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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Project 08-58

Final Research Report: Development of Guidebook for Corridor-Based Statewide Transportation Planning

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Final Research Report: Development of Guidebook for Corridor-Based Statewide Transportation Planning

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CHAPTER 1 - INTRODUCTION

The objective of this research is to develop a guidebook for a multimodal statewide corridor planning (SWCP) process. The purpose of this report is to describe the methodology and products of this research project, thus, serving primarily as a resource for researchers and individuals who are seeking background information on the research process, resources, and findings.

The audience for the SWCP guidebook is envisioned to be state transportation agency officials and practitioners in the United States who are responsible for the development of the federally-mandated statewide transportation plan. In particular, the guidebook is intended for those who wish to focus on specific major modal or multimodal corridors in the state transportation system.

Elements of this multimodal corridor planning process may also be adapted for use by metropolitan planning organizations and rural planning organizations for their regional planning efforts. The guidebook may also be useful to consultants and academics who work in the field of systems-wide transportation planning.

The guidebook is published separately as *National Cooperative Highway Research Program (NCHRP) 635, Guidebook for Corridor-Based Statewide Transportation Planning*. Throughout this report, that document will commonly be described as the "guidebook," the "Statewide Corridor Planning Guidebook" or the "SWCP Guidebook." State transportation agencies will commonly be called "state DOTs." References may also be made to other transportation agencies or organizations, such as metropolitan planning organizations (MPOs), rural planning organizations (RPOs), and public transit agencies, but these will be specifically named in the report.

Organization and Contents of the Report

This Research Report is organized as follows:

- The remainder of Chapter 1 provides background on statewide corridor planning and presents the research objectives and approach.
- Chapter 2 presents an overview of the research methodology, including the literature review, transportation agency surveys, and case study research.
- Chapter 3 provides a summary of the research findings, including factors and issues that influence the statewide transportation planning process
- Chapter 4 gives a description of the statewide transportation planning process, including a history of federal legislation, regulations, and guidance; types of statewide plans; and the relation between planning and programming.
- Chapter 5 discusses the corridor-based approach to statewide planning, including corridor analysis, corridor planning studies, the statewide transportation planning context, and the relationship with individual corridor planning efforts.

- Chapter 6 presents the purpose and principles of the SWCP Guidebook and offers a basic conceptual framework developed for the SWCP process.
- Chapter 7 provides a summary of the SWCP Guidebook and potential future research and enhancements for the SWCP process.
- Chapter 8 presents an implementation plan for developing awareness and disseminating information presented in SWCP Guidebook.
- The Appendices provide more detailed summaries of the literature review, the transportation agency surveys, the case study research, and a bibliography.

Background

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) was the first time a federal law required states to develop a long-range statewide transportation plan, even though many states had been developing statewide plans for years. ISTEA required that these statewide transportation plans were to have at least a 20-year planning horizon, with updates required at least every five years.

Subsequent federal legislation has continued these requirements, usually with some revisions in the requirements, such as the changes in planning factors that must be considered in the planning process (e.g., most recently, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or SAFETEA-LU). Federal laws governing statewide transportation planning process requirements are codified in 23 USC 134 and 135, and Federal transportation planning regulations are codified in 23 CFR 450.

State transportation agencies have generally used two general approaches to meet the state transportation planning requirement: a policy-based plan or a plan that primarily focuses on the projects that were to be implemented over the time horizon for the plan.

- A policy plan generally sets forth a vision, goals, policies, and decision-making process for the state's transportation system in relationship to other state goals (such as goals for economic development and environmental protection).
- A project plan would generally include the same elements as a policy plan, but goes a step further by using the vision, goals, policies, and/or defined evaluation criteria to define, prioritize, and select specific projects to be implemented for the planning horizon.

Several approaches have been used to develop statewide transportation plans. In some states, the statewide transportation plan has examined the transportation system from the perspective of the entire state; for example, all facilities are evaluated somewhat equally, metropolitan transportation plans are incorporated into the statewide plan, and intercity passenger and freight movement facilities and systems are added to provide a statewide perspective on transportation system performance and needs. In other cases, statewide transportation plans

focus on transportation systems of statewide significance, most notably the highway system, with targeted investments identified to improve modal components of the system that hinder system performance.

In still other cases, states have refined these plans by focusing on major transportation corridors of statewide or regional significance. These corridors address not only highways, but also other transportation modes for moving people and goods.

Although there are examples of states adopting a corridor planning approach in the late 1970s (e.g., Massachusetts), it has only been in the past 15 years (since the passage of ISTEA) that the concept has received increased attention. Therefore, there are several state DOTs that provide good examples of how a corridor approach can be used to identify statewide needs, while other state DOTs have seriously considered implementing a corridor-based planning process as a means of developing a statewide transportation plan.

Given this increased interest in a corridor planning approach to statewide transportation planning, this research project – *NCHRP 8-58: Development of a Multimodal Statewide Corridor Planning Guidebook* – was initiated based on a request from the AASHTO Standing Committee on Planning.

Research Objective and Approach

This research project is intended to provide guidance on how to develop corridor-based statewide transportation plans. This guidance places special emphasis on how to:

- Assist states in identifying and analyzing corridors; and
- Use this information to identify needs and prioritize projects to feed into the development of a statewide transportation investment program.

Most of the information for the research project was derived from the three initial tasks of this research project: Literature Review, Transportation Agency Surveys, and Case Study Interviews. The goals of these tasks were to:

- Gather basic information on the state of the practice for long-range transportation planning by state transportation agencies, metropolitan planning organizations, and transit agencies;
- Identify transportation agencies that are using a corridor-based transportation planning process;
- Assess how these agencies identify and analyze corridors and how this information is used in the planning and decision-making process;
- Identify potential agencies for further investigation into “best practices” that could be applied to a corridor-focused statewide transportation planning process; and
- Conduct case studies of selected agencies to better understand and document the rationale and methods for these “best practices.”

There are two key issues related to the results of these tasks:

- Although several states have adopted corridor planning as an approach to statewide planning, there are few papers or technical reports that describe the process, its advantages, and its limitations. Much of the information obtained in this research has come from the few technical reports that have been produced, the surveys of transportation agencies, case studies of selected agencies, and a web search of state-specific corridor planning efforts.
- It has been almost three years since the research project began. Some states were making major changes in their statewide transportation planning process during the initial collection of research data and information; and almost all states have been continually making modifications to their process, especially as they update their previous Statewide Transportation Plan and as they responded to the passage of SAFETEA-LU Therefore, some information in this report may not be current – although attempts to update information were made through internet searches and follow-up contacts as the project neared completion.

From this research, the research team has identified:

- Factors and issues that influence the statewide transportation planning process;
- Basic features or steps involved in the statewide transportation planning process;
- Characteristics of a corridor-focused statewide planning process; and
- Examples of "best practices" for a corridor-based statewide planning process.

This information was used to formulate a conceptual framework, issues, procedures, and methods for a basic SWCP Process to be presented in the development of the SWCP Guidebook for state DOTs, which is published as a separate NCHRP document.

Further discussion of the research process and findings are contained in subsequent chapters of this report.

CHAPTER 2 - RESEARCH METHODOLOGY

The objective of this research project was to develop a framework and guidance for a multimodal statewide corridor planning process as a major planning input into the development of the Statewide Transportation Plan, including procedures and methods.

Information on the State of the Practice

Much of the information for this Research Report was derived from the three initial tasks of this research project: Literature Review, Transportation Agency Surveys, and Case Study Interviews. The goals of these tasks were to:

- Gather basic information on the state of the practice for long-range transportation planning by state transportation agencies, metropolitan planning organizations, and transit agencies;
- Determine which transportation agencies were using a corridor-based transportation planning process;
- Assess how those agencies identify and address corridors and how this information is used in the planning process; and
- Identify potential case studies for further investigation into "best practices" that could be applied to a corridor-focused statewide transportation planning process for state DOTs.

Literature Review

The purpose of the literature review was to identify and assimilate the results of previous research, conferences, and activities related to statewide and/or systems-wide corridor planning and associated topics that have occurred at the national, regional, and local level. Numerous reports and web documents were initially identified and reviewed, including documents and/or web pages on corridor planning, statewide transportation planning, and several "special emphasis areas" that should be addressed in the planning process (e.g., environment, safety, economic development, financing, etc.).

Other documents and web pages potentially applicable to statewide corridor planning were also identified through the literature review process and other tasks, and these were included as appropriate. This additional literature included state DOT statewide transportation plans and supporting documents; however, many of these were examined further as part of the Agency Survey and/or Case Study Review tasks for this research project. Overall, approximately 80 reports and web documents were reviewed. From these, approximately half of the documents were recognized as having special value for this research study. Summaries of these are included in Appendix A: Literature Review.

For the selected documents that had specific relevance to statewide corridor planning, the literature review proceeded with the following goals:

- Assess what agencies have been doing or considering in statewide or systems-wide corridor planning;
- Identify issues, trends, and effective practices in multimodal statewide or systems-wide corridor planning; and
- Identify how special issues have been considered in the transportation planning process.

Transportation Agency Surveys

To gather specific information on current practices for statewide corridor transportation planning, a survey questionnaire was developed and sent to state transportation agencies, metropolitan planning organizations, and public transit agencies in June 2006. The survey form for each group was customized for that particular target group.

Copies of the survey forms for DOTs and MPOs are included in Appendix B: Transportation Agency Survey Forms. No survey responses were received from transit agencies, so the transit survey form is not included in this report.

Follow-up contacts were made in July 2006 to increase the number of returned responses. Responses were received in June, July, and August 2006.

State DOT Surveys

Using e-mail, DOT surveys were sent by the American Association of State Highway Officials (AASHTO) to all members, which includes transportation agencies of the 50 states, the District of Columbia, and Puerto Rico.

Thirty-three of the 52 members (63.5%) responded to the survey.

MPO Surveys

Using e-mail, MPO surveys were sent by the Association of Metropolitan Planning Organizations (AMPO) to all members. For this discussion, these agencies are collectively referred to as MPOs.

Survey responses were received from 18 of the 384 MPOs (4.9%).

Public Transit Agency Surveys

Survey forms were provided to the American Public Transportation Association (APTA) for distribution to public transit agency membership. However, no responses were received from any of the public transit agencies.

Case Studies

Although the literature review and transportation agency surveys encompassed a range of agencies and organizations, the research team also undertook case studies of selected agencies, based in part on their demonstration of "best practices" for corridor-based systems-wide transportation planning. The case

studies were intended to focus in more detail on the questions in the agency survey, as well as on institutional and process-oriented information that is often difficult to obtain from a survey. This research placed emphasis on documenting the lessons learned and best practices for agencies that appeared to have a successful corridor planning process or a unique characteristic or approach to this process.

The research plan emphasized case studies for state transportation agencies, but it also called for the inclusion of one or more MPOs, public transportation agencies, and/or multi-state corridor coalition groups to broaden the perspective beyond the state DOT practices and process.

The first step in the case study research was to identify agencies involved in a corridor-based statewide or systems-wide planning process. Transportation agencies were not considered case study candidates if they did not respond to the survey. No responses were received from transit agencies, so that group was eliminated from further consideration. From the surveys, the following agencies were identified as potential case study candidates, including multi-state coalitions identified by some state DOTs:

- Arizona DOT
- Colorado DOT
- Connecticut DOT
- Florida DOT
- Idaho DOT
- Indiana DOT
- Maine DOT
- Michigan DOT
- Minnesota DOT
- North Carolina DOT
- North Dakota DOT
- Oklahoma DOT
- Pennsylvania DOT
- South Carolina DOT
- Wisconsin DOT
- Baton Rouge, Louisiana MPO
- Bend, Oregon MPO
- Burlington, Vermont MPO
- Janesville, Wisconsin MPO
- San Diego, California MPO
- Seattle, Washington MPO
- St. Louis, Missouri MPO
- Corridor 18 (I-69) Coalition
- I-95 Coalition
- Ports-to-Plains Coalition
- Upper Midwest Freight Corridor Coalition

Survey responses from DOT and MPO candidates indicate that each has a corridor-based planning process. Based on a review of the surveys and input from the NCHRP Review Panel, it was decided that the case studies would include one MPO, one multi-state coalition, and five state transportation agencies. A larger number of state DOTs was chosen since statewide transportation planning was the main purpose of the research project and since there were considerably more responses from DOTs than from MPOs.

After identifying the state DOTs that use a corridor-based statewide transportation planning process from the survey, additional criteria were applied to select the final state DOT case study candidates. These were aimed at a mix of

different attributes based not only on the survey, but also the agency's organizational features, decision-making process, transportation system attributes, and socioeconomic factors. The criteria tried to strike a balance using the following characteristics taken from the survey results and from transportation, census, and economic data:

- Centralized or Decentralized
- Policy or Project-Based Plan
- Legislative Requirements
- Public and State Road Mileage
- VMT per Capita
- Urban/Rural Population Density
- Personal Income per Capita
- Diversity of Modes

Other factors were also considered in making the final selection. For example, it was deemed important to select some states involved in multi-state corridor planning. Consideration was also given to the geographical distribution of the selected states and to input from the NCHRP Review Panel.

Table 2-1 compares candidates for the selected criteria.

Based on input from the survey responses and knowledge gained through secondary research, the following were selected for further case study research:

- Five DOTs: Colorado, Florida, Indiana, North Carolina, and Pennsylvania;
- One MPO: St. Louis; and
- One multi-state corridor organization: The I-95 Corridor Coalition.

Following is a brief discussion of each of the selected DOT candidates:

- Colorado DOT: Colorado has a decentralized planning process, whereby the responsibility for planning is shared with rural regions, MPOs, DOT Districts, and other DOT offices. Like most states, CDOT prepares a policy-based Statewide Transportation Plan. The planning process is affected by some legislative requirements. The Colorado DOT was chosen primarily because the DOT's criteria for corridors may be of value as a potential model for other states.

  Both the public road mileage and VMT per capita approximate the national average. Colorado is predominantly a rural state with a population density well below the national average, but the personal income per capita is high. Also, Colorado works with a Transportation Commission, which can serve as an example for other states that work with similar groups. Finally, Colorado has also been involved in a major multi-state corridor planning effort, the Ports-to-Plains Corridor, so the DOT can provide some insight into how such efforts can be incorporated into the statewide planning process.

TABLE 2-1 Candidate Comparison Matrix

NCHRP 8-58: DEVELOPMENT OF A STATEWIDE CORRIDOR PLANNING GUIDEBOOK
CASE STUDY SELECTION CRITERIA

CRITERIA	SELECTED CASE STUDY CANDIDATES						
	Florida DOT	Colorado DOT	NC DOT	Indiana DOT	Pennsylvania DOT	St. Louis MPO	I-95 Coalition
Completed a survey form	YES	YES	YES	YES	YES	YES	FL/NC/PA
Uses a corridor-based approach	YES	YES	YES	YES	YES	YES	FL/NC/PA
Centralized process for STP	NO	NO	YES	YES*	YES	YES	N/A
De-centralized process for STP	YES	YES	NO	YES*	NO	NO	N/A
Policy-based Transportation Plan	NO	YES	YES	NO	YES	NO	N/A
Project-based Transportation Plan	NO	NO	NO	YES	NO	YES	N/A
"Other" type of plan	YES	NO	NO	NO	NO	NO	YES
State legislative, regulatory, or policy requirement for STP process	Legislation	Legislation	Policy	NO	NO	NO	NO
Corridors are used in selecting and/or prioritizing projects	YES	YES	YES	YES	NO	YES	FL/NC
Overseen by a Board or Commission	YES	YES	YES	NO	YES	YES	N/A
No Board or Commission	NO	NO	NO	YES	NO	NO	NO
Predominantly urban state	YES	NO	NO	NO	YES	N/A	FL/PA
Predominantly rural state	NO	YES	YES	YES	NO	N/A	NC
State with high personal income per capita	NO	YES	NO	NO	YES	N/A	PA
State with low personal income per capita (at least one)	NO	NO	YES	YES	NO	N/A	NC
State with approx. average personal income per capita	YES	NO	NO	NO	NO	N/A	FL
High state road mileage or percentage	NO	NO	YES	NO	YES	N/A	NC/PA
Low state road mileage or percentage	YES	YES	NO	YES	NO	N/A	FL
State with high VMT per capita	NO	NO	NO	YES	NO	N/A	N/A
State with low VMT per capita	NO	YES	NO	NO	YES	N/A	PA
State with average VMT per capita	YES	NO	YES	NO	NO	N/A	FL/NC
MPO	NO	NO	NO	NO	NO	YES	N/A
Multi-state corridor organization	NO	NO	NO	NO	NO	NO	YES
Other factors	Major multimodal/ intermodal issues -- have designated a Strategic Intermodal System (SIS)	Extremely low population density, and very high personal income per capita	Major multimodal/ intermodal issues -- recently converted to a corridor-based plan	Undergoing transition from centralized to de-centralized process -- the only project plan among the corridor-based states	Multimodal/ intermodal issues - strong collaborative planning process with MPOs and RPOs	Multimodal/ intermodal issues -- Interacts with two state DOTS with different levels of planning involvement and intensity	Major effort with many states and Canada -- includes two of the selected Case Study states

- Florida DOT: Florida was chosen as a candidate case study largely because the DOT has formally established an intermodal transportation system that includes every major type of transportation mode and facility: highways, transit, rail (freight and transit), airports, waterways (inland and coastal), and seaports. The system also includes a spaceport, the Kennedy Space Center.

  More important, through the establishment of this system, FDOT is one of only a few states that have made serious attempts to address multimodal/intermodal transportation issues and trade-offs.

  FDOT Central Office has developed a variety of tools to assist Districts in prioritizing recommended projects and also provides assistance in prioritizing projects throughout the state. Many aspects of the process are guided by legislation.

  Florida has relatively high public road mileage, but relatively low state road mileage. The VMT per capita is approximately the same as the national average. Florida has a slightly higher than average amount of urban land, and a population density close to the national average. The personal income per capita is also close to the national average. In addition, Florida DOT has been involved in a multi-state corridor planning effort, the I-95 Coalition, so their experiences can provide input on how such efforts are incorporated into the statewide planning process.

- North Carolina DOT: North Carolina has a centralized planning process. NCDOT prepares a policy-based statewide transportation plan, but has no specific legislative requirements for the statewide planning process. However, NCDOT does have a formal DOT policy that guides the process.

  NCDOT is a candidate for a case study primarily because the DOT had recently made the transition to a corridor-based approach (established by a Policy Statement in September 2004) and had, therefore, given this process a lot of thought and consideration. The case study research provides an opportunity to learn more about the reasons for this decision, including potential advantages and disadvantages. North Carolina has a Transportation Board, so this provides an opportunity to evaluate the relationship between the DOT and the Board.

  North Carolina has relatively high public road mileage, and an extremely high state road mileage and percentage. Like Florida, North Carolina is a coastal state, with all major modes of transportation, including seaports. North Carolina has a moderately low level of urban land, lower than the national average, and a population density about half of the national average. The state has a relatively low personal income per capita. The VMT per capita is approximately the same as the national average. NCDOT is also involved in multi-state corridors, including the I-95 Coalition, I-73/74, and recently the Continental 1 study of a 1,500-mile route through nine states from Miami to Toronto.

- Indiana DOT: Indiana is currently moving from a centralized to a decentralized process where the Central Office Division of Planning will be working with and supporting the District planning function. Indiana was the only respondent that uses a corridor-based statewide planning process for a project-based Statewide Transportation Plan, which is the primary reason that INDOT was chosen for a case study. There were no specific legislative or regulatory requirements and no formal agency policies or guidance that defined the approach for the statewide planning process.

  Indiana's public road mileage is somewhat higher than the national average, but their state road mileage and percentage is relatively low. Indiana is predominantly a rural state, with a population density less than half of the national average. Personal income per capita is somewhat higher than the national average; but VMT per capita is much higher than the national average, in fact, the highest of the candidate states.

- Pennsylvania DOT: Pennsylvania was included largely to represent the northeastern U.S. states. The Pennsylvania DOT has a centralized planning process. As with all but one of the states with a corridor-based planning process, PennDOT has developed a policy-based Statewide Transportation Plan. There were no specific legislative or regulatory requirements and no formal agency policies or guidance that defined the approach for the statewide planning process. Instead, PennDOT follows the federal guidelines for its statewide transportation planning process. PennDOT reports to a Transportation Commission, and planning/policy initiatives are undertaken by a Transportation Advisory Committee, established by legislation.

  Pennsylvania's public road mileage, state road mileage, and state road mileage percentage are higher than the national average. Pennsylvania's urban land area is slightly higher than the national average, but the population density is less than the national average. Personal income per capita is somewhat higher than the national average; but VMT per capita is lower than the national average.

In addition to the state DOT case study interview candidates, one MPO and one multi-state corridor organization were selected to obtain a different perspective on systems-wide corridor planning and how corridor planning is addressed at a multi-jurisdiction level. These two agencies are:

- St. Louis MPO: The East-West Gateway Council of Governments is the MPO for the St. Louis area. St. Louis is a large bi-state metropolitan area that uses a corridor-based planning process to (1) define major corridors in the plan and (2) use major corridor studies to identify investments for plan inclusion. The St. Louis MPO includes multiple jurisdictions and has many multimodal and intermodal transportation issues to consider, as well as the federally-mandated factors and processes. On the Missouri side of the bi-state region, the MPO has created an entity called the Transportation Corridor Improvement Group to oversee major corridor

studies. This Group, managed by the MPO, includes staff from the Missouri DOT and Metro, the regional transit operator. The MPO's involvement with the Illinois DOT statewide planning process is minimal.

- I-95 Corridor Coalition: The I-95 Corridor Coalition is a well-established group with an Executive Board, Steering Committee, and Executive Director. The membership is made up of 16 states, two major cities and 14 transportation authorities along the eastern seaboard of the United States, plus five federal agencies and Amtrak. It also has 22 transportation association and interest group affiliates from the study area and four transportation organization associates in the U.S. and Canada. Two of the selected case study DOTs for this research project, Florida DOT and North Carolina DOT, are members of this coalition, so this will provide an opportunity to obtain the perspectives of both the Coalition leadership and some of the DOTs who are participating in the process.

The next step in the case study research process was to conduct one-on-one interviews with officials and/or staff with primary responsibility for the statewide or systems-wide planning process. The first interview was conducted by telephone with the Executive Director of the I-95 Coalition in early October 2006. Prior to the conference call, the research team provided a copy of the state DOT survey to help guide the discussion.

Scheduling the remaining interviews proved to be more difficult than originally anticipated, so there were significant delays in the proposed schedule of the project. The second interview was conducted with the Florida DOT in mid-October 2006, and the third was conducted with the North Carolina DOT during the last week of October 2006. The fourth and fifth interviews were conducted with the Colorado DOT and Indiana DOT in November 2006. The sixth interview was conducted with the St. Louis MPO in January 2007, and the last interview was with the Pennsylvania DOT in late February 2007.

Prior to the first interview, the research team developed guidelines and a format for the interviews, as shown in Appendix C: Case Study Format and Interview Guide. For the state DOT and MPO interviews, members of the research team traveled to the offices of each agency to meet with the officials and/or staff responsible for statewide or systems-wide transportation planning. The Interview Guide was provided to agency representatives prior to the meeting, along with a copy of the completed survey form returned by the agency. These were used to frame and focus the discussions. In most cases, answers supplied on the survey form were clarified and expanded. Some of the key questions included:

- Why did the agency begin using a corridor-based systems planning approach?
- What is the organizational "position" of those responsible for the process?
- How is information obtained through the SWCP process used to make decisions about project and/or program implementation?

- What are some of the key successes and benefits gained from the SWCP process?
- What are some of the lessons learned, both positive and negative?

From these elements of the research effort, the research team was able to identify:

- Factors and issues that influence the statewide transportation planning process;
- Basic features or steps involved in the statewide transportation planning process;
- Characteristics of a corridor-focused statewide transportation planning process;
- Challenges faced by the state transportation planning agencies; and
- Examples of "best practices" for a corridor-based statewide planning process.

More detailed information on the findings of the literature review, transportation agency surveys, and case study research is provided in Chapter 3. These findings were used to help formulate a conceptual framework for a proposed SWCP process (discussed further in Chapter 6) and to develop the SWCP Guidebook (discussed further in Chapter 7).

Interim Report

After the conceptual framework was developed, a preliminary Interim Report was prepared and submitted in April 2007 to document progress to date for the NCHRP Review Panel members and solicit early feedback. This report was revised and expanded with additional information and a second draft of the Interim Report was submitted in September 2007. Based on NCHRP review, a final version of the Interim Report was prepared and submitted in January 2008

This final Interim Report presented background information, the purpose of the project, a summary of the Literature Review, a summary of findings from the transportation agency surveys, a discussion of the case study research findings, presentation of the conceptual framework, and a proposed outline of the SWCP Guidebook.

Portions of the final Interim Report are incorporated into or helped form the basis for much of the information presented in this Research Report.

Development of the Statewide Corridor Planning Guidebook

The next step in the research project was the development of a draft Statewide Corridor Planning Guidebook, which was completed in late March 2008.

One of the final steps in the completion of the guidebook was an outreach to transportation planning practitioners for their review and input on the initial draft document.

Following its completion, copies of the draft SWCP Guidebook were forwarded for distribution to the NCHRP Panel members and planning practitioners for their review. Subsequently, in June 2008, a conference call meeting was held with practitioners to get input on the draft guidebook, and a meeting was held with the NCHRP Review Panel to provide their review comments on the SWCP Guidebook. These efforts are described further in Chapter 6 of this report.

Based on this input, further research was undertaken and the Statewide Corridor Planning Guidebook was revised and re-submitted for final NCHRP review.

CHAPTER 3 - STATE OF THE PRACTICE: RESEARCH FINDINGS

This chapter provides a summary of the findings from the three initial major tasks for this research project: Literature Review; Transportation Agency Survey; and Case Study Research.

There are two key issues related to the results of these tasks:

- Although several states have adopted corridor planning as a methodological approach to statewide planning, there are very few papers or technical reports that describe the process, advantages, and/or limitations of this approach. Much of the information obtained to date comes from the few technical reports that have been produced, from case studies of selected transportation agencies and jurisdictions, and from a web search of state-specific corridor planning efforts.
- It has been almost three years since the research project began. Some states were making major changes in their statewide transportation planning process during research data collection; and almost all states are continually making modifications to their process, especially as they update their previous Statewide Transportation Plan. Therefore, some information contained in this report may not be current – although attempts to update information were made through internet searches and follow-up contacts as the project neared its completion.

The objective of this research project was to develop a framework and guidance for a Multimodal Statewide Corridor Planning Process as a major planning input into the development of the Statewide Transportation Plan, including procedures and methods. As indicated in Chapter 2, information on the state of the practice came from the three initial tasks of this research project. The following presents information on the findings from these research efforts.

Literature Review

There is not a large volume of research specifically designed for statewide transportation corridor planning. However, there are documents developed by a few states that have made significant progress with this process, and there is significant research on topics that could directly (or indirectly) relate to the statewide transportation corridor planning process.

Much of this information is already widely known by state DOT planners who have actively sought guidance for continual improvement of the statewide planning process. Literature review, transportation newsletters, regional and national meetings, and state-to-state contacts are often used by state DOTs to identify innovations and tools to address the myriad of issues that must be considered. Although many key issues and experiences gleaned from the literature search are already well known, they are presented in this report to ensure that they are not inadvertently overlooked.

After reviewing numerous documents, specific documents were identified that had the most relevance to Statewide Corridor Planning. For the documents that had specific relevance to statewide transportation planning and statewide corridor planning, the literature review proceeded with the following goals:

- Assess what agencies are doing or considering in systems-wide corridor planning;
- Identify issues, trends, and effective practices in multimodal statewide or systems-wide corridor planning; and
- Identify how special issues are considered in the transportation planning process.

The following provides findings and general observations on statewide transportation corridor planning, as well as some current "special emphasis" areas, based on the literature review.

Statewide and Corridor Planning

- One of the major issues for state DOTs (and MPOs) is system preservation, especially for highway systems. With a corridor-based statewide planning process, it is much easier to focus on deficiencies and needs for existing facilities and systems as part of an overall system preservation strategy, rather than addressing each deficiency and need in isolation from overall system needs.
- Recent experience and growth forecasts indicate that traffic volumes and vehicle miles traveled (VMT) – as well as passenger and freight traffic – are predicted to grow substantially in the future. For this reason, statewide corridor planning is a valuable strategy to address the potential impacts of that growth to meet the urgent need to address capacity problems not only on highways, but also for public transportation and other freight transportation systems, such as rail and waterways. (Note: As this research project neared completion, high fuel prices resulted in a decrease in VMT during 2008. Considering expected increases in freight traffic, forecasted population growth, and expected advances in vehicle propulsion technology, VMT is still expected to increase over the long term although the rate of growth may not be as high as previously expected.)
- Statewide corridor planning typically focuses on transportation corridors of multi-regional and statewide significance, as well as segments of significant multi-state corridors. One of the biggest concerns is how to identify those corridors. The methods and criteria are diverse, ranging from the simple to the complex.
    - Examples of the simplest methods include selection of highway corridors for existing routes based strictly on the system classification (e.g., as defined by the federal functional classification system), facility type (e.g., freeway or surface street), relative traffic volumes, and connectivity between major population centers.

    - More complex planning methods may consider all modes of transportation, combined with thresholds of travel or performance measures, and may include connectivity between a broader variety of defined activity centers. Perhaps the best example of this is the Strategic Intermodal System (SIS) established by Florida DOT.
- Corridor studies have been used as an important planning tool by state DOTs that have developed project specific long-range plans.
- For corridor planning, DOTs should partner with regional and local planning agencies to ensure that a well-defined vision that incorporates regional and local issues is developed for each corridor under study.
- During the project identification phase, transportation planners must be creative in seeking multiple potential solutions to address the wide range of concerns of various stakeholders and resource agencies.
- Multimodal planning results in a broader range of alternatives and strategies that can be considered as part of the planning and project development process.
    - The impediments to effective multimodal corridor planning are funding restrictions, organizational/institutional fragmentation, and the lack of technical tools.
    - Successful multimodal corridor planning processes include the consideration of state, regional, and local visions, goals and objectives.
    - Innovations in multimodal practices include the development of "modal neutral" performance measures and the creation of partnerships among state DOTs and MPOs.
    - Multimodal transportation corridor planning is best carried out when all modes are analyzed simultaneously and interactions between modes are taken into account.
    - Analysis of multimodal alternatives is often driven by shifts in transportation policy rather than an assessment of the need for a facility.
    - Lack of significant funding for non-highway modes limits full consideration of multimodal alternatives in the corridor planning process when fiscal constraint is applied. Highway improvements become the default solution because of the inability of state DOTs to shift dedicated highway funds to other transportation modes.
    - Application of financial constraint should occur later in the corridor-based planning process to allow for more creative development and more objective examination of multimodal alternatives.
- Transportation planning should continue to change the focus on facilities to addressing policy issues, system management and preservation, system operations, system performance, customer needs and issues, and financial constraints, as well as broader goals such as economics, efficiency, environment and the quality of life.

Data Collection

- Corridor planning requires a range of data collected by federal, state, regional and local agencies. Often, this necessitates partnering with internal and external entities for data collection, integration and transmittal.
- Lack of data may impede consideration of multimodal solutions in rural areas.
- It is important to identify what data is to be used, where it can be obtained, and who controls and owns the data early in the planning process.
- Sharing data leads to better data and better planning and programming decisions. Sharing data saves money, eliminates redundancy, provides consistency in report findings, and can eliminate conflicting answers.
- Practitioners must have the proper data and tools to continue the process into the future.

Performance Measures

- Performance measures should be used to evaluate the effectiveness of a transportation corridor from the supply side (capacity) and demand side (traffic volumes). Supply side actions would increase the physical capacity of a facility. To distinguish between supply and demand actions, volume-to-capacity (V/C) ratios can be used. *NCHRP Report 339* provides good examples of methods and measures that can be implemented along highway corridors to improve highway capacity from both the supply and demand sides.
- Performance measures should be based on outcomes (e.g., improved safety) instead of outputs (e.g., numerical measures, such as miles of paved roads).
- Effective performance measures shift attention to customer-oriented outcomes to justify investments, generate stakeholder interest and participation, and provide decision-makers with the tools to choose wisely.
- Different organizations have different needs, and performance measures must be tailored directly to the goals and objectives defined at the beginning of the planning process.
- One of the most important linkages between transportation planning and decision making is the use of evaluation criteria to define performance categories that are of interest to decision makers. For example, for projects with possible effects on environmentally sensitive resources, the criteria of greatest interest to decision makers often relate to federal and state environmental assessment requirements.

Public Involvement and Agency Coordination

- An early effort to involve the public is crucial in statewide corridor planning to enhance the credibility and acceptance of the plan.

- Local community planners, public officials, and transportation planners can assist in developing corridor plans that are comprehensive and responsive to community values and local heritage.
- Applying several different methods and venues for engaging the public increases the chance of involving the "typically uninvolved."
- Public participation can be an effective tool in better understanding the needs of users or potential users of transportation corridors, and, thus, it should be considered a very important component of the multimodal corridor planning process.
- Involving local elected officials from the beginning is an important factor in building credibility in the corridor planning process.
- The ability to compromise, treating all participants as equal partners, and keeping all parties apprised of substantive developments throughout the process are important components of successful corridor planning.
- The goal should be to establish a shared vision of the corridor and to ask each party to examine the corridor as a whole – not just from within or outside the right-of-way.
- The initial step for the successful consideration of multimodal aspects is the creation of a dialogue with the customers and stakeholders of the transportation corridor.
- Continual public involvement in implementation of the plan's proposals increases the likelihood of planning moving from paper to reality.
- Cooperation is necessary between government agencies (at all levels), as well as with private entities to accomplish corridor management improvements.
- Effective formal cooperative agreements can ensure that difficult issues will be resolved through the direct involvement of affected parties.
- The willingness of each party to work toward a common vision and to accept compromises for mutual benefit can form the basis of a lasting and effective agreement on corridor management and multimodal improvements.
- Since transportation planning decisions are influenced by political factors, engaging individuals responsible for making and influencing decisions in the public arena during the corridor planning process is essential. This will assist in successful plan implementations since transportation projects can impact land use, economic development and social equity along the entire corridor.
- To increase effectiveness, the consideration of multimodal aspects should be institutionalized through the governing agency.
- Operations staff should be included in the corridor planning process, since they can provide insight into system deficiency assessments, safety, and alternative scenario development and selection.

Access Management

- Access management considerations should be addressed effectively within major components of the transportation planning process. Implementing access management strategies through the transportation planning process can be accomplished since DOTs manage all aspects of roadway design and operations on the state route system. Incorporating access management into corridor planning, rather than later in the project development phase, is critical.
- Access management requires improved coordination between land use and transportation and between government agencies. While a state DOT logically initiates the statewide agenda to integrate access management practices into transportation planning, MPOs and local governments must also play a strong role in facilitating local and regional coordination on access management objectives. The state DOT must be open to allowing local planning agencies to participate and assist in formulating access management strategies that can be done cooperatively.

Economic Development

- State highways can have a significant impact on the state's economy so protecting their mobility function is of major importance.
- Transportation planning is an essential component of a region's economic development and prosperity.
- In a number of states, statewide economic forecasts are used by local governments in the planning process. Providing direct and indirect economic impacts of an improvement provides powerful information to share with elected officials and the public.

Environmental

- Identify environmentally sensitive and critical areas very early in the corridor planning process so decision-makers know at the beginning of the process where important natural and community resources are located.
- Considering environmental factors in transportation planning provides an opportunity to discover potential environmental issues and build working relationships with environmental resource agencies that would likely play key roles in project implementation.
- GIS is now a standard tool for conducting and documenting a low-cost, effective environmental assessment in transportation corridor planning.
- A context-sensitive solutions (CSS) approach to project development is viewed by DOTs, MPOs and the public as a mutually beneficial situation that can expedite the implementation of a controversial capacity improvement.
- An "environmental alternative" could be one of the alternatives to be examined in the analysis of alternatives. While there are few examples of such an approach in the U.S., the public's growing concern for

environmental quality could make the identification of an environmental alternative an important part of planning.

- National Environmental Policy Act (NEPA) requirements can be used to help protect the mobility and safety of a corridor through commitments in NEPA documents.
- NEPA can be used as a corridor protection instrument through at least four techniques: conditioning the Record of Decision (ROD), using the Federal-Aid Project Agreement (FAPA), using other supplemental agreements, and using a mitigated Finding of No Significant Impact (FONSI).
- Because of the diverse array of stakeholders, state DOTs need to introduce corridor protection concepts early in the NEPA process and ensure that they are carried throughout the process to the ROD.
- Establishment of procedures for early and continual coordination and cooperation in developing mitigation plans will provide more cost effective and efficient mitigation, and ultimately, a higher level of protection and conservation of valuable resources.
- The importance of including environmental factors early in systems planning depends on the degree to which impacts can be defined at a level that allows an understanding of consequences.
- Successful consideration of environmental factors in systems planning will require substantive public involvement and participation of environmental stakeholders.

State Examples

- In Arizona, DOT planners are using statewide corridor profiles to develop the long range plan for the entire state highway system, dividing the state into 12 regions. Modified HERS-ST software serves as the analytical platform to identify and bundle regional projects. These are judged by safety, cost effectiveness, and other factors to evaluate funding priorities for specific projects. This process has not yet formally been integrated with the MPO planning process.
- In California, CALTRANS is developing a statewide performance measuring standard to be used by all regional agencies. The goal is to get a consistent snapshot of system performance and to be able to tell which investments are paying off.
- Florida DOT created five goals to guide the continuing growth of their transportation system. To accomplish these goals in a financially constrained reality. FDOT developed a Strategic Intermodal System (SIS), a multimodal network of facilities essential to international, interstate, and interregional movement that are designated for initial capacity funding.
- As the next step, FDOT developed the Florida Future Corridors Action Plan to identify a vision, goals, objectives, planning processes, screening

criteria and implementation activities for statewide multimodal corridors for the next 50 years.

- The Kentucky Transportation Cabinet (KYTC) has created an internal project scoring system to prioritize future investments. They have a standard project identification form (PIF) and are creating a program to sort through the data and weigh benefit/cost comparisons. This scoring system is not the only factor in making the decisions, but it is one of the factors considered during project selection and prioritization.
- Louisiana has started using their statewide travel demand model to update their statewide transportation plan. This provides a quantitative measure to evaluate corridor-level upgrade funding priorities.
- The North Carolina statewide plan now considers mode-neutral needs assessment during the statewide planning process. It is a three-tier system known as the North Carolina Multimodal Investment Network (NCMIN), in which the tiers include long-distance/high demand trips, regional commuter routes, and local access system components.
- Virginia has created a multimodal office dedicated to planning. They are also following the NCMIN model to rank project priorities.
- Wyoming's corridor planning approach places a large weight on NEPA elements coupled with public involvement.

Transportation Agency Surveys

As discussed in Chapter 2, surveys were provided to state DOTs, MPOs, and public transit agencies to gather information on the state of the practice. The following discussion summarizes the DOT responses.

Centralized/Decentralized Statewide Planning Process

According to the state DOT surveys, 23 of the 33 responding states (70%) use a centralized statewide planning process, i.e., the responsibility for the planning process is housed in the Central Office of the DOT, not in the districts or with regional planning agencies.

Nine states (27%) were decentralized and one (Indiana) was transitioning towards decentralization. For this study, decentralization generally means that the responsibility for the planning process is undertaken at the district or regional level, often including partnerships with MPOs and Rural Planning Organizations (RPOs), or the process is partly borne at the district or regional level in partnership with the Central Office.

Policy/Project-Based Statewide Transportation Plan

Most state DOTs currently develop a policy-based plan. In fact, 29 of the 33 state DOT respondents (88%) have Statewide Transportation Plans which typically define the state's vision for the transportation system, identify specific goals and strategies for meeting that vision, and establish policies for the identification, development, prioritization, and programming of projects. However, these

policy-based Statewide Transportation Plans do not usually list specific projects that will be pursued during the planning horizon.

Three of the 33 (0.9%) responding states reported that they are using project-based plans. That is, these states have identified specific projects to meet their long-range vision and goals. Further, they provide project costs and anticipated funding for the planning period to ensure that the plan is fiscally responsible. In some cases, these states may also identify "illustrative" projects for which funds are not available, but which still are a priority for a state. These are usually very expensive mega-projects (often for multi-state corridors) that cannot be undertaken without additional funding support, multi-state partnerships, or other financing options.

One state, New Mexico, reports using a combined policy-project plan.

Use of a Corridor-Based Planning Process

Of the respondents, 15 DOTs (45.5%) indicated that they have some form of corridor-based statewide transportation plan: Arizona, Colorado, Connecticut, Florida, Idaho, Indiana, Maine, Michigan, Minnesota, North Carolina, North Dakota, Oklahoma, Pennsylvania, South Carolina, and Wisconsin.

In addition, a web search was made of the remaining 18 state DOTs that failed to respond to the survey. Of these 18 states, 5 DOTs appear to use a corridor-based approach to statewide transportation planning: California, Mississippi, Ohio, Tennessee, and Virginia. However, no additional detailed information was available on these processes, since these five DOTs did not respond to the NCHRP 8-58 survey.

Overall, 20 of the 50 states (40%) appear to use a corridor-based approach to the statewide transportation planning process. The remaining states do not appear to employ corridor planning techniques at the statewide level, although several identify corridors that undergo more detailed planning during project development. The District of Columbia also responded to the survey, but DC does not use a corridor approach in its system planning efforts.

Most states perform corridor planning studies for transportation facilities, even if the studies are not part of a formal statewide transportation planning process. The information from such studies is frequently used to identify needs, to define projects prior to commencing the NEPA process and/or final design, and to help in programming funds for implementation.

Legislative/Regulatory/Policy Requirements or Guidance

There was apparently some misunderstanding of the survey question on this topic by some recipients. Although the question was intended to focus states with a corridor-based statewide transportation planning process, some states without a statewide corridor planning process responded positively to the question.

