

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP Report 419

Tourism Travel and Transportation  
System Development

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# Report 419

## Tourism Travel and Transportation System Development

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## **NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM**

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Research Council was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state and local governmental agencies, universities, and industry; its relationship to the National Research Council is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the National Research Council and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Research Council and the Transportation Research Board.

The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.

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The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, the American Association of State Highway and Transportation Officials, or the Federal Highway Administration, U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical committee according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

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# FOREWORD

*By Staff  
Transportation Research  
Board*

This report contains findings and recommendations for coordinating and integrating state transportation and tourism program decision making. The report includes evaluation of approaches for accommodating tourism travel, principles for integrating transportation and tourism objectives, guidelines for achieving interagency coordination in transportation planning, measures of tourism travel output and linkages with economic development, and approaches for improving traveler information. The report should be useful to practitioners in state DOTs and state offices of tourism who are interested in the effective coordination and integration of transportation system development and operational activities with statewide efforts to support and accommodate increased tourism.

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Since the enactment of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), there has been an increasing formalization of coordinated statewide tourism and transportation planning and policies. Primarily, this stems from the recognition that the relationship between the quality and operation of the transportation system and the growth of tourism travel must be understood and appreciated in order to guide statewide planning and transportation and investment decisions. States take different approaches to the promotion and facilitation of tourism travel and to the measurement of its effect on economic development. It is critical that an effective approach to the demonstration and measurement of the economic benefits of tourism be developed and that the states be provided with information and guidelines on how investments in transportation infrastructure and traveler facilities can increase these economic benefits.

Under NCHRP Project 2-17(6), *Tourism Travel Contributions to Economic Development*, Greenhorne & O'Mara, Inc., of Greenbelt, Maryland, provided the research team to (1) develop measurement techniques and common approaches for evaluating tourism-related highway transportation investment decisions, (2) synthesize and evaluate highway transportation strategies for promoting tourism, and (3) recommend improvements to facilitate traveler use of the highway transportation system.

In addition to this report, the project produced an unpublished volume of supporting materials and references. Included in this volume are (1) the survey instrument employed for data and information gathering, (2) a statistical summary of the survey results, (3) excerpts of various policy documents collected during the research, and (4) a worksheet developed by the Oregon Tourism Division for evaluating the economic effects of transportation investments. This reference document can be found on the NCHRP homepage ([www2.nas.edu/trbcrp](http://www2.nas.edu/trbcrp)) as *NCHRP Web Document 18*.

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#### **AUTHOR ACKNOWLEDGMENTS**

The research documented in this report was performed under NCHRP Project 2-17(6) by Greenhorne & O'Mara, Inc., Douglas C. Frechtling, Michael D. Meyer, and Alan E. Pisarski. Greenhorne & O'Mara served as the prime contractor for this project, with Messrs. Frechtling, Meyer, and Pisarski collaborating under sub-contract agreements with Greenhorne & O'Mara.

The principal investigator for this research was Lowell B. Jackson, P.E., former Vice President of Transportation/Structures at Greenhorne & O'Mara and now an independent consultant. Other contributors to this research and report were Barbara Barnow, former Transportation Planner with Greenhorne & O'Mara and now Manager, Research and Special Studies; Douglas C. Frechtling, Visiting Associate Professor of Tourism, The George Washington University at the onset of this research and now Associate Professor of Tourism Studies at the same institution; Michael D. Meyer, former Professor and Director, Transportation Research and Education Center, School of Civil Engineering, Georgia Institute of Technology and now Director, School of Civil and Environmental Engineering at that same institution; and Alan E. Pisarski, independent consultant.

Additional contributors to this research project include eight members of a Technical Council selected to critique survey

instruments, survey results, and proposed recommendations. Representing state transportation agencies were J. Don Clark, former Director, Division of Travel and Information, Texas Department of Transportation and now independent consultant; Lucy Garliauskas, former Assistant Division Chief, Regional and Intermodal Planning Division, Maryland State Highway Administration and now Air Quality Specialist, Office of Environment and Planning, Federal Highway Administration; George Gunderson, former Director, Bureau of System Planning, Wisconsin Department of Transportation and now an independent consultant; and Patrick McCue, former State Transportation Planner, Florida Department of Transportation and now Executive Director, Tampa-Hillsborough Expressway Authority. State travel offices were represented by Marjorie Beenders, former Director, Missouri Division of Tourism and now an independent consultant; David DePetrillo, Director of Tourism, Rhode Island Department of Economic Development; Marion Edmonds, Director of Marketing Services, South Carolina Department of Parks, Recreation & Tourism; and Rich Meredith, former Executive Director, Colorado Tourism Board and now an independent consultant.

# TOURISM TRAVEL AND TRANSPORTATION SYSTEM DEVELOPMENT

## SUMMARY

Because of a growing appreciation for the strong link between transportation investment and economic development, the NCHRP has sponsored research projects to explore this relationship. This report focuses on one particular aspect of economic development—tourism growth.

In order for state DOTs to make better informed decisions on transportation improvements that support tourism, it is necessary to understand the current institutional environment in which transportation and tourism activities occur. Under NCHRP Project 2-17(6), extensive research on current practices was undertaken in the areas of policies, planning procedures, planning analytics, and program elements to identify the institutional framework where recommended improvements could be viable. This framework was determined largely from the findings of a national survey of state DOTs and state travel offices (STOs).

Survey results showed that written policies on interagency coordination facilitate the effective planning and implementation of transportation projects that support tourism. The survey results confirmed that DOTs are primarily involved in traditional roadway issues related to tourism activities (e.g., signage, rest areas, scenic turnouts, and scenic byways). The areas where DOTs and STOs are most likely to interface are highway welcome centers and tourist information maps. The survey also identified areas where because of differing processes, programs, and priorities DOT-STO coordination may be incompatible. The potential for DOT and STO activities to be complementary was also identified. Examples are as follows:

- DOT planning is long range compared with the faster track STO approach for identifying projects and implementing them—this difference in approach may hinder coordination.
- STOs tend to collect and use more types of data in planning than DOTs—it might be beneficial for STOs and DOTs to share data and even share costs for data collection.
- DOTs and STOs give different priority to projects for special user groups (e.g., tourists who are elderly, foreign, or have disabilities)—at a minimum, these independent program objectives need to be recognized.



In light of such findings the research team developed five products addressing interagency coordination practices, analytic issues (e.g., data sufficiency and economic measurements), and traveler information service delivery. These products are as follows:

1. A methodology for states to characterize existing DOT-STO interactions in relation to an optimum institutional arrangement for interagency cooperation and coordination.
2. An identification of 11 key principles that must be considered in the state transportation planning process if states are to make more informed decisions on transportation projects geared to tourism growth.
3. A set of 13 guidelines for establishing a DOT planning and project development process that incorporates tourism concerns.
4. An approach to considering the economic benefits of a highway investment project intended to enhance tourism development.
5. An approach to applying the most significant criteria for designing traveler information services to various market segments and the identification of 10 areas that should receive priority attention to advance the delivery of these services.

Each of these products is structured to support state DOTs in the selection, implementation (including design, construction, maintenance, and staffing), and funding of transportation actions that promote tourism. Although additional research may be needed to equip state DOTs with more complete knowledge of the economic tools that could be useful to them, improving coordination with STOs and other tourism-involved agencies in order to foster joint planning and implementation is a strong, rational first step for promoting tourism growth.

## CHAPTER 1

# INTRODUCTION

National transportation policy and related federal funding programs affect the types of activities that state transportation agencies undertake. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) shifts the emphasis from primarily construction solutions to more comprehensive planning strategies that promote better interagency coordination and greater attention to economic development objectives.

The shortage of money available for transportation improvement projects encourages use of better planning methods. In fact, a central theme of ISTEA legislation is to promote planning practices that (1) enable interagency and public input to inform decision-making, (2) support cooperative public and private ventures in implementation, and (3) focus on investing in a broader range of transportation activities selected specifically to stimulate economic development. With tourism now ranking among the top three industries in most states, this single area of economic development was isolated in this research to examine its relationship to transportation investment in the context of state transportation planning.

The research conducted under NCHRP Project 2-17(6) was done in two phases. The first phase can be characterized as an extensive data collection effort, whereby several techniques were used to survey the state of practice on policies, procedures, analytic methods, and programs that connected state-level transportation planning and investment with tourism growth. The second phase of this study was to develop recommendations that incorporated the research findings into guidelines to support a DOT decision-making process oriented toward economic development objectives.

This report consists of two volumes. Volume I discusses the findings and recommendations associated with this research. Volume II contains supporting materials (including survey results and select policy excerpts) that can serve as supplementary guides.

Volume I briefly summarizes the Phase I research findings to establish the foundation on which subsequent recommendations were based. These findings largely represent the results of a national survey of state DOTs and state travel offices (STOs). More detailed documentation on these findings is available in a set of interim reports; these additional materials will be identified under the discussion of Phase I.

The bulk of Volume I is devoted to a discussion of the Phase II recommendations. These recommendations were developed to suggest “best” practices that could be implemented successfully in the institutional environments identified in the

national survey. Although this research uncovered “most common” practices that define many of the parameters for the Phase II recommendations, it also revealed that state agencies have unique organizational features, often influenced by geographic, demographic, and political conditions. For example, geographic conditions affect a state’s tourism. States rich in scenic or cultural resources are more likely than states with moderate attractions to develop a comprehensive tourism program focusing on preservation, enhancement, and economic objectives. Often, the magnitude of these programs, coupled with support from the Governor, generates recognition that tourism depends on the functions of multiple state agencies, including DOTs.

In addition, definitions of “tourism” and “economic development” vary with the types of travel activities and objectives adopted by each state. In some states, commuters are considered in the category of “tourists and travelers” if their trip length is beyond 100 miles; in some states, truck drivers are included in this category because their work schedule requires food and fuel consumption as well as accommodations typical of tourists.

The organizational structures of state tourism agencies differ—some operate independently and are headed by Cabinet-level secretaries while others are incorporated in departments of commerce, economic development, or natural resources. These organizational differences will affect any efforts to coordinate or integrate State DOT and STO activities. Because of these differences, the audience for this report is diverse. In order to establish a common understanding of the terms used in this report, a glossary is provided at the end of this document. One of these terms, “tourism,” represents the major component of this research. The definition that has been used to guide both the investigations and recommendations associated with this study is

*Tourism refers to travel to any place at least 100 miles away from the home area. Implicitly, this definition includes not only recreational travel but also business and personal travel involving all modes of transportation, with the exclusion of commuting to and from work.*

This study places a great deal of emphasis on the current and future practices of two agencies in particular: the state transportation agency, referred to in this report as the DOT,

and the state travel office, or STO. Throughout this report, these two agencies may be referred to as counterparts. The research sponsor of this work, the NCHRP, appreciates that all economic activity depends on transportation facilities and services to support and promote productivity and growth. In the particular area of tourism development, investments in transportation are less effective if made in isolation. Rather, decisions on state-level programs and projects should be made with input from the tourism community, with the STO serving as a major point of contact.

This report provides guidance to both DOTs and STOs, keyed to their shared interests in the most effective allocation of agency resources. The proposed recommendations were developed with a sensitivity to the distinctions that make each state's tourism agenda valid, recognizing that each agency involved in that agenda makes an important contribution. At the same time, the recommendations provide direction for achieving greater efficiencies through improved interagency coordination and greater consideration of economic development objectives.

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## CHAPTER 2

### PHASE I: FINDINGS

The purpose of the Phase I study effort was to perform a series of research tasks that would generate a profile of those current DOT and STO practices that represent the transportation-tourism interface, including agency roles for advancing economic development objectives. The information collected under this first phase was used to establish parameters for developing recommendations that could be adopted within a broad range of institutional environments.

The following tasks were undertaken to develop this profile of current practices:

- *An extensive literature search*, conducted to gauge the level of activity in relating transportation investments to tourism development;
- *A preliminary survey of select states*, performed to identify decision-making tools and practices employed by DOTs and STOs and to guide the subsequent design of the national survey;
- *A national survey of state transportation agencies and STOs*, conducted to examine specific practices in institutional coordination, planning analytics, and traveler information services; and
- *Two focus group sessions*, held with representatives of AASHTO and Educational Seminar of State Travel Officials (ESSTO), to identify coordination issues and analytic methods in an interactive setting.

An annotated bibliography of references pertinent to this research has been prepared as a stand-alone document; however, the most useful findings came from the national survey, the analysis of policies collected under the preliminary survey, and the focus group sessions. A summary of the highlights associated with each of these activities follows. Interim reports providing some additional information on the Phase I findings include "A Profile of Current DOT Planning Practices in Tourism," prepared July 1995, and "Tourism Travel Contributions to Economic Development: Phase I Report Summary," also prepared July 1995. Both of these reports are available through the Transportation Research Board.

#### KEY RESULTS OF THE NATIONAL SURVEY

A comprehensive survey on current transportation-tourism practices was administered nationally to document the broad

variations in these practices, which are influenced by regional and state conditions, both geographic and political. The questionnaire was distributed to 53 AASHTO member transportation departments and 53 STOs. A total of 99 questionnaires was returned, including responses from both agencies in a total of 48 states and from 3 "singletons." Appendix A lists the participating agencies.

The survey, extensive in scope, covered three topics:

- Overall policy and institutional coordination,
- Consideration of tourism in statewide transportation planning and programming, and
- Traveler information services.

Volume II includes a copy of the survey administered to DOTs. A second version was prepared for STOs with minor modifications that address agency differences. A detailed analysis of the survey responses was provided in "Current Practices in Addressing the Transportation Needs of Tourism," prepared in October 1994. A statistical summary of the responses is in Volume II of this report. The most significant survey results are as follows.

1. A state-level executive or legislative mandate or written policy that defines tourism coordination responsibilities facilitates agency interactions.
2. The existence of some formal policy or memorandum of agreement between DOTs and STOs facilitates more discussions between the agencies.
3. The number of DOTs developing explicit policies that relate transportation investment to tourism is high, suggesting the effect of ISTEA.
4. DOTs are most involved with tourism projects that relate to the DOTs' traditional role of developing roads.
5. DOTs and STOs interact most frequently on the two types of projects that have been traditionally at the interface—welcome centers and the development and distribution of maps.
6. DOTs interact with those groups traditionally most involved with construction project development, whereas STOs interact with tourism-related groups.
7. By and large, DOTs provide the bulk of funding for the types of tourism-oriented transportation projects considered in the survey.

8. DOTs are more likely to resolve conflicts about tourism-related transportation activities at the policy level of the executive branch (e.g., Cabinet Office, Commission, and Governor) than are STOs.
9. STOs use a wider range of tourism-related data in their planning than do DOTs. DOTs seem to prefer those strategies and data analyses that fit with their traditional roles.
10. According to both DOTs and STOs, among the eight types of data listed in the questionnaire, O/D (origin and destination) data are among the most desirable for incorporating tourism needs into statewide transportation planning.
11. Some agencies indicate that they *choose* not to employ the other seven types of tourist data in their transportation planning rather than suggest there is an obstacle to obtaining it.
12. DOTs and STOs need to communicate better about whether or not the economic benefits of tourism are considered in transportation planning and what specific methods are actually used.
13. In theory, these two agencies can supplement each other in the types of analytical capabilities used for measuring tourism benefits; however, actual sharing of data does not seem to be occurring. STOs use statewide economic models and outside consultants exclusively, while DOTs use “default values, rules of thumb, etc.” to assess the economic benefits of tourism in transportation projects. Only in the case of hiring outside consultants is there any overlap.
14. All but six agencies report that they are involved in implementing, organizing, or regulating the provision of road maps for tourists. Most agencies deal with highway welcome centers in some capacity. For the 12 other types of visitor information services examined, there appears to be an informal division of labor between DOTs and STOs.
15. DOTs dominate four operational activities—planning, design, funding, and approval—in 7 of the 13 categories of traveler information services examined in this survey. DOTs tend to dominate all four of these activities in a service category if they dominate any at all. STOs dominate activities in three categories—tourist-oriented road signage, promotional brochures, and interactive video kiosks—and tend to be most active in their design and funding.
16. Tourist-oriented road maps, highway welcome centers, tourist-oriented road signage, and promotional/informational brochures are the most commonly reported traveler information service activities among the STOs and the DOTs, with more than 80 percent of STOs and DOTs reporting involvement in these services. DOTs dominate in their involvement with maps and signage, while STOs take the lead in brochures. In the area of welcome centers, DOTs and STOs had similar levels of involvement.
17. STO activity is concentrated in the planning of the tourism-related transportation activities examined, with little participation in the approval stage and even less participation in facility design and funding. DOTs, on the other hand, participate actively in design and funding and to a somewhat lesser extent in planning and approval.
18. DOTs and STOs provide special information services for elderly travelers in about one-sixth of the states, services for foreign visitors in about one-third, and services for travelers with disabilities in nearly one-half of the states. STOs dominate information services to foreign visitors—the only category where one type of agency clearly eclipses the other.
19. Overall, DOTs anticipate that services for elderly visitors will be a priority in the future. STOs place greater importance on future services for visitors with disabilities and foreign visitors.
20. At the time of the survey, fewer than one-half of the agencies reporting indicated that their states had used ISTEA enhancement funds for tourism-related projects. However, another one-quarter of the agencies indicated that initiatives to use ISTEA funds were “in progress.”

## SUMMARY OF FOCUS GROUP SESSIONS

Two focus group sessions were held with top officials associated with DOTs and STOs to provide an interactive forum for a deeper exploration of the research issues. These meetings helped to illuminate institutional factors essential to consider in the development of recommendations.

### ESSTO Focus Group Meeting

This meeting was held on July 11, 1993, with six directors of STOs in association with their attendance at the annual ESSTO (Educational Seminar for State Travel Officials) meeting. These directors represented the following agencies:

- Maryland Office of Tourism Development,
- Minnesota Office of Tourism,
- New Jersey Division of Travel and Tourism,
- North Carolina Travel and Tourism Division,
- Oklahoma Tourism and Recreation Department, and
- Tennessee Department of Tourist Development.

Two important points on the differences in DOT and STO agency practices were identified. First, some STO representatives mentioned that they are not familiar with the DOT planning and programming process. Those who are familiar with it find it geared to accommodate long-range planning objectives rather than their own agency’s faster process for identifying projects, approving funds, and contracting work.

A second institutional difference is in the orientation for evaluating transportation projects that support tourism. Understandably, DOTs employ an engineering approach, and STOs adopt a marketing approach. A comment from one STO representative captures this dichotomy succinctly: "I know (their) basic philosophy is to expeditiously move people from one point to the other point in a very fast and safe and efficient way. My purpose is to slow them down."

A key area of contention raised by STO representatives was the production of highway maps. This activity is one that involves the participation of both DOTs and STOs, and STOs expressed some dissatisfaction about responsibility and equity related to the production and financing of these maps.

As indicated statistically in the national survey results, ESSTO participants confirmed that communication between them and their counterpart was largely informal.

STOs stated that the role of the STO was usually secondary for site-specific tourism projects. In such cases, industry representatives tended to contact the DOT directly with requests for transportation consideration, and the STO provided support if requested. This account agreed with statements offered later by state transportation agency officials in their own focus group.

Lastly, members of this focus group were not able to identify any useful measurement models nor were they aware of any models used by DOTs to gauge the tourism outcomes of transportation investments.

### **AASHTO Focus Group Meeting**

The second focus group meeting was conducted on October 26, 1993, with six representatives of the AASHTO Standing Committee on Planning who were attending the annual AASHTO meeting. These individuals represented the following state organizations:

- Georgia Department of Transportation,
- Iowa Department of Transportation,
- Kansas Department of Transportation,
- Pennsylvania Department of Transportation, and
- Virginia Department of Transportation.

Many of the same issues previously identified by STOs were raised in this session by DOT representatives. There was agreement that communication between DOTs and STOs was largely informal, with few established mechanisms for coordination in place.

DOT representatives also agreed that for site-specific transportation projects developed by industry, they generally dealt with local industry or government rather than with STO staff. Interaction with local interests most likely refers to road improvements or access to recreational sites (e.g., Six Flags or Opry-Land) and to access substate regions where tourism is targeted for economic development.

DOT representatives also recognized that DOTs and STOs had different perspectives on assessing the need for transportation investment: DOTs considered capacity and safety issues, and STOs evaluated market effects.

There was considerably more discussion among DOT representatives than their STO counterparts about analytic methods and economic models. Members of this group were familiar with REMI, HIAP, and models used by the U.S. Travel Data Center; however, it was determined that none of these models isolates tourism benefits from other economic development benefits. The Iowa DOT representative referred to that state's economic-development-oriented investment program, which is primarily concerned with access highways for tourism projects as well as for general projects.

In the case of the two focus group sessions, there was considerable agreement among the participants on the issues that affect the transportation-tourism interface. Many of these issues were confirmed on a broader basis by the results of the national survey.

### **ANALYSIS OF SELECT POLICIES**

In association with the preliminary survey conducted in the early stage of this research, policy documents and strategic plans were submitted by those agencies reporting written policies that explicitly connected transportation planning and tourism. These materials were reviewed to identify (1) policy features that foster coordination between DOT and an STO within a state, and (2) institutional mechanisms that support better planning and programming of tourism-related transportation investment.

Materials were received from the following 11 states: Alaska, Colorado, Florida, Georgia, Minnesota, New York, Oregon, South Dakota, Texas, Washington, and Wisconsin. Some materials were more substantive than others in terms of their value to this research. This review emphasizes those materials that can serve as informative references for other state agencies. A list of these materials is provided in Volume II together with excerpts from selected submissions.

The criteria used to review these documents are presented below. A distinction is made concerning whether the document originated in a DOT or an STO.

For state transportation policies, the following criteria were used:

- Formal recognition that tourism should be considered in transportation planning,
- Formal institutional arrangements fostering meaningful consideration of tourism needs in state DOT planning, programming, and investment, and
- Any other stated policies that might affect tourism-related transportation investment.

For state tourism policies, the following criteria were used:

- Formal recognition of the role of transportation in statewide tourism development and facilitation,

- Formal institutional arrangements fostering meaningful cooperation between the STO and the state DOT, and
- Any stated policies that might affect tourism-related transportation investment.

The following discussion summarizes the findings, by state, proceeding from the most extensive policies and practices to the least extensive.

## Oregon

Oregon has the most extensive policy statements covering tourism and transportation investment of any of the states submitting written documents as part of the preliminary survey.

### *State Transportation Policies*

The “Oregon Transportation Plan” states,

It is the policy of the State of Oregon to develop a transportation system that supports intrastate, interstate and international tourism and improves access to recreation destinations. (Oregon Department of Transportation 1992, p. 61)

Specific actions supporting this policy are identified as well:

1. Promote intercity bus, rail and commuter air services to link areas in the state with national and international transportation systems (ibid., p. 58)
2. Facilitate development and operation of intermodal transportation hubs (ibid., p. 60)
3. Identify and incorporate into state transportation plans, facilities and services that serve tourism (ibid., p. 61)
4. Identify scenic tourism corridors and consider “scenic values” in corridor planning, improvement and maintenance (ibid., p. 61)

Presumably, tourism needs will be considered in the process to update the statewide transportation improvement program (STIP for 1995–2000, Oregon Department of Transportation, 1993a). Certain transportation enhancement projects defined in the ISTEA are narrowly related to tourism, such as scenic or historic highway programs and acquisition of scenic or historic sites (Oregon Department of Transportation, 1993b, p. 2).

### *State Tourism Policies*

The Oregon Tourism Division (OTD) published a “Strategic Implementation Plan for Tourism Development, 1992–1996” on April 4, 1993 (Oregon Tourism Division, 1993) that names “transportation development” among eight specific implementation strategies. The tourism division’s objective is, “Work with the Oregon Department of

Transportation to develop a tourism transportation plan to identify facilities and minimal levels of service to serve tourism. Incorporate plan into state and local transportation plans.” Four related strategies are specified, requiring inter-agency cooperation but assigning the lead role to ODOT (ibid, pp. 6–7):

1. Complete development of the Oregon Scenic Byways Program
2. Complete development of the Oregon Travel Signing Project
3. Develop a system that combines these two in a “complete driving tour system”
4. Organize an intermodal tourism transportation committee to seek ways and means to reduce visitor dependence on the automobile in Oregon (p. 10)

In addition, OTD plans to work with ODOT to upgrade three welcome center facilities over a 2-year period (ibid, p. 34).

Meaningful cooperation between OTD and ODOT has been the rule since 1987, the earliest date that the OTD strategic plan lists specific transportation projects that have been funded by the state Regional Strategies Program (Oregon Tourism Division 1992, p. 5). These projects include welcome center construction, tour and trail development, airport expansion, signage, and a scenic overlook.

OTD has developed a simplified model for estimating tourist expenditures resulting from Regional Strategies Program projects, such as the above (Oregon Tourism Division, no date). This model is deficient in both measurement standards and estimation techniques. A copy of the tourism expenditure worksheet used is included in Volume II.

In summary, Oregon’s STO recognizes the importance of tourism in planning and implementing certain transportation projects and has established interagency task forces for each of these projects. ODOT recognizes the importance of tourism in its transportation plan, but aside from its process to involve all interested parties in developing its new STIP, it does not go beyond referencing ISTEA requirements that international border crossings, access to tourism-related facilities, and recreational travel and tourism be addressed.

## Texas

### *State Transportation Policies*

The Texas DOT strategic plan also emphasizes promotion and visitor facilitation aspects of transportation without explicit consideration of any other transportation activities. The only tourism-related responsibility listed is “travel services and publications in support of tourism” (Texas Department of Transportation, 1992, p. 3). Its external/internal assessment mentions only needs for travel and information services in the tourism area, while its section on “Service Population Trends—Tourism” notes that the Department

provides tourists with travel counseling, maps, literature and free 1-800 service (ibid., pp. 3, 16).

Two of the nine formal Texas DOT objectives briefly refer to tourism:

Goal 1, Objective 4: To increase public use of travel and information services (ibid., p. 25)

Goal 2, Objective 3: To promote aviation safety, economic development, and air transportation for Texas by conducting aviation programs to satisfy aviation needs (ibid., p.30)

### *State Tourism Policies*

Although Texas does not formally recognize the role of transportation in statewide tourism development and facilitation, the Governor recently established the Texas State Agency Tourism Council, composed of nine state agencies "involved in tourism promotion, marketing, and development efforts" (Texas Office of the Governor, 1992, p. i).

The Texas DOT is a member of this council. However, only a single Texas DOT division is listed as having responsibilities—the Division of Travel and Information, which operates the state's travel information centers, produces and distributes tourism materials, and answers visitor inquiries (ibid., p. 1). Texas DOT tourism transportation activities seem limited to promotion and provision of information to tourists. In addition to producing and distributing materials, Texas DOT operates computerized travel information services and visitor information centers (ibid., pp. 16–17, 39, 41–42).

The impression that Texas DOT's role is so limited is confirmed in the performance standards for the Council, none of which addresses transportation investment, planning, maintenance, or access (ibid., p. 27).

In short, although Texas has established a formal institutional arrangement for considering tourism needs in transportation planning, these needs are limited to promotion and tourism facilitation through information access.

