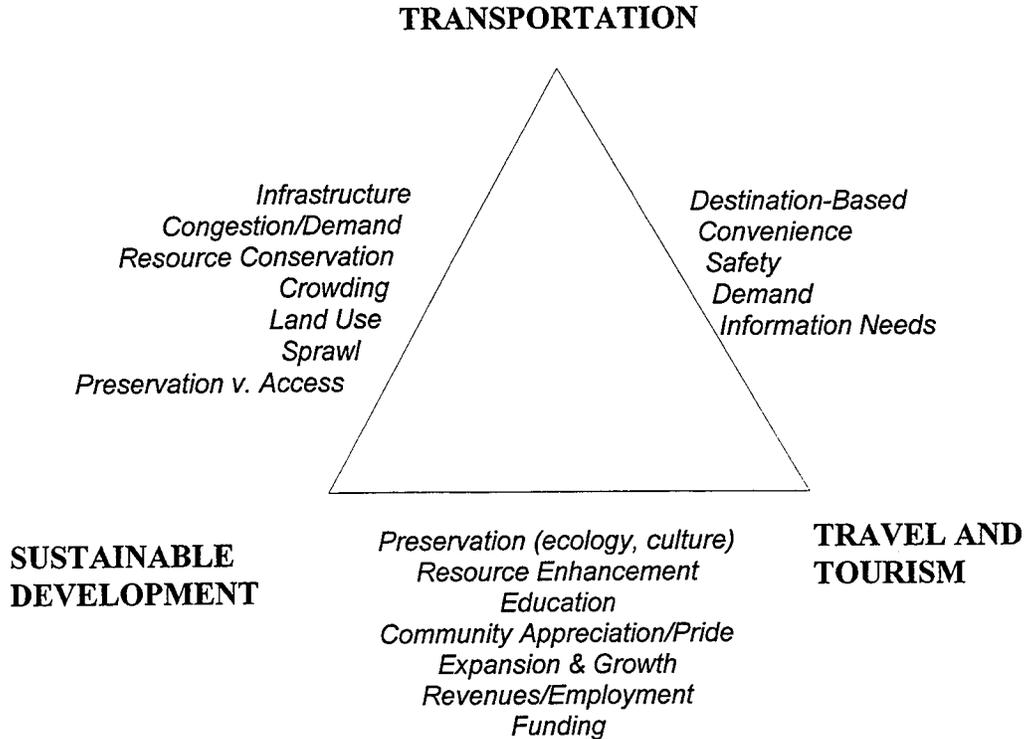
- ▶ tourist attractions and activities;
- ▶ accommodations;
- ▶ other tourist facilities and services (restaurants, retail establishments, personal services, and medical facilities);
- ▶ transportation facilities and services;
- ▶ other infrastructure elements (water, electric, sewage, and others); and
- ▶ institutional elements (tourism development and management services).

Having identified the approach and components of tourism planning, how the plan is implemented should also be considered. Implementation, according to Inskip (1991), should be considered throughout the planning process. This requires taking into account what is realistic from multiple perspectives, including the financial and political perspectives. Plan implementation must often include multiple stakeholders, including state and national agencies. These stakeholders interact with local and regional tourism developers in the planning and implementation processes. The basic steps for implementing a tourism plan are as follows:

- ▶ **Plan Review.** This step requires formal and legal processes in order to effectively relay the information in the plan to interested and affected stakeholders.

- ▶ **Plan Adoption.** The requires formal and legal adoption of the plan in order to give it the force of law.
- ▶ **Adoption of Legislation and Regulations.** Land use or zoning requirements in the plan must be legally adopted in the area in which the plan will be implemented.
- ▶ **Integration into Public and Private Sector Development Policies, Plans, and Programs.** Relevant components of the tourism plan must be integrated into other area plans, such as the local development plans or environmental plans.
- ▶ **Development Funding and Project Implementation.** Tourism plans should identify potential sources of funding from public and private sectors. The step in the implementation process links these sources with actual projects for implementation.
- ▶ **Continuous Monitoring of Tourism.** Monitoring provides information on project development, marketing effectiveness, and tourist satisfaction.
- ▶ **Adjustments to the Plan and Program.** Monitoring allows decision makers to determine what, if any, adjustments to the plan are required.
- ▶ **Periodic Formal Plan Review and Revision.** As conditions and influencing factors change, periodic formal reviews of the plan may be needed in order to revise the scope and focus (Inskeep 1991).

CHAPTER 3: TOURISM, SUSTAINABLE DEVELOPMENT, AND TRANSPORTATION



Pervasive tourism growth globally has been a boon to many locations, as the global service economy gradually increases its scope and reach. As other aspects of economies weaken, such as manufacturing, tourism has become a quick and easy solution for many localities. This trend has produced mixed results. Improvements in the technology and efficiency of automobile and air travel have allowed more people to travel, yet many destinations have been overwhelmed by congestion and overburdened facilities and infrastructure. When resources, including natural, historical, and cultural, are touted to promote visits to a site or region, a visitor often experiences more ugly commercialism than beautiful scenery. As areas are promoted for their pristine scenic beauty, the visitor is often confronted by overcrowding, over commercialization, and degradation of the very resources they came to see. Communities which seek the economic benefits from

tourists often find economic rewards come at the cost of cultural conflict, degradation of historical and cultural resources, and conflicts between residents and visitors (Gunn 1994).

With a well-traveled society, and so many investors eager to develop the dwindling number of tourism resources, the proliferation of promotion for travel destinations is massive. New markets, such as ecotourism and adventure travel and cultural touring, are burgeoning. As a consequence, tourism development, once considered the purview of hoteliers and travel promoters, has become a complicated phenomenon, involving not only the cooperation and support of the voting public, but also of individuals who are not experts in the tourism industry, and who may not even be residents of the community. Tourism is not inherently destructive, but tourism development and planning by groups made up largely of individuals from outside a community and/or individuals with little or no experience or understanding of how to plan for tourism increases the potential for destructive development. Voter support of the development and maintenance of highways, streets, sidewalks, safe and attractive neighborhoods, and other related resources is important, because even if the visitor does not use all the location's amenities, the visitor will be exposed to most of them, influencing the visitor's enjoyment of the experience. Still, the larger community may still not understand many of the issues involved in tourism planning (Gunn 1994). The need for planning, therefore, may not be obvious but is necessary because the business of travel and tourism has become so competitive and potentially conflictual.

Although tourism has become a fast-growing industry and pervasive, its economic analysis can be extremely complex. This is due, in part, to the fact that tourism is not a single industry but rather an industry comprised of other industries and individuals/organizations from the public and non-profit sectors as well. In the minds of many, tourism is a business-only concern. To be sure, the business of tourism (such as lodging, food service, and transportation, including automobile and air transport) represents a major economic input to tourism and its success, but it

takes the work and cooperation of many other sectors to create a complete (and sustainable) agenda for tourism (Gunn 1994).

For many decades, the dominant belief about tourism was that promotion (advertising and publicity) was the only means to develop and encourage it in any particular location. The assumption was that the establishment of worthwhile, appropriate, and interesting attractions, and the development of transportation services to, in, and through these destinations, would happen “naturally” in response to market conditions (such as the number of people who visited the site annually, seasonal peaks, points of origin of visitors, or other kind of fluctuations/increases in demand) and community/regional development needs. Although promotion is obviously still an important part of a successful tourism development strategy, tourism organizations, local communities, convention and visitors’ bureaus, and regional groups are showing increased concern over what is to be promoted and how it is to be promoted, particularly over the long term. If tourism is to be employed as an economic development tool, it is important to assess several factors:

- ▶ How well the tourism site fits with community culture and values;
- ▶ How well the site fits with community plans for the future;
- ▶ How well, or poorly, the site uses the community’s available resources;
- ▶ How well the site can be managed, expanded, or developed over time and in what ways; and,
- ▶ How well the site meets economic needs in the short and long term.

These are questions of integrated planning rather than advertising, and at the core of these questions lies the concept of sustainability (Gunn 1994).

Planning and sustainability concepts for tourism are becoming more important to communities for a variety of reasons. One primary factor is economics. Areas under economic stress,

particularly rural areas, are planning for tourism as a new producer of jobs and incomes. Another factor is environmentalism. Destination areas are becoming increasingly aware of and sensitive to the issues of pollution, toxic waste, habitat loss, resource degradation, and the effects of urban sprawl. Travelers, in turn, are more aware of the quality of the destinations to which they travel, and seek clean, safe, and interesting locations. There is little economic sense in not pursuing an environmentally sound planning strategy for a tourism site. Lastly, tourism is coming to be viewed as an exportable commodity—not only exportable out of a city, town, or region, but nationally and internationally. Taking these factors together, it is apparent that not only is there a need for planning, but also a need to educate and involve the public regarding the relationship between tourism planning and sustainability. The “public,” however, is not only the traveler as patron, but also the real estate developer, engineer, planner, politician, and businessperson (Gunn 1994).

Another important factor must also be considered, which is the central focus of this chapter. At the same time that communities are beginning to plan for tourism with the concept of sustainability in mind, improved transportation technologies have increased opportunities for people to travel, and travel destinations are experiencing congestion and overburdened facilities. Therefore, even though tourism can enrich people’s lives, be sensitive to and protective of the environment, and be integrated into a community or region with minimal ecological impact and maximal economic impact, transportation planning and sustainability are exceedingly important components of the larger ecological and economic systems (Gunn 1994). The purpose of this chapter is to provide additional background information on tourism planning, and the essential linkages between sustainable tourism and transportation.

INTEGRATIVE TOURISM PLANNING AND SUSTAINABLE DEVELOPMENT

“Many of the same values that determine a community’s character, its quality of life, and its potential for growth also determine its potential for tourism

promotion. These values include a desire on the part of the community and its leadership to create jobs, preserve local historic sites, enhance its rural areas, address environmental concerns—such as clean air and water—create economic opportunities for women and minorities, and foster the wise use and preservation of natural resources, wetlands, and national parks and forests. The development of a strong tourism industry in a community can promote these values and aid in the community’s future growth and success. Many communities, both rural and urban, already have the necessary tourism resources to improve their economic conditions, but lack the leadership and organizational framework to organize, plan, and implement programs.” --James L. Oberstar, Chairman, Congressional Travel and Tourism Caucus (U.S. Congress, House 1993).

The success of tourism planning efforts depends in large part on the quality of the natural and human/built environments. The travel preferences of tourists seem to be greatly affected by not only the quality of a destination’s cultural and natural resources, but also by the quality of the travel to and from those resources (i.e., the mode of travel, its convenience, and the extent to which travel using this mode is or is not a pleasurable experience). As such, the long-term viability of the tourism industry depends, to a great extent, on the manner in which natural and cultural/historical resources are maintained, and the nature of the transportation network to, in, and around those resources. Tourism planners need to take into account the capacity of a location to support a variety of uses, including transport. Without this kind of planning, a destination can be degraded or made undesirable to the point that tourists will stay away.

The integrative approach to tourism planning is one in which an assessment is made of the economic, social, and environmental impacts of tourism in relation to other development strategies currently being undertaken in the locality, including efforts at sustainable development. Core concepts of an integrative approach are collaborative planning with affected stakeholders,

and the assessment of specific planning issues (including transportation planning) that foster the integration of tourism with overall plans for regional development. Integrative tourism planning is appropriate for both urban and rural tourism sites.

WHAT IS “SUSTAINABLE DEVELOPMENT”? HOW DOES IT RELATE TO TOURISM?

Volumes have been written about sustainable development, what it is, and how it should be defined and measured. This report does not include an extensive discourse on sustainable development concepts. However, as the term is widely used, sustainable development means the use of resources to support economic activity without compromising the ability of the environment to respond without degradation, or without losing the ability to continue to support the economic activity in both the short and long term. The resources that must be managed and maintained can be natural resources, and historical or cultural resources. In this sense sustainable development supports the long-term development and maintenance of both urban and rural areas and the resources contained within them (Manning and Dougherty 1995).

Another commonly cited definition describes sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission in Environment and Development 1987). This definition stresses the concepts of “equity”—intergenerational equity, social equity, economic equity, environmental equity—and “systems.” Sustainability planning is about how environmental, social, and economic systems interact both positively and negatively over time and at various levels. This suggests that sustainability relates not just to the planned outcome, but to the process of planning. It requires that any and all possible options be considered, that equity be addressed, that decision making be explicit and deliberate, and that the public participate in determining the questions asked, the issues addressed, and the evaluation of the conclusions and alternatives. Careful

deliberation, public participation, and fair negotiation are essential to addressing planning problems, particularly those of economic development.

Tourism often puts stress on local and regional environments because it consumes energy, goods, and resources. Particularly in more sensitive or rural environments, the tourism industry can either be a force for maintenance and preservation, or for degradation and decline. Tourism planning can therefore determine the difference between which of these scenarios occurs. Planning must therefore be integrated and come from all sectors of the economy and government because actions from a variety of sectors affect the quality of and nature of access to and activities within specific sites or regions. Unless responsible management and planning practices are in place, the tourism industry will wind up degrading the very resource it depends on, in direct violation of the concept of sustainability.

CARRYING CAPACITY

One of the most important concepts for tourism planners to understand is the idea of “carrying capacity”(Manning and Dougherty 1995). Historically, the environment and its resources have been portrayed as a “treasure trove” of goods and services to be consumed in order to satisfy human demands; negative effects of this consumption have often been considered “externalities,” or outcomes that are difficult to measure in terms of their negative consequences. Yet even though negative environmental externalities may not be easy to measure, there is little doubt that every area has limits of activity beyond which it is detrimental to go. This is the notion of “carrying capacity,” and especially for environmentally sensitive areas, this concept is a crucial one.

According to Manning and Dougherty (1995), the “carrying capacity” of an area, whether urban or rural, is “the degree to which the area can be used for economic activity without degrading the environment, culture, and interactive harmony among sectors of the economy, groups of people,

and individuals.” Failure to recognize the concept of “carrying capacity” is obvious in many tourism destinations where operators or tourists themselves have exceeded the limitations of the destination’s environmental and cultural resources, resulting in the degradation of the industry. In some cases, the damage has been irreversible. For example, even the most careful hikers over time can divagate a meadow or erode the soil simply by the cumulative effects of their footsteps. Pollution from seaside resort hotels can render the beaches and ocean water in the area unsafe for swimming. Runoff from roads designed to control the movement of tourists within sensitive areas kills plants and seeps into the groundwater. Cars and buses touring in rural areas create problems with roadkill. Noise from airplanes flying over scenic areas disturbs wildlife and can ruin the experience for those seeking quiet enjoyment.

The tourism industry can benefit from management and planning efforts that anticipate and prevent the problems that may occur when developing a site, community, or region for tourism and by becoming aware of the area’s “carrying capacity.” This is difficult to do, however, without quantitative measures of carrying capacity, the economic push to keep expanding the tourism industry is strong. That is, until the resource is irrevocably damaged and is no longer attractive to tourists. Attempts to determine the “carrying capacity” of an area can meet with many obstacles, including:

- ▶ ***Uniqueness.*** Tourism depends on many attributes that are site specific, and each responds in its own way to different levels of use. Some important attributes are cleanliness, presence and diversity of wildlife, access to shoreline, abundance of vegetation, access, and ability to support a variety of activities.
- ▶ ***Gradualness.*** The impact of tourists on the environment or in a community may be gradual, and affect the area at different times and at different rates.
- ▶ ***Activities.*** Different types of use create different impacts which may be difficult to measure individually or collectively (Manning and Dougherty 1995).

TOURISM PLANNING

What is important, however, when creating a plan for sustainable tourism is that there must be consideration for long-term impacts and developing a system of priorities for development and resource use. What is the goal of developing a resource for tourism? Is there a limit to development? What tradeoffs are reasonable over time? Planners must make a concerted effort to assess the complex mix of values associated with the consumption of a tourism resource in order to balance human wants and needs against a resource's sustained ability to serve those demands.

Tourism planning efforts should attempt to reflect:

- ▶ basic physical, biological, and historical/cultural attributes of the site, community, or region;
- ▶ the current uses of the environment (natural and built);
- ▶ an assessment of what users desire from a particular resource;
- ▶ the sensitivity of natural and historical/cultural resources to future activities and changes;
- ▶ an assessment of what would be lost if the environment (natural and built) is changed and who loses it; and
- ▶ the extent to which the natural and built environment can be changed while maintaining its valued characteristics (Manning and Dougherty 1995).

The planner or decision maker needs to measure these in order to reduce the risk of unknowingly stepping over biological or cultural thresholds and damaging the business that he or she wants to manage or expand. The key for the planner is to identify the important environmental values of the area and the interested stakeholders, and conduct an analysis of tradeoffs for any given activity or plan: what must be traded off for what is desired? Ultimately, there are three general factors which need to be directly addressed: degradation, overcrowding, and/or local resistance.

The presence of any one or more of these factors indicates a need for intervention (Manning and Dougherty 1995).

The tourism industry is beginning to take an increasingly proactive stance to protect the very assets it relies so heavily upon, and is becoming involved in the creation and facilitation of federal, state, and local policies that encourage and strengthen the goals of sustainable development. However, the tourism industry has a responsibility to maintain areas of natural beauty and to take a proactive position to assure that concerns regarding the development of the tourism industry are addressed. If these issues are not addressed by the tourism industry in cooperation with other sectors of society and the economy, the tourism industry will most certainly feel the negative impact in both the short and long term.

ECOTOURISM

Ecotourism typically involves travel for recreational purposes under certain accepted “ethical” principles that involve not only the natural environment, but also historical and cultural resources. “Ecotourists” visit sensitive natural and historical/cultural environments for the purpose of observation, learning, and participating in non-consumptive or low-impact activities, such as canoeing, kayaking, hiking, education, or photography. These travelers attempt to not disrupt local ecology or culture, and, where possible, try to enrich the local resources by keeping revenues within the community rather than drawn away to other economies and outside businesses.

Ecotourism has become the current travel buzzword yet the concept of “ecotourism” has evolved over time to include a wide variety of activities and destinations, not just tours of the Galapagos Islands and rainforest adventures. Ecotourism has become a complex, multifaceted tourism “style” with the following components:

- ▶ Ecotourism practices minimize environmental impact by encouraging tourists to “tread lightly” on the area they are visiting, whether it be a federally protected wetland, or a state park.
- ▶ Ecotourism practices attempt to minimize the negative impacts on, and maximize respect for, “host cultures,” whether these are in urban or rural areas.
- ▶ Ecotourism practices attempt to maximize economic benefits to host communities without causing environmental disruption or lasting negative impacts, whether they be environmental or cultural.
- ▶ Ecotourism practices attempt to provide the traveler with the maximum of recreational satisfaction, whether by maximizing the visual impact of a scenic or natural resource, by educating the traveler, or in other creative ways (U.S. Congress, House 1993).

Ecotourism has been described in both positive and negative terms as “the way of the future,” “a new source of destinations and profits,” and “a high risk both ecologically and economically” (Manning and Dougherty 1995). The ecotourism concept seems at face value to be a positive way of seeing and experiencing unique resources. But ecotourism also specifically targets fragile cultural and natural environments. Ecotourism appeals to those who seek to visit unusual areas and experience “unspoiled” areas, but the more ecotourists seek to travel to these unspoiled areas, the areas eventually will become “spoiled.” The National Parks system, for example, was an early effort at preserving sensitive and unique natural resources; today, many of these parks (such as Yosemite, Yellowstone, and the Grand Canyon) can be held up as examples of the worst kind of overcrowding, congestion, and resource degradation.

In its most narrow definition, ecotourism involves small groups of individuals pursuing rugged activities in remote areas. However, the term also now includes ocean-liner passages up the Amazon, bus tours, air tours, and various kinds of “expeditions” which may or may not

necessarily conform to environmental concerns and needs. Ecotourism is not necessarily nature-friendly travel, and cannot be used as a synonym for sustainable tourism. Ten thousand “ecotravelers” arriving in a sensitive area can still wreak havoc with environmental and cultural resources, eventually spoiling and degrading the attributes that brought them there. As such, ecotourism can only be one of the components for a strategy for sustainable tourism (Manning and Dougherty 1995).

Certain essential characteristics of ecotourism can be identified. Ecotourism should:

- ▶ contribute to the conservation of the natural and historical/cultural resources of communities or regions while respecting their integrity;
- ▶ respect the limits and opportunities afforded by the natural/built environment and not impact it negatively;
- ▶ be sensitive to the needs and wishes of host communities;
- ▶ contribute to greater understanding of environments, histories, and cultures; and
- ▶ provide long-term benefits to host communities/regions (Manning and Dougherty 1995).

In this sense, any kind of tourism can become ecotourism. What this means is that, for example, there may need to be limits placed on the number of people able to gain access to a resource. There may need to be careful design and management of facilities and activities. Operators may need to accept responsibility for the effects of their activities on the environment and in the communities in which they operate. Management and intervention by national, regional or local authorities may become necessary, as will self-policing by the industry (Manning and Dougherty 1995). A balance must be found between access and preservation. In spite of potential problems, ecotourism is still a generally positive movement for the tourism industry and can contribute to general efforts at sustainable development.

TRANSPORTATION PLANNING, SUSTAINABLE DEVELOPMENT, AND TOURISM

In order for transportation and tourism planning efforts to contribute to sustainable development, not only must tourism practices be “sustainable,” but transportation must also stress concepts of sustainability. In general, sustainability requires that three factors be integrated in any planning decision: environment, equity, and economics. This remains true for sustainable transportation planning. Some of the qualities of a sustainable transportation system include:

- ▶ a system that allows the basic access needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health, and with equity within and between generations;
- ▶ a system that is affordable, operates efficiently, offers choice of transport mode, and supports a vibrant economy; and
- ▶ a system that limits emissions and waste within the ecosystem’s ability to absorb them, minimizes consumption of non-renewable resources, reuses and recycles its components, and minimizes the use of land and the production of noise.

These qualities are especially applicable when designing or expanding a transportation system, and maintaining its infrastructure and services, when this transportation system also must exist to serve and preserve a natural, historical, or cultural attraction. Not only must the individual mode or modes used to deliver tourists and manage their movements fit within a framework of sustainability, but the entire system over time must also fit within a framework of sustainability. If the transportation system is not operated in a “sustainable” fashion, or planned to be “sustainable,” then the tourism resource will certainly be degraded over time.

Another issue, related to sustainability, is the intermodal nature of tourism. In contrast to commuting, which usually employs only one or two modes, it is not unusual for a modern traveler or tourist to use several modes on one trip—a car or taxi to an airport, a trip by plane, a taxi to a hotel or use of a rental car, and the possible use of public transportation. Tourism

planning not only requires simple transportation planning efforts, but complex intermodal planning efforts within the context of environmental, social, and economic factors. Because different modes may be built, owned, operated, and managed by different organizations over vast areas, there may be uncertainty regarding transportation planning, especially for tourism, where routes and itineraries are not set, and rarely “scheduled” in the same way as peak commuter traffic or containerized freight movement would be scheduled.

Another issue related to transportation planning and tourism is the level of analysis and plan implementation. For example, if a popular state park is located near a small rural community, does the transportation planning occur on the local, county, state, or regional level, or combinations of these? Do most visitors to the park drive on an interstate, turn off on to a state road, and then a park road? Who maintains these thoroughfares, and who pays for this maintenance? Who has the authority to say when the roadway needs to be widened to serve increased capacity? These issues come into sharp relief in a discussion of our national parks and the various stakeholders involved in the development of tourism on a national level.

ROLE OF GATEWAY COMMUNITIES

The role of the gateway community in tourism and transportation planning has become quite significant. A “gateway community” is a town or city that has grown at the entrance to a destination, such as a park or other well-defined area. Examples of such communities include Gatlinburg, Tennessee (at the major entrance to Great Smoky Mountains National Park), and Tusayan, Arizona (at the main entrance to Grand Canyon National Park). These gateway communities are of particular importance to tourism resources because the extent and nature of their growth directly affects park resources and visitor experiences. The tourism destinations, in turn, affect these communities by creating a demand for visitor accommodations and services. Cooperation on such questions of land use, economic development strategies, and transportation

infrastructure development are imperative and must be considered in the broader context of the region.

To accomplish this, destinations and their gateway communities need to develop and nurture cooperative relationships that focus on financial resources, visitor services and accommodations, and transportation. With respect to transportation, for example, the National Park Service does not make key decisions about how visitors arrive or leave from a National Park. The only way to address transportation issues in and around such parks is, therefore, through partnerships. These cooperative partnerships are often difficult to create and sustain because, although there is a great deal of support for managing parks on an ecosystem basis, many park personnel often doubt the value of spending a great deal of time on issues considered to be “outside” the park boundary at the expense of caring for the “resource.”

One of the major transportation issues between parks and their gateway communities is the development, construction, and maintenance of transportation infrastructure and services. In many cases, state roads form a major portion of the roads that lead from gateway communities into national parks. In addition, it is typically the responsibility of the state, and in many cases the city, to plan and construct transportation-related infrastructure in addition to roads. These include traffic signs and lights, parking lots, bus stops and routes, bike paths, pedestrian walkways, and others. State Departments of Transportation (DOTs), gateway communities, environmentalists, and national agencies often have different planning objectives and budgets. Yet each depends upon the other, making cooperation extremely important. There need to be regional institutional structures to manage these issues and be proactive regarding future encroachment on park lands and resources and management of the economic development needs of those living full time in the gateway communities. Many of the issues concerning gateway communities are explored in this study, particularly in the Hill Country and Big Bend areas.