Fifteen (15) of the 33 responding states (45.5%) indicated that they have legislative, regulatory, and/or policy requirements or guidance to direct or implement the statewide transportation planning process. Due to the possible confusion on what was being asked, this may not represent all states that have some sort of official guidance for the statewide transportation planning process.

Of the 15 DOTs using a corridor-based statewide transportation planning process, eight indicated that the DOT had legislative, regulatory, and/or policy requirements or guidance to direct or implement a corridor-based approach to statewide transportation planning. These vary considerably, as illustrated by the following examples:

- Arizona statutes require the use of performance-based planning in the long-range plan and five-year capital program; identify several specific performance factors that must be addressed; require consistency with local planning; and require coordination with regional planning efforts. The state Transportation Policy Board has established several policies related to the planning process. Among these is a requirement for the DOT to prioritize highways that connect Arizona, its regions, and its population centers with other states and with Mexico.
- Colorado statutes establish a regional and statewide transportation planning process involving MPOs, Regional Planning Commissions, and the DOT; impose fiscal constraints; and define factors to be considered in the process.
- Connecticut has two statutes that provide legislative direction for the preparation of both the statewide Master Transportation Plan and Connecticut's Transportation Strategy Board Plan. Otherwise, Connecticut follows USDOT regulations and guidance for preparation and publication of the statewide Long Range Plan and for corridor planning.
- Florida is widely recognized for the many statutes and policies that have been established to provide a rigorous and detailed multimodal transportation planning process to deal with the state's dramatic population growth, extensive tourism traffic, and increased freight movement. Among the many statutes are directives for the DOT to develop a statewide multimodal plan (a policy plan that designates hubs, corridors, and connectors of statewide significance); a statewide multimodal systems plan consistent with the statewide transportation plan, including needs, cost feasible, and project priority components; statewide corridor plans; and individual statewide modal plans for highways, passenger and freight rail, bicycle and pedestrian transportation, seaports, waterways, intermodal development, and freight transportation.
- Maine DOT is governed by the state's Sensible Transportation Policy Act (STPA) that includes incentives for integrating land use and transportation.
- Michigan DOT is required by legislative statute to spend 90% of trunkline revenues for system preservation.

- Minnesota DOT policy provides for District input into the statewide planning process via specific District Plan Guidance. The purpose of the District long-range plan is to create an objective, consistent statewide estimate of investments needed to provide critical transportation services, as established in the Statewide Transportation Plan. The plans also identify District investment priorities. The investment needs are based on quantitative performance measures and targets for the entire trunk highway system. Investments are to be developed at the corridor level for the state system. Corridors are defined by the Districts, except for a state-focused Interregional Corridor (IRC) System.

Seven states anticipated changes in legislation, regulations, policies, or processes in the future that would require, encourage, or direct the use of corridor planning as part of the statewide transportation planning or programming process: Colorado, Florida, Idaho, Kansas, Maine, Wisconsin, and Vermont. At the time of the survey (June-July 2006), these changes were expected to be as follows:

- Colorado was initiating the "2035 Planning Process" and the Transportation Commission was reviewing its policies to determine if resource allocation should be more closely tied to specific tiers of the state highway system. In addition, the Statewide Transportation Planning Rules were being updated to incorporate corridor visions into the planning process, including transportation needs and desires related to land use, major activity centers, economic development, environmental protection, and modal choices.
- Florida statutes designate a Strategic Intermodal System (SIS), a truly multimodal state transportation system. However, urban transit facilities were not part of the SIS and are expected to be designated as such in the future. Also, statutory requirements exist for the Florida Intrastate Highway System (FIHS) and consideration was being given to completely folding the FIHS into the SIS in statute, regulation, and policy in the future. Consistent with current statutes, Florida DOT planning processes had been modified in a multimodal manner at the time of the survey.
- Idaho was in the process of emphasizing Context Sensitive Solutions in the DOT's planning processes. Also, the DOT was updating its corridor planning guidebook to place more emphasis on linking planning and NEPA.
- Kansas was about to begin development of a new Long Range Transportation Plan, and the DOT was considering identifying major state corridors in that plan.
- Maine was expecting rulemaking for the Sensible Transportation Policy Act (STPA) to encourage and provide incentives to municipalities to conduct regional and corridor planning. Also, rulemaking changes regarding Maine's Growth Management Act, administered through the State Planning Office, were expected to move toward regional land use planning.

- Wisconsin was developing an internal "implementation" policy development process that. This policy would create internal committees organized around topics that require implementation guidance: on corridor management plan content, corridor management plan tools, public involvement, internal communication, and finance.
- In Vermont, the DOT (VTrans) recognized the need to address transportation (and land use) issues in a comprehensive way through a corridor management approach. This was initially recognized and articulated as a recommended policy in VTrans' Highway System Policy Plan. The *Vermont Corridor Management Handbook* was subsequently developed to provide assistance to state and regional planners when developing corridor management studies.

Previous Corridor Experience

Four DOTs indicated that they have previously tried a corridor-based approach to planning, but do not currently use this approach for the statewide transportation planning process. One of these, the Oregon DOT, is particularly noteworthy.

Oregon DOT embarked on a corridor planning process in 1995 to implement and carry out an integrated transportation planning structure. ODOT targeted major corridors throughout the state and proceeded to develop plans that would identify corridor-length issues and problems, plus proposed planning level solutions to meet the objectives for improving and managing each corridor. These were done in concert with local governments to be consistent with local transportation system plans and comprehensive plans.

The Oregon program was discontinued in 2000. Oregon DOT completed seven corridor plans which were adopted by the Oregon Commission before the program was discontinued. The primary reasons for ending the program were as follows:

- There were concerns about the efficiency of the process, i.e., it did not efficiently establish priorities as expected.
- The three-phase planning process was too cumbersome in comparison to the results.
- The process was more complex and time-consuming than anticipated, and the agency decided to divert these resources to critical facility planning to develop expressway plans, interchange plans, and access management plans.
- It was difficult to get modal representatives to participate fully in the process, primarily because of modal agency staff and time limitations, so plans tended to focus only on highway needs.

Corridor Identification, Comparisons, and Funding Allocations

Criteria used for identifying, comparing, and prioritizing corridors, grouped below by frequency of occurrence, include:

- Connectivity between Population/Economic Centers (15 DOTs: AZ, CO, FL, ID, IN, ME, MI, MN, NC, ND, NM, OR, PA, SC, WI)
- Traffic Volumes (10 DOTs: AZ, CO, FL, IN, MI, MN, NC, ND, OK, WI)

- Classification of Roadway (6 DOTs: AZ, IN, OK, OR, ND, SC)
- Safety (6 DOTs: AZ, CT, ID, MN, SC, WI)

- Economic Development (5 DOTs: DC, ME, NM, SC, WI)
- Freight Volumes (5 DOTs: FL, ID, MI, OK, WI)
- Multimodal Connections/Availability (5 DOTs: MI, NM, PA, SC, WI)

- Level of Service (4 DOTs: CO, MI, OK, SC)

- Capacity/Bottlenecks (3 DOTs: AZ, MI, ID)
- Congestion (3 DOTs: CT, DC, MN)
- Input from Public/MPO/RPO (3 DOTs: CT, IN, ME)

- Emergency Evacuation Routes (2 DOTs: NC, SC)
- Land Use (2 DOTs: ME, WI)
- Needs Categories, e.g. Safety or Preservation (2 DOTs: CO, MN)
- Parallel Routes (2 DOTs: NC, SC)
- Speed of Vehicles Using Facility (2 DOTs: IN, MN)

- Access Control (IN)
- Bike Routes (SC)
- Regional Travel Vectors (ME)
- Travel Time (AZ)

Different approaches have been developed to govern how funding is allocated to prioritize needs, varying in the amount of control the DOT assumes in the process.

Six of 15 DOT respondents using corridor-based planning follow a decentralized planning process, in which individual MPOs, RPOs, or DOT district/region offices are given the freedom to create lists of prioritized corridors. Estimates of available funding are divided among those planning regions, often with percentage-based guidance for appropriate types of improvement investments (e.g., safety).

Similarly, three state DOTs initially divide funding into various improvement investment types before further corridor analysis is done. Public input is then combined with analytical data on existing conditions to define a specific needs category for each corridor, e.g. "safety improvements" or "maintenance and preservation." Corridors are then ranked within each category and funding is applied accordingly.

Four states have built a preliminary ranking designation into their corridor definitions. Based upon the area served by a particular route, corridors may be classified as having statewide, regional, or local significance, and these are scored, rated, or ranked accordingly.

Data/Information

Planning is very data-intensive, and all state DOTs have a myriad of databases and datasets that are used to evaluate the transportation system and corridors. Data for planning is usually maintained, stored, and analyzed using a Geographic Information System (GIS). Some of the data and other information used for statewide planning include:

- Socioeconomic Characteristics
- Population Projections
- Land Conversion Rates
- Potential Economic Activity
- Traffic Generators/Attractors
- Transportation System Inventory
- Highway Performance Measures, especially for Pavement, Bridges, Safety, and Congestion
- Highway Classification (e.g., NHS, Functional System, State System, etc.)
- Average Annual Daily Traffic/Vehicles Mile of Travel
- Truck Percentage on Highways
- Crash Rates and Severity
- Capacity/Level of Service (LOS) for All Modes
- Travel Purpose (e.g., Home-to-Work or Recreation)
- Travel Time or Speed
- State, Regional, and Local Plans (e.g., Comprehensive Plans, Transit Plans, Air Quality Plans, Modal Plans, etc.)
- Public Acceptability
- Financial Sustainability

Analytical Processes and Tools

States generally use similar processes and tools to quantify measurable corridor criteria. A range of tools have been developed to assist planners and to manage corridor information. These vary in complexity. Some were used by several

states. A few were identified by only one state although it is likely that other states also use these tools. Tools identified by the survey include:

- Geographic Information System (GIS)
- Travel Demand Models (TDM)
- Regional Economic Models (e.g., REMI)
- Highway Economic Requirements Systems (HERS)
- Highway Performance Monitoring Systems (HPMS)
- Project Scoring Criteria
- Benefit/Cost Analysis
- Pavement/Bridge Condition Inventory and Management Systems
- Road Quality Forecasting Systems
- TELUS Model, developed by FHWA - Maine
- Capacity Increase Prioritization Model - Michigan
- MOBILE6 Emissions Estimator - Pennsylvania
- SCALDS (land consumption estimator for alternative scenarios) - Pennsylvania
- Congestion Relief Program (routes with a volume/capacity ratio > 0.85) - Colorado
- Travel Time Mobility Demand Measure (for capacity prioritization) - Colorado

At the time of the survey, Florida was developing Visual Basic-based software for scoring individual projects. This tool is designated as the Strategic Intermodal System (SIS) Investment Tool, or SIT. This tool is built around the five SIS Goals: Safety, Preservation, Mobility, Economic Competitiveness, and Community/ Environment. The SIT processes data in each of these five categories to generate scores ranging from 0 to 100.

Other Planning Factors

All DOTs were asked to identify which of several "special emphasis" issues were considered as part of the statewide transportation planning process. While most of this information is not revolutionary or "ground-breaking," it is still important to provide a complete inventory of factors considered important to the planning process, even if it only validates what is generally known.

A summary of the state DOT responses is shown in Table 3-1. According to the survey responses, all state DOTs consider Economic Development, Public Input, MPO and Local Consultation, and the Federal Planning Factors in the statewide transportation planning process. Almost all state DOTs also give consideration to Safety, Freight Movement, Public Transportation, Resource Agency Input, Stakeholder Interests, and Consistency with Local and State Plans; and a significant number consider Traffic Operations Environmental Objectives, Innovative Financing, Land Use, Performance Measures, the NEPA Process, and Public/Private Partnerships.

STATE	Comparisons between Modes within Corridors	Eight Federal Planning Factors	Land Use	Urban Design	Economic Development	Local/Regional Planning Agency Consistency	Other State Agency Planning Agency Consistency	Freight Movement	Public Transportation	Traffic Operations	Safety	NEPA Process	Environmental Objectives and Mitigations	Coordinated with Other Resource Agencies	Stakeholder Priorities or Interests	Public Involvement	MPO and Local Official Consultation	Performance Measures	Institutional/Organizational Procedures	Innovative Financing Options	Public/Private Partnerships	Other
Alaska DOT	x	x			x	x	x	x					x	x	x	x	x			x	x	
Arizona DOT		x	x		x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	
Arkansas SHTD		x			x	x	x	x	x		x			x		x	x		x	x	x	
Colorado DOT	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Connecticut DOT	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x					
DC DOT	x	x	x	x	x		x	x	x	x	x	x	x		x	x	x	x	x	x	x	
Florida DOT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Idaho DOT	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Illinois DOT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Indiana DOT		x			x	x	x	x			x	x		x	x	x	x	x		x	x	
Kansas DOT		x	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	
Kentucky Tr Cabinet		x			x	x	x	x			x	x		x	x	x	x	x				
Maine DOT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	
Michigan DOT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Minnesota DOT		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	
Missouri DOT	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Nebraska DOR		x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	
Nevada DOT		x	x		x	x	x	x	x	x	x		x	x	x	x	x	x				
New Jersey DOT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
New Mexico DOT		x	x		x	x		x	x		x		x		x	x	x					
New York DOT	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
North Carolina DOT		x			x				x	x	x			x	x	x	x		x			
North Dakota DOT		x			x	x	x	x	x	x	x			x	x	x			x	x	x	
Oklahoma DOT		x			x	x	x	x	x			x		x		x	x					
Oregon DOT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	
Pennsylvania DOT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
South Carolina DOT	x	x	x	x	x	x	x	x	x	x	x		x	x		x	x	x		x		
South Dakota DOT	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x		x			
Texas DOT	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Vermont DOT		x	x		x	x			x	x	x	x	x	x	x	x	x	x	x	x		
West Virginia DOH			x	x	x	x	x		x	x	x	x		x	x	x	x			x	x	
Wisconsin DOT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Wyoming DOT	x	x	x		x		x	x	x	x	x		x	x	x	x	x		x	x		
YES Responses	**19**	**32**	**24**	**14**	**33**	**30**	**29**	**30**	**30**	**27**	**31**	**23**	**25**	**30**	**30**	**33**	**32**	**23**	**21**	**25**	**23**	**4**
Total Responses	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**
% YES	**58%**	**97%**	**73%**	**42%**	**100%**	**91%**	**88%**	**91%**	**91%**	**82%**	**94%**	**70%**	**76%**	**91%**	**91%**	**100%**	**97%**	**70%**	**64%**	**76%**	**70%**	**12%**

TABLE 3.1 Survey Responses for Question 20: Which of the following are considered in your statewide transportation planning process...?

Following is a discussion of some major points raised in the survey responses:

- Economic Analysis: Because an effective transportation system must meet the needs of its users, most states specifically mention facilitating economic development and competitiveness as a goal for transportation networks. Therefore, states sometimes perform some type of economic analysis. States commonly use REMI or HERS-ST models, cost/benefit analyses, and projected funding estimates to quantify available resources and determine the best investments.
- Urban/Rural Differentiation: DOTs often distinguish between urban and rural needs. Some DOTs have established different processes for MPOs and RPOs to recommend projects. Others set different urban and rural goals and policy priorities for long range plans, e.g., Florida has named 28 counties as "Rural Areas of Critical Economic Concern" which are given allocation priority to spur economic development.
- Multimodal/Intermodal Considerations: As mandated by federal legislation, DOTs incorporate multimodal/intermodal factors into statewide planning through stakeholder involvement, corridor visioning, policy guidance, performance measures, or individual statewide plans for each mode. Some states use multimodal availability to help determine and/or prioritize corridors, e.g., South Carolina relies on multimodal data to rank priority corridors. Other than highway travel, the most common types of multimodal transportation considered by state DOTs include public transit, freight and passenger rail, aviation, waterways, bicycle/pedestrian needs, and ferry services.
- Public/Stakeholder Involvement: Federal planning requirements have also created a major emphasis on public and stakeholder involvement at the state level, including consultation with local, state, and federal officials. All respondents report using multiple methods to obtain input from system users, including:
    - Applying tools, e.g., mapping exercises, games, discussion forums;
    - Collaborating with local/regional planning agencies and partnering in outreach efforts;
    - Coordinating discussion groups for specific topics;
    - Facilitating charrettes;
    - Forming focus groups for specific niches, such as low income areas, freight, small communities, tribal representatives, etc.;
    - Hosting a web site to disseminate information and gather input;
    - Meeting with existing stakeholders as a special presentation;
    - Placing information in daily and weekly newspapers;
    - Publishing and distributing planning newsletters;
    - Setting up information tables in malls or major commercial centers;
    - Submitting draft plans to members of the public for major review; and
    - Surveying transportation system users via paper, web, or phone.

Following are some examples of other innovative public participation practices:

- Michigan DOT and the Library of Michigan teamed up to bring the Michigan Transportation Plan to the public. Michigan's library cooperatives and public libraries statewide assisted in gathering important information and opinions on the long-term future of Michigan's transportation systems and infrastructure.
- Arkansas DOT offered a series of "listening sessions" around the state. The format included informal communications with local officials in an open house setting. This was followed by a brief presentation on current statewide needs then a question-and-answer session.
- In Minnesota, market research has been used as a tool to define products and services important to citizens and in tracking how well Mn/DOT delivers them. This information was used alongside other outreach efforts to involve the public in developing the Statewide Transportation Plan.

To resolve differences and conflicts, state DOTs usually rely on a proactive and collaborative public/stakeholder involvement process and/or an oversight group. However, some DOTs indicate that they do not have a mechanism to address such conflicts in the statewide planning process, but instead defer those issues by relying on others to address potential problems in future phases of the project.

Current Issues

When asked to identify challenges that are critical to statewide transportation planning, DOTs listed six primary categories:

1. Funding: Seventeen of 33 states identified funding as a major challenge. Alternative revenue sources (e.g. tolling and public/private partnerships) are under investigation by most state DOTs to provide additional funding options for growing backlogs of maintenance needs and essential capacity expansion projects.
2. Interagency Coordination: Fourteen DOTs found that collaborating with political entities, planning regions, businesses, and resource agencies to build consensus and integrate separate plans is an essential element of the process, but it is often a challenge to get and maintain meaningful participation.
3. Streamlining Process Efficiency: Thirteen DOTs recognized the importance of creating a smooth process to link planning to project prioritization, selection, development, and delivery. Bringing key components – public involvement, agency coordination, NEPA requirements, and multimodal approaches – together into one integrated outcome makes better use of constrained resources.
4. Stakeholder Involvement: Ten of 33 DOTs indicated that a strong public participation program is an essential feature of a statewide planning process, but there are problems in effective communication and winning public trust. Specific challenges include eliciting responses from the

general public, effectively communicating technical matters, gaining public support, and demonstrating that input affects planning decisions.

5. Multimodal Integration: Eight DOTs indicated that it is difficult to balance available resources and staff capacity to adequately address alternative modes of transportation as part of the planning process.
6. Institutional Change: Seven DOTs identified internal challenges to the planning process, usually due to problems with leadership, organization, policies, or processes. These challenges sometimes include finding and maintaining an experienced staff or implementing innovative practices and policies.

Effective Practices

Each state DOT was also asked to describe which aspects of their program were the most effective. Thirty-nine percent of respondents reported that their stakeholder involvement methodology is an excellent component in the planning process. Some effective practices included:

- Stakeholder involvement procedures (13 states: AR, AZ, DC, ID, IN, KY, NC, NJ, NM, NV, OK, SD, WI)
- Project identification and selection techniques (6 states: FL, KY, MI, OR, WI, WV)
- Goal setting/visioning approaches (5 states: AK, CO, IL, ME, TX)
- Interagency collaboration efforts (3 states: ME, NY, PA)
- Objective performance measures (3 states: MN, NE, VT)
- Management Systems (SD)
- Safety improvement measures (IL)
- Modeling capabilities (IN)

A few examples of effective practices by DOTs are as follows:

- Maine has partnered with its RPOs to develop Regional Transportation Assessments (RTAs). An RTA identifies significant corridors in a region and develops transportation, land use, and economic objectives unique to regional needs. These are further refined into proposed investment scenarios that are evaluated against long range plan goals.
- Arkansas has invested time and resources to catalogue statewide needs. This inventory has proven to be an effective tool during meetings with local officials and community groups to demonstrate that needs are distributed throughout the state, beyond urban boundaries or areas with economic development needs.
- New York has recently begun an innovative effort to prioritize and select service-oriented transit projects with 5307 Capital Revenues. The process requires cooperation with multiple MPOs along a major commuter corridor.

Areas for Improvement

Common trends arose when DOTs were asked to identify processes that needed improvement within statewide planning. The top four issues cited as critical to the industry also were referenced as the least effective planning elements:

- Public involvement – 13 responses;
- Interagency coordination – 6 responses;
- Streamlining planning processes – 5 responses; and
- Funding constraints – 3 responses.

In addition, three states identified the need to improve their technical analyses.

Two special cases were also identified. The Alaska DOT faces unique challenges to keep plans relevant for a vast area with a unique set of transportation systems issues; and the Arkansas DOT is primarily a state highway agency and is challenged in its efforts to address multimodal integration.

Multi-State Corridor Planning

Twenty-eight of the 33 DOTs (85%) indicated that they had participated in multi-state corridor planning efforts. Among these are I-10, I-49, I-66, I-69, I-73, I-74, I-81, I-87, I-95, Continental One Corridor, Heartland Expressway, Theodore Roosevelt Expressway, Wilmington-Harrisburg Freight Study, MAROPS, Northeast CanAm Connections Study, Woodrow Wilson Bridge, Theodore Roosevelt Bridge, Midwest Regional Rail Initiative, Gary-Chicago-Milwaukee Corridor, Major Ohio River Bridge Crossings, Chicago Region Environmental and Transportation Efficiency (CREATE) Program, Upper Midwest Freight Corridor Study, CANAMEX, I-5/I-205 Freight Corridor, Missouri River Bridge Crossings, New Haven-Hartford-Springfield Commuter Rail, Boston-Springfield-New Haven High Speed Rail, Bobby Jones Expressway/Palmetto Parkway, Capital Corridor, and the Ports-to-Plains Study.

Actions or elements of these studies that were considered most effective were:

- Support from top management;
- Commitment and dedication to see that improvements are implemented;
- Collaboration and partnerships that result from working together with other states;
- Improved communication and consultation among participants;
- Local consultation with officials and stakeholders;
- Creation of a plan that identifies needs and provides a tool for securing funding; and
- Establishment of a new environmental process for Chicago's CREATE program,: the Systematic, Project Expediting, Environmental Decision-making (SPEED) strategy to provide an expeditious method for moving low-risk projects forward.

Actions or elements that provided challenges or were least effective included:

- Prioritizing and financing multi-state corridor projects;
- Dealing with political interests in making investment decisions;
- Competing priorities among states; and
- Sustaining effort and interest over the time needed to program, design, and implement projects.

When asked how needs and priorities on multi-state corridors should be addressed in the Statewide Transportation Plan, DOTs provided the following responses:

- Consider consistency at state borders;
- Describe multi-state projects in terms of their priority for the state and region and how they fit with state plans and programs;
- Coordinate with adjacent states to identify linkages that they consider as critical;
- Bring together a consortium of affected states to identify common goals and needs, with leadership and/or facilitation by third parties, such as AASHTO or NADO;
- Coordinate through established procedures, since a parallel process could present problems;
- Base needs and priorities on the reasonable expectations of available funds (i.e., can the project be completed within a reasonable timeframe?);
- Incorporate a vision of corridors and projects in the Statewide Plan;
- Focus on the "need" for the project, and evaluate priorities in the same manner as in-state corridors;
- Use a strategic approach that incorporates sufficient flexibility to address changes in conditions, priorities, and funding;
- Use the corridor designation as one of the evaluation factors for each need or project; and
- Address multi-state issues outside the plan in a joint document with other states.

Major Challenges for Statewide Planning

The states were asked to identify major challenges that are critical to a successful statewide planning process. These challenges include:

- Closing the gap between resources and needs;
- Finding and keeping staff;
- Integrating modes to effectively find a way to make modal trade-offs;
- Providing for a seamless transportation system by integrating public and private entities;

- Accommodating rapid growth;
- Coordinating and collaborating with stakeholders;
- Allocating resources fairly;
- Linking NEPA and planning;
- Linking all of the steps in the project identification, programming, and delivery process;
- Changing the selection process to be more reflective of a statewide investment policy;
- Initiating institutional change to create a multimodal and/or non-auto modal culture in the DOT;
- Finding or building political support to invest in transportation infrastructure;
- Increasing public awareness and participation in projects, influencing transportation decisions, and accepting innovative funding options;
- Coordinating with local governments and integrating with existing local plans;
- Integrating transportation planning with the plans of resource agencies and economic development interests;
- Meeting federally mandated legislation and, specifically, burdensome new requirements in SAFETEA-LU;
- Establishing performance benchmarks;
- Integrating land use planning with transportation planning;
- Involving the business sector in the planning process;
- Increasing public-private partnerships in providing transportation facilities and services;
- Providing adequate capacity to address travel congestion and freight movement needs within limited fiscal resources; and
- Engaging communities along a corridor to reach local and regional consensus and support for proposed solutions and strategies.

CASE STUDIES

As indicated in Chapter 2, seven agencies were chosen for Case Study research, including:

- Five DOTs: Colorado, Florida, Indiana, North Carolina, and Pennsylvania;
- One MPO: St. Louis; and
- One multi-state corridor organization: The I-95 Corridor Coalition.

The study process for the Case Study research involved:

- One-on-one interviews with the transportation planning officials and/or staff for each of the case study agencies; and
- Reviews of agency documents and information found on agency web sites.

The interview guide used for the case study interviews is shown in Appendix C., and case study summary reports for each of the agencies are included in Appendix D: Case Study Findings. Each report includes a detailed discussion of the agency's corridor-based planning process, decision-making process, special emphasis areas (if any), and a self-assessment of the special challenges, effective practices, and lessons learned in the statewide corridor planning process.

The following section presents a summary of the findings for the seven agencies chosen for this research project.

Colorado

The Colorado Department of Transportation (CDOT) was selected as a case study candidate primarily because of its corridor selection process.

Colorado has a decentralized planning process, with responsibility for planning shared with rural regions, MPOs, Districts, and other DOT offices. CDOT prepares a policy plan. Colorado's process is affected by some legislative requirements.

With policy direction provided at the statewide level through the Colorado Transportation Commission, regional planning commissions prepare transportation plans that identify and prioritize regional long-range transportation needs for all modes. These regional plans and priorities are integrated and consolidated into the state's 20-year intermodal plan.

Colorado is divided into 15 Transportation Planning Regions (TPRs). Each TPR is responsible for developing a financially constrained, corridor-based, multimodal Regional Transportation Plan that is consistent with Transportation Commission policy. CDOT and the Transportation Commission set the direction for these plans, and CDOT provides funding for regional plan development, but the regional planning process is locally driven.

A Statewide Transportation Advisory Committee (STAC), created by Colorado statutes, assists the DOT in consolidating the regional plans into a unified Statewide Transportation Plan. The Transportation Commission sets policy guidance for the process, including operating parameters, investment category goals, and performance measures.

The statewide transportation plan, *Moving Colorado – Visions for the Future*, is a policy level, corridor-based plan in which the DOT defines corridors, identifies specific need categories, and reviews financial abilities and limitations. The plan is fiscally constrained.

The 2030 plan includes corridor visions for about 350 transportation corridor segments. CDOT established corridors in collaboration with the Transportation

Planning Regions (TPRs) by segmenting Colorado's highway system into sections, including all modes and facilities within a given geographic area.

Logical corridor boundaries were defined by "travelsheds." Travelsheds are not specifically defined by a given corridor width based on a specific distance from the major corridor facility. Rather, boundaries are based on a subjective assessment that determines locations that are dependent on a facility for access and mobility outside the immediate area.

A Corridor Vision Statement, covering needs, values, goals, and strategies, was developed for each corridor section. Input from local communities, transportation regions, and statewide perspectives was collected to develop each Vision. To assist in the regional visioning effort, CDOT developed a Corridor Vision toolkit with involvement by the TPRs.

Multimodal and intermodal issues are addressed in the corridor visions. Regional and MPO Corridor Visions were incorporated into *Moving Colorado – Visions for the Future.*

Comparisons between corridors are made and conflicting demands between users are resolved at the regional planning level during initial corridor visioning and plan development. Corridors are fit into a tiered priority system based on systems designation: interstate, non-interstate NHS, and other state highways.

Four investment categories were identified to guide funding decisions by CDOT: mobility, safety, system quality, and program delivery. Specific performance measures and objectives have been developed for each investment category, allowing the Transportation Commission and CDOT to make informed trade-offs as they decide how best to allocate limited financial resources. These categories are applied to available funding and matched to corridor needs outlined in the vision statements.

CDOT has developed a Plansite database which includes all regional plan projects and costs, provides reports on corridors by investment categories (mobility, safety, system quality, and program delivery), and electronically links STIP projects to the respective corridor to assure that there is money available for that corridor to implement the project.

Each Colorado DOT region conducts public involvement activities with TPRs to identify high priority projects at least every two years. These projects are screened against the corridor visions, goals, strategies, and available funds before going into the STIP.

If there are different perspectives, the differences between CDOT and the TPRs are negotiated, and differences between TPRs are reviewed and resolved by a legislatively-created Transportation Advisory Committee.

Transportation Commission policy prioritizes the spending of most state and federal highway funds in accordance with the investments-strategy categories of mobility, safety, system quality, and program delivery. Local governments decide how to allocate local funds for roads and transit, as well as the portion of the state Highway Users Tax Fund that is directed to upkeep local roads.

Florida

Florida's Department of Transportation (FDOT) was selected for a case study because they have a transportation planning process that addresses every major intermodal transportation system, including every type of transportation facility, and they have attempted to address multimodal/intermodal transportation issues and trade-offs.

Florida has a decentralized planning process, with responsibility shared among several offices. Florida's Statewide Plan is not solely policy or project-based. Instead, specialized plans are prepared by several offices, with a mix of policy, program, and projects.

Almost all corridor planning is done at the District level, and some prioritization of projects is done both at the Districts and through coordination with the Central Office. Many aspects of the process are guided by legislation.

The 2025 Florida Transportation Plan (FTP) identifies goals, objectives, and strategies to address how Florida's transportation system can meet the mobility needs of a growing population, help make the economy more competitive, help build great communities, help preserve the natural environment and ensure that the transportation system is safe and secure. The FTP provides guidance on how transportation investments should be focused, as well as how public and private transportation partners should work together to make such decisions.

A committee of 45 people worked together to develop the 2025 FTP, representing all levels of government, all transportation modes, the private sector, economic development organizations, environmental interests and all regions of the state. Extensive public and partner involvement was used to support the committee's work.

The 2025 FTP differs from previous state plans by focusing on transportation's role in supporting economic competitiveness, community building, and conservation planning – and by giving greater attention to the financing of transportation needs. The FTP focuses on achieving identified goals and strategies by defining roles, responsibilities, and accountability for implementing the FTP, with greater emphasis on regional transportation planning.

FDOT has done multi-modal corridor planning studies for multi-use corridors (e.g., highway, rail, seaports, and even including utilities). However, there were often problems raised by environmental agencies and the public because the DOT

had historically used the “Decide and Defend” (DAD) approach to transportation project development and particularly to highway widening.

Several statewide transportation and transportation-related groups convened in 1999 and 2000 to address concerns resulting in the establishment of a new long range objective under the Economic Competitiveness Goal in the then-current FTP (2020 Florida Transportation Plan, updated in 2000). Thus, the need for a strategic intermodal transportation system was established.

The Strategic Intermodal System (SIS), formally established in 2003, includes all forms of transportation and integrates individual facilities, services, modes, and linkages into a single, integrated transportation system. The SIS is a statewide network of high-priority statewide and regionally significant transportation facilities and services, including the state’s largest and most significant commercial service airports, spaceport, deepwater seaports, freight rail terminals, passenger rail and intercity bus terminals, rail corridors, waterways, and highways.

Multimodal SIS Hubs, Corridors, and Connectors rely on connectivity and volume thresholds for designation of facilities as primary elements of Florida’s mobility network. Facilities may be designated as of Statewide/Interregional, Regional, or Local significance.

The SIS helps FDOT to target expenditures to help the State's economic competitiveness (including increased corridor emphasis in planning and funding projects); apply innovative policies and technologies (including Intelligent Transportation Systems); and clarify the State's roles and responsibilities on and off this system.

The SIS assisted FDOT in the latest update of the 2025 Florida Transportation Plan. The 2025 FTP directs full implementation of the SIS Strategic Plan and an update of the SIS designation and Strategic Plan at least once every five years, based on guidance provided by the initial SIS Strategic Plan and the 2025 FTP.

Florida’s Future Corridors Action Plan was created to identify a vision, goals, objectives, planning processes, and implementation strategies for statewide multimodal transportation corridors for the next 50 years. The FTP criteria were used to guide decision-making for the Future Corridors Program. The Future Corridors Action Plan identified three types of statewide corridor improvements for highways, railways, and waterways to fill gaps:

- Transformation of existing facilities;
- Development of new parallel facilities; and
- Development of new facilities.

Existing corridors may be enhanced with the addition of other modes within or near the right-of-way, while new corridors would be planned for multimodal

uses. Four broad policy goals, along with corresponding policy objectives and criteria for corridor evaluation, were developed for the Future Corridors Program:

- Mobility/Connectivity;
- Economic Competitiveness;
- Community Livability; and
- Environmental Stewardship.

Comparisons occur between projects, prioritized by DOT District offices with Central Office guidance. FDOT Central Office has developed a variety of tools to assist the Districts in prioritizing recommended projects.

Prioritization among corridors gives consideration to transportation needs now and in the future (e.g., by addressing current and future commodity flows and tourism travel). In 2006, FDOT was still trying to define the screening process, but project readiness and impacts were expected to be key factors in the process.

Priorities among modes depend on the corridors, since the importance of modes are more applicable in some corridors than others.

At the time of the case study research, FDOT was developing a methodology for determining project priorities for the Strategic Intermodal System (SIS). This incorporates project priority criteria currently used by operators of Florida's highways, seaports, airports, and railroads.

To spur economic development, Florida state policy identifies “Rural Areas of Critical Economic Concern” which are given preference during project allocations, when appropriate.

Indiana

The Indiana Department of Transportation (INDOT) was the only survey respondent that indicated use of a corridor-based statewide planning process for a project-based Statewide Transportation Plan, which is the primary reason that INDOT was chosen for a case study.

There are no specific legislative or regulatory requirements and no formal agency guidance or policies that define the approach for the statewide planning process in Indiana. However, legislation enacted several years ago had identified some specific priority corridors, as discussed later in this summary.

At the time the research was conducted, the state and the DOT had recently gone through a change in administration and, therefore, corresponding changes in agency direction, policies, and priorities. Of special importance, INDOT was converting from a centralized to a decentralized planning process, in which the Central Office Division of Planning would be working with and supporting the

District planning function. Therefore, the full case study (in Appendix D) and this summary provides a snapshot of where INDOT was at the time the survey and interviews were done for this research project.

The Indiana Department of Transportation's *2030 Long Range Transportation Plan* includes integration with the DOT's *Major Moves 2006-2015 Construction Plan*, a 10-year "programming" document. The Plan focuses on identifying and prioritizing specific highway expansion projects (e.g. added travel lanes, new road construction, interchange modifications, and new interchange construction). More specifically, the 2030 plan:

- Assigns project priorities by using a data-driven analysis and scoring process to score long-range projects on congestion relief and system importance;
- Estimates realistic future project costs;
- Provides long range fiscal forecasts to account for economic conditions; and
- Sequentially applies priority projects to the estimated available funding by implementation period (years).

Under prior legislation passed several years earlier, the Indiana legislature had established specific Commerce Corridors, largely based on the National Highway System (NHS), which were used in previous statewide planning efforts. The new INDOT direction was to also establish a system of Statewide Mobility Corridors to address travel-time deficiencies between cities, relying heavily on Travel Demand Model forecasts, HPMS data, and HERS analysis.

At the time the statewide plan update was done, there were 10 proposed corridor studies, with three of those already active. To ensure inclusion of projects from these studies, funding "placeholders" for unfunded projects were included in the STP.

Some key elements of INDOT's corridor planning process are as follows:

- Corridors are defined between major activity centers based on travel time, traffic volumes, route classifications, and stakeholder input.
- Corridors are tiered into one of three levels for highways – statewide, regional, or local access.
- Multi-jurisdictional project issues are resolved through coordination. The INDOT Central Office is responsible for the final decision on projects, priorities, and programs.
- A corridor-based plan complements the project-specific statewide plan to determine system-wide priorities. In the INDOT project scoring system, points are awarded for projects which lie along an identified priority corridor.

- Political considerations are awarded points in the project scoring criteria by using a "community input variable" that provides an additional point value for letters of support from elected officials.
- INDOT's primary tool to engage the public concerning the 2007 update to the Long-Range Plan was a web page dedicated to the plan.
- INDOT conducted a market research study to identify issues of importance to the general public, as well as particular stakeholders. A key component of the research study was a survey of the state's population aimed at validating INDOT's Policy Plan and identifying emerging areas on which INDOT should focus.

  Survey responses were evaluated for potential implications for long range transportation, particularly the current relevance of the nine previously-determined transportation policy areas: System Effectiveness, Safety, Demographic Changes and Quality of Life, Finance, Intergovernmental Coordination, Economic Development, Natural Environmental and Energy, Bicycle and Pedestrian Facilities, and New Technology.

  From this public input survey, it was determined that the previously identified policy areas continued to be relevant, although there are some emerging areas that should also be recognized, including:
  - Congestion management;
  - Improved highway maintenance; and
  - Scheduling of construction and maintenance projects.

One of the significant aspects of the INDOT statewide planning process is the creation of a scoring system based on Congestion Relief, Roadway System Importance, and Project Priority. This scoring process was used to determine which projects were included in the 2030 Long Range Transportation Plan. Fiscal constraints were based on available funds derived from long-range fiscal forecasts and geographical allocations based largely on historical funding and expenditures.

North Carolina

The North Carolina Department of Transportation (NCDOT) was selected for case study review primarily because they had recently made the transition to a corridor-based approach with their Strategic Highway Corridor Initiative (SHCI).

The NCDOT is divided into 11 main divisions with 14 local division offices under the Division of Highways located geographically throughout the state. The Transportation Planning Branch is organized into six regional planning groups. Each of these units is responsible for coordinating transportation planning activities in their region.

In 1989, the North Carolina General Assembly passed legislation to designate the North Carolina Intrastate System. This is a 3,600-mile system of specifically designated and prioritized highways to "provide high speed, safe travel service" to

connect population centers within and outside the state. The legislation stipulated that routes on the Intrastate System were to be improved to (1) encourage economic development and growth, and (2) connect outlying areas of the state to major population centers. All routes in the Intrastate System were to be upgraded to at least four travel lanes, unless fewer lanes are needed due to low projected traffic volumes or environmental considerations. When warranted, segments of the Intrastate System were to include vertical separations or interchanges at major crossings and bypasses. Access to the Intrastate System was to be determined by travel service and economic considerations. While a process was included in the legislation to add routes to the Intrastate System, an Equity Formula used to distribute funds has had the effect of limiting the number of changes. Therefore, there have only been two additions to this system since its creation.

North Carolina's *Long Range Statewide Multimodal Transportation Plan* was approved and adopted by the Board of Transportation in September 2004. This plan was the product of a three-year planning process that included technical analysis, public outreach and strategic planning.

One major element of the transportation planning framework was the creation of the North Carolina Multimodal Investment Network (NCMIN) which organized all transportation facilities by interest, travel function, role, and use. The NCMIN is also stratified into three tiers: Statewide, Regional, and Sub-Regional. One key element of the NCMIN is a system of Strategic Highway Corridors. The selection of Strategic Highway Corridors was based on mobility, connectivity, interstate connectivity, and interstate relief.

The North Carolina Board of Transportation has adopted the Strategic Highway Corridor Initiative (SHCI) into North Carolina's Statewide Transportation Plan. The SHCI was driven largely as a result of issues related to cost, environmental protection, alternatives analysis, population growth, and public input.

NCDOT developed the SHCI with extensive public input and the cooperation and endorsement of the North Carolina Department of Commerce and the North Carolina Department of Environmental and Natural Resources. The SHCI currently incorporates 5,400 miles of state highways.

SHC "visions" place each corridor into one of four categories: freeways, expressways, boulevards, and thoroughfares. The corridor visions define a specific long-term function for each facility, and future projects are reviewed to ensure compliance with these visions. Planning decisions and design standards vary for each category. Most of the Strategic Highway Corridors are freeways and expressways.

The primary goals for each corridor include improvements in mobility and modal alternatives. The SHCI focuses on (1) preserving and maximizing mobility and connectivity on a core set of highway corridors, (2) promoting environmental

stewardship through the maximum use of existing facilities to the extent possible, and (3) fostering economic prosperity through the quick and efficient movement of people and goods.

Local input into the planning process is gained through coordination and collaboration with local governments and regional planning organizations, including metropolitan, small urban, and rural. State legislation requires municipalities to develop long-range plans and mandates that the NCDOT cooperate in developing these plans. This has been expanded by NCDOT policy to include both urban and rural planning.

The results of these local and regional long-range plans feed directly into the statewide planning process. NCDOT's stated goal for using a corridor approach is to preserve, not to prioritize. Therefore, there is no direct tie between corridor designation and project selection or prioritization.

The centerpiece of the Statewide Transportation Plan is the Recommended Investment Scenario. This strategy proposes targeted levels of funding in three major transportation categories: maintenance/preservation, modernization, and expansion. The Recommended Investment Scenario underscores the importance of safety in all investments and focuses on upgrading and preserving the state's existing transportation system. It proposes greater investment in the state's highest use facilities and in non-highway modes that have historically received disproportionately low levels of transportation funding. The scenario represents an investment strategy from a statewide, system-oriented analysis. Investment does not target specific projects, but emphasizes areas where the DOT should invest to achieve system-wide improvement goals.