## **South Dakota**

### *State Transportation Policies*

South Dakota's DOT is unique among those submitting policy statements for this project in emphasizing its commitment to tourism directly in its mission statement:

The Department of Transportation's mission is to plan, finance, design, construct, and maintain a cost-effective transportation system to support tourism. . . (South Dakota Department of Transportation, no date, p. 1).

Among the current objectives in support of this mission is Objective L (ibid., pp. 26–27):

*Improve tourism and recreation access.* To develop annually a plan to promote the development of highways leading to tourism and recreation sites, facilities and services. . .

Strategy 1: *Construct recreational road projects.*

Strategy 2: *Construct river access projects.*

Strategy 3: *Implement tourism related projects.*

These strategies are accompanied by specific actions to implement these policies.

Other tourism-related goals include developing new aviation facilities (ibid., p. 23), evaluating air service (ibid., p. 60), promoting scenic byways in conjunction with the Department of Tourism (ibid, p. 69), conducting feasibility studies for intercity expressways (ibid., p. 74), and producing maps (ibid, p. 130).

There is no indication of a formal institutional arrangement ensuring consideration of tourism needs in state DOT planning, programming, and investment. Tourism industry needs are apparently considered in the statewide meetings designed to gather public input for project selection, held in July of each year (ibid., p. 15).

### *State Tourism Policies*

No information was provided.

In general, South Dakota's DOT is committed to serving the needs of tourists in the state and has developed specific programs to do so, as stated in its current strategic plan. What is unclear is how this came to be, and what the Department of Tourism's role is in the transportation planning process.

Based on the materials received and reviewed, there is no indication that any of the states has demonstrated a recognition of tourism interests in transportation planning with a formal arrangement for ensuring that such interests are incorporated in transportation investment decision-making.

Oregon has strong policy statements regarding tourism's needs for transportation and tourism interests in transportation planning and investment and these statements are supported by the designation of specific individual projects, albeit rather limited in scope. The South Dakota DOT formally incorporates tourism considerations in statewide transportation planning, but the STO's recognition of transportation cannot be evaluated.

Texas demonstrates the best institutional mechanism to support better planning and programming of tourism-related transportation investment, but limits this investment to promotion and visitor information services.

Overall, Oregon provides the best model of formal recognition of tourism development's interests in transportation investment and a state DOT's recognition of tourism in its planning and implementation. The approach in the Texas model may be the most effective in practice (assuming such coordination eventually acknowledges transportation's broader role in assisting tourism development in a state).

## **REPORT ON "BEST PRACTICE" STATES**

Although the analysis of the survey results proved valuable in providing an overview of the full range of practices



nationwide, the study team conducted a narrower assessment of the results by identifying the six states that indicated exemplary performance in the areas examined. The methodology that was used to identify the “best practice” states is described here.

## Methodology

Drawing from the national survey, there are four distinct areas that, together, constitute best practice for states considering the transportation needs of tourists. These four areas are (1) a high degree of institutional coordination; (2) regular, explicit consideration of tourism needs in statewide transportation planning; (3) a tourism transportation planning process that uses specific, objective data and analytical methodologies; and (4) a strong program of traveler information services.

The research team then identified 19 criteria that correspond to specific survey questions and established a standard for a “best” response for each. Listed below are the practices, corresponding questions, and standards.

- High degree of institutional coordination
  - Existence of a written policy (Question 1)
  - Existence of statutes or administrative laws (Question 2)
  - Existence of interagency memoranda of agreement or policy (Question 9)
  - Frequent involvement with a variety of groups (five or more) to plan transportation projects related to tourism (Question 10)
  - Policy and program conflict resolution at the lowest (operating department) level for more than 50 percent of the transportation activities listed (Question 12)
- Regular, explicit consideration of tourism needs in statewide transportation planning
  - Existence of written policy on the importance of tourism in guiding transportation investment (Question 13)
  - Indication of explicit consideration of tourism-related investment in the transportation planning process (Question 14)
  - Primary responsibility for planning tourism-related facilities and services for two or more of the activities listed (Question 5)
  - Frequent discussions with counterpart (Question 6)
  - Discussions with counterpart on at least four of the activities listed (Question 7)
- Use of specific, objective data and analytic methodologies
  - Explicit consideration of economic benefits in establishing transportation project priorities (Question 18)
  - Use of one of the quantitative methods cited (estimated tourism economic impact or benefit/cost for tourism projects) to assess tourism benefits (Question 19)

- Use of at least four types of tourist-related data (Question 16)
- Indication of preferred ranking of data (at least one item ranked) required to better incorporate tourism travel needs into transportation planning (Question 17)
- Strong program of traveler information services
  - Frequent provision of a variety of traveler information services (six or more “often” responses) (Question 22)
  - Appraisal of adequacy of tourist information services (Question 31)
  - Use of innovative approach to joint efforts (Question 24)
  - Indication of at least one special effort to serve tourists who are elderly, or foreign or have disabilities (Question 26)
  - Indication of one or more effective tourist information services (Question 29)

To identify the best practice states, the pair of questionnaires (both DOT and STO) from each state was reviewed to determine its conformance with the 19 criteria previously described. All responses were accepted at face value. Obviously, states or agencies that did not return a completed questionnaire were eliminated from this review process. States received a point for each of the criteria measures where both the DOT and STO met the requirement. The points then were totaled, producing a preliminary list of best practices states. This list was subsequently modified by deleting any states that did not meet at least some of the requirements in each of the four areas examined—institutional coordination, explicit consideration of tourism in planning, methodological tools, and traveler information services.

The six states that were identified as “best practice” were

- Minnesota,
- West Virginia,
- Michigan,
- South Dakota,
- Arizona, and
- Idaho.

Subsequently, interviews were conducted with individuals from the DOTs and STOs representing these states in order to identify any additional factors that enabled these states to distinguish themselves as strong coordinators. The comments offered vary in detail and length. Highlights are presented here.

## RESULTS

### Minnesota

Although the facilitation of “recreational travel and tourism” is one of the 14 state goals in the Minnesota Department of Transportation’s statewide planning process, the

high degree of coordination between the DOT and STO predates this statute. Recognition of the benefits to be gained by explicit consideration of tourism development needs in statewide transportation planning has been in effect for at least 12 years. The fact that major officials in both agencies enjoy long tenures has further encouraged this cooperation and this state's output. Governmentwide quality management programs have been implemented, and this practice has facilitated cooperation by breaking down "turf" barriers among agencies.

There has been a strong interest on the part of Minnesota DOT to use transportation to help market the state, including its tourism resources. Providing continuous and relevant information to tourists is viewed as a way to increase visitor satisfaction and visitor expenditures in the state. Cooperation takes the form of continual communication between Minnesota DOT and Minnesota Office of Tourism (MNOT) staff, and the inclusion of MNOT staff on Minnesota DOT committees, such as on business signage, rest area welcome signs, and scenic byways. The agencies share data when necessary.

### **West Virginia**

The West Virginia case study provides an interesting example of developing cooperation between the state transportation agency and the STO. By and large, the specific interaction has been on a project-by-project basis. The DOT takes lead responsibility for those projects most related to the roadside (e.g., rest areas, welcome centers, and signage), for which they provide almost all of the funding. Traditionally, the greatest interaction between the two agencies has been on tourist information maps. Both agencies reported that the relationship with their counterparts was very productive, and the STO thought that the relationship was being strengthened because of ISTEAs.

The state collects data on tourists' visiting specific locations in the state (e.g., state parks) and estimates tourist dollars spent as part of tourist trips. Like Minnesota, West Virginia views all transportation projects as helping tourists in the state. They report that they do not isolate tourist trips when planning specific projects.

The evolution of incorporating tourism into transportation investment decisions began in the Governor's Office, which promoted the encouragement of tourism through a general mandate of state agency responsibilities. Although the state DOT added tourism as one of its general emphasis areas, there were no specific regulations or administrative mandates that outlined how tourism would be considered. The strength of their approach to incorporating tourism into investment decision-making is that the process depends on the level of investment being considered and the degree to which interagency coordination is necessary. For example, welcome centers often require a memorandum of agreement because there are negotiations associated with staffing and maintenance responsibilities. However, for other types of

projects (e.g., rest areas or tourist signage), the interaction tends to be on an ad hoc basis. The major obstacles identified seem to be related to funding—in terms of the levels and willingness of the state DOT to allocate funds specifically for tourism activities.

The STO uses West Virginia University for its modeling capabilities in tourism; however, these models tend to be at a statewide level and not oriented toward project-specific issues.

### **Michigan**

The Michigan DOT considers tourism in the state mostly as it relates to transportation investment. There does not seem to be any formal or semi-formal relationship with the state travel office. Most of the interaction has been on an ad hoc basis and primarily in relation to projects such as tourist maps and signage.

The DOT interacts with a variety of other agencies and groups, such as tourist service providers and local road agencies, when tourist-related projects are going to be built in their jurisdiction.

### **South Dakota**

The South Dakota DOT and the Department of Tourism report working very closely together. Past governors, particularly Governor George Mickelson, encouraged cooperation, and there are official mandates to address this issue. However, it is also very significant that the Secretaries of the two departments have worked together since 1987 when the Department of Tourism was raised to cabinet status.

The explanation given for this culture of cooperation is that a small, rural state with limited resources needs to have agencies cooperate in order to maximize their effectiveness. There are few formal committees, although the DOT has formed one on ISTEAs, and the STO is active on it. In lieu of committees, the staffs meet to discuss new highways (e.g., an extension of the highway from Denver to Rapid City and an expanded I-90 to Pierre), rest areas, and signage, as needs arise.

The two agencies share information on an ad hoc basis. Neither has a method for estimating the benefits of tourism-related investment in transportation, and neither anticipates such studies in the future. The STO does measure the effect of all visitors annually at the county level.

### **Arizona**

Arizona is characterized as a state with heavy federal involvement in its transportation activities. The Office of Tourism produced a memorandum of understanding called ACERT (Arizona Council for Enhancing Recreation and Tourism), which establishes rules of coordination between the

many state resource agencies and the many federal agencies involved. Four agencies have provided funding to ACERT.

Budgets for the agencies involved in tourism are separate but coordinated. The state parks agency has located parks throughout the state to disperse demand and travel activity, often placing facilities at midpoints of long trips. Arizona DOT has had annual appropriations of about \$5 million since around 1986 to provide access to and service within these state parks. The state park board sets priorities, and the transportation board programs the activities in its 5-year construction program.

Both the DOT and STO touted the effectiveness of the nationally recognized state magazine, *Arizona Highways*, for establishing a positive relationship between the two agencies. This magazine, produced by the DOT, advertises the state's scenic wonders and is considered an effective marketing technique.

It was the view of the DOT representative that coordination was facilitated because the STO is small and designed to be an independent office close to the Governor rather than included as part of a larger organization such as a commerce agency. The Office of Tourism has a small fund to provide grants to local communities for tourism, and, in many cases where these monies are used for transportation projects, the DOT gets involved (e.g., to provide assistance for signage).

Other illustrations of coordination include the use of Arizona DOT staff to handle "800 number" calls to the state for tourism information. The two agencies work together on responding to requests for maps, travel information, and so forth. In addition, the scenic highway program run by Arizona DOT has an advisory board on which the Office of Tourism sits.

The STO noted the distinction between welcome centers, located at the state border and information centers, which are operated by local governments while meeting STO-specified criteria. The STO recently completed its first welcome center, and they are collecting the data for extensive benefit/cost analyses, including visitation generation and dollar effects. Arizona DOT performs traffic counts at rest stops and conducts surveys to determine the acceptance of tourism materials distributed at these rest stops. Detailed benefit analyses of tourism have not been done because of the lack of data. The Office of Tourism often estimates the sales tax effects of a project but secures the services of estimators to establish prospective effects.

## Idaho

The value of a first successful cooperative effort between the Idaho DOT and STO was cited as a factor in establishing a good working relationship. An early activity that was successful was the development of the centennial state map for 1990.

Technical elements of the map were produced by the DOT, and the development of other map materials and then dissemination were handled by the STO. This activity paved the way for further cooperative efforts. A later experience that also fostered cooperation occurred during a series of forest fires when the DOT expeditiously provided information to visitors.

Several years before this 1990 collaboration, a conference with 400 key players had been held to foster a cooperative program between outdoor recreation, tourism, and transportation. Included in this group were parks and recreation representatives and fish and wildlife representatives. In terms of advancing coordination, it also may be significant that federal agencies own about 70 percent of the state's land.

The key point cited by both Idaho agencies is that the state's tourism is highly automobile-oriented: 87 percent of the tourists arrive in private vehicles. Consequently, it is commonly viewed that because tourism's benefits are well distributed throughout the state, support for tourism boosts the overall economy.

As in the case of South Dakota, it was noted that the small size of government in Idaho engenders a cooperative spirit between agencies and a sense of the necessity to combine skills and resources when developing a program.

The ease in coordination was attributed, in part, to the fact that people held their positions for several years.

Although each of the six "best practice" states exhibits distinct enabling qualities to advance coordination of tourism needs in the state transportation planning process, several themes are suggested in the information collected from interviews with these state representatives.

Several states indicated a longstanding working relationship between DOT and STO officials that pre-dated ISTEA requirements. The success of these relationships seems to be attributed to one of several conditions: (1) long tenures for top officials and sometimes staff as well, (2) shared appreciation for the statewide economic benefits of transportation investment in tourism; and (3) Governor support for interagency coordination.

Three of the states interviewed cited the "smallness" of their government or agency as a facilitating factor for interagency coordination. Individuals interviewed suggested that the size of government or agency served as a catalyst for pooling resources to implement program objectives. In the case of Arizona, the small and independent structure of the STO enhanced that agency's ability to be flexible, thereby facilitating opportunities for coordination.

The interviews with South Dakota and Idaho representatives suggest that federal involvement in advancing tourism for federally owned roads may foster state DOT and STO relations.

Although these six states all passed the test for having analytical capabilities, there is no evidence of data used with advanced decision-making tools.

## CHAPTER 3

### PHASE II: RECOMMENDATIONS AND GUIDELINES

The research conducted under Phase I produced a profile of current and best practices used by DOTs and STOs in providing transportation facilities and services that support tourism. This profile identified the organizational parameters that needed to be considered to improve the state transportation planning process and its effective addressing of tourism needs.

This focused examination of DOT and STO roles and functions, and the subsequent evaluation of the extent to which their responsibilities can be complementary, supplementary, or independent helped target those arenas where changes in policy and procedures would be most feasible and most effective in addressing the transportation needs of tourism.

As a product of this effort, a set of five recommendations was developed. These recommendations were reviewed by the NCHRP Project 2-17(6) panel members and the study's Technical Council of DOT and STO officials to "test" their viability in these two institutional environments.

A summary of each recommendation is provided here, followed by an in-depth discussion of each.

1. A methodology for states to characterize, in detail, their DOT-STO interactions in relation to an optimum institutional arrangement for interagency cooperation and coordination.
2. Identification of 11 key principles to be considered in the state transportation planning process in order to facilitate more informed decisions on transportation projects geared to tourism growth.
3. A guide to establishing a DOT planning and project development process that incorporates tourism.
4. An approach to considering the economic benefits of a highway investment project intended to enhance tourism development.
5. An approach to applying the most significant criteria of traveler information services to various market segments, and the identification of nine areas that should receive priority attention in advancing the delivery of these services.

#### METHODOLOGY FOR EVALUATING INSTITUTIONAL ARRANGEMENTS TO ACCOMMODATE TOURISM TRAVEL ISSUES

One of the objectives of the 1991 ISTEA legislation was to identify how state DOTs could, through better coordina-

tion with their stakeholders, optimize the effectiveness of their planning. More complete knowledge of tourism supply, performance, and effects will enable DOTs to better prioritize and allocate their resources, thereby allowing greater consideration of the effects of transportation investment on economic development.

In order to appreciate the implications of the different institutional arrangements that prevail, it is important to examine an assortment of coordination practices in the context of the issues and functions associated with both transportation and tourism. This context is defined by the community of agencies involved in addressing the transportation needs of tourism, a situation that can vary from state to state.

All states operate transportation agencies—many dealing with several modes. All but one state operates a state tourism office. In addition, states maintain natural resource agencies, economic development or commerce agencies, and highway enforcement agencies, and/or subordinate units with narrower focuses on areas such as parks, fisheries, historical sites, cultural resources, and so forth.

For the purposes of this section of the report, the **transportation** entity refers to state transportation agencies (DOTs) and embraces the traditional capital improvement and operating functions for highways, transit, aviation, rail, and harbors as well as the enforcement function performed by the state police (patrol). The **tourism** entity includes state travel offices (STOs) and other government agencies involved in activities relevant to natural and cultural resource management and the promotion of state tourism/travel and recreation.

The following discussion provides an examination of five types of institutional arrangements. They are presented as a tiered representation of various degrees of institutional coordination, with each tier characterizing a relationship type identified by DOTs and STOs in the national survey conducted as part of this research. A further exploration of these relationships is conducted by imposing an institutional environment on them—namely, nine issues relevant to successfully accommodating and enhancing tourism and six functional areas where accommodation and integration can occur. This institutional environment can be envisioned as the intersection of the five types of institutional relationships, nine relevant issues, and six functions, creating a three-dimensional matrix that contains 270 cells. This concept is depicted in Figure 1, which serves as a reference for examining multiple facets of institutional arrangements.

Figure 1 presents the five types of institutional arrangement on the left face of the three-dimensional matrix and displays the nine relevant issues on the back face of the matrix. In more simple terms, the left face of the matrix represents the “who” and “when” (how often) aspects of interagency coordination; the back represents the “what” and “why” that cooperating agencies should jointly consider; and finally, the floor of the matrix represents the “how” or functional responsibilities involved in establishing and coordinating an optimum transportation-tourism interface.

**Five Types of Institutional Arrangements**

The national survey results illuminated differences in the way states have arranged their relationships between transportation and tourism institutions. In general, the quality of transportation products and services that directly enhance tourism is greatly dependent on the degree of coordination and cooperation between institutions. Thus, the types of institutional arrangements described here reflect the relative degree

or level of coordination and cooperation. Type I is the lowest level, already surpassed by most states; Type V is the highest level, attained in only a few particulars in some of the states.

A short description of each type, including a discussion of its advantages and disadvantages, follows:

• **Type I**

This type is characterized by infrequent coordination between transportation and tourism agencies on tourism-related goals or programs. Based on the national survey results collected under this research effort, about 10 percent of the states fall into this category. Under this arrangement, most coordination for transportation projects with tourism effects is likely to be between local governments or individuals affected, development or commercial interests, and the transportation agency.

• **Type II**

This type is characterized by interagency cooperation on a few discrete projects (e.g., scenic routes, welcome centers, or site-specific maintenance of important tourist routes). These arrangements are largely ad hoc and are

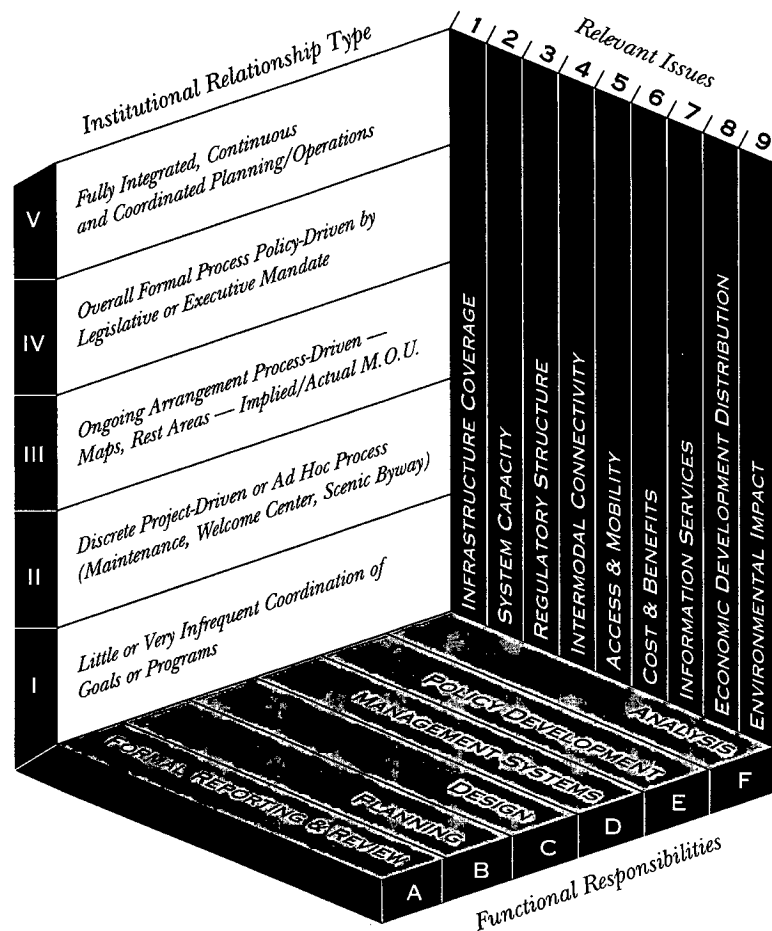


Figure 1. Attribute matrix of institutional arrangements.

not defined by an established relationship process. The responses of approximately 30 percent of states placed them in this category.

- **Type III**

This type appears to be the most prevalent relationship level, with 34 percent of the states reporting the kinds of activity characterizing this arrangement. A Type III arrangement involves *ongoing* process-driven activities (e.g., highway, bicycle, and aeronautical maps; rest areas; and public information programs). Under this type, transportation and tourism agencies act voluntarily under actual or implicit agency-to-agency memoranda of understanding and participate in joint activities that are repeated annually or biennially usually consistent with the state's budget cycle.

- **Type IV**

This type of arrangement, represented by about 26 percent of the states, is driven by the existence of written policy mandates emanating from the Governor through Executive Order or through legislative statutory action. In either case, the establishment of administrative rules directing interagency protocols may or may not be specified. Comparing the survey responses of Type IV states in conjunction with other responses revealed that this type of arrangement is consistent with much sounder tourism recognition in transportation plans and actions and a greater likelihood of continuity in the relationship. The level of interagency coordination resulting from these mandates is reported to be substantially higher than for states relying on more voluntary measures, particularly when considering the program accomplishments of states that employ such mandates.

- **Type V**

This type is shown as a "boundary" level, representing constant day-to-day coordination in planning, operations, funding, programming, and so forth. It represents the continuous integration that could occur best if the transportation and tourism agencies were combined in the same high level unit, probably a cabinet-level transportation department. Currently, no states use this type of institutional arrangement completely, although Texas comes close. Much of this integration could be achieved under Type IV, if sufficient incentives (not solely mandates) were employed (e.g., ISTEA enhancement opportunities).

#### *Advantages/Disadvantages*

- **Type I *Infrequent Coordination***

**Advantage:** Simplest arrangement, involving DOT in biggest projects, STO in public relations. DOT dominates, particularly in the planning process. In a few states, effective projects can result.

**Disadvantage:** Coordinated results are more accidental than planned, and data sharing has no influence on results.

- **Type II *Ad hoc-Project Level***

**Advantage:** Concentrates efforts in activity areas with some past history of interagency coordination. Simpler than higher types and can be effective if DOT is responsive to the needs of STOs and others.

**Disadvantage:** Limited issues are investigated, not part of an overall strategy, still substantial domination by DOT.

- **Type III *Ongoing Process Focus***

**Advantage:** Places related agencies together for recurrent activities on a regular basis. Several Type II agencies are now advancing to Type III (or IV) in recognition of the increased coordination benefits.

**Disadvantage:** The additional money, time, and staff resources needed may be problematic. Optimum coordination usually is not reached on capital improvement programs.

- **Type IV *Formal Policy Driven***

**Advantage:** Affirmative authorizing environment provided to engage all the appropriate agencies that can be used in strategy and implementation. Establishes effort as a state priority matter with specific accountability defined.

**Disadvantage:** Few. Still likely short of fully integrated coordination implicit in Type V. More planning time and resources may be required compared with lower types.

- **Type V *Fully Integrated (single agency)***

**Advantage:** Tourism interests can be explicitly considered throughout all planning, budgeting, maintenance, public relations, environmental functions, and so forth.

**Disadvantage:** Substantial government reorganization ("re-engineering") required. Could cause downplay of tourism if dominant agency component were the transportation representatives.

There are additional issues associated with the Type IV and the more hypothetical Type V arrangement. For one, "equity" between agencies is difficult to resolve because the transportation agency prominently plans capital improvement projects in the \$100s of million range while the tourism agency usually plans projects in the single digit or \$10s of millions range, primarily for public relations activities. Moreover, as revealed in focus groups, the usual lengthy and complex transportation program and project planning cycle

is foreign to the shorter-range (annual) focus of the state travel office.

### Recommendation

The research team recommendation is Type IV, a policy-driven institutional arrangement in which a clear authorizing environment exists and is recognized by both transportation and tourism interests as an essential strategy for economic development and health, fully supported by both the governor and the legislature. Some effort must be expended in this relationship to address the different authority levels of the agencies involved. Specifically, the cabinet-level status of the DOT or the DNR personnel and the often subcabinet level placement of the STO personnel (e.g., under Department of Development or Commerce) may create inequities that inhibit creativity, priority setting, or conflict resolution. In only a very few cases is the tourism function performed directly out of the Governor's Office. Therefore, it is very important that the Governor's Office be involved to influence this potential difficulty, particularly at executive budget-making time.

Type I is not endorsed because it is likely to produce a DOT-dominant arrangement, one that will probably create a "less than informed" planning process, yielding less pertinent data useful for decision-making. Type II is better but falls short of the continuous arrangements necessary to keep a wide variety of tourism issues in front of transportation planners. Type III, in some cases, has reached the potential for the Type IV arrangement, but it lacks full continuity, especially if the chief operating officers of relevant agencies change frequently, as is often the case. Significantly, the survey indicates that perhaps one third of the Type III states are developing legislative or executive mandates to elevate their agency relationships to a Type IV level.

Although Type V, by definition, would provide optimum coordination, it would be difficult to achieve unless state governments were "re-engineered" across the board to create single cabinet-level agencies with responsibility for both transportation and tourism. However, Type IV is a realistic possibility for all states. Based on the survey, the simple existence of a gubernatorial or legislative mandate is a necessary but not sufficient condition for optimum results. Of course, a state with low-level tourism activity might operate adequately with Type I or II; but the fact should not be minimized that no state surveyed indicated a disinterest in tourism, and commerce reports confirm that tourism is a major industry in most states, often among the top two or three.

Assuming the goal of a Type IV arrangement, it is necessary to ensure both state transportation and tourism agency participation in a formally coordinated effort. Because transportation agencies have demonstrated substantial proficiency in complex planning processes and because they are the key actor for the functional areas shown in Figure 1, it is recommended that this agency take the lead in inviting its state travel office to participate in a process that explicitly

considers tourism interests in association with the economic benefits of transportation plans and programs.

### Relevant Issues

These institutional arrangements exist in an organizational environment largely defined by the issues that must be addressed and the functional responsibilities that must be performed. The following two sections, relevant issues and functional responsibilities, lay out this framework in order to establish the arena where cooperative relationships are to be considered.