IMPORTANCE OF TOURISM TO TEXAS

Texas is a leader in the travel and tourism industry in the United States; tourism revenues, infrastructure, and activities/services provide the citizens of the state with a host of positive economic benefits. Texas' leadership position in the travel and tourism industry also challenges the state to provide and maintain, in the long and short term, the infrastructure and related services to facilitate travel to and within the state. That means direct investment in transportation infrastructure and related services, which include highways, signage and lighting, traffic management technologies, public transportation, airports, railroads, safety enforcement officers (police and Department of Public Safety), transportation management centers, traveler information systems, and printed informational materials (including maps, promotional materials, guides, etc.) to assist visitors and promote destinations. These activities involve significant expenditures, and the fact that Texas is able to invest in these resources so extensively is an indication of the level of revenue generated by the industry in the state. The figures are impressive within the context of the state itself, but also in comparison to other states.

Tourism in Texas generates billions of dollars each year. Consider the following:

- ▶ Tourism pumped \$25.4 billion into the Texas economy in 1995, making travel and tourism the third largest revenue-generating industry in the state.
- ▶ Texas ranks third as a pleasure travel destination for U.S. travelers and a leading destination for international travelers as well, with more than 3 million visitors from Mexico in 1995 alone.
- ▶ An estimated 446,000 Texans credit their jobs to the travel industry, with a combined payroll of approximately \$8.5 billion.
- ▶ In 1995, travel generated over \$1.7 billion in taxes for local and state government.

- ▶ In 1995, over 300 Texas cities and 14 Texas counties levied the local hotel occupancy tax.² This tax generated over \$158 million in revenue for these cities and counties in 1994.
- ▶ The Intermodal Surface Transportation Act of 1991 (ISTEA), and now the Transportation Equity Act of the 21st Century (TEA-21), provide millions of dollars for the funding and development of roadways, air transport, water transport, public transit, rail, bike paths, and hiking paths; the legislation also has special sections for transportation enhancement, scenic byways, parkways, and park roads. Each year, Texas receives tens of millions of dollars that address the interrelationship between transportation and tourism.
- ▶ The Texas Recreation and Parks Account (TRPA) was established by the 73rd State Legislature in 1993; by 1997, the program “has supported more than 500 different local projects with over \$135 million in matching grant assistance activities,” (Texas Department of Commerce Tourism Division 1999).

Increased state and local revenues help to support education, health and human services, and a variety of other budgetary needs (including transportation), but the tourism activities that bring in these revenues also have the power to erode the very nature of the resources (natural, cultural, and historical) that people have come to visit. Its dominant position in many local Texas economies makes this balance an important one for Texas. The Texas Department of Economic Development (1998a) estimates that visitors to Texas spent over \$29 billion on travel-related services or products. Food service expenditures comprise the largest segment of travel spending, with 27.3%. Over 19.5% is spent on public transportation, followed by 18.9% spent on lodging. Table 1 illustrates the direct travel expenditures in Texas, by industry sector.

²Texas cities may adopt a hotel occupancy tax of up to 7% of the cost of a hotel room. Texas counties are authorized to adopt a tax amount between 2 and 7% of the amount paid for a hotel. The state of Texas also imposes a hotel occupancy tax of 6%. Unlike the local sales tax, hotel occupancy tax is optional.

Table 1. Direct Travel Expenditures in Texas, by Industry Sector, 1996-1997

1997 Expenditures	Domestic (\$ millions)	International (\$ millions)	Total (\$ millions)	% of Total
Public Transportation	\$5,399.2	\$347.1	\$5,746.3	19.6
Auto Transportation	\$3,932.9	\$80.6	\$4,013.8	13.7
Lodging	\$4,825.8	\$732.2	\$5,558.0	18.9
Food Service	\$744.3	\$556.9	\$7,001.2	27.3
Entertainment & Recreation	\$2,141.3	\$225.6	\$2,366.9	8.1
General Retail Trade	\$2,703.9	\$941.9	\$3,645.8	12.4
Total	\$26,447.4	\$2,884.6	\$29,332.0	100.00

Source: Texas Department of Economic Development

Travel-related spending in the state translates into significant numbers of jobs and employment opportunities. Again, the food service sector ranks the highest, with over 182,000 jobs (37.4% of the state total). Public transportation sector was again second, with 102,000 jobs, or 20.9% of the total. Table 2 shows travel-generated employment in Texas.

Second in number of tourists only to California, Texas had 160 million person trips in 1997. The majority of these trips, 62%, were generated by Texans traveling within their own state (Texas Department of Economic Development 1998b). The success of Texas in retaining travel within the state has a variety of implications. Not only does this suggest that Texans find traveling within the state pleasurable, but that Texas has a responsibility to continue to keep these revenues within the state. One of the ways to accomplish this is to continue to view transportation infrastructure and services as a crucial aspect of retaining this tourism business.

Table 2. Travel-Generated Employment in Texas, by Industry Sector, 1996-1997

1997 Employment	Domestic (thousands)	International (thousands)	Total (thousands)	% of Total
Public Transportation	95.8	6.2	102.0	20.9
Auto Transportation	12.1	0.2	12.3	2.5
Lodging	71.8	10.9	82.7	17.0
Food Service	169.3	12.8	182.1	37.4
Entertainment & Recreation	49.1	5.2	54.3	11.1
General Retail Trade	30.1	10.5	40.6	8.3
Travel Planning	12.9	0.0	12.9	2.6
Total	441.2	45.8	486.9	100.00

Source: Texas Department of Economic Development

In regard to market share, Texas enjoyed a 6.3% share (347 million person days) of U.S. travel, which ranked the state third behind California (9.6%) and Florida (9.%) in total U.S. travel person-days. Personal automobile was the preferred mode of transportation, with 67% of the travel accomplished by car. The top ranked travel destination within Texas, for non-Texans, was the Dallas-Fort Worth Metroplex region, which attracted 40% of business travel and 26% of leisure travel. The South Texas region, which includes the Lower Rio Grande Valley, attracted 19% of business travel and 23% of leisure travel (Texas Department of Economic Development 1998b).

The domestic travel market also has significant economic impact on several counties in Texas. The top 10 counties based in tourism expenditures benefit greatly from the tourism industry, at both the state and local level. Table 3 shows the domestic travel impact on these counties.

Table 3. 1997 Domestic Travel Impacts on Texas: Top Ten Counties by Expenditure Levels

County	Expenditures (\$millions)	Payroll (\$millions)	Employment (thousands)	State Tax Receipts (\$millions)	Local Tax Receipts (\$millions)
DALLAS	\$6,100.78	\$2,543.27	108.66	\$216.27	\$179.57
HARRIS	\$5,187.53	\$2,070.41	89.30	\$183.69	\$159.59
BEXAR	\$2,484.61	\$684.06	41.66	\$120.15	\$70.15
TARRANT	\$2,116.12	\$911.32	37.13	\$67.58	\$62.01
TRAVIS	\$1,580.12	\$513.28	27.64	\$68.63	\$48.23
EL PASO	\$595.61	\$208.93	9.68	\$22.48	\$17.64
NUECES	\$522.89	\$144.58	8.88	\$24.70	\$15.61
CAMERON	\$433.05	\$126.64	7.48	\$19.34	\$13.79
GALVESTON	\$413.76	\$93.45	6.63	\$19.58	\$14.02
HIDALGO	\$363.85	\$93.80	5.78	\$14.54	\$11.21

Source: Texas Department of Economic Development

The Texas Department of Economic Development also provides some indication of why people are traveling, and, as a consequence, how their travel mode was influenced by these choices. The activities break down as follows:

- ▶ Culture
 - Visit Historic Site
 - Museum, Play, Concert
 - Festival, Craft Fair
- ▶ Nature
 - Beach/Waterfront
 - National/State Parks
 - Hike/Bike
 - Camping

- ▶ Attractions
 - Theme/Amusement Park
 - Gamble
 - Watch Sports Events
 - Auto/Boat Shows
- ▶ Touring
 - Touring by Auto/Bus
 - Group Tour
- ▶ Outdoor Sports
 - Hunt/Fish
 - Boat/Sail
 - Play Golf
 - Snow Ski (Texas Department of Economic Development 1998b)

As a whole, visitors to Texas (both Texans and non-Texans) enjoyed cultural (18%), attraction-based (16%), and nature-based (14%) activities most of all. Specific activities they enjoyed were visiting historic sites, visiting museums/attending plays, touring by auto/bus, and visiting theme/amusement parks.

Non-Texans participated more in cultural activities and touring than did resident Texans. Other examples of greater non-Texan participation include touring by auto or bus, visiting historic sites, visiting museums, and visiting theme parks. Resident Texans were more likely to participate in outdoor sports activities and nature-based activities than non-Texan travelers. Specific examples of greater Texan participation include visiting beaches and hunting/fishing (Texas Department of Economic Development 1998b).

ECOTOURISM IN THE STATE OF TEXAS

Sustainability in tourism planning and activities most directly expresses itself in the concept of “ecotourism.” According to the Texas Nature Tourism Task force, “ecotourism” is defined as “discretionary travel to natural areas that conserves the environmental, social, and cultural values [of an area or community] while generating an economic benefit to the local community” (Texas Department of Commerce, Tourism Division 1999). Activities that are included in ecotourism are photography, nature study, backpacking, hiking, boating, camping, rafting, biking, climbing, wildlife/bird watching, and even fishing/hunting in certain circumstances. The emphasis is on conserving and preserving the natural resources, as well as the social and cultural aspects, of the area being visited.

Ecotourism is also one of the fastest growing segments of the tourism industry, its growth estimated at an average 30% annually since 1987. The number of Texans who participate in “nature tourism” is expected to grow to 18 million people by the year 2000, an increase of 17% over 1990 levels.

Nature travelers are considered to be responsible travelers who believe in ensuring that their visit has a minimal environmental impact. They also tend to want to be actively involved in the tourism experience, rather than passive observers. Ecotourism is, of course, not without costs. Travelers coming into fragile areas may, over time, cause negative impacts. It is important, according to the Texas Department of Commerce Tourism Division, to have solid infrastructure in place to support tourism so that the environment, wildlife habitats, and property rights are not adversely impacted. The Texas Nature Tourism Association (TNNTA) was formed for reasons such as these; according to the TNNTA, tourism can be a profitable and sustainable industry if the resource base is continually protected.

Nature tourism is popular in Texas, in part because Texas is one of the few states with a large diversity of wildlife and habitats, including mountains, canyons, forests, grasslands, deserts, and bayous, all within state boundaries. Because ecotourism is such a rapidly developing industry, businesses and communities that provide goods and services to support these activities will profit. In

Great Texas Coastal Birding Trail

The Great Texas Coastal Birding Trail resulted from a partnership between TxDOT and TPWD through a Statewide Transportation Enhancement Program (funded through ISTEPA). The trail winds its way along the Texas coast, where birders can see more than 75% of the state's 600 bird species. It is comprised of 12 separate loops, with each encompassing an array of associated sites and birds. The Central Texas Coast section of the trail, which was the first segment constructed, features 95 birding sites, seven of which are enhanced with boardwalks, kiosks, observation platforms, and/or landscaping. (Transportation News)

In addition, nature tourism also provides an opportunity for communities to simultaneously promote their cultural, ethnic, and historical resources. This represents a significant opportunity for private landowners, small businesses, and rural communities. Ninety-seven percent of Texas lands are privately owned, and many of these areas, which are often rural, include impressive natural resources for tourism. According to a report from Texas Rural Communities, Inc., an estimated 62% of Texas' rural communities have expressed interest in implementing programs that would increase visitation in their communities, bringing additional revenue without the necessity of raising taxes.

Some statistics which reinforce this concept are related to bird watching:

- ▶ The Texas coastline offers a safe haven for many different species of migratory birds. The TPWD is in the process of completing the Great Texas Coastal Birding Trail, which is an automobile touring route that will stretch all the way from Port Arthur to Brownsville. The Laguna Atacosta Wildlife refuge near Brownsville draws over 200,000 visitors per year.
- ▶ Between 75,000 and 100,000 tourists visit the Rockport-Fulton area annually for bird watching; and these travelers add an estimated \$5 million in revenue to the local economy.

- ▶ During a six-week period in 1992, approximately 6,000 tourists visited High Island for bird watching; they spent an estimated \$2.5 million on the island on lodging and other travel-related activities. The total economic impact was estimated at between \$4 and \$6 million for a two-month period.

TEXAS TOURISM “ZONES”

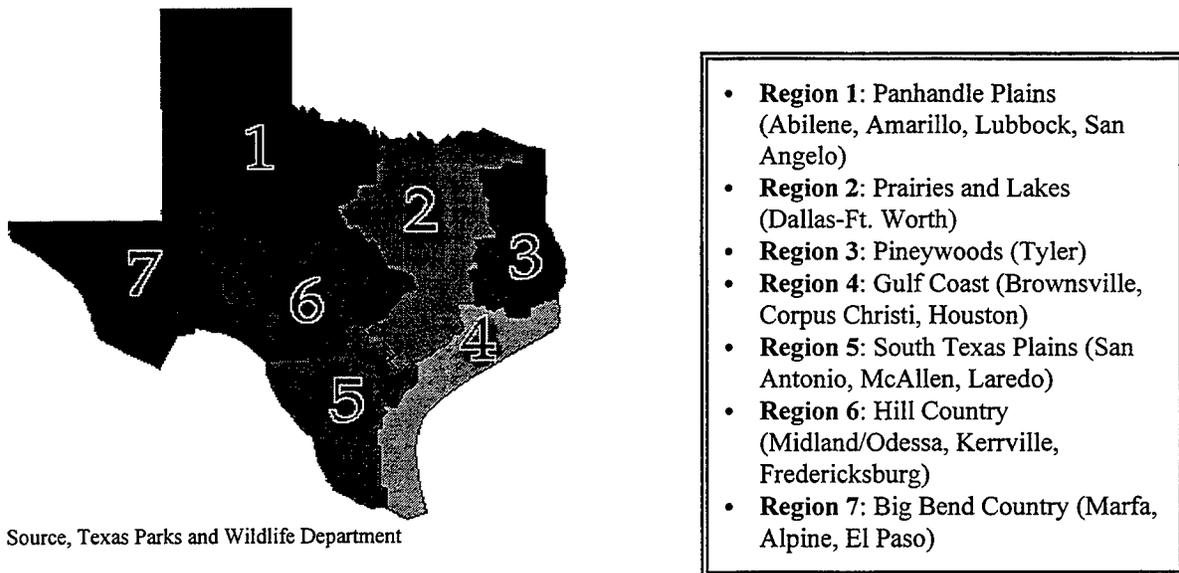
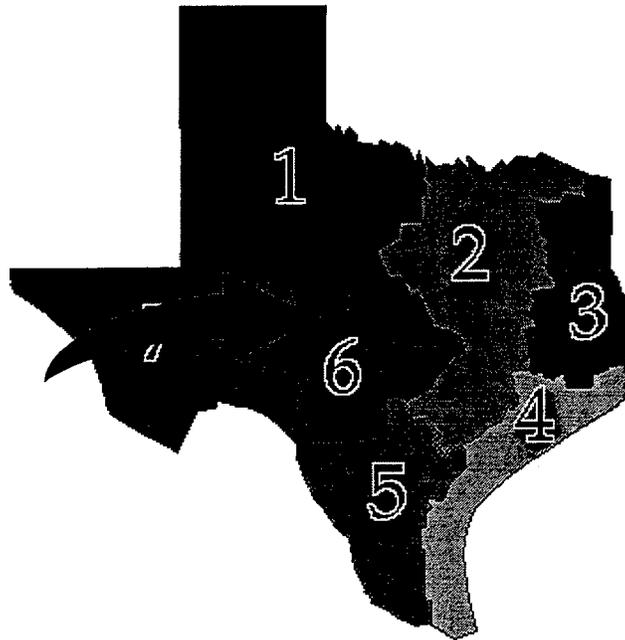


Figure 3. TPWD’s Regional Tourism Zones

These are the regional designations as developed by the Texas Parks and Wildlife Department, and they correspond closely with the regional tourism designations of TxDOT’s Travel and Information Division, which, according to the *Texas State Travel Guide*, are:

- ▶ Austin, Central Texas Area
- ▶ Corpus Christi and the Coastal Bend
- ▶ Dallas/Ft. Worth Metroplex Cities
- ▶ El Paso, City in the Sun
- ▶ Houston/Galveston and the Bay Cities of Texas
- ▶ San Antonio, Alamo Country
- ▶ The Lower Rio Grande Valley

CHAPTER 4: TOURISM, TRANSPORTATION AND SUSTAINABLE DEVELOPMENT IN THE TEXAS HILL COUNTRY



Case Study #1: The Texas Hill Country Summary Points

- ▶ Roads are a crucial part of tourism experience in this region
- ▶ The “windshield view” is how most tourists see the natural resources
- ▶ Car touring is popular, particularly because of close proximity to major cities
- ▶ Effects of urban sprawl contribute to degradation of visitor experience
- ▶ Avoid turning historical districts into “Disneylands”

INTRODUCTION

Travelers come from all over the world to drive through the Texas Hill Country during bluebonnet season. The beauty of the wildflowers in this special region, along with other natural and historical/cultural attractions, encourage millions to travel the winding roads of the Hill Country each year.

For many, the attractions of the Hill Country are seen from the windshield of a car. In this sense, the roads of the Hill Country are an important part of the visitor experience, and if the positive nature of this experience is destroyed by negative attributes that can be experienced from a car, such as urban blight, traffic congestion, visual clutter, strip malls, litter, or billboards, the touring experience is significantly diminished. As the experience is devalued, the economic utility of the resources is reduced, making them less valuable as tourist attractions.

This is just one of the ways in which Texas roads play an enormous part in tourism development throughout the state. In the Hill Country, many people come to drive, enjoy the wildflowers, and experience the wide open vistas and panoramic views as they travel from town to town, where they may also spend time exploring old and historic buildings, or perhaps attending a festival. In this sense, the scenic character of the roadways in the Hill Country, particularly the scenic character of the roads leading into and out of some of the more popular tourist destinations play a significant part in the development and long-term success of tourism in the region.

Tourism and its regular influx of visitors, however, places a great deal of stress on an area's resources. Over time, this results in degradation of the cultural and natural environment. One aspect in which such negative impacts can be felt is on the transportation system of a region (Manning and Dougherty 1995). Large numbers of visitors to a destination almost invariably mean generation of high traffic volumes, traffic conflicts, accidents, congestion, pollution, and problems that impact the quality of life in these tourist destinations.

The purpose of this chapter is to document and evaluate tourist attractions in the Hill Country, the impact of tourism on the environment, and the extent to which sustainable planning practices have been applied to protect the resource base and enhance the performance of the tourism industry in the region. The first section of this chapter outlines general physiological, ecological, and historical characteristics of the Hill Country. This is followed by a summary of the scenic

roads field survey conducted in the area. To protect the resource base of the industry, it is necessary to first assess the carrying capacity of the environment—the threshold at which tourism activity begins to impact the environment negatively. This prepares a knowledge base for evaluating and devising measures for mitigating these impacts. An inventory of environmental resources is needed to define a base against which environmental impacts are measured. The final section of this chapter focuses on the city of Fredericksburg, its role as a gateway community in the Hill Country, and its recent planning efforts.

THE PHYSIOLOGICAL, ECOLOGICAL, AND HISTORICAL CONTEXT OF TOURISM RESOURCES IN THE TEXAS HILL COUNTRY

This section is a summary inventory of the physical, ecological, and historical attributes and resources of the Hill Country that form its tourism resource base. The objective is to identify the resources that make the Hill Country attractive to both residents and visitors. Once defined, it becomes easier to understand the relationship between these resources and traffic patterns in the region, especially by way of trip generation to, and within the region.

The inventory is based mainly on a compilation of existing information from primary sources and is organized in three main parts of *physiographic*, *ecological*, and *cultural/historical contexts* as defined by Copps (1995). It describes the region in terms of elements that have shaped its character over time — such as long-term climatic conditions, the influence of vegetation, water, and wildlife, and the influence of people and their activities/culture.

PHYSIOGRAPHIC CONTEXT

The physiographic context of a region or community involves a description of the area's topographical features, patterns of vegetation, water and other natural resources, rivers and lakes, mountains, and other distinguishing physical features of the landscape. The physiographic context of a region or area determines, in great part, how individuals and groups of individuals

adapt to the requirements of the land and climate, and how they influence the location/configuration of communities and the roads between them (Copps 1995).

In many cases, and particularly in the Hill Country, the character of the roads in the region is greatly influenced by the “lay of the land,” from winding and twisting paths around mountains and rivers, to long, straight stretches where the contours of the land are flat. Older roads seem to follow the physiography of the locale more closely; newer roads tend to be straighter, having had the benefit of advanced technology and engineering to help smooth out irregular features to enhance safety, perhaps make trips shorter, and make road design easier and more economical. However, this process also tends to reduce the unique character on many roadways, especially rural ones (Copps 1995). In the Hill Country, the abundance of spectacular physiographic elements has long been its major attraction to visitors from all over the world, and is perhaps the most important factor in tourism in the region. The roads of the region reflect this, and many adhere remarkably well to the contours of the landscape, enhancing the travel experience.

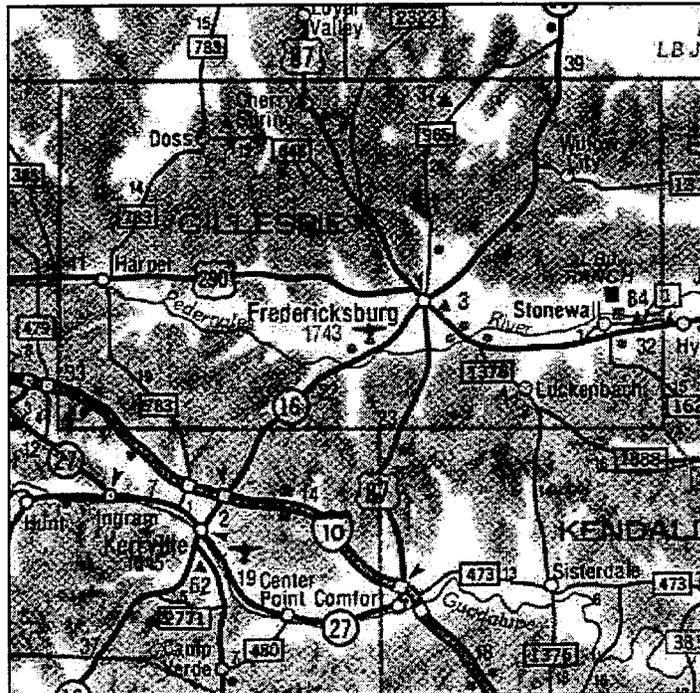
The Hill Country is often described as the cultural and geographical crossroads of Texas, separating east and west. Physically, the divide between East and West Texas begins at the Balcones Escarpment near Austin, where the landscape changes dramatically from the rolling prairies and plains of the Texas Gulf Coast to a more rugged terrain characterized by limestone hills and outcroppings with rivers, creeks, and fertile valleys in between. These physical barriers also tend to divide the culture and economy of the state. To the east of the escarpment are the rich lands of the prairies where cotton and grains have traditionally flourished. In contrast, the land west of Austin is rugged ranch country, where the soil is thin and rocky, and, for the most part, best suited for pasture and ranches.

The Texas Hill Country is an informally bounded region covering some 25 counties in central Texas. It is a plateau of limestone, bordered by the Balcones Escarpment to the east and south, the Edwards Plateau to the west, and to the north by rolling plains and prairies.

Beginning in Travis County, the Hill Country stretches a distance of about 100 miles due west of Austin and north of San Antonio. One of the most extensively traveled areas of the region is a triangle between San Antonio, Austin, and Fredericksburg. This area is

characterized by rugged terrain, freshwater creeks and springs, large stands of

cedars, mesquite and live oak, fields of wildflowers in the springtime, ranches, pastures, and farms growing a wide variety of produce, including peaches and wine grapes (Maguire 1964; Goodwyn 1991; Griffith 1994). If one examines a map of the region that includes topographical features it is noticeable that the settlements that sprung up in the Hill Country most typically exist in the valleys between the “hills”—this is, of course, where the rivers flow as well. Not surprisingly, because of the hills, regional roads also tend to follow the valleys and rivers. More modern roads cross them, or rise with them, but still generally follow the topography of the land.



Source: Texas Hill Country Information Service Website: www.eden.com

Figure 4. Texas State Highway Map with Topographical Features

ECOLOGICAL CONTEXT

The ecological context of a region includes an examination of soils, hydrology, vegetation, wildlife, wind, and flood/fire patterns which may be present. The ecological features of a landscape provide the raw materials needed for settlement and development of land, and therefore form a major component of the natural economic base of a locale (Copps 1995). The ecological components of roads, though not necessarily obvious to the traveler, are many and varied. Most of these ecological components can be found in the road rights-of-way, which can include native grasses, trees and other plants and shrubs, as well as habitat for a variety of native animals. Roads, however, can also negatively impact the environment, by disrupting habitat and migratory patterns, increasing pollution from runoff, affecting patterns and levels of erosion and flooding, killing wildlife (by motorists), and increased air pollution.

The Hill Country is the most distinct of the seven biotic regions into which biologists divide the state, and that which has species of wildlife that cannot be found anywhere else. Similarly, the Balcones Escarpment is a kind of divide between the eastern and western United States, sustaining a diversity of plant and animals that converge uniquely in the Hill Country, like the Rocky Mountain and eastern species of oak and pine trees (Zelade 1983). The spectacular rock formations and exposed limestone hills of the area, as well as a variety of lakes, rivers, and creeks, also make it an area of concentration for a variety of flora (such as bluebonnets in the spring, peaches, vineyards, and agricultural commodities) and fauna, drawing many hundreds of thousands of tourists to the area (Flawn 1964; West 1991; Goodwyn 1991).

The unique ecology of the Hill Country attracts visitors not only for sightseeing and enjoying nature, but for hunting as well. Deer and other game hunting is a major industry in the region and a major trip generator to the Hill Country.