Pennsylvania

The Pennsylvania Department of Transportation (PennDOT) was included for case study review largely to represent the Northeastern states and because of their ongoing efforts to define a state corridor system.

PennDOT has a centralized planning process. As with most other states, PennDOT has developed a policy-based Statewide Transportation Plan.

PennDOT reports to the State Transportation Commission. In addition, a Pennsylvania Transportation Advisory Committee (TAC) was created by statute in 1970 by legislation that created the current Pennsylvania Department of Transportation.

Primary responsibility for the state's Long Range Transportation Plan lies with PennDOT's Center for Program Development and Management. The Center is divided into three divisions: Transportation Program Development; Funding and Twelve Year Plan; and Planning and Contract Management.

The statewide planning process is undertaken in partnership with the state's 15 MPOs, seven RPOs, and one independent county.

PennDOT completed its first corridor-based statewide transportation plan, *PennPlan Moves*, in January 2000. The most recent update, the *Pennsylvania Mobility Plan*, was completed in June 2007. This policy-based plan established statewide goals; inventoried the existing transportation system (including rail, highway, air, transit, and waterway modes); and identified 28 multimodal corridors with specific objectives for each.

The 28 corridors identified and briefly described in *PennPlan* included all modes and their interconnections. *PennPlan* recognized that individual corridor planning was being carried out by MPOs and RPOs, with corridors selected using a variety of criteria. Thus, one goal of *PennPlan* was to identify those corridors and then establish continuity among the corridor plans of the various local and regional planning jurisdictions, the state, and surrounding states. Objectives were proposed for each of the 28 *PennPlan* corridors that were consistent with statewide goals established in conjunction with PennDOT's transportation partners.

For the *Pennsylvania Mobility Plan*, the Pennsylvania Transportation Advisory Committee (TAC) worked with PennDOT to develop an initial concept for a multimodal "Core PA Transportation System" through a special study completed in August 2006. This study focused on corridors of statewide significance, but also recognized that future efforts were likely occur to address corridors that have regional or local significance.

As part of the Core initiative, PennDOT was given the responsibility by the TAC to develop the corridor system. The Core System was defined through a series of iterative steps by:

- Establishing economic centers and criteria;
- Organizing the Core System connections into three layers, or tiers for:
    - Major MPO core cities (metropolitan areas/economic hubs),
    - Smaller economic and activity centers, including activity centers in MPO core cities (hubs, terminals, nodes); smaller economic centers outside the MPO core cities; and core urban clusters in micropolitan statistical areas, and
    - Economic and activity centers in areas of less population and employment;
- Establishing modal criteria, especially for the highest tier; and
- Adjusting the Core System to promote the application of state policy objectives.

This process was still under development at the time of the case study interview. However, specific criteria had been developed for each transportation mode.

These were used to determine which modal facilities met those criteria and, therefore, would become part of the Core System. The Core Pennsylvania Transportation System presented in the *Mobility Plan* was considered as an illustrative system still under development, but it is recognized as the first effort to consider the transportation network as an interconnected entity rather than a collection of discrete modes.

Other key elements related to PennDOT's planning process are as follows:

- The long range transportation plan is developed in collaboration with the MPOS and RPOs (i.e., the MPOs and RPOs take the lead in developing local and regional transportation plans, with PennDOT providing overall policy guidance and participating as a member of the plan development team). There are transportation planning programs in 15 MPOs, seven RPOs, and one independent county.
- Multimodal and intermodal issues are addressed in the development of the local and regional planning process and incorporated into corridor goals and strategies.
- Corridors are examined on a regional basis, and PennDOT provides oversight for the statewide planning and programming process.
- PennDOT conducts public hearings every two years in various locations throughout the state to hear testimony as it develops the Twelve Year Program.

At present, there is no direct link between the Core PA Transportation System and the project selection, prioritization, and programming process. Project prioritization, selection, and allocations occur primarily at the MPO/RPO level. These priorities are then considered by PennDOT during the agency's programming process.

St. Louis MPO

The East-West Gateway Council of Governments (COG) is the designated Metropolitan Planning Organization (MPO) for the St. Louis, Missouri/East St. Louis, Illinois metropolitan area. With assistance from an Executive Advisory Committee, the St. Louis MPO formulates policy and provides oversight for the metropolitan transportation planning process. This MPO was selected for a case study because it: (1) adopts a corridor-based long-range transportation plan; (2) incorporates multi-modal planning into its planning process; (3) carries the corridor planning process to the next step (i.e., looking at identified corridors in greater detail); (4) has a very proactive public involvement process; (5) has found an effective way to manage corridor planning cooperatively with multiple jurisdictions; (6) addresses land use and environmental issues as part of the transportation planning process; and, perhaps most important, (7) uses the results of the corridor planning efforts to identify, prioritize, and select projects for future implementation.

Legacy 2030, completed in August 2005, is a corridor-based long-range transportation plan in which the MPO defines major corridors and uses major corridor studies to identify investments for inclusion in the long-range plan.

In the Missouri portion of the metropolitan planning area, where the state-local partnership is much stronger and more effective than on the Illinois side, the MPO has created a "Transportation Corridor Improvement Group" (TCIG) to oversee major corridor studies.

The East-West Gateway Council of Governments has no pre-established criteria to define corridors of regional significance. Rather, the MPO defines corridors based on the identification of needs. Specifically, the MPO undertakes a systems analysis to identify problem areas for both highways and transit. From this analysis, the locations of major needs are identified along all routes in the study area, and these needs are then examined in greater detail for corridors where problems exist, if warranted. Any route or facility may be identified as a corridor for this more detailed analysis.

The MPO's primary focus is on highways. The highway systems analysis addresses six focus areas or factors, with safety and congestion considered the most important. The other four focus areas include systems preservation, access to opportunity, goods movement, and sustainable development. Through the systems analysis process, problems and needs are identified, and these are then linked to specific corridors on the highway network.

Many needs are addressed by corridor planning studies. Through these corridor planning studies, projects are defined and carried forward for consideration in the development of the long-range plan and the Transportation Improvement Program (TIP). At this point, projects are prioritized and selected through mutual cooperation among MPO committee members and Board members.

Comparisons and conflicts among different transportation users in a corridor are also identified and worked out, if possible, within the context of corridor studies through extensive outreach to stakeholders and system users.

Extensive proactive public outreach and input are major elements of the process and, particularly, include working with the public to create a corridor Problem Statement to frame the development of alternatives and the subsequent analysis. Ultimately, the Problem Statement will help form the basis for the Purpose and Need for proposed projects which arise from the corridor study.

While corridor studies are usually mode-specific, major transit corridor studies have been undertaken through a Major Transportation Investment Analysis (MTIA) that looks not only at transit options (including both light-rail and bus options), but also highway alternatives within the corridor. There have been significant efforts during the last decade to study and implement light-rail service in the area, but highway options have always been considered as one of the

alternative solutions in these studies. Similarly, highway studies give consideration to public transit and bicycle/pedestrian movements and issues within a corridor, but the emphasis is almost always on highway improvement solutions, not on comparisons or trade-offs between modes.

Since the MPO Policy Board is comprised of the chief local officials in the metropolitan area, politically sensitive issues are resolved in that forum. Jurisdictional issues are given consideration in the project selection process through a geographic distribution of resources.

The MPO's funding policy is that planning should not take place if there is no idea how projects and programs will be financed. The MPO is largely dependent on the state DOTs to provide funds for major projects, so the relationship and communication with state DOTs is critical.

Within the MPO, final decisions on projects and priorities are made by the East-West Gateway COG Board of Directors, based on information and recommendations from the MPO staff.

The I-95 Coalition

The I-95 Coalition was selected as the one multi-jurisdictional corridor coalition for case study review because some of the Case Study DOTs were already involved in the study of I-95. Participation in the coalition is voluntary. There is no compact or legislation. This is a multi-state effort led by the Maryland DOT, with oversight by a coalition of the states through which I-95 passes. There is participation from all 16 states in the corridor. However, it is understood that states will include I-95 corridor improvements in their plans and programs on a voluntary basis.

The planning efforts for the I-95 Corridor began as an ITS study in the early 1990s. It was later broadened to a rail planning study, known as the Mid-Atlantic Rail Operations Study (MAROps), to also look at regional rail transportation issues. In recent years, there has been a growing interest in further broadening the coalition's planning efforts. The I-95 Corridor Coalition prepares an annual work program which encompasses other planning projects focused on the I-95 highway corridor.

One purpose of the I-95 initiative is to identify I-95 bottlenecks and undertake an assessment of needs along the corridor. Other related major facilities that are being considered in the study include I-81, railroads, and connections to the ports. No states have a formal policy to use the results from the I-95 efforts for project identification. Once needs are identified, the process for addressing those needs is left to the states.

A new Integrated Corridor Analysis Tool (ICAT) has been developed for the I-95 corridor. Highway networks are linked to the NHS, and linear referencing is appended to a GIS network. There are some jurisdictional concerns over the

ICAT network and data results, since some state DOT representatives are concerned that the ICAT results do not supersede local state data and analysis. The I-95 coalition states have mutually agreed that the state data and analysis, not the I-95 findings, will be the "official data."

Nonetheless, the most effective aspect of the I-95 planning process is thought to be the information sharing among the participants; but how the information is used is left up to the individual states. At the time of case study interview, a major I-95 Coalition initiative was developing linkages to share information among states to help with emerging transportation issues. Since then, the coalition has also worked together to successfully be recognized by the USDOT in September 2007 as a federally designated "Corridor of the Future."

CHAPTER 4 - STATEWIDE TRANSPORTATION PLANNING

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) introduced a new vision for transportation planning using a comprehensive, long-range approach that incorporates the coordination and consideration of all transportation modes and the key elements that impact these modes. This planning approach placed emphasis on:

- Enhancing transportation system efficiency;
- Monitoring and improving transportation system performance; and
- Ensuring that future investments reflect consideration of economic, environmental, and quality-of-life impacts.

Under this program, federal interim guidelines were issued in 1994, to implement the federal legislative requirement that state DOTs submit their first federally-mandated statewide long-range transportation plans by January 1995. However, this historic moment was prefaced by a long history of legislative and policy initiatives.

Early Federal Transportation Legislation

The following outlines the evolution of key federal legislative milestones that influenced the statewide transportation planning process, from its beginnings in infrastructure development to its current focus on intermodal connectivity, sustainable development, and broad participation.

Coordinated state and federal transportation planning in the United States has evolved with the growing economic, social and technological complexity of the nation as a whole. For most of the 20th century, the federal-state partnership focused on the coordinated development of a transportation infrastructure that facilitated the nation's rise to the top tier of economic powers. Over time, as the system matured, the partnership and the planning process that guided it shifted focus from construction to maintenance and operations. Procedurally, a planning and decision-making process that had once been based largely on technical and political considerations – and that was sometimes unilateral in implementation – evolved to consider a broader range of factors and to be more democratic, collaborative, and inclusive.

The creation of the Office of Road Inquiry in 1893, with a mandate to assist local and state officials with their road improvement efforts, marked the beginnings of a formalized process for federal-state collaboration in transportation infrastructure development. At the same time, states were also formalizing their relationships with municipal and county governments. New Jersey, for example, had initiated an appropriations process for allocating transportation improvement funds to counties in 1891, two years earlier. Of special note in the current era of multimodal transportation options, bicycling interests played a large role at that time in encouraging states to improve the design and maintenance of roads.

The Post Office Department Appropriations Bill of 1913 provided for a 1/3 federal-2/3 state match for the improvement of the nation's system of post roads. The bill also established a process of federal oversight for the planning, design, and construction of those roads. This provision was unpopular and, in some cases, ignored.

The nation's first "official" federal-aid highways bill was passed in 1916. This bill established an administrative system of shared funding and authority between the federal government and the states and, thus, was the genesis of future federal transportation legislation. The Office of Road Inquiry was re-established as the Bureau of Public Roads (BPR). The BPR was given review and approval authority for roads that were to be planned and constructed using federal-aid dollars, which were matched with a minimum 50% local/state contribution. The bill included a federal-state funding allocation formula that weighted total area, population, and postal route mileage equally. Each state was required to authorize its participation with the federal-aid program through local legislation by the passage of an "assenting act." An additional condition for program participation was the establishment of a state highway agency that would plan and implement road projects. The BPR, under the authority of the Secretary of Agriculture, was empowered to review and approve these projects. The act directed most funding to the improvement of rural (farm-to-market) roads, and federal funds could not be used to improve or build roads in cities of 2,500 or greater population.

Another federal-aid act was passed in 1921 which introduced support for a system of roadways that would link cities. It can also be considered the beginning of the of an early national interstate system. The act allowed up to 60% of all program funding to be spent on "interstate" routes, and such roadways could comprise up to 7 percent of the total roadway distance in any single state. By 1923, the entire federal-aid system, including local and regional routes, accounted for 5.9% of the nation's public roads.

The National Industrial Recovery Act of June 16, 1933 used roadway construction as part of a broad economic stimulus package during the Great Depression. The Act authorized $400 million in grants to the states for road construction, with no match required. For the first time, this legislation allowed federal-aid dollars to be used for urban roadway improvements.

In 1934, the Hayden-Cartwright Act first provided federal support for state planning activities. The bill allocated 1.5% of total funding that "may be used for surveys, plans, and engineering investigations of projects for future construction ...". By 1937, 43 of the 48 states had initiated transportation planning-related activities such as mapping, asset inventories, traffic surveys, and financial studies.

The 1938 and 1944 federal-aid acts began to provide the technical underpinnings of what would become the post-World War II interstate highway system. The

1938 Act directed the BPR to study the feasibility of a national system of high-speed free and toll roads. For this study, the BPR and its state partners conducted extensive quantitative traffic volume and driver surveys of the type that transportation planners still use today.

Through the Federal-Aid Highway Act of 1944, the planning process became more inclusive, too, as municipalities were invited to participate in the federal-state partnership with funds specifically directed at urban highways. A subsequent study in 1944, mandated by Congress, led to the expansion of the highway system and provided additional cost and route location information.

Following World War II, there was interest in creating a national highway system and economic expansion occurred in the post-war era. This encouraged state transportation agencies to expand and accelerate their planning efforts. The Public Roads Administration (formerly the Bureau of Public Roads) asked each state to identify routes for nomination to a proposed interstate highway system. Subsequently, many states conducted highway needs studies that included cost estimates, user cost allocation studies, and traffic forecasts.

The 1952 Federal-Aid Highway Act got the modern interstate highway system started, providing $25 million in federal funds, subject to a 50% match; however, most states were unable to provide the matching funds. The 1956 federal-aid act jump-started the system by creating the "National System of Interstate and Defense Highways" and by vastly expanding the funding authorization of the 1952 Act.

The goals of the new interstate system were to promote economic development and restore blighted urban areas. The interstate system was intended to link 90% of all cities with populations of 50,000 or more and be constructed according to common design and engineering standards. The BPR (renamed again) funded development of urban and rural interstate design handbooks that were used by state highway engineers. Examples of design standards for the Interstate System included full control of access, design speeds of 50 to 70 miles per hour (depending on type of terrain), a minimum of two travel lanes in each direction, 12-foot lane widths, a 10-foot right paved shoulder, and a 4-foot left paved shoulder. Initially, the design had to be adequate to meet traffic volumes expected in 1975. Later, the requirement was changed to a more general 20-year design period to allow for evolution of the System.

To fund the system, the 1956 Act established a trust fund derived from fuel taxes, with the revenue dedicated for highway-related expenditures. It set the federal-state contribution at 90% and 10%, respectively, for the interstate system. The much larger federal contribution of the federal government gave a large measure of authority to the BPR in matters of design and quality control. The 1956 Act unleashed a highway construction boom that created the interstate highway system as we know it today. By 1957, the BPR reported that planning and construction were “going on at a furious pace throughout the nation.”

The 1956 federal-aid bill also established a requirement to consider the economic effects of federal-aid projects that accessed cities and towns, as well as a requirement for public hearings for federal-aid projects. However, a 1957 conference of planners, engineers, and social scientists in Hartford, Connecticut, revealed a schism between proponents of roadway construction as a means of promoting economic development and those who criticized such projects. Critics claimed that there was a lack of understanding by government officials about the negative impacts on affected populations, as well as a lack of an integrated land use and transportation planning process to guide location and design decisions. In 1957, the Executive Secretary of the Association of American State Highway Officials advised state highway officials at a conference in Mississippi that public hearings must present "factual data and logical reasons" for highway location and design decisions.

Construction in urban areas remained the most controversial aspect of the interstate construction program. Concerns over increasing traffic congestion grew, but the potential negative impacts of improving transportation capacity on land use patterns began to be recognized. Local residents and their advocates cited their concerns over the displacement of large or entire portions of communities and the loss of local businesses.

The Federal-Aid Highway Act of 1962 was the first law to affect state transportation planning directly and to address the issues identified with the construction of the interstate system. The Act established a “3C” process of continuing, comprehensive, and cooperative planning at the state and local levels for all urban areas with populations greater than 50,000. The 3C process encompassed consideration of land use, zoning ordinances, and impacts (such as open space and historic resource impacts) that later became components of required environmental assessments. This Act directed the U.S. Secretary of Transportation to cooperate with states and local communities to develop highway plans that were coordinated with non-highway modes and future development patterns. The BPR also issued guidance on the development of the required transportation plans with "attention to social and community value factors, such as preservation, enhancement, and extension of parks and open space, preservation of historic buildings and sites, avoidance of disruption of neighborhoods, and appearance of the facility both from the viewpoints of its users and its neighbors."

The 1962 Act gave rise to the formation of regional planning agencies, which were funded in part by highway planning and research funds. Many states established such agencies in response to the legislation. In California, for example, these regional planning agencies developed a five-year regional transportation program that identified rural and urban projects financed with federal and state transportation funds. The state DOT, CALTRANS, which had completed its first self-initiated statewide transportation plan in 1959, also developed a state

transportation improvement program (STIP) that was generally consistent with regional plans.

Other Pre-ISTEA Legislation and Regulations

Prior to the passage of ISTEA in 1991, other federal legislation, regulations, and initiatives further defined or influenced the statewide transportation planning process. Highlights of other pre-ISTEA legislation of importance to the statewide planning process include the following:

- Federal-Aid Highway Act of 1970: Established federal-aid urban highway system and directed the Secretary of Transportation to issue guidelines for consideration of the economic, social, and environmental impacts of highway projects.
- National Environmental Policy Act, 1970: Developed a framework for state transportation agencies and other lead agencies to consider the social and environmental impacts of individual transportation projects. This framework has come to be called the "NEPA process" and is frequently just referenced as NEPA. Under NEPA, transportation agencies identify and evaluate potential impacts in assessing alternative courses of action to address proposed transportation projects. The NEPA requirements for an open and inclusive public involvement process, full documentation, and justification of the alternatives considered and the recommendations made are consistent with the spirit of the statewide planning process. Any project studied and approved through the NEPA process would likely be incorporated into a long-range transportation plan and/or STIP.
- Federal-Aid Highway Act of 1973: Allowed use of highway trust funds and urban interstate funds for mass transportation projects. Provided dedicated funding for transportation planning to MPOs designated by States.
- 1975 FHWA and Urban Mass Transit Administration Regulations: Established process for and responsibilities of MPOs. Required transportation plans with both a long-range and short-range element, as well as a five-year transportation improvement program.
- Federal-Aid Highway Act of 1976: Expanded use of federal funds for highway maintenance and rehabilitation and for transfer of interstate funds for capital investments for public transportation.
- Surface Transportation Assistance Act of 1978: Combined highway, public transportation, and safety authorizations.
- Federal-Aid Highway Act of 1981: Shifted funding emphasis to completion and maintenance of the interstate system. Permitted use of federal funds for federal-aid highway reconstruction.
- Surface Transportation Assistance Act of 1982: Raised federal fuel taxes by five cents and increased commercial vehicle user fees. Increased the interstate resurfacing, restoration, rehabilitation and reconstruction program. Extended highway, transit, and safety program authorizations. Provided state highway and planning research funds at an 85% federal

match. Increased local and state discretion in use of federal urban transit programs and increased mass transit funding from the Trust Fund.

- USDOT Regulations, 1983: Reversed the trend of gradually increasing federal requirements in the transportation planning process. MPO TIP and long-range plan requirements were retained for areas of 200,000. States and local agencies would certify the MPO planning processes.
- Clean Air Act Amendments, 1990: Linked transportation planning and programming with the attainment of air quality standards in metropolitan areas. The Act, which is administered by the United States Environmental Protection Agency (EPA), set emissions standards for the "criteria pollutants" (i.e., carbon monoxide, volatile organic compounds, and oxides of nitrogen) in metropolitan areas. Metropolitan areas were classified by their level of conformity with the emissions standards, known as National Air Quality Attainment Standards. Areas in non-attainment were directed to plan and implement transportation control measures that would achieve a reduction in transportation use. Sanctions, such as withholding approval for federal-aid highway projects, could be imposed for failure to submit a plan that demonstrates compliance or for failure to implement the plan submitted. Required all states with one or more counties in a non-attainment area to submit State Implementation Plans (SIPs), prepared by the state's environmental agency, which contains state pollution control regulations that can demonstrate compliance, including prescribed transportation-related actions.

ISTEA

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was a major point of departure from the highway-only emphasis of previous transportation bills by the requirement of a multimodal approach in planning and funding transportation projects. ISTEA defined a coordinated state and MPO planning process and encouraged performance measurements and improved data systems to plan, prioritize, and program transportation improvements. The bill also strengthened and expanded public participation, as well as encouraging the use of non-highway transportation expenditures through flexible funding provisions.

ISTEA brought state DOTs closer than ever into the MPO planning and programming process. Procedural requirements mandated broad public agency participation in the creation of the TIP, LRTPs, major investment studies, transportation control measures in non-attainment areas, and air quality conformity analyses. TIPs and LRTPs were to be incorporated into the state's transportation program and long-range plan. Flexing dollars away from highway funding to the Congestion Mitigation Air Quality (CMAQ) program also required the cooperation of the state DOTs and led to relationships that could at times be either cooperative or adversarial.

Many of the ISTEA provisions remain in force today, as described below:

- High Priority Corridors/NHS: Congress designated key corridor routes as "High Priority Corridors" and provided funding for feasibility studies. This designation allowed states to direct federal-aid funding to improve and expand these routes. The routes were a component of the newly-created National Highway System (NHS), a system of high-priority routes, which also included the Interstate System, the Strategic Highway Network (for military use), selected Other Principal Arterials that provide access to key services and facilities, and selected Intermodal Connectors. The NHS was more fully defined later in the National Highway System Act of 1995.
- Statewide Transportation Plans: ISTEA required state DOTs to develop long-range plans with at least a 20-year planning horizon. The long-range plans had to reflect fiscal constraints, which in turn required revenue forecasts and project prioritization by project or by type of program (e.g., expansion, maintenance, and operations). ISTEA enumerated 23 statewide "planning factors" that had to be considered and that were intended to improve the linkage between planning and implementation. Taken together, these factors encouraged coordination and collaboration among stakeholders; improved mobility and access for people and goods; improved system performance; and increased consideration of system preservation, operations, the environment, and quality of life. By 1996, all 50 states had developed a long-range transportation plan with constrained budgets.
- Management Systems: Six management systems were devised to encourage data-driven planning and operations in the areas of safety, congestion, transit, pavement, bridges, traffic monitoring, and intermodal transportation. ISTEA required that each state develop performance measures for each of the management systems to establish baseline performance and track progress. These systems would utilize data and performance management concepts to improve decision-making.
- Public Participation: To improve the linkage between decision-making and local priorities, ISTEA encouraged consensus building and broad public participation throughout the planning process. Key stakeholders were to be identified and forums provided to voice their opinions.
- Funding: Investments in non-auto modes were eligible for funding through the Surface Transportation Program and the Congestion Mitigation and Air Quality Improvement (CMAQ) Program, including transit, bicycle, and pedestrian facilities. These programs allowed states and their local partners to direct funds towards non-highway projects that may better reflect local goals and priorities.

  Significantly, for the first time, state DOTs were allowed to establish cooperative agreements with the private sector and other public agencies to build, improve, and maintain highway infrastructure. This provision helped cash-strapped states accelerate highway construction through contracts with private entities that provided total or partial funding to build infrastructure in return for a lease or concession that allowed a private entity to recoup the investment through tolls.

- State Transportation Improvement Program: ISTEA required states to submit a list of all federally (FHWA/FTA) funded transportation projects that would be implemented over a three year period. The STIP included all projects that are "regionally significant" and that require federal approval, whether or not federal funds were used for construction. STIPS were "financially constrained" which means that states had to identify a source of funding for a project to be included in the program.

  The STIP was to be consistent with the long-range transportation plan, but there was no requirement that the projects in the STIP also appear in the LRTP. Public input for the STIP was a facet of the STIP as it was for the LRTP.
- Coordination with Planning Partners: State DOTs had to coordinate the development of their STIPS, and share their revenue forecasts with planning agencies in metropolitan areas (MPOs). In EPA-designated non-attainment or maintenance areas, MPOs had to develop two-year fiscally constrained plans, which increased the need for coordination between the MPOS and the state DOTs. ISTEA also encouraged a collaborative and cooperative decision-making process with MPOs and transportation planning agencies in non-urban areas in the formulation of the statewide plan and STIP.

Some of the new mandates contained in ISTEA were eventually scaled back after a political backlash from the states. Shortly before passage of the first post-ISTEA transportation authorization bill, President Clinton issued an executive order that made the six management systems voluntary instead of mandatory, with exceptions. The congestion management system remains a requirement in transportation management areas (generally, areas with populations greater than 200,000) that are in air quality non-attainment.

TEA-21

Passed by Congress in 1998, the Transportation Equity Act for the 21st century (TEA-21) carried forward many of the statewide planning initiatives established under ISTEA. One of the key changes in TEA-21 was the consolidation of planning factors from 23 for statewide planning and 16 for metropolitan planning to 7 broad emphasis areas, encompassing economic vitality, safety and security, accessibility and mobility, environmental protection, energy conservation and quality of life, modal connectivity, and systems management and preservation. The act exempted from legal review plans and programs developed by states and MPOs that did not consider all these factors explicitly. Other key features of TEA-21 included the following:

- Consistent with ISTEA's provisions, the statewide LRTP and STIP development was to be a consultative process with MPOs and officials from non-metropolitan areas.

- Freight stakeholders, transit operators, and private transportation providers were specifically named as additional stakeholders to consider in the planning process.
- The inclusion of a financial plan was encouraged to identify funding sources and financing strategies to accomplish the plan's recommendations, although preparation of a fiscally constrained plan was no longer mandated.
- The STIP provisions re-emphasized consistency with all relevant planning activities and documents, including the LRTP, MPO plans, and air quality conformity plans.

More generally, the legislation had new funding and financing provisions. TEA-21 guaranteed a minimum level of spending for highway and transit projects, and increased the minimum percentage of trust fund dollars that would be returned to each state to 90.5% of the revenues collected from that state.

SAFETEA-LU: Statewide Planning Requirements

The most recent transportation bill, the Safe, Accountable, Flexible Transportation Efficiency Act: A Legacy for Users (SAFETEA-LU) was signed into law in 2005. The statewide planning requirements embodied in this legislation reflect the long evolution from a singular focus on roadway construction to an approach that considers all modes, is consultative with other stakeholders, and encourages not only capacity expansion, but also management and operations to maintain and enhance mobility. The current legislation also strengthens the linkages between planning and environmental protection.

Under SAFETEA-LU, state DOTs are still responsible for the development of statewide long range plans (SLRPs) and state transportation improvement programs (STIPs), as follows:

- Long-Range Transportation Plans: State DOTs are required to develop statewide long-range plans that express the state's future vision for transportation projects and programs for at least a 20-year period.

  Mandates for the plans include the consultation and review process, the manner in which planning information is conveyed, and environmental initiatives. A broad mandate to provide public outreach with potentially affected citizens and public agencies must include the use of visualization (through mapping and other means) and electronic methods of communication to the maximum extent practicable to provide opportunities for review and comment. The need to conduct outreach to minority stakeholders and under-represented populations has been emphasized in all recent legislation.

  Representatives of non-motorized modes of travel and the disabled are mentioned specifically in SAFETEA-LU as additional stakeholders that should be targeted by outreach efforts. The legislation also calls for consultation not only with transportation agencies, but also non-

transportation agencies, such as those responsible for "land use management, natural resources, environmental protection, conservation and historic preservation."

The statewide transportation plan is required to include a discussion of mitigation activities that a transportation agency might undertake to reduce or ameliorate the environmental impacts of the plan's implementation.

Current legislation continues to require the consideration of several factors in statewide planning activities, now expanded from seven to eight factors. The broad planning factors to be considered in the LRTP cover the following:

1. Economic vitality;
2. Safety;
3. Security;
4. Freight mobility/accessibility;
5. Environmental protection;
6. Modal connectivity;
7. System management; and
8. System preservation.

All significant transportation projects must be described and justified in the plan, including those on federal and state transportation systems; projects in National Parks, tribal lands, and National Forests; and other facilities or systems that are eligible for funding. The plan includes both capital investment and infrastructure management strategies to operate and expand the existing system with maximum efficiency. Current legislation also encourages states to include a financial plan. The financial plan would identify future funding sources and financing strategies, and would provide all stakeholders and reviewers with information to assess the realism of the plan.

Although plans must be prepared in accordance with current federal requirements to maintain eligibility for federal funding programs, it allows considerable discretion in determining the content and the approach used to develop statewide transportation plans, providing wide latitude in terms of the "detail and scope" of the long-range plan, including the provision of a financial plan.

- Transportation Improvement Programs: The State Transportation Improvement Program (STIP) documents the DOT's capital improvement program. Like the long-range plan, it is multimodal, considers capacity and system management, and includes projects on federal, state, local, and tribal lands. Typically, the STIP contains a project description, including cost estimates and an implementation year for all statewide and regionally significant projects. Local projects may be included as a single line item. The STIP is to be updated every four years. All programs in the STIP must

conform to federal air quality regulations and be consistent with metropolitan plans as well as the long-range statewide plan.

The legislative provisions for the STIP are similar to those for long range transportation plans. Public involvement must be inclusive and provide opportunities for early and ongoing involvement, and this must continue throughout the transportation planning and programming process. There must also be a process established for the consideration of and response to public input during STIP development. The planning factors for consideration in the planning process and the encouragement for a financial plan are components of the STIP provision, just as they are for the LRTP.

- Other Provisions: There are several other programs in SAFETEA-LU that address large projects that often require the involvement and coordination of multiple state DOTs to plan and implement. These include:
  - Projects of National and Regional Significance: Very large projects are eligible for funding under this program (i.e., those projects greater than $500 million in cost or 75% of the current annual federal assistance to a state). Up to 80% of project costs is available for projects that (1) can demonstrate an economic benefit to the regions they serve; (2) address safety and congestion issues; (3) have an "acceptable degree" of non-federal funding for construction, operations and maintenance; and (4) have preliminary engineering already completed. While these projects would be included in a LRTP and a STIP, their justification would involve a more detailed and rigorous analysis process by one or more state DOTs.
  - National Corridor Infrastructure Program: This program provides funding for highway projects in corridors of national significance to promote economic development. Projects are eligible for up to 80% in federal project funding if they connect two existing segments of the Interstate System or improve commercial or passenger travel within or across states.

Types of Statewide Transportation Plans

Since the passage of ISTEA, state DOTs have refined the content and format of their statewide transportation plans to respond to requirements, to respond to changing needs, or because their technical capabilities and information resources have evolved. There is considerable variety in the depth and breadth of these plans across the nation, reflecting each state's unique transportation challenges, as well as the complexity of each state's underlying economic, geographic, and demographic make-up.

The FHWA/FTA "Planning Capacity Building Program" web site identifies several types of statewide long-range transportation plans. Statewide plans

usually fall into two general categories, "policy plans" and "project plans," described as follows:

- Policy Plans: Statewide transportation plans that are not corridor-based or project-specific may be considered as policy plans. Policy plans may focus on a desired future state (vision-based), overarching strategies to attain desired future performance (policy-based) and future costs (needs-based); or they may include some combination of these, perhaps with emphasis on one of these elements over the others. For this research project, these are all considered as policy plans because they do not include a specific list of the projects to be implemented during the planning horizon.

  Policy-oriented plans contain statements of anticipated outcomes and/or desired accomplishments for the state's transportation system and its users. A policy plan provides guidance on what can be accomplished, often with a defined level of funding and with optional courses of action to achieve that level of funding. Policy plans may associate needed funding levels with programmatic emphasis areas to achieve desired outcomes (e.g., preservation or system expansion).

  Policy-oriented plans can provide a planning framework for subsequent modal plans, or they may synthesize existing modal plans – such as those for rail, water, seaports, airports and transit – since the planning function for these modes often resides in separate divisions, offices, or agencies. Policy plans that follow modal plans can present a coherent and integrated estimate of needs that reflects and balances the priorities established in the plan's goals and/or vision statements.
- Project Plans: Project-based plans are focused on the identification and prioritization of a long-range list of specific projects to be implemented during the planning timeframe, usually 20 or 25 years. A project-based plan will likely include many of the features of a policy plan, such as types of needs, a future vision, future goals and objectives, and/or future programs or strategies. However, it goes a step further to identify specific projects to help meet those needs, reach the vision, address the goals and objectives, and/or implement those programs and strategies.

  To do this, the project-based statewide transportation planning process generally includes a compilation of potential future transportation needs based primarily on long-term transportation goals and objectives, data analysis, performance measures, and public and political input. The cost of these needs are compared to projected available funds for implementation from all possible funding sources, including the consideration of potential new revenues and innovative financing methods.

  The planning process is then used to develop a recommended long-range plan that selects the highest priority projects for future implementation. Again, this selection process is generally based on data analysis, performance measures, and public and political input, as well as an assessment of how each project could help meet the state's

long-term transportation goals and objectives. This is usually an iterative process and continues until the costs of implementation fall within the projected available funding to develop a final fiscally-constrained long-range plan.

Another type of statewide transportation plan identified by the USDOT is the corridor-based plan, the subject of this research project. Corridor-based plans focus on the movement of people and goods along or between distinct routes and may be addressed as types of and incorporate elements of policy plans or project plans. Corridor-based plans are discussed in more detail in Chapter 5 of this report.

Common Elements of Statewide Plans

Whether policy, project, or corridor-based, most statewide transportation plans contain all or most of the following elements:

- Goals or Vision Statements: Most plans describe the state's transportation priorities as expressions of goals or visions for the future. Often these statements reflect the substance or intent of ISTEA and post-ISTEA planning factors, while recognizing that a balance must be struck among competing objectives. These statements can reflect broader aspirations and transportation's relationship to economic well-being, quality of life, health, and welfare. These broad statements may then be linked to more detailed statements that describe how the goals or vision statements will be achieved. Some states, such as Pennsylvania and Michigan, have developed numeric thresholds or benchmarks that can be used to measure progress towards the plan's goals. Some plans may also be expanded to consider service delivery issues between the DOT and its "clients."
- Public Participation and Outreach: Statewide plans document efforts to understand the issues, priorities, and opinions of the general public, single-issue groups, and minority stakeholders throughout the plan development process. With the passage of SAFETEA-LU, new emphasis has been placed on the non-motorized community and the disabled. Based on the experience of all state DOTs, many sources are now available that provide methods for effective public participation, including methods and examples in statewide plans, technical documents, web sites, federal guidance, etc. Public participation and outreach efforts are limited only by the amount of time and funds available and the creativity of the transportation planners.
- Issues and Trends: There are many economic, political, and social factors that influence current and future needs, yet are beyond the DOT's power to control. The deteriorating highway infrastructure, scarcity of funding for transportation improvements, continued globalization of the economy, graying of the population, climate change, and high fuel prices are issues that most states are currently trying to address. A description and analysis of such trends and how the state transportation agency intends to respond to them can help identify potential strategies and broaden stakeholders'

understanding of the rationale for proposed changes in challenges, policies, programs, and priorities.

- Modal Inventory: Statewide plans describe the condition, extent and performance of all modes, including highway, transit, airports, rail, waterways, pipelines, seaports, and other intermodal facilities. Maps and tables are often used to describe existing inventories, as well as current expansion plans. Assembling this information requires coordinating asset management and planning inventories of all the modal divisions within a state DOT, as well as data from MPOs and non-urban planning areas. Planning or intermodal divisions within a DOT are often charged with this responsibility.
- Needs: Each state must determine how its policy objectives and financial constraints will dictate the characterization of needs in its statewide plan. Needs may be expressed essentially in terms of broad scenarios based on two key variables, condition and performance. A "state of good repair" scenario may focus on reconstruction, repair, and replacement to provide a safe, functional system, while an "expansion" scenario may address current and future capacity bottlenecks, safety hotspots, improved access for economic development, and/or modal or network connectivity issues.
- Cost Estimates and Revenue Estimation: The strategic direction of the statewide plan depends upon the resources available to accomplish the state DOT's multiple missions. The most fundamental piece of information sought by state agencies is whether or not revenue projections will be sufficient to maintain safe operating conditions over the life of the plan. Transportation revenues are derived from many sources, most notably fuel taxes, licensing fees, and sales taxes. Revenue projections rely on forecasts of population, vehicle miles of travel (VMT) forecasts, and economic conditions, while cost estimates are critically influenced by the cost of labor and the cost of raw materials. While there are large uncertainties in forecasting these variables, this exercise can bring the issue of new revenue sources to the attention of planners and decision-makers.

Relationship between Planning and Programming

The statewide long-range plan (SLRP) provides a general sense of the state DOT's transportation system needs, long-term priorities, and strategic direction in the future. The programming document, the State Transportation Improvement Program (STIP), addresses immediate needs under funding constraints. Linking the two processes promotes accountability by enabling assessments of progress towards fulfillment of long-term desires versus actual delivery. The linkage can also help state DOTs make critically important, short-term progress towards strategic transportation initiatives for which ultimate benefits may only be realized far into the future.

Current federal regulations stipulate that SLRPs and STIPs must be consistent. State DOTs have a great deal of latitude in determining how to define and

develop that linkage. In recent years, plans have become increasingly policy-oriented, as requirements for interdisciplinary, multimodal plans have vastly complicated the project development process; therefore, states that develop policy-based SLRPs can point to established goals or vision statements to justify the selection of individual projects in the STIP.

On the other hand, project-specific SLRPs use more quantitative and rigorous methods whereby results can be used to complement the STIP analyses. State DOTs that have MPOs within their boundaries, and especially those with large MPOs, may be more likely to employ a project-specific approach to the development of SLRPs because the air quality conformity and MPO LRTP development process is project-specific.

There are several trends in the use of transportation funds that have complicated the state's ability to create a strong linkage between planning and programming. The increased use of federal earmarks that may be beyond the control of state DOTs, the increased emphasis on maintenance rather than expansion, and restrictions on the use of motor fuel taxes for non-highway uses in some states have undercut the ability of DOTs to adequately link their planning efforts with the programming process.

Another research project, *NCHRP 591*, identified a set of "intermediate factors" that are critical to the planning and programming linkage:

- A clear statement of desired goals or plan outcomes;
- A set of measures to determine progress towards those outcomes;
- Data systems to allow actual measurement of progress;
- Use of performance measures in project evaluation and prioritization;
- Consideration of performance in allocation of funds;
- Analysis and reporting of results; and
- Feedback into subsequent cycles of planning and programming.

Organizational and procedural factors influence the linkage as well. Agencies that integrate or link their planning and programming functions, as well as those that set clear procedures for STIP development, emphasize the linkage and have obvious advantages over those that do not. Internal and external leadership or support and the maintenance of a high level of staff expertise are important factors as well.

State DOTs can improve the utility of policy-based documents by organizing and assigning priorities to discrete funding categories in a consistent fashion with the STIP, without being overly prescriptive. This provides a middle ground whereby broad programmatic priorities are identified in the SLRP and can be applied in the development of the STIP, leaving the short-term document to identify specific projects and priorities.

Funding categories may be organized geographically (e.g., by district or region) and/or functionally (e.g., by specific subsystems or modes). However, consistent with the purpose of this research project, some states are also using multimodal corridors as a category and a means of prioritizing resource allocations.

The ultimate goal of the statewide planning process is to establish a link between planning, other phases of project development, and implementation. Since implementation is dependent on the programming process, this research study has been cognizant of this relationship and has given strong consideration to how corridor-based statewide transportation plans can provide results that complement the programming process.

CHAPTER 5 - STATEWIDE CORRIDOR PLANNING

Transportation planning provides important information to those making decisions on improving transportation system performance. Prior to the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), statewide transportation planning was already being undertaken by many state DOTs.

There are many different reasons for undertaking a statewide transportation planning process, and there many different ways of developing a statewide transportation plan. Some of the early statewide planning efforts were aimed at producing a list of projects that best met the transportation needs of the state. Other efforts were required by state law, with many of those focusing not only on transportation needs, but also on the expected impacts on the environment, economic development, tourism and myriad other activities that are influenced by transportation system performance. Still others were developed as policy statements that established overall direction for transportation investment, but did not identify specific projects.

Over the past 10 to 15 years, another model for conducting multimodal statewide transportation planning has been evolving. This model, based on a statewide corridor planning (SWCP) approach, relies on the identification of significant state transportation corridors and the results of individual corridor analysis to provide a more detailed and comprehensive perspective on corridors that are designated as having statewide or regional significance. Statewide plans and programs are then developed based largely on the aggregated results of individual corridor analyses.

Rationale for Corridor-Based Statewide Planning

Many reasons have been given for using a corridor-based statewide transportation planning process. Most notably, the corridor approach has taken on added importance due to a recent requirement under SAFETEA-LU that the statewide plan include measures to ensure the preservation and most efficient use of the existing transportation system. The corridor approach allows states to analyze and give attention to the transportation needs for an entire corridor, rather than just individual projects that may represent only corridor segments. Also, the land use and transportation system context can be better addressed at the corridor level and may, therefore, permit a more refined assessment of the effectiveness of identified projects. Conversely, the SWCP approach may also allow transportation officials to compare between corridors or identify specific projects within a corridor that can benefit corridor or systems-wide travel flows.