Although the nine relevant issues described here may not constitute an exhaustive list, the research team believes that consideration of these factors will address comprehensively the needs of cooperative interagency planning and operations that support tourism economic benefits. The inherent imbalance in money, personnel, and time requirements between transportation and tourism agencies is often evident in the issues discussed.

#### *Supply*

The first set of relevant issues are grouped as "Supply Issues": Is there enough of a commodity, service, quality, or standard? Is it distributed throughout the state? Do the rules (e.g., speed limits) allow its maximum use and does it connect with, draw from, or generate additional activity with other transportation modes (e.g., rail, air, ferry, and transit)? These types of questions can be applied to the following supply categories:

- Infrastructure Coverage
- System Capacities
- Regulatory Structure
- Intermodal Connectivity

At this stage in the development of our national and local highway networks, there are few tourism destinations or potential destinations that are inaccessible to vehicular traffic. The infrastructure coverage issue relates more to the required level of operation, maintenance, and rehabilitation consistent with the primary use of facilities. Whether tourism is enhanced by a six-lane interstate or a narrow scenic byway, it should be considered within the context of state highway system planning.

Virtually all of the operational characteristics of highways are determinants to the success of tourism. For instance, summer season construction and maintenance often substantially reduce capacity. Innovative work zone plans, well-planned detours, and timely information systems can ameliorate temporary capacity problems. Emerging ITS (smart car, smart highway) technology can help to better use existing capacity. Nonetheless, there are choke points along tourism routes that require underlying capacity increases.

The regulatory structure affecting tourism largely relates to traffic enforcement. These regulations, established for the general public, are designed to enhance safety. However, there is often a conflict between enforcement agencies and tourism businesses regarding the application of these regulations to tourists. Often the use of “prosecutorial discretion” is not consistent across different jurisdictions of police and judicial agencies, with a predisposition to regard tourists suspiciously. Extremes, such as strip-searching out-of-state drivers arrested for inoperable taillights, are rare, but the publicity is damaging.

One of the areas of tourism with the most potential for improvement is the manner in which various travel modes connect with each other to form a “seamless” passenger trip. As more and more travelers fall into the elderly and foreign category, their transfer from long distance modes (e.g., air, bus, train, and ferry) to shorter range highway modes (e.g., auto, taxi, bus, transit, and bicycle) becomes much more important. This issue is assuming more prominence in state and federal surface transportation legislation and is likely to gain increasing attention in the future.

### *Performance*

In addition to the tourism aspects of these four supply categories, related Performance Issues are as follows:

- Access and mobility,
- Cost and benefits, and
- Information systems.

The “attractiveness” of a highway system, measured in terms of accessibility to a tourism destination, has a profound effect on the economic outcomes of the subject facility. Congestion, construction delays, maintenance problems, and barriers for people with disabilities all diminish the attractiveness of a tourism site. Significantly, congestion is not uniquely an urban problem. It occurs during ski season at the Eisenhower Tunnel in Colorado, infrequently at an auto racing facility in the Poconos in rural Pennsylvania, annually at a huge experimental aircraft convention at Oshkosh, Wisconsin, and at thousands of other events throughout the nation on a year-round basis. Often, these event- or seasonal-related access and mobility problems are not given enough consideration in the design phase of a capital project, when the main concern is the determination of design capacity under free-flow traffic conditions. Not surprisingly, the national survey revealed that the more a state’s institutional arrangements are characterized by mandated or at least regular coordination (i.e., Types III and up), the more it is likely that recurring traffic problems will be considered in evaluations of system performance.

The “cost” of providing easy access and comfortable mobility is often the controlling factor for whether a tourism-targeted transportation investment can be justified. Actual benefit/cost calculations are difficult to perform to determine

tourism economic gains external to the highway, and repeated calculations are almost certain to “double-count” benefits already received by users of the basic capital improvement. Certainly, extra lanes on access highways may enhance mobility for the tourist attraction, but they are often difficult to justify. For example, another parallel tube for the Eisenhower Tunnel would be a prohibitive solution to the day-skier congestion problem.

Therefore, the “cost” of accommodating tourism is frequently borne by the non-tourist traveler in various congestion and incident management operational techniques. For instance, citing again the Eisenhower Tunnel, during certain weekend hours day-trip skiers returning to the Denver area are allotted three of the four lanes of the tunnel, while opposing traffic is allocated one lane—or the option of turning a torturous parallel route through a mountain pass.

To complement traffic control mechanisms employed for easy access and mobility, information systems need to be in place to inform the traveling public about what to expect en route to and at their tourism destinations. Billboards, radio/TV broadcasts, travel information at welcome centers and rest areas, kiosks at public locations (e.g., fairs, libraries, and government buildings), lighted information signs (e.g., for the occasional requirement for carrying tire chains as one approaches a high mountain pass in California), and a host of public and private published brochures, maps and advisories are, can be, and/or should be employed to reduce the real or perceived cost of delay for the tourist. Joint consideration of these operational performance issues by transportation and tourism agencies is more likely to occur in those states with a Type IV institutional arrangement, although Type III states with a history of interaction on some performance issues are shown to consider, at a minimum, the information services aspects of performance issues.

A strong institutional arrangement between transportation and tourism agencies is particularly important for developing a traveler information strategy for elderly and foreign tourists. Because of the special information needs of both, sustained throughout the duration of a trip, transportation and tourism agencies must work together to construct an effective means of conveying information. It seems likely that such cooperation would be most forthcoming in a Type IV (or V) institutional arrangement.

### *Impact Issues*

The Impact Issues, both of prominent interest within the political arena, are as follows:

- Distribution of economic development benefits and
- Environmental impacts.

The first issue concerns questions of equity, economic efficiency, and the effectiveness of distribution of economic benefits. This issue will continue to be paramount in the budget



allocation processes as states continue the transition from rural dominance to a more urban and suburban focus. Currently, there is substantial competition within states between rural and urban tourism interests with regard to spending public (largely transportation) funds to support tourism services and facilities.

The second impact issue—one that is perhaps most prominent of all—is the environmental impact of actions taken in support of tourism. In performing necessary environmental assessments, very complex relationships may ensue between state transportation agencies, natural resource agencies, attorneys general, and other state or local entities, as well as federal regulatory agencies such as the EPA or the Corps of Engineers.

The consequences of federal mandates, (e.g., ISTEA, the Clean Air Act, and the Clean Water Act), have imposed substantial restrictions on states in several areas. However, as a result of these same mandates, many of the state and federal oversight institutions have encouraged the practice of multi-agency decision integration—all the way from realistic project need estimation, through planning and design, to mitigation and performance characteristics. With regard to the tourism community, their interests should be more energetically integrated into this complex process.

The complexity described above pertains mostly to construction of additional capacity. There are also many aspects of environmental quality that are operational: traveler amenities, incident management that reduces extreme congestion, facility beautification, rest area cleanliness, and other “soft-side” elements that enhance traveler appreciation.

### Functional Responsibilities

In every organization there are basic intra- and inter-agency coordination activities that occur. For the institutional types previously described, these activities involve the additional application of six organizational functions to *each* of the nine relevant issues. These six functions are

- A. Formal Reporting and Review: keeping track of plans, projects, data, achievements, and so forth;
- B. Planning: evaluating what was done and what will be done about an issue;
- C. Design: developing the specifications for real and executable projects that support the planning expectations;
- D. Management Systems: maintaining ongoing control of inputs and outputs (data, money, personnel, equipment);
- E. Policy Development: developing specifications for each issue of the “who,” “when,” “why,” and “how” as a guide to a successor set of players; a repeatable process; and
- F. Impact Analysis: determining in magnitude how changes within Supply, Performance, and Impact elements enhance economic benefits associated with tourism.

The following section details an approach to evaluating the interrelationship of the matrix elements, both in terms of existing institutional arrangements and desired ones. Referring again to Figure 1, the reader will note that the three dimensions of the matrix are I to V types, 1 to 9 issues, and A to F functions. There is, as a result, the potential for 270 cells within this matrix. In the first analysis, the focus is restricted to a single level, Type III. This approach reduces our focus to 54 cells—the Issues versus Functions set for evaluating an arrangement presumed to be Type III.

### A Step-by-Step Process for Analyzing Interagency Relationships

It is recommended that the analysis of an existing institutional arrangement involve rating the effectiveness extant for each cell, say on a scale of 1 to 5 (5 being the highest grade). These “grades” would most likely result from qualitative observations, largely perceptions of excellence (or lack thereof), but measured inputs should be encouraged and developed where possible. Although not universal, the national survey suggests that these 1 to 5 grades typically will correspond to the “type” category for institutional arrangements. That is, interagency relationships demonstrating little or no coordination will characterize Type I, and substantial mandated cooperation would be Type IV. It would follow then that, in a cell of the Type IV level, the grade of “1” would indicate that—in terms of that cell—the two agencies are operating at a Type I (i.e., lower) level.

A more detailed description of this process is provided below.

- **Step 1(a): Form Teams**

*Form a team of transportation and related agencies and teams of tourism/travel and related agencies on a combined team*

- **Step 1(b): Decide Type of Institutional Arrangement in Existence**

For purposes of illustration, let us assume that teams of representatives of transportation agencies and tourism agencies are meeting to analyze and improve the coordination of transportation/tourism affairs (e.g., policies, procedures, projects, and programs). Suppose then that the group (or each team independently) decides that the type of institutional arrangement they appear to be operating under is Type III, based on the perception that coordination is the result of an informal (perhaps verbal) memorandum of understanding or a tradition under which relatively frequent meetings occur to discuss specific activities or issues.

- **Step 2: Establish Issue versus Function Questions and “Grade” Cells**

For the 54 matrix cells collectively, a grade “topography” can be produced, representing a self-evaluation of an agency’s performance relative to the 54 variables in

this matrix. There is substantial value in considering the grades supplied by both agencies; however, there may often be a discrepancy in these two agencies' perceptions of transportation-tourism activities. Therefore, it is recommended that, in the first round of this exercise, each of the two teams performs its consensus grading independently to illuminate more precisely where perceived disparities are most severe.

As the exercise continues, each team should be required to develop a pertinent question for each cell, addressing the interaction of issue and function until all 54 cells are graded. As an example, a series of such questions is provided in Appendix B.

The analysis exercise should be performed as follows: For each cell, the question is posed that examines the Issue versus Function interaction and then a grade of "how well" (1 to 5) is agreed upon, using known examples as reference points. For instance, consider cell III-2-A: III is the assumed level (and likely degree of effectiveness); 2 describes systems capacities; A is the area of formal reporting and review.

Sample Question: (III-2-A)

Is the impact on tourism explicitly considered when determining highway capacity, and is that consideration enabled or enhanced by the existence of reviewable and reliable data in an accessible written report or database?

Transportation Team consensus— grade = 4

Tourism Team consensus — grade = 2

Sample Question: (III-8-B)

How well does the capital program transportation planning process account for the distribution of economic benefits to various tourism facilities and the geographic areas surrounding them?

Transportation Team consensus— grade = 3

Tourism Team consensus — grade = 1

The disparity of grades between these two hypothetical teams is very consistent with the results that were generated in the national survey. In part, it can be explained by a general lack of knowledge by tourism agency personnel about the transportation capital project planning process.

• **Step 3: Conduct Joint Meeting with Teams to Achieve Consensus**

After each of the two teams completes its analysis according to the procedure suggested, the teams need to meet together to arrive at consensus grades. This exercise is designed as an opportunity to discover the reasons for disparate grades for a particular cell. In many cases, these disparities may be attributed to the fact that each team has posed a different question. It is intended that any misunderstanding of roles, processes, data needs, and other coordination elements will be unearthed in this process.

Following these discussions, the group as a whole (i.e., both teams) needs to determine the consensus grade for each cell. They then will need to compare these results with those expected for a Type III (or better) institutional arrangement.

• **Step 4: Report Results and Compare with Expectations**

The results of a hypothetical case analysis are shown in Figure 2, in which the grade for each cell (Issue versus Function) is represented as the height of a three-dimensional bar. These heights are displayed in comparison with a grade of 3 (equivalent to Type III), providing a visual method for comparing actual inter-agency practices in relation to a grade 3 benchmark. Opportunities for improvement can be identified in this graphic, and areas or relative strength are shown by the white portions of the bar heights at "III" or above.

To support Figure 2, sample questions and grades for each of the 54 Issue versus Function cells are provided in Appendix B. In actual practice, it is preferable that the questions be created by the two teams individually. Where significantly different questions are framed by each team, it further illuminates the need for better understanding of relevant processes affecting these two agencies.

Performing this analysis will guide the selection of elements for an Action Plan that can enhance and improve coordination between transportation and tourism agencies and ensure maximum beneficial economic outcomes. The Action Plan should be very specific on funding requirements, data needs, personnel assignments, time schedules, reporting lines, and administrative guidelines for obtaining and maintaining an authorizing environment. The research has shown that such an environment will be strongest if a top-level mandate is driving it. Therefore, it is recommended that the Action Plan outline the strategy for obtaining said mandate from the Governor or legislature or at the very least from a cabinet-level memorandum of understanding.

### Achieving the Optimum Level

The analysis exercise described above, used to compare a state's current coordination practices with those of a standard type of institutional arrangement, relies on the existence of evaluation mechanisms.

The institutional arrangement selected to most effectively carry out coordination of agency responsibilities will depend on the answers to the following questions:

- Were all relevant issues identified, adequately described, and understood in the same way by both agencies?
- Were consensus priorities achieved among the agencies?
- Were adequate resources provided in terms of time, people, administrative support, and executive guidance for the coordination process itself?

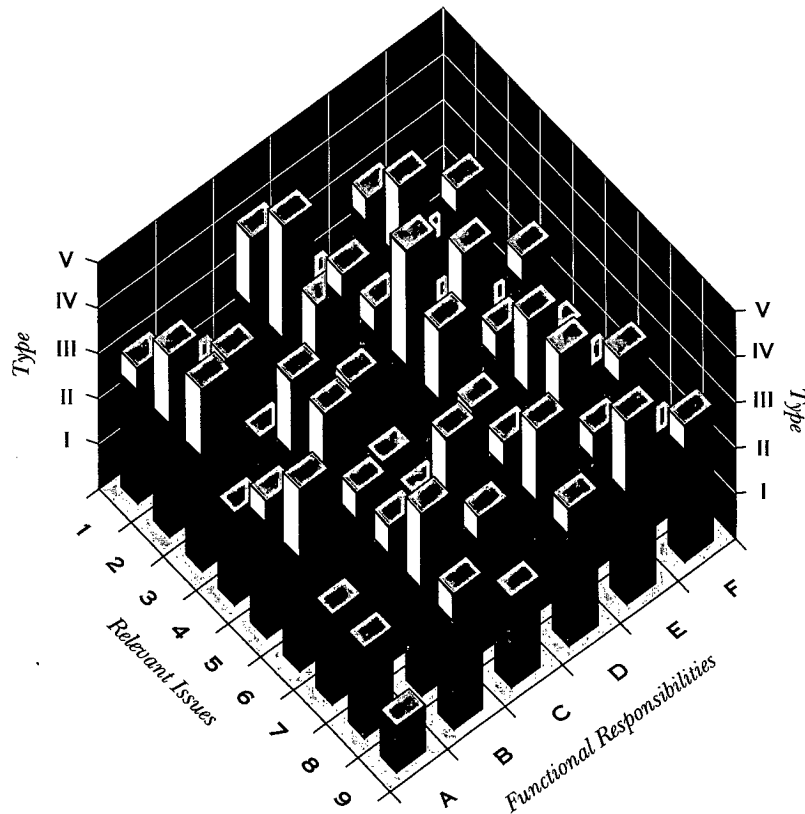


Figure 2. Attributes compared with Type III expectation.

- Were solutions found, implemented, and then evaluated for use in the next cycle?

The information received from this project's extensive surveys, and particularly the impressions gained during discussions with two focus groups representing state transportation agencies and state travel officers, point toward Type IV (or at least Type III) as the institutional arrangement necessary for effectively addressing these four evaluation criteria.

### Final Comments

On the basis of the survey results and related elements of this study, the most critical coordination cells concern the issues/functions of (1) planning infrastructure coverage that addresses tourist requirements; (2) considering intermodal connectivity for tourists during the policy development phase; (3) performing cost/benefit assessments that include the planning and design of transportation services and facilities for tourists; (4) incorporating traveler information services into planning, design, and policy development; (5) explicitly considering the distribution of economic benefits versus a state-level, engineering-oriented investment in transportation projects during the planning and analysis phases; and finally (6) enhancing and mitigating environmental effects on tourists through policy-driven planning.

The 12 cells of the attribute matrix (Figure 1) that appear to bear most directly on these issue/function elements are: 1-B, 4-E, 6-B, 6-C, 6-F, 7-B, 7-C, 7-E, 8-B, 8-F, 9-B, and 9-E.

As explained earlier, the questions in Appendix B provide examples of defining each cell. Concentrating on only 12 cells is a less daunting exercise than the full 54 cells and should yield a manageable action plan. The remainder of this report provides principles, guidelines, methods, and recommendations that further illuminate the 12 function/issue cells shown above.

### PRINCIPLES FOR INTEGRATING TRANSPORTATION AND TOURISM OBJECTIVES

The previous section detailed an approach for state governments to assess their coordination practices as a basis for improvement. This section discusses the essential principles that shape transportation-tourism relationships, with greater emphasis on economic development objectives. This discussion is intended to guide transportation officials on steps to take to better relate transportation investment decision-making to tourism concerns.

Transportation investment is becoming increasingly tied to economic development goals and to the corresponding activ-

ities that result in enhanced state and local economic growth. Tourism, a critically important industry in most states, is such an activity and offers the opportunity to produce economic paybacks through transportation investment. Tourism generates significant revenues and jobs. In some states, many local economies are closely tied to tourism (often seasonal).

The ability of international and domestic tourists to travel to recreational and tourist sites is an important element of a state's strategy to attract tourism revenues. The types of actions available to the state DOTs for enhancing tourism can vary from urban to rural areas, from recreational to historic sites, from a focus on international visitors to domestic tourists, and from access via automobile to access via other means of transportation. Thus, a coordinated approach for linking transportation investment with investment strategies designed to enhance tourism should occur within an overall coordinated policy and planning framework. One such framework, of course, is the statewide transportation planning process that has received emphasis under the aegis of ISTEPA.

The study team's preliminary research revealed that, even though there is widespread state recognition of the importance of the transportation-tourism relationship, there are few examples of where such a comprehensive and affirmative strategy or policy has been developed. Given the importance of tourism to national, state, and local economies, there is a role for state DOTs, in addition to STOs, in advancing the objectives of tourism.

The three major areas where transportation planning and tourism concerns can be linked are the **policy level** (where overall organizational coordination for a state's strategy can be outlined), during the **transportation planning process** (when investment strategies are being identified and prioritized), and at the **project-development level** (when individual projects are being implemented and greater sensitivity to tourism concerns can be incorporated into project design). In this last case, these projects are typically grouped (after analysis) into multi-year (5-, 6-, 10- and 12-year) programs for program budgeting purposes.

The following sections of this report provide specific recommendations on how tourism and transportation decision-making can be linked to each of these three areas.

### **Policy-Level Coordination**

As observed in connection with institutional relationship types, effective coordination between tourism concerns and transportation decision-makers is greatly enhanced if some formal policy or strategy statement is created that outlines the mandate and the goals to be achieved. In association with this project, the research team reviewed a series of such policy documents submitted by agencies participating in the preliminary survey of agency practices. As was found in the State of Oregon, for example, both the state transportation agency and the state travel office include mutually supporting policies in their respective plans. The state-level strategies that were produced by this joint effort include actions related to scenic

byways; travel signing; welcome centers; rail, transit, and air connections to tourism sites; and the designation of scenic tourism corridors. By providing for the coordinated development of these strategies in their respective state agency plans, these two agencies enabled the most cost-effective allocation of transportation and tourism funds to occur.

Below is a discussion of four basic principles that provide an important point of departure for **linking tourism with transportation decision-making at the policy level**.

#### **Principle 1. The private sector plays a decisive and critical role in tourism planning.**

Private firms and groups provide many of the attractions and marketing activities that define a state's tourism industry. Although public investment and coordinated public agency activities can provide increased visibility and supporting services to this industry, the central direction comes from the private sector. Thus, a coordinated approach to tourism involves creating new interactions among the different groups involved and developing new joint efforts between the public and private sectors. There is an important role that state agencies can play at this level, namely providing support through government policy and through investment in those services and infrastructure that best complement actions taken by the private sector.

#### **Principle 2. Institutional mechanisms facilitate coordination between the state transportation agency and tourism organizations and groups.**

For tourism concerns to be incorporated meaningfully into statewide transportation planning, some form of institutional framework needs to be in place to foster such a linkage. Methods for establishing this framework include interagency agreements and policy statements, and/or gubernatorial directives that outline the overall goals for coordinated statewide investment. In addition, any of these policy initiatives should include a definition of the organizational responsibilities for implementing the state policy. As noted in the results from a preliminary survey of DOTs and STOs, a gubernatorial directive seems to increase coordination efforts designed to further a state's tourism goals.

The State of Texas Strategic Travel and Tourism Plan is an excellent example of this kind of policy directive. Although called a Plan, this document was actually a strategy document that defined the importance of tourism to Texas, identified the specific goals that coordinated state action was to achieve, and assigned organizational responsibilities for the action items associated with each goal. Some examples of the role for Texas DOT in implementing this state plan are shown in Table 1.

Although certainly an excellent reference for a well-thought-out strategy for enhancing tourism, this effort probably goes far beyond what most states have in place or possibly need as a state strategy. If such a comprehensive strategy does not exist in a state, and the likelihood of not developing one is high, then a state can rely on other institu-

**TABLE 1 Example of the DOT role in implementing a state tourism strategy**

<u>Goal</u>	<u>TxDOT Role</u>
■ Attract More Domestic Visitors to Texas	<ul style="list-style-type: none"> <li>● Increase readership of popular magazine, <i>Texas Highways</i></li> <li>● Produce a quality fulfillment package that provides meaningful travel information and encourages potential visitors to come to Texas</li> <li>● Share inquiries for travel information with travel-related public and private sector organizations to enhance private sector marketing programs</li> <li>● Encourage increased motor coach trips to and within Texas</li> <li>● Produce information materials to assist domestic travel-trade professionals</li> </ul>
■ Develop, Manage, Preserve, and Promote Public Use of Texas Natural, Cultural, and Historical Resources	<ul style="list-style-type: none"> <li>● Assist regions, local communities, businesses, and individuals in developing and promoting attractions</li> <li>● Conduct and coordinate beach and lake cleanups and Adopt-A-Highway programs</li> </ul>
■ Provide Travelers in Texas With Accurate Up-to-Date Information on Destinations, Attractions, and Events	<ul style="list-style-type: none"> <li>● Use interpretive exhibits, "infoboards," and audiovisual exhibits at rest areas</li> <li>● Provide front-line travel information services via the Travel Centers</li> <li>● Provide computerized travel information services for use by travelers and the Texas travel industry</li> <li>● Operate toll-free telephone line</li> <li>● Provide media with a wide range of information including news releases, press packets, and media response kits</li> </ul>
■ Encourage Extended Stays and Visitations	<ul style="list-style-type: none"> <li>● Operate information centers at key gateway entry points</li> <li>● Provide professionally trained counselors to extend State's hospitality at State parks</li> <li>● Provide travel assistance through a toll-free number to help traveler's trip planning</li> </ul>

tional mechanisms to link transportation and tourism. These can include memoranda of understanding, interagency policy statements, and project-specific agreements. Of course, specific executive and legislative action could mandate such connective agreements as a matter of state policy. In addition, institutional agreements alone will not provide the desired outcome without some recognition that tourism should receive some priority in the state budget and revenue-raising process.

**Principle 3. Enhancing tourism can be accomplished through explicit consideration in a state transportation plan.**

Although this principle could reasonably be placed in the second area of linkage defined earlier (i.e., under the transportation planning process), many state transportation plans

function as policy documents and, therefore, can play an important role in guiding transportation investment. Statewide transportation planning focuses on various issues of concern to the state, including economic development, congestion on the road system, safety, maintenance, and improvement of the basic condition of the highway system, environmental quality, and mobility.

Given the importance of tourism to a state's economy, its transportation plan should identify enhanced tourism as one of the goals or objectives for transportation investment. Depending on the circumstances, tourism could be either a stand-alone issue or one integrated within economic development goals. In addition, state DOTs need to consider at what level of the organization this principle can be best implemented. Large states—Texas, for example—rely on

district offices to carry out their planning program. Therefore, this planning principle should be applied at the level where coordination with public and private tourism groups would occur most effectively.

The importance of this third principle lies in the ISTEA mandate that calls for a statewide transportation planning process that considers a broad set of factors as a basis for transportation investment decisions. Tourism is identified as one of these factors. The 1993–1994 Strategic Plan of the South Dakota Department of Transportation is a good example of how such concerns can be incorporated into the state transportation plan. The following was extracted from this Plan:

- Goal 1: The Department of Transportation's goal is to provide a cost-effective state and local transportation system to support tourism, enhance economic development, and facilitate the movement of people and goods in a safe, timely and efficient manner.
- Objective: *Improve tourism and recreational access*  
Annually develop a plan to promote the development of highways leading to tourism and recreational sites, facilities and services. . . .

By explicitly placing recreational travel and tourism in the transportation plan, a state transportation agency provides a focus on this important economic activity and its critical link to transportation investment. Such a focus should facilitate very specific identification of which travel and tourism markets are most important to the state and which transportation strategies are likely to be most effective in these markets. This is not to suggest that transportation planners assume a lead or exclusive role in defining the tourism markets where transportation investment can support tourism. This activity should be undertaken cooperatively with all of the relevant groups and organizations in the state. However, because identifying markets and strategies represents the primary purpose of the statewide transportation planning process, it is reasonable for the DOT to be proactive.

**Principle 4. Transportation policy addressing coordination with tourism concerns is most effective when all state DOT functions that can provide important enhancements to such activity are included.**

The case studies and literature search conducted as part of this project indicate that many state DOT functions could have an important link to tourism and recreational travel. Some of the more important include the following:

- Planning/programming,
- Project development/design,
- Traffic engineering,
- Construction,
- Maintenance, and
- Public relations.

Each of these functions will be discussed in greater detail in the next section of this report.

All of these functions are important areas of linkage to tourism; however, they tend to be neglected. Perhaps the one most neglected is maintenance. Maintenance includes a wide variety of activity that can affect a tourist's ability to reach a destination or a tourist's experience upon arrival. For example, closing rest areas during pavement resurfacing projects or neglecting to provide adequate routing on roads connecting to major tourism sites hinders tourism.

A comprehensive state DOT policy aimed at supporting a state's tourism should include specific actions for each functional group described above. This outcome is often not easily accomplished unless there is specific direction and continuing interest from an agency head.

**Transportation Planning Process**

The degree and level of sophistication in planning transportation facilities that serve tourism varies from one state to the next. As indicated in the national survey, 44 percent of the responding state DOTs reported that they explicitly consider tourism in their planning process. This consideration ranges from numerically estimating the positive tourism benefits associated with some change in the transportation system to simply assuming that general improvements to the transportation system will benefit all users, including visitors.

The principles that form the basis for **linking tourism concerns with transportation planning** are as follows.