HISTORICAL/CULTURAL CONTEXT

Exploring the historical context of an area includes obtaining an understanding of the patterns of prior human settlement, land use, and economic activity in the long term. In their historic context, roads are linkages between people and places, and the road pattern is a significant indicator of both economic development trends and the history of a locale. The historical context as used in this study establishes background information about patterns of human settlement and land use as they relate to tourism, visitor attraction and transportation.

Culturally, the Hill Country has been a meeting point of Indian, Spanish, Mexican, Anglo, and northern European cultures (mainly German), with the last two dominating the mosaic most recently. In the early 19th century, European immigrants settled in the area. The strong German influence in many settlements of the Hill Country remains one of the most notable characteristics of the region today (West 1991; Jordan 1996).

Mass settlement in the region was initiated by German immigrants in the mid-1800s. Lured to the region by promises from the Adelsverein—a society organized by wealthy German noblemen to purchase land in Texas for the development of colonies—the first group of 700 immigrants arrived on the coast of Texas late in 1844 (Shuffler 1964). To accommodate the arriving groups of immigrants, the Adelsverein purchased land on the coast and further inland for temporary settlement, and also to serve as a way-station to the Hill Country, their intended destination. The first inland way-station was established on the Comal and Guadalupe rivers, about 50 miles southwest of Austin near San Antonio. New Braunfels, as it was called, was to become the first of a series of German settlements to be established along the route from the Texas coast to the lands in the Hill Country.

As the Adelsverein brought more German colonists to the region the settlers moved further inland toward the areas populated by the Comanche Indians. In May 1846, Baron von

Meusebach, the Adelsverein manager of the settlements at the time, led a wagon train of 120 settlers from New Braunfels into the Hill Country to establish Fredericksburg. The settlement was established at the junction of two streams, later named Barons Creek and Town Creek, some 4 miles north of the Pedernales River (Edwards 1969; Goodwyn 1991; Kohout 1996a). By the next spring, Meusebach had negotiated a peace treaty with the Comanches. The Meusebach-Comanche Treaty eliminated the threat of Indian attacks and paved the way for expansion of the German settlements beyond Fredericksburg (Kohout 1996a; Griffith 1994).

By 1860, the German settlers had occupied a corridor stretching from New Braunfels and San Antonio northwest through Fredericksburg as far as Mason and north of the Llano River. The German settlers maintained strong cultural ties to their heritage, and each river valley in the German-settled sections of the Hill Country developed its own subculture, mostly along religious lines. It is not surprising then that towns such as Fredericksburg, Boerne, and Mason still bear distinctive German cultural traits. Some residents of Fredericksburg, for example, still speak German as a first language (Jordan 1996; Kohout 1996a; Griffith 1994).

Tourism as a major source of revenue is a relatively recent phenomenon in Texas, and the Hill Country represents one of the most vibrant centers of the business of tourism in the state. The unique history, climate, one-of-a-kind topographical features, and the beauty of the settlements that developed in the Hill Country, along with folklore and legend, have long served as a strong attraction for tourists.

SCENIC ROADS INVENTORY AND ASSESSMENT - SURVEY, DOCUMENTATION, AND ANALYSIS

One of the most important ingredients of the business of tourism is the tourist/traveler experience. The whole purpose of tourism is to offer scenic and environmental experiences outside the normal/everyday experiences of the traveler. Maintenance of environmental quality

and preservation of historic and cultural elements form the most basic activities necessary for the long-term development of tourism in a location. This necessitates planned monitoring and evaluation of the resources that support the industry. This element of planning is essential to integrative and sustainable tourism efforts. Effective planning entails periodic assessments of the use of resources identified in the tourism base inventory. In some cases, particularly when the scenic nature of an area is a tourist draw, such an assessment can be made via some kind of scenic evaluation process or technique. In the case of the Hill Country, researchers decided to develop a “scenic roads evaluation” form to assess the interaction between economic development, transportation, and tourism in a region known for its “views from the road.”

Aspects of environmental quality assessment considered in the study include: tourism impacts identified through activity patterns, traffic generation, and indirect impacts resulting from closely related economic activities, that affect the quality of the environment. Maintaining a current inventory, and effectively monitoring tourism resources is therefore essential to devising appropriate and sound protection methods to enhance environmental quality and sustain tourism business. This section describes methods used to document and evaluate the visual resources of the Hill Country based on sample road corridor studies.

OBJECTIVES OF THE SURVEY

The survey and documentation phase of the study was aimed at gathering visual information on the Hill Country to show the extent to which tourism, and related activities, have affected the environment, both positively and negatively. Such information can help to establish a basis for protecting resources and enhancing environmental quality in the region. This phase involved field studies to conduct visual evaluations and interviews with major stakeholders in the study, in order to document information on transportation infrastructure and services in the region.

Pertinent information was collected on the following aspects:

- ▶ road width and quality;
- ▶ tourism-related signage (including directional signage, historical markers, safety signs, ancillary service signage such as gas, food, and lodging service locations);
- ▶ land use patterns, natural features, scenic views, and vistas; and,
- ▶ other economic development activities that influence the total traveler experience.

The main objectives were, 1) to prepare a primary generalized database to combine with information from existing reports and other secondary sources; 2) present a composite picture of the extent to which transportation and its related movements and infrastructure impact the tourism experience; and, 3) to understand the extent to which transportation and tourism supports community or regional efforts at sustainable economic development.

METHODOLOGY

Having compiled existing information on the tourism resource base of the Hill Country, a field study was undertaken to gather site-specific visual data and appraise the quality of natural/historical/cultural resources in the region. This part of the study was based mainly on inventory processes and methodologies outlined in David Cobbs' *Views from the Road* (1995).

The field survey to document visual data on the Hill Country involved the following major steps:

- ▶ determining type and amount of information needed,
- ▶ preparing base maps,
- ▶ constructing survey recording form(s),
- ▶ conducting the windshield survey,
- ▶ conducting interviews with stakeholders, and
- ▶ organizing field data.

The amount and type of information needed was determined based on the goals of the study, and defined by generating a list of historical landscape characteristics, environmental features, and scenic patterns to be identified in the field. General environmental characteristics such as road condition and other elements that define the historical significance and integrity of roads were the focus of this list. Other key components of the list were natural and cultural landscape elements that influence the travel experience and define environmental quality.

Corridor-specific surveys based on two major road corridors in the Hill Country were carried out as samples for the regional study. The following are the selected samples for the study:

- ▶ the 78-mile stretch of the U.S. Highway 290 corridor between Austin and Fredericksburg; and
- ▶ the 18-mile stretch of State Highway 965 between Fredericksburg and Enchanted Rock.

The next step in the process was to prepare a base map for the study area, based on level of detail required in the information gathering process. Information was recorded on the road corridors by the mile, and at this level of detail, a U.S. Geological Survey (USGS) topographic map at a 1:24,000 scale (1 inch = 2,000 feet), was considered appropriate. The base maps were used alongside structured recording forms for recording information during the field survey.

The recording form used in the survey was adapted from a survey matrix developed by the New York Department of Conservation (NYDC) for the New York Scenic Roads Program, a sample copy of which is presented in Cobbs (1995). The evaluative matrix consists of a list of landscape characteristics and environmental elements presented in the “rows” of the matrix, and a series of recording intervals in the “columns.” Two sets of columns are presented, one for recording positive components, and the other for negative components for each mile stretch of road corridor. Each column of the matrix includes a series of boxes that correspond to a mile of road

segment, which is the recording interval. Survey components observed in a particular segment were simply marked off in the appropriate box. For better organization of the data, the recording intervals were further grouped in 10-mile segments so that each recording form covered a 10-mile segment of road corridor. Two forms were used for each segment to record information by direction of travel. Summary field records of this form for the roads examined are presented in Appendix A. The actual field survey was conducted by two researchers with a video camera. As the camera recorded the view out of the front windshield, one researcher recorded scenic elements on the form while the other drove. Both researchers narrated what they were seeing and their impressions to supplement and add to the information on the videotapes and forms.

Once the base maps and survey forms were ready and preparation for the field trip was complete, the survey team drove the selected corridors to document information. From the intersection of Interstate Highway 35 and U.S. Highway 290, as point of origin in Austin, the team traveled west toward Fredericksburg, identifying and recording data by the mile. The first leg of the survey ended at the intersection of U.S. Highway 290 and State Route 965, which doubled as the point of origin of the Fredericksburg to Enchanted Rock leg. Researchers then reversed course and took the same route east. Once completed, the team returned again to Fredericksburg. Using the same combination of direct field entries and photo-recording methods, the team traveled up State Route 965, to Enchanted Rock, and back. It took less than two days to complete the actual windshield survey, covering a total of about 190 miles in both directions.

The task of meeting with and interviewing stakeholders at the study area was undertaken concurrently with the visual survey, with the team stopping in Fredericksburg to meet with various city officials.

EVALUATION

The Hill Country inventory documents environmental characteristics and visual qualities of the U.S. 290 and State Route 965 road corridors as sample studies for the region. Site specific roadside conditions, landscape features, scenic views and patterns, and other features that affect visual character of road corridors and general environmental quality were documented along the selected corridors. Roads in the study area were generally determined to be in good shape, and the natural and cultural resources of the region generally present pleasant scenery and dramatic views that suggest a positive travel experience. However, visible signs of environmental degradation and the potential for deterioration were also identified, which are suggestive of negative impacts of tourism and economic development activity in some segments of the study area. Notable among these indicators are signs of urban blight at city edges, and traffic congestion problems in some of these cities. For a detailed and thorough evaluation of each segment see Appendix A.

Not surprisingly, the worst cases of urban blight in the study area occur at the outskirts of Austin (Travis County), and in Johnson City (Blanco County), and Fredericksburg (Gillespie County), which are the fastest growing cities in the main road corridor. Traffic congestion in the study area is most apparent in Fredericksburg, whose location makes it a through-route for some east-west commercial truck traffic. Its historic attractions continually draw large numbers of tourists, and new residents, with high traffic volumes, parking, and congestion implications. The next section focuses specifically on the city of Fredericksburg, and the transportation planning component in the *City of Fredericksburg Comprehensive Plan*.

FREDERICKSBURG

This section briefly describes the city of Fredericksburg, one of the primary gateway communities of the Hill Country. Not only does the city exist at the crossing of four major

highways for the region, but it is also a historical center known for its old buildings and German culture.

On May 8, 1864, the first wagon train of 120 colonists arrived from New Braunfels to start the settlement of Fredericksburg (Kohout 1996a). The new settlement was surveyed and laid out like many German villages, with one long, wide, main street. Realizing that freight wagons would, for a long time, be the major means of transport to the settlement, the streets of the town were planned accordingly. Each street was made wide enough to allow a freight wagon and team to negotiate a “U” turn easily (Edwards 1969; Kohout 1996a).

By 1884, Fredericksburg had grown into a town of nearly 1,000. Within this period a wagon road was also opened between the new settlement and Austin, and the Meusebach-Comanche Treaty had been signed, encouraging settlement in the area. Gillespie County was established at this time by the Texas Legislature, with Fredericksburg as the county seat. Some of the City’s most famous buildings were built in this period, notably the Vereins-Kirche, a public building which would serve as church, school, fortress, and meeting hall for 50 years, and the Nimitz Hotel, a historic landmark of Fredericksburg which now houses the *Admiral Nimitz Museum of the Pacific War and Historical Center* (Kohout 1996a; Griffith 1994).

Many of the older buildings in the city still retain their original traditional German styles, and several of these units comprise a National Historic District within the city. German language and traditional foods still form a large part of life in Fredericksburg, which continues to observe some old customs and festivals.

The Fredericksburg area is also the site of the granite dome called Enchanted Rock, the main attraction of Enchanted Rock State Park. Lying near the Gillespie-Llano County line in southern Llano County, and 18 miles north of Fredericksburg, the bald granite dome rises about 400 feet

above the surrounding hills, to a maximum elevation of 1,825 feet above mean sea level. Surrounding the “main dome” are other smaller granite domes and outcroppings, carved over time by rain and wind. These granite domes support rare species of plants in the natural pools that have formed on the domes. The park area itself covers approximately 640 acres, which includes many miles of hiking trails and space for camping. Many legends developed around the Enchanted Rock, mostly from interpretations of Indian folklore, which attribute supernatural powers to the rock and add to the mystery and beauty that serve as a magnet for visitors to the site (Shuffler 1964; Leatherwood 1996).

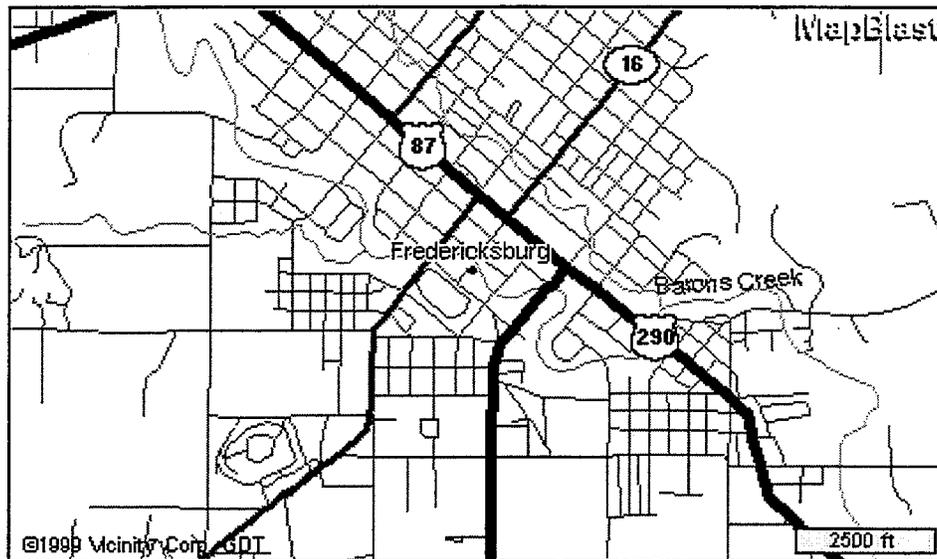
DEMOGRAPHICS OF FREDERICKSBURG—CURRENT AND PROJECTED

Forecasting for population increases in a city is important to planning, particularly in a city that experiences such a huge influx of outside visitors daily and seasonally. In the Fredericksburg city plan, four different types of projections were used to estimate population growth. The first set of criteria assumes either a “retiree trend” or a “family trend.” The second set of criteria assumes either “fast build” or “slow build.”

The “retiree trend” reflects the trend seen in the city from 1950 to 1990 that indicates that household size is decreasing. The other option is that this trend will not necessarily continue and instead will reflect a “family trend” in which household sizes are larger than they have been. The “fast build” trend assumes that the rate of population increase seen between 1989 and 1995 will continue; the “slow build” trend assumes that an average of approximately 50 new housing units will be built each year. “Mixing and matching” these four trends produces four scenarios for population growth by 2020 with a range from a high of 15,524 (family household/fast build) to a low estimate of 8,103 (retiree households/slow build). This is an almost 50% difference in population growth projections, with the “straight line” trend estimating the population to be 9,233 by 2020. With these large differences, transportation planning, especially for roads, parking, and public transportation, is of great importance to the city.

TRANSPORTATION INFRASTRUCTURE IN FREDERICKSBURG

The city of Fredericksburg is served by five highways, including two federal highways (U.S. 87 and U.S. 290) and three state highways (TX 16, TX 87, and FM 965). Fredericksburg also finds itself located close to two major U.S. Interstate Highways, IH-10 (23 miles) and IH-35 (76 miles). U.S. 87 and U.S. 290 are both 4-lane roadways, with U.S. 290 operating as a four-lane divided highway only in certain sections close to more heavily populated areas (Johnson City and Austin, for example); both these roads are shouldered, enabling motorists to pass and stop safely, and allowing for bicyclists. The state roads intersecting Fredericksburg are typically paved two-lane highways; TX 16 and TX 87 are shouldered, while FM 965 is not. The absence of shoulders on FM 965, which is the main conduit between Fredericksburg and Enchanted Rock, eliminates the possibility of bicyclists traveling safely between the city and the park.



Source: Texas Tour Guide Website www.traveltext.com

Figure 5. Map of the Transportation Infrastructure in Fredericksburg, Texas

Fredericksburg is served by the Gillespie County Airport, a general aviation facility 3 miles south of the city. No commercial flights currently operate there, although there are international airports in Austin and San Antonio. Taxi service from the Gillespie County airport is available, however, most who arrive at the facility tend to provide their own transport to their final destination. The city is also served by two Interstate carriers (commercial bus services) and four intrastate carriers, with one general bus terminal for arrivals and departures. There is currently no passenger rail service within the county.

The most popular and most convenient mode of transport within the region and into Fredericksburg and surrounding cities is the automobile, with commercial passenger buses coming in second. The implications of this are that roadway congestion within Fredericksburg and on the roads in the region generally (especially during peak tourist season) has become a problem, particularly with respect to planning issues, and will only continue to grow.

URBAN PLANNING AND SUSTAINABLE ECONOMIC DEVELOPMENT IN FREDERICKSBURG

Historic and cultural sites are of value to the traveling public and also provide valuable educational experiences to visitors of all ages and abilities. Heritage tourism generates revenues and employment for communities and for further restoration efforts, and can increase community pride and quality of life as residents experience a greater sense of connection to their community through history, architecture, and a shared socio-cultural background. As visitors enjoy a heritage site in a community, the community begins to appreciate its special characteristics, perhaps leading in turn to better efforts at protection and preservation of the environment and the local economy.

Focusing on a unique heritage can provide communities a marketing edge. Yet many communities, both urban and rural, need help with obtaining the resources necessary to restore, maintain, and promote sites and related infrastructure, including transportation infrastructure.

Community leaders need guidance on how to best market historic sites to interested audiences. Planners in turn need assistance with how to protect these places and integrate them into the community. Local organizers need advice on how to interpret the historic message to the public so the experience is educational rather than exploitative, and how to sustain travel to the sites without negatively impacting local residents and their interests.

Fredericksburg has experienced rapid growth in recent times along with increasing tourism by virtue of its rich history and natural beauty, and the concern of its government and citizenry is that its historical and natural resources need to be preserved while also supporting sustainable economic development. Although the trends for increased tourism, increased economic development, and increased efforts at preservation are positive, the population projections for the city, combined with expected increases in tourism flows are alarming in terms of planning. There is growing concern about the city losing the “small town” character that has been one of its unique attractions. This concern is addressed in the latest city plan, with its focus on managed growth to accommodate the new trends while maintaining a small town character and preserving its rich history and resources.

The *1996 City of Fredericksburg Comprehensive Plan* addresses the concept of growth management and presents guidelines for urban planning efforts. In the plan, growth management is defined as “a conscious attempt by local government to influence the character of future development within its jurisdiction...[it] addresses the rate, amount, type, location, and the quality of growth and development.” According to the plan, the amount of growth is to be determined by the natural carrying capacity of the land, public policy, and the market for

development, with the first two factors setting the parameters of the third. For example, certain environmental constraints to transportation infrastructure development in the Fredericksburg area, such as floodplains, rivers and creeks, various ecological and topographical barriers, environmental sensitivities, drainage, preexisting structures (historic or otherwise), air quality concerns, and even destruction of scenic views, reduce the ability of certain areas in and surrounding the city to support the creation or expansion of roadways. Public policy set by city officials and residents sets the physical limits to urban sprawl, limiting the total amount and type of growth that is physically possible within a given area, in turn setting limits on certain kinds of transportation infrastructure and services that are useful and/or can be further developed. The carrying capacity of the land, combined with policies for its use, will in turn influence the direction of the market in many sectors of the local economy, not just real estate. The tourism sector is also affected by these limits and policies.

Active municipal participation in the development of guidelines for urban development and planning is traditional. A city's ability to use zoning and subdivision controls, as well as a city's ability to support or deny financing to certain project affects new development, as well as the utility system, and the transportation system. Still, these are some of the most important decisions a city can make, particularly a small city like Fredericksburg that depends on tourism for a high percentage its revenues.

There is a tendency in most cities and towns to locate intensive commercial, industrial, and high-density residential development along major traffic corridors for both visibility and accessibility. In the beginning this development is usually spotty and does not necessarily create traffic problems or visual blight. As development begins to fill in, traffic can become a problem due to the volume generated and the movement conflicts created by uncontrolled or unplanned access to major thoroughfares and highways. Also, competition for the visibility that originally attracted commercial development to the strip intensifies to the point of visual confusion and blight.

Problems like these are extremely important to the city of Fredericksburg as this unpleasant traffic and visual blight detracts from the tourism experience.

According to the city plan, Fredericksburg chose to use a “neo-traditional” town planning model. This model assumes that the most intensive types of land uses occur in clusters at the intersections of streets and along thoroughfares. The Fredericksburg concept is neo-traditional in that it takes the grid street pattern already present and relates it to a hierarchy of collector and arterial streets. In this way non-residential uses are kept from intruding into the residential areas of the city (the neighborhood concept). The neighborhood concept is important to maintaining a sense of place. A specific instance of this is the creation of a “point of arrival” or “gateway” into the historic part of the city.

The gateway to a city tends to become less distinct as development occurs along the highways leading into the community. The character of this highway development can be controlled to some extent through sign and landscape ordinances, but this type of development also tends to expand continuously without consistent, identifiable edges. Therefore, it is important when attempting to preserve the gateway to a community to reinforce the images created by existing landmarks, either public or private. This can be accomplished not only through zoning but with signage and landscaping in the public right-of-way to mark the historical edges of the city. Such accents and developments in the built environment let people know when they have arrived “in town.”

The visual survey conducted by research staff reinforces the validity of the conclusions presented in the city plan. The gateway into Fredericksburg, although not free from the problems of overdevelopment, visual clutter, and traffic, shows the planning efforts of the city. Yet, other cities along the survey routes did display what could be described as a lack of planning, creating long strips of visual blight and generally unpleasant development.

FREDERICKSBURG CITY PLANNING OBJECTIVES

The city of Fredericksburg Comprehensive Plan includes a list of planning and development goals and objectives, and an outline of the priorities of the city, designed to guide officials and citizens into the future. Each objective in the comprehensive plan is accompanied by a series of “Implementation Strategies” to guide city officials in implementing each objective and achieving each goal. There are several objectives and accompanying “strategies” that are relevant to this report. They directly address the ideas of sprawl and blight, and how transportation planning fits in with the notion of economic development and tourism planning. Figure 6 outlines some of the goals of the comprehensive plan relevant to this study.

Strategies to achieve Objectives 1.3 (“To preserve, protect, and acquire, if necessary, historically and culturally significant areas, sites, structures and objects that contribute to the historic charm of Fredericksburg”) and 1.4 (“To create “points of arrival” at the highway entrances to Fredericksburg at the city limits and at historical edges of the community”), for example, include:

- ▶ Giving preference to land use proposals that preserve and/or enhance the city’s historic and cultural resources;
- ▶ Supporting preservation of historic landmarks, buildings, and homes through zoning and historic preservation ordinances;
- ▶ Identifying landmarks at the historic edges of the community which would create “points of arrival,” including:
 - West Main Street (U.S. 87 North and U.S. 290 West).
 - North Milam Street (RM 965).
- ▶ Landmarks with entry signs and landscaping including:
 - North Llano Street (SH 16 North).
 - South Adams Street (SH 16 South).
 - South Washington Street (U.S. 87 South).

Selected City of Fredericksburg Planning Goals and Objectives

Goal 1: To protect and enhance the small town values and the quality of life that characterize Fredericksburg through its historic charm, safe neighborhoods, and excellent community services and facilities.

Objective 1.3: To preserve, protect, and acquire, if necessary, historically and culturally significant areas, sites, structures and objects that contribute to the historic charm of Fredericksburg.

Objective 1.4: To create "points of arrival" at the highway entrances to Fredericksburg at the city limits and at historical edges of the community.

Goal 2: To improve the identity, safety, convenience, and competitiveness of the central business district.

Objective 2.1: To expand and give visual definition to the downtown area.

Objective 2.2: To increase the number of designated parking spaces and access to parking within the downtown area.

Goal 3: To provide a well-balanced transportation system that will assure expeditious, safe and convenient circulation of people and goods through and around the city with a minimum of conflicts and adverse effects to adjacent land uses.

Objective 3.1: To create a U.S. 290 truck route around the urbanized area of Fredericksburg.

Objective 3.2: To adopt an official comprehensive circulation plan so that the required rights-of-way for future thoroughfares will be provided when needed.

Goal 4: To increase the opportunities for youth to congregate safely and to participate in family-oriented activities.

Goal 5: To promote the availability of adequate, affordable housing throughout the city for all present and future residents of Fredericksburg.

Goal 6: To develop and promote an economic development program to diversify the local economy and to take advantage of Fredericksburg's geographic location.

Objective 6.1: To market Fredericksburg's tourist, retail and service opportunities.

Objective 6.2: To insure continued support for agriculture and related uses and programs in recognition of the importance agribusiness has to the region's economy.

Objective 6.3: To attract new industries and businesses and to work with existing businesses and industries to diversify the economic base...and preserve the environmental qualities of the area.

Goal 7: To increase parks and recreation opportunities in Fredericksburg.

Goal 8: To promote managed growth through comprehensive planning, capital improvements programming, and fiscally responsible development.

Goal 9: To work to maintain and improve, when necessary, the natural resources and the environmental quality of the area in recognition of the fact that the natural environment plays a major role in the quality of life in Fredericksburg.

Goal 10: To implement the comprehensive plan 1996 goals in a manner that will maintain the financial integrity of the city.

Figure 6. City of Fredericksburg Comprehensive Plan

- ▶ Utilizing grant funds to beautify and accent the highway rights-of-way; and
- ▶ Continuing to implement landscape and sign ordinances to lessen the negative impact of strip development and to create a distinct awareness of being within the city limits upon crossing the city limit line.