In addition, different but complementary project types or strategies can be targeted for subsequent action to address corridor needs. For example, a corridor planning approach might identify capacity expansion projects for further consideration in the transportation plan, but it might also discover opportunities

for operational, ITS, land use, public transit, intermodal, pricing, or other types of strategies that could improve corridor performance.

Corridor Planning

State DOTs are familiar with and have confidence in the basic corridor planning process that has evolved over time. Therefore, it is important to briefly review what is involved in corridor planning studies before discussing how their results might be utilized in the statewide transportation planning process.

The NEPA Process

The corridor planning process is based largely on the project development process that has been established by the 1970 *National Environmental Policy Act* (NEPA) and subsequent related federal guidelines, as well as accepted practices based on case law.

The following presents a short summary of the steps in the NEPA process that are used in early project development:

- Purpose and Need: One of the most important steps in the NEPA process is the development of a purpose and need statement. This statement justifies the proposed project by describing current and likely future deficiencies and how those could be addressed by a transportation investment. Congestion, safety, connectivity, mobility, accessibility, and economic needs are among the issues that are usually addressed in the purpose and need statement. Another accepted purpose and need for a project could be a federally legislated mandate.
- Alternatives Analysis: Once the purpose and need for the project has been established, a range of feasible alternatives to address that purpose and need are developed and analyzed, including a no-build alternative.
- Impacts: The transportation alternatives are evaluated according to a broad range of impact criteria that include transportation, environmental, and social dimensions, such as aesthetic, historic, and cultural considerations. Immediate local impacts (direct impacts) and secondary effects (indirect impacts) that will occur must both be considered. While the concept of impacts is usually inferred as negative, positive impacts may also be identified and considered.
- Mitigation: A sequential approach to addressing negative consequences of a transportation investment includes consideration of avoidance of impacts, minimization, rectification, reduction, and the provision of substitute resources.
- Resource Agency Coordination and Public Involvement: NEPA-mandated collaboration and communication includes all concerned and potentially impacted citizens and stakeholders, as well as state, local and federal agencies, throughout the project review process.

While corridor planning studies should be consistent with the NEPA process to comply with FHWA/FTA guidelines, they are not a substitute. There is no assurance that planning decisions could be successfully adopted into the NEPA process when that time comes. However, corridor planning decisions are usually accepted as support for some NEPA steps, such as the purpose and need statement, identification of a range of alternatives, the analysis of potential impacts, and potential mitigation measures.

Corridor Planning Studies

Corridor studies may or may not be a part of a formal NEPA process, but best practices dictate that they will be incorporated into or complementary to that process, while also providing technical issues and solutions to address an identified need. The following description of corridor planning is taken from a recognized "how-to manual" developed in 1999, *NCHRP 435, A Guidebook for Transportation Corridor Studies: A Process for Effective Decision Making*.

As with the statewide planning process, the focus of corridor planning is the application of effective, systematic practices as part of the transportation investment decision-making process. Collaboration with stakeholders and elected officials throughout the study process is essential, because infrastructure decisions are not only technical, but also political in nature. Each corridor planning study is designed to provide technical information to persons or groups responsible for making informed transportation decisions that are:

- Effective in addressing deficiencies;
- In line with local and regional goals and plans:
- Cost-effective:
- Collaborative;
- Sensitive to community needs and concerns;
- Implementable; and
- Able to stand the test of time.

There is no "one-size-fits-all" approach that applies perfectly to all corridor studies. However, a typical corridor planning study encompasses the following steps:

- Identifying the Problem: The identification of deficiencies in the study area helps determine whether a proposed project is needed; establishes the framework on which alternatives are constructed; and helps establish criteria for evaluating those alternatives. Weaknesses in the purpose and need section of environmental documents have frequently been identified as a problem by federal agencies and are often the reason for project approval denials or delays. When defining study area deficiencies, problems should:
    - Describe the deficiency, not imply a solution;
    - Include both current and anticipated future issues;

- Be specific;
- Be presented in an easy-to-understand format;
- Be applicable to alternatives;
- Be coordinated with resource agency and stakeholder input; and
- Be documented in a form compliant with NEPA principles.

Perceived problems cited by the public or an elected official, not just issues identified through technical analysis, should be treated as "real" problems.

- Corridor Study Strategy: Some basic organizational factors should be determined before a study is undertaken. The study purpose, schedule and budget constraints, and a strategy for seeking outside input are all important issues to determine. Because the corridor study is only one step in the project development process, it is important to consider the corridor study process as an integrated first step in the life of a project. Whether the study is performed as part of the NEPA process or not, it should be planned so study decisions can be seamlessly integrated with those environmental requirements in the future.
- Study Organization: A detailed work plan should be developed for each corridor study. For example, it is essential to monitor the study schedule and budgets, develop a community outreach plan, identify data needs and management procedures, and establish roles and responsibilities for project team members and other participants, including any other offices and/or agencies that may be involved.
- Community Involvement Planning: Five distinct groups will be critical outreach focuses: the public, elected officials, key project stakeholders, the media, and resource agencies. To help with this, an initial meeting should be held with a diverse cross-section of decision makers and stakeholders to identify key issues and concerns. While public involvement tips and techniques are readily available, how a technique is applied may be more important than which technique is used. Emphasis should be placed on good listening practices, building consensus, and establishing long-term trusting relationships. It is important to include outreach elements prior to major decisions being made to ensure that the input is relevant and worthwhile.
- Problem Confirmation: It is important to confirm and/or expand the problems established prior to or at the outset of the study through the input of resource agencies, local officials, stakeholders, and the public. Based on this input and on technical analyses, available information should be evaluated and summarized into a problem statement that can earn group consensus.
- Evaluation Criteria: Evaluation criteria must strike a balance between presenting enough information to distinguish between alternatives, while not generating too much detail that might overwhelm decision-makers or cloud essential issues. Criteria may come from identified issues in the study area, regional and local goals, potential impacts, transportation

performance measures, project selection criteria, and/or governmental funding eligibility requirements. A key point is that the criteria and evaluations are intended to better inform the decision-making process, not to rigidly govern or dictate outcomes or decisions.

- Development and Evaluation of Alternatives: The development and evaluation of alternatives is the foundation of each transportation corridor study where the decision-making process begins. General principles and lessons learned on the development of alternatives include the following:
    - Alternatives should correspond to study area problems.
    - Identified alternatives should present the full range of possible solutions.
    - A collaborative process should be used to define alternatives.
    - Alternatives should be reasonable and competitive.

  A variety of methodologies are available for evaluation, for example:
    - Traditionally, a tiered analysis is commonly used to eliminate a number of early alternatives so a more detailed analysis can be performed on the remaining alternatives.
    - An incremental analysis starts with a small number of alternatives and applies lessons learned after an initial screening to refine or add alternatives.
    - Component analyses look at impacts associated with a given element and then combine these aggregate effects to define alternative impacts.

  A range of evaluation tips, tools, and resources can be used in a corridor study, including traffic forecasting, land use analyses, environmental analyses, costing, and economic analyses. In all cases, alternatives should be evaluated against a base condition, e.g., current and forecasted future conditions on the existing facility or network and on any improvements listed in the transportation plan or transportation improvement program.
- Financial Analysis and Selection of Preferred Investment Strategy: A review of funding needs and available funding sources for any preferred alternative(s) should be undertaken, either before or after final alternative selection.
- Documentation: Throughout the corridor planning process, documentation is extremely important to record facts, meetings, and analyses leading up to project decisions. It facilitates decision-making, so it should be understandable and concise to further this end. Proper documentation also provides credibility and credence for the decisions reached in the study, thereby making those decisions more valid and acceptable in future phases of project development.

The ultimate goal of this research project is to integrate corridor planning studies, analysis, and/or principles into the overall statewide planning process.

Statewide Corridor Planning

The SWCP process is intended to provide a more detailed and structured methodology by utilizing information derived from planning efforts on individual corridors. Interest in statewide corridor planning has grown significantly in recent years. As an indicator of this interest, the federal government has given recognition of and the authority for corridor planning and sub-area planning, as part of the statewide transportation planning process, under federal regulations under 23 CFR 450.212.

The FHWA/FTA has defined 'corridor plans' as a type of state transportation plan, as discussed previously in Chapter 4, with the following "ideal" characteristics;

- Focuses on specific major transportation corridors, considering all modes and both passenger and freight needs;
- Includes a synthesis of each major corridor, considering existing conditions, projected use, and funding, while also highlighting unique uses and regional preferences; and
- May rely on regional or DOT district planning activities to identify and/or analyze corridors, carry out public participation and outreach, and help set priorities.

Transportation planning is undertaken by state transportation agencies for a variety of reasons, not the least of which is to satisfy federal requirements. A transportation planning process can also provide:

- Important information to help make decisions on transportation investments;
- Credibility for transportation agencies in identifying needs and making recommendations that the public and decision makers can accept; and
- A link between transportation decision-making and broader policy goals.

Transportation planning follows a standard problem-solving process using the following steps: identify goals; gather information; analyze and evaluate the information to better define the problem; develop alternatives to address that problem; evaluate the likely outcomes from those alternatives; decide which of the alternatives best solves the problem; and then formulate a plan to implement that solution. However, even within this standard approach, there are several issues that can differentiate one transportation planning process from another:

- What policy, economic, and social factors influence the process?
- Who should be involved in the process?
- What is the geographical "reach" of the process, and how should it be organized?

- How should transportation goals be established and by whom?
- What data or other information is needed?
- What methods are used for analysis?
- What is the range of alternatives that should be explored?
- How can future outcomes be determined and evaluated?
- What criteria are needed to decide the best solution?
- What support, resources, and process are needed for implementation?

Some of the major issues related to statewide corridor planning for transportation facilities and systems are discussed in the following section.

Influences on the Statewide Corridor Planning Process

Given a variety of reasons and expectations among states, it is not surprising that the statewide transportation planning process differs somewhat from one state to another. Each state DOT has its own unique set of "external" factors that influence the planning process. However, there is some commonality in the types of influences, for example:

- Governance: The statewide transportation planning process usually mirrors the level of interest by the executive and legislative branches of the government. It must also fit the decision-making process used in each state. Some states have a direct connection between the Governor and the head of the transportation agency, whereas other transportation agencies have oversight or decision-making authority resting in a Commission or Board or are required to coordinate and collaborate with a politically-appointed advisory group.
- Legislative/Regulatory Requirements: Some transportation agencies are relatively free of legislative or regulatory mandates or restrictions on the planning process. Others must follow specific requirements related to transportation planning, land use planning, coordination with local governments or regional agencies, modal issues, special transportation systems, and other factors.
- Political Climate/Support: The success of a state DOT's transportation planning process depends in part on the level of political or organizational support within state government or the transportation agency. For example, it is highly unlikely that there will be unanimity among state legislators on what the most appropriate statewide transportation strategy should be. However, the planning process provides an opportunity for all issues to be identified and debated. As noted before, a credible planning process can be an important factor in garnering political support for transportation investments.
- Political/Organizational Champion: To develop a plan that can be successfully implemented requires someone to push and/or support the results of the planning process: first, within the organization, whether that

is an executive, manager or well-respected staff member – and, second, within the political arena, both in the executive and legislative branch.

- Organization (DOT, Office, Division, District or Region): The use of a corridor planning approach as a key input into statewide transportation planning could require a different allocation of organizational resources. One of the major issues could be whether the planning process should be centralized or decentralized. That is, will the major share of the work be borne by a Central Office staff in a transportation agency, or should it be delegated to or at least shared with other offices, divisions, districts, or regions? Each method has strengths and weaknesses, but the process should be based on what is best for the state DOT.
- Resources (Funds, Staff, Tools): A successful planning process must have the appropriate level of funding, staff, and tools. Staff resources refer not only to the number of personnel, but also the level of education, skills, and experience. Resources depend largely on the level of political and organizational support, so the process may result from involvement by a political or organizational champion, or it can be the outcome of legislative or regulatory requirements.
- Type of Statewide Plan (Policy or Project): Most states have adopted the policy plan approach toward the Statewide Transportation Plan. Generally, a policy plan lays out a vision for the state's transportation system and then defines policies, principles, standards, and strategies for meeting that vision – as well as the method by which those will be applied for future project development. A project-based plan incorporates the same elements of the policy plan, but it carries it to a final step: a fiscally-constrained list of high-priority projects to be pursued over the life of the planning horizon. The advantages and disadvantages of these approaches must be considered and weighed by the DOT.
- Options for Outreach (MPOs, RPOs, DOT Districts, Other): A major element of the statewide planning process is how to communicate, coordinate, consult, and cooperate with other state offices, local governments, resource agencies, regional planning agencies (both rural and urban), major stakeholders, stakeholders, and the public at large. Therefore, one major decision is how to share information with and get input from many statewide, regional, and local interests. Many states have established working relationships with both Metropolitan and Rural Planning Organizations (MPOs and RPOs), often through local agency districts or regions.
- Roles and Responsibilities: The statewide transportation planning process must provide opportunities for a large number of interests to be involved in the process. An important key to success is to adequately establish the roles and responsibilities of the various participants. Some state DOTs, such as Colorado and Pennsylvania, have developed guidebooks and manuals for their planning partners to clearly establish what is expected of each office or organization.

The *Statewide Corridor Planning Guidebook* is based on a conceptual framework developed for this research project that attempts to address these factors and relate them specifically to a statewide corridor planning process. A discussion of the Conceptual SWCP Framework is presented in Chapter 6 of this report.

CHAPTER 6 - STATEWIDE CORRIDOR PLANNING FRAMEWORK

This chapter presents the purpose of the Statewide Corridor Planning Guidebook and formulates a conceptual framework for a statewide corridor planning process for state DOTs. The basic steps involved in a typical statewide transportation planning process were discussed in Chapter 4 of this report, and discussions of corridor planning and corridor-based statewide planning tasks and issues were presented in Chapter 5.

Purpose of the Guidebook

Development of a SWCP Guidebook was requested by AASHTO's Standing Committee on Planning in response to input from state DOTs. The objectives of the research were spelled out in the NCHRP request for services, as follows:

> "Without extensive detailed planning, neither policy plans nor project-specific plans contain a sufficient basis for decision making and prioritization.
>
> Statewide corridor planning (SWCP) can provide a geographic framework that allows states to better understand the implications of transportation decisions on mobility, communities, economic development, and environmental stewardship and to facilitate wise programming of funds consistent with identified needs and priorities. SWCP can be an effective method to understand the relationship between modes, evaluate performance, and generate innovative solutions to transportation problems. SWCP can serve as the link between broad policies and strategies that serve as the foundation of many statewide transportation plans and the evaluation of needs and performance expectations that can guide development of priority programs. SWCP can also serve as the mechanism for prioritizing implementation of project-specific plans.
>
> Guidance is needed on how to develop detailed statewide corridor plans that can effectively link long-range transportation plans to shorter-term state transportation improvement programs (STIPs). Such guidance can also assist the states in responding to new planning requirements that can be expected to emerge from the new surface transportation reauthorization.
>
> *Objective*
>
> The objective of this research is to develop a guidebook for multimodal statewide corridor planning (SWCP). The guidebook will describe processes, methods, and techniques for defining, analyzing, and prioritizing among and within statewide corridors to aid in preparing an effective statewide transportation plan. This project will provide guidance for transportation decision makers, managers, and planning practitioners

involved in the preparation of statewide transportation plans and priority programs."

SWCP Conceptual Framework

The purpose of a conceptual framework is to provide guidance on the key steps or variables that comprise a particular effort. Not only does such a framework identify important variables, but it often describes the relationships among them. To accomplish the stated objective of the research, a conceptual framework for statewide corridor planning was established based on:

- The findings of the research project to date;
- The basic requirements and principles of the statewide planning process;
- Current state of the practice, including initiatives proposed or tried that had not been successful; and
- "Best practice" examples related to statewide corridor planning.

A corridor-based approach naturally encompasses all modes and intermodal connections, as well as land use and accessibility issues. In addition to the usual steps in a statewide transportation planning process, there are three additional phases included in a corridor-based statewide planning process, as follows:

1. Selection and definition of significant statewide or regional transportation corridors to be addressed in the statewide planning process;
2. Analysis of selected corridors to provide a means of developing and communicating a detailed understanding of a selected corridor's economic and social value, its function, the travel "markets" that use it, and the transportation needs to serve those markets in the future; and
3. Applying the quantitative and qualitative findings to establish policies, set priorities, and make recommendations about which projects (or types of projects), strategies, and programs should be implemented to carry out the vision and/or the goals and objectives identified in the statewide planning process.

The SWCP recommendations form the basis for a long-range plan that includes a transportation investment program and potential non-investment strategies. Any recommended financial investments that emerge will need to have a strong linkage with the state's programming process and STIPs.

State DOTs are familiar with and knowledgeable about corridor planning, the middle phase of the SWCP process; but they are less certain about the beginning and ending of the process. Therefore, the primary focus of this research was on these two phases:

1. The identification of major corridors; and
2. The use of corridor analyses and other information to make decisions and set priorities for policies, programs, projects, and other strategies.

Corridor-based planning can facilitate a tiered approach to statewide planning. For example, several states have developed statewide plans that identify or validate statewide or regionally significant corridors, characterize them by the purposes they serve (e.g., freight, tourism, or emergency evacuation), and identify their transportation needs through studies or other analysis. The statewide plan may utilize information from previous corridor planning studies or analysis, and/or it may be followed by a series of corridor-specific studies that provide more detail on other issues, such as capacity, condition, preservation, and environmental and community factors.

A diagram of the conceptual framework from this research project, and for the planning guidance that follows, is shown in Figure 6-1 and discussed further in this chapter. This Statewide Corridor Planning Framework incorporates the following key steps that are part of a corridor-based approach to statewide transportation planning:

- Identify Potential Corridors: The framework begins with the identification of candidate corridors that will serve as the source for potential investment opportunities. This process will likely be based on both quantitative and subjective criteria; that is, critical corridors will be defined through the periodic collection (and analysis) of condition and performance data, the estimation of travel flows and expected future travel demands, or by the function the corridors serve in broader policy perspective.

  As an illustration of this latter consideration, in Minnesota and Michigan, intercity corridors have been identified for their role in supporting state economic development. The identification of potential corridors could also be influenced by non-quantifiable factors, such as geographic equity or political considerations.

  In the examples of corridor-based planning found in practice, the approach toward corridor identification has been based largely on geographical significance, transportation classification or function, and thresholds of volume or throughput, and sometimes a higher-level analysis of key performance measures. Performance measures are related to such things as travel delay or some other measure of corridor congestion (current and future), safety, physical condition, traffic volumes, tonnage, ridership, or some other measure of commodity flows or passenger volumes.

  Levels of analysis vary widely. For example, Indiana DOT has developed criteria primarily focused on highways and based on geographical tiers, system classification, travel characteristics, and design features; while the Florida and Pennsylvania DOTs have developed measures that address geographical tiers, all modes, and specified levels for a group of extensive performance measures.

Figure 1. Conceptual Framework for a Statewide Corridor-Based Transportation Investment Pro

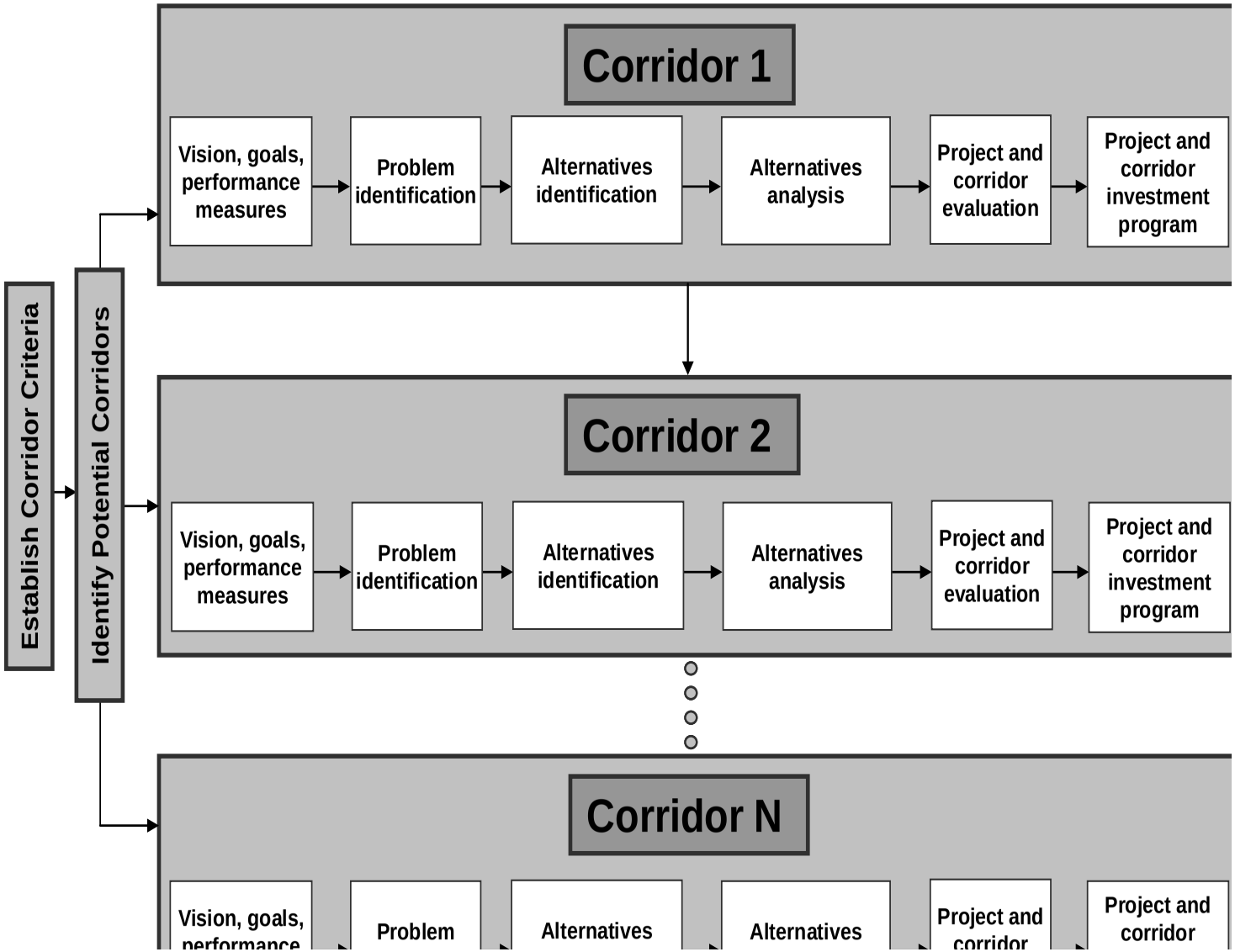


Figure 6-1. Conceptual Framework for a Statewide Corridor-Based Transportation Investment Program

One of the more interesting aspects of this first step in the planning framework is the degree to which corridors are focused on intercity travel and corridors in metropolitan areas. The "best practice" examples of a statewide corridor-based planning process combine both intercity and metropolitan corridors into a comprehensive statewide perspective of transportation needs.

In California, for example, Caltrans has identified intercity corridors and has also worked with metropolitan and regional planning organizations to identify the most critical corridor needs within the metropolitan area. The best example is the corridor-based planning approach in the San Francisco Bay Area where both Caltrans and the Metropolitan Transportation Commission have partnered to examine several transportation corridors that are potential candidates for state and regional investment. If the corridor identification process is to include corridors in metropolitan areas, close coordination and collaboration is required between the state DOT and the respective metropolitan planning organizations.

The more sophisticated corridor-based planning processes will incorporate periodic or real-time monitoring capabilities into the data collection efforts of the relevant agencies. For example, the Bay Area example mentioned previously has relied on real-time monitoring of facility speeds, a periodic assessment of the impacts of incidents and crashes on facility performance, and the identification of freeway bottleneck points.

An important characteristic of this initial step in the planning process is that corridors are likely to be identified and proceed into more detailed analysis at different times (thereby creating a challenge in later steps where priorities among corridors are to be determined). If major corridor planning studies are done, it is highly unlikely that all studies will begin simultaneously, nor will they finish at the same time. Thus, at any given point in the planning process, some corridor studies could be underway, others in the early stages of being identified, and still others in the final stages of completion. This emphasizes the need for periodic monitoring of the performance and condition of corridor transportation facilities.

To the extent that the corridor approach is tied to other policy objectives, such as economic development, the on-going corridor identification process needs to monitor the changing characteristics of the contextual factors within which the corridor planning process occurs, In the case of economic development, this would suggest a periodic assessment of the changing economic opportunities afforded the state and the corresponding importance of transportation infrastructure to supporting this policy goal. A more specific example might be the monitoring of freight flows into and out of a port and an

estimation of the future volumes that might occur due to changing global trade flows.

- Conduct Corridor Analysis: Once transportation corridors of significance have been identified and prioritized, various methods of corridor analysis could be used for the statewide transportation planning process, such as the following three levels of effort:
    - Level 1 - Overview: The simplest and quickest level of corridor analysis is to use and analyze available data to give a quick overview of the major state corridors.
    - Level 2 – Preliminary Studies: For the initial statewide transportation planning efforts, it may not be necessary to develop a full corridor planning study for all major corridors. Instead, a time-limited, concentrated effort could be undertaken for a large number of corridors simultaneously.
    - Level 3 – Corridor Planning Study: The highest level of effort is a complete and detailed corridor planning study that is part of, or compatible with, the NEPA process. Such studies may eventually be needed on all priority corridors so that all issues are properly addressed and so local officials, resource agencies, and the public have a chance to participate in the decision-making process.

  These different levels are discussed in more detail in Appendix B of the SWCP Guidebook. However, assuming that a state DOT will eventually wish to develop major corridor planning studies for all of the state significant corridors, more information is provided here on corridor planning.

- Conduct Corridor Studies: Once potential corridors are identified, a corridor planning process could occur, ideally based on a statewide template to assure consistency in approach and the information produced. As discussed previously, NCHRP Report 435, A Guidebook for Transportation Corridor Studies: A Process for Effective Decision Making, is an excellent reference that provides a more detailed description of how to conduct corridor planning. The basic steps in the process are described below.

  Vision, goals, and performance measures: The initial step in any planning process is to identify a desirable end state for both transportation system performance and for the broader community. This is usually done by creating a vision of the corridor's future and of the role that transportation will play in achieving this vision. Specific goals are identified, usually through a public involvement program, and key performance measures that will be used to assess the desirability of different corridor strategies are defined. In Colorado, the DOT worked with the state's Transportation Planning Regions (TPRs, which include both MPOs and RPOs) to define a vision for each of the 350 corridor segments in the state. CDOT provides policy and

guidance – and has even developed a CD-ROM *Corridor Vision Toolkit* – to assist the TPRs in this effort.

It seems likely that both a corridor vision or goals statement will be very specific to each corridor. For example, an urban corridor that primarily serves commuter trips would have a very different vision and set of goals than an intercity corridor that serves large freight volumes. Performance measures are often tied to goals identified for a corridor, so such measures will be closely linked to the types of issues and strategies that will be considered during the corridor study. However, it is important that a statewide corridor planning template be developed that has some performance measures common to all corridors to help make comparisons and identify priorities among different corridors.

The performance measures common to all corridor studies would be determined by the state DOT, and they would reflect the types of issues of greatest concern to the state. Nonetheless, with respect to transportation system performance, it seems likely that performance measures will include measures of such things as:

- Travel time or delay, or volume vs. capacity, or level of service;
- Number and extent of bottlenecks;
- Safety impacts;
- Improvements in access, mobility, or connectivity;
- Condition of infrastructure;
- Physical or operational deficiencies;
- Service productivity;
- Cost efficiency; and
- Maintenance productivity.

Corridor System Management Plans in California Include the Following Tasks

- Corridor definition
- Stakeholder team development
- Preliminary performance assessment
- Detection in place
- Comprehensive performance assessment
- Identify causes of congestion
- Test improvement scenarios
- Prioritize recommendations

With respect to contextual factors, one might envision performance measures relating to economic development impacts, social or community impacts, environmental quality, or quality of life. In addition to performance measures that report on changes to individual factors, it will be important to define a set of cost effectiveness measures that will provide decision makers with some sense of the relative benefit of investing in one set of projects versus another. These measures could simply be benefit/cost ratios, or perhaps cost effectiveness indicators targeted on specific performance categories (for example, cost per hour of delay reduced for highway improvements; or operating expense per passenger for public transit).

Problem definition and needs identification: Problem definitions will relate to the role that transportation services and facilities serve in a corridor. As an example, an important route serving a military base that might be used for military deployments or mobilization could be viewed from two perspectives: both the physical condition of roads and railroads to handle heavy loads and the level of congestion that such movements might encounter. In contrast, a highway corridor in a heavily urbanized area might suffer from large numbers of incidents and crashes that disrupt the efficient flow of vehicles in the corridor, as well as a large number of bottlenecks that cause delays downstream. In this case, the problem definition would include the need to remove bottlenecks and more efficiently handle incidents.

The problem definition does not have to be consistent from one corridor to another, and in most cases it will not be. However, there might be a situation in which a state has defined a particular policy interest as having statewide significance; thus, it could be incorporated into each corridor study. For example, if freight movement is considered a statewide policy concern, every corridor study could have efficient truck movement and improved intermodal connectivity as problems that need to be addressed in the corridor.

The performance measures identified in the previous step can be used to identify specific needs in the corridor. For example, if change in congestion is being used to assess the effectiveness of different corridor strategies and the overall priorities of individual and corridor investment strategies, then a set of congestion measures should be used to identify where needs exist in the corridor. Congestion bottlenecks could be identified with such measures, resulting in strategies targeted at reducing congestion at these locations. Again, to the extent that a subset of the performance measures is common across all corridor studies, the needs identification process can focus on those corridor problems to address statewide planning concerns.

Alternatives development: This step in corridor planning will reflect the types of problems and needs that were identified previously. It seems likely that the alternatives will range in type (for example, from

road expansion to increased transit operations to ITS applications) and scope (for example, from corridor-level investments on alternative modes to site-specific bottleneck reduction strategies).

Because different types of alternatives could reflect different types of organizational responsibilities, it is important that, early in the process, the alternatives development process identify who would be responsible for implementing improvement strategies to ensure that the appropriate expertise is available to properly define the alternatives. This is especially important in the subsequent use of corridor planning information to make statewide investment decisions. For example, if traffic signal improvements are part of the corridor solutions package, this investment can likely occur through the state DOT district office, a local transportation agency, or even a private interest. Therefore, there may be no need to involve the DOT central office (unless, of course, such decisions are made at that level).

Another way of looking at the level of state interest is to categorize alternatives by the likely source of funding. At this early stage of analysis, it might be too soon to identify who will fund different investments; however, the extent to which state funds will be used for individual projects and/or the extent to which the state DOT will have to be involved in subsequent implementation of a project (for example, permits) should be identified as soon as possible.

Alternatives analysis and evaluation: Depending on the types of alternatives being considered, a variety of analysis tools can be used in corridor planning.

Highway capacity projects, for example, would likely use some form of major network-based travel demand model to identify needs, whereas operations-type improvements would use computer simulation models or other software packages, such as the Highway Capacity Software. From the perspective of statewide planning, it is probably useful to have an approved set of analysis tools that can be used in state DOT analysis so that state planners are familiar with the data requirements and limitations of the tools being used. This would be at the discretion of individual states. A discussion of some potential corridor analysis tools is included in Appendix C of the SWCP Guidebook.

What is most important, however, is having some common evaluation criteria that will be used in the assessment of individual projects. Similar to performance measures, it is important for some of the information submitted to the state DOT to be comparable from one corridor to another. Evaluation measures or criteria are the way that such information can be used for decision making. Such criteria will reflect the performance measures previously identified and provide information on both the differences in impacts among the alternatives and the cost effectiveness of each major project that feeds into the next step of the overall statewide planning and programming process.

Project selection and prioritization: Project selection and prioritization at the corridor level should reflect both the specific circumstances in the corridor (such as corridor-specific goals), as well as state DOT concerns for transportation performance. The prioritization criteria should, therefore, be consistent from one corridor to another. This would suggest that the state should have a suggested procedure in its corridor planning template for selecting projects and a set of prioritization criteria that would be required; although planners and stakeholders could add to this set to address special issues for each corridor. At this point in the planning process, the level of funding might not be known, so it could be desirable to have a tiered ranking that showed the most cost-effective projects in the first tier, followed by lower tiers. For example, Indiana DOT has developed a scoring system for highway projects based on the level of congestion and a tiered system classification. The INDOT scoring system is tempered by a priority index that gauges the level of political will or support.

Project and corridor investment program: This final step in corridor planning produces a list of the projects and strategies that will be put forth for possible implementation, with specific funding levels and potential sources identified. This step identifies both individual projects and corridor investment programs. This distinction is important. Although it is possible for a state to fund all the projects in a particular corridor, it is not likely that a corridor-based statewide planning process will select investment priorities in such a way. More likely, the most cost-effective projects (from a state perspective) in each of the corridors will be identified and become the subject of statewide prioritization efforts. As noted in the alternatives development step, it is important to identify which projects in individual corridor studies are likely to have significant state funding available.

As part of this research project, special focus must be given to how each step in the corridor studies relates to a much broader statewide planning process based on input from corridor planning analysis, findings, and recommendations.

- Identify Statewide Investment Program: The final step in the statewide corridor planning process is identifying project investments, as well as other strategies that would meet the goals of the state program. As noted earlier, it is possible that all of the desired corridor information will not be available for state DOT prioritization and programming at the same time.

  The statewide corridor planning process itself will include a prioritization effort based on the information received from individual corridor studies and analysis, as well as from other sources (such as metropolitan plans, regional plans, and statewide modal plans). Assuming that cost-effectiveness and other evaluation criteria were selected specifically to allow statewide comparisons, this process should be relatively straightforward.

The structure of the individual corridor planning efforts will allow projects and other strategies to be considered, once the cost-effectiveness is known. However, consideration of statewide equity and differential funding availability by districts or regions, as is done by some state DOTs, could possibly constrain the composition of the investment program. For example, balancing funds for statewide needs, while also fairly distributing revenues among regions, was identified as a major challenge by the Colorado DOT.

Many issues still need to be discussed concerning the application of this framework and in determining its usefulness, for example:

- Will the statewide plan be a policy or project-oriented plan, and how does this influence the relevant characteristics for corridor analysis?
- What criteria will be used to select/designate corridors? Some examples include:
  - Geography (urban/rural, interstate, state, interregional, regional, local)
  - Modes (passenger, freight; highway, transit, rail, water, air, bicycle/pedestrian)
  - System (functional, federal, or state highways; trunklines, routes; regional, local)
  - Economic centers (cities, freight OD, tourist centers, job centers, other attractors)
  - Operational characteristics (ADT, truck volumes, ridership, headways, ton-miles, other throughput, thresholds)
  - Analytical methods/tools (capacity analysis, travel demand models, management systems, economic analysis)
  - Performance measures (travel time, LOS, CRF, pavement index, adequacy ratings, ridership, economic costs/benefits)
- What types of local consultation, public outreach, and stakeholder involvement strategies should be considered (information sharing, partnerships, customer/client surveys)?
- What types of statewide or corridor visions, goals, and objectives will be used? Some examples could include:
  - Environmental; land use; community; economic; TOD; freight
  - Future forecasts; scenario planning; transit propensity
- How should needs/projects be identified? Some examples could include:
  - Performance measures
  - Trade-offs (e.g., among modes, corridors and regions; interregional vs. regional; state vs. interstate; expansion versus ITS or other operations strategies)
- How should environmental, land use, community, and economic impacts of projects be considered in the evaluation process?

- How should projects be selected and prioritized? (Some examples could include modes; geography; project/funding categories; and multi-state corridor analysis.)
- How should financial analysis be conducted to provide consistent information across different corridors? (Some examples could include available funding, financing options, and innovative financing)
- How should statewide programming be undertaken to be compatible with and take advantage of a SWCP process?
- What are the most effective strategies for implementing different types of corridor projects and actions?

This research project attempts to address these issues in the technical guidance provided in the SWCP Guidebook, summarized in Chapter 7.

Development of the SWCP Guidebook

Using the conceptual framework as the starting point, along with research findings and the input provided by the NCHRP Review Panel, the following decisions were made regarding the content and format of the Guidebook:

- The SWCP Guidebook would include information on the benefits of the statewide corridor planning process.
- The Guidebook would present and discuss the schematic outline for the SWCP process, as diagrammed in Figure 6-1 of this chapter.
- The Guidebook would provide technical guidance using a matrix or checklist of steps in the SWCP process, along with reasons for that step.
- Every effort would be made to ensure that the Guidebook would include and even emphasize multimodal transportation planning.
- The Guidebook should recognize the need to address specific "special emphasis" areas, including environmental issues, public participation, economic development, freight transportation, the transportation-land use linkage, fiscal constraints, innovative financing, ITS and traffic operations, multi-state corridors, and others.

Based on these principles, a draft SWCP Guidebook was prepared and submitted for distribution to the NCHRP Review Panel on March 28, 2008.

Input from Practitioners

In early April of 2008, the draft SWCP Guidebook was provided to the American Association of Highway and Transportation Officials (AASHTO) for distribution by e-mail to the members of AASHTO's Standing Committee on Planning, which includes transportation planning practitioners from all state DOTs. SCOP members were asked to review and provide comments on the Guidebook.

In early May 2008, AASHTO complied with a request from the Principal Investigator to send a reminder to SCOP members. Also, in early June, the

Principal Investigator attended the SCOP spring meeting and had the opportunity to make an announcement requesting further input and asking SCOP members to participate in a conference call to discuss the draft SWCP Guidebook.

By the middle of June, written comments had been received by e-mail from eight states, five of which were involved in a corridor-based statewide planning process. Five of the states had favorable comments about the Guidebook, and the others provided specific concerns about discussion of issues that needed to be addressed or expanded. On June 16, 2008, a conference call was held with participation by 23 transportation planning practitioners from 16 DOTs. Specific concerns were discussed and recommendations were made regarding topics to be addressed or expanded.

One major issue raised during the practitioners' input session was the impact that climate change would have on the development of the statewide transportation plan. While this issue is not addressed in the Guidebook, it has been included in Chapter 7 as a topic for future additional research due to its far-reaching ramifications.

Other major issues raised by practitioners for additional research included multimodal planning, prioritization between corridors, liking planning and NEPA, technical tools, performance measures, the inclusion of non-investment strategies, public involvement, context sensitive solutions, and consistency with local plans.

Input from the NCHRP Review Panel

Following distribution of the draft SWCP Guidebook to the NCHRP Review Panel in late March 2008, written comments were received on the draft SWCP Guidebook from the panel members. The panel suggested some changes in the organization and format of the Guidebook and, as with the transportation planning practitioners, raised some concerns about issues and topics that needed to be addressed or expanded. Two of the state DOT representatives on the Panel also provided some additional written comments on their statewide transportation planning process to clarify and exemplify their efforts with statewide corridor planning.

On June 19, 2008, the research team met with the panel at the TRB offices in Washington. The research team made a presentation on the purpose of the project, efforts to date, the outreach to practitioners, issues and concerns raised by the practitioners and Panel members, and how these would be addressed in the final SWCP Guidebook. After the presentation, there was a lengthy discussion on some of those issues and concerns, and decisions were made on how to include and discuss them in the SWCP Guidebook.

Climate change was also raised by the Panel as a major issue that needed to be recognized in the SWCP process. Some of the other issues raised in the discussion with the Panel included fiscal constraint, public participation, project

purpose and need, involvement of public transit providers, corridor definition (and naming), involvement of local officials and stakeholders (especially in corridor analysis), prioritization among corridors and between modes, the use of common performance measures in corridor analysis for comparisons, financial options (including public-private partnerships, toll financing, and regional transportation funding authorities), and the advantages of a corridor-based statewide planning process.

The Panel agreed that the products of the research project would be published. The Panel also wanted the technical guidance to be the main focus of the SWCP Guidebook.

With decisions made on changes, additions, and format, and with the approval of the NCHRP Review Panel, the research team began preparation of a revised version of the SWCP Guidebook. This revised version of the Guidebook was submitted in mid-August 2008 for final review, with no further comments, and the final version was submitted in early December 2008.

A summary of the Guidebook is presented in Chapter 7 of this report.

CHAPTER 7 - STATEWIDE CORRIDOR PLANNING GUIDEBOOK

As indicated previously, the most important end product of this research project is a document published as NCHRP Report 635 entitled *Guidebook for Corridor-Based Statewide Transportation Planning*. This chapter presents a summary of this guidebook, including the organization of the guidebook, the technical guidance, and the application of the guidance using a hypothetical example. It also presents recommendations for future research on the SWCP process.

Purpose of the SWCP Guidebook

As discussed in Chapters 1 and 6, the primary intent of the guidebook is to describe a strategic approach for initiating a multimodal, corridor-based statewide transportation planning process and for applying the results of corridor planning studies and analyses in making decisions about future investments and strategies for transportation facilities and systems.

Organization of the SWCP Guidebook

The SWCP Guidebook is organized into five sections, plus six appendices to present additional information that may be of interest:

The first section presents the organization of the guidebook, some background for context, and purpose and an overview of the guidebook,

The second section offers reasons for undertaking SWCP and presents the conceptual planning framework for SWCP.

The third section provides technical guidance on the activities and actions that transportation planners can follow to develop a SWCP approach to statewide transportation planning. This includes a series of charts listing and describing the various steps in the SWCP process from the identification of corridors to applying the outcome of the SWCP analysis to a statewide investment program. These charts can be used as a checklist by state DOTs, MPOs, or other regional transportation planning agencies that may wish to develop a corridor-based systems-wide transportation planning process.