**Principle 5. A state DOT's proactive involvement of tourism groups in the transportation planning process will facilitate linking transportation investment with tourism concerns.**

To be successful, the statewide transportation planning process must be a cooperative venture involving a state DOT, STO, and other agencies and groups having a stake in cost-effective transportation system performance. This cooperative venture offers opportunity to include in the planning process those stakeholders who may be able to contribute to finding solutions to tourism problems. This opportunity, however, could become a significant challenge to a state DOT. The tourism industry is characterized by numerous agencies and groups, each necessarily having its own set of mandates and missions. Not only is the challenge to identify all those groups having potentially important contributions, but also to establish a mechanism (see Principle 2) that will enable constructive interaction among all parties. In implementing the state's strategic plan, the Texas DOT, for example, is an active liaison with local chambers of commerce, convention bureaus, event sponsors, campgrounds, museums, recreational site operators, commercial tourism attractions, resorts, and numerous tourism associations. All of these groups often can provide unique perspectives on the transportation needs of that portion of the tourism market they represent. However,

because there is usually no mechanism for these needs to be communicated, the state DOT must play a very proactive role in seeking input, particularly from the STO.

**Principle 6. It is beneficial to have a broader definition of transportation system performance (as defined by performance measures) that includes the linkage between such system performance and the benefits associated with tourism.**

One of the important contributions of ISTEA is the formal consideration of transportation system performance in the statewide transportation planning process. This consideration includes relating performance to overall goals and objectives by identifying performance measures and periodically monitoring the achievement of desired performance through system monitoring (e.g., through the now-optional ISTEA-defined management systems). System performance can be defined in many different ways, with the more traditional engineering-oriented approaches (e.g., surface condition) applied to the system or with facility efficiency measures such as volume-to-capacity and congestion indexes.

In many states, system performance is defined in broader terms related to the fundamental roles that transportation plays in a state or metropolitan area. For example, transportation infrastructure and services can be directly linked to economic development, environmental quality, and quality of life. In this broader context of system performance, tourism can be associated with the benefits derived from the transportation system. One perspective is that tourism revenues and job creation are a significant benefit under the category of economic development. Access to recreational facilities is an important consideration in quality of life and thus could become an important tourism-related performance measure. The traditional highway performance measures, which emphasize high volumes, would preclude consideration of scenic routes with generally lower volumes. Such routes, however, would be candidate projects for maintaining road conditions and route attractiveness and for applying land use protection measures to ensure continued attractiveness of the area.

Therefore, to the extent that DOT officials are adopting a broader definition of system performance, tourism and recreation benefits should be directly linked to how “good” system performance is measured.

**Principle 7. Transportation planning to enhance tourism improves with the use of better tourist-related travel data.**

Effective transportation planning for all types of issues and problems is based on the collection and analysis of relevant data. This is especially true for tourism, which is market-driven and responds to economic and behavioral factors associated with different market groups. Therefore, to truly understand the tourism market and its relationship to transportation investment in infrastructure and services, DOT

planners need to use data that describe the underlying travel phenomena.

According to the national survey, 96 percent of the DOTs responding use origin-destination tourist travel data in their planning efforts. Other types of data used by DOT officials included, in order of use, visits to recreational sites, origin-destination data for terminals, tourists entering and leaving the state, tourism-related employment, statewide tourism expenditures, regional tourism expenditures, and tourism-related business receipts. Interestingly, STO use more of these types of data in planning than their DOT counterparts. Three-quarters of the reporting STOs use at least six of the eight data items mentioned above—38 percent of the DOTs use five or more from this list. The implication of this finding is that a larger database of tourism-related information is probably available to DOT planners, if such data were desired. In addition, DOTs might consider the joint funding of data collection efforts designed to provide tourism data that would benefit both agencies.

**Principle 8. Establishing project priorities for inclusion in a transportation program is best based on analytically sound methods that include the benefits associated with tourism.**

Two-thirds of the DOTs responding in the national survey indicated that the economic benefits of tourism are considered in establishing project priorities. The DOTs and STOs in only six states indicated agreement on the question of whether economic benefits of tourism were considered in project prioritization. This result indicates that, in most cases, there is little analytical rigor applied to how economic benefits are actually considered in prioritization. Not surprisingly, the survey results indicate that those states having state legislative or gubernatorial mandates for DOT support of tourism-related policies are more likely to have an economic model or, at least, more sophisticated analysis procedures to estimate the benefits of tourism than states without such mandates.

There are some examples of good practice in states where benefit/cost ratios (which include the benefits of tourism) and economic models are used to estimate, in economic terms, the benefits associated with a specific transportation improvement project. However, many DOTs show a reliance on default values. Principle 8 does not require that all DOTs develop and use either benefit/cost ratios or statewide economic models to assess project priorities in the development of the transportation program; however, as ISTEA and diminishing resources for transportation encourage the more rigorous assessment of project priorities, this principle suggests that tourism benefits should be explicitly represented in any tools and/or procedures that are developed and used.

**Principle 9. Funding and project implementation for tourist-oriented projects should reflect those partners in the process who have a jurisdictional role to play and those who will benefit from the improvement.**

One of the important principles embedded in ISTEA was the need for partnerships among the many different groups interested in the provision of transportation infrastructure and services. Given the importance of tourism to a state's economy, major transportation system improvements intended to enhance tourism opportunities should be of interest to various organizations and groups. The project implementation process, therefore, should be designed to provide opportunities for these groups to participate fully. This participation means not only providing input on strategies that will be used to construct a project or implement a service, but also possibly channeling information to key constituencies or user groups that need to know what is happening and when it will happen. An example of this liaison role is providing information to tourists and other users when a particular transportation facility is under construction for an extended period and could cause disruption to the traveling public. Tourist groups, chambers of commerce, hotel/motel associations, automobile associations, and local governments can play a critical role in disseminating information on how to travel during the construction periods.

At a more involved level, those groups that benefit from a transportation improvement might also be part of the strategy to fund the construction and operations of a facility or service. An example of such an arrangement is found in many states where welcome centers are funded by the state transportation agency (or jointly funded with the STO), with the operations and maintenance of that facility then becoming the responsibility of the STO. Each project will have its unique institutional and political circumstances, so that the level of success of jointly funded projects will vary from one jurisdiction to another. However, tourist-related transportation improvements are oriented to a fairly well-defined traveling market. It seems likely that those who will benefit from such improvements can be identified, which is the first step in formulating a strategy for shared project funding.

Other forms of innovative funding include the use of ISTEA enhancement funds (in combination with private funds) for improvements aimed at the tourism market and the requirement for a greater than normal local sponsor funding match to motivate non-government funding sources. Innovative funding packages also can be developed with funds designated for scenic highways and recreational trails.

### Project Development

The national survey results indicate that DOTs are most active in tourism issues at the individual project level. Often, the DOT provides some component of a project that complements the overall project design, such as road signing or logo signs. This type of involvement is usually done on a project-by-project basis with most participation directed from the project development or operations groups within a DOT. For other types of projects, such as scenic turnouts, bicycle paths, and rest areas, the DOT is the principal plan-

ner and designer of the project. The survey further indicates that for welcome centers and tourist information maps, the DOTs and STOs have similar responsibilities, with primary responsibility negotiated on a case-by-case basis.

The principles that form the basis for **linking tourism concerns with project development** are as follows.

**Principle 10. Although the responsibility for providing traveler information service activities tends to be divided between state transportation departments and state travel offices, the most effective tourism-related transportation projects will likely occur when projects are jointly planned and designed.**

The survey results indicated that different types of traveler information service activities were most often the major responsibility of a state DOT or a state travel office, but seldom a joint responsibility. For example, the planning, design, and approval of projects primarily considered as part of the "normal" transportation agency mandate (e.g., scenic turnouts, road signage, historical markers, and road advisories) were clearly dominated by state DOTs. There was little indication in the survey results that much interaction occurred between the tourism industry or state travel office during the development of these types of projects. As noted above, however, the tourism organization will often have much more data on travel behavior and visitor characteristics than will the state DOT. These data and what they reveal about travel and information needs for a given market could be an invaluable source for those responsible for prioritizing and designing projects. For those projects with a clear effect on tourism, the project design process should be structured as a team approach with representatives from the tourism organization solidly represented.

One of the confounding differences between STO and DOT administrative practices is that time horizons associated with each type of planning differ. Transportation planning often has a very long time horizons for considering the transportation needs of the state and adopting strategies to meet these needs. For STOs, many of the key goals addressed in their planning process are very short term and designed to be as flexible as possible to respond to changing market demands. Therefore, coordinated planning between these two agencies can often be a significant challenge.

**Principle 11. Traveler information services are an integral element in all projects designed to enhance tourism.**

Transportation investments that encourage tourism can take many different forms, ranging from new highway construction to additional scenic turnouts on an existing roadway. In each case, however, providing traveler information for the sites served or for the new opportunities created by an enhancement is critical to the success of the project. Tourist-oriented road signage, promotional brochures, tourist-oriented radio channels, interactive kiosks, and special con-



dition advisories, just to name a few, will produce significant improvement in reducing traveler uncertainty about reaching a destination.

Approximately three-quarters of the agencies surveyed reported the use of special strategies or innovative approaches to implement traveler information services. In addition, the survey indicated that many state DOTs are beginning to emphasize special traveler information for elderly travelers, whereas state travel offices seem to be placing more emphasis on international visitors and visitors with disabilities. One of the probable reasons for these differences in emphasis is the importance that DOTs give to safety issues, including driver ability, which tends to decrease with advancing age, versus the significance that STOs give to accommodating visitors in a new environment. The importance of each of these market groups cannot be overestimated. Both will likely account for an increasing share of travel expenditures in the coming decades. With the advent of intelligent transportation system technologies, transportation and tourism officials will be able to provide tailored information services to these important markets as part of investment projects or even as stand-alone initiatives.

For both agencies, the concept of providing up-to-date and relevant travel information to specific market groups is an important component of a state's transportation and tourism strategy. The most effective time to emphasize traveler information services is during project development. Careful consideration of the information needs of the target users of the system or facility during project development can help link the physical design of a project and the ability and willingness of individuals to use it.

These 11 principles are an important starting point for better linking of transportation system investment and operational decisions with tourism concerns. The actions that state DOTs must take to support these principles embrace changes that could occur at the policy level, in the planning process, and in project development. Many of the actions will vary from agency to agency, depending on a state's emphasis on tourism, agency policies, and agency structure.

#### **GUIDELINES FOR FOSTERING INTERAGENCY COORDINATION IN STATEWIDE TRANSPORTATION PLANNING**

This research effort has produced some basic principles that can guide transportation and tourism planning. These principles provide a framework for coordinated action between DOT and STO agencies by identifying where joint planning, or at least communication, can advance tourism-related transportation activities. This section, incorporating previous research findings from this study, provides guidelines for instituting a planning and project development process that is sensitive to tourism concerns. These guidelines relate to data, goals/objectives, evaluation criteria, and meth-

ods for analyzing tourism benefits in project prioritization. In addition, these guidelines are designed to foster joint planning in those areas where this research has found clear overlapping interests (e.g., welcome centers, maps, and signage).

Success for the tourism sector is primarily related to the activities taken (or not taken) by private sector organizations. Market forces heavily influence the types of services offered and how tourism opportunities are marketed. Investment in transportation facilities and services is important to a state's tourism strategy, but often it is not critical to success. Investment is, in fact, a complement to the many other decisions made by a host of organizations, that are all intent on attracting more visitors to the state.

The guidelines offered here focus primarily on actions that can support a transportation investment decision-making process that is sensitive to the challenges and opportunities associated with tourism. These guidelines are presented as a checklist of questions that state transportation and state travel officials should ask themselves about their current approach to planning and project development. Each question has attached to it a series of actions that could be taken, depending on the response and the circumstances found within the agency. Using such a format for guidelines has proven effective in providing guidance to program implementors.

#### **Guidelines**

**1. Does your state or agency have a formal policy statement that cites tourism as an important benefit associated with transportation investment and vice versa?**

*Yes:* Having a formal policy statement is important for an effective transportation-tourism relationship; however, policy statements often are general and do not provide direct guidance to agency personnel on the justifiable investment of funds. Review and consider rewording your policy.

*No:* The legislature, agency policy board, or chief executive should adopt a written policy clearly stating the important tie between transportation investment and tourism. This action could be a revision to a current policy statement or the adoption of a separate statement. Elements of such a formal policy statement should include statements relating to

- Policy links between transportation and tourism investments,
- Institutional coordination among the different agencies and groups involved in transportation and tourism establishment of clear agency responsibilities for different aspects of the project development process and project implementation,
- Active consideration of tourism benefits in investment and operational decisions,

- Guidance on the types of projects and services that should be considered jointly by the state transportation agency and the state travel office, and
- Creative funding arrangements for projects that offer important tourism benefits to the state.

A formal policy statement should indicate that the state's expectations on transportation and tourism interaction include resulting actions that can be measured and evaluated.

**2. Are tourism benefits and concerns incorporated in the state transportation agency's standard operating procedures for planning, project development, design, and maintenance?**

*Yes:* Review to ensure that these procedures reflect the most recent information on appropriate agency actions that relate to tourism concerns.

*No:* Examine current standard operating procedures (perhaps using an agencywide task force and STO participation) to identify where changes should occur. Special attention should be given to planning, engineering design, traffic signage, and maintenance. Some possible actions include the following:

- **Planning** – Provide systems-level connections to tourism activities and incorporate such concerns into the priorities established for program implementation.
- **Project development/design** – Establish design concepts and project characteristics that are conducive to tourism (e.g., scenic vistas, scenic byways, rustic roads, local road improvement programs, and rest areas along heavily traveled routes) and geometric design considerations appropriate for recreational vehicles and tour buses.
- **Traffic** – Provide effective signing to tourism sites and coordinate traffic operational patterns associated with seasonal events and travel demands.
- **Construction** – Incorporate effective mitigation strategies into construction projects to avoid confusion and long delays for travelers. (Peak tourism seasons usually coincide with peak construction activity on the highway system, so many road users will be unfamiliar with the condition of the highway system in the state. Mitigation strategies

could include provision of circulation patterns through the construction site and provision of advance warnings and public information.)

- **Maintenance** – Target tourism routes for priority maintenance activities (e.g., snow removal, litter pickup, and grass cutting).
- **Public relations** – At a minimum, provide the traveling public with periodic updates on construction activities. [In a more comprehensive program or in a state defined by its tourism (e.g., Hawaii), providing marketing material and information to those interested in visiting the state is crucial. A special role for both transportation and tourism agencies is the joint preparation of state transportation maps that convey important transportation user information on key tourism sites in the state. The STO is likely to be most active in this area.]

Representatives from the tourism industry should be included in this assessment process, as well as officials from the state travel office and other agencies having a tourism role (e.g., Department of Natural Resources, Department of Environmental Quality, National or State Park Service, and Chambers of Commerce). Particular attention should also be given to the standard operating procedures in the district or division offices where many of the direct links between transportation action and tourism impacts occur.

**3. Is there an institutional mechanism for incorporating input from the tourism industry into your agency's activities?**

*Yes:* If so, is this mechanism working? Is there consistent participation from industry representatives? Has any specific, positive change occurred because of this participation? Does this group meet regularly or on an ad hoc basis?

*No:* ISTEPA requires each state to have a statewide transportation planning process that considers many factors, including tourism. As part of this embracing effort, representatives of various industries and concerns should be active participants in the planning process. If an advisory committee already exists, add tourism industry representatives and representatives from government agencies with a tourism role. If no such mechanism exists, consider establishing one. Another approach might be to

work with your state's MPOs and their public outreach process to obtain input on tourism concerns.

**4. Is the state travel office familiar with how the transportation project development and programming processes work?**

*Yes:* Familiarity with project development and programming is key to successful interaction between the state travel office and the state transportation agency. This is an important first step in coordinating the actions of both agencies.

*No:* Meet with STO staff and other key actors in the state's tourism industry to educate them on the often long and detailed process for taking a project from an idea to final construction or implementation. Describe the types of transportation projects that can affect tourism to and within the state and how these effects are expressed. Many private-sector tourism executives will not have an appreciation for the range of projects that can affect their businesses. Knowledge of how different projects often require alternative funding sources and project designs will be an important foundation for more cooperation in future projects.

**5. Have the state transportation agency, state travel office, and representatives from the state's tourism industry worked together on a very specific project or program focused on enhancing the state's tourism industry?**

*Yes:* Use the experience from this joint activity to better understand what institutional foundation needs to be established or enhanced to foster such joint efforts in the future.

*No:* Identify specific projects that could be undertaken in a cooperative fashion with the major tourism and transportation organizations in the state. Working on such a project will help develop relationships with key tourism and transportation representatives, and a successful project will demonstrate that cooperative activities can produce useful results. Projects that could provide important opportunities for cooperative efforts include

- Designation of a scenic road system,
- Inventory of major tourism traffic generators in the state (this activity would reinforce the recognition of interests shared by tourism and transportation organizations and would identify facilities and areas that need a transportation focus; data collection for these facilities also could be a valuable joint exercise),
- Identification of critical seasonal capacity constraints in the transportation system and development of strategies for dealing with the temporary capacity deficiency,
- Development of tourist-sensitive transportation maps and brochures for distribution at gateways,

- Development of a tourist-oriented road signage policy and system, and
- Selection of the state's largest tourist attraction for a special transportation study that examines a wide range of possible solutions to identified problems.

**6. Have the state transportation agency and state travel office adopted a formal memorandum of understanding?**

*Yes:* Be sure this agreement is specific enough with regard to responsibilities and process in order to be meaningful. Does the memorandum provide enough guidance to be helpful in project-specific activities (e.g., in developing welcome centers)?

*No:* Develop one. Although ad hoc interaction between the state travel office and the state transportation agency can be successful, some basic principles should guide this interaction. This memorandum should address areas such as organizational responsibilities for different actions to be taken, the process to be followed, and points of contact. The agreement could also address responsibilities for data collection and use.

**7. Does your agency collect or otherwise acquire data related to the tourism market?**

*Yes:* Examine such data to ensure that it is the type of data needed for the planning activities in your agency. Data should be related to the type of information necessary to support decision-making. If your agency is actively involved in tourism travel infrastructure and service investments, does such data provide you with a good foundation for making these types of decisions?

*No:* Data should not be collected simply to have good data. The types of data collected need to relate directly to the role your agency is playing or wants to play in the state's tourism strategy. The following data might be appropriate:

- Tourists entering/leaving state,
- Origin/destination data for tourist travel,
- Home residence of visitors,
- Visits to recreation sites,
- Length of stay,
- Origin/destination data for transport terminals,
- Tourism expenditures in regions,
- Tourism expenditures statewide,
- Tourism-related business receipts,
- Tourism-related employment,
- Tourism-related motor fuel tax revenues.

Use the following criteria for selecting the appropriate data to use in planning:

- Is the data item relevant to the target market for anticipated investments?
- Is the data item readily available?
- Can other indicators be used in order to avoid the cost of collecting source data?

- How often does the data need to be collected to provide useful information to the planning process?
- Are there ways of sharing the costs of data collection (e.g., with the state travel office)?
- Ultimately, does the ongoing collection of data used for planning provide some sense of the impact of transportation investments over time?

It is particularly important to examine your agency's data needs from a strategic perspective that considers who else could participate in and benefit from the collection of such data. Strategic alliances with public and private groups could save your agency a great deal in data collection costs and could result in access to information that is in private hands or otherwise unavailable.

**8. Do other agencies collect and maintain data that would be useful in statewide planning concerned with tourism development?**

*Yes:* Develop a strategy for obtaining these data. This research established that state travel offices tend to collect more data on tourism patterns and behavior than a typical state transportation agency. Given the high cost of data collection, there is a strong incentive to use data that already have been collected. Although some available data might not measure direct behavior or system performance for a selected site, the data or some combination thereof could be used as a substitute for the desired information. Of particular interest is the need for "good" traffic data at major tourism facilities, especially large attractions (e.g., federal parks).

*No:* Propose to those agencies interested in such data that joint data collection activities would be cost-effective. View this collaboration as an opportunity for developing an overall strategy for joint activities with the other organizations interested in tourism and transportation.

**9. If your agency uses formal analysis methods to plan and prioritize projects, are benefits to tourism a criterion in the methodology?**

*Yes:* Depending on the level of sophistication of your analysis methods, assess the degree to which this information is useful for the decisions to be made.

*No:* Because each agency has its own approach to analyzing project benefits and assigning priorities, it is inappropriate to provide specific guidance on what methods should be used in all cases. Where the analysis of project benefits is undertaken systematically, however, tourism benefits should be part of the evaluation process. The model developed in association with this research project is one approach to ensuring this (see next section).

**10. Does your agency have specific written guidance (e.g., rules, regulations, policy statements, and statutes) for personnel involved in planning and implementing the most common type of joint projects (e.g., welcome centers and signage)?**

*Yes:* Review this guidance periodically to ensure applicability to changing market characteristics.

*No:* Develop agency guidance on process and design strategies associated with the type of facilities most often undertaken jointly. This guidance can be defined according to types of actions. Guidance for welcome centers, for example, may be very different than that for historical markers.

**11. Do state travel office staff or other industry representatives participate in the development and operation of the state transportation agency's traveler information services?**

*Yes:* This research revealed that projects such as tourist maps, welcome centers, signage, and brochures were the primary types of projects involving interaction between the tourism and transportation agencies. If such is the case, can this cooperative effort be extended to other types of projects? Identify different project opportunities where such involvement would be useful and productive.

*No:* Seek such participation. The most common interaction between the two agencies is with traveler information services. Tourism representatives will have very useful perspectives on the information needs of tourists. This input effort should include soliciting recommendations from visitors on their information needs and on how such needs can best be met.

**12. Has your agency developed a long-term strategy for providing information to special user groups (e.g., the elderly and foreign visitors)?**

*Yes:* Special user groups usually have distinct information needs and ways of obtaining such information. A comprehensive strategy for meeting these needs should include actions that can be taken by both the state transportation agency and the state travel office.

*No:* In many states, tourism is recognized as a critically important industry. Providing information to tourists in a manner that is understandable and convenient is important to a successful strategy. The state travel office and state transportation agency should develop a comprehensive program of information services that will help meet the needs of current and future tourists, especially special user groups.

**13. Is the state transportation agency developing a statewide strategy for the implementation of intelligent transportation system (ITS) technologies? [ITS refers to a collection of traffic management**

**technologies, many of which are designed to improve real-time traffic conditions through techniques such as road incident identification and response and in-vehicle and roadway informational and navigational aids (e.g., “best route” attraction/event information)].**

*Yes:* If information system technologies dealing with the needs of the tourism industry are not in the strategy, work with state travel officials and industry representatives to include them. One of the most beneficial aspects of ITS technologies is the conveyance of timely and relevant information—such information is critical for tourists.

*No:* Consider developing such a strategy for the tourism market. The tourist is usually the most uninformed traveler on the road with regard to local surroundings and best routes to reach destinations. The tourism market thus has excellent potential for the cost-effective implementation of ITS technologies.

## Summary

The guidelines presented here are intended to help state transportation officials in their assessment of current agency procedures concerning interaction between state travel and transportation representatives. These guidelines address the key topics that DOT and STO agency staff highlighted in the national survey. By answering the preceding questions and taking the necessary steps that result from these answers, state transportation officials will be able to provide an organizational environment that is more responsive to tourism concerns.

## MEASURES OF TOURISM TRAVEL OUTPUT AND LINKS WITH ECONOMIC DEVELOPMENT

Although interest in using more advanced analytic techniques in statewide transportation planning is growing, this research and other recent studies confirm that few state transportation agencies have the appropriate staff or tools to revise their standard practices. Engineering criteria have long been the gauge for assessing and prioritizing transportation construction and improvement projects. However, the new emphasis on maximizing transportation dollars through more comprehensive and strategic planning has elevated the significance of linking transportation investment to economic development.

Among the challenges for developing a tool that connects tourism travel output to measuring tourism growth in particular is the fundamental need to define appropriate terms and factors. This research has revealed wide variations in state perspectives and practices regarding tourism. Many of these differences can be attributed to state institutional structures

and state tourism programs. Therefore, in order to equip DOTs and STOs with economic analysis capabilities, it is essential to establish a foundation of concepts. The approach crafted here involves

- Defining “economic development,”
- Determining the best measure of economic development,
- Identifying preferred measures of tourism travel output currently used,
- Describing an optimum model for relating tourism activity to economic development through considering tools and data currently employed by state agencies, and reviewing existing models and case studies, and
- Validating the model.

The geographic unit of analysis for this discussion is the individual state; the costs and benefits of economic growth refer to those occurring within a state’s boundaries. Although the development model is considered optimum for state-level analysis, it is also conceptually applicable to sub-state areas, such as metropolitan areas or multi-county regions. The model’s successful use in a given sub-state area (hereafter termed “region”) depends on the availability of relevant data for that region and the degree of emphasis on economic impact within the chosen region’s boundaries. A distinction should be made, however, between economic growth at the state level and economic impact on a region. The former is analogous to enlarging the size of the state’s economic pie, while the latter relates to how the statewide pie is shared. When a transportation investment, such as a tourism-related highway improvement, is undertaken to shift “the uneven distribution of economic prosperity . . . among the regions and localities of individual states,” income redistribution is the objective and not economic growth. Although such an investment may increase jobs and incomes in a region, it may merely redistribute income growth from one area of the state to another, making no net contribution to the economic growth of the state. This assertion does not question that state authorities may choose to direct transportation investment funds to economically weak regions for legitimate reasons other than economic growth, but these other criteria are simply outside the scope of this research.

## Definition of Economic Development

“Economic development” can be defined in several ways. In standard economic texts, economic development usually relates to (1) analyses of why some countries are poorer and less industrialized than others and (2) policies for achieving development, such as financing necessary imports, attracting investment, encouraging exports, educating the work force, exploiting natural resources, and adopting new technologies. However, for state DOTs and STOs, this concept has little meaning.

The definition of economic development will thus vary from state to state (and decision to decision) depending upon the objectives chosen by executives and decision makers and the balance struck between them. This definition is too vague to serve as an objective or measurement standard. Consequently, it is more appropriate here to equate economic development in a state with its economic growth, a term commonly defined as “increased total production valued at market prices.” This interpretation provides the broadest measure of the economic output of a state (gross state product), often using a per capita basis to control for economic growth that results simply from population growth. This definition is somewhat broader than the definition of “economic development” proposed by Louis Berger International in *Transportation Investment and Economic Expansion*. The present definition includes income to all factors of production, not just personal income as proposed in the Berger study.

### **Best Measure of Economic Development**

There are two approaches to measuring the economic output of a nation or state. One is to total the final demand generated by the goods and services produced in a state for the four sectors of the economy: households (consumption), businesses (investment), governments (purchases), and residents outside the area (net exports). There is a practical difficulty in using this concept to measure output in a state in that it is important to distinguish whether purchases are made in in-state versus out-of-state locations for each of these sectors. Such data are not generally available.