Strategies to achieve Objectives 2.1 (“To expand and give visual definition to the downtown area”) and 2.2 (“To increase the number of designated parking spaces and access to parking within the downtown area”) include:

- ▶ Using Central Business District (CBD) zoning, points of arrival landscaping and signage, crosswalk pavers, sidewalk enhancements, parking improvements, and green belts;
- ▶ Working with merchants in the West End of the CBD to generate more traffic in the area (this would include encouraging the U.S. Postal Service to locate their office at the west end of Main Street to create an immediate traffic generator in the vicinity);
- ▶ Striping both sides of Austin and San Antonio Streets for parking and working with property owners to provide a pedestrian linkage to parking in this area by improving the sidewalks along Main Street and intersecting side streets;
- ▶ Attempting to create an “alley” system providing access to merchants’ and employees’ parking as well as access for deliveries; and
- ▶ Creating parking for recreational vehicles (RVs) and other large vehicles, or vehicles with trailers, at or near the periphery of the CBD.

Strategies to achieve Objectives 3.1 (“To create a U.S. 290 truck route around the urbanized area of Fredericksburg”), and 3.2 (“To adopt an official comprehensive circulation plan so that the required rights-of-way for future thoroughfares will be provided when needed”), which are issues still ongoing from the 1985 plan, include:

- ▶ City and county officials working with the local TxDOT office and local state representatives to designate a truck route around the city, using existing thoroughfares and rights-of-way as much as possible;
- ▶ Coordinating the street and thoroughfare plan with the county and the state;
- ▶ Continuously updating the circulation plan by coordinating traffic studies and closely examining projected traffic volumes, lane widths, and signal controls with participation from the county and TxDOT;
- ▶ Improving pedestrian access;
- ▶ Working with TxDOT to install mid-block crosswalks, signalized as appropriate, across Main Street in the CBD;
- ▶ Upgrading airport facilities while simultaneously initiating airport zoning regulations to prevent uses of land which would be in conflict with noise and crash hazards generated by aircraft; and
- ▶ Incorporating plans for a bus, shuttle, taxi, park-and-ride, and possibly rail multi-modal transportation center into future comprehensive circulation plans.

TRANSPORTATION, PARKING, AND PEDESTRIAN SYSTEMS IN FREDERICKSBURG

As can be seen from the above objectives and strategies, planning for the safe and efficient movement of goods and people is an integral part of the comprehensive plan. The city has explicitly acknowledged the importance of addressing long- and short-term transportation planning issues for all modes by recognizing the role transportation plays in the future development, economic growth, and quality of life of Fredericksburg. Along these lines, the city has conducted a series of studies to gather data related to traffic volumes, roadway design standards, planned street alignments, parking, and sidewalks. This data, along with the demographic information and projections it has also collected, form the basis for future transportation planning in the city.

Streets and Roadways

Most of the transportation system capacity within the city of Fredericksburg, and within Gillespie County, has traditionally been provided by state-maintained arterial roadways. The regional arterial roadway network serving Gillespie County has been characterized as a radial system with Fredericksburg serving as the county's transportation focal point and hub. U.S. 290 provides the primary east/west service, with SH 16, U.S. 87, and FM 965 as major north/south routes. These major roadways all converge along Main Street (U.S. 290) in Fredericksburg, creating both opportunities and problems. For example, downtown Fredericksburg is accessible to many people, which positively affects the tourism industry and economic development in general. Mixing local and through-traffic in the downtown area also negatively affects traffic flows and patterns. Congestion and slower speeds result in delays for local residents, tourists, and commercial traffic. Mixing local and through traffic downtown also affects parking and pedestrian operations, as downtown visitors, Fredericksburg residents, and employees of downtown businesses essentially compete for street capacity and parking.

Most trips within the city and its vicinity are by automobile, although there are some regionally oriented transportation options to the automobile, including intercity bus service provided by Kerrville Bus Company and tour bus services operated by Grayline Tours out of San Antonio. There are some limited local transit options, including Section 18 rural transit service provided by Alamo Coordinated Transit (based in Seguin) and elderly/disabled transit services provided by the Golden Hub Senior Center. There has been interest expressed by a number of transportation operators for the city to develop a localized tour bus or shuttle service. It is envisioned that these services would be integrated into the multimodal transportation center. Although a funding application for this center has been pending with TxDOT, the experience of the city has been that TxDOT, although not averse to the project, has wanted to place a variety of restrictions on the project and its funding, as well as the operators, and the city deemed these restrictions, or

qualifications, too restricting and have put the project on hold (Interview with Fredericksburg Mayor).

Traffic Volumes

Traffic volume data indicate growth in traffic along all corridors, ranging from a low of 0.45% growth annually along FM 1631 north of U.S. 290 to a high of 6% growth in volume annually along U.S. 290 at the eastern end (traffic volumes along arterials in an urban area are typically assumed to grow at an average of 3% per year). Growth in traffic volume is seen to be a consequence of increasing tourism-related traffic and local population growth. An evaluation of highway capacity is usually based on the concept of “level of service” (LOS) defined in the Highway Capacity Manual as a qualitative measurement of factors such as speed and travel time, freedom to maneuver a vehicle, traffic interruptions, and traveling comfort, convenience, and safety (see Table 4).

Table 4. Level of Service

Level of Service	Description	Volume to Capacity Ratio
A	Free Flow	.60
B	Stable Flow	.70
C	Stable Flow	.80
D	Approaching Unstable Flow	.90
E	Unstable Flow/Capacity Threshold	1.00
F	Forced Flow	---

In urban areas, an LOS of “A” through “D” is usually considered within the range of acceptable. An LOS of “E” indicates that the roadway in question is at its theoretical capacity, while an LOS of “F” indicates that the roadway levels of service are unacceptable. Fredericksburg has taken an LOS of “C” to be its community acceptable level of service, reflecting the lifestyles and values of

a smaller community.³ Maintenance of an LOS “C” transportation environment is important to the city of Fredericksburg, but this will result in increased expenditures for transportation infrastructure and services in the future, especially as population growth is expected to continue and as tourism-related traffic is also expected to increase.

City arterials volume estimates for 1994 indicate acceptable performance along all roadway segments, with all but three performing at LOS “A.” U.S. 290 (Main Street) performs at LOS “B” from west of FM 1631 to west of SH 16; this “decline” in performance reflects expected levels of traffic in the downtown area and the capacity constraints created by signal spacing, pedestrian activity, and parking activity. Although the local perception seems to be that the downtown area is at an unacceptable level of congestion, data indicates that, comparatively, this is not the case. In any event, projected future population and traffic increases may indeed affect level of service rankings negatively over time.

Projected Service Levels and A Proposed Thoroughfare Plan

Year 2000 projections indicate no street segment with traffic volumes corresponding to an LOS worse than “C” (the recommended service standard for Fredericksburg). In the year 2005, one street segment, U.S. 290 west of SH 16, exhibits an LOS “D.” This LOS implies that by the year 2005, capacity enhancements for U.S. 290 will become necessary. By the year 2010, numerous segments of U.S. 290 are projected to have “undesirable” service levels, with one segment, FM 965 north of U.S. 290, also expected to have an “undesirable” LOS ranking. The projection for 2015 indicates that the entire segment of U.S. 290 east of FM 965 will function with “undesirable” service levels, with the U.S. 290 segment east of FM 1631 exhibiting an LOS close

³An example of different levels of service between an LOS “C” and an LOS of “D” at a signalized intersection, for example, is that the maximum average stopped delay at a LOS “C” intersection is 25 seconds, whereas at an LOS “D” intersection it would be approximately 40 seconds.

to or at level “F.” Many other road segments also are projected to function at an LOS level “D” or worse.

Because problems with traffic and congestion caused by population increases and increases in tourism-related traffic will continue to rise to unacceptable levels by 2015, the city of Fredericksburg has developed a proposed thoroughfare plan that concentrates on the development of a southern bypass of the CBD that would join U.S. 290 on the west side of the city (prior to entry into the CBD) to FM 2093, and then proceed to cut across both SH 16 and U.S. 87, reattaching to U.S. 290 on the east side of town.

Parking System

According to the city plan, one of the key components of keeping Fredericksburg a tourist-friendly town is preserving the ability of both tourists and local residents to park their automobiles close to the attractions they wish to visit and/or the business establishments they wish to patronize. Tourists and local residents both desire a sufficient number of parking spaces to satisfy demand, and they desire that these spaces be located in convenient locations. In other words, parking spaces too far from Main Street or spaces with parking meters with too short a time limit, would not be viewed as “desirable.” This could lead to individuals parking in inappropriate or illegal locations or parking in a way that impedes commercial activity, such as double-parking, or parking in delivery zones.

Due to the mix of tourist traffic and local traffic, parking demand patterns in downtown Fredericksburg typically reflect “short-term parkers” and “long-term parkers.” “Short-term parkers” are individuals who are conducting day-to-day activities like grocery shopping, eating a meal, dropping off packages, and/or performing various errands. “Long-term parkers” are generally tourists who are visiting the downtown area for the day or residents working in the downtown area. Long-term parkers reduce the supply of available short-term parking spaces in

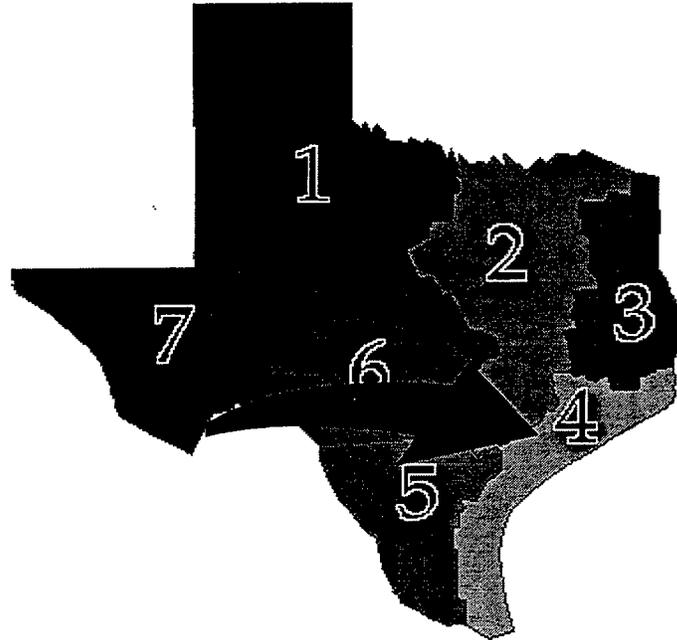
the downtown area; often, cities relieve this shortage by increasing the rate of parking space “turnover,” usually by enforcing hourly limits or using parking meters. However, the city of Fredericksburg does not presently enforce hourly limits and does not employ parking meters. At present, Fredericksburg residents perceive there to be a shortage of desirable parking in the CBD.

CONCLUSIONS

It seems apparent that the Texas Hill Country’s and the city of Fredericksburg’s success as a regional major tourist attraction can be attributed in great part to natural, cultural, and historical resources — and also to the fact that the area is easily accessible. However, accessibility has also contributed significantly to the deterioration of many of the natural, cultural, and historical points of interest the region has to offer.

The transportation corridors in the region bring carloads and busloads of one-day tourists, weekend tourists, and business travelers from larger urban areas around the region. These corridors are also major transportation routes for commercial vehicles moving through the state. These modes compete with one another and the local traffic for space in the infrastructure, causing levels of congestion to rise over time, and also causing the pleasure of travel within the region to decrease. Over development, urban sprawl, pollution (of the air, land, and water), and other forms of environmental degradation that occur as a consequence of population growth also contribute to this phenomenon. Therefore, measures to encourage sustainable economic development in the region, along with more effective tourism planning and transportation planning, are a priority.

CHAPTER 5: TOURISM, TRANSPORTATION, AND SUSTAINABLE DEVELOPMENT IN PORT ARANSAS, TEXAS



Case Study #2: Port Aransas Summary Points

- ▶ At the crossroads of development choices and direction
- ▶ Potential for destruction of tourism industry and resources by hurricane/flooding or an environmental disaster (such as an oil spill or chemical incident)
- ▶ Role of ecological sensitivity of area
- ▶ Islands are naturally limited with respect to space
- ▶ Impact of spring break and other seasonal events

INTRODUCTION

As indicated in the previous chapter, a significant percentage of Texans enjoy traveling to participate in outdoor sports such as hunting, fishing, boating, golfing, birdwatching, and hiking/climbing. A significant number of Texans also travel to enjoy nature-based attractions and activities, such as beaches/waterfronts, national/state parks, hiking/biking, and camping. Not surprisingly, Texans and non-Texans both prefer to travel to these attractions and activities by

automobile and bus. This would seem to indicate that transportation services and infrastructure are important even to the enjoyment of activities that are not described as “touring” and are crucial to individuals who want to access a variety of natural attractions and activities.

The Gulf Coast region of Texas supports a high percentage of the activities and destination types considered to be most popular for tourism, and also supports a wide variety of quasi-tourist activities for the individual who may be attending a business conference, meeting, or other similar event. Many of the communities along the Gulf Coast have economies that depend on tourism and tourism dollars. Communities such as South Padre Island, Galveston, and Corpus Christi each have thriving tourist industries, with all the accompanying infrastructure, including large hotels and convention centers, developed waterfronts, and sub-economies of charter boat operators, outfitters, guides, and restaurateurs. These communities depend on beach goers, conventioners, “winter Texans,” and “spring breakers,” and cater to them in full-scale fashion. Many of Texas’ Gulf Coast communities made an economic decision to pursue a large-scale approach to tourism. Other communities are still struggling at the crossroads of this important decision. Often the questions that arise at this juncture are most difficult to answer, and go to the heart of many of the issues of sustainability and community. Researchers therefore chose to examine one of these Gulf Coast communities “at the crossroads,” Port Aransas, Texas.

The research methodology for examining transportation, tourism, and sustainable development in Port Aransas was different from the methodology used in the Hill Country case study. For Port Aransas, researchers did not concentrate on a “windshield survey” or scenic road evaluation; the roads to and around Port Aransas are not the focal point of tourism. The focal point of tourism in Port Aransas is the environment—the beaches, the tidal marshes, the birding, the fishing, the sailing, and all the other activities one would pursue on an island in the Gulf of Mexico. The sensitivity of the environment in and around Port Aransas places a different perspective on the relationship between transportation, tourism, and sustainable economic development. Issues of

land use and zoning are particularly important, as is population growth and politics. These are just some of the issues that researchers concentrated on for this case study.

Researchers conducted a series of interviews with many of the stakeholders in the decision processes over the direction of development in Port Aransas, and also conducted a site visit during which many of the area's most sensitive areas were toured.

PHYSIOLOGICAL, ECOLOGICAL, AND HISTORIC CONTEXT OF PORT ARANSAS

The city of Port Aransas is located across the bay from Corpus Christi and at the tip of Mustang Island, itself connected further south with Padre Island and the Padre Island National Seashore. Port Aransas can be reached most directly by ferry, unless traveling from Corpus Christi, in which case Mustang Island can be reached by a causeway and Park Road; one then travels all the way up the island on SH 361. The ferry service, operated by TxDOT, runs 24 hours a day.

Scientists believe that the islands were originally submerged offshore sandbars that emerged approximately 4,500 years ago. The first human occupants of the island were the Karankawa Indians. The Spanish explorer Cabeza de Vaca was probably the first European to meet the Karankawas in approximately 1528. Mustang Island (originally Wild Horse Island) was named because of the wild horses, called "mestenos" brought to the island by the Spanish in the 1800s. Also in the early 1800s, John Lafitte and his band of buccaneers spent some time in the area.

By the mid-1800s, the natural pass by the Island into Corpus Christi Bay and Aransas Bay attracted more commerce; around that time, maps began appearing that noted the location of a settlement that would later become Port Aransas. Over the years, Mustang Island developed as a departure point for regular steamship service to New Orleans with the first deep-draught steamship going through the pass in 1859. Unfortunately, a storm in 1875 devastated the island and washed away the docks. The town that had begun to grow at the tip of Mustang Island

named itself Ropesville in the early 1890s, changing its name to Tarpon in 1899 because of the large numbers of these fish being caught in surrounding waters. At that time, Tarpon had a population of around 250. By 1910, the town began to call itself Port Aransas.

Another storm in 1919 virtually wiped out the entire town except for two or three structures, and town again returned to making its living from the sea. At the turn of the century, the village was doing big business in sea turtle export, and has continued to grow since that time, depending mostly on the sea.

Port Aransas has approximately 18 miles of accessible beaches which also serve as an alternative roadway along the island. Many activities can be enjoyed on and near the island, including deep-sea, pier, bay, and jetty fishing, bird and dolphin watching, scenic cruises, and nature boat tours, horseback riding, water sports, and a variety of other activities that one would find in a resort area.

ECOLOGICAL SENSITIVITY AND TOURISM

The island of Port Aransas is part of a sensitive ecosystem. Except for urban development, the terrain of Port Aransas is similar to that of the rest of Mustang Island. The 300-400 foot wide strip of beach runs the length of Mustang Island, with 5-40 foot high sand dunes creating a barrier between the Gulf and the island's development and population. Because the dune ridge is stabilized by easily destroyed vegetation, development is restricted within the first 1,000 feet landward of mean high tide. Development of the dunes is now restricted by the Dune Protection Act (see box). Breaks in the dune ridge created by roadcuts and other developments are evaluated and regulated in order to assure a consistent minimum elevation at the primary dunes of 11 feet above sea level.

The inland portion of the island is a relatively flat expanse of land varying in elevation from only 5-10 feet and a width of 1-3 miles. Most structures on Port Aransas are built on this portion of land. Not surprisingly, this interior portion of the island is prone to flooding during storms. The occurrence of tropical storms is a major concern to the people living and working on the island. Flooding caused by these storms can reach in excess of 9 feet above normal high tide.

On May 13, 1975, the city of Port Aransas adopted a dune protection ordinance that established a dune protection line and required a permit for building within this line. Another major factor in the city's dune protection system is the recent implementation of the Coastal Management Plan. The goals of the plan include:

- ▶ Protecting public health and safety while preserving, restoring, and enhancing coastal natural resources;
- ▶ Assisting coastal landowners in using beachfront property in a manner compatible with preserving public and private property, public access to the beach coastal natural resources, and the protective and recreational function of the beach/dune system;
- ▶ Preventing the destruction and erosion of public beaches;
- ▶ Educating the public about coastal issues such as dune protection, beach access, erosion, and flood protection; and

The Dune Protection Act and Open Beaches Act

On May 13, 1975, the city of Port Aransas adopted a dune protection ordinance that established a dune protection line and required a permit for building within this line. The Dune Protection and Open Beaches Acts require the City of Port Aransas and Nueces County to adopt and implement programs for the preservation of dunes and the preservation and enhancement of use of and access to and from public beaches. Some provisions of the Acts include:

- ▶ Beachfront Construction Certification Areas
- ▶ Critical Dune Areas and Dune Protection Lines
- ▶ Exempt Areas (such as National Park areas, national wildlife refuges, state park areas and refuges, and inaccessible beaches)
- ▶ Activities Exempt from Dune Protection Permits (such as exploration/production of oil and gas, grazing livestock, and certain recreational activities)
- ▶ Standards for Issuance of Dune Protection Permits

(City of Port Aransas Coastal Management Plan, 1995)

- ▶ Promoting dune protection and ensuring that adverse effects on critical dunes and critical dune vegetation are avoided or minimized/mitigated (Port Aransas 1995).

The Port Aransas development boom has occurred during an almost hurricane-free period. As a result, many of the people moving into the area lack the knowledge and respect for hurricanes that long-time residents possess. Although the enforcement of more stringent building codes and the improvement of the ferry system and land access routes through Corpus Christi have helped to ameliorate the effects of future storms, the city must continually focus on the threat of hurricanes in its planning and development efforts. Hurricanes and tropical storms remain a serious deterrent to extensive development in Port Aransas, even though alleviated somewhat by federally subsidized flood insurance. The fact remains that one strong hurricane could wipe out a significant percentage of development, tourism-related or otherwise, on the island.⁴

The Port Aransas economy is based primarily upon one natural resource—the Gulf Of Mexico. The sandy soils of Port Aransas are not suitable for agriculture, and in many cases cannot support heavy industrial structures. However, their suitability for urban, recreational, and transportation facilities is good, with the exception of the coastal beaches and dunes. This in many respects limits the type of development on the island and reinforces the primary importance of tourism to the economy.

Water is another sensitive issue for Port Aransas. Although Port Aransas gained fame as a fishing and resort center, lack of amenities (such as a large source of fresh water) and accessibility hindered population and commercial expansion for years. Infrastructure development in the past 30 years, including a 3.45 million gallon water storage system, has enhanced the area's attractiveness as a vacation center and enhanced its ability to handle an

⁴Information in the following sections is from the *City of Port Aransas Comprehensive Plan*, October 1994 unless otherwise indicated.

increasing number of tourists and full-time residents. This water system get its water from the Nueces River Reservoir System, which also supplies the city of Corpus Christi. The water from the Nueces system enters the city system via two pipelines: one from the north under the ship channel and one from the south via Corpus Christi.

The groundwater supply in Port Aransas is much more limited and is not potable. However, the groundwater system is still tapped by more than 100 shallow wells that use the water for irrigation and other purposes. This local source of relatively inexpensive water has encouraged the development of trees, lawns, and gardens in an area normally restricted to dune grasses, weeds, and sunflowers. This has set the stage for the possible development of golf courses on the island. Surface water includes the saltwater marshes and tidal flats, marine grass flats, and saltwater shoals. The tidal flats and salt marshes can be thought of as flood basins which store storm water and other surface runoff. When flooded, these shallow waters support populations of small fish, crabs, and birds. Manmade marinas, canals, and channels for recreational purposes and navigation provide refuge for shrimp, crabs, and fish. However, water problems often occur in canals and marinas when the water is not dynamically flushed. Runoff of all kinds, including petrochemicals, pesticides, and other pollutants threaten these restricted bodies of water and the creatures living in them. As can be seen, increased levels of tourism of all kinds, and increased access by cars, trucks, and water craft affect the water quality of the island, and can alter the sensitive ecosystem there. If tourism development is to be “sustainable,” these issues must be addressed by tourism planners, developers, and city officials.

SOCIOECONOMIC ISSUES AND TOURISM DEVELOPMENT

Port Aransas has many socioeconomic characteristics similar to other small towns having an influx of tourists. The nature of a tourism-based economy tends to socially and economically segregate the permanent and seasonal residents. The permanent, year-round population consists primarily of individuals who own or are employed in various commercial enterprises in the area;

a significant percentage also work in local or state government jobs. During the summer months, 70% of the residential population is a vacationer-type who owns or rents accommodations in town. The summer visitors remain in the area for a short time, yet they serve as a principal source of income for the community. In the winter months, a large portion of the population is made up of long-term visitors, and many reside in trailers and long-term condominiums or apartments. These individuals are often referred to “winter Texans” by the local community.

Transportation Infrastructure

The transportation infrastructure is extremely important to Port Aransas for three general reasons: 1) it supports tourism; 2) it allows the evacuation of residents/visitors in the event of a large storm or hurricane; and, 3) it allows people access to their jobs, especially off island. Yet, almost paradoxically, the transportation limitations posed by the island’s size and location reinforce the image of Port Aransas as a small, slow-paced destination, where visitors can escape the “bustle” of the city.

The only two roadway accesses into the city are either the ferry from Aransas Pass or SH 61 from Corpus Christi on a bridge across Corpus Christi Bay. Ferry transport is often perceived to be a type of transportation bottleneck in high season, yet the 24-hour ferry service to and from Port Aransas (operated by TxDOT) can run up to six 20-car ferries at once. The crossing itself takes between five and 10 minutes, and although during rush hours in high season the lines for the ferry can get quite long, the wait can be shorter than one might think.

The public bus transportation system, the “Flexi-B,” enhances not only the tourism industry in Port Aransas but also the attractiveness of Port Aransas to full-time residents who can commute/travel freely to and from Corpus Christi. The Flexi-B, however, is a demand-response service with 24-hour advance notice required, even for airport arrivals and departures. The city

of Port Aransas also provides a shuttle service around the island, passing major destinations and attractions, such as the local airport, birding facility, condominium and hotels, and restaurants.

THE PORT ARANSAS CHAMBER OF COMMERCE

The primary agency driving the extent and quality of tourism development on the island is the Chamber of Commerce. Researchers were able to acquire a copy of the Chamber's Marketing Plan (Port Aransas Chamber of Commerce 1997), and were also able to interview Ms. Carol Ann Anderson, the Executive Director of the Chamber of Commerce, Tourist and Convention Bureau.

According to the Marketing Plan, the Port Aransas Chamber of Commerce Tourist Bureau's primary objective is "to create maximum hotel occupancy within the city and island. By attracting and securing overnight visitors who will spend money in the Port Aransas area, we assist these visitors in having a successful and enjoyable stay and encourage their return...we can build the image of Port Aransas as an excellent place to visit, stimulate the Port Aransas trade area, and diversify the economy, thus sustaining jobs and improving the quality of life" (Port Aransas Chamber of Commerce 1997).

The marketing plan directly addresses several development issues of concern to the community and possible ways to address them, with the main goals of the marketing plan to promote overnight stays to individuals, families, and groups, with an emphasis on family activities. Within the marketing plan, the Chamber of Commerce identified strengths and weaknesses of the community. Obviously, one of the major strengths is the Gulf of Mexico and the resources it provides, including beaches, mild weather, excellent fishing, and other nature-oriented activities. Another perceived strength is the size and location of the community: it is a small island with a slower pace and a relatively low population density, plus most all the tourist attractions are within a short distance from each other. It is close to the major city of Corpus Christi and in

relative proximity to both Houston and San Antonio. Another strength of the city is perceived to be its central location along the migratory paths of several hundred species of birds, including some endangered species, such as the whooping crane and the piping. Port Aransas is considered a hub city on the Great Texas Birding Trail.