The fourth section illustrates the application of the various steps in the SWCP guidance by a hypothetical state DOT. This section shows how the "ideal" steps in the previous section might be adapted and applied in a "typical" state DOT environment.

The fifth and final section presents a list of references for practitioners.

Appendix A presents some real-life examples on how the steps in the SWCP process have been implemented by state DOTs and one MPO.

Appendix B and Appendix C present more detailed guidance on the levels of corridor analysis and analytical tools that can be used in the SWCP process.

Appendix D, Appendix E, and Appendix F present additional guidance on three topics: pubic transit, freight transportation, and economic development, respectively. These were identified as challenges by state DOTs through the surveys and case studies undertaken during the research project, as well as input received during the review of the SWCP Guidebook.

It is important to note that the guidebook does not provide detailed guidance on how to conduct transportation corridor planning studies or analysis since it is assumed that planning practitioners are familiar with methods for conducting corridor analysis. However, it does discuss different levels of analysis that might be done. The reader is also referred to other reports and technical guidance that have been produced on this particular topic. See, for example:

- Coogan, M.A. and M. Meyer, *NCHRP Report 404: Innovative Practices for Multimodal Transportation Planning for Freight and Passengers*. 1998; and
- TransCore, *NCHRP Report 435, Guidebook for Transportation Corridor Studies: A Process for Effective Decision-Making*. 1999.

Why Statewide Corridor Planning?

Chapter II of the SWCP Guidebook presents the advantages of the statewide corridor planning process. Based on state DOT input on the SWCP process and analysis of the research findings, the following potential benefits of a corridor-based statewide planning process have been identified.

- Provides a more direct connection between the movement of people and goods and state-significant economic activity;
- Provides the transportation agency with an ability to more closely examine the trade-offs among different modes;
- Provides a higher precision in monitoring the performance of transportation facilities and services;
- Permits a more complete investigation of non-transportation strategies for addressing transportation challenges;
- Provides a focus of multi-state efforts at improving transportation capabilities across boundaries;
- Promotes credibility and acceptance since corridor planning is familiar to planning agency partners; and
- Promotes greater engagement in planning by local officials and other stakeholders by allowing them to better relate to the issues being faced.

Statewide Corridor Planning Framework

The conceptual framework for the SWCP process and the SWCP Guidebook is discussed in detail in Chapter 6 of this report. As noted in that chapter, the three major phases of corridor-based statewide planning that go beyond a "basic" statewide transportation planning process are as follows:

1. Select and define corridors;

2. Analyze corridors; and
3. Use the findings and other statewide planning data and information to develop a long-range plan that includes investment and non-investment strategies.

The primary focus of the guidebook is on the first and last phases of the SWCP process.

This section of the guidebook also lists several challenges, posed as questions: some for the SWCP process and some that apply to statewide planning in general. These include:

- How can information generated from individual corridor analyses be consolidated to develop a comprehensive statewide investment program and action plan?
- How can broader state goals and policies be incorporated into the SWCP approach to provide consistency across all of the corridor studies?
- How does one provide consistency in planning goals and objectives when agency or political leadership changes?
- How can corridor and NEPA planning efforts be integrated into both the SWCP process and long-range plan updates?
- How can the relationship between SWCP and planning efforts by all appropriate agencies be coordinated, such as local governments, rural planning organizations (RPOs), metropolitan planning organizations (MPOs), transit agencies, tribal governments, and federal land management agencies?
- How can the SWCP process help stakeholders and decision-makers think in terms of corridors (which is somewhat conceptual) as opposed to focusing on individual projects?
- How does one make sure that the information and findings from individual corridor studies are consistent, replicable, and comparable?
- How does one distinguish between intrastate, interstate and international corridors?
- Assuming that all corridor studies do not start and end at the same time, how can an internally consistent and comprehensive statewide transportation plan be developed with incomplete information for some corridors?

Technical Guidance

The main section of the SWCP Guidebook presents technical guidance on each step in the multimodal SWCP process. This is presented in a matrix/table format that describes the steps to be taken and the reasons and issues for each of those steps. Briefly, these steps are divided into categories of actions. Following is a list of these categories and a summary of the steps in each category.

- Establish Organizing Principles and Institutional Structure
    - Establish process guidelines.
    - Utilize or adopt transportation goals.

    - Identify common data sources and analysis methods.
    - Identify policy or problem areas of statewide significance.
    - Create procedures for prioritizing projects.
- Establish Corridor Network
    - Develop criteria for corridor selection.
    - Analyze candidate corridors and select those of statewide significance.
    - Develop a statewide corridor database.
- Identify Study Corridors
    - Prioritize corridors previously selected.
    - Establish a corridor analysis strategy and schedule.
    - Coordinate roles and responsibilities with planning partners.
- Conduct Corridor Studies
    - Establish principles of study process.
    - Develop corridor vision and performance measures.
    - Identify problems.
    - Identify and alternatives and analyze impacts.
    - Evaluate projects and corridors using common criteria.
    - Develop project and corridor investment program.
- Identify Statewide Investment Program
    - Establish a process for using corridor information in statewide planning.
    - Monitor the ongoing SWCP process and adjust as needed.

Application of Technical Guidance

The SWCP Guidebook illustrates how the SWCP technical guidance can be applied to a state DOT for a hypothetical state of South Orange.

Information is given about the characteristics of the state and its transportation system. It then follows the actions and decisions of the state planning director through the steps in the technical guidance of the SWCP Guidebook. This includes major issues to be addressed, alternative strategies and projects, financial considerations, and the analysis and evaluation of the corridors, projects, and strategies.

Ultimately, it describes how the process is used to arrive at a long-range plan and programming strategy for future implementation.

Special Emphasis Areas

At the beginning of the research project, the NCHRP Review Panel identified a number of “special emphasis” areas to be considered as part of the statewide planning process, as follows:

- Comparisons between modes within corridors
- The eight Federal planning factors

- Land use
- Urban design
- Economic development
- Consistency with local or regional planning agencies
- Consistency with other planning by other state agencies
- Freight movement
- Public transportation
- Traffic operations
- Safety
- Linking NEPA and planning
- Environmental objectives and mitigation opportunities
- Coordination with local, state, and/or federal resource agencies
- Addressing different stakeholder priorities and interests
- MPO and non-metropolitan local official consultation
- Performance measures
- Institutional/organizational issues and procedures
- Innovative financing options
- Public/private partnerships

A literature review was done on most of these topics, and a question was included on the transportation agency survey forms to identify which were being emphasized at the time of the survey. A discussion of the survey findings is included in Appendix A of this report. As the SWCP research neared completion, the research team and the Review Panel agreed that special emphasis areas were not a primary focus of the research project. Therefore, the Guidebook and this report do not include detailed information on all of the special emphasis areas.

Within the past year, two other major special issues have grown in importance: climate change/greenhouse gases and the cost of fuel. Each of these is also acknowledged in the Guidebook and will need additional research regarding its relationship to the SWCP process.

State Examples

Appendix A of the SWCP Guidebook presents real-life examples of how some state DOTs and one MPO accomplished various steps described in the technical guidance for the SWCP process. More detailed discussions on these methods and "best practices" are included in the appendix of the guidebook.

Additional Guidance

Appendices B, C, D, E, and F of the SWCP Guidebook present additional guidance on some issues identified during the research project as challenges for some state DOTs. These issues include the level of corridor analysis that should be conducted, some SWCP analysis tools, the incorporation of public

transit into the process, and some methods of addressing freight transportation and economic development in the SWCP process.

Additional Research

There are many topics that may not be adequately covered in the SWCP Guidebook and which may require additional research. A compilation of future research needs for statewide transportation planning mirrors some of the "special emphasis" areas included in this chapter.

Certainly, a number of issues have already been addressed extensively and/or thoroughly elsewhere: for example, public involvement and the allocation of funds. Extensive research has also been done on some of the methodologies and tools, such as corridor planning and travel demand modeling.

However, there are still many challenges to state DOT planners in addressing some issues as part of the statewide transportation planning process. Among those are:

- Linking NEPA and planning;
- Environmental mitigation;
- Economic analysis;
- Freight transportation;
- Linking land use and transportation planning;
- Safety and security;
- Climate change and green house gases;
- Impacts of rising fuel costs;
- Trade-offs between transportation modes; and
- Forecasting of future federal and state transportation funding.

There are also research needs that apply only to statewide corridor planning. Some of these are discussed here:

- Trade-Offs: Perhaps the two most important issues are related to making trade-offs among corridors and making trade-offs among projects in different corridors. This includes how to balance statewide transportation needs with the needs and desires of the immediate area located within the travelshed of each corridor. Each of these two types of trade-offs includes the issue of how to make modal trade-offs, which would need to be addressed in a customized manner for statewide corridor planning.

  Because corridors serve multiple travel markets, conflicting needs inevitably arise, necessitating trade-offs and stakeholder consultation. Over time, for example, communities in corridors that once served long-distance traffic may grow and create competing local demands for the available capacity. Comprehensive land use planning, access management, and the addition of new capacity (such as bypasses), have been used to address these issues. The planning approach known as context sensitive solutions (CSS) has arisen over the past ten years as a

method for addressing these types of issues directly and effectively, while also considering potential community and environmental impacts.

At a minimum, however, the corridor-level statewide planning process provides a meaningful forum to air and balance the interests of the state in maintaining long-distance travel mobility with those of the community in maintaining livability and safety.

- Performance Measures: In part, the issue of trade-offs is related to the development of performance measures. There is already valuable information available on performance measures that could be used as part of an individual corridor study. However, for a corridor-based statewide planning process, some performance measures need to be relevant to all corridors, so that comparisons can be made more easily. This proposed research would also include how to apply those performance measures in the final evaluation, prioritization, and decision-making process.

- Analysis Methods and Data Requirements: Corridor analysis for statewide planning is another potential research topic: in particular, the development of an abbreviated methodology or tool that can provide sufficient data or information to make statewide planning level decisions. While state DOTs are familiar with corridor planning studies as the primary method for providing corridor level information, these are labor intensive and time-consuming; therefore, it is difficult to complete corridor studies within a suitable timeframe on all major corridors to provide information needed for long-range plan and TIP updates. Three different levels of data analysis are suggested in the SWCP Guidebook, including two methods that could produce results in a short period of time. However, more research is needed to better define the methodologies and the data analysis required for statewide corridor planning.

- Non-Investment Strategies: Another issue is the consideration of problem-solving strategies that require limited or no investment of funds. Many, if not most, planning documents seem to focus on investment strategies, either through capital projects or operating funds, to implement a project or program to address the problem. There may be other ways of addressing transportation problems, particularly at the corridor level, that could be considered as "non-investment" strategies. Two of the most obvious examples are legislative actions or land use planning and controls.

- Freight Transportation: Freight transportation was an issue frequently raised by DOTs and MPOs in this research project. All transportation agencies seem to know they need to do something to address freight transportation in long-range planning. However, they are less certain about what they should and can do, since freight movement is primarily a private sector responsibility. In particular, many want to know how to incorporate and adequately address non-highway freight modes into corridor analysis and corridor studies.

- Corridors and Resources: Another frequently raised issue was how a corridor-based process could give proper consideration to limits on the resources available for implementation. This research could be aimed at

identifying and addressing institutional funding constraints and, then, giving guidance on how this would affect statewide planning policies and recommendations.

- Multi-State Corridor Planning: The final proposed research issue is the incorporation of multi-state corridor planning into the statewide corridor planning process. Many of the major corridors within a state are segments of multi-state corridors, so any policies or improvement projects – or lack of improvements – in one state may also affect how that corridor should be addressed in other states. One interesting issue is whether funding from one state could or should be used to make an improvement in another state if that improvement would improve transportation service in the state that is providing the extra funds.

  At present, multi-state corridor planning initiatives are voluntary, and the use of the findings is also voluntary. Some research has been done on multi-state corridor planning, but there may be a need to better institutionalize such initiatives and better relate multi-state planning to a corridor-based statewide planning process.

These topics should be referred to the AASHTO Standing Committee on Planning for consideration as future NCHRP Research Projects.

CHAPTER 8 - DISSEMINATION OF STATEWIDE CORRIDOR PLANNING GUIDEBOOK FINDINGS AND GUIDANCE

The following implementation plan describes steps that can be taken for the dissemination of the research findings and framework and technical guidance that can be found in the SWCP Guidebook.

Publication of Documents

The fist major step is the publication of the documents. The SWCP Guidebook will be published as a separate National Cooperative Highway Research Program document. The published SWCP Guidebook will include this Research Report in an electronic file format on compact disc included in the back of the guidebook. An electronic version of the guidebook is also included on this CD for those who prefer to download it to their computer or server.

The reports should also be made available as web documents on the NCHRP web site.

Distribution of Documents

It is recommended that announcements should be sent by direct mail to planning officials and staff for state transportation planning agencies to inform them that the published documents are available. Announcements should also be sent by direct mail to members of the following:

- AASHTO Standing Committee on Planning (SCOP)
- Association of Metropolitan Planning Organizations (AMPO)
- American Planning Association (APA)
- American Public Transportation Association (APTA)
- American Consulting Engineers Council (ACEC)
- Institute of Transportation Engineers (ITE)
- National Association of Development Organizations (NADO)
- National Association of Regional Councils (NARC)

Meetings and Conferences

In the short term, announcements about the SWCP Guidebook should be distributed at Transportation Research Board meetings during the first year following the publication of the documents. This would include the annual meeting in January 2009 and the spring meeting in 2009. To provide more details on the SWCP guidance and to allow sufficient time for preparation, a formal presentation could be scheduled in 2009 before the TRB state planning committee on the SWCP research findings and technical guidance.

Information or announcements could also be distributed at meetings of the AASHTO Standing Committee on Planning during the year following completion of the documents.

Specialty meetings and/or conferences on statewide corridor planning could also be held, perhaps sponsored by a transportation organization such as AASHTO, the FHWA, a state transportation agency, or a university. Such meetings could have sessions to discuss various elements of the SWCP process, with participation and input from state DOTs and other interested parties to give examples of real-life experiences in applying SWCP principles.

Training

A number of training venues could be used to disseminate SWCP information. One of the most popular current methods is the "webinar." Webinars allow participants to receive training via internet access directly from their desk or office. These are attractive to practitioners in public agencies because training can be provided, perhaps in small doses over a longer time period, with no travel expenses involved.

Another possibility is to work with AASHTO or the FHWA to provide special workshops on statewide corridor planning issues and methods. These could be taken to different states or regions, based on the level of interest from specific areas. This would require special training materials, as well as trainers to be identified and developed to present the information.

Such training could also be piggybacked onto other meetings and conferences, such as the AASHTO SCOP meetings or TRB meetings.

Authorization of federal surface transportation legislation to replace SAFETEA-LU may identify funding for specific training opportunities to enhance integration of corridor planning into the statewide transportation planning process. If these training funds are authorized, implementation opportunities should be discussed with FHWA and AASHTO, and perhaps with AMPO and NADO.

APPENDIX A - LITERATURE REVIEW

A summary of literature found to have valuable information pertinent to this research study follows.

Corridor Planning

NCHRP Report 399, Multimodal Corridor and Capacity Analysis Manual. Cambridge Systematics, Transmode Consultants, Asil Gezen and ICF Kaiser Engineers, Inc. 1998.

Traffic volumes in many corridors throughout the United States are predicted to grow at substantial rates in the near future. Passenger and freight movements are expected to continue to increase in proportion to the demands for goods, services and mobility in both rural and urban areas. Transportation agencies, planners and analysts are concerned about providing sufficient capacity in many corridors to handle the projected future traffic. There is an urgent need to address capacity problems not only on highways but in other modes such as rail, waterway, and air. This first edition of the *Multimodal Corridor and Capacity Analysis Manual* provides a rather comprehensive framework and set of procedures for analyzing and characterizing the nature, extent, and severity of capacity problems in many transportation corridors.

The manual provides a comprehensive framework for dealing with capacity analysis, performance determination, needs and options identification, and alternatives evaluation for transportation corridors. The manual provides a summary and description of options that are available to enhance corridor capacity and performance by providing additional capacity, freeing up unused capacity or reducing travel demands.

Using the following 10 steps provides an easy yet useful way to analyze and find solutions to corridor capacity problems. However, the analyst must still be creative in seeking multiple potential solutions to overcome objections.

- Define the study area;
- Identify the type of corridor that best describes setting and problem;
- Identify the primary modes and the links that serve these modes;
- Determine person trip, vehicle trip and/or good movement demand for each link and node;
- Identify principal traffic generators/attractors that use the link and nodes;
- Determine the location, nature and extent of congestion and capacity problems including the time of day, duration and service levels;
- Examine trends in person trips and good movement growth;
- Identify constraints to capacity expansion;
- Develop an initial set of alternatives for dealing with the problem; and
- Provide written summary of problem so people outside of the study team can evaluate and add to the understanding of the problem.

The manual describes existing procedures to determine the capacity of various components of multimodal corridors in terms of volume of vehicles, carriers, passengers, or freight traffic and capacity measures can be computed for each component. The first step is to identify link and node. Links should be identified wherever possible so they pertain to a single mode of transportation. The second step is to develop component capacity analysis. Traditionally, highways, railroads, waterways, airways and ports have been treated differently and separately, and an overall approach to capacity analysis involving all modes does not appear to be practical. However, the manual provides some principles common to many types of capacity analysis that can be used to check for reasonableness of some mode and facility specific capacity calculations, but not used in lieu of procedures tailored to specific circumstances. The manual provides capacity analysis techniques pertinent to specific modes, facilities, and types of traffic, such as highways, rail transit, rail freight, air transportation, waterway transportation, pipeline transportation, Steps 1 and 2 describe how to break up corridors into individual components (links and nodes) to allow one to analyze any type of corridor. The manual also provides guidance on procedures for calculating the person and freight capacities of multimodal corridors.

Performance measures are used to evaluate the effectiveness of a transportation system and its individual components and it can be approached by a variety of perspectives. The manual identifies various measures of link/node/corridor performance and explains how they are related to capacity (supply) and traffic volume (demand). To explain the performance aspects of segments and nodes of a multimodal transportation corridor one must:

- Identify single mode or multimodal corridor performance measures;
- Stipulate the time periods;
- Identify constraints;
- Develop the capacity on each segment;
- Determine the flows on each segment for the identified time period;
- Calculate existing and/or future segment performance measures;
- Summarize performance for typical trips; and
- Identify locations where poor performance occurs.

The manual provides some qualitative and quantitative performance measures examples and provides a discussion of service frequency, travel time, travel comfort, travel time reliability, probability of loss and/or damage and cost. Although performance measures are useful as indicators of the performance of segments in a corridor, the ultimate use is in the evaluation process.

The manual provides a detailed discussion of identifying alternative actions for increasing capacity or improving the performance of a corridor by providing additional capacity, tapping unused or underutilized capacity, coordinating the movement of traffic, or influencing the demand for transportation services. On the demand side, some ways to alleviate congestion include:

- Limit or restrict use of mode or facility;
- Increase real cost;
- Provide incentives;
- Discourage travel during peak times;
- Provide information to users to make informed decisions; and
- Improve level of service of less congested facilities.

Supply side actions increase the physical capacity of a facility and to distinguish between demand and supply actions, v/c ratios are considered. Supply side actions can range from minor and low-cost improvements to large capital outlays. Technology, such as high speed trains, vehicle guidance and navigation aids, adaptive traffic control devices, and automated toll collection play a vital role in enhancing the supply of corridor capacity.

The manual provides examples under each of the following categories to improve highway capacity using:

- Highway improvements;
- Traffic engineering improvements;
- Traffic management and control system improvements;
- Priority treatment for HOV;
- Corridor parking facilities;
- Transit service improvements;
- Transit fare changes;
- Rideshare programs;
- Variable work hours;
- Telecommunications;
- ITS technologies;
- Corridor preservation; and
- Truck traffic management.

The manual provides examples under each of the following categories to improve rail capacity for:

- Urban passenger rail;
- Intercity passenger rail; and
- Intercity freight rail.

The manual provides examples under each of the following categories to improve air transport capacity for:

- Infrastructure options;
- Demand management options; and
- Advanced vehicle and control system technology.

The manual provides examples under each of the following categories to improve waterway transport capacity for:

- Infrastructure;
- Land use regulation; and
- Terminal operations.

The manual describes methods of assessing the cost and effectiveness of demand-side capacity enhancement actions to provide quantitative and qualitative evaluation. To complete this type of analysis, it is necessary to determine the factors affecting the demand for both the short-term and long-term future. The manual provides the following steps to evaluate demand management options:

- Identify where demand management strategies can be most effective;
- Identify demand management options;
- Identify the type of travel related choice;
- Determine the factors or attributes of choices;
- Predict future demand;
- Apply incremental analysis;
- Assess the change in performance;
- Identify the type and estimate the magnitude of induced demand; and
- Assess the cost and benefits

The manual notes that economic criteria, rather than physical constraints, often determine capacity. Only recently have public agencies found that economics is increasingly driving project selection. The manual provides a method for determining the economic capacity of segments, nodes, and other elements of multimodal corridors. Steps in the process include:

- Determine total cost;
- Determine total benefits;
- Maximize net benefits;
- Compare economic capacity with physical capacity; and
- Determine economic capacities under budget constraints.

The Highway Capacity Manual has been the most widely used reference of work, but it only concentrates on the supply side. The manual provides techniques to address corridor capacity problems, particularly where multimodal and intermodal solutions can play an important role.

<u>Key Findings for Multimodal Corridor Capacity Analysis</u>

- The types of corridors and the range of potential solutions are so broad that simple answers are insufficient.
- Analysts must be creative in seeking multiple potential solutions to overcome objections.
- Practitioners need a toolkit that can be used to evaluate a wide range of capacity problems involving all the principal person and freight transport modes.

- The toolkit needs to address both supply side and demand side solutions.

NCHRP Report 404, Innovative Practices for Multimodal Transportation Planning for Freight and Passengers. Coogan, M.A. and M. Meyer. 1998.

This report contains a compilation of successful and innovative multimodal planning practices currently employed in a variety of settings, for both freight and passenger transportation. Through 19 case studies, the report documents recent (1998) practices at nine state departments of transportation, five metropolitan planning organizations, and one airport (Logan International Airport, Boston, MA) involving both passenger and freight transportation.

The research provides guidance on the importance organizational structure and institutional relationships at State DOTs and MPOs in promoting integrated multimodal transportation planning. The focus is on innovative practices at the state and regional levels. The study noted that the most innovative procedures were developed in response to a need to solve a policy problem defined by forces outside the traditional planning community. The study noted that multimodal planning is best carried out when all modes are analyzed simultaneously and interactions among the modes are accounted for; multimodal practices are most needed when applied to planning that is driven by policy needs, rather than the analysis of facilities; and it is valuable from a methodological point of view to organize the basic data in terms of characteristics and needs of a person or thing need the transportation.

The report examines the question of how to reasonably measure the performance of the transportation system relative to specific policy concerns. The report notes that measurements must be linked to outcomes; single mode-based measures are not always the most useful; and definitions of performance measurement vary.

This report examines innovative public involvement practices that have potential application in other state or metropolitan areas. The report notes that early efforts to involve the public in the planning process are important to the credibility and acceptance of the plan; continual public involvement in implementation of the plan's proposals increases the likelihood of planning moving from paper to structure and services; and using several different methods and venues for engaging the public increases the chances of involving the typically "uninvolved". The study noted that public participation can be an effective tool in better understanding the needs of users or potential users of transportation, and in that context, it is a very important contribution to the multimodal planning process.

The report examines approaches to multimodal planning in rural areas. The report notes that involving local elected officials from the beginning is an important factor in building credibility in the planning process. State policy guidance is welcomed by local officials in rural areas where experience with

transportation planning is limited or nonexistent; policy guidance and information are critical factors affecting multimodal considerations; and techniques are needed to resolve concerns about equity between rural and urban interests in statewide planning processes. It is evident that rural areas want more policy guidance, multimodal information and access to technical expertise. One of the main issues is the availability of non-highway data in rural areas. The lack of data may impede consideration of multimodal solutions.

The report examines the effects of financial constraints on multimodal planning and programming. The report notes that financial constraint requires decision makers to consider investment decisions more carefully. A financially constrained program requires more debate and careful consideration during the planning process, which resulted in states and MPOs developing ways to prioritize projects. Financial constraint also discourages the "wish list" approach to transportation planning. Financial constraint increased the pressure to identify sources of funding that are not restricted to any one mode. When financial constraint is applied late in the planning process, plans are developed without regard for the restrictions, as a result the planning process can explore alternatives to meeting transportation needs regardless of mode. Financial constraint focuses more attention on the lack of funding for non-highway projects and encourages efforts to identify innovative or private sources of funding.

Key Findings for Statewide Corridor Planning

- Analyze all modes simultaneously.
- Account for interactions among the modes.
- Address policy issues for multimodal transportation, not just facility needs.
- Organize basic data in terms of characteristics of persons or things.
- Link performance measures to outcomes.
- Engage public in the planning process to ensure credibility and acceptance of the plan.
- Engage local elected officials from the beginning of the planning process.
- Resolve concerns about equity between rural and urban interests in statewide planning processes.

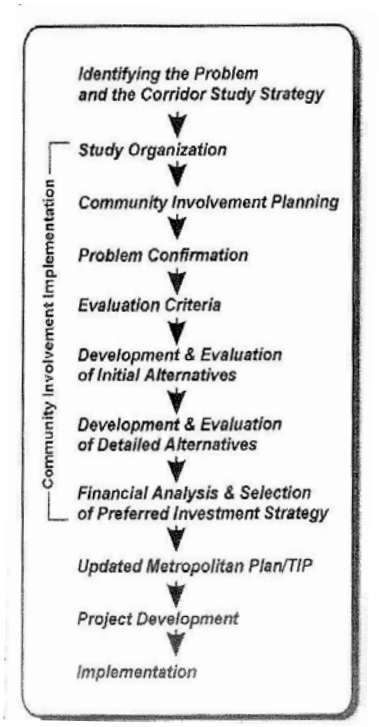
NCHRP Report 435, Guidebook for Transportation Corridor Studies: A Process for Effective Decision-Making. TransCore. 1999.

This report is designed to describe systematic, effective study procedures used in the corridor planning process to facilitate good transportation decisions. Throughout the guide, an emphasis is place on decision-making. Discrete elements of the planning process (e.g. public participation, alternatives evaluation, etc.) are presented as a means to gather insight necessary to define decisions which are:

1. Effective in addressing identified problems,
2. Consistent with regional goals,

3. Cost effective,
4. Well-informed and collaborative,
5. Sensitive to community concerns,
6. Implementable, and,
7. Durable.

Inherent differences between corridors mean that no "one-size-fits-all" approach can be applied to all corridors, but general principles and "lessons learned" may provide useful information.



The study process is divided into 11 steps, which are shown in the figure at the right. There is an emphasis on integrating planning and later project development phases, including NEPA documentation, to streamline the decision-making process. Establishing a work plan early in the process to define study objectives, schedule and budget, public involvement details, and decisions which will be required is essential. Collaboration with stakeholders, the public, elected officials, advisory committees, the media, and resource agencies is important to make informed decisions that can stand the test of time; a variety of techniques for working with these groups are presented in the text.

After the existing and anticipated problems in a project area are defined, measurable evaluation criteria should be established based on these issues. Numeric ranking systems may be used for evaluation, but THAT should only be one consideration: decision-makers should be given flexibility to weigh criteria in their own minds. Requiring evaluation of select criteria at a regional level will assist in comparing multiple corridor studies against one another. Evaluation criteria and level of detail should be carefully considered to ensure that breadth of information does not distract from key issues and that the audience can understand the important points.

Defined alternatives should:

- Relate to the identified study needs;
- Represent the spectrum of choices and tradeoffs;
- Be developed through a collaborative process;
- Be reasonable; and
- Be competitive within the established alternative objectives.

Studies may result in single recommended alternatives or a set of reasonable strategies to bring forward to later NEPA analysis. Collaboration helps when

defending decisions based on alternatives evaluations. This guidebook presents a selection of evaluation methodologies and tips for traffic forecasting, land use analyses, environmental analyses, costing, and economic analyses.

Key Findings for Developing Performance-Based Transportation Planning

- Planning, NEPA analyses, and project development phases should be considered as an integrated process for effective decision-making.
- To be effective, the technical and political processes must work together.
- Even though a win-win scenarios is not often possible, a win-win solution should at least be the goal in every transportation planning effort.
- The best defense against unnecessary revisiting of decisions is good planning and consensus building.
- Study participants must understand HOW evaluation criteria will be used, not just WHICH criteria will be used.

Bluegrass Corridor Management Planning Handbook. Glatting Jackson Kercher Anglin Lopez Rinehart, Inc. for Bluegrass Tomorrow. 2000.

This handbook was undertaken as a cooperative effort between the Kentucky Transportation Cabinet (KYTC) and Bluegrass Tomorrow, a regional coalition of business, farming, development and preservation interests dedicated to promoting coordinated growth and preservation planning for the seven-county central Bluegrass region of Kentucky. The purpose of the handbook was to serve "as a guide for local community leaders, planners, and transportation officials for the development of corridor plans that are comprehensive and responsive to community values and the Kentucky heritage." The project had extensive involvement from a Technical Advisory Committee that included representatives from KYTC, Bluegrass Tomorrow, local universities, landowners, planning commissions, Bluegrass Area Development District, Bluegrass Conservancy, local governments, utilities, Kentucky Heritage Council, visitor bureau, chamber of commerce, National Park Service, Greenspace Commission, and private citizens.

The Handbook focused on the following:

- Getting organized;
- Involving stakeholders and the public, including a Corridor Advisory Group;
- Data collection and establishing context;
- Developing vision choices;
- Evaluating choices;
- Selecting a preferred vision, master plan, and action plan;
- Establishing partnerships for implementation; and
- Sustaining the vision.

The chapters in the Handbook give a detailed approach for each of the steps listed above. Appendix A includes some gives some guiding principles on how to

coordinate transportation, land use, and design. Appendix B includes sample materials for public outreach and input. Appendix C includes sample regulations on access management and land development. Appendix D presents a glossary of terms, and Appendix E lists some additional references and resources.

Key Findings for Statewide Corridor Planning

- There is a strong emphasis on involving stakeholders and the public, especially the creation of a Corridor Advisory Group to be involved and take ownership of the process and its outcome.
- It is important to gather data and information about the corridor in order to establish the corridor context.

2030 Statewide Transportation Plan – Corridor Visions Technical Report. Colorado DOT. 2005.

The Colorado statewide transportation plan is a recently developed corridor-based plan. Begun in 2003, the Corridor Visions concept allows CDOT to partner with 15 planning regions across the state to define a direction for the future of transportation in Colorado based on community values, travel characteristics, and accountability.

CODOT defines a corridor as "a transportation system that includes all modes and facilities within a described geographic area having length and width." The vision for each of these corridors includes four elements:

1. A primary investment category – one of three basic areas of improvement (mobility, safety, or system preservation) on which to focus and to guide funding direction;
2. Community values – concerns determined by residents of each region which relate specifically to their portion of the system;
3. Primary type of travel – characteristic description of the main type of system user which will help define corridor needs; and
4. Goals, objectives, and strategies supporting the vision statement.

Examples of different corridor visions are provided in the document. Strategies varied along routes as the infrastructure passed between planning regions, but adjacent goals were coordinated to avoid contradictory visions.

A toolkit is included in the appendix for developing corridor visions in other communities.

Key Findings for Statewide Corridor Planning

- A description of the Colorado corridor planning process is provided in great detail. Generally, this includes identifying a primary investment category, identifying community values affecting quality of life, identifying

the primary travel demographic served by the corridor, and identifying specific goals to meet the needs of the corridor.

Statewide Planning

Multimodal Statewide Transportation Planning: A Survey of State Practices. Miller, John S. 2005.

Within the structure of state government, some amount of transportation planning is usually performed within separate modal administrations, which may include aviation, bus, highway, ports, and rail, as well as separate toll agencies. Some states coordinate these planning efforts through a single office responsible for statewide multimodal planning while other states work to achieve such coordination by using a decentralized approach. To determine if the value to centralizing statewide multimodal planning efforts in a single office, representatives from 41 of 50 states responded to a survey on the utility of centralized versus decentralized multimodal statewide planning.

Six advantages of a centralized approach to multimodal planning included:

- Consistency of plans;
- Coordination of modes given that modal staff are in the same office;
- Unbiased study of the entire transportation network;
- Greater emphasis on smaller modes (occurs by aggregating them);
- Better training and development for planners (by exposing them to multiple modes); and
- Guarantee that planning will not be forgotten.

Three advantages for decentralization included:

- Garnering modal support is easier if the same agency developing a long-range plan implements it in the short term;
- Modal expertise is more accessible; and
- Planning resources may be devoted to the most critical mode and this approach might be preferable if multimodal authority does not exist.

States mentioned several practices that merit further exploration, including:

- Using a statewide multimodal planning office to provide technical assistance to other modes;
- Using a centralized office to consider NEPA processes earlier in the planning process, thereby possibly accelerating the pace with which projects may be performed;
- Testing alternatives through modeling or other analysis; and
- Coordinating modal investments and land development activities.

Key Findings for Statewide Multimodal Transportation Planning

- States rated themselves on average as being more centralized than decentralized.
- The decision to centralize statewide multimodal long-range planning in one unit or to have it decentralized in the different modal units may have limited influence on how statewide multimodal planning is accomplished because of external factors. The most pressing of these appears to be federal or state regulations or processes that tie some funding pots to specific modes.

Survey of Statewide Multimodal Transportation Planning Practices. Fontaine, M.D. and Miller, J.S. 2002.

This study identified states thought to excel in multimodal planning, documented their best practices, and recommended areas for further exploration. Two key reports published under the TRB's NCHRP program and telephone interviews of representatives from Florida, Maine, Maryland, Michigan, Minnesota, New Jersey, North Carolina, Oregon, and Wisconsin revealed a wide range of techniques to improve multimodal planning. The techniques can be grouped into three categories: (1) organization of the state departments of transportation (DOTs), (2) innovations in multimodal practices, and (3) public outreach efforts.

In terms of state DOT organization, the states emphasize cooperation and the sharing of modal-specific information, even though some states concentrate planning in one office and other states give planning authority to each mode. Innovations in multimodal practices include modally blind performance measures and partnerships among state DOTs and metropolitan planning organizations. In terms of public outreach, tactics to broaden the stakeholder base include the provision of 800 numbers for comments; freight advisory committees; community impact workshop assessments to train staff; and charrettes, which are goal-oriented, facilitated workshops that help produce consensus-based direction or targets for studies.

Many of the agencies surveyed changed their organizational structure to incorporate multimodal planning into their everyday activities. They adapted to multimodal planning in a variety of ways, including:

- Creating new offices to handle planning for passengers and freight (Maine)
- Using strong modal units within the DOT as advocacy groups (Maryland, Washington)
- Grouping modal units into one division to facilitate interaction (Minnesota)
- Delegating planning activities to districts (Oregon, Washington)
- Creating new divisions to deal with urban areas (Minnesota, Washington).

The states used a number of innovative planning techniques to consider alternative modes in the planning process including:

- Modeling of freight traffic (Florida, Wisconsin)
- Performance-based planning (Florida, Maryland, Minnesota, Oregon)
- Intermodal management systems (Michigan, Oregon)
- Context-sensitive design/solutions (New Jersey)
- Better delineation of planning responsibilities (North Carolina).

In many cases, ongoing relationships were established with interested parties, rather than only a series of public meetings being held. Some of the techniques developed to improve outreach include:

- Facilitated meetings (Florida)
- E-mail notifications (Florida)
- Websites (Florida)
- 800 numbers (Florida)
- Creation of rural/regional transportation planning committees (Maine, North Carolina, Oregon)
- Statewide transportation advisory boards (Maine, Oregon)
- Charrettes (New Jersey)
- Improved staff training (North Carolina, Oregon)
- Freight Advisory Committee (Florida, Minnesota, Oregon).

Key Findings for Statewide Multimodal Transportation Planning

- There is no single way to accommodate multimodal planning with the DOT.
- A strong commitment from DOT leadership to institutionalizing multimodal issues within the DOT existed in all of the states surveyed.
- The innovative planning techniques moved the planning process to a more modally blind procedure.
- The innovative planning techniques helped in assessing the needs of the traveler or commodity using the transportation system and in determining how best to accommodate these needs.
- The creation of standing advisory committees was successful in most states.
- Regular stakeholder meetings made it is easier for the DOT to seek input from local stakeholder on a consistent basis.

NCHRP Synthesis of Highway Practice 286, Multimodal Aspects of Statewide Transportation Planning. Henry L. Peyrebrune. 2000.

This synthesis report provides information for practitioners interested in the results of attempts to apply multimodal considerations at the statewide level and identifies key research findings. It covers post-ISTEA (Intermodal Surface Transportation Efficiency Act of 1991) processes and projects and both passenger and freight activities. The report examines the application of three multimodal aspects: alternatives, modal mix, and integration into three statewide planning functions, which include state planning, corridor studies, and financing,

budgeting, and programming. The emphasis is on implementation. This report of the Transportation Research Board documents processes and research currently under development, using three approaches: a literature review, results of a survey of state DOTs, and five case studies. It cites the following states with exemplary practices in multimodal/intermodal transportation based on a 1998 report by the policy research project at the University of Texas on Multimodal/Intermodal Transportation: Florida, Minnesota, Oregon, Pennsylvania, Virginia, Washington, and Wisconsin.

The synthesis organized statewide planning activities into three categories:

- Statewide Transportation Plan, Including Strategic and Policy Planning;
- Corridor Planning Studies; and
- Statewide Financing, Budgeting and Programming.

Additionally, the statewide planning process was considered multimodal if it included one of the following:

- Consideration of modal alternatives – starts with a broad set of goals and objectives and analyzes different modes or combinations of modes for meeting the objectives;
- Modal mix – considers the appropriate role of each modal alternative with the process and the development of the most appropriate mix of modes to meet the objectives;
- Modal integration and connection – considers a trip from the origin to the ultimate destination that involves several modes and the effective integration of the modes.

A survey was developed and sent to all state DOTs. The survey established the setting in each state for consideration of multimodal aspects, asked if the three multimodal aspects were being used in their statewide processes, and asked other questions relevant to consideration of multimodal aspects. The purpose of the survey was, first, to document the state of the practice and provide preliminary answers to some questions; and, second, to identify potential case studies that would provide more detailed information. Thirty-eight states responded:

- Overwhelmingly, the majority of states consider multimodal aspects in their state transportation plans.
- All states reports that they consider alternatives in corridor planning
- Two-thirds of the states reported that statewide multimodal plans have affected programming and budgeting decisions.
- One-third of the states noted that lack of adequate recourse impeded implementing multimodal projects.

<u>Key Findings for Statewide Corridor Planning</u>

- The consideration of multimodal aspects is a policy decision.

- Successful multimodal planning processes operate best under some higher state or regional vision.
- To increase effectiveness, the consideration of multimodal aspects could be institutionalized throughout the agency.
- The impediments to effective multimodal planning are funding restrictions, organization and institutional fragmentation, and the lack of technical tools.
- The initial step for the successful consideration of multimodal aspects is the creation of a dialogue with the customers and stakeholders of the transportation system

***Statewide Transportation Planning: Sixth Conference on Refocusing Statewide Transportation Planning for the 21st Century, Girdwood, Alaska, July 21-24, 1999*, Transportation Research E-Circular E-C015.**
TRB Committee on Statewide Multimodal Transportation Planning. 2000.

Following the passage of the ISTEA reauthorization, the *Transportation Equity Act for the 21st Century* (TEA-21), in 1998, the 6th Conference on Refocusing Statewide Transportation Planning for the 21st Century was held from July 21 through 24, 1999, in Girdwood, Alaska. Since TEA-21 kept in place most of the basic statewide planning requirements, the focus of the conference was on the state of the practice of statewide planning and preparing to meet the challenges of the 21st century. More than 90 people attended the conference, with over 30 states represented. The conference brought together a mix of state planning officials, representatives from the federal transportation agencies, and members from the private sector, academia, national organizations, and local planning organizations in an interactive dialog on current and future issues in statewide transportation planning.

The issues, conclusions, and research needs emerging from this sixth Conference on Refocusing Statewide Transportation Planning for the 21st Century reflect the broad agenda for transportation in this country since statewide planning in most DOTs encompass more and more issues and processes.

The need for leadership from statewide planning in leading change within the DOT is vital. The conference dealt with many of the issues that require change within the DOT, including:

- Environmental streamlining;
- Transportation's role in smart growth initiatives;
- Integrating state planning with systems management and operations;
- Involving all stakeholders in the process at all the different levels of planning;
- Globalization of transportation, especially in the freight area;
- Changes in demographics and lifestyles that affect transportation; and
- Additional areas of concern regarding the equity impacts of transportation programs and projects.

Another issue discussed during the conference was that planning will be involved in politics. Many of the presentations talked about openly engaging those individuals responsible for making and influencing decisions in the political arena in a dialogue or planning process dealing with the role of transportation in the larger context of land use, economic development, and social equity. The results reported at the conference revealed several instances where state, local, and private sector stakeholders became aware of the transportation issues and actually recognized the importance of state transportation systems. In some cases this resulted in set-asides for statewide projects.

The need for changing skill sets and for training not only DOT employees but also employees of other agencies whose actions affect transportation projects is still a top priority and was reinforced throughout the conference, particularly as recommendations coming out of the various workshop sessions. The conference also heard from heads of several state DOTs, federal agencies, and national organizations. Their issues of concern for statewide planning included:

- Environmental streamlining;
- Transportation and smart growth;
- Globalization impacts on transportation;
- Expanding transportation planning into rural areas; and
- Changing demographics and life-style impacts on transportation.