The second approach is to sum payments associated with factors of “resident” production located in the state where output is produced. The traditional factors of production (and the form of the payments they receive) are labor (i.e., wages and salaries), capital (i.e., interest and dividends), land (i.e., rent), and entrepreneurial skill (i.e., profit). The “residents” of a state include corporations (both for-profit and not-for-profit), partnerships, sole proprietorships, and individuals maintaining their locations or residences in the state. Economists add to this list indirect business taxes (e.g., sales and excise taxes) collected by governments in order to arrive at gross domestic product (GDP) or gross state product (GSP). In contrast to the demand data discussed above, data on sector incomes in a state, particularly labor earnings, are readily available.

The concept “value added” has application to the present discussion. “Value added” is the value of the total output produced in an area less the cost of materials and other inputs from other firms. As applied in this research, it refers to the sum of employee compensation, proprietors’ income, indirect business taxes, rental income, interest and dividends received by the residents of a state, including corporations and other non-government institutions, produced by tourism activity in the state.

Many agencies concerned with the economic growth of a state, including state DOTs and STOs, focus on the personal incomes of their residents with respect to a specific economic development program. These agencies tend to monitor only the change in personal income (wages and salaries, dividends, interest, and rent paid to persons) or only the change in wages and salaries resulting from the investment project. This latter approach may be adopted when data are not readily identifiable to earmark economic returns to corporations and other businesses associated with a specific project. Although less comprehensive than other approaches, it is likely to capture most of the impact.

In short, “economic development” is tied to the economic growth in a state and is best represented by total payments to factors of production resident in a state on a per capita basis.

### **Preferred Measures of Tourism Travel Output Currently Used**

During the summer of 1994, the research team conducted a national survey of state DOTs and STOs to identify current practices in addressing the transportation needs of tourism. This survey included the solicitation of names and telephone numbers of individuals who were most familiar with their agency’s analysis capabilities in considering tourism benefits (Question 21). Approximately 35 individual names were provided, covering 30 states, in answer to this question.

In September 1995, the research team conducted a telephone survey of these individuals to determine their preferred measures of tourism travel output and to identify the existence and applicability of tourism transportation economic impact models relevant to the objectives of this project. Twenty-three individuals in this group were interviewed—the balance had changed positions or could not be reached after four attempts.

The consensus was that visitor expenditure incurred while in state was the preferred measure of tourism travel output at the state level. The second most popular measure was the number of visitors. However, those reporting this preference acknowledged that this measure often was used as a proxy for visitor expenditures or as a means of estimating this type of spending.

Tourist or visitor expenditures constitute the preferred measure of tourism travel output among state DOTs and STOs. Within the context of this study, “tourism travel output” is defined as the market value of those goods and services produced in state and then sold to visitors traveling within that state. This definition differs somewhat from the concept of gross state product by including sales to business travelers. Purchases made by the latter are counted as intermediate consumption in the income and product accounts and input-output accounts normally used at state and national levels. However, this departure from the customary income and product accounts follows recommendations on tourism statistics by the United Nations Statistical Commission and the World Tourism Organization.

Under this definition, output will be produced predominantly by public passenger carriers (e.g., airlines, intercity bus companies, and Amtrak), local passenger transportation services (e.g., taxicabs and auto rental companies), personal motor vehicle services (e.g., gasoline service stations and automotive repairs), public lodging establishments (e.g., hotels, motels, bed and breakfasts, and rental condominiums), eating and drinking places, participant and spectator sport/recreational facilities, meeting and convention centers, and entertainment facilities (e.g., casinos, performing arts companies, theme and amusement parks, and sightseeing companies). Additional output often will be produced by retail establishments (e.g., grocery stores, book stores, clothing stores, and gift shops) selling to visitors. The key to identifying this output is determining that its end user is a visitor (tourist) in the state (i.e., traveling out of his/her usual environment for a purpose other than commuting to work).

### **Optimum Model for Relating Tourism Activity to Economic Development**

This section describes the best model for projecting the economic growth consequences of public investment in a tourism-related highway improvement project.

“Tourism-related highway improvement project” refers to those highway investment projects expected to increase tourism travel output in the state. These include improved directional signage for tourism facilities, expanded highway capacity to such facilities, roadside rest areas, scenic turnouts, and upgraded access to these facilities in the way of interchanges, ramps, and so forth.

Development of an optimum model for estimating economic impacts of tourism-related transportation projects requires first specifying criteria for judging among alternatives and then applying these to available models. The following criteria were developed by Douglas C. Frechtling, a member of this project team, following two decades of extensive and specialized research on tourism economic impacts models.

#### *Criteria for Evaluating Tourism Economic Impact Estimation Models*

Methods of estimating the economic impact of travel are numerous and vary widely in their approaches and output. Unfortunately, there are few independent measures of this impact that can be used to judge the accuracy of these methods. Therefore, formal criteria for evaluating these methods are crucial.

Five criteria can help ensure that any approach for estimating the economic impact of a tourism-related highway investment is valid and reliable, including the approach recommended at the end of this section. These criteria are relevance, coverage, efficiency, accuracy, and reliability. Each of these criteria is discussed below.

**Relevance.** To develop a model that has relevance, it is important that an approach measure the economic impact of *tourism* in particular and not some other activity. For example, a study of the economic effects of restaurants in a community would not accurately represent tourism impact because it is conceivable that most of the business could be derived from local residents. Another example of an approach that misrepresents tourism activity is one where data on recreation activity (e.g., visitors to a state park) is used and includes local-origin effects as well as those generated by travelers.

In developing an approach, specific attention should be directed to ensuring that an impact estimation method and the data used in it represent state-specific characteristics (i.e., the economic characteristics of the state under study). Estimated economic benefits of a highway investment should truly accrue to the residents of the state, including individuals and businesses. Additionally, these residents should bear the costs estimated as a result of visitor activities.

In sum, three aspects of the approach are particularly interesting in terms of relevancy:

- Does it relate to tourism activity alone?
- Does it truly cover the state under study and only that state?
- Does it cover the time period under study?

Finally, the method should focus on the statewide output associated with a particular transportation project rather than the output for a region within the state. A given highway improvement project might be located in a specific location in order to aid a specific region (e.g., an underdeveloped rural area or depressed urban area). However, the so-called “redistributive” rationale for undertaking that project may, in fact, produce smaller state-level economic benefits than if it were undertaken in another location.

This effect will occur if the project simply shifts economic growth from one part of the state to where the project is located. This relocation does not produce economic growth for the state but redistributes it. Another example where investment may not produce economic growth is a highway expansion project designed to reduce travel times through a region. Although this type of project might increase the facility’s capacity and thereby allow greater non-stop travel through the region while also serving residents’ travel needs to destinations outside the state, the net effects of this project on local economic growth could actually be negative.

Comparing local outputs generated by alternative projects in different regions of a state obscures a determination of the broader statewide output implications. As a result, highway investment monies may be squandered on larger statewide output benefits that could have been achieved with the money invested in a different project.

**Coverage.** The approach should also cover the effect of *all* in-state tourism activities resulting from any single invest-

ment. Visitor expenditures affected by an investment should include transportation, accommodations, food consumption, entertainment, recreation, and incidental purchases (e.g., souvenirs). In some cases, expenditures will not be financed by a visitor but by residents on behalf of the visitor. Expenses associated with business trips as well as spending by residents on behalf of visiting friends and relatives are two examples of coverage issues. Such expenditures should be included in a model because they are attributable to the visit.

The approach also should cover *all* visitors or tourists. Some methods neglect foreign visitors, business travelers, or residents traveling within their home states. These methods preclude consideration of the breadth of activity relevant in any tourism economic development model.

It is important to quantify all tourism activity, even if a conscious choice is made later to exclude certain segments of this activity. Following this approach, users of the model can be made aware of the magnitude of activity being excluded, which is especially useful if it is included in later analyses.

The secondary or “multiplier” effects of tourist expenditures also should be included in the model. These effects occur when tourism businesses and related organizations make in-state purchases that support their services to visitors (called the “indirect impact”) and when employees of these organizations spend their wages and salaries in state (called the “induced impact”).

Finally, all supply effects should be covered. Some studies examine the effects of tourism growth on only the location of new businesses in the area. Others concentrate on the expansion of existing firms as well but ignore augmented demand served with existing plant and equipment having excess capacity. All three of these effects should be included in a study of effects to ensure that the consideration of factors is comprehensive.

**Efficiency.** Because funds available for economic impact estimation are generally limited, the approach should make maximum use of existing data consistent with satisfying the other criteria discussed here. Primary data collection on tourists and tourism businesses is costly and difficult to do well. It should be avoided whenever possible in favor of using relevant, comprehensive, and accurate secondary data.

Such data may be available from the State Travel Office, from the State Department of Revenue, the State Department of Commerce or Economic Development, from federal business data programs (e.g. the U.S. Census Bureau’s quinquennial census of business), and from proximate college and university research programs.

**Accuracy.** The issue of accuracy refers to how closely the results of an estimation methodology approach the actual outcome. Theoretically, measuring accuracy should involve simply comparing an estimation model’s predicted results with what actually occurs. There are two problems with such a straightforward approach:

- One is usually interested in a stream of net economic benefits accruing over the design life of a highway investment project that may be 15 years or more; to determine the accuracy of a model with these parameters requires measuring the annual returns to the end of a design period and then comparing them with the pre-investment forecast, a lengthy process that delays a determination of findings..
- Tourism activity is a highly complex phenomenon and can be affected by a host of factors beyond the control of those building a model (e.g., general economic conditions, weather, and environmental conditions [e.g., air quality and water quality]). Therefore, because of the difficulty in representing these factors in a model, it may not be possible to distinguish the effect of a highway investment on tourism growth (as the specific measure of economic development) from other effects created as time unfolds.

Consequently, it often is not possible to assess a tourism impact estimation model’s accuracy directly in the present or in the near future. However, we can break down the accuracy issue into two proxy issues and evaluate them individually as follows:

- **Validity:** are we measuring what we intend to measure?
- **Reliability:** would we achieve the same results from our estimation approach if we applied it again to the same investment project?

In addressing the validity issue, it is important to assess answers to the following questions:

- Do the input data accurately measure tourism activity?
- Does the methodology accurately incorporate real relationships between highway investment and tourism activity?

This assessment approach involves investigating the techniques used to generate the primary or secondary data used in any impact method. It also includes comparing the results with other, independent measures of visitor impact wherever possible. Given that other measures generally do not pass these five evaluation criteria themselves, a good deal of informed judgment often is required to assess the logic of an approach as well as its output.

One essential feature of an investment in infrastructure is that it generates benefits over a long period. During this benefit period, tourism activity will generate economic impacts, even in the absence of any new investment. To achieve an accurate measure of the benefits attributable to a given investment, the “base case” stream of impacts must be subtracted from the total economic benefits over the life of the investment project.

This calculation may be done by first estimating the base case scenario: the stream of benefits that ordinarily is produced without the improvement under study. Then, the total



impact of tourism to a state is estimated assuming the investment project is undertaken and successfully completed. The benefits attributable to this investment are those incremental over the base case.

It is important to understand the concept of the base case. It is *not* the stream of benefits that would occur if there were no actions taken to maintain or enhance a transportation facility. For example, the base case for ascertaining the benefits of widening a highway in support of a tourism site is not a change in either current conditions or the management of that highway over the design life of the proposed improvements. Rather, the base case should be “a careful projection of how the infrastructure system in question would develop with the guidance of sound and innovative management.” Such management could include applying

- Electronic traffic control technologies,
- Modified rules of traffic flow and control, and
- Demand management techniques (e.g., congestion pricing).

Finally, the reliability issue requires us to examine how input data were collected and processed in the estimation model. If the data originate from carefully designed probability sample surveys, one can estimate through statistical theory how much the results will differ from a complete census. However, if the input data are derived from focus groups, in-depth interviews of relatively few respondents, or surveys of convenience samples, then one cannot be certain that a different group of respondents might not produce substantially different input data for the model.

**Transferability.** For an approach to be transferable, it needs to be applicable to different investment projects covering different periods, rather than limited to data unique to a particular case each time a project is evaluated. It should also be sensitive to differences in travel patterns, industry structure, and prices in different places and in different states. The main objective here is to develop an approach that produces consistent results in these varying contexts. This feature permits valid comparisons of alternative investment projects across time and space and provides a broader based track record on which to assess the model in the future.

These five criteria should be applied to the structure of the estimation procedure, the input data, and the results. They should also be applied to sample design, questionnaires, interview modes, expansion factors, and weighting in surveys.

#### *Data Available to State Agencies*

Determining the significance of data available to state agencies was based on DOT and STO survey responses to one question in the national survey: Which tourist related

data do you use in your planning? (Question 16) These responses are summarized in Table 2.

According to the survey responses, virtually all states have access to data on tourists entering or leaving the state, tourist origin/destination flows, and tourism expenditures in the state. These types of data can be helpful in developing models of the economic development consequences of tourism-related highway investments. A smaller, but still relatively large, proportion of states have access to tourism-related business receipts—such access also is crucial to understanding economic consequences.

In summary, most states have access to information that can form a foundation for estimating the economic development impact of highway investment projects; however, additional data and better focused models are necessary to complete such estimations over the life of these projects.

#### *Existing Economic Impact Models and Case Studies*

The review of existing economic impact models and case studies was undertaken by examining the annotated bibliography on tourism travel and highway transportation services, produced in the early stages of this research, and interviewing state agency representatives who indicated in the national survey a familiarity with economic models. In addition, a few highly respected economic impact studies relevant to the objectives of this project were identified and reviewed. These studies are summarized and assessed below.

**TABLE 2 Use of tourist-related data by state DOTs or STOs (percent of all states, District of Columbia, and Puerto Rico)**

Type of Data	Either State agency uses (%)
a. Tourists entering/leaving state	94
b. Tourist origin/destination (O/D)	98
c. Visits to recreation sites	94
d. Origin/destination data for transport terminals	85
e. Tourism expenditures in regions	94
f. Tourism expenditures statewide	96
g. Tourism-related business receipts	81
h. Tourism-related employment	98

Source: Greenhome and O'Mara, et al., *Survey of Current Practices in Addressing the Transportation Needs of Tourism*, Question 16.

**Iowa RISE Case Study.** Conducted by the Midwest Transportation Center, this study examines the relationships between highway investments and state economic development. The parameters of a model for evaluating potential high investment were derived from theoretical considerations. The model then was applied to 18 projects financed under Iowa's Revitalize Iowa's Sound Economy (RISE) program. The RISE program was established by the Iowa legislature in 1985 "to promote economic development in Iowa through the establishment, construction, improvement, and maintenance of roads and streets." Although this objective is not the pre-project application desired for this research, the RISE approach does assess the economic benefits of projects after their completion.

The Iowa RISE study focuses on economic development by evaluating the effect of highway investment on a firm's decision to locate in the state. It does not address economic development that may occur as a result of increasing the output of existing business operations, tourist-oriented or otherwise.

The concept of "economic development" employed in the Iowa study focuses on incremental real incomes generated by a highway investment project. If real income is viewed as including all factors of production (i.e., land, labor, capital, and entrepreneurship), then this approach is identical to the economic output (i.e., value added) approach previously described.

This study presents an evaluation framework for determining whether a proposed highway investment project will increase economic development in a state but stops short of detailing a model to estimate the economic output expected to be generated by a highway investment project. Instead, a sequence of questions or "screens" is presented to allow for qualitative answers to two key questions, both related to the effect of a proposed highway investment project on a firm's decision to locate at a particular site:

1. Will the expected net benefits of the transportation project (i.e., increased economic development) exceed the net benefits that would occur if the firm located at the site *without the project*?
2. Are the expected net benefits associated with the firm's locating at the site *without the investment project* greater than zero?

In summary, the Midwest Transportation Center report on the Iowa RISE projects presents an evaluation model for determining whether the economic development consequences of an anticipated highway investment project justifies state spending on that project, but it does not present a model for estimating those consequences. Once such a model is developed, the RISE study can provide a useful approach for applying its results to alternative projects, determining which ones actually promote economic development of the state. However, even with an estimation model, the scope is

limited to locational decisions for firms and does not incorporate their decisions to expand at a given location or even to increase service (and, therefore, output) using existing plants and equipment.

In terms of the six evaluation criteria recommended to evaluate estimation methods, this study fails the coverage test because of its focus on new business. It is unclear how it meets the other criteria because of its conceptual nature and lack of supporting data.

**Wisconsin Highways 29/45 Corridor Study.** In early 1989, Cambridge Systematics, in conjunction with two other firms, completed a large-scale study that looked at impacts of possible improvements to State Highway 29. The study area stretched east-west across central Wisconsin between the Lake Michigan coast near Green Bay and Minneapolis-St. Paul, Minnesota, through its connection with Interstate 94, and U.S. Highway 45 connecting Fox Valley with Highway 29.

Part of this study was designed to estimate the potential effects of a range of highway improvements on the tourism industry located along that corridor as well as the indirect effects on other industries in the state. These effects were presented in terms of sales from 1987 to 2020. The sequence of steps and the sources of input data used in the Wisconsin methodology are provided in Table 3.

The regional economic model used to estimate the indirect and induced effects of the direct output generated by increased visitor spending in step (K) is a popular one but may not be the only such model available.

According to the evaluation criteria, this methodology fails on the reliability aspect of accuracy: Key data in steps 2 and 4 are derived from interviews with a group of tourism industry representatives—the data obtained could differ drastically among different groups of respondents depending on who is included in each group, what time of year they are contacted, and how their responses are combined into single point estimates. For example, are unweighted means computed from the various responses, or are they weighted to reflect some approximation of importance?

There is also a problem with coverage. According to the methodology, a visitor survey is conducted in the peak tourism months (step 8), and its results are used to represent average spending per visitor for all lodging venues in the sub-state region. It is well known that lodging, campground, and admission fees vary by season of the year. In some places, food and beverage prices vary as well. A survey conducted to cover each of the major seasons would be preferable.

Table 4 summarizes improvements in the Wisconsin Highways 29/45 estimation procedures that would remove these deficiencies.

Finally, this approach does not appear to satisfy the accuracy criterion in that it neglects estimating base case economic benefits compared to project impact estimates. There is no discussion of what tourism-related output will be in the year 2020 under the base case scenario. It is very important

**TABLE 3 Procedures for estimating the impact of Highways 29/45 Improvement Project on tourism and related industries**

Step	Source of data
(1) Estimate current visitor-days by lodging venue for each identifiable sub-state region that is projected to be affected by the planned highway improvement project.	(A) Various studies of visitors, 1980 Census of Housing, and occupancy rates of hotel/motel and campground facilities.
(2) Estimate percent of total visitor-days representing the highways to be improved for each region.	(B) Interviews with owners and managers of hospitality, tourism and recreation businesses and promotional organizations located within the sub-state areas.
(3) Estimate visitor-days by lodging venue spent by tourists currently traveling the highways to be improved for each sub-state region.	(C) Multiply step 1 estimates by step 2 estimates.
(4) Estimate for each region the percentage increase in visitor-days by lodging venue, as projected to result from the planned improvement project by year 2020.	(D) Interviews in step B.
(5) Estimate for each region gross visitor-days by lodging venue, where attributable to the planned improvement project.	(E) Multiply step 3 estimates by step 4 estimates.
(6) Estimate for each region proportion of (5) visitor-days projected to be diverted from other parts of the state or slated to be diverted to out-of-state destinations by the improvement, otherwise called the "transfer effect."	(F) Not specified.
(7) Estimate for each sub-state region visitor-days attributable to the improvement by lodging venue after removing the transfer effect estimated in step 6.	(G) Subtract step 6 visitor-days from step 5 gross visitor days.
(8) Estimate for all sub-state regions current average spending per visitor day by lodging venue.	(H) Visitor survey conducted in July-August of base year.
(9) Estimate for each sub-state region total visitor spending attributable to the highway improvement in the year 2020.	(I) Multiply step 7 estimates by step 8 estimates, and aggregate for all of the sub-state regions.
(10) Estimate output attributable to the highway improvement for each retail and service sector in the year 2020.	(J) Not specified.
(11) Estimate for all sub-state regions total sales attributable to highway improvement in 2020, including direct, indirect, and induced impacts.	(K) Input step 10 results into a regional input-output model such as the REMI-FS model.
(12) Estimate total output (value added) attributable to tourism-impacts of highway improvement in 2020.	(L) Same as step K

Note: In this study, lodging venue categories are:

- hotel, motel or resort
- campground, summer camp or educational camp
- seasonal or vacation home
- home of friends or relatives
- passing through without spending night on a day trip

Source: Cambridge Systematics, Donohue and Associates, and Regional Economic Models, *Highway 29/45/10 Corridor Study: Economic Development Benefits and Cost-benefit Evaluation Final Report.*

**TABLE 4 Recommendations for improving the tourism economic impact estimates of the Wisconsin Highways 29/45 Investment Project**

Step in Current Procedures	Recommended Improvement in Estimation Method
Step 2	Estimate total number of visitor-days by conducting roadside survey of current travelers in the study area, covering an entire year prior to the investment project.
Step 4	Step 2 roadside survey used with traffic generation model sensitive to expected changes in travel time, costs and safety to result from the investment project.
Step 8	Step 2 roadside survey of current travelers in the study area conducted to cover an entire year prior to the investment project.
Step 10	Trip generation model based on step 2 survey that projects amount of current traffic that would pass through the area without stopping because of the highway improvement.

that this baseline stream of benefits be estimated and subtracted from the stream of total benefits expected to result from the investment project, particularly given that some of the proposed improvements already had been accomplished by the time of the Highway 29/45 study.

**Heartland Expressway Studies.** In ISTEA, the U.S. Congress authorized two studies on the feasibility of building the Heartland Expressway, a high priority corridor from Denver, Colorado, to Rapid City, South Dakota, through Scottsbluff, Nebraska. One study area was from Rapid City to Scottsbluff ("Heartland North") and the other was from Denver to Scottsbluff ("Heartland South"). These two studies were performed by Wilbur Smith Associates in association with Banner Associates and Davidson-Peterson Associates in 1993 and 1995, respectively.

These studies evaluated the feasibility of several highway improvement alternatives using five dimensions:

- Need based on traffic,
- Cost and engineering feasibility,
- Environmental feasibility,
- Travel efficiency feasibility, and
- Economic development feasibility.

The only aspect relevant to this NCHRP study effort is economic development feasibility, where the economic benefits are estimated in terms of the additional tourists to the nine-county corridor region for the period of 1994–2015.

Economic development benefits that were merely shifted from locations within the Colorado-Wyoming-Nebraska region to the corridor were estimated and then excluded. All quantifiable economic development benefits were included, but improvement implications that "cannot reasonably be tab-

ulated in monetary costs, such as environmental and social impacts" were excluded. This exclusion is reasonable in an economic impact study.

Economic development was defined as follows:

For the purposes of the Heartland Expressway South Feasibility Study, economic development is defined as "an increase in the prosperity and incomes of peoples and institutions." Economic development of this nature in a given area occurs when the incomes and products generated in the area are caused to increase.

While somewhat less exact than the definition adopted in this research, it is consistent with it.

The Heartland study maintains that income and product increases can occur in either of two ways:

1. Through attracting new firms or encouraging existing firms to expand, or
2. Through increased efficiency that reduces production costs.

The study adds that the benefits of a given highway improvement, in terms of output, operate through significantly reduced transportation costs or "revised perceptions of the area." The incremental benefits of a highway improvement are computed by comparing the post-improvement stream of benefits with its base case.

"Tourists" are defined as persons traveling outside their "normal living or normal working routine." Specifically, this includes those

- Staying in paid accommodations in the nine-county region,
- Visiting friends and relatives (VFR) in the region,
- On day trips to the region, or
- Passing through the region to a destination outside of it.

For the purposes of the Heartland South corridor study, only the impact associated with the last category of tourist is included because:

- Travel to the region as a primary destination will not be promoted by the improvements proposed because there is very little congestion now, and improvements would reduce neither travel time nor transportation costs significantly;
- Visiting friends and relatives (VFR) is not a function of access times or costs;
- Day trippers "represent a very small segment of today's travel . . . and offer very modest potential for growth."

This narrowed definition of "tourist," compared with the one used in this research, reduces the coverage of the study

to less than comprehensive. A deeper discussion of the VFR issue and the day visitor potential or lack thereof would have been helpful.

Table 5 outlines the process used in the Heartland South feasibility study.

The Heartland North Expressway feasibility report is far less detailed on how tourism-related benefits were estimated over the 30-year specified life of alternative highway improvements. However, it appears to use a simpler version of the Heartland South Expressway methodology.

In terms of evaluation criteria, the methodology raises problems of coverage and reliability. On coverage, the roadside survey, so critical to the Step 2 data, was conducted during only 10 days in June. In this period, the proportion of motor vehicles containing tourists and their occupancy rates would likely be nearer their peaks and not representative of a full year. Moreover, the expenditure averages in Step 7 are national averages and may not relate to the actual region under study. (That certain kinds of tourists were intentionally excluded from this study is not a problem, because, with little adjustment, they could be incorporated into a modeling process in a future study, if needed.)

To address these problems, the study should have included roadside interviews conducted during a probability sample of all days of the year to capture full-year visitor characteristics (Step 2). Moreover, the survey should have captured expenditure information from respondents in the study area (Step 7).

The reliability issue is the same one raised in the previous Wisconsin study. Key data are derived from a survey of a small group of industry sources (Step 5) or from subjective estimates by staff (Steps 8, 12, and 13) and therefore prevent the results from being replicated, an important feature of scientific inquiry. If a different group were polled, the study results could be considerably different from those presented.

The reliability issues could be resolved by substituting objective data for the subjective estimates of industry sources or staff. Table 6 summarizes recommended sources of such data.

Given that the assumptions and relationships in the REMI model are not documented, it is not possible to apply the accuracy criterion to the estimates; however, given its frequent use in studies of this sort, it can be assumed that this model has proved to be valid and reliable.

**Southwest Indiana Highway Study.** This study was “initiated in response to a perceived lack of highways connecting the major cities in the area with the state capital.” Three corridors were identified running from 135 to 148 miles in length, and alternative highway improvement projects were evaluated for each one. Relatively little information is provided about the actual methods used to gather data, analyze them, and estimate the tourism-related economic development consequences of these alternatives. Table 7 summarizes what is available.

It is difficult to evaluate this case because the following information is missing:

- The method of developing Step 1 and 2 data in “Indiana Tourism Report,”
- The relationships and data used in the “gravity model” in Step 3, and
- The structure and input data of the “econometric model” mentioned in Steps 5 and 6.

However, the methodology clearly violates the coverage criterion by neglecting to provide base case projections. In addition, the accuracy criterion is not met because the study relies on interviews of a collection of experts (Step C) that is unlikely to prove reliable.

This study benefitted from the fact that a special tourism study had been conducted several years earlier. This was fortuitous but cannot be expected to exist in other cases—a transferability criterion issue.

**The Travel Economic Impact Model (TEIM).** In 1975, the nonprofit U.S. Travel Data Center developed the Travel Economic Impact Model (TEIM) to provide estimates of the economic impact of tourism activities in U.S. states, counties, and cities. Since then, it has provided annual estimates of tourism’s impact in each of the states and local area estimates in nearly 200 studies, covering more than half of the counties in America. In late 1995, it was used for the White House Conference on Travel and Tourism to estimate the economic contribution that tourism makes to each Congressional district.