The marketing plan also addressed some of the perceived weaknesses of the city. The lack of a full service franchise hotel causes the community to miss out on corporate business, and often return business. Lack of “spring break” activities causes a decline in Spring Break peaks, and also causes these individuals to have idle time, lack of direct commercial air transport, and regularly scheduled commercial shuttle bus or ground transportation. Other weaknesses included things such as the weather-dependent nature of the tourist attractions, limited shopping, the large influx of winter Texans (causing a loss of bed-tax revenue to the city), the extensive development of properties outside the city limits (loss of taxes and less responsibility to maintain the beaches to city standards), and the shortage of hotel rooms that are not privately owned.

In our interview with Ms. Anderson, some of these strengths and weaknesses were addressed and further described. Research staff first asked Ms. Anderson to speak about some of the issues, both positive and negative, regarding the influx of winter Texans. Ms. Anderson indicated that the winter Texans were a “mixed blessing” for the community. On the one hand, she said, the majority of the “winter Texans” seemed supportive of the goals of the community and its permanent resident population, such as attending town meetings and similar activities related to planning for the future of the island. On the other hand, she added, a small percentage of these visitors are perceived to have negative impacts on the community. For example, they are perceived to “take advantage” of many of the community’s resources without “giving back” very much. Some of these winter Texans spend very little money on the island, preferring to do their shopping and other revenue-producing activities and socializing (movies, entertainment, restaurants) on the mainland. In addition, some of these individuals tend to rent condos and RV

spaces on a monthly basis, and therefore contribute very little to the portion of revenues represented by hotel and motel taxes. The loss of these hotel and motel taxes directly affects many city services, such as the Sheriff's and Constable's Offices and other agencies that depend on money from the city's budget. Some lodging establishments that rent space by the month (and thereby lose out on collecting hotel and motel taxes), have now changed their policies to rent by the night for a month so they can collect these taxes.

Research staff asked Ms. Anderson about the public transportation services on the island. She commented that the current shuttle trolley service has been quite successful, especially for the winter Texans. However, she also noted that the shuttle service to and from the airport was viewed as ineffective, largely because of the advanced reservation requirement and, as a result, the lack of regularly scheduled and relatively inexpensive service. This, in turn, results in the perception that it is too expensive to get to Port Aransas from far away, and/or that it just takes too much time and effort. Also, it encourages people to drive to the island, increasing the vehicle traffic and, in peak season, causing congestion.

The increasing popularity of the Birding Center, said Anderson, makes the issue of getting to and from the island a bigger issue—the event is a major draw, with the Birding Fest, for example, drawing an estimated 2,500 people to the community in 1996. Although it is the strategy of the Chamber of Commerce to schedule big events spaced out throughout the year to minimize congestion and even out revenues throughout the year, as some events begin to draw larger and larger crowds, many of the perceived “weaknesses” may become true concerns.

Other issues discussed during the interview included:

- ▶ The Chamber of Commerce (as well as the community at large) is trying to stress more family-based activities. In terms of advertising, Ms. Anderson indicated that they do not specifically target their advertisements and publicity toward students on

Spring Break and prefer to advertise in family publications, teaching magazines, and similar kinds of media. She added that Port Aransas had actually eliminated Spring Break advertising for a couple of years.

- ▶ The city anticipates developing landscaping and greenspace more appropriate to bikes and pedestrians, although there seems to be some resistance on the part of merchants who, for example, didn't want to build sidewalks on their property.
- ▶ There seems to be some conflict between directing resources toward continuing the development and marketing of the Birding Center and the extremely popular birding events, versus developing a golf course, which many see as a huge tourist draw and revenue generator.

THE PORT ARANSAS CITY MANAGER'S OFFICE

Researchers interviewed Mr. Tom Brooks, the city manager of Port Aransas, in order to discuss issues such as zoning and land use, ferry operations, and other issues related to infrastructure.

One of the first issues that was discussed was related to zoning. Mr. Brooks believed that the island still had a great amount of space for expansion of both residential and commercial properties, but felt that the Coastal Zone and Management Plan and Zoning Regulations were restricting this development. For example, each new building must have space on its sides equal to its height (i.e., a 20-story hotel/resort would need at least 200 feet of undeveloped land on all sides). This restricts development in that it has become very difficult to obtain permits for large resorts and high rises. On the other hand, this zoning ordinance also tends to support more open space and therefore tends to create a more sustainable type of growth.

Still, despite this zoning restriction, there has been a recent explosion in residential housing construction on the island. It has gone from two new houses built in 1990, to 56 new houses built in 1997. Most of this residential building has occurred in new subdivisions away from the beachfront and main dune area, and has moved from strictly single-family residences to a

combination of single-family, multi-family, and duplex construction. Retirees are now building and buying, as opposed to renting. In addition, RV parks on the island are prevalent and are becoming increasingly crowded. Mr. Brooks indicated that the population is also becoming more affluent, and people tend to pay for these properties in cash. Perhaps surprisingly, it seems that the school district population is also increasing, due to an influx of families with children as well. He noted that most of the new residents, and visitors as well, are coming from Austin and San Antonio.

This influx of new residents and visitors has caused the traffic on the ferry to increase steadily over time, as can be seen in the following table.

Table 5. Port Aransas Ferry Traffic

Month/Year	1991	1992	1993	1994	1995	1996	1997	1998
January	95,886	104,519	116,378	125,806	134,721	139,356	136,752	149,877
February	115,549	125,726	125,210	133,403	145,174	151,285	147,441	
March	171,522	162,240	170,022	188,560	183,011	191,877	201,340	
April	119,590	128,019	140,056	149,134	154,904	157,578	153,480	
May	143,100	151,272	163,042	173,763	172,507	186,609	188,124	
June	170,941	172,072	172,378	201,128	205,537	214,819	217,412	
July	193,251	205,738	224,677	235,522	241,996	246,579	252,530	
August	175,321	179,504	187,756	187,281	182,360	197,075	209,438	
September	122,047	131,686	146,210	154,089	161,676	155,153	157,567	
October	117,276	128,953	143,469	164,373	149,239	148,384	138,383	
November	105,097	113,616	116,880	130,925	132,060	136,705	130,747	
December	<u>97,100</u>	<u>100,704</u>	<u>109,781</u>	<u>120,104</u>	<u>120,528</u>	<u>126,484</u>	<u>120,195</u>	
TOTAL	1,626,680	1,704,049	1,815,769	1,949,088	2,013,713	2,051,904	2,053,409	
Previous Yr		+ 77,369	+ 111,720	+ 133,319	+ 64,625	+ 38,191	+ 1,505	

To better manage congestion at the ferry crossing points, TxDOT has created a ferry “loop,” on the Port Aransas side of the crossing that encourages organized queuing for the ferry and reduces the traffic on the main thoroughfares leading to the ferry. However, better managing the flow of individuals into and out of the community has not reduced congestion levels on the beaches on popular summer and spring weekends. Moving cars and trucks compete with parked vehicles and pedestrians/beach goers.

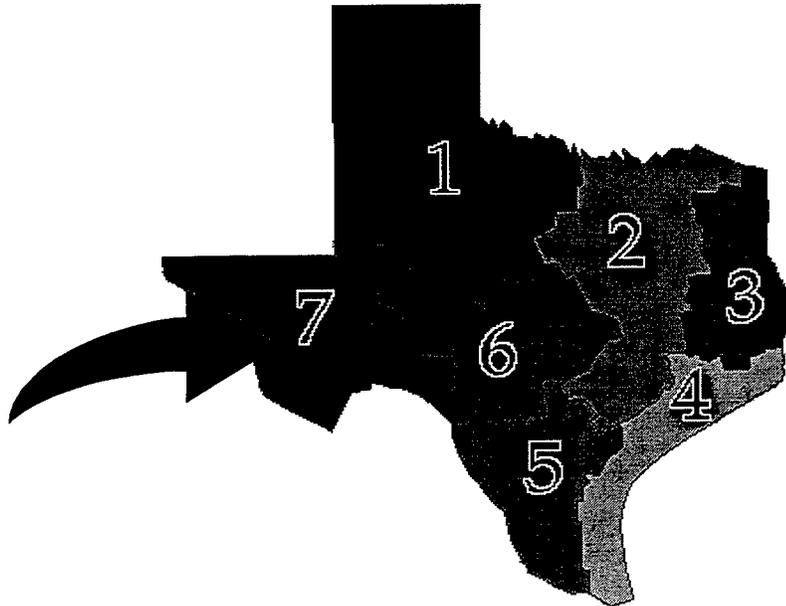
However, despite the increasing levels of visitation to the island, Mr. Brooks believes that the infrastructure and services the city provides are more than adequate to handle the influx. For example, he believes that the sewage and water systems have more than enough capacity to handle continued increases into the future. If nothing else, he added, the sewage plant attracts tourists because it is the location of the wetlands that have grown up around its fresh water discharges. This area was made into the new Birding Center.

CONCLUSIONS

What researchers concluded from this interview was that the community of Port Aransas was indeed at a critical threshold for development — big chain hotels and conference centers, or smaller hotels and family-oriented outdoor activities on a smaller scale? Birding or golfing? Cars or shuttles? These are important issues for a small community (though growing at an amazing pace) with a relatively small tax base. Changes in direction would impact the community for decades to come—and any and all planning investment could indeed come to an abrupt halt due to a major natural disaster.

Where the city manager's Office and the Chamber of Commerce seem to disagree is on the subject of a proposal for a new golf course, space for which is competing with a proposed new wetlands development for birding. Mr. Brooks has supported bond elections for a \$3-4 million city contribution to the development of this golf course and resort complex. He believes that having golf as an available activity on the island would encourage families to extend their vacations and spend more money while they are in Port Aransas.

CHAPTER 6: TOURISM, TRANSPORTATION, AND SUSTAINABLE DEVELOPMENT IN THE BIG BEND REGION



Case Study #3: The Big Bend Summary Points

- ▶ Water as a limiting resource
- ▶ Big Bend as a “destination”—one does not “stop by” on the way to somewhere else
- ▶ Attracts more environmentally aware tourists
- ▶ Responsibilities of gateway communities
- ▶ Sensitive archaeological sites still being explored
- ▶ Access requirements of individuals—must the parks give total access to all?
- ▶ Spring break crowds

INTRODUCTION

To many, the “real” West begins not with the Hill Country but at the Pecos River Valley, a vast and sparsely populated basin. Between the river, as it runs in a southeasterly course from Loving County to the area around Del Rio and the Amistad Reservoir, and El Paso are the highest peaks east of the Rockies along with great stretches of uninhabited. For the approximately 284 miles between Midland-Odessa and El Paso there is not a single commercial airport. Yet there is a

wealth of activities and site-seeing opportunities available in this region—Big Bend National Park, Big Bend Ranch State Park, the McDonald Observatory, communities like Alpine, Marathon, Fort Davis, and Marfa, a vast portion of the Chihuahuan desert, archaeological sites, historical landmarks, and a wide variety of plants and animals.

The area known as “the Big Bend” is part of this western section of Texas. It comprises, generally, Brewster, Presidio, Jeff Davis, and Pecos counties. This region of Texas is a relatively large tourist draw despite its extremely rural nature. It is the difficulty in traveling to and within the Big Bend region that was of interest to research staff in deciding which regions to examine. Staff decided to explore the interrelationship between transportation, sustainable development, and tourism in the Big Bend region for several reasons. The primary reason was the extremely rural nature of the area. Few roads, widely spaced small towns, and minimal transportation infrastructure to support large scale tourism make travel to Big Bend a “destination” as opposed to a stopover point for people on their way to do something else; it is certainly not a “day trip” like the Hill Country—most people tend to stay a while. Second, the communities in this area represent stopping points for the traveler, whether the need is for lodging, food, gas, or even car repair, and play an important role in developing and sustaining tourism in the area. Third, research staff wanted to examine the issues surrounding the debate over access versus preservation.

PHYSIOLOGICAL, ECOLOGICAL, AND HISTORICAL CONTEXT OF THE BIG BEND AREA

Humans have populated the Big Bend area for thousands of years. The first inhabitants were hunter-gatherers who moved their camps seasonally to take advantage of the varying elevations, as well as the seasonal plant and animal life of the area. Pictographs, mortar holes where American Indian tribes such as the Apache, Kiowa, and Comanche ground mesquite beans or

grass seeds, campsites, and other sites of archaeological significance are common sights in this region.

Records indicate that Mexicans had established small landholdings, called *rancherías*, south of the Rio Grande as early as 1805, but few Americans had ventured into the area. By 1848, the Treaty of Guadalupe-Hidalgo was signed, officially ending the Mexican-American War, and ceding California and all land north of the Rio Grande to the United States. As these lands were mostly unknown to the Americans, both U.S. and Mexican Boundary Commissions were called under the treaty to survey the new border. It was this joint effort that led Chief Surveyor William H. Emory down the Rio Grande in 1852. The survey of the Big Bend region was finally completed in 1853 by another party led by Lt. Nathaniel Michler. The combined results of the two expeditions proved that navigating the Rio Grande via steamboat (to reduce the cost, risk, and time involved in overland travel by wagon) were impossible. This, combined with the relative inhospitable nature of the terrain, kept settlement in the area to a minimum.

The Civil War also slowed American settlement of the area; however, with the completion of the Southern Pacific Railroad in 1882, the vast, empty stretches of land in the Big Bend area became the province of cattlemen, who quickly claimed huge tracks of stock land. Previously unfenced and grazed only by migratory herds of native animals, the grasslands were quite rich, and within 20 years, ranchers from both sides of the Rio Grande were moving to the area, raising cattle and planting crops on the relatively fertile flood plain of the river. A few towns and communities began to thrive along the river and inland.

Permanent occupation of the land by cattle and goat ranchers brought significant changes to the Big Bend area. Ranchers actively hunted, trapped, and poisoned huge populations of predatory animals such as lions, bobcats, wolves, and bears. For some species, such as the Mexican Grey Wolf (now known only in captivity) and the desert Bighorn Sheep (unable to survive in the area

because of diseases borne by domestic livestock), these changes were permanent. As the balance of animal populations changed, so did the balance of plant species. Pastured animals disturbed soils and grazed vegetation in ways that free-roaming animals did not, resulting in soil erosion and an extreme reduction in grass cover. With the rest of the West, this region suffered through the severe droughts of the 1930s and the Great Depression (Sperling 1995).

MARATHON

Research staff made their first stop in Marathon, the town closest to the main headquarters and entrance to Big Bend National Park; it is the main “jumping off” point for visitors to the national park despite the fact that it is still a 40-mile drive to the entrance of the park, and an additional 30 miles before one reaches the park headquarters and visitors’ center at Panther Junction. The main campground at the Chisos Basin is an additional 10-mile drive from Panther Junction (the other major campground at Rio Grande Village is 24 miles from Panther Junction). Although Marathon is the closest gateway community to Big Bend National Park, it is still a significant distance from the park. This is partly the reason that traveling in this part of Texas is so arduous—the distances are vast, and there are very few places to stop on the way. Marathon and, by extension, Big Bend National Park, are therefore not places to which one would travel for a short vacation. Most travelers, however, if they are going to spend time in the park, usually spend only a night in Marathon, preferring to make their extended stays within the park.

The city of Marathon was founded in 1882 when the Southern Pacific Railroad laid rails through the area. Prior to the founding of Marathon, there were troops from Fort Stockton posted at a small military camp called Fort Pena Colorado. These troops were sent to protect the railroad and its personnel, as well as ranchers living in the area, from Indians. Troops were stationed there until 1893 when the post was abandoned and made into a county park.

The main attraction in Marathon is the Gage Hotel and, recently, the new collection of artists shops and other stores selling antiques and other collectibles. The Gage Hotel was opened in 1927 by Alfred Gage, who was a prosperous banker, businessman, and rancher who owned a 500,000 acre ranch right outside of Marathon. Mr. Gage had believed there were too few adequate accommodations in this important mining and ranching center of West Texas, so he built a hotel which also served as his business headquarters when he was away from his home in San Antonio. Alfred Gage died the year the hotel opened, and there were many attempts to make the building a museum. However, the once-busy hotel became neglected, and ownership of the property changed several times before being purchased in 1978 by J.P. and Mary Jon Bryan of Houston.

Research staff interviewed Ms. Julie Harrison, sales director of the Gage Hotel, about the role that the hotel and the community play in tourism in West Texas, and how the community perceives the future development of tourism as a tool for economic development. Ms. Harrison explained that the Gage Hotel (and the related community businesses, which were all owned in whole or in part by the Bryants) was in a unique position. The community of Marathon basically depends almost completely on business and revenues generated by Big Bend-related tourist traffic; very few people would make the trip out to Marathon “just” to stay at the Gage Hotel. She indicated that, surprisingly, the Gage Hotel would welcome competition from other businesses. The presence of other attractions and activities in the small town of Marathon could only serve to attract more people to the area and entice them to stay longer. Ms. Harrison also indicated that, like many of the towns in West Texas, she fields calls frequently from film companies wishing to find lodging for their crews while filming. This fills the limited number of hotel rooms in the area, forcing them often to turn away business; in this sense, said Harrison, increasing the number of hotels, and restaurants, would be welcome.

BIG BEND NATIONAL PARK

In 1933, the state of Texas established Texas Canyons State Park with 15 school sections owned by the state. Additional lands in the area that had been forfeited for non-payment of taxes were quickly added to the parcel and the name of the park was changed. By October 1933, the state park included approximately 160,000 acres. In 1935, President Franklin D. Roosevelt authorized the establishment of Big Bend National Park, but left it up to the state of Texas to acquire the land. On June 6, 1944, a deed for approximately 700,000 acres was presented to the President and six days later Big Bend National Park was officially declared open.

Today, Big Bend National Park is one of the most lightly visited and sparsely populated national parks in the National Parks System. The park today covers a little over 800,000 acres; in 1997, it had an estimated 308,246 visitors, significantly less than other national parks such as Yellowstone, Yosemite, and Grand Canyon. Part of the reason for this is the park's remoteness. There are only two access points into the park—one via Marathon through the main entrance of the park through the Visitors' Center at Panther Junction (70 miles one way), and the other through Study Butte, 25 miles one way from the Panther Junction Center. Although the drive from Study Butte is shorter than from Marathon, Study Butte itself, located on the far southwest corner of the park, is a fair distance from even Lajitas, known best as the place to hire outfitters for trips along the Rio Grande. More will be said about this later in this section. Table 6 shows some of the pertinent statistics of the park.

Table 6. 1997 Big Bend Facts

1997 Staffing	National Park Service	96 Permanent 59 Seasonal 179 Volunteers
	Big Bend Natural History Association	4 Permanent 1 Seasonal
	National Park Concessions, Inc.	60 Permanent 15 Seasonal
1997 Visitor Protection	Search and Rescue Operations	18
	Motor Vehicle Accidents	40
	Emergency Medical Incidents	71
	Fatalities	2
Campground Sites	Chisos Basin Campground	63 sites
	Cottonwood Campground	35 sites
	Rio Grande Village Campground	100 sites
	Rio Grande Village Trailer Park	25 sites
	Back country Campsites	116 sites
Lodging	Chisos Mountain Lodge	72 Rooms
Roads	Unpaved Roads	112 miles
	Improved Unpaved Roads	45 miles
	Primitive Unpaved Roads	112 miles
Trails	Improved + Primitive	200 miles
Elevations	Emory Peak	7825 ft.
	South Rim	7375 ft.
	Casa Grande	7325 ft.
	Chisos Basin	5400 ft.
	Panther Junction	3750 ft.
	Castolon	2169 ft.
	Rio Grande Village	1850 ft.
Wildlife Species	Amphibians	11 species
	Reptiles	56 species
	Fish	40 species
	Mammals	75 species
	Birds	450 species
International Borders	Shared International Border	118 miles
	Mexican States Bordering Park	Coahuila, Chihuahua
Major Resource Issues	Air Quality/Visibility	
	Rio Grande Water Quantity/Quality	
	Wildlife/Plant Poaching	
	Trespass of Livestock	

Source: Visitors' Information Center Pamphlet, Big Bend National Park

For those who make the trip to Big Bend National Park, many opportunities exist for hiking, rafting, birding, photography, and other pursuits, including exploring historic sites and scenic driving. Big Bend National Park is a laboratory of sorts for the study of desert environments and their flora and fauna, and also represents a rare opportunity for bi-national cooperation and research in the areas of preservation and the environment. While the land is operated by the U.S. National Parks Service, the park itself is influenced by a variety of factors outside of the direct control of the Park Service and, in many cases, outside the control of the United States.

One of the most pressing problems for the park is that the air quality of the region and within the park itself is the worst of any western national park. This is largely presumed to be caused by particulate matter flowing northward across the border on the prevailing northerly winds moving up from Mexico. The Rio Grande is also heavily used upstream, and pollutants flow into the park canyons and streams. At the time the research was conducted, the area was going through an extreme drought period; park personnel explained to researchers that they have not seen any real rain for over a year. One of the many consequences of this drought was that some of the animals that forage in the wilderness of the park, such as skunks, mountain lions, and bears, have been forced to forage in the park's many campgrounds in their search for food and water sources, where they often came into contact with humans. The risk of fire was also extremely high because of the drought, and campers were warned against open fires or the use of wood. These risk factors, water shortages, wildlife and plant poaching, and the encroachment of livestock into the park, result in extremely stressed environment.

Big Bend National Park however, despite its rural location, experienced a 7.5% increase in visitation in the first three months of 1997, compared to the same period in 1996, with a 4.6% increase in March (Spring Break month) alone. This points to the growing popularity of the destination. The additional number of visitors increases the need for proactivity in the

management of vehicular traffic to and within the park, of pedestrian traffic on trails, and finally of camping effects, including attendant resource use and destruction).

Transportation, Sustainable Development, and Tourism in Big Bend

Research staff took a multifaceted approach to exploring the interrelationship between transportation, tourism, and sustainable development in Big Bend National Park (this approach was repeated in Big Bend Ranch State Park). First, researchers drove their vehicle on a variety of park roads—paved, unpaved, and “jeep roads,” which are basically very rugged, unimproved rural paths on rough terrain. Research staff also attempted to experience the impact of other modes of access through the park, such as hiking/pedestrian activity, biking if applicable, camping, and the use of recreational vehicles (RVs). Lastly, research staff conducted a variety of interviews with park personnel.

AUTOMOBILE ACCESS WITHIN BIG BEND NATIONAL PARK

There are a variety of driveable trails in Big Bend National Park, but not all trails can accommodate all types of vehicles. For example, the main road into the park is a paved, two-lane road with shoulders up to Panther Junction, the main Visitor’s Center. At Panther Junction, the road remains two-lane, but the shoulders disappear and the speed limit decreases to a maximum of 45 mph. Continuing east from Panther Junction, the road crosses fairly flat terrain and can be used by all vehicles, particularly RVs heading to Rio Grande Village where hookups are available. Continuing south from the Visitor’s Center at Panther Junction with a destination of either the Chisos Mountain Lodge or the basin campgrounds, some vehicle restrictions do exist. The road south into the general Chisos basin area forks near the bottom, one direction moving toward the lodge and the other to the basin campgrounds. Although tour buses, cars/trucks with trailers and RVs can easily make it to the lodge, the road to the main campgrounds at the basin develops very sharp curves and extremely steep grades (>12%) and is not recommended for vehicles with trailers longer than 20 feet or RVs longer than 24 feet.

The national park has also developed the Ross Maxwell Scenic Drive. It is worth noting that care has been taken to provide a “Big Bend experience” to individuals who may choose not to hike or camp, or who would prefer to tour by car or bus. This kind of access is important to the visitor experience and even for the hiker/camper and can provide an excellent visual introduction to the character, topography, and terrain of the park.

HIKING/PEDESTRIAN ACCESS WITHIN BIG BEND NATIONAL PARK

The park provides a wide variety of trails for hikers, as well as campers interested in primitive camping. These range from developed trails with well-maintained paths and markers, to true wilderness trails. The park also provides a range of hike lengths, including some short trails that can be completed in a few hours or less, and hiking difficulty, including some very steep and strenuous trails that require advanced skills.

Research staff hiked along a variety of these trails to determine firsthand the impact of hikers and campers on the park environment. Naturally, where there are trails cut into mountains (such as switchbacks), the impacts on nature are easily seen, particularly patterns of erosion caused by hikers getting off the trail and cutting across the switchbacks. However, the signs on all the trails researchers took were clear and relatively unobtrusive, even the signs warning hikers not to stray off the trails. On most of the trails there are “primitive” campsite areas, meaning campsites where there are no sanitary facilities, benches, concrete slabs, or grills for preparing meals; there is also no water. Only rarely did the park provide “primitive” toilet facilities. The rule is, “pack it in and pack it out.” Park rangers generally agree that individuals who make the effort to access the park, then hike the arduous trails, are usually aware and protective of the environment. In the opinion of one of the park rangers, the park, due to its remoteness, tends to attract a more sensitive crowd than might be seen in other national parks where access and mobility are fairly easy. Many of the trails in Big Bend are not necessarily designed for families with young

children—many of the trails were made for serious hikers, campers, and wilderness enthusiasts. This, however, is most likely the consequence of the park's topography and ecology.

For example, research staff decided to hike two of the most popular trails in the park, one somewhat strenuous but relatively short (the Lost Mines trail, 4.8 miles round-trip), and one very strenuous and quite long (the South Rim Trail, 14 miles, recommended two-day hike). The Lost Mines Trail, which has its own self-guiding nature trail handbook that you can pick up at the trail head, begins at an elevation of 5,600 ft. and, in 2.4 miles, ends at 6,850 ft. (a net elevation gain of about 1,250 ft.). There were other people on the trail, and the informative booklet could be used to learn aspects of the trail along the way. The path was marked by small numbered indicators, corresponding to numbered paragraphs in the booklet. It was obviously well traveled, but also very well maintained, with a minimum of visible erosion and litter. There were, however, instances of graffiti, even etched into plants, that served as reminders that access does have its consequences.