Planning is moving from focusing on facilities to dealing with policy issues, system management and preservation, system operations, system performance, customer needs and issues, financial and fiscal\ constraints, and the role of transportation in broader societal goals such as economy, efficiency, environment, and livability. Future challenges include:

- Land-Use Considerations in Statewide Planning
- Environmental Integration with the Planning Process
- Performance-Based Planning
- Asset Management in Statewide Planning
- Goods Movement and Intermodal Issues
- Safety Issues in Statewide Planning
- Planning at Many Different Levels
- Integration of Management and Operations into Statewide Planning
- Incorporating Environmental Justice and Related Issues into Statewide Planning
- Technical Issues in Statewide Planning
- Organization Implications for State DOTs
- Institutional Issues
- Staying on Top of the Changing Technology
- Measuring the Impact of Changing Demographics

Key Findings for Statewide Corridor Planning

- Planning is moving from focusing on facilities to dealing with policy issues, system management and preservation, system operations, system performance, customer needs and issues, financial and fiscal\ constraints, and the role of transportation in broader societal goals such as economy, efficiency, environment, and livability.
- Make state, local, and private sector stakeholders aware of the importance of state transportation issues since planning is becoming more political.

Transportation Research Circular Number E-C091, Innovations in Statewide Planning. Rhonda Young, University of Wyoming. 2006.

This document presents a summary of presentations on innovative practices in statewide planning. Specific cases are listed below. Overall, the key issues that appeared repeatedly during the conference were political cycle time incompatibility with long-term planning, debate over whether project-based or policy-based plans best meet state needs, and funding limitations.

Innovative state practices related to corridor planning or performance evaluation:

- Louisiana has started using their statewide model to update their statewide plan. This provides a quantitative measure to evaluate corridor-level upgrade funding priorities, providing hard facts (more or less) to offset public and political preferences. They put a lot of emphasis on public involvement in updating the plan, even though using the model reduces the significance of public input.
- Wyoming's corridor planning approach places a large weight on NEPA elements coupled with public involvement. (Their public policy is included in the appendix.) They also go into their enterprise resource planning/asset management process, "WY@ERP".
- In Arizona, planners are using statewide corridor profiles to develop the LRP for the entire state highway system, dividing the state into 12 regions. Modified HERS-ST software serves as the analytical platform to identify and bundle regional projects. These are judged by safety, cost effectiveness, etc. factors to evaluate funding priorities for specific projects. This is not formally integrated with MPO planning activities yet.
- Caltrans is developing a statewide performance measuring standard to be used by all regional agencies. They hope to get a consistent snapshot of system performance and to be able to tell which investments are paying off.
- KYTC is creating a project scoring system to prioritize future investments. They have a standard project ID form and are creating a program to sort through the data and weigh benefit/costs.
- The North Carolina statewide plan has recently been revised to consider mode-neutral need assessment. It is a three-tier system known as

NCMIN; tiers include long-distance/high demand trips, regional commuter routes, and local access system components.
- Virginia has created a multimodal office dedicated to planning. They are also following the NCMIN model to rank project priorities.
- Washington has created a transit office to encourage other forms of transportation and to eliminate redundancies between regional service provider jurisdictions.

Key Findings for Developing Performance-Based Transportation Planning

- There is a lot of variation between state planning approaches, reflecting the diversity of needs between states.
- Different case studies are briefly presented which measure and evaluate performance in different ways.

Transportation Research E-Circular E-C062, *Addressing Fiscal Constraint and Congestion Issues In State Transportation Planning*. Hendren, Patricia. 2004.

This report documents the three segments of the 2002 Statewide Multimodal Transportation Planning Peer Exchange. In the first section, "Identification of Key Issues Facing Statewide Transportation Planning," the key issues facing state transportation planning raised during the informal discussion are summarized. Written lists of key issues submitted by the Maryland and Florida Departments of Transportation (DOTs) are included. The next section, "Fiscal Constraint and Financial Planning Issues," presents state DOT answers to fiscal constraint and financial planning questions, a summary of the written responses and a description of additional items raised during the discussion. The final section, "Addressing Congestion in State Transportation Plans," contains state DOT answers to the questions related to congestion, as well as a summary of the written responses, synopses of the five presentations, recapitulation of the discussion, and identified conclusion and research items. Appendices contain a list of participants and supporting documents.

Each state DOT representative was asked to answer the following questions prior to attending the peer exchange and the report documents their responses:

- How do you address financial planning in your statewide planning process?
- How does your statewide plan document financial planning issues?
- How do you demonstrate fiscal constraint in your STIP?
- How does the current fiscal/economic environment play into your long-range statewide planning and programming processes?
- What, if any, performance measures that you may use have a financial basis?

One potential barrier to addressing cost overruns is that FHWA will not grant National Environmental Policy Act of 1969 (NEPA) approval until a state DOT has identified funds within a fiscally constrained plan. A catch-22 exists: states need funding to develop accurate estimates but in order to receive funding the state must show the project fits into their fiscally constrained plan. A potential solution is to designate federal funds for preliminary engineering and NEPA requirement in the TIPs.

Revenue distribution and geographic equity are important issues that are difficult to tackle in the statewide planning process. The peer exchange participants shared the following approaches to revenue distribution in their state:

- Maryland revenue distribution is formula driven.
- California distributes 60% of funds to local agencies and 40% to Caltrans.
- Massachusetts recently developed distribution formulas through a collaborative effort.
- Michigan first distributes preservation dollars and then allocates remaining funds for congestion projects typically selected through a political process.
- Wisconsin allocates preservation dollars based on criteria (e.g., VMT and pavement condition), but major projects are prioritized by the transportation projects commission.
- Florida has passed numerous statutes to guide the distribution of revenues down to the district level (e.g., 50% of all funds earmarked for highway improvements are designated for intrastate segments and 15% of all state revenue are allocated to transit). As much as possible, the revenue is spent in the county where it was collected.

Most participants felt that preservation distribution formulas are easier to implement than congestion formulas and can be based on available data. In addition, capacity projects are typically very political. Finally, no single distribution approach exists that will be considered fair and equitable to all constituents.

To learn more about how states are addressing congestion in their STPs, each participant was asked to answer the following questions:

- How does your statewide plan address congestion?
    - Discusses how transportation and land use planning can address congestion.
    - Explores causes of congestion and offers policies/strategies to address congestion
    - Monitors capacity needs based on roadway operations and citizen input.
    - Congestion is incorporated as one of the performance measures.
    - Congestion is included, but is viewed as a location specific issue
    - Congestion is discussed, but it is not location or project specific.

    - Congestion is addressed through operation and capital enhancement strategies.
    - Capacity analysis is completed on the State Truck Highway system
- What performance measures are used to describe the congestion problem and the effect of congestion-related projects?
    - LOS and delay
    - Travel time, reliability and accessibility
    - System condition, accessibility, mobility, safety, LOS
    - Performance measure not currently used but are under development
- How does your plan address funding and implementing congestion-related projects?
    - Advocates the flexibility of transportation revenue expenditures
    - Recommends increasing the weight congestion reduction has in project evaluation
    - Based on needs and formulas
    - Projects focus on corridors of highest significance
    - Implementation and funding occur in the district planning process
    - Project specific issues are not dealt with in the statewide plan
    - Serves as a guide as to which projects are recommended for study and funding
- What is the relationship between capital and operations approaches to congestion in your plan?
    - Both are encouraged
    - Lower capital operational improvements are considered before considering high cost improvements.
    - An operational approach is considered before capacity in addressing capacity issues
    - Relationship is not addressed in the plan
- What intergovernmental relations issues is your state facing related to congestion? (city/suburb, urban/rural, state/MPO; etc.)
    - Better coordination between decision makers is needed
    - Equity issues are vital, rural vs. urban projects.
- What land use issues do you face related to congestion plans?
    - Land use is under the jurisdiction of local government.
    - It is not always clear who is responsible for mitigating land use impacts on the transportation system
    - Limited coordination exists between local agencies.
    - Access management is used to increase knowledge and cooperation between local governments.

While responses were similar for some of the questions, most of the approaches differ state by state suggesting that there is no one way to address congestion at a statewide level.

Key Findings for State Fiscal Constraints and Congestion Issues

- Transportation planning must exist in the push-pull environment of politics and the support of elected officials can help propel an important project forward.
- The current economic climate (2002) has created more uncertainty in revenue availability for state DOTs.
- Traditional transportation funding sources cannot produce sufficient revenue to meet the transportation needs of the next 20 years.
- A key problem with maintaining fiscal constraint is project cost estimation overruns.
- Land us is under local control and coordination between agencies is vital to they are linked.

TRB Circular #471, Statewide Transportation Planning. Committee on Statewide Multimodal Transportation Planning. 1997.

This document is a summary of an AASHTO conference held in 1997 which focused on the reauthorization of ISTEA. The main points of their discussion included:

- ISTEA is a good concept but needs fine tuning;
- Planning should lead to programming, regardless of organization;
- Public/stakeholder involvement is critical;
- Planners must find a way to measure performance;
- An effort should be made to incorporate operations into planning;
- Plans should anticipate freight needs in the future; and
- One goal of the process to find a good software which can manage data, track performance, and measure the results.

The first page or two provides a summary of the first few years of transportation planning under ISTEA, followed by a discussion of the points listed above. This is followed by the transcripts of the conference speakers. In brief, they discussed:

- The importance of transportation accountability, achieved through performance measurements. Florida and Washington were cited as having good programs.
- There are different analytical tools and approaches being developed. Defining goals and specific needs is an important step in making a plan. Washington requires local and regional plans in addition to the state plan and places a separate emphasis on freight. North Carolina made its first statewide plan in 1910, followed by urban planning in '59, 3C planning in the 1960s, and multimodal planning in the '70s. In 1990, North Carolina began a "corridor preservation pilot program" which was just wrapping up at the time of the presentation.
- Because of the scarcity of financial resources, operations should be consulted throughout the planning process. Ocean shipping is discussed,

with goals to improve efficiency and intermodal connection facilities through better planning and performance monitoring.

Key Findings for Developing Performance-Based Transportation Planning

- The planning process should be strongly linked to programming.
- Performance measures should be based upon outcomes (e.g. results like improved safety) instead of outputs (e.g. numerical measures like miles paved)
- Partnerships with outside/private agencies and public organizations are essential
- Operations staff will provide important insight into planning for efficiency and safety.

***Statewide Multimodal Transportation Planning Proceedings: 2004 Peer Exchange*, Transportation Research E-Circular E-C082**. AASHTO/FHWA. 2005.

TRB Transportation Research Circular E-C082, Statewide Multimodal Transportation Planning Proceedings: 2004 Peer Exchange focuses on cost estimating for transportation planning and incorporating safety into the transportation planning process. The report provides an overview of the presentation and roundtable discussions that took place during the peer exchange on July 27-28, 2004, in Park City, Utah. The report also includes responses to questions on statewide multimodal transportation planning from state departments of transportation and metropolitan planning organizations.

The first set of questions provided to the participants related to cost estimating.

- What are the major issues you are facing regarding planning or programming cost estimates?
- Describe policies, procedures, techniques, and standards used in preparing planning and programming conceptual estimates. If these policies, procedures, techniques, and standards are documented (written), please provide a copy or a website location where we can obtain a copy.
- How do you ensure that conceptual estimates reflect all elements of project scope (e.g., related to design, construction administration, construction, right-of-way, environment, etc.) as defined at the time conceptual estimates are prepared?
- What types of historical data do you use as a basis for preparing conceptual estimates? How are these data adjusted for time (schedule), location, and other project specific conditions?
- How are contingency amounts incorporated into the estimate? Are contingency amounts based on total estimated cost, identified project risks, or some other variable?

Key Findings related to Statewide Cost Estimating

- Because NEPA is not cost constrained, and design engineers want to build projects, promises are often made that are not reasonable to get the project approved.
- Projects that have an Environmental Assessment (EA) or Environmental Impact Statement (EIS) tend to have high cost increase risks. Categorical Exclusion projects tend to have low cost risk and variability.
- Michigan DOT has found that routine projects that are funded in 5-year increments (e.g., pavement overlays, bridge maintenance, etc.) have less risk and variability, and changes in cost estimates tend to be minor and can be absorbed in the overall program.
- Michigan DOT under-programs by the amount of contingency in projects. The agency keeps a contingency in cost estimates, but does not program this amount so that it avoids the automatic escalation that seems to occur.
- Florida DOT has developed an extensive set of internal documents and models for cost estimating, and a cost-estimating report is used in planning. FDOT develops all planning-level cost estimates for SIS projects, even those within MPO boundaries.
- Florida DOT allows local jurisdictions to deliver DOT projects with the idea that cost containment is easier at the local level.
- Washington DOT developed the Cost Estimation Validation Process (CVEP), which is a risk assessment process for individual projects to help develop realistic cost estimates. Projects are programmed at 90% confidence level
- In Ohio, major projects go through a 14-step cost-estimation review process, and both minor and major projects need to have cost estimates updated monthly. Ohio DOT also conducts a red flag analysis at the beginning of a project's planning phase to help identify potential cost-estimation risk areas.
- Utah DOT is transitioning from a policy to a project-specific SWTP. Cost estimating is now a much bigger issue, and UDOT is considering value engineering or something similar to CEVP as a pre- STIP process.

The second set of questions related to addressing safety in transportation planning.

- To what extent is the framework presented in the NCHRP 8-44 initial draft report relevant to what you are doing in addressing safety in your statewide or metropolitan transportation plan?
- What are the gaps between what you are doing and what this framework suggests?
- What are the barriers to implementing this framework?
- What lessons have you learned in addressing safety in your state transportation plan that may be useful to other states?

Key Challenges related to Statewide Safety

- Better collaboration strategies between agencies with a stake in transportation safety.
- Better models, particularly with predictive capabilities.
- Tort liability and "paranoia" about predicting crash rates as part of LRTP. Does this concern hamper us from taking actions in advance of an observable safety problem?
- Better causal data on attributable factors for vehicle crashes is needed to identify the most effective initiatives for a jurisdiction.
- Predicting safety benefits of non-infrastructure initiatives.
- Better information on effective strategies for improving non-motorized safety.
- Multimodal and urban design safety perspectives.
- Information and tools to address special situations such as vehicle - wildlife crashes or collisions with slow-moving vehicles (e.g., farm vehicles, Amish carriages, etc.)
- Integrating safety into TIP, STIP, SWTP, and RTP prioritization processes.
- A variety of data issues including timeliness, overall availability (especially for off-system data), privacy, data ownership, and agency transitions to GIS.
- Data collection and analysis for smaller MPOs. Michigan DOT's CRASH program provides an example of how data querying and analysis capabilities can be provided.
- Forecasting the growth in commercial and freight traffic.
- Encouraging planners to think of short-term strategies, which can be at odds with the typical long-range perspective of the transportation planning process.
- Overcoming the traditional perspective that an engineering solution is always available to solve a safety problem, and the general difficulty in engaging engineers and designers in safety planning.

Strategic Intermodal System (SIS) Strategic Guide Implementation Guidance. Florida DOT. 2005.

In the most recent iteration of the statewide transportation planning process, FDOT created five goals to guide the continuing growth of the transportation system. These goals are designed to promote:

1. A safer and more secure transportation system for residents, businesses, and visitors;
2. Enriched quality of life and responsible environmental stewardship;
3. Adequate and cost-efficient maintenance and preservation of transportation assets;
4. A stronger economy through enhanced mobility for people and freight; and
5. Sustainable transportation investments for Florida's future.

To accomplish these goals in a financially constrained reality, FDOT developed a Strategic Intermodal System (SIS) – a network of facilities essential to international, interstate, and interregional movement – which are designated for initial capacity funding.

Three types of facilities may be designated as components of the SIS: hubs, corridors, and connectors. For each of these, FDOT has established minimum criteria for SIS inclusion. Criteria are based on volume of freight or passengers, interregional connectivity, and economic influence. Facilities below these levels may be designated as Emerging SIS if they convey adequate volumes for significance. Table 2.3 in the document provides the specific criteria requirements by facility type.

Although this new system focuses funding on infrastructure with statewide importance, regional and local needs are incorporated as well. FDOT coordinates with other planning agencies to imitate this process on smaller scales. This is an essential practice as urban areas continue to grow and expand, merging into multi-regional urban centers with unique transportation demands.

Not all funding is committed to SIS facilities. Areas beyond the scope of the SIS designation have been set aside to receive state money as well, including military needs, emergency evacuation routes (a significant portion of which align with SIS), regional rail lines, transit needs, and pedestrian and bicycle facilities.

The revised statewide plan also redefines project selection to a three step process.

1. SIS Needs Identification – This document identifies all needs essential to address anticipated long-term system shortcomings. FDOT and its partner organizations determine these needs without financial constraints.
2. SIS Cost Feasible Plan – This document prioritizes projects from the previous step into 10 and 20 year components restrained by actual revenues. This ordering is based on technical analysis, partner input, and financial analysis, designed to promote the 5 goals mentioned previously.
3. SIS Projects – Following prioritization, a list of projects with approved funding is published, spanning 5 years.

Charting a New Direction for NCDOT. North Carolina DOT. 2004**.**

The current North Carolina long-range statewide multimodal transportation plan (STP) was created to address safety concerns and a growing backlog of deferred system maintenance/preservation projects in a financially constrained environment. The state faces challenges of rapid population growth, economic expansion, and increased trade volumes over the coming decades.

The initial step was to develop goals to guide the long range planning process. For NCDOT, these goals include mobility, maintenance and preservation, economic development and efficiency, safety, modal options, efficient and

balanced community growth, Intermodal connectivity, fiscal stewardship, environmental stewardship, and stakeholder coordination.

Economic analysis of state revenues was the next essential step to create realistic fiscal limits. Based on current levels, an estimated $55.5 billion will be invested into transportation needs over the next 25 years.

To better allocate resources and apply investment strategies, planners created the North Carolina Multimodal Investment Network (NCMIN) – a tiered framework to organize existing infrastructure. The NCMIN distributes all facilities into one of three levels: statewide, regional, or sub-regional. An existing multimodal system inventory provided a starting point to determine needs, broken down by mode and tier. The STP documents these projected needs over the next 25 years for highways/bridges, ITS, transit, passenger rail, freight rail, ferries, bicycle and pedestrian facilities, and aviation. The total needs across the network come to around $84 billion, well over the projected $55.5 billion budget.

After extensive public involvement and partner organization coordination, NCDOT developed the Recommended Investment Scenario, dividing anticipated resources by mode between four main allocation areas: maintenance/preservation, modernization, and expansion. The current plan places an emphasis on safety and system preservation; historically, NCDOT has spent around 60% of funds on highway system expansion. It also portions a greater division of funds to high demand facilities and non-highway travel modes. A network of Strategic Highway Corridors (SHC) has been developed to "improve, protect, and maximize the capacity of a set of existing highways that are critical to statewide mobility and regional connectivity." These corridors are identified based on delivering mobility, providing connectivity, relieving interstate traffic over long distances, or being a component of a special system (e.g. hurricane evacuation route or NHS facility).

This radical change in the planning process for North Carolina will require legislative change and policy revisions to implement the new system.

Economic Development

State Multimodal and Intermodal Transportation – An Overview of Policies and Programs Promoting Economic Growth. Lyndon B Johnson School of Public Affairs. 1989.

"The purpose of this study is to provide a comprehensive overview of state efforts to use multimodal and Intermodal transportation plans, programs, and projects to promote economic development or to respond to competitive market considerations."

Key themes of the report are as follows:

- Transportation planning is an essential component of a region's economic development;
- Tools of the 1980s to implement effective planning are
  - A single lead agency to oversee planning;
  - A statewide plan; and
  - Communication between agencies.
- Multimodal emphases will help reduce congestion and improve planning/performance but remain nominal commitments at this time;
- Funding is necessary to make the process work but should be flexible; and
- Local involvement improves planning by incorporating local needs. It should be linked to the planning process.

Chapter two describes the federal/state/local roles in planning and the impacts deregulation has made on transportation. Chapter three discusses the planning process in different metropolitan areas of Texas. Basically, each involves a lot of government agencies at various levels (and a few private agencies) splitting funding and cooperating to make a plan that will best serve the region. Innovative practices are on the order of park-n-ride lots and using computer models to predict urban growth. Private companies have almost exclusive control over Intermodal facilities.

Chapter four provides summaries of 13 states' plans, programs, and policies, exploring the different organizational roles of DOTs, MPOs, and other agencies. In Illinois, the "Corridors of Opportunity" program aims at planning for local economic development by attracting businesses based upon transportation amenities. Other states emphasize growth management over economic development. At this time, none of the states studies had produced an integrated multimodal state plan.

Key Findings for Developing Performance-Based Transportation Planning

- Coordination between agencies is important
- Intermodal emphases can reduce congestion and increase system efficiency.
- The planning process is different for each state

Land Use and Economic Development in Statewide Transportation Planning. Edward Beimborn, Alan Horowitz, Smitha Vijayan and Melissa Bordewin. 1999.

The connection between transportation and land use is a fundamental concept in transportation and they are inevitably connected. Everything that happens to land use has transportation implications and every transportation action affects land use. This report provides an overview of land use activities of state departments of transportation. Such activities occur in various states and along a

scale ranging from passive to active in six major categories: land use/transportation planning; state land use planning capabilities; education/technical assistance; access management; land use controls; and economic development. This report addresses each of these categories in detail. The report discusses how states incorporate land use issues into their statewide transportation planning and policy efforts. Also examined are the direct role the state DOTs have in land use and their role in the local and regional land use decision-making.

In most states, land use decisions are made locally by governmental review boards and elected officials. State DOTs typically defer to local governments on land use issues. However, DOTs may have review authority when the development involves access to a state highway or causes traffic impacts on a state highway.

State DOTs influence land development through providing infrastructure and, to a lesser extent, through transportation-related regulations. These influences are seldom part of a project's goal and are usually not intentional. State transportation projects are normally planned to improve safety, decrease travel time by alleviating congestion, and achieve other mobility-related goals. Transportation's most significant impact on land development occurs when access is provided to land. Increased access to land raises its potential for development, and more development generates additional travel. Once access has been provided, land patterns begin to change over a period of time. The results of these changes are, for the most part, irreversible. Recently, concerns about urban sprawl have arisen in many areas of the nation. Many groups have common concerns about the role transportation plays in combating the problems associated with urban sprawl, suburban congestion, and jobs/housing mismatches.

State Roles in Land Use Activities

There are considerable variations between the state DOTs in their role in land use and economic development activities. Roles in an individual state can vary along a broad spectrum ranging from very active involvement in the coordination of transportation and land use to a very passive role, where the state leaves most of the decision-making to other agencies. In order to help understand the spectrum of activity that states may undertake a chart has been developed to show the range of state activities. A state's role can be defined along a continuum from active to passive in the following six categories.

- Land Use/Transportation Planning Requirements
- State Land Use Planning Capabilities
- Education/Technical Assistance
- Access Management
- Land Use Controls
- Economic Development

State Land Use Planning Requirements and Capabilities

Sixteen of the 45 states surveyed require local governments to perform comprehensive planning in addition to zoning and regulations related to the zoning designation. State DOTs vary considerably in their capability to conduct technical studies and analysis related to land use issues. Those states that have adopted an active role in land use generally have more extensive capabilities. In many situations the states provide technical services to local governments to assist them in their decision making. These activities range from simple assistance with data collection to full scale statewide land use modeling efforts.

Economic forecasting can be an important land use planning tool. In a number of states, statewide economic forecasts are used by local governments in their planning processes. These forecasts require special expertise not normally available at the local level. Some of the commonly used methods for economic forecasting are input-output analysis, shift share analysis, elasticity methods, linear regression and ARIMA time series models.

Regardless of the role that a state takes in land use control and regulation, and regardless of its technical capabilities, there are different approaches to the assistance it provides to local government. Since different states approach the coordination of transportation, land use and economic development in different ways, styles of technical assistance and training also differ. Some of the more important ways in which states perform local technical assistance are:

- Reacting to local requests involves the state in only a reactive, passive, role.
- A number of states have established joint committees and councils as a means of coordinating land use programs. These committees can be made up of only state agencies, or they could be broadened to include representatives of local government and individuals. The scope of such committees can vary from a means to communicate new information to a specific task force charged to create new legislation.
- A number of states have issued guidebooks and technical assistance materials that are specifically directed to local agencies. These materials are used to help local government better understand good land use planning practices and the interaction between transportation and land use. The materials can help create consistency in planning practice between different locales and to transfer information on emerging practices and techniques. Some examples are given below.
- States have also had involvement in land use issues through the sponsorship of conferences and training sessions. These programs are designed to make local government personnel more aware of good land use and transportation practices.

Access Management Concepts

State highways can have a significant impact on the state's economy and their mobility function must be protected. The main function of access management is

to establish a balance between the existing traffic flow and highway access. Access management requires improved coordination between land use and transportation and between government agencies. While a state DOT logically initiates the statewide agenda to integrate access management practices into transportation planning, MPOs and local governments must also play a strong role in facilitating coordination on access management objectives.

Access management requires improved coordination between land use and transportation and between government agencies. While a state DOT logically initiates the agenda to integrate access management practices into transportation planning, MPOs and local governments must also play a strong role in facilitating coordination on access management objectives.

The benefits of access control relate primarily to the orderly flow of traffic on higher-order facilities. For statewide program evaluation it is also necessary to account for induced demand in the measures of effectiveness. That is, improvement s in capacity or speeds can result in more travel, thereby offsetting reductions in emissions and energy consumption.

Key Findings related to Land Use and Economic Development

Land and economic impacts of transportation must be understood in their geographic context. The increased access to land provided by new or upgraded transportation facilities can either induce new development or change existing development patterns.

- In most states, land use decisions are made locally by governmental review boards and elected officials.
- State highways can have a significant impact on the state's economy and their mobility function must be protected.
- Access management requires improved coordination between land use and transportation and between government agencies.

Environmental

NCHRP Report 541, Consideration of Environmental Factors in Transportation Systems Planning. Amekudzi, A. and M. Meyer. 2005.

Transportation systems plans provide the basis for selecting and developing transportation projects. However, because of their long time frames and broad scopes, systems plans often are developed without detailed consideration of how plan implementation will affect the built and natural environment. This creates problems in that some important projects may be very difficult, if not impossible, to implement because of environmental consequences that could have been identified, considered, and possibly avoided much earlier in the planning process. This report examines processes, procedures, and methods for integrating environmental factors in transportation systems planning and decision making at the statewide, regional, and metropolitan levels.

Few processes, procedures, or analysis methods are generally accepted for considering environmental factors in transportation systems planning. In addition to "fatal flaw" analyses, other environmental considerations are more appropriately addressed at the systems planning level. These include purpose and need determinations, areawide air- and water-quality impacts, ecosystem analysis, watershed evaluations, secondary and cumulative impacts, and social and community impacts. If elements of transportation systems plans are to proceed through project development to implementation, systems-level environmental considerations must be addressed earlier in planning. This report identifies, develops, and describes a process, procedures, and methods for integrating environmental factors in transportation systems planning and decision making at the statewide, regional, and metropolitan levels. The report focuses on environmental issues within the long-range transportation planning processes of state DOTs and MPOs. A planning process was developed that describes how and when various methods can best be applied in developing systems-level transportation plans. The process addresses decision-making relationships, technical requirements necessary, staffing capabilities, public involvement, interagency coordination, financial commitments; and methods for tying the systems planning considerations to more detailed processes such as corridor planning, sub-area planning, modal development planning, priority programming, and project development.

Analysis Process

The first step is identifying environmentally sensitive and critical areas very early in systems planning so that decision makers know at the beginning of the process where important natural and community resources are located. Identifying environmental sensitive areas can be completed by using geographic information systems (GIS) by analyzing databases that include spatially located environmental resources. The second step is to develop a range of alternative strategies that can be considered as part of the planning and project development process. Traditionally, transportation agencies focus their efforts on identifying transportation alternatives, with little thought given early in the process to the type of strategies that might be needed to enhance the environment. The analysis for a typical major transportation investment decision usually focuses on a few alternatives. However, the types of strategies that
can be considered by transportation agencies to mitigate or enhance environmental quality can range widely. The third step is the definition of an "environmental alternative" as one of the alternatives to be examined as part of the analysis of alternatives. An environmental alternative is defined in a way that purposely avoids environmentally sensitive areas. The concept of an environmental alternative implies that planning for future infrastructure must account for environmental consequences, and attempt to avoid these consequences as much as possible. While there are few examples of such an approach in the United States, the public's growing concern for environmental quality could make the adoption of an environmental alternative an important part of planning in the future.

Evaluation Process

One of the most important linkages between transportation planning and decision making is the use of evaluation criteria to define performance categories that are of interest to decision makers. For projects with possible effects on environmentally sensitive resources, the criteria of greatest interest to decision makers often relate to federal and state environmental assessment requirements. To a lesser extent, other environmental and quality-of-life effects that decision makers feel are important to their decision are also considered.

Project Development Process

The final part of the conceptual framework is the project development process. Traditionally, environmental factors, and the proposal of specific mitigation strategies to avoid or minimize environmental impacts, have been considered in much greater detail during the project development element of the process than in any other element shown in the conceptual framework. Although this report focuses on incorporating environmental factors into transportation systems planning, many of the case studies showed various efforts to make project development more efficient as well.

Tools and Techniques

Based on surveys completed by DOTs and MPOs, the following are tools used by these agencies in considering environmental factors in transportation planning:

- Data trend analysis;
- GIS and overlay mapping;
- Socioeconomic/community impact assessment methods;
- Public or expert surveys;
- Focus groups; and
- Environmental impact models (specifically, air quality impact models).

The environmental impacts considered, and the manner in which they are analyzed, include traffic congestion, direct and indirect land-use, economic development, and community and neighborhood impacts. A wide range of methods and tools are available for assessing social and economic impacts including:

- GIS and spatial-statistical analysis for environmental justice analysis;
- Resident or neighborhood surveys for studies on neighborhood cohesion;
- Risk models for analyzing the settlement of displaced populations;
- Regression models, spatial interaction and entropy-maximizing models, Markov models, and simulation models for modeling pedestrian movement;
- Photomontage techniques for visual impact assessment involving the superimposition of images of transportation system changes onto an existing street scene;
- Noise prediction models such as STAMINA, the FHA's noise prediction software; and

- Simulation models to estimate economic development impacts of transportation investments.

Key Findings for Environmental Factors in Transportation Planning

- The importance of a vision in guiding the activities of a state DOT is critical. This vision includes important concepts relating to sustainability, environmental preservation, and social equity.
- Considering environmental factors early in planning could provide an important opportunity to discover potential environmental problems and build a working relationship with those environmental resource agencies that would be likely to play key roles in project implementation.
- Availability of powerful database management capabilities has spurred intensive efforts to identify sensitive environmental resources.
- Use GIS to inventory and analyze environmental resources.
- GIS is becoming a standard tool for environmental assessment in transportation planning. This tool is particularly useful for spatial analysis of equity issues.
- Policy-level guidance can provide greater sensitivity to environmental considerations as they relate to development and infrastructure decisions.
- Using a well integrated approach to land use, transportation, and environmental planning that occurs within a broader state-defined legislative framework requires statewide comprehensive planning, with transportation as just one element of the overall comprehensive plan.
- Establishment of procedures for early and continual coordination and cooperation in developing mitigation plans will provide more cost effective and efficient mitigation, and ultimately, a higher level of protection and conservation of our valuable resources.
- States having strong environmental laws have undertaken more efforts to consider environmental factors in transportation systems planning.
- Scientific literature is increasingly identifying a systems-level perspective on environmental impact determination as being the most appropriate.
- The importance to decision making of including environmental factors early in systems planning very much depends on the degree to which impacts can be defined at a level that allows an understanding of consequences.
- Successful consideration of environmental factors in system planning will require substantive public involvement and participation of environmental stakeholders.
- Conducting environmental assessments earlier in systems planning, project development has been made more effective.
- A context-sensitive solutions (CSS) approach to project development is viewed by DOTs and MPOs as a mutually beneficial situation.

Improved Linkage Between Transportation Systems Planning and the National Environmental Policy Act (NEPA). Emerson, Donald J. 2006.

This document is a resource that can be used to streamline and enhance the transportation planning and project development process. The objective is to help transportation agencies establish of a seamless decision-making process that minimizes duplication of effort, promotes environmental stewardship, and reduces delays in project implementation. The toolbox offers a range of strategies – for integrating planning and project development, for increasing interagency collaboration, and for early consideration of social, economic and environmental factors – that may be carried out under existing laws and regulations. The strategies in this toolbox are drawn from research, case studies, pilot projects, and experiences of states and metropolitan areas throughout the United States.

This resource is especially relevant to major capital projects and programs that are likely to require an Environmental Impact Statement (EIS) and/or extensive permitting. It offers ideas for meeting the intent of Section 6001 and 6002 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and the FHWA/FTA Guidance on Linking the Transportation Planning and NEPA Processes (February 2005).

Chapters 1 through 3 focuses on broad concepts, principles and emerging philosophy associated with the planning and environmental analysis processes. Chapters 4 through 7 offer specific techniques to advance from the concepts and principles to practical implementation. Chapter 8 provides advice on how begin. This document is organized into eight chapters, reflecting the challenges of linking planning and NEPA as well as the techniques being used:

Chapter 1, Understanding Your Decision-Making Process.
Transportation planning and NEPA can be viewed as part of a decision- making continuum. Implementing this concept depends on a broad understanding of the sequence of decisions leading to a project — who makes them, when they are made, and on the basis of what information. Linking planning and NEPA in a systematic and streamlined manner is likely to work best when all participants start from a common and comprehensive understanding of the entire process, and the roles and responsibilities of each agency. Thus, a starting point may be the development of a "map" of the overall process. Once the basic steps are identified, the process map might be fleshed out with further details by answering such questions as:

- Under the current process, when are project concept decisions made? (Project concept might include mode, general location, amount of capacity, degree of access control, and termini.)
- Who makes these decisions?
- Who else is involved?

- What do decision-makers know when they reach these decisions in terms of costs, benefits, and environmental impacts of alternative strategies or concepts?

By design and by necessity, decision-making in planning and in NEPA involves multiple agencies. Each agency follows a decision-making process that is aligned with its mission and objectives. Resource/regulatory agency responsibilities extend beyond transportation and their internal processes may not align with those of transportation agencies. Strategies to link planning and NEPA work best if the overall transportation decision-making process acknowledges the processes of other agencies. Since cooperation and participation among agencies can be enhanced through mutual definition of roles, responsibilities, and expectations, this mapping exercise might best be done in a collaborative way involving all agencies involved in the process.

Chapter 2, Overcoming the Barriers between Planning and NEPA.
The range of challenges to linking Planning and NEPA include:

- Different missions (among agencies and within agencies) and organizational cultures;
- Lack of trust;
- Perception of federal requirements;
- Fear of litigation; and
- Lack of planning resources.

In many parts of the country, transportation and environmental agencies are finding ways to overcome these barriers including:

- Systematic approach - involves a comprehensive assessment of the overall process possibly focusing on the early steps and decisions in planning while anticipating the needs of later phases. The goal is to develop an approach that is logical, consistent, efficient, and widely understood and accepted. Utilizing a systematic approach requires the involvement and cooperation of all parties with a significant role in the decision-making process.
- Willingness to change - This change can be threatening, open up turf issues, involve risk, and require resources.
- Management Commitment - Real, meaningful change rarely can occur unless management is supportive. Integrating the transportation planning process with the NEPA process is likely to require top level management from each of the planning, implementing, and resource agencies involved.
- Building trust
- Ability to demonstrate results/outcomes.
- Communication and education.

Chapter 3, Laying the Groundwork for NEPA in Planning.

Laying the groundwork for NEPA in planning starts by applying the basic principles of NEPA in planning. Planning level decisions (mode, capacity, general location and the like) are less likely to need revisiting in subsequent phases of project development when it can be demonstrated that they were based on a process that followed NEPA principles. Where planning analyses and decisions are to be relied upon through the NEPA process, planners should take care to thoroughly document:

- The alternatives considered;
- The environmental analyses performed to support each phase of decision-making;
- Evidence of federal agency oversight at key project milestones;
- Coordination among federal, state and other agencies;
- Public involvement; public comments and responses; and
- Formal planning or decision documents.

A second way to lay the groundwork for NEPA in planning is to collect data and perform analyses that will be useful in establishing the purpose and need for future investments, and for understanding their impacts, either as stand-alone projects or as part of a broader program of projects.

Growth and land use issues often arise during the project development stage, when there are fewer opportunities to address them effectively. The planning process can lay a foundation for NEPA and reduce the likelihood of regional land use issues arising during the project stage by:

- Identifying and assessing growth scenarios, including their associated transportation requirements and environmental consequences;
- Seeking the involvement of outside agencies, including environmental agencies;
- Coordinating land use with resource planning;
- Conducting indirect and cumulative impact assessment during planning;
- Covering the land use and development impacts of the plan or a package of improvements; and
- Adopting growth and development strategies that reduce travel or that are compatible with planned infrastructure investments.

Chapter 4, Enhancing the Planning Process

This chapter asks the question, what procedural approaches are transportation agencies using to improve the link between planning and NEPA?

The report noted three procedural approaches in use today:

- Consideration of environmental factors in system planning and programming;
- Corridor and sub-area studies; and
- Tiering of NEPA documents.

When environmental factors are considered in planning and programming, transportation planning and decision-making may benefit in a number of ways including:

- Transportation and environmental plans can be coordinated and made to support each participating agency's goals;
- The cumulative effects of the plan and program can be considered at the system level and incorporated into subsequent NEPA documents;
- Projects with significant adverse impacts can be identified early, before significant resources are spent on project development;
- Projects can be modified to avoid, minimize or mitigate adverse impacts at an early stage when there is still decision-making flexibility;
- Mitigation can be dealt with on a programmatic basis, where it may be more effective; and
- Project development and NEPA documentation can be completed more quickly.

Many transportation agencies have completed corridor-level planning studies to analyze and evaluate alternative transportation concepts in a more focused way than is possible in statewide or regional planning. With the added focus and detail that is possible in a corridor study, agencies are able to more precisely define the alternatives and estimate their costs, benefits, and impacts. Corridor studies often lead to decisions on a preferred project concept, or at least narrow the range of alternatives carried forward. They can offer a forum for addressing transportation and land use relationships in greater detail than is possible in system planning. This can lead to local actions (comprehensive planning, zoning, access management, incentives, etc.) that complement transportation improvements and minimize adverse impacts.
Corridor studies are typically performed when:

- There is perceived to be value in looking at and transportation and community needs in a more focused way than is possible in system planning, but on a broader scale than a single facility or project;
- There is no consensus on purpose and need or project concept;
- The number of reasonable alternatives is high;
- A fixed guideway transit project is being considered3; or
- A proposed project is large, controversial and/or multi-modal.

Corridors are typically defined broadly and may be defined to include a "travel shed" composed of both trip origins and destinations.
Three approaches are often used for linking corridor studies to NEPA documents:

- A Draft EIS or EA is prepared as part of the corridor study, serving to document the results and seek input on alternative project concepts. Following circulation, a preferred concept is adopted or confirmed within the statewide or metropolitan transportation plan. This approach is

frequently used in corridor-level Alternatives Analysis studies performed under the FTA New Starts program.

- The NEPA document is prepared later in project development, but draws upon the analyses and decision-making within the corridor study. This is done most effectively when the corridor study follows NEPA process principles (consideration of alternatives and their environmental impacts, collaboration with other agencies, public involvement).
- The formal NEPA process is initiated during the corridor study, perhaps with a Notice of Intent and scoping, but the NEPA documents are not completed until later in project development. NEPA scoping may help to establish the corridor study as a part of the NEPA process, and help to alleviate concerns about dropping alternatives prior to scoping.

Council on Environmental Quality (CEQ) regulations allow environmental documents to be "tiered". First tier documents might cover a broad study area in which a program of related projects is contemplated, while the subsequent second tier documents might focus on a specific action included within the entire program. Second tier documents need only summarize the issues discussed in the broader first tier statement, and may incorporate discussions from the broader statement by reference.

Tiering offers a formal mechanism, within the NEPA process, for analyzing alternatives and their environmental impacts at a conceptual level, and for involving other agencies and the public. This can lead to decisions on preferred project concepts without carrying the analysis to the level of detail needed to complete the NEPA documentation process. Tiering also:

- Offers a way to look comprehensively at related projects and their cumulative impacts;
- Helps to eliminate repetitive discussions of the same issues in multiple NEPA documents, allowing each document to focus on the issues ripe for decision at each level of environmental review; and
- Offers a tool for corridor preservation. In most cases, a transportation agency is precluded from acquiring right-of-way prior to receiving a ROD or a FONSI. A Tier 1 NEPA document, leading to a Tier 1 ROD or FONSI, may offer sufficient detail to support right-of-way acquisition while other project details are being resolved.

Transportation agencies should think strategically about how tiering might best fit within the overall planning and project decision-making process. First, decide upon an appropriate sequence of decisions, then think through ways in which the NEPA process and NEPA documents can most effectively support the various decisions.

Chapter 5, Determining the Appropriate Level of Analysis.

How much environmental analysis is enough in planning? The answer, "It depends", requires the planner to think further about the type of planning being performed, the nature of the decision at hand, and the risks of overestimating or

underestimating an impact. Other considerations may include the interests and concerns expressed by the public and by participating environmental resource/regulatory agencies. "How much is enough" often requires negotiation among the involved parties. The level of detail includes:

- System planning takes a statewide or regional view of transportation needs and solutions, is long range (20 years or more), and encompasses multiple types of travel, modes and facility types. System plans typically articulate goals, objectives and policies, and list and/or describe strategies and projects that have been adopted as part of the plan (often based on more detailed studies, including NEPA studies, previously completed). System plans offer a snapshot of adopted policies and the totality of projects being planned, the interactions among the projects, estimates of costs and financial resources, and priorities for implementation.
- With a more focused geographic scope, corridor and sub-area planning allows for more focused analyses into purpose and need, alternatives, and their costs, benefits and impacts. Corridor planning – often viewed as a "bridge" between system planning and detailed project planning – provides a way to sort through alternative project concepts in sufficient detail to make an informed choice. Whether or not a NEPA document is developed (see Chapter 4), corridor and sub-area planning is often undertaken in the hope that the decisions will "stick" and be sustainable through the NEPA process. There are also procedural and institutional barriers, real or perceived, that may need to be overcome

Chapter 6, Collaboration.