The TEIM employs data from periodic, large-scale surveys of tourism activity and of the tourism industry. The TEIM also uses annual industry statistics to generate local area estimates. Clearly, it has the advantage of uniformly covering all of the United States with a consistent annual time series.

However, the TEIM does not incorporate state-specific estimates of trips or visitor-days or vehicle-miles in its routines, nor, as currently configured, can it project economic relationships over the 10- to 30-year spans common to highway investment analyses. It can, however, provide estimates of the current volume of visitor expenditures in each state for more than a dozen categories. This capability may provide useful background and base-case control figures for project-specific estimates of tourism-related economic activity.

#### *Optimum Tourism Economic Development Model*

As indicated above, few studies have attempted to link economic development with a specific transportation investment project. Indeed, some researchers have concluded the economic development process is too complex and the role of transportation is not likely to be sufficiently dominant to allow causal relationships to be established. The members of this research team do not subscribe to this view.

Although the cases examined as part of this research effort violate one or more of the criteria for sound tourism impact

**TABLE 5 Procedures for estimating the impact of a Heartland South Investment Project on tourism and related industries**

Step	Source of data
(1) Estimate monthly volume of motor vehicles using the corridor under consideration for improvement for the base year.	(A) Highway traffic counts.
(2) Estimate (a) proportion of these motor vehicles "on a pleasure or recreational trip," (i.e., "tourists"), (b) average occupancy (persons per vehicle), (c) proportion passing through the region, and (d) destinations of the tourists.	(B) Roadside survey at 8 locations in the corridor region conducted June 13 through 23.
(3) Estimate total number of tourists using the corridor in the base year.	(C) Multiply estimate of total motor vehicles in the base year from step 1 by proportion in step 2a and average occupancy in step 2b.
(4) Estimate number of tourists passing through the corridor region (i.e., not destined in the region).	(D) Multiply estimate from step 3 by proportion in step 2c.
(5) Estimate additional tourist parties that would be attracted to the corridor because of the given highway improvement.	(E) Interviews with representatives of chambers of commerce, convention and visitors bureaus, attractions and "others knowledgeable about visitation."
(6) Estimate average expenditure per visitor-day for each expenditure category (admissions/recreation, lodging, shopping, meals and other expenses) in each community.	(F) National average for "independent travelers, hotel/motel/resort guests" from study by Davidson-Peterson Associates plus local admission/ recreation fees.
(7) Estimate number of days and average expenditure per tourist party by type of expenditure made by tourists in each community after the highway improvement is completed.	(G) Apparently "hypothesized" by study staff.
(8) Estimate tourist expenditures in each community after the highway improvement is completed.	(H) Multiply average expenditures per tourist party in step 7 by current tourist party volume from step 3 plus the additional tourist party volume attributable to the improvement in step 5.
(9) Estimate gross tourist expenditures in the corridor region after the highway improvement is completed.	(I) Total values for the communities in step 8.
(10) Estimate number of tourist parties (i.e., tourists' motor vehicles) currently passing each community.	(J) Highway traffic counts.
(11) Estimate number of tourist parties that would be diverted from each step 6 community in the corridor by the highway improvement.	(K) Apparently staff speculation.
(12) Estimate average expenditure per tourist that would be lost from the step 11 diversion, by expenditure category.	(L) Staff hypotheses in step G.
(13) Estimate total expenditure that would be lost from the step 11 diversion.	(M) Multiply step 11 tourist parties by step 12 average expenditures and sum for all communities.
(14) Estimate net tourism expenditures by category in the corridor region after highway improvement is completed.	(N) Subtract step 13 result from step 9 result.

(continued on next page)

TABLE 5 (Continued)

Step	Source of data
(15) Estimate net tourism expenditures in step 14 in real terms for each year of the specified life of the highway improvement.	(O) Input step 14 expenditures using a model such as the REMI-FS model.
(16) Estimate output (value added) attributable to the highway improvement for the corridor region in real terms for each year over the specified life of the improvement, including direct, indirect and induced impacts.	(P) Input each year's expenditures from step 15 into a regional input-output model such as the REMI-FS model.
(17) Estimate the present value of the total output (value added) attributable to tourism-impacts of the highway improvement in real terms over the specified life of the improvement.	(Q) Apply relevant discount rate such as the 7 percent rate specified in US Office of Management and Budget Revised Circular A-94, October 29, 1992. Compute the net present value of the value added attributable to the highway improvement by dividing the value in each year in the future by $(1+r)^n$ , where "r" is the discount rate and "n" is the difference in years between the present year and the future year.

Source: Wilbur Smith Associates, Banner Associates, and Davidson-Peterson Associates (1995), *Heartland Expressway South Economic and Engineering Feasibility Study*, for the Wyoming Department of Transportation, Colorado Department of Transportation, and the Nebraska Department of Roads, chapters 3, 4, 10, 12, and 13.

modeling, they do suggest approaches that could be incorporated in an optimum tourism economic development model. An outline of such a model is presented below.

Before the model can be applied, the study area must be carefully defined as the geographic area that includes all portions of transportation network which may be affected by the proposed development. As it relates to the optimum model, the study area should also include the communities that currently host visitors who travel on this network. The economic development consequences of the highway investment will be expressed in the form of value added in serving visitors through the accommodations, food services, attractions, and other tourism-related facilities in these communities.

Figure 3 presents the base-year relationships of the proposed optimum model. These relationships need to be described in order to evaluate a highway investment project's impact on these relationships over a period of future years. Base-year estimates should be developed to serve as the departure point for dynamic analyses.

Stage 1 indicates that there are three important tourism activity variables that determine how much is spent by visitors to a state. Total tourist spending is the product of the number of tourists or tourist parties, their length of stay in days, and their mean spending per day in the state.

Stage 2 indicates the categories considered important in ascertaining the impact of spending on business output. These are matched with standard industry categories in input-output models and other regional development models. The U.S. Travel Data Center has detailed the relationships between

expenditure categories and industry classifications in U.S. input-output and other economic models.

Stage 3 indicates the three processes that convert visitor spending into output—the measure of economic development recommended by this research team. First, this spending directly impacts factor incomes (middle box), primarily composed of employee earnings, proprietors' income, profits, and rental income. Visitor spending also sets in motion a train of indirect impacts, as businesses in the state purchase goods and services from one another in order to serve visitor demand. Finally, the induced impacts result as employees and proprietors of these businesses spend their tourism-generated incomes on consumption goods and services within the state.

The "Outcome" in this figure is output as value added rather than the gross value of the sales. Sales volumes do not indicate how much was actually produced in the region, but rather the value added by all of the inputs, whether resident in the state or elsewhere.

The user of this model should note that all benefits are expressed as "net benefits." This means that what should be considered a benefit depends on the scale of analysis being undertaken. For example, a state study that shows increased tourism benefits in one part of the state at the expense of another is not necessarily producing a positive benefit unless there were distributional benefits associated with this shift. At the local level, this shifting of benefits might be an important consideration in an investment decision. Therefore, users are encouraged to remember **when using this model that only**

**TABLE 6 Procedures for improving the tourism economic impact estimates of the Heartland South Highway Investment Project**

Step in Current Procedures	Recommended Improvement in Estimation Method
Step 5	Employ a trip generation model based on origin-destination data collected in year-long step 2 survey that employs relationships of traffic volume to changes in travel time, costs and safety anticipated from the investment project.
Step 6	Inventory tourist attractions, accommodations and other amenities along with step 2 survey data on places visited currently for select relevant communities.
Step 8	Develop projections based on current relationships between travel volumes and use of tourism facilities, time spent in area, and expenditures from the expanded step 2 survey.
Step 12	Use trip generation model (based on step 2 survey) that projects amount of current traffic that would pass through the area without stopping due to the highway improvement.
Step 13	Employ expanded step 2 survey.

those benefits considered to have value added, or net benefits as termed here, should be included in the analysis.

Stages 1 and 2 should be familiar to transportation planners. They incorporate methodologies that have been used in the studies previously discussed and in other studies as well. Stage 3 leading to the Outcome requires the special tools and capabilities of economists.

Figure 4 shows these relationships under two possible scenarios: the highway investment case and the base case under sound and innovative management.

**Highway Investment Case.** Stage 1 embodies the reaction of tourist volumes, length of stays, and spending per visitor-day to the reduced transportation costs that result from the highway investment project. These reduced costs come in a number of forms:

- Time savings that result from less congestion or a more direct route,
- Improved safety, and
- Reduced vehicle operating costs.

In many cases, these reduced transportation costs will stimulate demand, which may encourage businesses to build new tourism facilities ("superstructures"), such as hotels,

**TABLE 7 Procedures for estimating the impact of a Southwest Indiana Highway Investment Project on tourism and related industries**

Step	Source of Data
(1) Estimate number of visitors to the region by type (hotel/motel/resort accommodations, campground accommodations, others) in base year	(A) "Indiana Tourism Report" of 1987, methodology not specified.
(2) Estimate average expenditure per visitor-day by category (retail, eating and drinking, entertainment, lodging, other goods and services) in the region for the base year.	(B) Same as step A.
(3) Estimate increase in visitors from the highway improvement project.	(C) A gravity model (methodology not specified) supplemented by interviews with owners and managers of hospitality, tourism and recreation businesses and promotional organizations within the study area.
(4) Estimate increased visitor expenditures attributable to highway improvement for the base year.	(D) Multiply average expenditures in step 2 by increased visitor volume in step 3.
(5) Estimate direct, indirect and induced sales attributable to the highway improvement in the region for the base year.	(E) Use an "econometric model previously described" but not explained in the literature provided.
(6) Project step 5 estimated total sales annually from 2000 to 2020.	(F) Same as step E.

Source: Donohue & Associates, Cambridge Systematics and Congdon Engineering Associates (1990), "Chapter 5: Tourism Benefits," in *Southwest Indiana Highway Feasibility Study* prepared for the Indiana Department of Transportation.



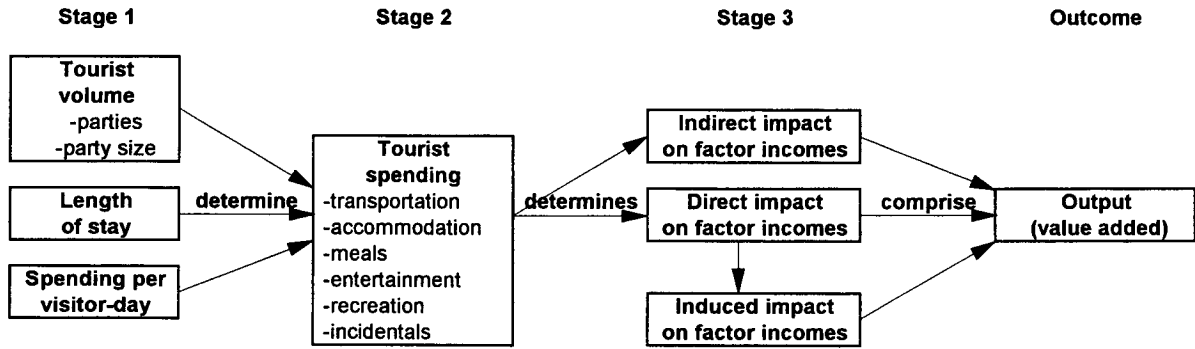


Figure 3. Tourism economic development model: base-year state.

restaurants, and amusement parks. These additional supply choices could have a salutary affect on both the number of visitors and average spending per visitor-day, given that more choices induce greater spending.

Stage 2 represents the categories of visitor spending that may be expanded. These will be matched with industry categories in input-output or other regional economic development models. The adjective “net” is included because it is important to remove from the base-year estimate any loss in visitor spending when that loss is associated with the reduced costs of traveling to out-of-state destinations with the benefit of that highway improvement.

Stage 3 notes that the visitor spending under the investment project scenario contributes to factor incomes directly, indirectly, and in an induced manner. The sum of these incomes constitutes the output or value added under the highway investment project scenario.

The Outcome stage produces the value added to the state economy over the design life of the project. This income stream should be discounted to the present value, using an appropriate discount rate. Use of a discount rate acknowledges that one dollar of benefits in the future is worth less than one dollar of costs today. The discount rate should embody the real (i.e., excluding inflation) social opportunity

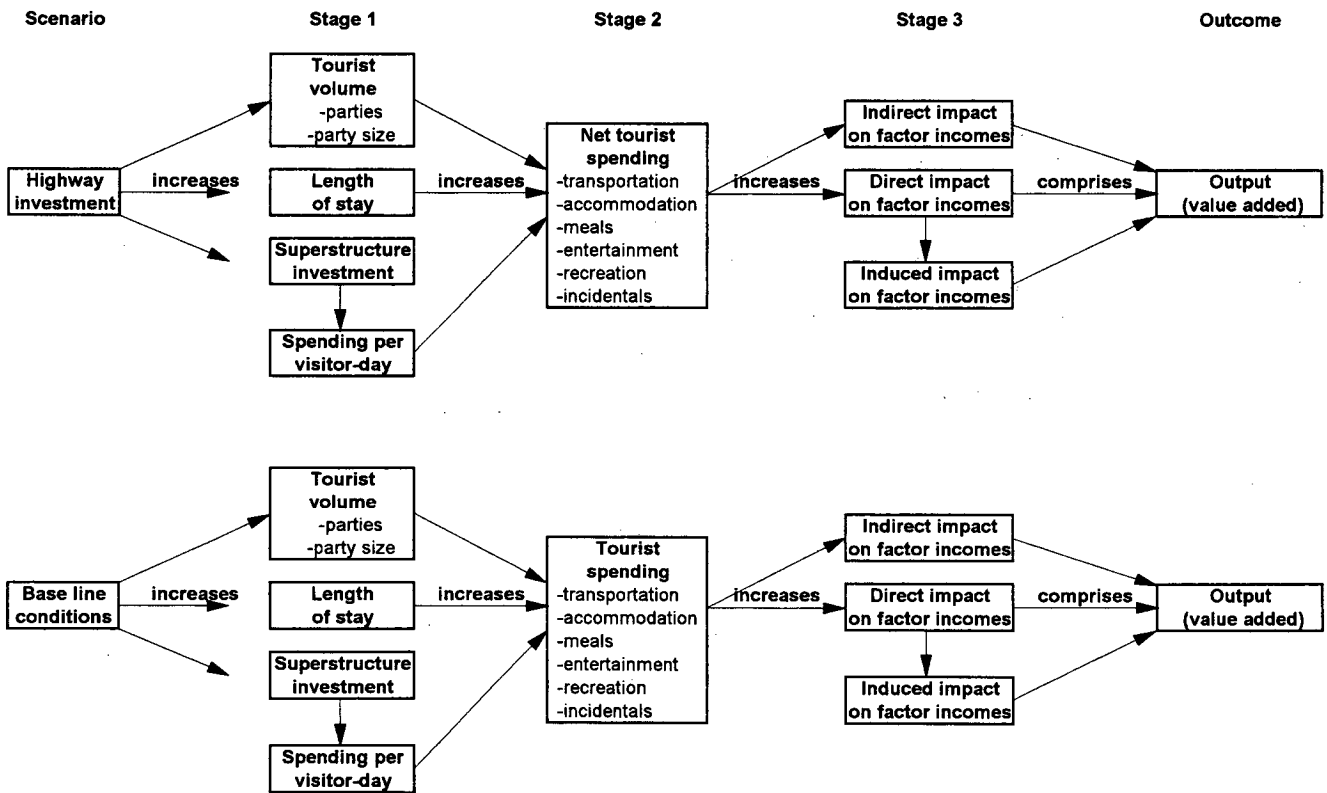


Figure 4. Tourism economic development model: dynamic form.

cost of capital, sometimes called the social discount rate. This is the “estimated rate of return on capital in its next best use relative to the investment in question.” There appears to be a consensus that it is less than the average rate of return of private capital but greater than the average interest rate on consumer savings. The U.S. Office of Management and Budget has specified the use of a 7 percent discount rate for such projects; however, some state DOTs perform benefit/cost analyses using a 5 percent discount rate.

**Base Case.** As discussed above, the base-case scenario represents the visitor activity, expenditures, and output (projected over the design life of a proposed investment project) that would result from innovative and sound management designed to produce maximum benefits from the existing infrastructure. The base case is designed to indicate the increased economic impact of tourism activities that would occur without the investment project under consideration.

The estimation process is similar to the highway investment case detailed above. The most efficient use of existing infrastructure (i.e., without improvements) will produce, through the relationships shown in Figure 4, a stream of tourism-related output. This stream, discounted to the present as net present value, represents the outcome, which then should be compared with the outcome of the highway investment scenario in Figure 4 to determine if the investment produces a net positive impact. If so, then it contributes economic benefits over the design life of the project. If not, then it produces net costs and should not be undertaken if based on solely tourism outputs.

Some highway investment projects, such as an individual information center or a scenic turn-off, may not produce

measurable benefits because of their small scope. They may, however, produce other benefits that justify their costs. For example, scenic turnouts increase visitor satisfaction, although visitor spending in an area may not increase.

Table 8 indicates research methods that can provide input data, estimate relationships, and generate results necessary to project the economic development resulting from a given highway investment project.

This model relies on tools used in the studies discussed earlier. These tools are

- Roadside surveys. These are carefully conducted probability sample surveys of visitors traveling on the highway under study and reflect daily and seasonal patterns over the entire base year and throughout the area expected to be affected by the completed investment project. Surveys should be designed to estimate visitor volumes by origins and destinations, length of stay in the area affected by the highway improvement, and average expenditure per person per day.
- Travel demand and assignment model. This model projects the visitor flows along the highway improvement corridor in reaction to reduced travel costs and assigns these flows to specific highways.
- Trend projections. These are based on past trends in these variables as a function of new or expanded business development.
- Business development model. This model determines whether a firm’s profitability from locating a new plant or expanding an existing one at a site is greater after the highway project than at any other alternative site the firm is considering.

**TABLE 8 Methods for producing results for each stage in the tourism economic development model**

Stage	Base Year	Dynamic Form (base-case and highway investment scenarios)
One	Roadside survey conducted at representative points throughout a calendar year.	Travel demand and assignment models sensitive to transport costs and time; trend projections of length of stay and spending per visitor day adjusted for expected new businesses and expanded current businesses.
Two	Product of stage one factors.	Product of stage one factors.
Three	Existing input-output or regional economic development model, such as REMI.	Inter-regional economic model, such as REMI, that can forecast factor costs and determinants of traffic growth each year over specified future.
Outcome	Aggregation of factor incomes to equal value added.	Annual aggregation of values added over specified future, discounted to their net present values.

- Input/output models. These models produced in some states and regions embody the inter-industry transactions in the study area and the revenue and income changes produced by increases in final demand in the area.
- Inter-regional economic model. This improvement of the input/output model permits more realistic forecasting and simulation of the highway investment project.

### Validation of the Model

The optimum tourism economic development model was based on the few case studies accumulated and their evaluation according to criteria assessing theoretical soundness, data quality, and logical structure. The next step is to validate this model.

One approach is to apply the same evaluation criteria used to assess the existing studies previously described.

### Relevance

By carefully identifying visitors and their expenditures and linking them spatially to the highway corridor affected by the investment project under consideration, the model ensures that the resulting impact estimates relate to tourism activity alone. By limiting the impact area for quantification of multiplier effects, estimates relate to the state alone. Finally, by conducting interviews that cover all seasons of the year, visitor expenditures temporally related to the project are accurately represented.

### Coverage

Because all visitors to the corridor are accounted for or covered, there is no possibility of excluding any type. Interviewing visitors to identify by category all of their expenditures in the previous 24 hours and then multiplying their average length of stay in the area will provide accurate coverage of their total spending in the area. Finally, the use of input-output or other regional economic impact models can help ensure that the "multiplier" impact of their expenditures is included.

### Efficiency

The optimum method requires that primary data be collected relating to the highway corridor under study. It is highly unlikely that secondary data will be available on this subject. However, employing existing input-output or other regional economic impact models will help keep data collection/analysis costs to a maximum.

### Accuracy

The optimum model depends on carefully conducted probability surveys of current visitors to determine their base-year

expenditures. Assuming sound and innovative management practices have been in place, these expenditures then are projected over the design life of the proposed project to obtain the base case. Similarly, visitor volumes and expenditures are forecast, assuming the investment project goes forward and using travel projection and assignment models. Regional economic impact models are used to convert the current levels of direct impact into projected multiplier impacts over the future.

These models should have track records that demonstrate their effectiveness in previous cases. While there is no guarantee that a successful track record will ensure a desired level of accuracy, such procedures reduce the risk of inaccurate results. The scope of the investment project will affect the accuracy of this model. The effects of small-scale projects, such as individual information centers or scenic turn-outs, will be much more difficult to quantify accurately than those of large-scale projects, such as widening a road or building a new one.

### Transferability

The optimum model described here is general in its application to a wide range of investment applications. Except for the primary data collected on current visitor expenditures, the model uses existing traffic projection and assignment techniques and regional economic impact models.

In summary, the optimum tourism economic development model described above is designed to satisfy the five evaluation criteria. Thus, it satisfies one concept of validation.

Several other approaches to validation could be considered here. One is to apply the tourism economic development model to an actual highway investment case, either pre-project or post-project. If pre-project, one would need to supply all of the input data required for the model, an unlikely occurrence. If post-project, one would need to conduct a year-long field study to gather the data necessary for operating the model. To exhaustively investigate the model's validity by such criteria, it would be necessary to monitor the tourism-related development impacts of a highway project that went forward after applying the model. For this research effort, these alternative validation approaches do not appear feasible given the time and resources available to the study team.

Another concept of validation is to subject the model to peer review by those most familiar with the challenges of estimating the tourism related impacts of highway improvement projects and with trying to estimate them. A consensus on the configuration and data requirements of this model by such a group would suggest its validity was substantial enough for future use.

### *In summary:*

Based on existing models and the data on tourism activity available to DOTs and STOs, this research produced an optimum model to project the economic development benefits of a proposed tourism-related highway investment project. The

model meets all five criteria identified to demonstrate its fitness; yet, further validation using field-testing in actual pre- and post-investment conditions is desirable.

The previous discussion on measures and models supports the need for data-sharing among agencies in both the data collection phase and the data analysis. The national survey results indicate that DOTs and STOs maintain different types of data—all of them are valuable in individual agency planning efforts and in joint planning efforts with economic development objectives.

### APPROACHES TO IMPROVING TRAVELER INFORMATION SERVICES

Transportation investment can contribute to the attractiveness of tourism and, therefore, to tourism growth, through infrastructure improvements that enhance capacity and accessibility. In addition, a full assortment of traveler information services enhances the attractiveness of a site, and many of these services include both a transportation and a tourism component. The recommendations offered here are based on an understanding of agency responsibilities and traveler needs, particularly in the areas of information content and media type.

In this study, the term “traveler information services” (TIS) refers to the full range of communication services designed to guide tourists through the highway network to tourism sites, facilities, and services. Here, we concentrate on those services provided while the tourist is away from home, as distinguished from the types of information and supportive services that tourists seek before they leave home (i.e., trip planning). Although a study of trip planning services certainly is valuable in terms of evaluating economic development objectives and trip demand, it is outside the scope of this research.

The following discussion is organized into four major sections. The first section presents a conceptual model of the traveler decision process, identifying where traveler information services fit into this model. In the second section, this model becomes the basis for a framework to guide DOTs and STOs in providing effective traveler information services. The third

section covers considerations of existing coordination practices in implementation and funding, based on the national survey findings. The final section presents recommendations on improving traveler information services. These recommendations are primarily oriented to state government agencies. However, they also are useful to the private tourism and recreation industry, which has a critical role in better linking tourism concerns and transportation investments, especially in the area of traveler information.

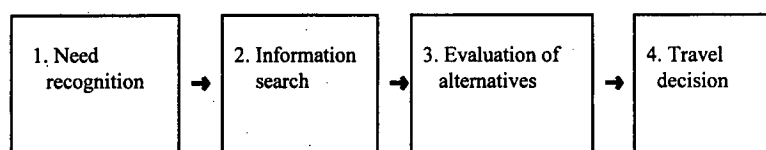
### Conceptual Model of Traveler Information Decision Needs

A model of the buyer decision process is commonly used in tourism marketing to understand the needs of potential customers and in particular to explain the role that information plays in tourism behavior en route. This model is shown in Figure 5. This conceptual model is similar to the one that serves as the underlying rationale for travel choice models used in transportation planning.

On the basis of this model, the traveler passes through four stages prior to making a trip. For example, a leisure traveler may first recognize a difference between a current state of mind and a desired state of mind (e.g., a release from day-to-day stress). This assessment is identified as a “need” under Stage 1. In Stage 2, the traveler then searches to identify alternatives that satisfy this need (e.g., taking leave from work, traveling to visit friends, or vacationing at a resort). In Stage 3, the traveler evaluates these alternatives based on attitudes, experiences, budget, and other personal factors. Finally, in Stage 4, the traveler chooses one of these alternatives to satisfy the original need (e.g., spending a week at a beach resort in Florida).

In some situations, the potential tourist (and business traveler) can bypass the second and third stages. For example, a person accustomed to spending summer weekends at a vacation home or skiing at a specific resort every winter need not search for information or evaluate alternatives but follows the pattern of previous experiences.

The buyer decision model was designed to explain how consumers move through the decision process in the trip plan-



Source: Adapted from Philip Kotler, John Bowen and James Makens, *Marketing for Hospitality and Tourism*, Prentice Hall, Upper Saddle River, NJ, 1996, p. 202.

Figure 5. Traveler decision process.

ning stage, prior to actual departure. However, this model can be adapted to reflect the needs, information search, content and delivery alternatives, and decisions tourists make while actually traveling. Combining both the trip planning and en route decision processes, a model can be produced, where Tier 1 represents

- Transport mode for the main trip,
- Season of travel,
- Main destination,
- Purpose of trip,
- Travel party composition,
- Overall duration, and
- Overall budget.

With these parameters established, traveler information services should then be designed to help tourists make Tier 2 types of decisions, such as

- Alternative modes of travel while on trip,
- Places to visit,
- Length of stay in the state or local area,
- Visitor expenditures in the state or local area,
- Services to use, and
- Establishments to use.

Under this two-tier decision model, it can be assumed that the tourist has identified a need for accommodations or a need for visiting attractions in areas identified in the travel plan (see Stage 1 in Figure 5). Independently or in conjunction with other members in the travel party, the tourist will search for information on alternatives (Stage 2). In contrast with the original model, the information search stage is considerably constrained, bounded by the days available for the trip and the advance arrangements (e.g., accommodations) made for interim and/or final destinations. As a result of these limits, the time spent evaluating alternatives is considerably restricted as well. In a real sense, the number of alternatives that can be evaluated is inversely proportional to the time spent searching for information on them. To the extent that the traveler's time is spent trying to locate and access traveler information services (TIS), there will be less time to evaluate choices and then execute them.

Consequently, there is a premium on rapid access to services pertinent to a traveler's current location and time. These considerations guide the development of criteria for an optimum TIS system that addresses both information content and media issues. The following criteria are considered to be significant.