The second trail, South Rim, is a lengthy trail covering parts of several shorter trails in the high Chisos Complex. These high country trails are some of the most attractive in the park, but also the most difficult. There are many primitive campsites along the route, and human impact at these campsites is clearly visible, though open fires are not allowed. The entire South Rim trail covers approximately 14 miles, covering a circular area, and is a recommended two-day hike (due to the limited time, research staff took one day). Hikers begin and end at the same point, the trail can be hiked in either direction, and it is not necessary to hike the entire loop. The trail rises (on the Laguana Meadow side, which is the less steep climb) from about 5,200 feet to 7,375 feet in just under 6 miles, with most of the 2,175 feet elevation gain within the first 3-4 miles. The trails are well marked, although a topographical map and compass are suggested due to the remote nature of the area. There were few other individuals on the trail, and those present seemed focused, many intending to camp at one of the back-country sites along the route. There

were definitely signs of erosion, but very little litter. There were postings at irregular intervals warning of mountain lions and bears in the area. It also appeared as though the campers were heeding serious warnings about the ban on open fires, and consequently, many had carried propane stoves with them.

THE EFFECT OF CAMPING

Back-country camping carries with it a different set of risks and environmental impacts than does camping on an official campground. The park must provide water, sewage treatment, and related infrastructure, such as bear-proof food cabinets, benches, and grills. In Big Bend, the basin campground is the most popular, despite the fact that, although there are toilets, there are no showers.

Research staff interviewed Park Ranger Gary Carver, Law Enforcement Division regarding his opinion on the issue of access versus preservation, as it related to the Big Bend. He indicated that he had hoped visitation levels would remain relatively low, in comparison to other national parks. He explained that both the remoteness of Big Bend, and the difficulty people experienced trying to reach it, would likely combine to stem the tide of visitors, at least for the time being. He did express concern over the drought situation in the park, and the very real possibility that, as had happened in 1980 when a fire, started in the back-country by careless campers, had raged out of control over hundreds of acres in the Chisos, these campgrounds would one day experience a fire.

In an area known for its periodic droughts and dry conditions, as well as for the sensitivity of its desert ecosystem, increased access over time might endanger the park and all its resources.

STUDY BUTTE, TERLINGUA, AND LAJITAS; THE RIVER ROAD (FM 170) AND FORT LEATON

Exiting Big Bend National Park via its west entrance, one drives through three small communities—Study Butte, Terlingua, and Lajitas, all located at the beginning of FM 170. This road is also known as “El Camino del Rio,” or The River Road, and is reportedly one of the most scenic drives in Texas, as well as throughout the United States.

FM 170 is a well-known scenic drive with a large historical component. The 100-mile long road is noted for its striking views of mountains and desert on one side, and river on the other, passing through diverse and unique geological formations, fossil finds, and remnants of some of the most violent volcanic eruptions in the history of the planet. The drive also takes the traveler through areas rich in history, and the remains of the many cultures that have populated, and continue to populate, the Big Bend region. This road also has one of the steepest grades in Texas; The Big Hill located 30.3 miles from Study Butte has grades in excess of 15° with tight curves at both approaches. Much of FM 170 passes through Big Bend Ranch State Park, and there are extensive stretches where the road moves through private land.

Prior to paving, the road was called “*Muerte del Burro*,” which translates into “Death of the Donkey.” When the new paved road was completed in 1961, the Texas Department of Transportation sponsored a contest for local school children to name the highway; the name that was chosen was *El Camino del Rio*, or The River Road. In June 1985, *National Geographic* called FM 170 perhaps “the prettiest drive in all America” (TPWD 1995).

Similar to the case study of the Hill Country, the travel experience along FM 170 is closely linked to the enjoyment of the tourism experience in the area. While in Big Bend National Park, research staff acquired a 50-page driving guide to the road from Study Butte to Presidio. The driving is organized by marker, which in this case corresponded to the mileage on an odometer.

Study Butte

Study (STEW-dy) Butte is the first small town located just outside the western entrance of Big Bend National Park. Some groceries, beverages, gasoline, and souvenirs can be purchased there, and there are a few small motels. It is easy to see that the town depends on tourists for its existence. Study Butte had its origins at the turn of the century with the establishment of a cinnabar mine to extract mercury; the town was named after the owner of the company that operated the mine, Will Study. The Study Butte mine was noted for its long-lasting productivity, yielding mercury long after the other mines in the area ran out. Altogether, over 500 tons of mercury were produced at Study Butte.

After WWII, the mercury market hit a record low, and all the mines in the area, including Study Butte, were closed. But in 1965, an all-time high for the price-per-flask of mercury was reached, and the Fresno and Study Butte mines were reopened. Study Butte was the last producing mine in Big Bend, closing in 1973.

Terlingua

The town of Terlingua was the hub of mercury mining in the Big Bend area; today it is the most famous ghost town in Texas, as well as a tourist attraction.

Major development of Terlingua began in 1903 with the incorporation of the largest mercury mining operation in the United States. The town of Terlingua was operated as one big “company store” until the mine closed in 1942 and the population of Terlingua dwindled. It currently has a handful of full-time residents, mostly employed as guides or in tourist services. The town became famous because of the Chili Cookoff that was held there annually. The ruins, the cemetery, and the abandoned mine shafts all still exist today.

Barton Warnock Environmental Education Center

A few miles before reaching Lajitas, travelers on FM 170 come upon the Barton Warnock Environmental Education Center, a museum and desert garden operated by the Texas Parks and Wildlife Department. There is a bookstore available for browsing, in addition to the exhibits and gardens.

Lajitas

Lajitas (la-HEE-tas) is the first town one reaches that is along the Rio Grande; from this point on, the road follows the contours of the landscape and the river. Lajitas has never actually been a “real” town, in that it has always been privately owned. Today, it is a resort (“Lajitas on the Rio Grande”) managed by the Mischer Corporation, headed by Walter Mischer, Sr., of Houston. The resort/town offers varied lodging, from the Badlands Hotel, a faithful replica of an Old West hotel, the Calvary Post Motel, the Officers’ Quarters, an exact replica of the original building in Fort Davis, or the Spanish-style La Cuesta Motel. There are condos, houses, and an RV park as well. The resort/town also has an airstrip for private planes. The permanent population of Lajitas is approximately 150, most of whom are involved in tourism.

Lajitas is the Spanish word for flagstone, a common material in the region due to a limestone deposit called the Boquillas Formation; the same limestone makes up the bed of the Rio Grande in the area, creating a flat ford that has been used as a natural crossing point on the Rio Grande for centuries. As such, there have been settlements in the area since the 18th century, and at least three have been called Lajitas. At the turn of the 20th century, however, the land that the present-day Lajitas is now on was purchased by H.W. McGuirk, who built a small settlement and church.

When the Mexican Revolution started around 1916, U.S. troops were sent to the U.S. border; one of the posts was placed in Lajitas and the town prospered. After the soldiers left, Lajitas settled

into a small trading community for both legal and illegal goods. The town eventually shrunk to a few occupants and the Trading Post; telephones and electricity did not arrive until the 1960s.

Interestingly, many of the buildings of the tourist resort, such as the church and the calvary post, were accurately restored; the rest of the resort/town was built to a Wild West motif to, among other things, attract movie companies. In fact, many movies, commercials, and television productions have been filmed there. One can find evidence of abandoned film sets all the way down FM 170, some so authentic looking they seem to be actual ruins. The film industry brings additional revenue to the region, though whether film industry personnel and the revenues they generate could be considered “tourism-based” is an interesting question.

Big Hill

Before FM 170 was created, the Big Hill blocked most overland passage between Presidio and Lajitas. Today, the road rises 451 feet on the westbound side (driving toward Presidio) and 362 feet on the opposite side. From the top of the rocks crag between the road and the canyon bottom, the Rio Grande has cut a gorge 560 feet deep. There are several parking areas on both sides the road to and from Big Hill so tourists can stop their cars, get out, and photograph the views.

Often in this part of Texas, scenic vistas and natural beauty not only attract tourists, who leave their own set of impacts, but also film crews. They, too, have left their mark on the landscape, and their access to scenes of natural beauty combined with their ability to change the landscape to fit the needs of filming has forever changed the Big Bend region, both positively and negatively.

Fort Leaton

There are a variety of scenic trails and campgrounds, as well as significant geological features, archaeological sites, and other, more recent, ruins on the stretch of FM 170 past Big Hill through Redford past Fort Leaton to Presidio. The ranger station that serves as the entrance station to Big Bend Ranch State Park (BBRSP) is located at Fort Leaton.

Fort Leaton was established in 1848 as a border trading post by former Indian bounty hunter Benjamin Leaton. The massive adobe fortress protected his family and employees from Indian raids. The fort was occupied by family until 1926; soon after it fell into ruins. In 1967, the ruins were donated to the state of Texas and placed under the jurisdiction of the TPWD for restoration as a state historic site. The site is still undergoing restoration, but there is a visitor's center there with materials about the site, and many events are held there, such as art shows and craft classes.

BIG BEND RANCH STATE PARK (BBRSP)

The building that houses the TPWD personnel responsible for registering and permitting visitors to BBRSP is adjacent to Fort Leaton. Research staff interviewed Ranger David Alloway, in which a variety of tourism issues were discussed, mostly concerning issues of access and the role of tour providers. In addition to his regular duties, David also teaches a desert survival course at BBRSP, and has written several books on the area. Mr. Alloway's tour of BBRSP is also on the Internet.

The trip to the Big House covers approximately 30 miles of dirt road. In the main area of the park, there is a small Visitor's Center (with showers for those who may be camping in the primitive back-country sites), the Big House, the ranch foreman's house, the quarters for TPWD personnel who work on the ranch, and the Saucedo Lodge, a hunting lodge built in the 1960s that accommodates 30 in a segregated dormitory style (meals are available through private arrangement). The Big House contains three bedrooms with fireplaces and accommodates eight

persons. There is a huge living room with a fireplace and a dining room; meals can be taken in the Saucedo Lodge or made (by guest with their own provisions) in the kitchen which is fully stocked with plates, pans, utensils, glasses, etc.

BRIEF HISTORY

An understanding of the park's history is crucial when studying the many issues facing tourism, transportation, and economic development/access. BBRSP is, at 300,000 acres, the largest state park in Texas. Previous to its purchase by TPWD, BBRSP was a working ranch that also contained records of human occupation dating back almost 11,000 years.

The first ranchers in the area were Spanish settlers whose ranching efforts were limited by water. Modest herds of sheep, goats, and cattle were kept close to reliable water sources. In the early 1900's, ranching became the main economic force in the region; by 1909, the three Bogel brothers accumulated the land which would become the Saucedo ranch. The Bogels lived in the Big House, which still exists and accepts visitors for overnight stays. However, the severe droughts of the 1930s combined with the effects of the depression forced the sale of the Saucedo ranch in 1935.

The next owners, the Fowlkes, continued consolidation by purchasing neighboring ranches. Eventually the Fowlkes brothers accumulated over 300,000 acres that they called Big Bend Ranch. However, drought took its toll once again and the ranch was sold again in the mid-1950s. A Texas oilman then bought the property and subsequently sold it to an electrical engineer from Massachusetts who used the ranch as a corporate retreat. However, he died only six months after moving to the area. In 1961, Big Bend Ranch was purchased from the engineer's estate and then subsequently sold to the state of Texas in 1988, with TPWD purchasing 210,000 acres for \$8.8 million. Since that time, additional land has been purchased from the Texas General Land Office and private individuals. BBRSP alone accounts for over 50% of state park lands in Texas.

BBRSP is located in the Chihuahuan desert and contains flora and fauna typical of this type of southwestern desert. There are numerous enclaves for springs and waterfalls, and a variety of unique geological and archaeological attractions. BBRSP comprises some of the most rugged and remote terrain in the Southwest.

PUBLIC ACCESS

At this time there is truly very little development in the park outside the Saucedá (Big House/Lodge) area, and certain areas of the park have limited recreational use and vehicular access. Vehicular repair service is extremely limited, there is no medical care facility in or near the park, and there is no cell phone service within the park.

- ▶ **Vehicular Access**—vehicular access in the park is limited. Traffic into the park interior is along a 35-mile, fairly well-maintained gravel road. There are also several miles of 4-wheel-drive (or “Jeep”) trails. These trails are VERY rough, and warnings against access by motor homes and RVs should be heeded. In fact, many of the Jeep roads themselves are barely trails and are infrequently maintained. In addition, many of these gravel, rock-filled trails have grades exceeding 12°, are narrow with steep drop-offs, and are washed out, or eroded, in many places. However, FM 170 does run through parts of the park along the river. Although permits are necessary for hikes and drives on these trails that lead off of FM 170, there are quite a few park resources (almost 30 miles of hiking and biking trails) accessible from trailheads along this road. In addition, several hiking trails in the park are accessible from the park entrance road.

► **Recreational Activities:**

- **Camping**—There are two camping areas accessible along FM 170, with composting toilets only; there are no other facilities, electrical hookups, water, or dump stations. There are 10 back-country primitive campsites within the park itself; these campgrounds are accessible to high-clearance vehicles only. Permits must be secured.
- **Backpacking**—There is a 19-mile loop trail for serious backpackers with designated campsites; all water must be carried in, waste carried out, and no open fires allowed.
- **Day Hiking**—There are several short trails along FM 170 and also within the park, but they are not all well marked, and may be moderately strenuous. Even for these hikes it is recommended that hikers bring along topographical maps, a compass, and water.
- **Rafting/Canoeing**—Opportunities abound along the Rio Grande, but you must bring your own equipment or hire an outfitter in Study Butte, Lajitas, or Terlingua. Permits must be secured.
- **Tours and Special Events**—All-day interpretive bus tours, led by a naturalist, are scheduled for the first and third weekends of each month, departing from Fort Leaton and the Barton Warnock Center. Periodic educational seminars and workshops are held on varying aspects of the cultural and natural resources of the park. Several times a year the park staff moves the Texas Longhorn cattle between pastures, since BBRSP is still a working ranch.

DEVELOPMENT ISSUES IN AND AROUND THE PARK

BBRSP is a remote and rugged area, with limited facilities. The park is itself a very fragile environment, not only because of its unique geology, but also because of its archaeological significance and sensitivity. Hundreds of years of ranching have taken their toll on the land here,

not only with respect to vegetation and erosion caused by the movement of cattle herds, but also with respect to the destruction and disturbance of archaeological finds. Research staff interviewed Mr. J. David Ing, cultural resource specialist/archaeologist with the TPWD, Region 1, Public Lands Division (Fort Davis), who spends a significant portion of his time in the park investigating archaeological resources and sites. His feeling was that TPWD has only brushed the surface of the archaeological resources in the park, and that if campers, hikers, and vehicles were allowed expanded access into the park's largely unexplored interior, many of these resources would be destroyed, degraded, vandalized, or lost. He cited an example of ranchers from the area donating entire collections of arrowheads and other artifacts collected from the area to the state. However, the removal of these artifacts away from their geographical context destroys their archaeological significance and value. They can no longer be interpreted or accurately dated and the areas in which they were found are now unknown, making identification of other significant items that may have been in or around the area virtually impossible to find. Mr. Ing indicated that BBRSP likely still has many of these artifacts laying about in unidentified areas. By allowing people and vehicles into these areas, many of the resources may be lost or destroyed.

He also indicated that he would want to discourage the paving of the dirt-and-gravel road that leads into the park because this would further increase the vehicular traffic in and around the park. In addition, keeping the road in its present state enhances the aesthetics of the ranch, preserving its character and solitary, remote feeling. He indicated that TxDOT was supportive of these efforts to keep the road unpaved, and that TxDOT had an excellent relationship with the BBRSP/TPWD personnel in the area, particularly with respect to maintenance activities which may involve areas adjacent to sites of archaeological significance.

Some of the other issues Mr. Ing brought up arise from the vastness of the land that comprises the park, and the fact that within and without the park there exist working ranches. Some

ranchers carelessly allow their cattle to wander inside park boundaries, trampling vegetation and degrading/eroding the soil and other resources, already in a sensitive state because of the prolonged drought in the area.

Mr. David Alloway, the exhibit technician/naturalist for the ranch, echoed many of these concerns. His first point was that water was an extremely limiting factor in the area, and water scarcity, combined with drought, reduced the capacity of the area to handle tourists and tourist services, such as hotels and resorts. Yet the area, he said, was popular for movie productions—this has also hurt tourism because the movie personnel take up the scarce hotel rooms, but do not contribute much to the economy, preferring only to pay for a limited amount of food and very little entertainment. He added that the “bus crowd” that comes into the area twice a month to take the tour of BBRSP does not spend much money either—they “buy postcards,” but not much else. However, he also stated that the people who come all the way to BBRSP are generally very environmentally respectful and aware.

CONCLUSIONS AND RECOMMENDATIONS

This is an interesting development not because of what it says about the limits of a rural community trying to provide services and resources for increasing numbers of people. Which tourism development must come first—increasing numbers of people to justify building more infrastructure, or creating more infrastructure to accommodate more people? When asked whether the community was worried about becoming “overrun” with tourists or losing its character to chain hotels and fast food shops, Harrison said no, mostly because the location was too remote, and there were too few people to support such growth. Also, echoing a sentiment heard many times during interviews, water was a limiting resource. Despite all good intentions, lack of water for hotels, restaurants, landscaping, and other uses effectively limits the amount of development that is possible in the community (Interview, Harrison).

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APPENDIX A: HILL COUNTRY WINDSHIELD SURVEY

The Hill Country inventory conducted for this report documents environmental characteristics and visual qualities of the U.S. 290 and Ranch Road 965 road corridors as sample studies for the region. A third sample survey was done on FM 1431, between Lake Buchanan and Round Rock, a back-road drive through typical rural Hill country communities. Site-specific roadside conditions, landscape features, and other elements that affect visual character and general environmental quality, were documented for evaluation in terms of their significance to, and the interrelationship between, tourism, transportation, and economic development, within the region.

Basis of Evaluation

To the tourist traveling on a road, the major source of information, experience, and aesthetic pleasure results from the view of the landscape from the road. The sequence of visual images along road corridors and the visual information obtained from the landscape influences the traveler's perception of the total environment of the corridor. Road corridors are important visual resources to communities and the tourist destinations they serve, and it is important that such visual experience is classified and evaluated as part of the tourism resource endowment (Copps 1996).

For the driver on the road, what is seen is also used in way-finding from one place to another. This becomes the image of the region and a major source of pleasure. Pleasure driving along scenic routes is a favored activity of the American traveler, which implies that the "view from the road" is an important determinant of both visual and physical quality of road travel experience. The journey to and from a tourist destination is therefore an important component of the total tourist experience. This further indicates an assessment of the physical and visual quality of road corridors to and within destinations as a crucial element in a tourist resource inventory (U.S. DOT 1991).

Visual Quality Assessment

Visual quality is an evaluative appraisal of the relative excellence of a view, or a sequence of views that make up the visual resources of an area. There is not a single, comprehensive approach to evaluating visual quality of a landscape, as aesthetics are inherently subjective, and interpretation of a visual experience can differ from one observer to another. While individual judgments of quality differ among people, yielding varied subjective interpretations, broad consensus can usually be established on the relative quality of different landscapes observed within the same region. One of the most pragmatic approaches to visual quality assessment is to base the evaluation on such generalization or public judgment. The evaluative method used in this study recognizes that Americans are generally in agreement on the high visual quality of many landscapes, defining what may be considered proof of high visual quality, and what is not. Parks, scenic rivers, and mountains, for example, are generally considered high-value visual resources (U.S. DOT 1981).

Another approach to visual quality evaluation is the definition of quality indicators based on the level of visual relationships between landscape components rather than the level of the components themselves. Evaluative criteria used in this sense include vividness, intactness, and unity, the presence of which are collectively indicative of high visual quality and vice versa:

Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns... *Intactness* is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements... *Unity* is the visual coherence and compositional harmony of the landscape considered as a whole...(U.S. DOT 1981).

Based on these relationships, evaluative appraisals of visual quality can be conducted on landscapes within the same region. Incompatible building structures, for example, are generally considered low visual quality elements in the landscape, but in relation to other elements in the town scape. The definition of visual components for this study focuses, in part, on the relational approach to evaluating visual quality and on the general interpretation of beauty in the landscape.

Roadway Characteristics, Mode of Travel, and Physical Travel Experience

The other crucial component of tourist experience considered in this study is the relationship between mode of travel and the physical experience. Visitor experience, as mentioned earlier, is the key product of the tourism industry, and if the visitor must use a mode of transport to get to a destination, then the experience using this mode is a crucial variable in the success or failure of the product. This implies that ease of travel between destination points, comfort, and safety are as much key factors in tourist/traveler experience as the scenic qualities of the environment traveled in. For many communities, and especially those that rely heavily on tourism for economic development, this experience may be the line between a successful program, or sustainable economy, and failure. Landscape elements and attributes such as road quality, signage, traffic control devices, roadside rest facilities, and other amenities that enhance safety and comfort in road travel, are just as important to travel experience, as visual elements, although some of these may not be visually pleasing. The evaluation of road corridor elements in the study is based on subjective judgment of aesthetics and assessment of functional elements in the road corridors, which formed the basis for defining landscape components for the survey.

Definition of Survey Components

The method of assessing landscape quality in this study is based on a general definition of landscape components in terms of their potential to:

- ▶ enhance visual quality and promote safe, and comfortable travel experiences, in which case they are defined as positive components; or
- ▶ impair visual quality and physical travel experience, in which case they are classified as negative components.

Positive Landscape Components

Positive landscape components identified for the study are grouped into five categories in the scenic evaluation forms. These are:

- ▶ *Water and land form features* such as lakes, ponds, creeks, rivers, wetlands, rock outcrops, and hills/mountains.
- ▶ *Landscape composition effects* such as panoramas, framed views, and other dramatic scenic effects.
- ▶ *Vegetation* such as agricultural patterns, forest patterns and edges, woodland/trees, wildflower, and public parks.
- ▶ *Man-made structures* such as unique buildings, historic structures, hotel/motels, and special fence construction.
- ▶ *Roadway characteristics* such as conformance to topography, nature of surface, tourist signage, traffic control devices, and safety signals.

Negative Landscape Components and Blight

The negative components identified for the study collectively define conditions of blight in the landscape. “Blight” as defined in *Webster’s Third International Dictionary*, refers to something that impairs, or destroys. Used in reference to cities or townscapes, it generally implies a condition or influence that lowers real estate values, or the state resulting from such condition, such as congested, decaying areas of cities characterized by abandoned and dilapidated buildings or structures. Although difficult to define, there is a general agreement that blighted areas are negative visual elements in a town scape, and that blight is an initial indicator of decay, which results in degeneration or deterioration into slums, when unchecked.

Much research on the subject of blight is concentrated on its economic impacts on a city or neighborhood, and mostly on housing issues. The most obvious indicators of blight identified in these studies include litter accumulating in streets; abandoned buildings; unkempt yards and sidewalks; decaying public buildings and deteriorating residential property—qualities that ultimately reduce real estate values and reinforce the cycle of deterioration and neglect. Much as

the term has been associated more with large urban centers, it is important to note that “blight” is a malady of both urban, and rural centers. Blighted areas are found in small cities and villages as well as large metropolitan centers (Krumm and Vaughan 1976).

While blight is mostly associated with old rundown sections of cities, the term is also used to describe conditions of visual degradation resulting from unplanned urban fringe or town edge development. Rapid expansion of cities, where effective land use planning and zoning regulations are not in place to check sprawl, often leads to unwise land development with resulting visual and physical degradation at the fringes of the city. Typically, such unregulated growth is concentrated along major thoroughfares in commercial strip developments, with unsightly service facilities such as gas stations, fast-food restaurants, and other convenience facilities. This haphazard concentration of low order commercial development results in negative effects on visual intactness and unity, which substantially reduces visual quality in the landscape and ultimately leads to physical degradation of the environment. The Hill Country is known for its generally well-maintained, small towns that are currently attracting tourists, and retirees. The kind of blight most likely to be prevalent in the region will be of this second type.

For the purposes of this study, “blight” is used for any condition that potentially interferes with or impairs the traveler’s visual experience of the landscape, in essence, reducing visual quality. An attempt is made to differentiate between blight resulting from physical/natural landscape scars, and that resulting from man-built elements, which are specified as “urban blight,” as in the incidences of unsightly commercial fringe developments. These are manifestations of growth pressures and resultant sprawl or unplanned growth of towns in the region. These may be necessary developments to meet the needs of the communities and tourists alike but the way in which they are developed seems to be haphazard in nature. Such conditions are grouped into the following negative components as laid out in the survey form:

- ▶ *Landscape scars* from causes such as erosion, gravel/sand/stone mining, fire damage, flood damage, plant or tree disease, and utility lines/corridor/substation.

- ▶ *Structures*, notably strip development, incompatible buildings, fences, dilapidated structures, gas stations, junkyards etc.
- ▶ *Miscellaneous* elements such as litter, graffiti, traffic congestion, potholes, pollution, and obtrusive signage.

Documentation and Method of Assessment

Field entries were tallied for all landscape components and aggregated in 10-mile segments. Figure A-1 is an example of the field survey form used in the windshield survey. A score of “10” is the maximum for a component, per road segment, which means that the particular landscape component is visible in all 10 mile stretches of the segment. In those cases where a component was not visible in the stretch of road corridor, the corresponding cell was left blank on the survey forms. A blank cell in the summary evaluation forms implies that the particular component does not exist, or is not visible in the entire 10-mile road segment. For the purposes of evaluation, these criteria would be ranked by subjective assessment at three levels of significance of *high*, *medium*, and *low/none*. A high ranking is assessed to a corridor where there is judged to be a large concentration of visible landscape components and a low/none assessment is used for conditions where the observed landscape components are either insignificant or nonexistent.