Effective transportation planning and project development hinge on the participation and involvement of many public agencies, as well as the public at large. Non-transportation agencies, whether they have approval or permitting responsibilities or less formal opportunities to comment, exert considerable influence and can slow or stall project delivery. As noted in Chapter 3, involvement of other agencies and the public is one of the fundamental principles of NEPA. Additionally, SAFETEA-LU includes new consultation requirements for transportation planning, as outlined later in this chapter. Simply put, a successful foundation for NEPA cannot be laid in planning without the early and effective involvement of many agencies.

A variety of techniques are being used to foster collaboration between the planning and environmental units of a State DOT, and between MPOs and implementing agencies. This toolbox discusses agency reorganization, cross-functional training, rotational assignments, pilot studies, checklists and manuals. Techniques that foster collaboration between transportation and environmental resource/regulatory agencies tend to fall into seven categories – environmental stewardship, interagency agreements, committees and working groups, concurrence points, programmatic approvals, conflict resolution, and the funding of resource/regulatory agency positions.

Chapter 7, Data Sharing

Inter-agency and intra-agency collaboration will often involve the sharing of environmental and other information among and within agencies Information sharing helps to ensure that all participants are working with the same basic data – and reduces the chance that new issues will emerge late in project development and cause earlier decisions to be reopened. By sharing, agencies can also reduce the cost of data gathering, maintenance, and storage.

Environmental databases can be shared within or among agencies. With GIS and a well-maintained database, environmental resource information can be readily accessible to planners and NEPA staff alike. Users can share the cost of data collection, and all can be working with the latest information.

Chapter 8, Getting Started

Each state or metropolitan area that is interested in strengthening the link between planning and NEPA will start from a different place, and will have a different idea of the objectives it wants to achieve. Short-term strategies that appear in at least half of the Action Plans are:

- Convene follow-up partnering meeting(s) to further refine and build on the Action Plan;
- Create MOUs or other agreements;
- Define or refine the transportation decision-making process;
- Update or develop guidance and manuals to cover purpose and need, the analysis of environmental factors in planning, cumulative effects and other topics;
- Conduct training and cross-training, often using existing courses available from the National Highway Institute and the National Transit Institute;
- Improve the gathering of environmental data, and enhance understanding of data needs and availability; and
- Improve data sharing, often using GIS.

Key Points to Link Transportation System Planning and NEPA

- Planning and NEPA both embrace similar requirements – the consideration of alternatives and their environmental effects, interagency collaboration, public involvement, and the like – yet planning and NEPA are often treated as separate and independent processes carried out sequentially.
- Taking active steps to integrate planning and NEPA decision-making can streamline the overall process and make it more sensitive to environmental considerations.
- Process "mapping" can help an agency's employees, as well as others involved in the process, to understand and explain how transportation decisions are reached.

- Understanding the strengths and weaknesses of the existing process helps pinpoint those aspects that might be improved to forge stronger linkages between planning and NEPA.
- When trying to address any weaknesses in their existing process, agencies may encounter a number of institutional, cultural, procedural and technical barriers or challenges to be overcome.
- Common challenges to integrating planning and NEPA include differing agency missions and goals, lack of trust, long-standing agency cultures and process, fear of litigation, insufficient resources, and the like. Recognizing and explicitly identifying these challenges is an important early step in addressing them.
- Analyses performed during planning, such as needs studies, can also be useful in addressing NEPA requirements.
- Laying the groundwork for NEPA in planning starts by applying the basic principles of NEPA in planning. Planning level decisions – mode, capacity, general location and the like – are less likely to need revisiting in subsequent phases of project development when it can be demonstrated that they were based on a process that followed NEPA principles.
- A growing number of States, metropolitan areas, and local governments are considering environmental factors as part of transportation plan and program development. Early consideration of environmental factors may allow planners to screen out alternatives or projects that are expected to have adverse effects or generate controversy.
- There are many possible reasons for performing environmental analysis in system planning – to help identify and evaluate alternative transportation solutions, to engage environmental agencies in early discussions, to address environmental issues raised by other agencies and the public, to avoid conflicts with and/or support resource protection initiatives, to assess cumulative impacts of the plan, to satisfy Federal planning requirements, etc.
- Corridor planning – often viewed as a "bridge" between system planning and detailed project planning – provides a way to sort through alternative project concepts in sufficient detail to make an informed choice.
- Collaboration tends to refer to the act of working jointly to achieve a shared vision or mission, using shared resources. Collaboration can enable agencies to accomplish something jointly that one agency could not accomplish alone.
- A number of State DOTs have reorganized to put their planning and environmental staff in the same unit.
- Information sharing helps to ensure that all participants are working with the same basic data – and reduces the chance that new issues will emerge late in project development and cause earlier decisions to be reopened. By sharing, agencies can also reduce the cost of data gathering, maintenance, and storage.
- Having 'buy-in' from top management and involved agencies helps to ensure that everyone involved will work towards an outcome. Within an

agency, buy-in would include support from top level executives who deal with staffing and funding, as well as staff who carry out planning and project studies. Buy-in to a collaborative process involves multiple agencies.

Tools and Techniques

NCHRP Report 446, A Guidebook for Performance-Based Transportation Planning. Cambridge Systematics. 1997.

This report, a summary of the results of NCHRP Project 8-32(2)A, is intended to provide transportation organizations, planning practitioners, and transportation decision makers with practical tools and guidance for considering system performance in the multimodal transportation planning and decision-making process. It is also expected to support transportation investment decisions tailored to the specific conditions and performance needs of major transportation systems. Presented as a guidebook, it brings together lessons learned from different regions of the country and establishes a rationale for performance-based transportation planning and provides guidance for a wide range of applications having different scopes and levels of complexity. This guidebook provides a structured approach to monitoring, evaluating, and considering transportation system performance in various components of the planning process. It also includes a summary of case studies (Appendix A) and a "Performance Measures Library" (Appendix B) that catalogs measures currently being applied throughout the country.

This guidebook provides agencies with guidance and assistance on:

- Identifying needs and priorities, articulating key issues and translating all of them into specific goals and quantifiable objectives;
- Deciding on a framework for the planning process that more directly links priorities and the actual decision-making;
- Determining how best to measure the performance of the programs, systems and services that the agency supply;
- Developing data collection and management systems to generate performance data and to support applications and use of data; and
- Identifying, developing and applying analytical methods to generate useable, credible performance information on transportation decision.

The purpose of the guidebook is to help organizations improve the development, implementation and management of their transportation plans and programs. This guidebook focuses primarily on how to apply performance measurement to internal decision making regarding transportation plan and development and implementation. Some of the basic principles include:

- Performance-based planning is an incremental process;
- Beware of different terminology and nomenclature;
- Begin with a structured and simplified process;

- Ensure the approach fits the situation; and
- Ensure that those who will become accountable participate.

The guidebook provides a step by step process to develop a performance based planning process. The process is incremental and evolutionary and with sufficient review feedback and adjustment a highly effective process is developed.

The guidebook presents common criteria for selecting performance measure, which include:

- Measurability – Is it possible to generate performance measures with the tools and resources we have available?
- Forecastability – Can one realistically compare future alternative projects using this measure?
- Clarity – Is this measure understandable to policymakers, transportation professionals and the public?
- Usefulness – Is this measure useful? Is it a direct measure of the issue of concern?
- Temporal Issues – Is this measure comparable across time?
- Geographic Scale – Is the measure applicable to all areas of the state, region, and/or local area?
- Multiple indications of goals – How many of the project goals does the measure help to address?
- Control – Can the measure be controlled or corrected by the agency doing the measuring?

The performance measures selected as part of the planning process may generate needs for data collection that an agency does not currently have. The guidebook notes the importance of spending time during the performance measurement identification process to consider data needs and costs.

Agencies must have the proper data and tools to drive the performance measurement process. The guidebook references ways to support performance measurement include conducting surveys, which provide a way to collect data about system condition and performance, travelers perception about the system, mode, or individual trip. The guidebook provides eight (8) survey examples and explains how each can provide useful data. Another way to support the generation of performance measurement is through traffic monitoring programs, such as traffic counters, vehicle classification recorders and weigh in motion equipment. These programs assist in monitoring data travel time, vehicle occupancy, vehicle weight and classification and count data.

The guidebook provides insight into integrating customer information into the performance measurement-based planning process, but customer surveys should only be conducted after the agency understands its goals, objectives and performance measures.

The guidebook provides insight into the Highway Performance Monitoring System (HPMS) national database of highway conditions for each state and explained the HPMS Analytical Process which assess base year conditions and performance, forecast highway system needs, simulates highway system conditions, analyzes investment strategies and estimates user costs. This provides and understanding of what kind of performance can be expected when funding is constrained and tradeoffs must be made between different investment programs.

The guidebook notes that data generated from Intelligent Transportation Systems (ITS) can be of great value to performance-based planning, but surveillance data must be stored for future use to assist in this process. Freight issues in performance-based planning typically involve more complex data needs. The information collected and stored by ITS systems provide an opportunity to address freight related data needs. The guidebook identifies three ITS as sources of freight related data:

- Metropolitan Traffic Management Systems;
- Commercial Vehicle Operations (CVO); and
- Fleet Management Technologies.

Key Findings for Developing Performance-Based Transportation Planning

- Different organizations have different needs and performance measures must be tailored directly to the goals and objectives.
- Performance-based planning is an incremental process
- Start with a structured and simplified process
- Ensure the approach fits the situation
- No two performance-based planning efforts will be exactly alike.
- Practitioners must have the proper data and tools to drive the process into the future.

Development of a Methodology to Coordinate and Prioritize Multimodal Investment Networks. Lambert, James H. 2005.

Across the nation, there are opportunities to improve coordination among transportation modal agencies, including aviation, transit, ports, highway, rail, pedestrian, and bicycle modes. The purpose of this study was to demonstrate an analytical methodology that could aid efforts such as this to coordinate and prioritize multimodal investments. The methodology developed can help decision makers to identify and prioritize proposed multimodal investment networks (MINs). These are large-scale coordinated investments in transportation projects across modes. The analytical methodology developed assists multimodal transportation planning efforts across the nation, particularly where there is a need for systematic evidence-based approaches to coordinating the efforts of modal transportation agencies. The methodology developed in this project

fosters improved coordination in planning and programming transportation investments across modal agencies.

The potential benefits of the methodology include:

- Identification of lower-cost investment alternatives when considering multiple modes relative to considering only single modes to meet a particular travel demand;
- Selection and programming of multimodal solutions that have the highest performance relative to the available or required levels of investment; and
- Increased transparency and accountability of the multimodal transportation agencies for the uses of funding that can be allocated across multiple modes.

The costs of implementing the methodology are minimal and include one-time training of staff of the modal agencies in the use of the identification and priority-setting methodology and software demonstrated in the current study; and regular interaction and dialogue among the staff of the modal agencies that are involved in the identification and prioritization of investments across modes.

Virginia DOT (VDOT) as part of their statewide transportation plan developed a *Rating and Prioritization Workbook* to help prioritize their MINs. This workbook allows users to

- Score the proposed MINs, subject to the defined criteria provided by VTrans 2025 (Virginia's Statewide Plan);
- Vary the weightings of the six major performance criteria, and their subsequent performance objectives, across five weighting policies; and
- View and interpret the resulting weighted scores and rankings of the MINs.

Transportation modal agencies should consider the following questions in multimodal transportation planning and investing:

- How can coordination among agencies be improved through analytical methods?
- What agencies other than transportation agencies should be involved in developing analytical methods for multimodal transportation planning?
- What web-based or other information technologies can be used to improve planning?
- What are the unique analytical capabilities of the various state agencies?
- How should the private sector participate in the analysis for multimodal transportation planning?
- How can analytical methodology help MPOs and PDCs influence planning?
- How should freight and passenger issues be integrated in analytical methods?

- What analytical methods can be used for assessing associated benefits, costs, and cost savings?
- What is the available range of analytical methods for prioritizing investments?
- How can analytical methods represent federal, state, and local interests and those of the authorities?
- How can analytical methods represent the unique local and regional issues?
- How responsive are analytical methods to the relevant legislative, executive, and judiciary functions of the government?

Key Points to Coordinate and Prioritize Multimodal Investment Networks

- MINs can be prioritized based on a performance-based scoring and ranking methodology using various weighting policies for analysis.
- The statistical comparison of modal plans can be useful when assembling MINs and comparing the constituent projects according to their costs and associated quantitative and qualitative performance factors.
- Analytical methods that improve coordination among the state and local transportation agencies are critical to multimodal transportation planning.

Development of a Multimodal Tradeoffs Methodology for Use in Statewide Transportation Planning. Cambridge Systematics. 2004.

States confront a wide range of tradeoffs within and between modes, within and between policy objectives or performance goals, and within and between various geographic regions and market segments. All of these tradeoff issues face the same basic question and involve the same basic elements. At the core, a generalized tradeoff in transportation planning asks, "How much resource do I allocate to A versus B?" The actual tradeoff issue itself is "What are the consequences of a particular allocation of resources to A and B?" and the choice becomes the allocation and set of consequences that the decision-maker prefers.

The essential elements of a tradeoff analysis include:

- Clearly defined "program areas" (i.e., defining what the tradeoff is between);
- For each area, clearly defined performance objectives, evaluation criteria, or impact categories that define the "consequences" of different levels of investment in the area;
- For each area, some method to relate the level of investment in that area to the resulting consequences\ in that area; and
- Some method for comparing or "equating" the consequences generated by each program area as a result of a specific allocation of resources between the areas.

The general approach for performing multimodal tradeoff analysis involves a five-step evaluation process in which an analyst establishes appropriate analysis mechanisms, identifies relevant considerations for the evaluation, applies analysis methods and data in a structured sequence, and summarizes key results to highlight tradeoff considerations. In this generalized approach, the summarization of key distinguishing features between alternative investment strategies is the specific "tradeoff analysis."

Evaluation Step 1 - Establish Structure for Inter-Program Analysis. This step involves identifying and organizing factors that are explicitly or implicitly used by the agency's decision-makers to evaluate key agency-wide issues. In many agencies, these factors are the broad goals, objectives, and performance measures that are used in the ongoing statewide transportation planning process, and may also be reflected in top level programming and prioritization processes.

Evaluation Step 2 - Establish Structure for Intra-Program Analysis. The step involves identifying and organizing factors that are typically used by the agency's "front-line" managers and staff to evaluate issues within specific program areas. These program areas could reflect modal, geographic, functional, or other orientations depending upon a specific agency's decision-making needs.

Upon completing the two case applications, the research team now believes Evaluation Steps 1 and 2 should be replaced with a single step that identifies the decision-making factors and structures at the appropriate level for the decision being considered. Some decisions are at a high enough level that considering program-specific objectives and performance measures is unnecessarily detailed. Other decisions are at a low enough level that they have little impact on inter-program objectives and measures.

Evaluation Step 3 - Identify Program Areas of Interest. This step involves identifying the programs that should be explicitly analyzed in the tradeoff process. An agency may have many program areas that represent the top level for prioritization, decision-making, and current informal tradeoff processes.

Evaluation Step 4 - Apply Analysis Procedures. The fourth tradeoff evaluation step involves applying various tools and procedures to develop tradeoff information from available data for both intra-program and inter-program categories. Subsequent analysis procedures have the potential to produce a wealth of information regarding the different program funding levels that may comprise a specific tradeoff. The result we are trying to achieve is to develop a small set of information that focuses on key distinguishing features between the possible tradeoffs.

Evaluation Step 5 - Present Tradeoff Information. This final tradeoff evaluation step identifies information to help inform decision-makers' tradeoff considerations. Essentially, a "tradeoff analysis" is a way to summarize key distinguishing features between the proposed funding levels.

The primary finding was that it is possible to apply the NCHRP methodology to real-world situations using data from a state DOT. The methodology provided a systematic way to gather and organize data and present the information in a way comprehensible to staff and decision-makers. The research team found applying the methodology to a program-level analysis problematic, but this was due to the lack of adequate tools able to provide some key pieces of necessary information, rather than a flaw with the methodology itself. To perform program-level tradeoff analysis, the research team believes tools are needed that start with performance measure information at the project-level, and then "rolls-up" this information to generate program-level performance measures.

The National Cooperative Highway Research (NCHRP) Project 8-36, Task 7, Phase I developed an approach for states to use in analyzing investment tradeoffs. The objective of this report is to apply the approach in a real-world situation, using data from a state department of transportation (DOT). Applying the generalized approach for multimodal tradeoff analysis allowed the research team to discover the strengths and weaknesses of the methodology when applied to "real-world" situations.

Key Points from Multimodal Tradeoffs in Statewide Transportation Planning

- Before embarking on a multimodal tradeoff analysis, the analysis team should first determine whether a "marginal" analysis will suffice or if a "base-level" analysis will be needed. Most o the time, only a marginal analysis that considers incremental changes from existing conditions is needed (e.g., what are the costs and benefits of increasing level of funding for a program of reducing transit service, etc.).
- The general approach for performing multimodal tradeoff analysis involves a five-step evaluation process in which an analyst establishes appropriate analysis mechanisms, identifies relevant considerations for the evaluation, applies analysis methods and data in a structured sequence, and summarizes key results to highlight tradeoff considerations.
- The primary finding noted that it is possible to apply the NCHRP methodology to real-world situations using data from a state DOT. The methodology provided a systematic way to gather and organize data and present the information in a way comprehensible to staff and decision-makers.

Tool for Rural and Statewide Multimodal Transportation Planning.
Dixon, Karen; Sarasua, Wayne; Daniel, Janice; and Mazur, George, P.E. 2001.

The Georgia Department of Transportation's Multi-modal Transportation Planning Tool (MTPT) facilitates multimodal planning in rural areas. Using GDOT databases the tool aids in the analysis of transportation requirements of rural areas, identifies potential implementation constraints early in the planning process, and develops a prioritized project list by mode for an analysis region. The MTPT addresses highways, transit, intercity bus, commuter and passenger

rail, aviation, and bicycles. An integrated geographic information system plays an important role in the presentation of the results. This paper discusses the development of the MTPT and describes program functionality. The paper will be of particular interest to state transportation agencies interested in using statewide databases for multimodal planning purposes. Described techniques identify how data that are typically collected and maintained for an entire state (e.g., traffic volumes, posted speeds, designated bike routes, roadway functional classes, crash information, and county-based socioeconomic data) can be combined with field verified default factors, widely accepted planning and analysis methods, and additional regionally calibrated planning algorithms to perform system-level planning at the city, county, multicounty, or state levels.

To assist in evaluating rural multimodal transportation requirements, GDOT initiated the development of the MTPT. The vision of the MTPT called for three main capabilities:

- Evaluate existing and future system- and project-level needs;
- Integrate GDOT's planning and decision making processes with other best practices; and
- Create a user friendly desktop tool allowing transparent data handling.

The MTPT queries several GDOT databases including, aviation, bicycle, transit and the road characteristics file. Program users can evaluate future improvement plans for specific roadways, a particular town or county, GDOT district or a regional development center. The six primary modes evaluated by the tool include:

- Local Transit – The tool assesses which counties might make sense to consider rural transit service. In doing so, the tool consider the existence of social service transit providers in the county, percentages of population in certain target populations, and estimates potential ridership, vehicle requirements, capital and operating costs and economic benefits.
- Intercity Bus – The tool identifies geographic locations that could potentially benefit if discretionary capital funding could be programmed for intercity bus service.
- Commuter Rail – The tool identifies proposed rail implementations for a specific GDOT district, RDC, county, or city based upon the proposed rail station identified in the Georgia State Commuter Rail Plan.
- Aviation – The tool summarizes existing conditions and project proposals for all airports based on the five year aviation Capital Improvement Program and a general aviation database.
- Bicycle and Pedestrian – The tool evaluates bicycle and pedestrian improvements relative to the existing roadway facilities and it runs concurrent with the highway analysis. The tool identifies improvement options ad estimates improvement costs based on the statewide bicycle route plan.

- Highway - The tool analyzes freeways, multilane, two-lane and limited signalized intersections, crash analysis and estimates costs associated with recommended improvements. The tool estimates traffic volumes 10 and 20 years into the future based and the default growth rate can be changed by the user prior to beginning the analysis to reflect changing conditions.

Key Findings in using the GDOT MTPT in rural and statewide planning

- The basis of the tool analysis methodology focuses on facility operation and cost.
- The tool evaluates local transit, intercity bus, commuter rail, aviation, bicycle and pedestrian and highway needs at the state, county, GDOT district, RDC or city level.

Highway Economic Requirements System for Indiana: Statewide Planning Applications. Steve Smith, Dean Munn, Indiana DOT. 2002.

The HERS-ST model developed by the Federal Highway Administration (FHWA) is used to assess state highway investment needs. The model entails assessment of expected changes in physical system conditions as well as economic cost behavior determining highway economic requirements. The analysis is based on an application of engineering, economic and statistical methods to a standard sample of Highway Performances Monitoring System (HPMS) data. The Indiana Department of Transportation developed a HERS_IN model to provide a system planning tool for the identification of highway capacity needs and potential improvement projects throughout the state.

The HERS-ST model is based upon a sampling system, using HPMS data, which allows the number of miles of highway improvements to be estimated, but not the location of the improvement. However, the HERS_IN integrated the entire Indiana highway system data which provided specific highway project locations as well as system-wide analysis of highway investment.

The HERS_IN model can perform three types of investment analysis, which include selecting only improvements which have a benefit/cost ratio over a specified minimum level; conducting a full needs analysis where all deficiencies are corrected; and selecting the best improvement set as constrained by a funding level. The HERS_IN analysis is limited to the evaluation of the existing highway system. The analysis of new highway links, such as new highways providing new connections, need to be evaluated through other system planning tools such as the statewide travel demand model.

One of the major enhancements of the HERS_IN needs analysis model is the mapping the models project specific locations using TransCAD. This linkage allows the model recommended improvements to be mapped for presentation purposes and used as a "layer" for other GIS planning applications.

The HERS_IN improvement needs were used as one element in the overall process of determining statewide proposed highway improvements over a 25 year planning horizon. The HERS_IN improvements were selected without data on the actual feasibility of highway widening based upon available ROW. Since the data is based on roadway inventory segment length, INDOT reviewed each improvement to ensure the project provided logical termini. The HERS_IN analysis system provided important statewide analysis capabilities that supported the overall Indiana statewide transportation planning process.

Key Findings in Developing HERS_IN for Statewide Planning

- INDOT found limited value in the HERS-ST needs output and in order to provide specific project locations HERS_IN was developed to provide specific information and system level information for the 12,000 miles of state-maintained roadways.
- HERS_IN integrated the entire Indiana highway system data, which provided specific highway project locations throughout the state.
- Specific project locations were mapped using TransCAD.

APPENDIX B - TRANSPORTATION AGENCY SURVEY FORMS

STATE TRANSPORTATION AGENCY SURVEY FOR NCHRP PROJECT 8-58: DEVELOPMENT OF A MULTIMODAL STATEWIDE CORRIDOR PLANNING GUIDEBOOK

Please respond by June 30, 2006

We need help in gathering information about your statewide transportation planning process for a major research project for the National Cooperative Highway Research Program (NCHRP).

Your assistance will be greatly appreciated.

Background

Federal transportation legislation requires states to develop long-range, statewide multimodal plans with at least a 20-year planning horizon. To meet this requirement, state transportation agencies have usually developed either policy plans or project-based plans. In recent years, states have tried to refine those plans by giving special consideration to major transportation corridors of statewide or regional significance. These corridors address not only highways, but also other modes of moving people and goods. Using a corridor planning approach allows states to analyze an entire corridor, rather than just individual projects that are segments of a corridor.

Some states have asked for guidance on how to develop detailed statewide corridor plans. As a result, NCHRP 8-58 *Development of a Multimodal Statewide Corridor Planning Guidebook* was initiated based on a request from the AASHTO Standing Committee on Planning. This research project will assist states in analyzing and prioritizing corridors through development of a Statewide Corridor Plan. The Plan would address the entire network of modes and their connections. The Plan could also analyze existing and future conditions and give consideration to system performance, safety, environmental impacts, land use, air quality, tradeoffs between modes, and other issues. A well-defined corridor analysis methodology could be adopted by states, customized for a state's unique needs, as part of the planning process. This research could also address multi-state corridor planning and other special state, regional, and local issues.

Instructions

Please help by taking the time to complete this survey and return it by e-mail to John Carr (jcarr@wilbursmith.com) by June 30, 2006. Just type your answers after each question. Please don't worry about formatting. The completed survey forms will not be published in any report.

While completing this survey, please keep in mind that the goals are to:

- Assess what state transportation agencies are currently doing or considering in the practice of long-range statewide "corridor-based" planning;
- Identify best practices in long-range, multimodal, systems-wide statewide corridor planning;
- Identify how selected special issues are addressed in the transportation planning process; and
- Identify up to six "case study" transportation agencies for more in-depth analysis.

We realize that completing this survey will take valuable time away from your regular duties. Please be assured that your responses will provide a great benefit by helping us develop a guidebook that could ultimately be useful to your agency and other transportation agencies.

Again, thank you very much for participating in this survey!

Please provide contact information for (a) the person responsible for the statewide transportation planning process and (b) a contact person for any questions about this survey:

PERSON(S) RESPONSIBLE FOR STATEWIDE TRANSPORTATION PLANNING PROCESS

Name:
Title:
Office:
Agency:
Street, PO, or Office Address 1:
Street, PO, or Office Address 2:
City/State/Zip Code:
Phone Number:
Fax Number:
E-mail:

CONTACT PERSON FOR QUESTIONS ABOUT THIS SURVEY

Name:
Title:
Office:
Agency:
Street, PO, or Office Address 1:
Street, PO, or Office Address 2:
City/State/Zip Code:
Phone Number:
Fax Number:
E-mail:

PLEASE RESPOND BELOW BY CHECKING AN ANSWER OR PROVIDING A WRITTEN RESPONSE TO THE QUESTIONS, AS REQUESTED. THANK YOU!

Inquiry Area 1: Experience in using statewide transportation corridor planning in project identification, selection, and prioritization for statewide plans and programs

1. Which of the following best describes the primary organizational responsibility for the statewide transportation planning process in your transportation agency?

____ Centralized, i.e., primarily within a single division or office (please explain)
____ De-centralized, i.e., shared among several offices or agencies (please explain)
____ Other (please explain)

2. Which of the following best describes your Statewide Transportation Plan (check one)?

____ Policy plan
____ Project plan
____ Other (please explain)

3. Is your Statewide Transportation Plan a corridor-based plan (i.e., do you attempt to define major corridors and identify/prioritize needs or set policies for those corridors)?

4. Are there legislative or regulatory requirements or guidance – or agency policy or guidance – that directs such an approach for planning and/or how it is to be carried out? Please explain.

[NOTE: Please provide legislative/regulatory references that define or mandate requirements, procedures, and/or criteria for statewide transportation planning and programming. If available on-line, please provide us with a link/web address below:

_____

5. Are there any anticipated changes to legislation, regulations, policies, or process contemplated that would require, encourage, or direct the use of corridor planning as part of the statewide transportation planning or programming process? If so, please explain.

6. If you do not currently have a corridor-based Statewide Transportation Plan, has such a planning process been tried previously? If so, why is this approach no longer used?

7. If you do not have a corridor-based Statewide Transportation Plan, are you aware of any formal process in your state for integrating the results of corridor studies into a larger plan or program? Please explain.

If you do not have a corridor-based statewide transportation planning process, please skip to Inquiry Area 2 on Page 5. All respondents should answer questions 1 through 7 and all questions in Inquiry Area 2.

If you have a corridor-based statewide transportation planning process, please answer the remaining questions in Inquiry Area 1 (# 8 through 19) on the next page and the questions in Inquiry Area 2 (# 20 through 29) starting on Page 5.

8. How are corridors defined and selected for inclusion/evaluation in the statewide planning process? What criteria are used and how are they applied?

9. How are the results of the statewide corridor planning process used for project identification/selection/prioritization and program development?

[NOTE: If your project identification/selection/prioritization process is a public document, please provide a copy (electronic or hard copy) or a link/web address below:

_____

10. How are comparisons made between corridors for project identification, selection, or prioritization as part of the statewide planning and programming process?

11. How are the results of the statewide corridor planning process used to allocate resources?

12. Are there specific data requirements necessary to allow the comparison of corridors and corridor needs at the statewide level? If so, please explain.

13. Does your statewide transportation planning process differentiate between rural and urban needs? If so, how?

14. What is the role of economic analysis and what tools or techniques are used, if any, in the statewide transportation planning process, particularly at the corridor planning level?

15. Do you use any models, tools, or special methodologies (e.g., statewide travel model, HPMS, benefit/cost analysis, REMI, HERS, GIS analysis, or project scoring) in making decisions on project identification, selection, or prioritization? Please list and explain.

16. How are multimodal and intermodal considerations incorporated into the statewide planning process?

17. How are comparisons made and conflicting demands resolved among different transportation users within a corridor (i.e., freight shippers/providers, commuters, tourists, intercity travelers, etc.)

18. How are differences in jurisdictional priorities resolved? For example, how are local and regional priorities considered in the state decision-making process for corridors, projects, or modal solutions? Who is responsible for the final decision?

19. How do you give consideration to the political process in the development of statewide plans or programs? For example, how do you consider and/or address political issues in determining “needs” versus “wants”?

[Please complete Inquiry Area 2 starting on the next page.]

Inquiry Area 2: Best practices and lessons learned

20. Which of the following are considered in your statewide transportation planning process (check all that apply – feel free to provide information on how these elements are applied in the planning process if time permits)?

____ a. Comparisons between transportation modes within corridors
____ b. The eight Federal planning factors
____ c. Land use
____ d. Urban design
____ e. Economic development
____ f. Consistency with local or regional planning agencies
____ g. Consistency with other planning by other state agencies
____ h. Freight movement
____ i. Public transportation
____ j. Traffic operations (e.g., ITS, TSM/TDM, access/corridor management, and congestion management)
____ k. Safety
____ l. NEPA process
____ m. Environmental objectives and mitigation opportunities
____ n. Coordination with or input from local, state, and/or federal resource agencies
____ o. Addressing different stakeholder priorities and interests
____ p. Public involvement
____ q. MPO and Non-Metropolitan local official consultation
____ r. Performance measures
____ s. Institutional/organizational issues and procedures
____ t. Innovative financing options
____ u. Public/private partnerships
____ v. Other _____

21. How would you rate your state's statewide planning process (check one)? Please explain your response.

_____ Excellent
_____ Good
_____ Needs Improvement

22. How do you obtain public input into the long-range transportation planning process? Please provide any special or innovative efforts you have successfully used to get input.

23. What aspects of statewide planning in your state have been most effective in project identification/selection/prioritization and program development (e.g., type of process, criteria, methods for analysis, public involvement, or local consultation)? Please explain.

24. What aspects of the statewide planning in your state have been least effective? Please explain.

- What improvements are needed?

25. If your state has been involved in any multi-state corridor planning efforts, please describe the project(s) and any key actions or elements that were most effective?

- What actions or elements were least effective?

26. Based on your experience, how should needs and priorities on multi-state corridors be addressed in the Statewide Transportation Plan?

27. Please list at least two major challenges for your state that are critical to a successful statewide planning process.

28. Please describe any corridor planning efforts in other jurisdictions (e.g., other states, MPOs, RPOs, public transit system, etc.) that you consider good examples of the planning process or how planning information is used in the decision-making process. If available, please provide us with a name and contact information so we can obtain further information on those efforts.

29. To help in our research efforts, do you have any other comments or information to provide on issues or topics that we may have failed to consider or inadvertently omitted?

MPO SURVEY FOR NCHRP PROJECT 8-58: DEVELOPMENT OF A MULTIMODAL STATEWIDE CORRIDOR PLANNING GUIDEBOOK

Please respond by June 30, 2006

We need help in gathering information for a major research project on systems-wide planning focused on major corridors for the National Cooperative Highway Research Program (NCHRP).

Your assistance will be greatly appreciated.

Background

Federal transportation legislation requires states to develop long-range, statewide multimodal plans with at least a 20-year planning horizon. To meet this requirement, state transportation agencies have usually developed either policy plans or project-based plans. In recent years, some states have tried to refine those plans by giving special consideration to major transportation corridors of statewide or regional significance. These corridors address not only highways, but also other modes of moving people and goods.

Similarly, some MPOs have used a corridor planning approach for many years to develop their Long-Range Transportation Plans. One major method for accomplishing this was through the Major Investment Studies (MIS) based on requirements in the 1991 Federal Intermodal Surface Transportation Efficiency Act (ISTEA). Although later made optional, many MPOs still use the MIS approach to link Corridor Planning and NEPA to their long range planning process.

Some state DOTs have asked for guidance on how to develop detailed statewide corridor plans. As a result, NCHRP 8-58 *Development of a Multimodal Statewide Corridor Planning Guidebook* was initiated based on a request from the AASHTO Standing Committee on Planning. This research project will assist states in analyzing and prioritizing corridors through development of a Statewide Corridor Plan. The Plan could address the entire network of modes and their connections; analyze existing and future conditions; give consideration to system performance, safety, environmental impacts, land use, air quality, tradeoffs between modes, and other issues; and address multi-state corridor planning and other special state, regional, and local issues.

Instructions

Please help by taking the time to complete this survey and return it by e-mail to John Carr (jcarr@wilbursmith.com) by June 30, 2006. Just type your answers after each question. Please don't worry about formatting. The completed survey forms will not be published in any report.

While completing this survey, please keep in mind that the goals are to:

- Assess what transportation agencies are currently doing or considering in the practice of long-range, systems-wide corridor planning;
- Identify best practices in long-range, multimodal, systems-wide corridor planning;
- Identify how selected special issues are addressed in the transportation planning process; and
- Identify up to six "case study" transportation agencies for more in-depth analysis.

We realize that completing this survey will take valuable time away from your regular duties. Please be assured that your responses will provide a great benefit by helping us develop a guidebook that could be useful to your agency and other transportation agencies.

Thank you very much for participating in this survey!

Please provide contact information for (a) the person responsible for the MPO transportation planning process and (b) a contact person for any questions about this survey:

PERSON(S) RESPONSIBLE FOR MPO TRANSPORTATION PLANNING PROCESS

Name:
Title:
Office:
Agency:
Street, PO, or Office Address 1:
Street, PO, or Office Address 2:
City/State/Zip Code:
Phone Number:
Fax Number:
E-mail:

CONTACT PERSON FOR QUESTIONS ABOUT THIS SURVEY

Name:
Title:
Office:
Agency:
Street, PO, or Office Address 1:
Street, PO, or Office Address 2:
City/State/Zip Code:
Phone Number:
Fax Number:
E-mail:

PLEASE RESPOND BELOW BY CHECKING AN ANSWER OR PROVIDING A WRITTEN RESPONSE TO THE QUESTIONS, AS REQUESTED. THANK YOU!

Inquiry Area 1: Experience in using transportation corridor planning in project identification, selection, and prioritization for MPO plans and programs

1. Is your MPO Long Range Transportation Plan a corridor-based plan (i.e., do you attempt to define major corridors and identify/prioritize needs or set policies for those corridors)?

2. Are there state or local legislative or regulatory requirements or guidance – or agency policy or guidance – that directs such an approach for planning and/or how it is to be carried out? Please explain.

[NOTE: Please provide state and local legislative/regulatory references that define or mandate requirements, procedures, and/or criteria for statewide transportation planning and programming. If available on-line, please provide us with a link/web address below:

_____

3. Are there any anticipated changes to local or state legislation, regulations, policies, or process contemplated that would require, encourage, or direct the use of corridor planning as part of the transportation planning or programming process? If so, please explain.

4. If you do not currently have a corridor-based MPO Long Range Transportation Plan, has such a planning process been tried previously? If so, why is this approach no longer used?

5. If you do not have a corridor-based MPO Long Range Transportation Plan, are you aware of any formal process in your MPO for integrating the results of corridor studies into a larger plan or program? Please explain.

If you do not have a corridor-based MPO transportation planning process, please skip to Inquiry Area 2 on Page 5. All respondents should answer questions 1 through 7 and all questions in Inquiry Area 2.

If you have a corridor-based planning process, please answer the remaining questions in Inquiry Area 1 (# 6 through 17) on the next page and all questions in Inquiry Area 2 (# 18 through 28) starting on Page 5.

6. How are corridors defined and selected for inclusion/evaluation in the MPO transportation planning process? What criteria are used and how are they applied?

7. How are the results of the MPO corridor planning process used for project identification/selection/prioritization and development of the Transportation Improvement Program (TIP)?

[NOTE: If your project identification/selection/prioritization process is a public document, please provide a copy (electronic or hard copy) or a link/web address below:

_____

8. How are comparisons made between corridors for project identification, selection, or prioritization as part of the MPO planning and programming process?

9. How are the results of the MPO corridor planning process used to allocate resources?

10. Are there specific data requirements necessary to allow the comparison of corridors and corridor needs at the MPO level? If so, please explain.

11. How are comparisons made and conflicting demands resolved among different transportation users within a corridor (i.e., freight shippers/providers, commuters, tourists, intercity travelers, etc.)

12. How are multimodal and intermodal considerations incorporated into the MPO corridor planning process?

13. How is the MPO involved in your state transportation agency's statewide transportation planning process? If the state transportation agency uses a corridor-based statewide transportation planning process, what is the relationship between MPO corridors and state corridors?

14. What is the role of economic analysis and what tools or techniques are used, if any, in the MPO transportation planning process, particularly at the corridor planning level?

15. Do you use any models, tools, or special methodologies (e.g., travel model, benefit/cost analysis, REMI, HERS, HPMS, GIS analysis, or project scoring) in making decisions on project identification, selection, or prioritization, particularly at a corridor planning level? Please list and briefly explain.

16. How do you give consideration to the political process in the development of MPO plans or programs? For example, how do you consider and/or address political issues in determining "needs" versus "wants"?

17. If your MPO is comprised of more than one unit of government (i.e. multiple cities or counties) how do you address conflicting "wants" and "needs" in the development of MPO plans or programs and the prioritization process? How are differences in jurisdictional priorities resolved? Who makes the final decision?

[Please complete Inquiry Area 2 starting on the next page.]

Inquiry Area 2: Best practices and lessons learned

18. Which of the following are considered in your MPO transportation planning process (check all that apply – feel free to provide information on how these elements are applied in the planning process if time permits)?

____ a. Comparisons between transportation modes within corridors
____ b. The eight Federal planning factors
____ c. Land use
____ d. Urban design
____ e. Economic development
____ f. Consistency with other local or regional planning agencies
____ g. Consistency with other planning by state agencies
____ h. Freight movement
____ i. Public transportation
____ j. Traffic operations (e.g., ITS, TSM, TDM, access/corridor management, and congestion management)
____ k. Safety
____ l. NEPA process
____ m. Environmental objectives and mitigation opportunities
____ n. Coordination with or input from local, state, and/or federal resource agencies
____ o. Addressing different stakeholder priorities and interests
____ p. Public involvement
____ q. MPO local official consultation
____ r. Performance measures
____ s. Institutional/organizational issues and procedures
____ t. Innovative financing options
____ u. Public/private partnerships
____ v. Other _____

19. How do you obtain public input into your long-range transportation planning process? Please provide any special or innovative efforts you have successfully used to get input.

20. What aspects of long-range transportation planning in your MPO have been most effective in project identification/selection/prioritization and program development (e.g., type of process, criteria, methods for analysis, public involvement, or local consultation)? Please explain.

21. What aspects of the long-range transportation planning process in your MPO have been least effective? Please explain.

- What improvements are needed?

22. If your agency has been involved in any multi-jurisdictional (e.g., statewide, multi-government, inter-regional, or multi-state) corridor planning efforts, please briefly describe the project(s) and any key actions or elements that were most effective?

    o What actions or elements were least effective?

23. Based on your experience, how should needs and priorities on multi-jurisdictional corridors be addressed in the transportation planning process?

24. Please list at least two major challenges that are critical to a successful long-range transportation planning process.

25. Please describe any corridor planning efforts in other jurisdictions (e.g., states, other MPOs, RPOs, public transit system, etc.) that you consider good examples of the planning process or how planning information is used in the decision-making process. If available, please provide us with a name and contact information so we can obtain further information on those efforts.

26. Do you feel that your MPO is given adequate opportunity to participate or provide input into the statewide transportation planning process?

    _____ Yes

    _____ No (please explain)

27. Based on your knowledge and experience, how would you rate your state transportation agency's long-range transportation planning process (check one)? Please explain your response.

    _____ Excellent

    _____ Good

    _____ Needs Improvement

28. To help in our research efforts, do you have any other comments or information to provide on issues or topics that we may have failed to consider or inadvertently omitted?

APPENDIX C - CASE STUDY INTERVIEW GUIDE

NCHRP 8-58: Statewide Corridor Planning Guidebook

Case Study Format and Interview Guide **Oct. 2006**

Case Study Format

Following is the anticipated format for documentation of the case studies:

- Identification of state process, including supporting information and exhibits;
- Background, purpose, and description of the process;
- Lead/supporting agency and contact information;
- Key players/agencies/offices/organizations/stakeholders;
- Relationship to various planning and programming activities;
- Current status;
- Fiscal considerations;
- Key institutional structures;
- Method of corridor evaluation (i.e., prioritization/evaluation between or among corridors)
- Method of modal evaluation (i.e., prioritization/evaluation across modes);
- Method of addressing Special Emphasis areas;
- Method of addressing political considerations;
- Implementation strategies;
- "Iceberg" analysis – what obstacles were avoided and how?
- Success factors;
- Lessons learned;
- Opportunities for application of success factors; and
- "How to" information, as appropriate.

Case Study Interview Guide

Document review will precede the case study visits, as will telephone conversations with key participants to make sure they understand the intent of the visit and of the information desired.

The case studies will focus on questions from the national survey, with emphasis on items that have made the candidate of interest to the research team. It is likely that case study visits will also emphasize institutional and process-oriented type of information that is often difficult to obtain via a survey. It will also attempt to gather additional information on methods and processes used to address Special Emphasis areas.