#### *Relevance*

The TIS system should provide information that is relevant to tourists' needs. This content will differ by type of tourist

and type of trip. It is especially important to respond to the TIS needs of visitors who are elderly, have disabilities, or are foreign, for whom succinct, easy-to-understand travel information is an important element of a successful trip experience. Significantly, these travel markets also are growing rapidly in many states—so much so that they constitute a large percentage of the tourism market and are often one of the largest contributors to a state's economy. Therefore, states will need to research the information content needs of the various tourist segments visiting a particular area for each type of trip.

#### *Accuracy*

TIS content should be trustworthy and authentic. Moreover, it should be kept up-to-date systematically. An auditing system should periodically and randomly check the veracity of the information made available to tourists.

#### *Place Convenience*

The content should be provided through channels or media located such that tourists can access them with little difficulty. The media for these communications can vary in their facility of use, ranging from absolute convenience (in-vehicle information systems, tourist-oriented radio channels) to fixed and inaccessible locations (billboards and displays at transport terminals) where opportunities for information to be repeated or queried may not be an option.

#### *Time Convenience*

Tourists do not limit their travel to normal work-day hours. They frequently travel throughout a 24-hour period and require information compatible with such schedules. Some content items, such as reservation services and emergency services, require availability around the clock. In all cases content must be provided using media with limited "down time" (i.e., situations where technology fails [e.g., interactive kiosks, in-vehicle information, tourist-oriented radio channels, or variable message signs], or where channels are either inoperable [e.g., signage displays are undergoing maintenance, repair, or revision] or closed [e.g., city information centers close after business hours] are minimized).

#### *Format*

The TIS content should be provided in a format that meets the requirements of various types of tourism markets. In a study to synthesize passenger information systems, it was concluded that the principles for improving human learning, and specifically short-term memory, provide useful guidelines for developing information programs and aids for pub-

lic transit systems. These guidelines were rehearsal, simplicity, consistency, continuity, and repetition.

**Rehearsal.** Retention of information is significantly improved when there has been prior exposure to the subject matter. Lacking a basic understanding of a transportation system, for example, can create substantial communication problems, particularly for foreign travelers. "Rehearsal" of the transportation system can occur by hearing about transportation-related activities through the news media or more commonly through maps.

**Simplicity.** Communication is enhanced when the message content is simple and direct. These qualities require reducing the length of message to focus on the key concept and using common terms. For example, in transportation terminals common terms such as first floor or second floor are more meaningful than such terms as concourse, plaza level, or mezzanine.

**Consistency.** Uniform methods of presentation, design, and terminology facilitate communication. Successfully navigating through an area or site depends on an individual's cognitive map of the area. Unusual sign designs, information media, or variations in terminology can be confusing. Internationally recognized signs should be used wherever possible.

**Continuity.** Building up information from the simple to the more complex facilitates more effective communication than the simultaneous presentation of a great deal of information. Logos identifying a specific path through a tourist area constitute an example of continuity in a message.

**Repetition.** Repetitive, redundant presentation of information helps confirm and reinforce passenger trip information. This feature could include conveying sequential messages on successive signs or using strategies such as easy-to-remember route names (e.g., Red Line, the North Line, or the Freedom Trail as are used in Boston).

One of the key concepts in the conceptual model presented in Figure 5 is that different groups or segments of travelers may have distinct TIS needs in terms of content and perhaps even in terms of the medium used to communicate information. For example, adults traveling with children will be much more interested in educational and entertainment services suitable for children than adults traveling without children. Older and retired individuals often seek different information on tourism opportunities (e.g., historical and cultural sites, and museums) than do 18- to 34-year olds (e.g., active recreation options and night life). Business travelers require different TIS than leisure travelers. For example, to reduce travel times, the former will demand clear directions to hospitality facilities, routing advice, and information on traffic, road, and weather conditions. Business travelers may search for communication services and will be interested in tourism information only if

conditions warrant. In contrast, leisure travelers are more interested in promotional materials and information on attractions. Leisure travel parties may even seek reasons to extend their length of stay in the areas that they visit. Leisure travelers visiting friends and relatives can be expected to have different information needs than those on long vacations or sports-oriented trips. In most states, tourists visiting an area in the winter will have different TIS content needs than those traveling in the summer. Other trip characteristics associated with distinct information needs are pre-planned package tours versus individual itineraries, pass-through trips versus those destined in the state, and first-time versus repeat visitors.

This study also selectively focused on the TIS content needs of three special tourist populations: elderly tourists, foreign visitors, and tourists with disabilities. The needs of these groups, both as drivers and non-drivers (i.e., passengers of non-automobile modes such as tour buses, airplanes, rail, and so forth) were considered. On the basis of the basic elements of travel decision making shown in Figure 1 and after discussions with experts on these types of visitors, the following content needs seem evident for these market segments.

**Elderly tourists** require clear information about the most direct routes to their destinations. They also are interested in the location and characteristics of lodging facilities, eating and drinking places, heritage and cultural attractions, and shopping centers. In addition, they need to know the location of automobile service stations, restrooms and rest areas, and emergency services and telephone services. If road conditions are at all hazardous, they need to be informed before encountering them (e.g., presenting weather forecasts and information on current and expected road conditions). Elderly tourists require large-print materials and may not want to deal with advanced technology media (e.g., in-vehicle information systems and interactive kiosks). Intrusive audio advisories via radio on extreme weather conditions and road hazards are more apt to get their attention than posted signs.

**Foreign visitors** are generally most interested in information on attractions and outdoor recreation opportunities. They also need clear route information and multi-lingual personnel providing information on the availability of facilities and reservations services. A need peculiar to these tourists is information on places that conduct foreign exchange transactions. Foreign visitors require TIS using international signs and symbols, as well as print material in the most common foreign languages. Well advertised telephone access to multi-lingual personnel can help foreign visitors resolve many problems. Telephone access may be provided, for example, through cooperation with lodging chains using 800-numbers that have reservation agents fluent in the most common languages.

**Tourists** having disabilities fall into three main categories, each having distinctive TIS content needs:

- Travelers with visual impairments (non-drivers) require information on where to find brochures and other travel

information in Braille or on audio media (e.g., tapes, broadcasts, and other spoken announcements).

- Tourists with hearing impairments need information on facilities where sign language is available. Those with hearing impairments prefer well-lit signs, printed maps, and other materials, as well as welcome center personnel adept in sign language.
- Tourists with ambulatory impairments seek information on wheelchair-accessible tourist facilities and other facilities, particularly restrooms. They need directions to parking places that accommodate their vans and provide wheelchair access to these vehicles. They need information on where to find communication and financial services that are accessible to them. Non-ambulatory travelers require highway welcome centers with ramps; large, automatically opening doors; and interactive kiosks geared to the height of wheel chairs.

### Conceptual Framework for Traveler Information Services

The purpose of a conceptual framework is to identify key relationships between the different factors that influence the outcome of some particular event or activity. Based on

the conceptual model of travel decision-making discussed above, the conceptual framework for traveler information services will consist of three elements. These three elements are the information needs of the traveler, the medium through which these needs are conveyed, and the particular market-specific requirements of different tourist groups.

### Information Content

Table 9 shows the first element—the information content that travelers seek. This content falls into four major categories. Categories A and B comprise TIS content that expands tourists' choices and enhances their trip satisfaction. These choices might be viewed as luxury items not required for the trip but can increase the tourists' enjoyment simply through the provision of multiple alternatives. Moreover, to the extent that such information encourages tourists to spend more time in a state, their contribution to the state's economy is enhanced. Categories C and D primarily provide information vital to the conduct of the trip itself. Without these items, the tourist cannot successfully meet emergency needs or continue with a planned itinerary. These are considered to be necessities.

**TABLE 9 Information services content that tourists seek while traveling**

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<b>A.</b>	<b>Tourist attractions</b>
	1. Destination areas
	2. Attractions (natural and built - e.g., historic sites, museums, business districts, etc.)
	3. Outdoor recreation opportunities
	4. Surface and atmospheric conditions (snow at ski resorts, brilliance of fall foliage, height and velocity of rivers/ocean winds)
	5. Scenic views
	6. Picnic areas
	7. Scenic byways
<b>B.</b>	<b>Tourist facilities</b>
	1. Lodging facilities
	2. Eating/drinking facilities
	3. Campground facilities
	4. Transportation terminals
	5. Automobile service stations
	6. Entertainment/recreation facilities
	7. Shopping centers
<b>C.</b>	<b>Other facilities</b>
	1. Financial services (banks, ATM, etc.)
	2. Communication services (postal, telephone, facsimile transmissions)
	3. Emergency services (hospital, police, fire services)
	4. Rest/restroom facilities
<b>D.</b>	<b>Access and conditions</b>
	1. Routes
	2. Road conditions
	3. Traffic conditions
	4. Reservation services
	5. Weather
	6. Ferry/bus schedules

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## Media

The second element of the conceptual framework is the medium through which this information is transmitted to travelers. Table 10 shows the major forms of transmission used in a transportation environment. The advent of intelligent transportation systems (ITS) provides important opportunities for disseminating traveler information to appropriately equipped vehicles; however, at least for the foreseeable future, it is not likely that such systemwide technologies will be available on a widespread basis. Nevertheless, as such technologies are implemented in urban areas and states, the tourism market is likely to be a critical segment that can be well served by ITS and, therefore, it should be considered in the technology planning process.

The media types shown in Table 10 are presented as separate and distinct delivery systems. In reality, these delivery systems can be used to complement one another and should not be considered mutually exclusive. State highway welcome centers, for example, usually distribute print media materials and may provide interactive video kiosks as well. Interactive kiosks at tourist sites and other places outside welcome centers may provide special road condition advisories or even print out maps and promotional materials. Some media types can be considered substitutes for one another based on their function in providing TIS information to tourists. Indeed, a state agency has wide latitude in deciding which media to use for communicating a given piece of information. For example, signage and print options are popular media for TIS but are limited in their ability to provide time-sensitive information. Historical markers provide limited types of information as well. There is, of course, no limit to the number of media a state can use to communicate travel information to tourists—according to the national survey of DOTs and STOs conducted in association with this research

**TABLE 10 Information services media available to tourists while traveling**

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A.	<b>Signage or Displays</b>
	1. Displays at transport terminals
	2. Billboards
	3. Tourist-oriented road signage
	4. Information "logo" signs
	5. Variable message signs
	6. Historical markers
B.	<b>Facilities</b>
	1. Highway welcome centers
	2. Interactive video kiosks
C.	<b>Print</b>
	1. Tourist-oriented road maps
	2. Promotional/informational brochures
D.	<b>Other</b>
	1. In-vehicle tourist information
	2. Tourist-oriented radio channels
	3. Special road condition maps/advisories

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effort, seven states employed all 13 TIS channels listed in Table 10.

Because TIS systems are designed to serve tourists in addition to other segments of the traveling public, any decision on the optimum combination of content and media should be based on traveler needs and preferences. Business travelers anxious to reach their next appointment can be expected to prefer media that are updated rapidly, such as tourist-oriented radio channels and variable message signs. Travelers with more leisurely itineraries may look forward to stopping at welcome centers to rest and gather informational materials. However, both types of travelers require information on hazardous weather and road conditions, as well as other sources of travel delay. Optimally, states should consider the TIS needs of each major tourist segment coming to their state, based on analysis of their current inquiry behaviors and through sample surveys of visitors. Such segments will differ among states, but the populations shown in Table 11 appear to be of general interest based on tourism market research conducted by some STOs.

## Content-Media Combinations

The market-specific requirements of different groups is the third element of the conceptual framework.

A review of the literature indicates that little attention has been given to matching tourist segments with their TIS content and delivery preferences. Indeed, the study team uncovered no research-grounded, objective direction to help determine optimum content-media combinations. Limited research has been conducted on visitor preferences for highway welcome centers. For example, Fesenmaier (1994) reported that visitors to highway welcome centers in Illinois preferred centers located at Interstate rest areas where easy access, public restrooms, and a perceived level of safety are provided. An in-depth review of other studies examining the

**TABLE 11 Examples of tourism market segments of major interest to states**

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Active recreationers (skiers, boaters, golfers, etc.)
Campers
Elderly
Ethnic groups
Families with children
First-time visitors
Foreign visitors
Gamblers
Group tours
Meeting/convention delegates
Visitors with physical impairments
Nature-oriented visitors
Repeat visitors
Retired but active adults
Single adults

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delivery of traveler information at highway welcome centers also was conducted.

Nothing in the literature addressed the content that different travelers seek on different types of trips. Telephone interviews with R. Perdue and D. Fesenmaier, two researchers who have published widely on highway welcome center users and their needs, confirmed that no such studies have been published. Therefore, the following discussion is based on a review of the limited documentation in this area, the national survey results, and the discussions with individual state officials and tourism researchers.

The conceptual framework for traveler information services is shown in Table 12, which is a sample matrix for the elderly travel market. This matrix simply relates the information content sought by a particular market segment to the different media available to provide this information. Given that a matrix could and should be developed for each market segment, state officials need to determine where commonalities for the different markets exist for all appropriate media. Alternatively, and perhaps more importantly, an examination of all of the matrixes could show where such commonalities *do not* exist and thus where special attention is needed to disseminate information to the tourist market(s) not reached by common media.

The application of the conceptual framework shown in Table 12 will vary from one state to another. In some cases, the context of application will also be very specific (e.g., gamblers and convention/meeting delegates). Therefore, the matrix should be considered as an aid in developing a comprehensive statewide strategy for traveler information systems, including the selection of appropriate media for the various target market segments. In addition, the matrix can be expanded to include an assignment of the implementation responsibility for each medium/information combination. For example, printed material on tourist facilities might be the responsibility of private companies or owners of tourist attraction sites, whereas information on access routes (especially in real time or at least on a week-by-week basis) could be the responsibility of the state DOT. The STO might be responsible for providing state-level information on all of the tourist-oriented attractions that are available in the state, while the state DOT and private companies might be given the primary responsibility of disseminating this information. So, although Table 12 provides a point of departure for assessing the current status of traveler information services in a state and identifying where deficiencies exist, additional steps need to be taken to provide implementation guidance.

Based on results of the national survey, agencies should find it useful to apply the matrix in Table 12 to their state's TIS program. Ninety-nine state DOTs and STOs—representing 49 states, the District of Columbia, and Puerto Rico—responded to the TIS questions that were part of this survey. Table 13 shows the proportion of state DOTs and STOs reporting that they are involved with implementing, organizing, or regulating any of the 13 traveler information

services examined, either alone or jointly with another state agency.

In this table, the 13 services are listed in order of how frequently they are provided by states. Promotional/informational brochures (item 1) are provided by all states, and tourist-oriented road maps (item 2) by nearly all states. On the other hand, in-vehicle tourist information (item 13) is provided by very few states, although the expectation is that the evolution of intelligent transportation systems (ITS) will increase the use of this service. DOTs alone dominate the provision of historical markers and special condition maps and advisories (items 4 and 7). The only service STOs come close to dominating is interactive video kiosks (item 9).

Virtually all agencies surveyed are involved in providing road maps for tourists (item 2). Most agencies deal with highway welcome centers (item 3) in some capacity. Additional information gathered in focus group interviews with DOT and STO representatives suggests that these two agencies often jointly administer these two types of services. Not surprisingly, state DOTs dominate in providing tourist-oriented road signage (item 3) and historical markers (item 4), while STOs provide promotional/informational brochures (item 1) and interactive video kiosks (item 9) to a much greater extent than do DOTs. Few state DOTs provide in-vehicle tourist information (item 13) or interactive video kiosks (item 9). Few state travel offices provide variable message signs (item 8). In-vehicle tourist information is the traveler information service least often provided at the current time.

It is not clear from the information in Table 13 what these patterns demonstrate: Can they be attributed to the careful attention that states give to tourists' needs combined with their cooperative division of labor between DOTs and STOs, or do these two state agencies determine TIS priorities independently of one another? STOs dominate activities in three categories: promotional/informational brochures, tourist-oriented maps, and interactive video kiosks. The survey results support that STOs most often provide design support and funding for these strategies. Given the distinctive constituencies and staffing capabilities of these two state agencies, it is not surprising that certain specializations emerge in Table 13. Through joint consultation encouraged by the governmental officials, state DOTs and STOs will likely conclude that specialization maximizes TIS implementation. The "best practice" approach would be joint consultation for the planning and support of TIS in order to maximize the visitors' benefits from limited resources.

As mentioned earlier, private sector provision of traveler information services, especially promotional materials, is an important element of successful TIS program implementation. DOTs and STOs need to work closely with private organizations and groups to facilitate the use of TIS strategies that augment those provided by state agencies. For example, private billboards can be more effective in providing directions to a site when the information is compatible with DOT markings and signs. Information can be packaged and presented by

TABLE 12 Sample matrix for elderly travel market

	Signage					Facilities			Maps	Print	Other		
	Displ.	Billboards	Tour. Signs	Logos	Var. Mess.	Hist. Mkrs	Wel. Centers	Vid. Kiosks		Broch.	Inveh.	Radio	Spec. Maps
<b>Attractions</b>													
Dest. Areas	+		++				+++	+					
Attractions	+	+	++			+	+++	+	+	+			
Rec. Opp.		+	++				+++	+	+				
Conditions							+						
Scenic Views			++			+			+		++		
Picnic Areas			++				++		+		++		
Scenic Byways			+++				+++		++	++	++	++	
<b>Facilities</b>													
Lodging	++	++	+++	+++			+++	+		++	++		
Eating/Drinking		++		+++			+++	+		+	++		
Campground				+++			+++	+	+	++	++		
Terminals	++		++				++	+	++		++		
Service Stations		++		+++									
Entertainment	+	++		+			+	+		+			
Shopping		++					+						
<b>Other</b>													
Finance				+			+	+					
Communications	+		+	+			++	++		+	+		
Emergency	++		+	+			++	++	++	+	+		
Restroom	++		+	+			++	++		+	+		
<b>Access</b>													
Routes			+++		+		+++		++	++	+++		
Road Conditions					++						+++	++	
Traffic Conditions					+++						+++	++	
Reservations													
Weather							++				+++	++	
Schedules							+++						
+++	Very important means for conveying desired information to travel market												
++	Important means for conveying desired information to travel market												
+	Can be used for conveying desired information to travel market												
[Blank]	Not important for disseminating this type of information												

**TABLE 13 State DOTs and STOs involved with individual traveler information services (percent of agencies responding “often” or “sometimes”)**

Traveler Information Service	DOT Involved (%)	STO Involved (%)
1. Promotional/informational brochures	66	100
2. Tourist-oriented road maps	90	98
3. Tourist-oriented road signage	98	73
4. Historical markers	98	44
5. Highway welcome centers	94	86
6. Information “logo” signs	88	51
7. Special road condition maps/advisories	87	38
8. Variable message signs	64	19
9. Interactive video kiosks	19	62
10. Displays at transport terminals	57	54
11. Billboards	54	44
12. Tourist-oriented radio channels	42	32
13. In-vehicle tourist information	15	26

Source: *Survey of Current Practices in Addressing the Transportation Needs of Tourism*, Question 22.

private groups via kiosks, rest areas, and radio broadcasts. DOTs and STOs, for their part, can provide information to traveler service agencies, such as AAA, that reach a targeted market. In essence, the conceptual framework shown in Table 12 should be viewed from the perspective that various institutional arrangements can be implemented—some services might be solely the responsibility of public sector agencies, others provided by private organizations, and still others a combination of the two.

### Other Considerations

The survey also examined a list of special strategies or innovative approaches to implementing TIS media that are in use. Survey respondents were provided with the following list:

- Joint funding with other agencies,
- Joint funding with private organizations,
- Creating new quasi-governmental entities,
- Funding combined with in-kind services,
- Privatization of services,
- Special dedicated funding devices tied to the services,

- Use of volunteer organizations, and
- Other (to be identified by the respondent).

Twenty-eight state DOTs and 40 STOs, representing 46 separate states, reported using special strategies for their traveler information services. The following discussion includes salient findings on these strategies along with a statistical summary of state practices in each of the traveler information services examined in the survey.

### *Tourist-Oriented Road Maps*

Ninety agencies (44 DOTs and 46 STOs) indicated they played some role in either implementing, organizing, or regulating this service—a greater response than for any of the other services examined. STOs and DOTs participate almost equally in the planning, design, and funding of tourist-oriented road maps. This finding suggests that the provision of tourist-oriented road maps is a joint endeavor of these two agencies in three-quarters of the states. Fifteen state DOTs and 28 STOs reported they employ special implementation strategies for this TIS. More than 90 percent of the DOTs that participate in this activity reported doing so through joint funding with other agencies, primarily STOs. Three-quarters of the STOs involved in road maps fund these jointly with other agencies, predominantly DOTs, while more than one-third jointly fund this activity with private sector organizations.

### *Highway Welcome Centers*

These information centers for tourists are also taken on as joint projects in most states. Forty-five state DOTs and 42 STOs reported that they implement or organize this traveler information service. Most DOTs participate in the planning, design, funding, and approval of these centers. The STOs, on the other hand, are more involved in planning than they are in the other three activities. Twenty-two state DOTs reported using a special implementation strategy for this TIS, while 32 STOs did. The implementation strategy most commonly reported by both agencies (80 percent of the DOTs and 90 percent of the STOs) is joint funding with other agencies. Joint funding with the private sector was indicated by about one-third of both groups. Only five DOTs and four STOs reported using volunteers in these centers.

### *Tourist-Oriented Road Signage*

Almost all (48 of the 49) state DOTs responding are involved in tourist-oriented road signage. According to the survey, nearly all of the DOTs plan, design, or approve these signs, while three-quarters fund these signs. STO activity is largely confined to planning, with about one-third involved in the design or approval functions. Only 1 in 10 STOs plays

any role in funding tourist-oriented signage. Eighteen DOTs and 17 STOs indicated special implementation strategies for this TIS. Joint funding with another agency was indicated by more than one-half of both the DOTs and the STOs reporting such strategies, and more than one-third of these agencies reported joint funding with the private sector.

#### *Promotional/Informational Brochures*

This activity is the leading traveler information service among STOs, with every office participating. More than 80 percent are involved in planning or funding, with about three-quarters participating in design and approval as well. State DOTs are far less involved: only 31 report any activity. Special implementation strategies were reported by one-third of all DOTs and 85 percent of the STOs. All of the state DOTs noting the use of a special implementation strategy for this TIS employ joint funding with another government agency, while 50 percent indicate joint funding with the private sector. Sixty-six and one-half percent of the STOs with special strategies reported joint agency funding, and 80 percent indicated such funding involved the private sector.

#### *Historical Markers*

State DOTs dominate activities related to historical markers, with only one agency reporting no activity. More than 80 percent of those DOTs responding have responsibility for approving these markers, while nearly that same proportion reported funding them. Only one-half of the STOs indicated they play any role concerning state historical markers, and one-half of those agencies are engaged in planning aspects. Eighteen DOTs noted they use special strategies for this TIS, while 12 STOs did. Among those agencies reporting the use of special strategies, three-quarters of the DOTs and STOs responded they use joint funding with other agencies. Joint funding with the private sector was reported by one-fourth of both the DOTs and STOs.

#### *Specific Information Logo Signs*

Forty-two DOTs identified activities in this category, with three-quarters involved in approval and/or design. Based on the survey results, DOTs and STOs are likely to participate about equally in joint funding with other agencies, joint funding with private organizations, and through privatization. Only one-half of the STOs indicated activity relating to logo signs, and these responses were concentrated in the planning aspects. Roughly 12 DOTs and 12 STOs indicated special implementation strategies here: 40 percent of these DOTs reported that they used joint funding with another agency, joint funding with the private sector, and privatization for this TIS; about 50 percent of the STOs indicated joint agency funding, while slightly fewer (40 percent) reported privatization.

#### *Special Condition Maps/Advisories*

This information service is designed to notify travelers about road conditions—construction delays, poor road conditions, and detours. Ninety percent of the DOTs reported some activity in this area. Almost all of these agencies planned or funded these maps and advisories, while a somewhat smaller number were involved in design and/or approval. Only 18 of the STOs indicated any role here, with about one-half of the activity centered in planning and/or approval. Only nine DOTs and six STOs reported using any special implementation strategies. Nearly one-half of these STOs use dedicated funds for this TIS. There was no clear indication of the implementation strategy most commonly used by DOTs, although it is suspected that construction-related funds for mitigation are a primary source.

#### *Information Displays at Transportation Terminals*

Somewhat more than one-half of the DOTs and the STOs reported participating in this activity. The DOT efforts were directed mostly toward planning and approval, but about two-thirds indicated they designed or funded these displays. Planning was reported by three-quarters of the STOs that indicated any activity here. Ten DOTs and 20 STOs reported using special implementation strategies for this TIS. Nearly all of the DOTs indicated their implementation strategy was joint funding with other agencies. One-half of the STOs reporting any special strategies noted joint funding with other agencies, while a similar proportion reported joint funding with the private sector and/or funding combined with in-kind services.

#### *Billboards*

More than one-half of the state DOTs reported activities regarding billboards, while 80 percent of the STOs did so. The DOT participation centered on the approval process, while about one-half of the STOs reported participating in planning, design, funding, and/or approval. It appears that STOs regard billboard activities as promotional media, while DOTs consider billboards only in terms of their regulation. Only 5 DOTs and 10 STOs reported any special implementation strategies here, with joint funding with other agencies or with the private sector accounting for more than one-half of the responses for either group.

#### *Variable/Changeable Message Signs*

Thirty of the DOTs indicated some activity here, while only nine of the STOs did. DOT actions were concentrated in planning, design, and funding, with two-thirds reporting approval activities. Virtually no special implementation strategies were reported in this category.

### *Interactive Video Kiosks*

This relatively new technology provides travelers with computer-generated responses to inquiries about directions, lodging, eateries, and so forth. Thirty of the STOs participate primarily in the planning phase. Joint funding with other agencies and private organization characterizes virtually all of the STO activity. Only eight of the DOTs indicated any activity here, and this involvement was centered in the approval of these devices. Only 5 state DOTs indicated using any special implementation strategies for this TIS, while 16 STOs did. Of the latter, one-half indicated joint funding with the private sector and/or with another agency. One-quarter of the STOs indicated they privatized these kiosks.

### *Dedicated Tourist-Oriented Radio Channels*

Only about 40 percent of the DOTs and 30 percent of the STOs indicated any activity here. About two-thirds of these DOTs participated in each of the planning, design, funding, and approval phases. One-third of the STOs indicated activities in planning, funding, and/or approval of these radio channels. Only six DOTs and six STOs reported any special implementation strategies for this TIS.

### *In-Vehicle Tourist Information*

This service was the least-mentioned traveler information activity among the 13 listed in the survey questionnaire. Only 7 of the DOTs and 12 of the STOs reported any activity. The DOTs evenly participate in the four phases, while the STOs concentrated more in the planning and funding stages. Only four DOTs and four STOs indicated any participation in special implementation strategies for this TIS. However, this mechanism for disseminating traveler information, although a new, undeveloped technology, could become important in the future, given that it does not require the traveler to stop to obtain information—for example, at a rest area.