Analysis

As shown in Figures A-2, A-3, and A-4, the field data for the three sample corridors is aggregated into 10-mile corridor segments for the sample roads. The general guidelines for analysis are developed as a set of evaluation criteria from a classification of the various landscape components observed in the survey. This classification is based on the two main requirements of *scenic value* or *visual quality* (perceptual experience) of the road corridors and the *physical travel experience*. From these, three sets of criteria were developed for the positive components and two sets for the negative. The positive indicators identified for the analysis are:

SCENIC ROAD EVALUATION FORM

SURVEY CODE: _____
 Visible Component
 Component in ROW
 Screened by Vegetation

County _____ Town _____
 Road _____ Road Segment _____
 Weather _____
 Direction _____ Time of Day _____
 Team Member _____

Positive Subtotal	_____
Negative Subtotal	_____
Total Scenic Elements	_____

POSITIVE COMPONENTS:

- A. Water & Landform Features**
- Lake, Pond, Marsh or Wetland
 - River, Creek or Brook
 - Waterfall
 - Cliff, Boulder or Rock Outcrop
 - Hill or Mountain
 - Other, or special regional feature

- B. Landscape Composition or Effects**
- Enframed, Enclosed or Valley View
 - Panoramic or Distant View
 - Ephemeral Effect (sun, mist, reflection)
 - Seasonal Effect (ice, foliage)
 - Other natural effect

- C. Vegetation**
- National, state, city or town park
 - Agricultural pattern (orchard, contour plowing)
 - Field/forest edge
 - Woodland/tree pattern (species mix, hedgerow)
 - Mass of wildflowers, grasses or ferns
 - Other, or special regional feature

- D. Structures**
- Picturesque farm/ranch or unusual building
 - Historic structure or archaeological site
 - National/state park
 - Stone wall or wooden fence
 - Distant village or village edge
 - Historic inn or B&B
 - Hotel/motel
 - RV park/campground
 - Picnic areas/scenic overlooks
 - Historical/cultural sites (missions, homes)
 - Other

- E. Road Characteristics**
- Road conforming to landscape
 - Unique road pattern (brick, gravel, cobblestone)
 - Rustic drainage mechanism
 - Safety signage (flood gauge, speed, grade)
 - Tourist signage (direction)
 - Shoulder for passing?
 - More than two lanes?
 - Smooth, new uncracked pavement
 - Recently painted lines
 - Reflectors in road
 - Traffic Control Devices
 - Cattle Grates
 - Other

- A. Landscape Scars**
- Erosion
 - Gravel/sand/limestone mining
 - Utility line, corridor or substation
 - Fire damage, flood damage
 - Blight/plant or tree disease
 - Other

- B. Structures**
- Slip development
 - Incompatible bldg, town (style, mtrl, lot size)
 - Incompatible rural bldg (non-farm, non-residential)
 - Incompatible fence, wall, etc (scale, style, mtrl)
 - Dilapidated structure
 - Gas Station/auto repair shop
 - Outdoor auto sales or lg. pkg. lot
 - Junkyard or landfill
 - Residences unkempt (trash, cars, equip outside)
 - Storage tanks
 - Souvenir shops or other "inappropriate" retail
 - Warehouses, storage

- C. Other**
- Litter, graffiti
 - Heavy traffic/congestion
 - Potholes or poor road condition
 - Pollution (air, ground, water)
 - Structure(s) blocking view
 - Obtrusive signage (size, number, distracting)
 - Confusing or lack of signage
 - Other

NEGATIVE COMPONENTS

TOTAL NEGATIVE CHARACTERISTICS

REMARKS

- A. Water & Landform Features**
- Lake, Pond, Marsh or Wetland
 - River, Creek or Brook
 - Waterfall
 - Cliff, Boulder or Rock Outcrop
 - Hill or Mountain
 - Other, or special regional feature

- B. Landscape Composition or Effects**
- Enframed, Enclosed or Valley View
 - Panoramic or Distant View
 - Ephemeral Effect (sun, mist, reflection)
 - Seasonal Effect (ice, foliage)
 - Other natural effect

- C. Vegetation**
- National, state, city or town park
 - Agricultural pattern (orchard, contour plowing)
 - Field/forest edge
 - Woodland/tree pattern (species mix, hedgerow)
 - Mass of wildflowers, grasses or ferns
 - Other, or special regional feature

- D. Structures**
- Picturesque farm/ranch or unusual building
 - Historic structure or archaeological site
 - National/state park
 - Stone wall or wooden fence
 - Distant village or village edge
 - Historic inn or B&B
 - Hotel/motel
 - RV park/campground
 - Picnic areas/scenic overlooks
 - Historical/cultural sites (missions, homes)
 - Other

- E. Road Characteristics**
- Road conforming to landscape
 - Unique road pattern (brick, gravel, cobblestone)
 - Rustic drainage mechanism
 - Safety signage (flood gauge, speed, grade)
 - Tourist signage (direction)
 - Shoulder for passing?
 - More than two lanes?
 - Smooth, new uncracked pavement
 - Recently painted lines
 - Reflectors in road
 - Traffic Control Devices
 - Cattle Grates
 - Other

TOTAL POSITIVE CHARACTERISTICS

TOTAL POSITIVE CHARACTERISTICS

Figure A-1. Scenic Road Evaluation Form

SCENIC ROAD EVALUATION FORM - SUMMARY **AUSTIN - FREDERICKSBURG**

Positive Subtotal	615
Less Negative Subtotal	389
Total Scenic Elements	226

County TRAVIS, HAYS, BLANCO & GILLESPIE Town _____
 Road US-290 CORRIDOR Road Segment _____
 Weather _____
 Direction _____ Time of Day _____
 Team Member MARCIA PINCUS
CLIFFORD PERRY

- SURVEY CODE:**
- Visible Component
 - Component in ROW
 - Screened by Vegetation

POSITIVE COMPONENTS:

	TEN-MILE CORRIDOR SEGMENTS										TOTAL POSITIVE CHARACTERISTICS
	0	1	2	3	4	5	6	7	8	9	
A. Water & Landform Features											
1. Lake, Pond, Marsh or Wetland											
2. River, Creek or Brook											
3. Waterfall											
4. Cliff, Boulder or Rock Outcrop											
5. Hill or Mountain											
6. Other, or special regional feature											
B. Landscape Composition or Effects											
1. Enframed, Enclosed or Valley View											
2. Panoramic or Distant View											
3. Ephemeral Effect (sun, mist, reflection)											
4. Seasonal Effect (ice, foliage)											
5. Other natural effect											
C. Vegetation											
1. National, state, city or town park											
2. Agricultural pattern (orchard, contour plowing)											
3. Field/forest edge											
4. Woodland/tree pattern (species mix, hedgerow)											
5. Mass of wildflowers, grasses or ferns											
6. Other, or special regional feature											
D. Structures											
1. Picturesque farm/ranch or unusual building											
2. Historic structure or archaeological site											
3. National/state park											
4. Stone wall or wooden fence											
5. Distant village or village edge											
6. Historic inn or B&B											
7. Hotel/motel											
8. RV park/campground											
9. Picnic areas/scenic overlooks											
10. Historical/cultural sites (missions, homes)											
11. Other											
E. Road Characteristics											
1. Road conforming to landscape											
2. Unique road pattern (brick, gravel, cobblestone)											
3. Rustic drainage mechanism											
4. Safety signage (flood gauge, speed, grade)											
5. Tourist signage (direction)											
6. Shoulder for passing?											
7. More than two lanes?											
8. Smooth, new uncracked pavement											
9. Recently painted lines											
10. Reflectors in road											
11. Traffic Control Devices											
12. Cattle Gates											
13. Other											
TOTAL POSITIVE CHARACTERISTICS	615	97	83	100	92	76	65	56			

NEGATIVE COMPONENTS:

	TEN-MILE CORRIDOR SEGMENTS										TOTAL NEGATIVE CHARACTERISTICS
	0	1	2	3	4	5	6	7	8	9	
A. Landscape Scars											
1. Erosion											
2. Gravel/sand/limestone mining											
3. Utility line, corridor or substation											
4. Fire damage, flood damage											
5. Blight/plant or tree disease											
6. Other											
B. Structures											
1. Strip development											
2. Incompatible bldg, town (style, mtrl, lot size)											
3. Incompatible rural bldg (non-farm, non-residential)											
4. Incompatible fence, wall, etc (scale, style, mtrl)											
5. Dilapidated structure											
6. Gas Station/auto repair shop											
7. Outdoor auto sales or fig. pkg. lot											
8. Junkyard or landfill											
9. Residences unkempt (trash, cars, equip outside)											
10. Storage tanks											
11. Souvenir shops or other "inappropriate" retail											
12. Warehouses, storage											
C. Other											
1. Litter, graffiti											
2. Heavy traffic/congestion											
3. Potholes or poor road condition											
4. Pollution (air, ground, water)											
5. Structure(s) blocking view											
6. Obtrusive signage (size, number, distracting)											
7. Confusing or lack of signage											
8. Other											
TOTAL NEGATIVE CHARACTERISTICS	389	131	21	57	6	66	21	21	66		

REMARKS:

Figure A-2. Scenic Road Evaluation Form - Summary, Austin-Fredericksburg

SCENIC ROAD EVALUATION FORM - SUMMARY LAKE BUCHANAN - ROUNDROCK

Positive Subtotal	782
Less Negative Subtotal	456
Total Scenic Elements	326

County LLANO, BURNETT, TRAVIS, WILLIAMSON Town _____
 Road FARM ROAD 1431 CORRIDOR Road Segment _____
 Weather _____
 Direction _____ Time of Day _____
 Team Member MARCIA PINCUS
CLIFFORD PERRY

- SURVEY CODE**
- Visible Component
 - Component in ROW
 - Screened by Vegetation

POSITIVE COMPONENTS:

- A. Water & Landform Features**
- Lake, Pond, Marsh or Wetland
 - River, Creek or Brook
 - Waterfall
 - Cliff, Boulder or Rock Outcrop
 - Hill or Mountain
 - Other, or special regional feature
- B. Landscape Composition or Effects**
- Enclosed or Valley View
 - Panoramic or Distant View
 - Ephemeral Effect (sun, mist, reflection)
 - Seasonal Effect (ice, foliage)
 - Other natural effect
- C. Vegetation**
- National, state, city or town park
 - Agricultural pattern (orchard, contour plowing)
 - Field/forest edge
 - Woodland/tree pattern (species mix, hedgerow)
 - Mass of wildflowers, grasses or ferns
 - Other, or special regional feature
- D. Structures**
- Picturesque farm/ranch or unusual building
 - Historic structure or archaeological site
 - National/state park
 - Stone wall or wooden fence
 - Distant village or village edge
 - Historic inn or B&B
 - Hotel/motel
 - RV park/campground
 - Picnic areas/scenic overlooks
 - Historical/cultural sites (missions, homes)
 - Other

TEN-MILE CORRIDOR SEGMENTS

	0	1	2	3	4	5	6	7	8	9
0	0	15	0	0	45	54	1	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
TOTAL	0	15	0	0	45	54	1	0	0	0

NEGATIVE COMPONENTS

- A. Landscape Scars**
- Erosion
 - Gravel/sand/limestone mining
 - Utility line, corridor or substation
 - Fire damage, flood damage
 - Blight/plant or tree disease
 - Other
- B. Structures**
- Strip development
 - Incompatible bldg, town (style, mtd, lot size)
 - Incompatible rural bldg (non-farm, non-residential)
 - Incompatible fence, wall, etc (scale, style, mtd)
 - Dilapidated structure
 - Gas Station/auto repair shop
 - Outdoor auto sales or lg. pkg. lot
 - Junkyard or landfill
 - Residences unkempt (trash, cars, equip outside)
 - Storage tanks
 - Souvenir shops or other "inappropriate" retail
 - Warehouses, storage
- C. Other**
- Litter, graffiti
 - Heavy traffic/congestion
 - Potholes or poor road condition
 - Pollution (air, ground, water)
 - Structure(s) blocking view
 - Obtrusive signage (size, number, distracting)
 - Confusing or lack of signage
 - Other

	0	1	2	3	4	5	6	7	8	9
0	25	9	54	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
TOTAL	25	9	54	0	0	0	0	0	0	0

TOTAL NEGATIVE CHARACTERISTICS

99	85	36	17	84	114	21				
----	----	----	----	----	-----	----	--	--	--	--

REMARKS

REMARKS

TOTAL POSITIVE CHARACTERISTICS

	0	1	10	10	10	10	10	10	10	10
0	51	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
TOTAL	51	0	0	0	0	0	0	0	0	0

TOTAL POSITIVE CHARACTERISTICS

83	93	115	162	119	141	69				
----	----	-----	-----	-----	-----	----	--	--	--	--

Figure A-3. Scenic Road Evaluation Form - Summary, Round Rock

- ▶ ***Scenic Value***, which evaluates the road in terms of roadway condition, scenic views, and general visual characteristics. It is a valuation of the visual resources through consensus and general preferences to define scenic quality or aesthetic value of the landscape. Indicators of scenic value will include the level of such components as conformance of roadway to landscape, landscape composition effects, water and land form features, and other elements that enhance visual quality.
- ▶ ***Historic Significance***, which evaluates the road in terms of its historic value, and presence of adjacent historic structures, and other features.
- ▶ ***Road Travel Experience***, which evaluates the road in terms of complementary facilities or functional elements, such as nature of road surface, safety signals, traffic control devices, shoulders and other road amenities, that make the driving adventure more pleasurable.

The negative indicators were grouped into:

- ▶ ***Visual Blight/Vulnerability and Threats to Scenic Integrity***, which assesses the degree of incidence of blight, or the potential from land development. Indicators of this are the degree to which a roadway is free from intrusive development, power lines, obtrusive signage, and other features that would adversely affect visual quality of the corridor.
- ▶ ***Road Travel Experience*** assesses those elements that interfere with actual driving experience, such as presence of potholes in the road and confusing signage.

A. U.S. 290 CORRIDOR: Austin - Fredericksburg

As evidenced in the distribution and concentration of positive landscape components (see Table A-2), the U.S. 290 corridor, between Austin and Fredericksburg, abounds in visual resources that form a strong tourism resource base for the region. However, the characteristic pattern of urban blight in the corridor gives credence to the observation that growth pressures, spawned by the tourism industry and related economic activity, may be having a negative impact on the physical environment of the communities in the region. A notable pattern of development in the corridor that supports this observation is the fact that nearly all commercial development in the corridor is transit, hospitality, or tourism related. Most of these developments are also small-scale facilities, prominent among which are antique shops and other souvenir dealerships concentrated along major roads. The unregulated development of such facilities is the main source of blight in the corridor.

Another observation is that the incidence of blight is somewhat proportional to the size of the settlements, which is also related to the rate at which the settlements are growing. This is exemplified in the high intensity of blight observed in Segments 0, 2, 4, and 7, due to the influence of Austin, Dripping Springs, Johnson City, and Fredericksburg, respectively.

Key inferences that can be drawn from the above include the following:

- ▶ Tourism and related activities contribute to the degradation of the physical environment and visual resources in the corridor.
- ▶ The occurrence of blight in the corridor suggests that cities and communities in the corridor either do not have growth management regulations in place to check urban sprawl, or are not effectively enforcing the zoning and land use regulations that they currently have.
- ▶ Rapid growth rates will ultimately reduce quality of life in the corridor, and its attraction to tourists, through direct environmental degradation, and traffic congestion, as is already being experienced in Fredericksburg.

- ▶ Tourism and transportation development in the corridor is obviously carried out in piecemeal programs by key stakeholders. There is no record of, or attempt for, a regional strategy for development in the corridor.

B. RANCH ROAD 965 CORRIDOR: Fredericksburg-Enchanted Rock National Park

The RM 965 corridor has a high concentration of visual elements (see Table A-3) that make it the most scenic drive in the study area in terms of natural visual resources. It provides visual and physical access to major natural attractions of Fredericksburg and the Hill Country, such as Cross Mountain, Bear Mountain and Balanced Rock, and most of all, the legendary Enchanted Rock State Natural Area, which ranks it high on historic significance as well.

This corridor illustrates the rugged beauty of the Hill Country, with the road winding through the mountains and valleys, conforming closely to the terrain, and creating exciting views throughout the entire drive. Travel safety and comfort also seem to be well planned, allowing for a more dramatic and pleasurable driving experience through the corridor.

In contrast to the U.S. 290 corridor, this corridor is a countryside drive, without towns for the most part. The problem of blight is minimal and limited to visual encroachment from clusters of utility lines and a few cases of erosion/natural landscape scars. The significance of the corridor is rooted in its natural, historical, and rural character. In this sense it differs from the U.S. 290 corridor, which has more of a town scape and urban feel. The main inferences from this analysis include the following:

- ▶ The key values of this corridor are its spectacular vistas, historic sites, and rural character, which can be compromised when the use of the corridor and its resources is not well managed, or regulated.
- ▶ The main threat of degradation in this corridor is not so much an issue of urban blight, as in the U.S. 290 corridor. Rather, it is one of overuse of resources. With increasing tourist traffic to Fredericksburg and the Enchanted Rock Park, the potential exists for congestion on the road as well as overcrowding at the park.
- ▶ Regulations are being enforced at Enchanted Rock Park to control tourist activity by limiting the number of daily visitors to protect the cultural and natural resources. Quotas are now observed so that the park is temporarily closed for the day when it reaches capacity during peak periods such as weekends, holidays, and spring break.

However, traffic congestion at the entrance to the park is already becoming a problem during peak visit times. The park is also experiencing erosion problems, soil compaction, and tree loss due to root exposure caused by the large numbers of visitors it attracts.

- ▶ Protecting the visual resources and preserving the rural character of the corridor is therefore essential for sustainable tourism development in the corridor.

C. FARM ROAD 1431 CORRIDOR: Lake Buchanan-Round Rock

The FM 1431 corridor has a good concentration of visual resources that contribute to its attractiveness (see Table A-4). Its main attraction is the local water resources, which makes the area an extremely popular one for vacation travel and retirement. Boating, skiing, sailing, swimming, and fishing are some of the most attractive tourist activities in the area. In this sense, this corridor differs substantially from the other two, because it is mainly a water resort-based tourist destination. As in the U.S. 290 corridor however, severe blight is observed in the settlements in the corridor, indicating a lack of proper planning and tourism management. The result is marked degradation of the physical environment and visual resources of the corridor.

Conclusions

Roads in the study area were generally determined to be in good shape, and the natural and cultural resources of the region generally present pleasant scenery and dramatic views that suggest positive travel experience. However, visible signs of environmental degradation and the potential for deterioration were also identified, suggesting negative impacts that tourism and economic development activity have on the study area. Notable among these indicators are signs of blight at city edges and traffic congestion problems in some of these cities.

The worst cases of urban blight in the study area occur at the outskirts of Austin, Dripping Springs, Johnson City, and Fredericksburg, which are the fastest growing cities and towns in the main road corridor. Traffic congestion in the study area is most apparent in Fredericksburg, where its location makes it a through-route for some east-west commercial truck traffic. The city's historic attraction also continually draws large numbers of tourists and new residents, with high traffic volume, parking, and congestion implications.

APPENDIX B: ACCESS VERSUS PRESERVATION IN NATIONAL PARKS

Introduction

Tourism policy has traditionally been low on the national agenda, suffering from a lack of information on the important role tourism plays in the national economy. This has manifested itself in a general lack of planning for and management of tourism-related resources and services on the national level. Although the U.S. Travel and Tourism Administration (USTTA) was established in 1981 under the National Tourism Policy Act, it failed to secure continued funding and closed its doors in 1996. For the most part, there is still very little national level coordination of tourism to and within the United States. Unlike many countries, the U.S. does not have a national airline, federal railway, regulated bus service, or its own hotels. Therefore, the vast majority of tourism promotion is under the control and direction of the private sector at the state and local level.

In 1993, the Committee of Public Works and Transportation of the United States House of Representatives held a joint hearing before the Subcommittee on Aviation and the Subcommittee on Surface Transportation to recognize travel and tourism in the United States as a major economic force contributing greatly to the overall growth and economic stability of the nation. What was most revealing about this joint hearing was not that tourism is a generator of jobs and revenue, but that there was articulated a clear relationship between the nature and quality of our nation's transportation network and the ultimate success of tourism as one of the many tools available to help support and encourage national economic development:

“Successful tourism development requires the linkage of transportation facilities with recreational lands, small businesses, and businesses supporting the traveling public, such as intercity bus, rail, and air passenger carriers, cruise ships, dining establishments, hotels, motels, campgrounds, car rental firms and other recreation service providers...For transportation investment initiatives to contribute to economic development, such initiatives must be responsive to

emerging economic circumstances...Establishment of appropriate transportation links from each community to the rest of the nation is a desirable goal. The recent Federal commitment to scenic byways includes specific enticements to communities which invest in tourism development, successfully linking transportation with historic, scenic, and recreation interests across America.”
(U.S. Congress. House 1993)

The transcript of the hearing describes the benefits of the new Scenic Byways Program that had recently been approved as part of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA). The Scenic Byways Program was designed to enhance tourism development, especially in smaller communities, by giving these communities the opportunity to invest in economic development initiatives promoting responsible tourism growth while allowing tourists the opportunity to enjoy scenic areas and the most modern transportation/travel conveniences. The transcript also indicates that the committee believed travel and tourism represented a unique opportunity for business development, especially small business development, in disadvantaged or small communities by allowing these businesses and communities to diversify and improve their economic base. Further, the committee stressed the importance of linked and modern transportation networks for strategies involving tourism development for the purposes of economic growth.

The enactment of the ISTEA legislation in 1991 was seen as such an important event to the tourism industry. Surface transportation modes comprise such a large percentage of total traffic in the U.S., and it is the dominant means by which most people have access to the National Park System. It plays an extremely important role in tourism generally—a significant percentage of all tourists at some point use an automobile, recreational vehicle, or bus. Any funds earmarked toward the improvement of our national surface transportation infrastructure have a definite affect on tourism, and, as a consequence, on its successful use as a tool for sustainable development (U.S. Congress. House 1993).

The purpose of this Appendix is to, first, describe the historical conflict between preservation of and access to national parks in the United States. This is followed by a brief summary of discussions and findings from a recent national building museum conference on this conflict.

National Parks, Ecological Preservation, and Transportation—Access Versus Preservation

An estimated 250 million people will visit America's national parks this year. The vast majority of these visitors will drive, and few will venture far from the paved roads and paths that traverse these sensitive lands. For more than 100 years, roads have served as the primary means of experiencing the majestic beauty of America's most precious natural and historical resources. However, as the number of visitors touring federal parklands increases—causing and multiplying the effects of congestion, visual blight, pollution, and wear on park roads—the visitor experience is increasingly threatened.

Providing access to the nation's parks and public lands while preserving their unique resources and ecosystems is the ultimate challenge of federal land management. Park road development epitomizes this challenge: to protect unique resources while ensuring visitors access to them in comfort and safety. This century-old debate is fueled by a number of initiatives now being tested in several of the most visited and congested parks, including restricted access, public shuttle services and other forms of mass transportation, and higher entrance fees. These efforts symbolize the precarious balance between preservation and access, with park road builders attempting to find ways to provide access while minimizing the negative impacts of roads on the sensitive environments they are designed to showcase and protect.

Since the national parks opened in the second half of the 19th century, roads and vehicles have provided the primary means of experiencing our national parks. Even if visitors initially arrived at a park via rail, early visitors to the parks' interiors traveled by stagecoach along dirt roads constructed by private toll companies or the U.S. Army Corps of Engineers. Despite meager federal appropriations, relatively primitive equipment, and difficult working and living conditions, early park road builders accomplished significant construction feats including

Yellowstone's Golden Gate viaduct and the steep stage roads into Yosemite Valley. Stagecoach excursions through the national parks during this period were long, rough, and dusty trips. Seeing the sights of Yellowstone, for example, could take a week or more. These excursions were punctuated by stays in grand hotels or tent cabins. In these times, therefore, touring the parks was a privilege restricted to those who could afford the time and expense of lengthy vacations and expensive accommodations.

The arrival of the automobile at the turn of the century presented park managers with new challenges and opportunities. A few motorists made their way into Yosemite at this time, only to have automobiles subsequently banned as threats to the peace and safety of visitors traveling by stagecoach. However, aggressive lobbying by automobile interests, combined with the general desire to increase the accessibility of the parks to middle-class Americans, led all national parks to reopen their roads to automobile traffic by 1915. Stagecoach companies then switched from their horse-drawn vehicles to automobiles, and by the 1920s motor touring and car camping blossomed into national "fads"—and actively encouraged the National Park Service in its efforts to build a broader constituency of park supporters.

In order to accommodate the dramatic influx of motorists and their demand for modern, high-quality roads and travel-related facilities, landscape architects from the National Park Service worked with engineers from the U.S. Bureau of Public Roads to develop a systematic approach to road design, construction, and management. This collaborative effort produced the "Golden Age" of park road development that lasted from the mid-1920s until the start of World War II. Bigger budgets and newer, more powerful machinery enabled the park road designers and engineers to attempt more ambitious projects while simultaneously working to reduce the visual impact of road construction, harmonize structures with the local environment, and lead visitors through an enjoyable series of visual experiences. The basic characteristics of the national parks' road systems, and the parks themselves, were formed during this period.

The development of “parkways” was also an important element of the road construction during the “Golden Age” of park road development. The parks were designed to be linear surrounding attractively laid-out motor roads, and parkways were designed to enable motorists to enjoy miles of attractive scenery without confronting the traffic hazards and commercial intrusions found on ordinary highways. Some urban parkways functioned as commuter routes. Other, more rural parkways, provided miles of carefully maintained landscapes along with picturesque views and recreational features, along with picnic areas and scenic pullouts. Prime examples of projects of the era were: Going-to-the-Sun Road in Glacier National Park, the Zion-Mount Carmel Highway in Zion National Park, Shenandoah National Park’s Skyline Drive, and the reconstruction of the major entrance roads into Yosemite.

By the mid-1950s, increased prosperity, expanding leisure times, and rapidly improving interstate highways brought unprecedented numbers of motorists into national park facilities designed for more modest crowds. These vacationers demanded more and better roads to accommodate larger and wider vehicles, and quick and comfortable access to the many historical and natural features within the parks. In 1956, in response to widespread public demand, the National Park Service launched a 10-year program designed to upgrade park facilities, and expand/improve roads in time for the agency’s 50th anniversary in 1966. At the same time, increased interest in wilderness protection and ecological principles resulted in growing opposition to building park roads.

Competing concerns threatened to split the National Park Service constituency in two.

Environmentalists actively opposed road development, but the tourist industry continued to push for highway improvements. By the late 1960s, the National Park Service shifted its perspective, and policies began to gradually limit additional road construction, promote alternative modes of transport, and worked to minimize the negative impact of existing roads on the park environment. The park service worked to employ technology and concepts of environmental sensitivity to construct and maintain park roads to “lie lightly on the land”.

Tensions between preservation and access exist even today and play a prominent role in park road development. Park managers continue to face ever-increasing visitation rates, pressure to

upgrade park roads according to modern safety standards, and opposing demands to minimize motorist impact on limited park resources. Further complicating the issue is the growing awareness that many of the park roads are historically significant examples of landscape design, civil engineering, and cultural values. There are many ethical concepts at issue here which go to the heart of the questions concerning access versus preservation, pleasure versus protection, and the role and purpose of the national parks themselves.

“Accessing America’s National Parks & Public Lands: In Search of Balance”

In November 1997, the National Building Museum held a one-day symposium on “Accessing America’s National Parks & Public Lands: In Search of Balance,” which addressed a wide variety of issues concerning our national parks and land use within them. The symposium was sponsored by the Federal Lands Highway Office, the Federal Highway Administration (FHWA), the National Park Service, the Bureau of Land Management, and the Transportation Research Board (TRB). One of the first issues addressed was the notion of the “right” to access to national parks versus the special standard of protection accorded to them. Essentially, the argument was made that the system of national parks was created and should remain under a higher standard of protection than other federal lands, and that because of this expected higher level of protection, the “right” to certain kinds of access and activities within

Snowmobiles and Bison in Yellowstone

During the winter and spring of 1996, 1,084 bison—a third of the entire herd of 3,500—were killed by Montana livestock officials because the animals were carriers of a disease that might have contaminated a cattle herd in the area. At issue is the role played by the roads that are plowed to allow for access of snowmobiles. Some biologists and environmentalists insist that plowing the roads in the park to allow snowmobile use gives bison an easy way to wander outside the park, which increases the number of bison killed. This herd is the last unmanaged bison herd in the U.S.

To settle a lawsuit brought by environmental and animal rights groups, officials at Yellowstone and Grand Teton National Parks agreed to study whether snowmobiles in the parks encourage bison to migrate into Montana and Wyoming. The draft agreement called for the Park Service to shut down parts of the roads groomed in winter for snowmobiles to see if that would keep the bison in the parks.

Those who support the snowmobiling insist that the problem is not the groomed snowmobiling trails but that the bison herd has been allowed to grow beyond the carrying capacity of the range and that without the trails the bison would be trapped and starve to death or be killed by wolves.

The use of snowmobiles in Yellowstone has always been controversial for a variety of reasons, not the least of which is the crowds of thousands of snowmobilers who flock to the park each year to enjoy the winter scenery. The snowmobile engines are noisy and polluting, and some biologists say that this stresses wildlife already struggling to survive winter in the park.

the parks should not necessarily be complete. Because the parks are national symbols, and because they contain pristine and unique natural, historical, and cultural resources, the demand for access by all people at all times in every conceivable vehicle runs counter to the notion of a higher standard of protection. One participant mentioned that there is a limit to the responsibility of the government and the park managers to make sure visitors travel in complete comfort—there is no “right” to comfort and safety in pristine wilderness. These are important issues because they lie at the heart of the access versus preservation debate.

Others at the conference believed firmly in accessibility, but accessibility appropriately defined. In other words, each resource within a park need not be perfectly accessible by every individual, and individuals need not assume they have the right to access all areas of the park, especially with intrusive means of transport, such as snowmobiles and airplanes.

On the subject of park crowding, conference participants made sharp distinctions between crowding and congestion. Crowding was seen to be a “normative” concept that is subjective in the sense that each person has an expectation of how many people they expect or desire to meet in a destination, how long they must wait for the experience, and at what levels these would become excessive or intolerable, thereby ruining their experience. This level is different for each person. Congestion, on the other hand, can be viewed as a technical concept that addresses the inadequacy of infrastructure to handle traffic volumes. The question that arises with respect to crowding and congestion in our national parks is to what extent must national parks be responsible for meeting visitor expectations and to what extent must national parks continually expand infrastructure to meet these expectations—at what point will increased levels of infrastructure expansion in our national parks become counterproductive, in the sense that what is really needed is a mechanism or policy to begin managing crowding and congestion.

Historically, when most of the major park roads were developed, they were designed for a specific number of visitors, an estimated percent increase in those visitors over time, and for the automobile (not the tour bus, camper, RV, or snowmobile) to be the primary means of travel on

those roads. Expected increases in visitor volume have been exceeded by a large margin, and the old design requirements are inadequate for the weight, width, and number of vehicles entering the parks. The last time major road infrastructure was improved in Grand Canyon National Park was in 1960; since that time, the park has seen a 250% growth in visitation. Denali National Park has seen a 239% growth since 1975, and Zion National Park has seen a 298% since 1960. There are an estimated 25,000 visitors arriving each day in Yosemite and approximately the same number in Grand Canyon; and although roughly 75% of the visitors to Grand Canyon National Park arrived via automobile, almost 32,000 buses still tour the park annually. In Grand Canyon's peak visitor season, there were an average of 6,100 cars per day competing for the approximately 2,000 parking space reserved in the valley. Shuttle bus waiting lines at the transit center in the park could average up to an hour or more.

Park infrastructure design contributes to these problems. For example, one of the conference attendees discussed the problems of "bear jams," which are similar to the traffic jams caused by "rubbernecking" at the scene of an accident of a highway. These "bear jams" occur when there is a wildlife sighting along one of the major park roads. The cars and buses at the site slow down, perhaps stop, so their occupants can take photographs and video recordings. These individuals are then happy and satisfied from a visitor perspective because they are seeing what they came to see. Slowing or stopping causes congestion further down the line, however those individuals in these automobiles and buses have no idea why traffic is stopped — all they know is that they are sitting in traffic for an hour, not seeing much except the bumper of the vehicle in front of them, and breathing in exhaust. "Bear jams" occur in large part because there are, for example, no shoulders on most park roads to facilitate cars pulling off to watch wildlife or view scenery. There are also few hiking, biking, or pedestrian trails in many of the most visited parks so that even if people wanted to leave their car elsewhere they would not be able to see many of the primary attractions of the park.

Other problematic design aspects include road standards. Larger vehicles, heavier vehicles, the operation of tour buses, and the higher speeds of vehicles generally contribute to wear and tear on

park roads; runoff from roads, litter, and exhaust also pollute the environment. Creating more roads in parks will not necessarily eliminate these problems, and alternatively fueled buses and light rail will not eliminate them either; nor will doing so apparently alter driver behavior.

Many suggestions have been made on how to better manage existing traffic flows and encourage individuals to separate from their cars when touring park lands. The bus option is touted by many as an alternative to automobiles, but the size and weight of tour and shuttle buses are often incompatible with standards on existing park roads. In addition, the number of people discharged at once is often a contributor to crowding and long lines at sights and shuttle bus stops. Also, buses cannot stop at will, which decreases the visitor's travel flexibility and can degrade the visitor experience. Other options include use of a reservations system during peak seasons and times of day, private vehicle-use restrictions, time-restricted parking, intelligent transportation systems, light rail, bike and pedestrian trails, and gondola systems, to name a few.

At the end of November 1997, the Secretary of the Interior Bruce Babbitt and Secretary of Transportation Rodney Slater signed a Memorandum of Understanding (MOU) addressing transportation issues in and around national parks. The MOU establishes an interagency, multi-disciplinary team to develop park transportation procedures and coordination, develops transportation improvement programs, via three demonstration projects scheduled to be implemented at Zion, Yosemite, and Grand Canyon, develops a personnel exchange program to facilitate the sharing of expertise, and identifies national parks as prime sites for ITS demonstration projects. The following are summaries of the demonstration projects:

- ▶ ***Zion National Park:*** Zion will provide shuttle bus service from nearby hotels and campgrounds to the visitor's center, and another shuttle bus will provide service, with many drop-off points, along the narrow canyon's only paved road.
- ▶ ***Yosemite National Park:*** Yosemite recently released a draft plan that proposes integrating an in-valley shuttle system with regional transportation established by gateway communities. The east end of Yosemite will be significantly restored to its

natural condition, reclaiming areas where unnecessary roadways and buildings exist, and reducing traffic congestion.

- ▶ ***Grand Canyon National Park:*** Grand Canyon's transportation plan redesigns the South Rim to permit a combination of light rail and alternative-fuel buses to ride from the gateway community of Tusayan into the park's Mather Point Transit Center and to other trail heads, viewing areas, and facilities. Light rail will serve both the transportation hub at Mather Point and the former railway depot at Maswik from the Tusayan Gateway parking area. The light rail system is expected to ferry approximately 4,000 passengers per hour 24 hours a day, 365 days a year, at a cost of around \$67 million. Alternative-fuel buses will provide transport to other points of interest in areas that have been most plagued by congestion.

In addition, the MOU indicates that, starting in the year 2000, automobiles will be prohibited from entering the Grand Canyon and Zion parks, followed by Yosemite in 2001. Overnight visitors would still be able to drive into the parks to their hotels, but would not be allowed to use their cars to drive around the park. Shuttle buses will bring passengers to and from parking lots outside the park.

APPENDIX C: TXDOT: DESIGNING, BUILDING, AND MAINTAINING STATE PARK ROADS

Statewide, approximately 800 miles of park roads are on the state system, and a similar number of miles, though without the “PR” designation, are also under the purview of TxDOT. This stems from a legislative mandate and Memorandum of Agreement (MOA) between TxDOT and TPWD. In 1991, the 72nd Texas Legislature passed House Bill (HB) 9, requiring TxDOT to construct, repair, and maintain roads in and adjacent to state parks. State fish hatcheries, state wildlife management areas, and support facilities were added in 1995 as part of HB 1359. Prior to these bills, TPWD was responsible for the roads within park boundaries with the exception of PR-designated roads. With a limited budget for road construction and maintenance, and without enough proper equipment, or a statewide plan, TPWD was not in a position to care for the roads as efficiently as TxDOT.

Under the MOA, TxDOT maintains both paved and unpaved roads, parking lots and camper pads, bridges, and drainage within the construction width of roadways. TPWD is responsible for mowing, trimming, litter removal, sweeping, herbicide application, tree and brush removal, and other roadside maintenance for roads not on the state system, otherwise TxDOT performs this work as well on the roads that are designated as part of the state system. Additionally, TPWD is responsible for obtaining all environmental clearances and for the operation of the road should it, for example, need to be closed for some reason. The TxDOT maintenance section nearest the park serves as the primary local contact.

In the Amarillo District of TxDOT, TxDOT employees maintain PR 5, a 17-mile road through Palo Duro Canyon State Park, one of the largest state parks in Texas. The canyon, whose walls stand 1,000 feet tall and display multicolored strata just like the Grand Canyon, was created by a branch of the Red River. The topography and geology therefore make maintaining the park’s roads a challenge. One inch of rain can cause the five low-water crossings to flood and quickly

be under almost 6 feet of water. TxDOT is responsible for removing silt from the roadway and removing other debris after rock slides.

Each year, TPWD also submits a prioritized list of projects to TxDOT for consideration. TxDOT can incorporate these projects into annual planning and programming efforts in accordance with the budget. The Texas Transportation Commission awards contracts for park road construction.

Park roads are vital to the success of the state's park network. In Fiscal Year 1997, there were an estimated 21.8 million visits to the Texas state parks. About 6 million vehicles drove on park roads during this period. Said Larry Mills, TPWD's TxDOT coordinator, "We get letters from the public if the roads aren't in good shape. The condition of the roads affects the drive ability, but it also affects the park's appearance. A well-maintained road just makes the park look better." Jim Daily, operations programs manager in TxDOT's Construction and Maintenance Division, adds that giving TxDOT responsibility for park road construction and maintenance is good for the department, TPWD, and park visitors: "The roads are much better maintained and the state gets a bigger bang for its buck" (Whitten 1998).

APPENDIX D: TOURISM AND TEXAS

Texas is a leader in the travel and tourism industry in the United States and tourism revenues, related infrastructure, and activities provide the citizens of the state with a host of positive economic benefits. Texas' leadership position in the travel and tourism industry also challenges the state to provide and maintain, for the long and short terms, the infrastructure and related services to facilitate travel to and within the state. This means direct investment in transportation infrastructure and related services, including highways, signage and lighting, traffic management technologies, public transportation, airports, railroads, safety enforcement officers, transportation management centers, traveler information systems, and printed informational materials to assist visitors and promote destinations. These activities involve significant expenditures, and the fact that Texas is able to invest in these resources so extensively is an indication of the level of revenues generated by the industry in the state, not only as stand-alone figures but also as compared to other states.

The Texas Department of Economic Development (1998a) estimates that visitors to Texas spent over \$29 billion on travel-related services or products. Food service expenditures comprise the largest segment of travel spending, with 27.3%. Over 19.5% is spent on public transportation, followed by 18.9% spent on lodging. Table D-1 illustrates the direct travel expenditures in Texas, by industry sector.

Travel-related spending in the state translates into significant numbers of jobs and employment opportunities. Again, the food service sector ranks the highest, with over 182,000 jobs (37.4% of the state total). Public transportation sector was again second, with 102,000 jobs, or 20.9% of the total. Table D-2 shows travel-generated employment in Texas.

Table D-1. Direct Travel Expenditures in Texas, by Industry Sector, 1996-1997

1997 Expenditures	Domestic (\$ millions)	International (\$ millions)	Total (\$ millions)	% of Total
Public Transportation	\$5,399.2	\$347.1	\$5,746.3	19.6
Auto Transportation	\$3,932.9	\$80.6	\$4,013.8	13.7
Lodging	\$4,825.8	\$732.2	\$5,558.0	18.9
Food Service	\$744.3	\$556.9	\$7,001.2	27.3
Entertainment & Recreation	\$2,141.3	\$225.6	\$2,366.9	8.1
General Retail Trade	\$2,703.9	\$941.9	\$3,645.8	12.4
Total	\$26,447.4	\$2,884.6	\$29,332.0	100.00

Source: Texas Department of Economic Development

Table D-2. Travel-Generated Employment in Texas, by Industry Sector, 1996-1997

1997 Employment	Domestic (thousands)	International (thousands)	Total (thousands)	% of Total
Public Transportation	95.8	6.2	102.0	20.9
Auto Transportation	12.1	0.2	12.3	2.5
Lodging	71.8	10.9	82.7	17.0
Food Service	169.3	12.8	182.1	37.4
Entertainment & Recreation	49.1	5.2	54.3	11.1
General Retail Trade	30.1	10.5	40.6	8.3
Travel Planning	12.9	0.0	12.9	2.6
Total	441.2	45.8	486.9	100.00

Source: Texas Department of Economic Development

Second in number of tourists only to California, Texas had 160 million person trips in 1997. The majority of these trips, 62%, were generated by Texans traveling within their own state (Texas Department of Economic Development 1998b). The success of Texas in retaining travel within the state has a variety of implications. Not only does this suggest that Texans find traveling within the state pleasurable, but that Texas has a responsibility to continue to keep these revenues

within the state. One of the ways to accomplish this is to continue to view transportation infrastructure and services as a crucial aspect of retaining this tourism business.

In regard to market share, Texas enjoyed a 6.3% share (347 million person days) of U.S. travel, which ranked the state third behind California (9.6%) and Florida (9.%) in total U.S. travel person-days. Personal automobile was the preferred mode of transportation, with 67% of the travel accomplished by car. The top ranked travel destination within Texas, for non-Texas, was the Dallas-Fort Worth Metroplex region, which attracted 40% of business travel and 26% of leisure travel. The South Texas region, which includes the Lower Rio Grande Valley, attracted 19% of business travel and 23% of leisure travel (Texas Department of Economic Development 1998b).

The Texas Department of Economic Development also provides some indication of why people are traveling, and, as a consequence, how their travel mode was influenced by these choices. The activities break down as follows:

- ▶ Culture
 - Visit Historic Site
 - Museum, Play, Concert
 - Festival, Craft Fair
- ▶ Nature
 - Beach/Waterfront
 - National/State Parks
 - Hike/Bike
 - Camping
- ▶ Attractions
 - Theme/Amusement Park
 - Gamble
 - Watch Sports Events
 - Auto/Boat Shows

- ▶ Touring
 - Touring by Auto/Bus
 - Group Tour
- ▶ Outdoor Sports
 - Hunt/Fish
 - Boat/Sail
 - Play Golf
 - Snow Ski (Texas Department of Economic Development 1998b)

As a whole, visitors to Texas (both Texans and non-Texans) enjoyed cultural (18%), attraction-based (16%), and nature-based (14%) activities most of all. Specific activities they enjoyed were visiting historic sites, visiting museums/attending plays, touring by auto/bus, and visiting theme/amusement parks.

Non-Texans participated more in cultural activities and touring than did resident Texans. Other examples of greater non-Texan participation include touring by auto or bus, visiting historic sites, visiting museums, and visiting theme parks. Resident Texans were more likely to participate in outdoor sports activities and nature-based activities than non-Texan travelers. Specific examples of greater Texan participation include visiting beaches and hunting/fishing (Texas Department of Economic Development 1998b).

APPENDIX E: TEXAS STATE TOURISM STAKEHOLDERS

Texas acquires a great deal of revenue from many types of tourism activities by a wide variety of visitors who stay for differing lengths for various purposes. The advertising and promotion of tourism in the state is also, therefore, big business, and of great importance to a variety of state agencies. These agencies, included in the list below, are part of the development of the state's strategic travel and tourism plan, and form the Texas State Agency Tourism Council. The mission of the state and the council "is to provide promotional, informational, educational and developmental programs, service and facilities designed to maintain and increase Texas' standing as a premier U.S. and international destination, to fulfill and enrich travelers' experiences within the state, and to sustain travel and tourism as a major contributor and catalyst for state economic development, while protecting distinctive Texan lifestyles, cultures, and environments" (Texas Department of Commerce 1994).

Agencies, as part of the council, contribute significantly to the tourism industry's growth through a variety of programs and initiatives, including print media, Internet presence, video, and through programs involving the response to millions of consumer inquiries over the telephone, mail, and Internet. This Appendix describes the various stakeholders in the state and their goals and strategies for making tourism in Texas more enjoyable, efficient, and safe.

Texas Department of Commerce (Tourism Division)

The Texas Department of Commerce Tourism Division is the marketing arm for Texas tourism, and is charged with attracting visitors to the state, and in encouraging Texans to travel within Texas. The Tourism Division administers a wide range of programs to market Texas as a travel destination, including national and international advertising, in-state public service announcements, media publicity, travel industry sales development, travel research, and community and travel-related business development. Staff work closely with travel industry professionals and the media to create and publicize attractive travel opportunities, and coordinate special travel promotions and tour opportunities with communities, regions, and organizations

within the state. Tourism Division staff also work closely with communities, private companies, and investors to provide them with the most current information and marketing strategies, current comparative site information and statistics, and also referrals to local and regional economic development groups.

Texas Department of Transportation (Travel and Information Division)

TxDOT's Travel and Information Division operates the state's Travel Information Centers, produces a wide variety of Texas travel and tourism literature and audiovisuals, publishes the state's official travel magazine, *Texas Highways*, operates a toll-free number for trip planning and road conditions, operates various systems for communicating travel and tourism information to motorists while they are traveling on the state highway system, compiles automobile travel statistics, and assists the Texas Department of Commerce with fulfilling information requests.

Texas Parks and Wildlife Department

The Texas Parks and Wildlife Department is the primary state agency charged by the state legislature with providing travelers the opportunity to experience Texas' natural and cultural resources. It operates the system of state parks and state wildlife management areas, monitors, preserves and enhances the quality of the state's natural resources (including lakes, rivers, streams, public and private lands, coastal marshes, bays, beaches, and gulf waters), assists public and private entities in providing quality outdoor recreational opportunities, and manages fishing, hunting, and boating opportunities and activities.

Texas Historical Commission

The mission of the Texas Historical Commission is to preserve the landmarks, structures, monuments, museums, and historic/archaeological sites that make Texas unique. The organization administers a historical marker program, provides leadership for historical commissions and historical nonprofit organizations, administers a museum services program, helps cities maintain and preserve their historic areas and districts, nominates sites and structures

to the National Register of Historic Places, reviews federal programs affecting the historic and cultural resources of Texas.

Texas Department of Agriculture

The Texas Department of Agriculture promotes tourism indirectly through several marketing programs, including programs to promote the sale of Texas foods and beverages, and hosting delegations of national and international buyers of grain, livestock, and other agricultural products.

Texas Department of Public Safety (DPS)

DPS is not specifically charged with promoting tourism, but DPS officers are active in a variety of statewide programs designed to promote safety on the state's highways. The programs include efforts at discouraging and preventing drunk driving, encouraging seatbelt use, and the management of seasonal tourism safety issues in popular tourism destinations.

Texas A&M University

Texas universities support recreation and tourism in the state through education and research. At Texas A&M University (TAMU), the Department of Recreation, Park, and Tourism Sciences (RPTS), for example, involves teaching, research, and extension public-service programs. The mission of the RPTS is to disseminate new and existing knowledge concerning the development, management, and sustainable use of the state's natural resources for recreation and tourism. Workshops, seminars, demonstration projects, and technical assistance programs are used, among other activities, to disseminate information to the general public, and to managers and owners of tourism and recreation organizations and enterprises.

Texas General Land Office

The Texas General Land Office is the agency directly responsible for managing more than 12 million acres of land dedicated to the Permanent School Fund. Four million of these acres are located along the Texas coast in submerged tracts, and the remaining eight million acres are

surface and mineral tracts scattered throughout the state. The General Land Office promotes tourism indirectly through the active management of these lands through the implementation of the Texas Coastal Management Plan, the Texas Lakeshore and Clean River Program, the Texas Colonial Waterbird Survey, Adopt-A-Beach, and management of Texas Coastal Preserves.

Office of the Governor (Office of Music, Film, Television, and Multimedia Industries)

The Office of Music, Film, Television, and Multimedia (which includes the Texas Film Commission and the Texas Music Office) markets the state as a location for film and video shoots, researches and recommends film locations, consults on all aspects of location shooting, promotes the film and video industries within the state, provides assistance to Texas music businesses, events and talent, and publicizes significant Texas music developments and events to state, national, and international press. In addition, the office operates a database of over 1,250 Texas-based multimedia companies for use in business referrals, and exhibits the state's cultural and natural resources to the general public (Texas Department of Commerce 1994).

Other private or quasi-private/non-profit organizations in Texas that revolve around tourism include:

- ▶ Texas Travel Industry Association
- ▶ Texas Association of Convention and Visitor Bureaus
- ▶ Texas Restaurant Association
- ▶ Texas Hotel/Motel Association
- ▶ National Trust for Historic Preservation
- ▶ Texas Historic Hotel Association
- ▶ Texas Association of Museums
- ▶ Travel Industry Association of America
- ▶ Travel and Tourism Research Association, Texas Chapter
- ▶ Texas Association of Campground Owners

Goals and Strategies

Each of the agencies work actively to use innovative methods to encourage travel within Texas while making that experience more pleasurable, efficient, and safe. The Texas Department of Commerce, the Texas Department of Transportation, and Texas Parks and Wildlife are the three agencies with the most visible presence in tourism development within the state, and many of the state's tourism goals occur with the participation of at least one of these agencies. Table E-1 lists the goals and strategies for each of the tourism stakeholders.

Table E-1. Tourism Goals and Strategies in Texas by Agency

	TDOC	TxDOT	TPWD	THC	TDA	DPS	TAMU	GLO	OMFT & MI
Attract more domestic visitors to Texas	X	X	X						
Attract more international visitors to Texas	X	X	X				X		
Encourage Texans to travel in Texas	X	X	X	X					
Develop, manage, preserve, and promote public use of Texas' natural, cultural, and historic resources	X	X	X	X	X		X	X	X
Provide travelers in Texas with accurate, up-to-date information on Texas destinations, attractions, and events	X	X	X	X	X	X		X	X
Encourage extended stays and repeat visitations by enhancing the quality of travelers' experiences within Texas	X	X	X	X			X		
Present an accurate and appealing image of Texas to in-state, national, and international information media	X	X	X	X	X			X	
Support public- and private-sector tourism initiatives to improve the quality and quantity of Texas attractions and services	X	X	X	X	X		X	X	
Work with local, regional, state, and national organizations that promote and enhance travel and tourism to and within the state of Texas	X	X	X	X	X	X	X	X	X
Encourage travel-trade professionals to bring more domestic and international visitors to Texas	X	X	X	X					
Develop and communicate accurate, up-to-date trend information about actual and potential Texas travelers and their economic, social, and environmental attributes	X	X	X				X		
Enhance the quality of tourism education in Texas	X	X	X	X			X		
Promote safety and general welfare of residents and travelers in Texas	X	X	X	X	X	X	X	X	

Source: Strategic Travel and Tourism Plan