As can be seen in this review, “special implementation strategies” usually involved joint funding, primarily with other agencies but often with private sector organizations. “Funding combined with in-kind services” was reported relatively often by STOs, primarily in promotional/informational brochures and information displays at transportation terminals. Privatization—the practice of transferring the provision and funding of a government service to a private sector entity—was also somewhat popular among DOTs and STOs, particularly for special information logo signs. “Special dedicated funding devices tied to services” was sometimes reported by STOs across most of the traveler information services examined. Few DOTs reported using volunteer organizations, and when this response was given, it usually was associated with welcome centers. Several

STOs indicated using volunteers at information displays in transportation terminals. Creating new quasi-governmental entities was the least popular strategy reported by DOTs for special information logo signs and by STOs for highway welcome centers and promotional/information brochures.

With regard to the special market segments considered in this research project, foreign visitors are receiving special services from the STOs in more than one-third of the states. According to the survey results, elderly visitors receive relatively few special information services from DOTs or STOs. Generally, drivers receive attention from more DOTs and STOs than non-drivers, with the exception of those with disabilities. Overall, only in the category of foreign visitors is there a substantial difference between DOTs and STOs, with the latter providing considerably more for this population than the DOTs. This finding is probably one manifestation of the special emphasis many STOs place on attracting foreign visitors (see Table 14).

Agencies in 41 states reported they provide special travel information services to visitors with disabilities, but there is no discernible preference given to drivers versus non-drivers. DOTs and STOs in 24 states indicate they have special information services for foreign visitors, and the results suggest that these are aimed somewhat more toward the non-driver. Agencies in only 14 states indicate they provide special information services for elderly travelers, with a tendency to accommodate elderly drivers rather than non-drivers.

It appears that assistance to the elderly is mainly in the areas of special brochures and large-type signs. Services to foreign visitors are typically foreign language brochures, maps, and signs. Assistance to those with disabilities is primarily handicapped access to rest areas and information centers.

The survey included an investigation of the degree to which state DOTs and STOs viewed the importance of these

**TABLE 14 State DOTs and STOs reporting special information services for specific traveler groups (percent of agencies responding)**

Group	DOT Special Efforts (%)	STO Special Efforts (%)
<b><u>Elderly Visitors</u></b>		
Drivers	16	14
Non-drivers	8	6
<b><u>Foreign Visitors</u></b>		
Drivers	22	36
Non-drivers	14	36
<b><u>Visitors with Disabilities</u></b>		
Drivers	37	38
Non-drivers	39	44

Source: *Survey of Current Practices in Addressing the Transportation Needs of Tourism*, Question 26.

services in the future. The results summarized in Table 15 selectively present the number of agencies responding that these services would be “very important” as a proportion of all responses to that series of questions.

Overall, DOTs report that services for elderly visitors will be very important in the future to a greater extent than STOs do. However, STOs place a greater importance on services for visitors with disabilities and foreign drivers than do DOTs. These perceptions may be a function of how the different agencies are serving these groups now.

## Recommendations

The previous discussion examined traveler information services from the perspective of the basic elements of how travelers receive and interpret information in their trip-making process. The specific recommendations that result from this assessment follow.

### Market Identification

The tourism market consists of many different groups, each having its own needs for types of information and methods of communicating that information. State DOTs and STOs should jointly identify those markets that are most important to the state and, using the approach presented in Table 12, assess the effectiveness of the approaches being used by the state to determine where improvements could be made. Resources are probably not available to implement all of the strategies identified, but those markets and combinations of information needs deemed most important should receive priority.

**TABLE 15 State DOTs and STOs reporting special information services for specific traveler groups will be “very important” in the future (percent of agencies responding)**

Group	DOT Responses (%)	STO Responses (%)
<b>Elderly Visitors</b>		
Drivers	51	42
Non-drivers	37	34
<b>Foreign Visitors</b>		
Drivers	35	56
Non-drivers	51	46
<b>Visitors with Disabilities</b>		
Drivers	45	54
Non-drivers	39	46

Source: *Survey of Current Practices in Addressing the Transportation Needs of Tourism*, Question 28.

## Intelligent Transportation Systems

Intelligent transportation systems (ITS) provide a strategic opportunity to incorporate tourism information dissemination strategies into next-generation approaches to transportation system management. Technologies are now or soon will be available to collect and disseminate information never before possible in a real-time basis. Planning activities relating to the development of a statewide ITS implementation should include the tourism market as a key focus. In addition, the STO should be an active participant in defining information needs and the locations in the transportation system where the most effective information dissemination should occur.

### Tourist Surveys

The state DOT and STO should periodically and jointly conduct tourist surveys to assess the current approaches for providing desired information and to identify changing information needs of key tourist markets. The important element of this activity is the joint implementation of this data-gathering activity. This strategy is a useful way to incorporate into the operational procedures of the state DOT new ideas and concepts about traveler information.

### Visitors Who Are Elderly or Foreign or Who Have Disabilities

Although several states report that they have special information services for visitors who are elderly or foreign or who have disabilities, many more believe that these types of services will be even more important in the future. This finding is especially relevant for the elderly and foreign tourist markets. State DOTs and STOs should jointly review current procedures for providing information to these critical markets and establish a strategy for responding to the needs of these groups. In the case of foreign visitors, for example, valid strategies may include signage with international symbols or foreign languages and intelligent transportation system technologies to tailor information content and delivery for these markets. Responsive and carefully targeted strategies are particularly important in states, such as Florida and California, that have experienced tremendous growth in travel for these market segments.

### Funding Opportunities, Especially Public/Private Partnerships

Many states are using joint funding opportunities to provide traveler information services. Each state should conduct a strategic assessment of its current approaches to information dissemination in relation to likely future needs and the feasibility of different innovative funding opportunities for meet-

ing these needs. This assessment should include an examination of joint activities between state DOTs and STOs and look at the role that private organizations could play in providing traveler information. For example, in the context of ITS, could a private vendor use the data being collected by the DOT, repackage the data, and then disseminate information that is more meaningful (and useful) to tourists? Many opportunities to privatize the dissemination of traveler information could be identified through a feasibility study.

#### *Design Criteria*

At the design level of a TIS, five criteria should guide the choices for the implementation of the system: relevance of information, accuracy, place convenience, time convenience, and format, as described earlier. Transportation officials are familiar with these concepts as they relate to highway signing; however, with the advances in the technology of information dissemination, these criteria also define a key approach to designing these new forms of TIS.

#### *STO Leadership*

The tourism industry in a state has a critical role to play in influencing the Tier 1 decisions for prospective travelers. The DOT should be primarily focused on the Tier 2 decisions, and the STO should interact *proactively* in both areas.

#### *International Signage*

Foreign tourists using the U.S. highway system are expected to increase in number. Those jurisdictions that change

to the international road sign regime as their existing signs need replacement will appear more attractive and hospitable to foreign travelers. Care must be taken to make these changes gradual enough to avoid the "expense backlash" which has slowed conversion to metric signage.

#### *Electronic Information Technology*

Travel and destination information is emerging as an important element of the ubiquitous digital electronic networks, Internet, World Wide Web, and also CD-ROM formats. Establishment of state tourism "home pages" and STO provision of relevant and timely information to software developers will appropriately exploit the growing number of home computer users and the emergence of the "information highway." These modes will provide the prospective traveler who is computer literate with graphic previews of route and destination features by state or region and can be searched for individually desired features, such as child-friendly, handicapped-accessible, or even free attractions.

#### *Timely Delivery of Information*

No matter what mechanism or strategy is used to provide traveler information, this information must be up to date and delivered in a timely manner. Therefore, DOTs and STOs should examine the quality of information and information delivery periodically. They also should be continually investigating new approaches for collecting data on transportation system performance as part of the information dissemination process.

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## CHAPTER 4

# CONCLUSIONS

This research was undertaken to provide state transportation agencies with guidance on how to link transportation planning and investment with tourism development. The approach involved a comprehensive examination of existing and relevant DOT and STO practices that addressed four important aspects of the transportation-tourism interface: (1) policies, (2) planning procedures, (3) planning analytics, and (4) program elements.

As a result of this examination, it was possible to identify the most common agency practices, some of which were formally adopted but many of which were not. The research also uncovered “best” practices, which were studied to assess their viability in other institutional environments.

A set of five recommendations was developed to identify improvements for strengthening all of the above four aspects of the transportation-tourism interface. The first recommendation calls for a Type IV institutional arrangement, driven by a formal policy mandate initiated by the Governor. Such policies may be general, or they may be quite detailed and specify priority issues and process requirements. Limited memoranda of understanding, informal agreements, and ad hoc responses all rely heavily on the commitment of staff and CAOs and, therefore, often do not establish *ongoing* protocols for comprehensively addressing the transportation needs of the tourism industry.

The next recommendation is presented in the form of 11 principles for integrating transportation and tourism objectives. These principles cover three major areas where transportation and tourism interface: the policy level, the transportation planning process, and the project development level. As state transportation agencies more closely connect transportation planning and project selection to economic development, and as tourism sustains its economic importance to states, these two issues (transportation development and tourism) will become even more closely tied together. Those states that provide coordination in policy, planning, and project development will be better able to take advantage of the economic benefits that will occur from increases in tourism.

Next, a set of 13 guidelines is offered to foster interagency coordination in the statewide planning process. These guidelines suggest that the state transportation agency develop working partnerships with tourism agency (e.g., STO) and industry representatives to foster a proactive approach to

planning and project development that best meets the tourism needs of the state. The most likely benefit of such interaction will be in the provision of traveler information services. The results of the national survey indicated that such services already are the impetus for most interaction between transportation agency and tourism representatives. Examining the characteristics of this interaction and applying the successful elements to other functions within the transportation agency is a good approach to improving agency planning and implementation activities.

These 13 guidelines are intended to serve simply as a point of departure for transportation officials who want to incorporate tourism concerns into agency activities. In most cases, the context for planning and project development will be specific to individual states. Additional concerns and strategies for dealing with them probably will arise during the process of assessing agency programs and procedures. The basic point, however, remains that transportation planning and project development need to be sensitive to tourism issues and concerns.

Further guidance is provided in the form of recommended measures of tourism travel output and a conceptual tourism economic development model. State DOTs need to be oriented to use an economic methodology that will link their investment decisions with tourism development. The research shows that much of the data recommended as measures and required by the proposed model are available from DOTs and STOs. Given that these two agencies generally do not share data, opportunities are limited for field-testing the model. To enable better informed investment decisions, it is essential to optimize the use of existing databases and analytical capabilities. It is highly likely that additional data will be needed for application to a specific transportation improvement. In these cases, it is recommended that data gathering be a joint effort—not only to distribute the financial burden of this activity but to coordinate the undertaking of an economic analysis that isolates tourism benefits in relation to specific transportation improvements.

The final recommendation is in the area of traveler information services. Emphasis on information content and media type guides the discussion of more effectively communicating with various market segments. Also a methodology is presented for evaluating these different market segments. Last, 10 areas are identified where priority attention should



be given to maximize improvements to traveler information services. Special emphasis is given to elderly and foreign tourists. Both of these tourist markets probably will become increasingly important in the future and thus will require special consideration by DOTs and STOs.

Establishing the linkage between transportation investment and economic development is of recent and growing importance. Better interagency coordination and better analytical capabilities are the two essential components for enhancing the planning process. In the first case, coordination practices can and should be implemented formally, beginning with solid policies and mandates to guide interagency relation-

ships. With regard to analytical capabilities, data-sharing and joint data collection activities should be encouraged, along with state-level efforts to validate the proposed tourism economic development model and document the results.

Continued research on economic approaches to transportation investment will be valuable to DOT officials who need to make difficult decisions with limited funds. Identifying better methods for communicating available economic tools also will be of value. While engineering standards will remain important for determining safety and capacity deficiencies, economic criteria will become increasingly significant in the project selection process.

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## GLOSSARY

**AASHTO** — American Association State Highway and Transportation Officials

**base case scenario** — the stream of economic benefits over the benefit period of the investment resulting from maintaining current policies and programs affecting the specific highway improvement project under study

**default values** — imputed values used in lieu of more refined data

**discount rate** — an interest rate representing the opportunity cost of capital and used to convert a stream of future cash flows from a highway investment project or other project into an equivalent present value

**DOT** — state or federal department of transportation

**economic development** — increased total production valued at market prices on a per capita basis in an area under study

**ESSTO** — Educational Seminar for State Travel Officials conducted annually by the Travel Industry Association of America

**focus group** — a small group of interacting individuals with common interests that focuses on a few issues in a discussion led by a moderator; one each was conducted with state travel office directors and state DOT officials

**GDP** — gross domestic product, the total value of all goods and services produced within a country's border for final demand in a year

**GSP** — gross state product, the total value of all goods and services produced within a state's borders for final demand in a year

**HIAP** — Highway Investment Analysis Program

**input/output model** — a model of an economy that embodies the inter-industry transactions in the area and the total revenue and income consequences of increases in final demand in the area

**intelligent transportation system technologies** — colloquially referred to as “smart car or smart highway” technology, a collection of traffic management technologies many of which are targeted at improving real-time traffic conditions through such techniques as road incident identification and response, in-vehicle information systems, and roadway navigational aids

**intermodal connectivity** — the connection of two or more transport modes facilitating travelers easy transfer from one mode to another; examples include joint air/bus terminals and subway lines running to airports

**ITS** — intelligent transportation systems

**ISTEA** — Intermodal Surface Transportation Efficiency Act of 1991

**ISTEA enhancement funds** — the fraction of federal trust funds allocated to individual states that must be spent on specified types of projects, including recreational travel

**lodging venue** — in the Wisconsin Highway 29/45 Corridor Study, one of the following: hotel/motel, campground, seasonal home, home of friends or relatives pass-through, visitors (overnight stay), and day trippers (no overnight stay)

**model** — a simplified mathematical representation of a complex process or set of relationships such as those contributing to a regional economy

**MPO** — metropolitan planning organization, a local government organization responsible for transportation planning for a metropolitan region

**multiplier impact** — the total income, output, employment or other economic measure resulting from export sales (such as to tourists) of a regional or national economy, comprising the sum of the impacts of (a) the initial sales to tourists, (b) purchases by those selling directly to tourists that support these sales (called the “indirect impact”), and (c) sales to the employees of these organizations in spending their wages and salaries in the economy (called the “induced impact”)

**national survey** — the special survey (conducted for this project) of the state transportation agencies and state travel offices in the 50 states, the District of Columbia, and Puerto Rico, addressing the transportation needs of tourism-

**NCHRP** — the National Cooperative Highway Research Program administered by the Transportation Research Board of the National Academy of Sciences

**O/D data** — measurements of the flows of passengers between trip origins and trip destinations

**personal income** — all income actually received by households, including wages, salaries, interest, rent, and dividends

**recreational travel** — a subset of tourism travel representing pleasure travel

**regional economic impact models** — economic models that transform direct tourist expenditures in a region into a total “multiplier” impact in the present and for future periods

**reliability** — one criterion for evaluating economic impact models: a model is deemed reliable if two or more applications of its procedures produces approximately the same results for a given investment project

**REMI** — Regional Economic Models, Inc., multiregional dynamic economic and demographic forecasting model that estimates regional effects of various governmental or private policy changes or investments

**roadside surveys** — probability sample surveys of visitors traveling on the highway under study

**scenic road system** — a set of usually low-volume roads specially designated to enhance the traveler's view and/or bucolic experience (e.g., scenic byways)

**state travel office** — the official state agency responsible for tourism promotion and development

**statewide transportation planning process** — considers in detail the needs and use of state and local highways and their interaction with other travel modes

**STO** — state travel office

**Technical Council** — state DOT and STO officials selected to represent various regions in the country and charged with the review of survey results and recommendations before submission to the NCHRP Project 2-17(6) Panel

**TI** — traveler information

**TIS** — traveler information services

**tourism** — activities undertaken by or related to tourists on trips away from home

**tourism industry** — the various firms and establishments, including business and non-profit organizations, that wholly or in part provide goods and services to tourists, either directly or indirectly

**tourism-related highway improvement project** — those highway investment projects expected to increase tourism travel output in an area; includes improved directional signage for tourism facilities, expanded highway capacity to such facilities, roadside rest areas, scenic turnouts, and upgraded access to these facilities in the way of interchanges, ramps, and so forth

**tourism travel output** — the market value of those goods and services produced in state and sold to visitors traveling within the state

**tourist** — any individual on a trip to a place 100 miles or more away from his or her home or spending the night away from home and who returns home within 12 months; same as "visitor"

**transportation investment** — for the purposes of this study, public investment in the expansion of road or highway infrastructure capacity

**travel demand and assignment model** — a model that projects visitor flows along a highway improvement corridor in reaction to reduced travel costs and assigns these flows to specific highways

**traveler** — same as "tourist" for the purposes of this study

**traveler information services** — the wide range of communication devices that could be used to guide travelers and carriers through the transportation network to tourism sites

**trip generation model** — a model projecting the number of qualified trips generated by an origin based on origin-destination flows quantified in prior studies and including the relationship of traffic volume to travel time, costs, and safety considerations

**validity** — one criterion for evaluating economic impact models: a model is deemed valid if it measures what it is intended to measure—in the present case, the tourism-related development impacts of a highway improvement project

**value added** — the difference between the value of goods or services produced and the cost of materials and supplies used in producing them; consists of the wages, interest, and profit components added to the output of a firm, industry, or region

**visitor** — same as "tourist" but emphasizing the area visited

**visitor-days** — a measure of tourist demand: the number of visitors to an area multiplied by the number of days spent in the area

**visitor expenditure** — expenditure made by or on behalf of a visitor to an area in that area

**welcome center** — an office operated by a public or private organization that provides information such as maps, tourism directories, and routings to tourists

## APPENDIX A

### LIST OF AGENCIES PARTICIPATING IN NATIONAL SURVEY

Alabama Bureau of Tourism and Travel	Minnesota Office of Tourism
Alabama Department of Transportation	Mississippi Department of Transportation
Alaska Department of Transportation and Public Facilities	Mississippi Department of Economic Development
Arizona Department of Transportation	Missouri Highway & Transportation Department
Arizona Office of Tourism	Montana Department of Transportation
Arkansas Department of Parks and Tourism	Montana Travel Promotion Division
Arkansas State Highway and Transportation Department	Nebraska Department of Economic Development
California Department of Transportation	Nebraska Department of Roads
California Trade and Commerce	Nevada Commission on Tourism
Colorado Department of Transportation	Nevada Department of Transportation
Colorado Tourism Board	New Hampshire Department of Transportation
Connecticut Department of Economic Development	New Hampshire Office of Travel and Tourism Development
Connecticut Department of Transportation	New Jersey Department of Transportation
DC Convention and Visitor Association	New Mexico State Highway and Transportation Department
DC Department of Public Works	New Mexico Department of Tourism
Delaware Department of Transportation	New York State Department of Economic Development
Delaware Tourism Office	New York State Department of Transportation
Florida Department of Transportation	North Carolina Department of Transportation
Florida Department of Commerce	North Carolina Division of Travel and Tourism
Georgia Department of Transportation	North Dakota Department of Transportation
Georgia Department of Industry Trade and Tourism	North Dakota Tourism Department
Idaho Department of Commerce	Ohio Division of Travel & Tourism
Idaho Department of Transportation	Oklahoma Department of Transportation
Illinois Bureau of Tourism	Oklahoma Tourism and Recreation Department
Illinois Department of Transportation	Oregon Department of Transportation
Indiana Department of Commerce	Oregon Economic Development Department
Indiana Department of Transportation	Pennsylvania Department of Transportation
Iowa Department of Economic Development	Pennsylvania Office of Travel Marketing
Iowa Department of Transportation	Puerto Rico Department of Transportation and Public Works
Kansas Department of Transportation	Puerto Rico Tourism Company
Kansas Division of Travel and Tourism	Rhode Island Department of Economic Development
Kentucky Department of Travel Development	Rhode Island Department of Transportation
Kentucky Transportation Cabinet	South Carolina Department of Transportation
Louisiana Department of Culture, Recreation and Travel	South Carolina Department of Parks, Recreation and Tourism
Louisiana Department of Transportation and Development	South Dakota Department of Tourism
Maine Department of Transportation	South Dakota Department of Transportation
Maine Office of Tourism	Tennessee Department of Tourist Development
Maryland Department of Economic and Employment Development	Tennessee Department of Transportation
Maryland State Highway Administration	Texas Department of Commerce
Massachusetts Bureau of Transportation Planning and Development	Texas Department of Transportation
Massachusetts Office of Travel and Tourism	Utah Department of Transportation
Michigan Department of Transportation	Utah Travel Council
Michigan Travel Bureau	Vermont Agency of Transportation
Minnesota Department of Trade and Economic Development	Vermont Department of Travel and Tourism

Virginia Department of Transportation  
Virginia Department of Economic Development  
Washington Department of Trade and Economic Development  
Washington State Department of Transportation  
West Virginia Division of Highways

West Virginia Division of Tourism and Parks  
Wisconsin Department of Transportation  
Wisconsin Division of Tourism  
Wyoming Division of Tourism Department of Commerce  
Wyoming Department of Transportation

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## APPENDIX B

### SAMPLE QUESTIONS FOR ATTRIBUTE ANALYSIS OF AGENCY RELATIONSHIPS

Developing the actual questions for each cell in the matrix needs to be performed by the team members. However, to illustrate the use of this approach, sample questions are listed below in detail. The degree or status of accomplishment of each query is graded 1–5 (with “5” as the best grade).

	<b>Sample Grade</b>
<b>Formal Reporting and Review</b>	
1-A Is there a formal infrastructure (highway) system plan document which illustrates the current and planned scope as it pertains to travelers/tourists?	3
2-A Can the system(s) described in the documents noted above handle traffic to and from available and projected tourism facilities, based on actual demand data?	4
3-A Are rules published that influence the tourism/transportation interface, and is there a means for reviewing and modifying them to fit emerging needs?	4
4-A Is there an intermodal discussion that describes how effectively the highway infrastructure connects with or relates to other transportation modes—rail, air, bus, ferry, bicycle, and so forth?	3
5-A Do reports show sufficient access to tourism destinations, or to what degree is access and mobility inhibited by traffic constraints—maintenance, construction, congestion, signage?	3
6-A How well can we extract from past budget or procurement documents—or from the current budget—the resources spent on transportation elements directly for tourism outcomes?	4
7-A To what extent is there an inventory of tourism-related signs in place or planned, as well as documentation and data about welcome center use and information dissemination that can be reviewed for future justification?	2
8-A Are reports and studies available and reviewed that show the beneficial economic results obtained from transportation expenditures directed toward tourism and the geographical areas where the benefits occurred?	2
9-A Are the environmental impacts attributed to tourism included in environmental assessments identified and reviewable?	1
<b>Planning</b>	
1-B How well does the transportation planning process accommodate the needs of tourists?	2
2-B When systems are analyzed and planned, are the capacity requirements associated with tourists (including for special events) discretely accounted for?	2
3-B Do the transportation and/or travel/tourism agencies regularly review and consider amendments to relevant executive orders, laws, or administrative rules specifically to enhance the travel/tourism interests?	1

- 4-B How well does state capital investment planning accommodate the intermodal connectivity potential as it affects tourism? 4
- 5-B Do transportation plans include access and mobility concerns for tourists, including visitors who are foreign, or elderly or have disabilities? 4
- 6-B Are the tourism element costs accounted for separately and reflected in the appropriate budgets? 3
- 7-B Do facility and service plans for vehicles, drivers, and passengers include adequate attention to continuous improvement of information transfer to travelers, and are all appropriate media utilized? 3
- 8-B Are geographic areas identified within the state, and are plans made to enhance tourism where most economic benefit would result? 4
- 9-B How well does the planning process reflect environmental concerns of tourists? 3

### Design

- 1-C Do the designs of highway facilities serve the broader interests of travelers/tourists (e.g., rest areas, and waysides)? 4
- 2-C Are design details (e.g., traffic signals, turning lanes, and acceleration and deceleration lanes) attentive to tourism needs? 5
- 3-C Do traffic laws or other safety considerations (e.g., speed limits, zones, and turning protocols) help or impede travel/tourist interests? Is safety a major concentration area? 4
- 4-C Are facilities designed to maximize easy transition for the traveler from one mode to another? 3
- 5-C Are facilities designed to accommodate drivers who are elderly or have disabilities? Is traffic management of incidents or congestion effective in maintaining maximum mobility? 2
- 6-C Are design costs for the tourism component known even where they are easily included or shared with primary facility construction costs? Is adequate money made available to cover costs? 2
- 7-C Is the information transfer process designed to maximize understanding? Are the designs of maps, brochures, PSAs, and so forth attractive and attention-getting? 4
- 8-C Are facilities designed to afford easy on-off access to tourism/commercial destinations? 3
- 9-C Are the aesthetic aspects of clean air, clean water, excellent habitat, and scenic views designed into the highway facilities? 2

### Policy

- 1-D Is there a published state infrastructure policy that accounts for expanding highway development to maximize access to appropriate areas or to maximize attractiveness through highway beautification, scenic byways, and development roads? 3
- 2-D Is there a reasonable policy on level-of-service acceptable for travelers/tourists? 2
- 3-D Is there a uniform traffic citation across all jurisdictions and a reasonably uniform violation outcome? 3
- 4-D Does the state have a policy on intermodal connection that could guide public and private investors and operators? 2
- 5-D Are there statements of intent and expectation for ease of access and mobility for special transportation users? Are ADA practices followed? 3

- |     |   |   |
|-----|---|---|
| 6-D | Are there cost policies that require benefit/cost analysis or annual minimum/maximum for tourism-related costs?   | 4 |
| 7-D | Do state (or federal) policies inhibit the design and placement of information mechanisms or promotional activity?  | 4 |
| 8-D | Is there a policy (or policies) that requires or encourages economic development (including tourism growth) and identifies specific projects to enhance certain state areas or sectors? | 3 |
| 9-D | How well are the many environmental policies affecting transportation and tourism followed, and is environmental mitigation employed to enable projects with positive tourism outcome?  | 4 |

#### **Impact Analysis**

- |     |  |   |
|-----|--|---|
| 1-E | How well do we determine the effect of infrastructure coverage on travel/tourism economic outcome? Do we collect sufficient data to do so? | 2 |
| 2-E | Do we know the negative impact of congestion on tourism?   | 3 |
| 3-E | Do our regulations on vehicle use or taxation inhibit travel/tourism benefits?   | 4 |
| 4-E | Do we know much about choices made by travelers and tourists at or because of intermodal discontinuity locations?                          | 3 |
| 5-E | Can we say what impact our barriers to the transportation disadvantaged have had on tourism economics?                                     | 2 |
| 6-E | Can we quantify benefits and/or allocate costs of facility development and operation to tourism in particular?                             | 2 |
| 7-E | Can we measure the coverage and impact of our public relations efforts or welcome center hours of operation on travel/tourism?             | 3 |
| 8-E | Can we measure the changes in economic activity resulting from changes in transportation investment?                                       | 2 |
| 9-E | Can we determine the impact of mitigating negative environmental conditions on the response of tourists?                                   | 3 |
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## APPENDIX C

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Abbreviations used without definitions in TRB publications:

AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ITE	Institute of Transportation Engineers
NCHRP	National Cooperative Highway Research Program
NCTRP	National Cooperative Transit Research and Development Program
NHTSA	National Highway Traffic Safety Administration
SAE	Society of Automotive Engineers
TCRP	Transit Cooperative Research Program
TRB	Transportation Research Board
U.S.DOT	United States Department of Transportation

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