In general, on-site interviews with Case Study agencies and organizations will involve:

1. A quick discussion of all of the questions on the survey to better understand the responses and to clarify any comments, as needed.
2. Questions to give special attention to and gather more detailed information on the issues addressed in the survey, such as:
   - § Why the corridor planning approach was chosen for the transportation planning process;
   - § What are the overall goals and objectives of the statewide corridor planning process;
   - § Legislation, regulations, or official governmental or agency policies on the process;
   - § Organizational relationships and responsibilities;
   - § Process (i.e., tasks, schedules, work flow, responsible offices, roles, etc.);
   - § How multimodal/intermodal transportation systems and facilities are considered;
   - § Method for identifying, categorizing and/or selecting corridors;
   - § Method used to define corridor boundaries, including corridor access and connections;
   - § What data, information, tools, and performance measures are used for statewide corridor planning analysis;
   - § More detail on how the planning process addresses or gives consideration to Special Emphasis areas, such as public involvement, land use, environmental issues and mitigation, traffic operations, safety, economic development, freight movement, and transit;
   - § How corridors are considered to identify and/or prioritize projects for future implementation;
   - § Funding and financial requirements and processes;
   - § Perceived advantages and disadvantages of the corridor approach; and
   - § Addressing other issues as suitable, based on survey responses and/or literature review.
3. For MPOs, the interview will also include a discussion of how the MPO process interacts with the statewide transportation planning process.
4. For the organization(s)/states involved in multi-state corridor planning efforts, the interview will address how the states work together, how they reach agreement on prioritization of needs and projects, and how they incorporate those into statewide transportation planning and programming.

Obtain and review copies of any guidelines, reference manuals, technical documents, etc. issued by the state DOTs, the MPO, or the I-95 Coalition that may provide information relevant to the purpose of this research project.

APPENDIX D - CASE STUDY FINDINGS

The following presents more detailed information related to Statewide Corridor Planning for each of the agencies chosen for Case Study research, including a discussion of the corridor-based planning process used by the agency, the decision-making process, special emphasis areas (if any), and special challenges, effective practices, and lessons learned in the process.

Case Study: Colorado Department of Transportation

The Colorado Department of Transportation (CDOT) was selected as a Case Study candidate based upon input received in a survey completed for the NCHRP 8-58 research project. Colorado has a decentralized planning process, with responsibility for planning shared with rural regions, MPOs, Districts, and other DOT offices. Like most states, CDOT prepares a policy plan. CDOT's process is affected by some legislative requirements. The Colorado DOT was chosen as a case study candidate primarily because of its corridor selection process.

Corridor-Based Statewide Planning

State legislation enacted by the Colorado General Assembly in 1991 directed that the state transportation planning process is to occur as a cooperative process with regional planning commissions and transportation planning regions (TPRs). This legislation requires the development of a twenty-year regional transportation plan for TPRs that include a metropolitan planning organization and provides that other TPRs may also undertake development of a regional transportation plan.

With policy direction provided at the statewide level through the Colorado Transportation Commission, regional planning commissions prepare transportation plans that identify and prioritize regional long-range transportation needs for all modes. These regional plans and priorities are integrated and consolidated into the state's 20 year intermodal plan, which serves as the blueprint for how transportation resources are invested and projects are selected for implementation.

Colorado is divided into 15 Transportation Planning Regions (TPRs). There are 10 rural TPRs and five urban TPRs that include Metropolitan Planning Organizations (MPOs). Each TPR is responsible for developing a financially constrained, corridor-based, multimodal Regional Transportation Plan that is consistent with Transportation Commission policy. CDOT and the Transportation Commission set the direction for these plans, and CDOT provides funding for regional plan development, but the regional planning process is locally driven.

Colorado statutes have created a Statewide Transportation Advisory Committee (STAC), composed of one member from each transportation planning region

(TPR). The STAC assists the DOT in consolidating the regional plans into a unified Statewide Transportation Plan. The Transportation Commission sets policy guidance for the process, including operating parameters, investment category goals, and performance measures.

The Colorado DOT's early efforts in statewide transportation planning were toward a project-based Statewide Transportation Plan. However, for later updates of the plan, it was decided that making "promises" in a long-range plan was misleading since projects could easily be removed or delayed over time as circumstances change. Also, there was concern that officials and the public would only focus on "their" projects in the Statewide Plan and not give proper attention to the planning process for the overall transportation system.

The current statewide transportation plan, *Moving Colorado – Visions for the Future*, is a policy level, corridor-based plan in which the DOT defines corridors, identifies specific need categories established by public input for each corridor, and reviews financial abilities and limitations. *Moving Colorado – Visions for the Future* was published in February 2005 and has a planning horizon through year 2030. The plan is fiscally constrained.

The 2030 plan includes corridor visions for about 350 transportation corridor segments. CDOT established corridors in collaboration with the Transportation Planning Regions (TPRs), by segmenting Colorado's highway system into sections, including all modes and facilities within a given geographic area.

Logical corridor boundaries were defined by "travelsheds." Travelsheds are not specifically defined as a given corridor width based on a specific distance from the major facility on which the corridor is based. Rather, boundaries are based on a subjective assessment that determines which locations are dependent on that facility for access and mobility outside the immediate area. Therefore, travelsheds can be wide in some places, if no other major facilities are located nearby, or narrow in some places, if other nearby facilities are available to provide additional access or mobility to a given region.

A Corridor Vision Statement, covering needs, values, goals, and strategies, was developed for each corridor section. Input from local communities, transportation regions, and statewide perspectives was collected to develop each Vision. To assist in the regional visioning effort, CDOT developed a Corridor Vision toolkit with involvement by the TPRs. CDOT was planning to add an "environmental tab" to the Corridor Vision tool with input provided through an environmental forum held with resource agencies, including advocacy groups, in March of 2007.

Multimodal and intermodal issues are addressed in the corridor visions. Regional and MPO Corridor Visions were incorporated into *Moving Colorado – Visions for the Future.*

Comparisons between corridors are made and conflicting demands between users are resolved at the regional planning level during initial corridor visioning and plan development. Some of the data requirements for comparing corridors and needs include bridge and pavement condition inventories, safety information, congestion levels, AADT, VMT, and maintenance level of service. Corridors are fit into a tiered priority system based on systems designation: interstate, non-interstate NHS, and other state highways.

A variety of public involvement measures were incorporated into the statewide planning effort including: regional forums, focus groups, information tables at retail locations, Transportation Commission workshops, and more than 100 small community outreach meetings for towns with a population less than 5,000. Personal invitations were sent out for rural transportation forums. Outreach efforts also included a media campaign, newsletters, and expansion of CDOT's website. Electronic voting was utilized in some venues to engage the public.

A unique tool was used in some forums to get input on project priorities by challenging attendees to "spend" limited dollars on a program of projects in their areas. In this exercise, projects and costs were displayed on a map, and participants were assigned a fiscally constrained budget. The object of the exercise was for each participant to select his or her highest priority projects without exceeding his or her budget.

Decision-Making Process

Four investment categories have been identified to guide funding decisions by CDOT: mobility, safety, system quality, and program delivery. Specific performance measures and objectives have been developed for each investment category, allowing the Transportation Commission and CDOT to make informed trade-offs as they decide how best to allocate limited financial resources. These categories are applied to available funding and matched to corridor needs outlined in the vision statements. Changes can be made to investment category funding allocations through a formal approval process for: (1) a different purpose, (2) a different amount (generally, an increase), (3) a different mode (e.g., trading dollars from a highway project to a transit project, perhaps with a required local match), (4) retaining a project over time if TIP allocates only a part of the total cost (with cost adjusted for inflation over time), and (5) consideration of a non-plan project that does not meet the corridor vision.

CDOT has developed a Plansite database which includes all regional plan projects and costs, reports on corridors by investment categories (mobility, safety, system quality, and program delivery), and electronically links STIP projects to the respective corridor to assure there is money available for that corridor to implement the project.

Tools used in the project identification/prioritization process include:

- A pavement management system that creates annual pavement condition reports and estimates future needs in an attempt to maintain the pavement network according to specified performance goals. The PMS recommends the most cost-effective pavement surface treatments and maintenance activities;
- A congestion relief program that highlights sections of roadways where the volume/capacity ratio is greater than 0.85; and
- A travel time mobility demand measure that is being developed to rank congestion projects.

Each Colorado DOT region conducts public involvement activities with TPRs to identify high priority projects at least every two years. These projects are screened against the corridor visions, goals, strategies, and available funds before going into the STIP.

Differences between CDOT and the TPRs are negotiated, and differences between TPRs are reviewed and resolved by a legislatively-created Transportation Advisory Committee. There is a distribution of funds by DOT Region with TPRs.

Developing accurate project costs and funding transportation projects are major challenges. Transportation Commission policy prioritizes the spending of most state and federal highway funds in accordance with the investments-strategy categories of mobility, safety, system quality, and program delivery. Local governments decide how to allocate local funds for roads and transit, as well as the portion of the state Highway Users Tax Fund that is directed to upkeep local roads.

Special Planning Areas

Environment

CDOT has made significant efforts to link corridor planning to the STIP, particularly by combining planning and environmental analysis. Early environmental planning is done on corridors to try to streamline the NEPA process. This generally has had mixed results, with problems primarily in addressing endangered species. CDOT is trying to get ahead on habitat banking, and they are developing a more programmatic approach to environmental efforts. CDOT works with Colorado's Environmental Resource Council by providing data and assisting with Resource Management Plans.

Challenges, Effective Practices, and Lessons Learned

Challenges: A major challenge Colorado faces in the statewide corridor planning process is balancing the urban need for congestion relief with statewide/rural needs for system preservation.

Limited resources are another challenge, with finite state and federal funding levels coupled with the unlimited needs of an aging infrastructure and an

expanding population. CDOT is dealing with revenue shortfalls and finds that allocating limited resources fairly is a continuing challenge: first, between CDOT and the TPRs and, then, equitably among the 15 TPRs. To address funding, the following measures were being pursued at the time of case study development:

- The 2035 STP will provide a short term implementation component to guide STIP priorities in light of realistic revenues;
- The Colorado Tolling Enterprise had developed plans for a system of toll corridors to generate funding; and
- Public/private partnerships and other innovative techniques were being incorporated to provide key support to the system.

Last but not least, effective public involvement is a constant challenge for Colorado DOT.

Effective Practices: The following are viewed as effective practices being carried out by the Colorado DOT:

- Partnering with the TPRs fulfills a legislative requirement, but it is also a good practice for getting local input and participation in the decision-making process. Local TPR participants know the unique character of each region. Local participation also helps build local understanding of the process and support for the outcome.
- The corridor visioning approach to planning has been widely viewed as a positive step in the planning process, based on feedback from participating stakeholders. Of special note is the creation of an electronic Corridor Visioning Toolkit to assist the TPR partners in their visioning efforts.
- Further assistance has been provided to the TPRs and MPOs for planning guidebooks that spell out the tasks to be done, guidance on methods, and the roles and responsibilities of the planning process participants.
- Another key to success has been proactive communication/coordination with the State Transportation Advisory Committee. This has enabled the DOT to get valuable input and to build the support and buy-in needed to give credibility to the planning process.
- The extensive efforts to bring environmental issues into the process give an added dimension to the visions and project development for the corridors. The statewide environmental forum held in March 2007 brought together CDOT, TPRs, MPOs, resource agencies, and interest groups to discuss issues, share information, and develop basic environmental resources that can help guide the planning and project development process.
- For multi-state planning efforts, one key to success is ensuring travel connectivity by considering consistent border crossings.

Lessons Learned: Colorado DOT identified the following important lessons learned through the planning experience:

- The Colorado DOT needs to be more specific in defining the corridor visioning process to avoid the development of "visions" that are all-inclusive;
- Visions should be reality-based; and
- Implementation plans should be broken down into time periods, e.g., 5 to 10 year intervals.

Case Study: Florida Department of Transportation

Florida's Department of Transportation (FDOT) was selected as a Case Study agency based on information provided in the agency survey completed for the NCHRP 8-58 research project. Florida has a decentralized planning process, with responsibility shared among several offices. FDOT indicated that the *Florida Statewide Plan* (FTP) should be classified as "Other" (rather than as a Policy or Project plan) because specialized plans are prepared with a mix of policy, program, and projects by several offices.

Almost all corridor planning is done at the District level, and some prioritization of projects is done both at the Districts and through coordination with the Central Office. FDOT Central Office has developed a variety of tools to assist Districts in prioritizing recommended projects. Many aspects of the process are guided by legislation. Florida DOT was chosen as a case study candidate primarily because they have a transportation planning process that addresses every major intermodal transportation system including every major type of transportation facility: highways, transit, rail (freight/transit), airports, waterways (inland/coastal), and seaports.

More important, FDOT is one of the few states that has made serious attempts to address multimodal/intermodal transportation issues and trade-offs.

Corridor-Based Planning

The 2025 Florida Transportation Plan (FTP), which was adopted in December 2005, updated the 2020 Florida Transportation Plan. The 2025 FTP identifies goals, objectives, and strategies to guide transportation decisions in Florida over a 20 year horizon. The FTP addresses how Florida's transportation system can meet the mobility needs of a growing population, help make the economy more competitive, help build great communities, help preserve the natural environment and ensure that the transportation system is safe and secure in a time of unprecedented public concern. The FTP provides guidance on how transportation investments should be focused during a time of constrained funding, as well as how public and private transportation partners should work together to make such decisions.

A committee of 45 people, representing all levels of government, all transportation modes, the private sector, economic development organizations, environmental interests and all regions of the state worked together to develop

the 2025 FTP. Extensive public and partner involvement was used to support the committee's work. Two statewide summits, 14 regional forums, six focus group meetings, 43 briefings at regularly scheduled meetings of transportation partners, and an interactive website and email system contributed to this process.

The FTP examines trends that are expected to influence what Florida will look like in 2025 and implications of these trends for transportation. Long range goals, objectives, and implementation guidance identify how desired results can be achieved and progress monitored. This FTP differs from previous state plans by focusing on transportation's role in supporting economic competitiveness, community building, and conservation planning and by giving greater attention to financing needed transportation improvements. The FTP focuses on achieving identified goals and strategies by defining roles, responsibilities, and accountability for implementing the FTP, with greater emphasis on regional transportation planning.

Strategic Intermodal System

FDOT has historically done multi-modal corridor planning studies for multi-use corridors (e.g., highway, rail, seaports, and even including utilities). However, there were often problems raised by environmental agencies and the public because the DOT had used the "Decide and Defend" (DAD) approach to transportation project development, and particularly to highway widening.

Several statewide transportation and transportation-related groups convened in 1999 and 2000 to address concerns resulting in the establishment of a new long range objective under the Economic Competitiveness Goal in the then-current FTP (*2020 Florida Transportation Plan*, updated in 2000). Following is a summary of those meetings and the resulting recommendations:

- The Freight Stakeholders Task Force (1999) recommended fast track funding and enhancements to freight mobility;
- The Florida Chamber Foundation's Transportation Cornerstone Report (1999) recommended focused investment in trade corridors and efficient intermodal connections between airports, cruise terminals, and major attractions;
- The *Florida Strategic Plan For Economic Development 2001-2006* recommended improved modal options and connectivity between the different modes and terminals, as well as congestion relief;
- The Transportation and Land Use Study Committee (1999) recommended true multimodal planning and transportation systems like the Florida Intrastate Highway System, but including all modes; and
- The Growth Management Study Commission (2000) recommended a more strategic and efficient protection of the State's transportation interests.

Thus, the need for a strategic intermodal transportation system was established and work began by the Florida DOT to fulfill that need.

Florida's Strategic Intermodal System (SIS) was formally established in 2003. The SIS includes all forms of transportation and integrates individual facilities, services, modes, and linkages into a single, integrated transportation system. The SIS is a statewide network of high-priority statewide and regionally significant transportation facilities and services, including the state's largest and most significant commercial service airports, spaceport, deepwater seaports, freight rail terminals, passenger rail and intercity bus terminals, rail corridors, waterways and highways.

Multimodal SIS Hubs, Corridors, and Connectors rely on connectivity and volume thresholds to designate these facilities as primary to Florida's mobility network. Facilities may be designated as of Statewide/Interregional, Regional, or Local significance.

The SIS helps FDOT to:

- Target expenditures to help the State's economic competitiveness, including increased corridor emphasis in planning and funding projects;
- Apply innovative policies and technologies, including Intelligent Transportation Systems; and
- Clarify the State's roles and responsibilities on and off this system.

The SIS assisted FDOT in the recent update of the *Florida Transportation Plan* (2025 FTP), mentioned above. The 2025 FTP directs full implementation of the SIS Strategic Plan and update of the SIS designation and Strategic Plan at least once every five years based on guidance provided by the initial SIS Strategic Plan and the 2025 FTP.

Key elements to FDOT's SIS planning process include:

- FDOT Central Office (CO) develops policies, guidelines, training, tools, etc. for Districts. Each District has a SIS Coordinator. CO Systems Planning coordinates with the District.
- Public involvement measures have included open meetings, media coverage, consultations with elected officials, websites, newsletters, and focus groups.
- There is an increasing emphasis on linking transportation planning and economic analysis. Statewide economic impact forms a major module in the project prioritization process.

Florida's Future Corridors Action Plan

Florida's Future Corridors Action Plan (Action Plan) was created to identify a vision, goals, objectives, planning processes, and implementation strategies for statewide multimodal transportation corridors for the next 50 years. The FTP

criteria were used to guide decision-making for the Future Corridors Program. The *Future Corridors Action Plan* identified three types of statewide corridor improvements for highways, railways, and waterways to fill gaps:

- Transformation of existing facilities;
- Development of new parallel facilities; and
- Development of new facilities.

Existing corridors may be enhanced with the addition of other modes within or near the right-of-way, while new corridors would be planned for multimodal uses. Four broad policy goals, along with corresponding policy objectives and criteria for corridor evaluation, were developed for the Future Corridors Program:

- Mobility/Connectivity;
- Economic Competitiveness;
- Community Livability; and
- Environmental Stewardship.

A three step planning process for future corridors was developed that included:

- Concept Stage - High level screening of the concept to (1) identify potential corridors and validate whether statewide connectivity or mobility needs exist in the study area and (2) determine if a transportation investment is consistent with regional and state plans, including the State Transportation Plan.
- Feasibility Stage - Study of Corridor Feasibility to develop consensus in defining the corridor and corridor issues, resulting in specific and feasible improvement alternatives for the corridor
- ETDM/PD&E Stage – The "Efficient Transportation Decision-Making/Project Development and Environmental Stage" defines the effects and impacts of the alternative corridor improvement projects to address a full range of engineering, community, and environmental issues.

Discussion of the financial challenges for implementation identified tolls as a major funding source with traditional financing method covering the remaining funding "gaps".

Decision-Making Process

Comparisons occur between projects, prioritized by District DOT offices with Central Office guidance. FDOT Central Office has developed a variety of tools to assist Districts in prioritizing recommended projects. Two of the tools used by district DOT offices to provide standard planning input include:

- The Cost Feasible Plan Tool, which allows for project addition, editing, and ranking; and

- The SIS Investment Tool (SIT), still under development, which ranks potential projects based on the five SIS goals: safety, system preservation, mobility, economic competitiveness, and community/environment.

Corridor priorities are set through the SIT. This primarily involves highways, although some progress has been made for rail. Air and sea needs are negotiated with the respective councils that oversee those modes.

Prioritization among corridors gives consideration to transportation needs now and in the future (e.g., by addressing current and future commodity flows and tourism travel). In 2006, FDOT was still trying to define the screening process, but project readiness and impacts were expected to be key factors in the process.

Priorities among modes depend on the corridors, since the importance of modes are more applicable in some corridors than others. At one time, Florida had established a policy to limit highway expansion, with a maximum of six lanes and four managed lanes (up to 10 lanes), but this policy is no longer in the statutes.

FDOT, along with a Modal Outreach Team of transportation experts, is developing a methodology for determining project priorities for the Strategic Intermodal System (SIS). This incorporates project priority criteria currently used by operators of Florida's highways, seaports, airports, and railroads. There are five categories of prioritization criteria, each corresponding to SIS goals.

To spur economic development, Florida state policy identifies “Rural Areas of Critical Economic Concern” which are given preference during project allocations, when appropriate.

The SIS planning process moves projects through (1) the Multimodal Unfunded Needs Plan to (2) the Multimodal Cost Feasible Plan to (3) the 10 Year Plan and finally (4) the SIS Five Year Work Program, as funding becomes available.

Special Planning Areas

The Florida DOT has been involved in some special planning initiatives, including the following.

Multi-State Corridors

FDOT is involved with both the I-95 and I-10 multi-state corridor planning initiatives. The following summarizes these initiatives.

- I-95 and I-10 are two of six routes designated as a “Corridor of the Future”, as part of a new federal initiative to develop multi-state corridors to help reduce congestion. The initiative will encourage States to explore innovative financing as a tool to reduce congestion on some of the most critical trade corridors, improve the flow of goods across our Nation, and enhance the quality of life for all citizens.

- FDOT is part of the I-95 Corridor Coalition, an alliance of transportation agencies, toll authorities, and related organizations, including law enforcement, from the State of Maine to the State of Florida, with affiliate members in Canada, which provides a forum for key decision and policy makers to address transportation management and operations issues. The Coalition has successfully served as a model for multi-state/jurisdictional interagency cooperation and coordination for over a decade.
- Florida is part of the National I-10 Freight Corridor Coalition, which also includes California, Arizona, New Mexico, Texas, Louisiana, Mississippi, and Alabama.

Regionalism-Scenario Planning

Florida is divided into eight regions. FDOT acknowledges a need to address how to connect those regions by developing inter-regional corridors. One problem in dealing with these regions is the deficiency or absence of inter-governmental authority for decision-making and implementation. FDOT is working to influence regional growth through a "sentry" commission and through the use of scenario planning.

Land Use

FDOT recognizes that the current transportation system cannot sustain the expected growth (1,100 persons/day) over a 50-year horizon, so transportation is considered in Florida as a land-use tool to organize growth. In 2005, a Growth Management law was passed as a step to more adequately influence growth in Florida. The law updated Florida's growth management framework which sets out to close the gap between new development and the construction of needed transportation infrastructure. The bill provides increased funding through new and existing capital investment programs including SIS.

Challenges, Effective Practices, and Lessons Learned

Challenges: The following items are challenges to FDOT throughout the planning process:

- Successful public involvement;
- Coordination of planning efforts to maximize freight capacity, since planning horizons for the DOT and individual freight carriers differ widely and private companies are reluctant to share information;
- Intermodal allocation;
- Public transit guarantees; and
- Authority to use funds for other modes.

Effective Practices: FDOT has found the following to be successful throughout the planning process:

- Project identification and programming techniques developed during the 1990s for the Florida Intrastate Highway System (FIHS);

- Funding innovations and changes in the use of:
- Local option infrastructure tax (11 cents of gas tax, which has been initiated by 14 of 67 counties),
- Local option sales tax (1% for infrastructure – locals sometimes use this to advance schedule of projects),
- Gas tax use for air, sea, and rail, but one-half must come from local sources (at least half goes to the SIS – 62% in 2006, but goal is 75%),
- Public-private partnerships, and
- Tolls;
- Development of the SIS;
- Building constituency transparency into the process;
- Building a policy framework;
- Use of independent facilitation in the public involvement process;
- Effective Transportation Decision Making (ETDM) which creates a perception of openness and inclusion;
- Creation of the Wekiva Task Force and the planning framework for a special corridor planning effort in the Wekiva Basin Area, which is used as the framework for future corridors; and
- Support from Governor, legislature, environmental agencies, and land use agencies.

Lessons Learned: FDOT has learned the following from going through the planning process:

- MPO creation of multimodal LRTP would provide a valuable improvement within the planning process.
- Several issues are identified as key to the statewide planning process, including:
    - Increasing business involvement, as users and financiers,
    - Increasing public/private partnerships,
    - Improving regional coordination,
    - Improving multimodal coordination, and
    - Planning for several economic scenarios.
- The planning process must have a strong project manager and the right "champion" in a leadership role;
- To keep progressing, the DOT must continue processes with reduced staff and increased use of consultants; and
- Planning must be practical and political. It must be "in advance of saturation" and should include the use of: (1) existing facilities (e.g., adding truck lanes), (2) rail (freight and passenger), and (3) new corridors.

Case Study: Indiana Department of Transportation

The Indiana Department of Transportation (INDOT) was selected as a Case Study agency based on information provided in the agency survey completed for the NCHRP 8-58 research project. Indiana was the only survey respondent that indicated use of a corridor-based statewide planning process for a project-based Statewide Transportation Plan (STP), which is the primary reason that INDOT was chosen for a case study.

There are no specific legislative or regulatory requirements, and no formal agency policies or guidance, that define the approach for the statewide planning process in Indiana. However, prior legislation identified some specific priority corridors, as discussed later in this section.

At the time of the survey and interview, the state and the DOT had recently gone through a change in administration and, therefore, corresponding changes in agency direction, policies, and priorities. For example, the new administration was not in favor of the project-based transportation planning approach being used by INDOT for the new update.

Of special importance, INDOT was converting from a centralized to a decentralized planning process, in which the Central Office Division of Planning would be working with and supporting the District planning function. Due to the transition, there were still many unanswered questions regarding the future of INDOT's planning process, so the level of information gathered by the Case Study research team was somewhat limited.

With this qualification, the following sections summarize the results from the survey, a face-to-face interview with INDOT staff, and related INDOT document reviews. This summary provides a snapshot of the INDOT planning process at the time of the survey and interview.

Corridor-Based Statewide Planning

The Indiana Department of Transportation's 2030 Long Range Transportation Plan was recently updated, including integration with the DOT's Major Moves 2006-2015 Construction Plan, a 10-year "programming" document. The 2030 Plan provides INDOT and its planning partners – including the state's Metropolitan Planning Organizations (MPOs) and other key transportation stakeholders – with a long range vision of how the state's transportation system will develop in the future. The Plan focuses on identifying and prioritizing specific highway expansion projects (e.g. added travel lanes, new road construction, interchange modifications, and new interchange construction). More specifically, the 2030 plan:

- Assigns project priorities by using a data-driven analysis and scoring process to score long-range projects on congestion relief and system importance;

- Estimates realistic future project costs;
- Provides long range fiscal forecasts to appropriately account for economic conditions; and
- Sequentially applies priority projects to the estimated available funding by implementation period (years).

Major Moves, the new project-based construction plan, defined a toll/lease process dedicated to infrastructure that helped in securing and retaining funding. Project funding depends largely on the Highway Trust Fund and national policy and legislation, but the new long-range transportation plan also identifies potential funding sources, including projected tax revenues, bonding, toll revenues, and public-private partnership (3P) funding.

Under prior legislation, the Indiana legislature had established specific Commerce Corridors, largely based on the National Highway System (NHS), which were used in previous statewide planning efforts. The new INDOT direction was to also establish a new system of Statewide Mobility Corridors to address travel-time deficiencies between cities, relying heavily on Travel Demand Model forecasts, HPMS data, and HERS analysis.

At the time the plan update was done, there were 10 proposed corridor studies, with three of those already active. For inclusion of projects from these studies, funding "placeholders" for unfunded projects were included in the STP.

Some key elements of INDOT'S corridor planning process are as follows:

- With the new decentralized planning process, Districts would be taking the responsibility for meetings/consultation with the MPOs and RPOs in identifying and prioritizing corridors.
- Corridors are defined between major activity centers based on travel time, traffic volumes, route classifications, and stakeholder input.
- Corridors are tiered into one of three levels for highways – statewide, regional, or local access. Each of these incorporate special characteristics related to design standards, speed, level of free flow conditions, trip distance, traffic volumes, commercial vehicle traffic, commuter traffic, number of lanes, divided highways, access control, grade separations, travel through or around congested areas, vehicle/pedestrian interaction, major river crossings, and level of direct access to residences, businesses, and rural/urban areas.
- INDOT has used the following technical planning tools as part of the planning process:
    - TransCAD based Statewide Travel Demand Model and Geographic Information System;
    - Major Corridor Investment Benefit Analysis System (MCIBAS);
    - Corridor Travel Demand Analysis;
    - Benefit/Cost Analysis Framework;

    - User Benefit Analysis;
    - REMI Economic Simulation Model;
    - Indiana State Highway Economic Requirements System – State Version (HERS-ST-IN); and
    - INDOT Management Systems (Coordination with pavement, bridge, public transportation, intermodal congestion and safety management systems).
- Multi-jurisdictional project issues are resolved through coordination: DOT district offices, MPOs, and RPOs meet to discuss differences. The INDOT Central Office is responsible for the final decision on projects, priorities, and programs.
- A corridor-based plan complements the project-specific statewide plan to determine system-wide priorities. In the INDOT project scoring system, points are awarded for projects which lie along an identified priority corridor.
- Political considerations are awarded points in the project scoring criteria by using a "community input variable" that provides an additional point value for letters of support from elected officials.
- INDOT's primary tool to engage the public concerning the 2007 update to the Long-Range Plan was a web page dedicated to the plan. The website was updated regularly, particularly when significant milestones were achieved, and included a "Tell Us What You Think" link for users to provide input. A number of coordination meetings were held that included INDOT District personnel, MPOs, and RPOs.
- INDOT conducted a market research study to identify issues of importance to the general public, as well as particular stakeholders. A key component of the study was a survey of the state's population aimed at validating INDOT's Policy Plan and identifying emerging areas on which INDOT should focus. Survey responses were evaluated for potential implications for long range transportation, particularly the current relevance of the nine previously-determined transportation policy areas: System Effectiveness, Safety, Demographic Changes and Quality of Life, Finance, Intergovernmental Coordination, Economic Development, Natural Environmental and Energy, Bicycle and Pedestrian Facilities, and New Technology. From this public input survey, it was determined that the previously identified policy areas continued to be relevant, although there are some emerging areas that should also get recognized, including:
    - Congestion management;
    - Improved highway maintenance; and
    - Scheduling of construction and maintenance projects.

Decision-Making Process

One of the significant aspects of the INDOT statewide planning process is the creation of a scoring system based on Congestion Relief, Roadway System Importance, and Project Priority.

- For Congestion Relief, a pre-set number of points are assigned for specific thresholds of Annual Average Daily Traffic, Volume to Capacity Ratio, and Level of Service Improvement derived through the Travel Demand Model for future scenarios.
- For Roadway System Importance, pre-established points are assigned based on Functional Classification, Mobility Corridor Classification, and National Highway System.
- To adjust for political and/or public opinion, the scoring includes a Project Priority Index that assigns additional points, first, depending on whether a project is already committed and, second, for various levels of project support.

This scoring process was used to determine which projects were included in the 2030 Long Range Transportation Plan. Fiscal constraints were based on available funds derived from long-range fiscal forecasts and geographical allocations based largely on historical funding and expenditures.

Special Planning Areas

Access Management

INDOT completed a Statewide Access Management Study in 2004 and was currently working to implement strategies throughout the state. The Indiana Access Management Study produced an Access Management Guide intended to govern all access management decisions for INDOT, but may also be used by state and local officials in implementing access management

INDOT's access management process supports refinement of the Long Range Transportation Plan in terms of implementing the Statewide Mobility Corridor Concept and guiding the overall development of the state highway jurisdictional system.

Challenges, Effective Practices, and Lessons Learned

Challenges The following challenges to a successful statewide planning process were identified by INDOT:

- Providing adequate highway capacity for travel congestion and freight movements despite limited financial resources;
- Providing guidance to MPOs performing air quality analysis for long range projects;
- Getting buy-in on use of a project-based plan from leadership;
- Continuing to successfully fund projects while revenues are decreasing and project costs are rising. INDOT's 10-year Major Moves programming document included capital expansion projects totaling $14 billion, but financial constraints required that some projects be removed to match a $10 billion threshold.

Effective Practices: The following were considered as the most effective practices in INDOT's planning process:

- Development and application of criteria for the identification of Statewide Mobility corridors;
- The use of the Travel Demand Model and HERS-ST in project identification and analysis;
- Development of a project scoring system to select and prioritize projects for long-range planning and for programming;
- The use of a web-based distribution point for plan updates;
- The Access Management Study that developed standards for the Statewide Mobility Corridor concept, including access management guidelines based on number of lanes, corridor type, and highway classification; and
- The use of a streamlined environmental review process in partnership with FHWA on ten corridor studies.

Lessons Learned: The most important lesson learned by INDOT has been the importance of accurate cost estimation on proposed projects to manage decreasing revenues and increasing construction costs.

Case Study: North Carolina Department of Transportation

The North Carolina Department of Transportation (NCDOT) was selected as a Case Study candidate based upon input received in a survey completed for the NCHRP 8-58 research project. NCDOT was selected primarily because they have recently made the transition to a corridor-based approach with their Strategic Highway Corridor Initiative (SHCI), so it would be of value to determine how NCDOT came to that decision.

The North Carolina State Department of Transportation (NCDOT) is divided into 11 main divisions with 14 local division offices under the Division of Highways located geographically throughout the state. The Transportation Planning Branch is organized into six regional planning groups: Mountains, Metrolina, Triad, Triangle, Northeast and Southeast. Each of these units is responsible for coordinating transportation planning activities in their region.

Corridor-Based Statewide Planning

In 1989, the North Carolina General Assembly passed legislation to designate the North Carolina Intrastate System. This is a 3,600 mile system of specifically designated and prioritized highways to "provide high speed, safe travel service" to connect population centers within and outside the state. The legislation stipulated that routes on the Intrastate System were to be improved to (1) encourage economic development and growth, and (2) connect outlying areas of the state to major population centers. All routes in the Intrastate System were to be upgraded to at least four travel lanes, unless fewer lanes are needed due to low projected traffic volumes or environmental considerations. When warranted, segments of the Intrastate System were to include vertical separations or

interchanges at major crossings and bypasses. Access to the Intrastate System was to be determined by travel service and economic considerations. While a process was included in the legislation to add routes to the Intrastate System, an Equity Formula used to distribute funds has had the effect of limiting the number of changes. Therefore, there have only been two additions to this system since its creation.

North Carolina's current "Long Range Statewide Multimodal Transportation Plan" was approved and adopted by the Board of Transportation on September 2, 2004. The plan is an update of North Carolina's first statewide plan, completed in 1995. The new Statewide Transportation Plan is the product of a three-year planning process that included technical analysis, public outreach (regional forums, a leadership summit, a plan-specific website, stakeholder meetings, and distribution of various publications) and strategic planning.

One major element of the transportation planning framework was the creation of the North Carolina Multimodal Investment Network (NCMIN) which organizes all transportation facilities by interest, travel function, role, and use. The NCMIN is also stratified into three tiers: Statewide, Regional, and Sub-Regional. One key element of the NCMIN is a system of Strategic Highway Corridors.

The North Carolina Board of Transportation has adopted the Strategic Highway Corridor Initiative (SHCI) into *North Carolina's Statewide Transportation Plan*. The SHCI was driven largely as a result of issues related to cost, environmental protection, alternatives analysis, population growth, and public input.

NCDOT developed the SHCI with extensive public input and the cooperation and endorsement of the North Carolina Department of Commerce and the North Carolina Department of Environmental and Natural Resources.

The selection of Strategic Highway Corridors was based on mobility, connectivity, interstate connectivity, and interstate relief. The SHCI currently incorporates 5,400 miles of state highways. SHC visions place each corridor into one of four categories: freeways, expressways, boulevards, and thoroughfares. Planning decisions and design standards vary for each category. Most of the Strategic Highway Corridors are freeways and expressways. The primary goals for each corridor include improvements in mobility and modal alternatives. The corridor visions define a specific long-term function for each facility, and future projects are reviewed to ensure compliance with these visions.

The SHCI focuses on (1) preserving and maximizing mobility and connectivity on a core set of highway corridors, (2) promoting environmental stewardship through the maximum use of existing facilities to the extent possible, and (3) fostering economic prosperity through the quick and efficient movement of people and goods.

The SHCI has proven effective in bringing stakeholders into the discussion process for preserving critical statewide mobility. Widespread support was generated as a result of the effort. However, there has been a mixed reaction from the MPOs and RPOs. In particular, there have been problems in the development of a local vision for some corridors.

Local input into the planning process is gained through coordination and collaboration with local governments and regional planning organizations, including metropolitan, small urban, and rural. State legislation requires municipalities to develop long-range plans and mandates that the NCDOT cooperate in developing these plans. This has been expanded by NCDOT to include both urban and rural planning.

Analytical support is provided to local agencies by NCDOT. Tools used in this planning process are intended to be as quick and low-cost as possible, including the use of travel demand modeling. Travel modeling has three levels identified by NCDOT:

- Trend line;
- Manual allocation (relying on creation of trip tables and manual trip distribution); and
- A quick response format that is more complex and addresses transportation/land use interaction; relies on existing data (such as Census and state employment data); uses default parameters and trip rates; relies on stop-watch-timed travel times; and uses state GIS to plot data, e.g., high concentrations of employment and residences.

The results of these local and regional long-range plans feed directly into the statewide planning process.

Decision-Making Process

NCDOT's stated goal for using a corridor approach is to preserve, not to prioritize. Therefore, there is no direct tie between corridor designation and project selection or prioritization.

The centerpiece of the Statewide Transportation Plan is the Recommended Investment Scenario – a strategy that proposes targeted levels of funding within three major transportation categories: maintenance/preservation, modernization, and expansion. This strategy will serve as a policy guideline to support future investment decision-making. NCDOT acknowledges that the Recommended Investment Scenario is not a remedy to fix all of the State's transportation challenges. The plan identifies a funding gap that leaves nearly one-third of all needs unmet if no additional revenues are obtained. The Statewide Transportation Plan is not rigid. It maintains NCDOT's short-term commitments and recognizes differing regional needs within the context of a statewide vision. Full implementation of North Carolina's Statewide

Transportation Plan will require changes to existing State statutes and programming structures.

The Recommended Investment Scenario underscores the importance of safety in all investments and places focus on upgrading and preserving the state's existing transportation system. It proposes greater investment in the state's highest use facilities and in non-highway modes that have received disproportionately less transportation funding historically. The scenario represents investment from a statewide, system-oriented analysis. Investment does not target specific projects, but rather emphasizes areas where the Department should invest dollars to achieve system-wide improvement goals.

Challenges, Effective Practices, and Lessons Learned

Challenges: Major challenges facing NCDOT include:

- Having sufficient resources to sustain a planning process; and
- Changing the project selection process to become more reflective of a statewide investment policy.

Effective Practices: NCDOT has experienced success with:

- Obtaining buy-in from technical staff and senior management;
- Working with the Transportation Board to achieve consensus;
- Building credibility through 14 public meetings, 432 stakeholder meetings, an STP Summit in 2002, and more involvement of the NC Transportation Board;
- Establishing and implementing the NCMIN and SHCI;
- Developing and implementing the technical process; and
- Getting buy-in from NCDOT Division Engineers.

Lessons Learned: NCDOT has learned the importance of engaging Transportation Board members in the planning process and that long term investment strategies need to be more closely aligned with the programming process.

Case Study: Pennsylvania Department of Transportation

The Pennsylvania Department of Transportation (PennDOT) was selected as a Case Study candidate based on input received in a survey completed for the NCHRP 8-58 research project. Pennsylvania was included largely to represent the Northeastern states and because of their ongoing efforts to define a state corridor system. PennDOT has a centralized planning process. As with most other states, PennDOT has developed a policy-based Statewide Transportation Plan.

The Chief Executive Office of PennDOT is the Secretary of Transportation. PennDOT is divided into six "deputates" (each headed by a Deputy Secretary) for the following areas:

- Administration;
- Planning;
- Highway Administration;
- Local and Area Transportation;
- Safety Administration; and
- Aviation, Rail, Freight, Ports and Waterways.

Each "Deputate" is further divided into Bureaus for program administration and/or implementation, and three of the six Deputates also include offices for special programs.

PennDOT reports to the State Transportation Commission. In addition, a Pennsylvania Transportation Advisory Committee (TAC) was created by statute in 1970 by the legislation that created the Pennsylvania Department of Transportation. The TAC is made up of the heads of state agencies

Primary responsibility for the state's Long Range Transportation Plan lies with PennDOT's Center for Program Development and Management, a special office under the purview of the Deputy Secretary for Planning. The Center is divided into three divisions: Transportation Program Development; Funding and Twelve Year Plan; and Planning and Contract Management. Four persons in the Planning Division are responsible for the statewide transportation planning process, including coordination with the Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), PennDOT Districts, and other PennDOT divisions and offices.

The statewide planning process is undertaken in partnership with the state's 15 MPOs, seven RPOs, and one independent county. Among the responsibilities of this office is the development of the Long Range Transportation Plan, updated as established Federal requirements; Twelve Year Program (TYP), the official PennDOT programming document required by statute, updated every two years; and Transportation Improvement Plan (TIP), which essentially is comprised of the first four years of the Twelve Year Program.

The following summarizes the results from the NCHRP 8-58 transportation agency survey, a face-to-face interview, and reviews of related PennDOT documents and web sites.

Corridor-Based Statewide Planning

PennDOT completed its first corridor-based statewide transportation plan, *PennPlan Moves*! in January 2000. The most recent update, the *Pennsylvania Mobility Plan,* was completed in June 2007. This policy-based plan established

statewide goals; inventoried the existing transportation system, including the rail, highway, air, transit, and waterway modes; and identified 28 multimodal corridors with specific objectives.

The 28 corridors identified and briefly described in *PennPlan* included all modes and their interconnections. *PennPlan* recognized that individual corridor planning was being carried out by MPOs and RPOs, with corridors selected using a variety of criteria. Thus, one goal of *PennPlan* was to identify those corridors and then establish continuity among the corridor plans of the various local and regional planning jurisdictions, the state, and surrounding states. Objectives were proposed for each of the 28 *PennPlan* corridors that were consistent with statewide goals established in conjunction with PennDOT's transportation partners.

For the *Pennsylvania Mobility Plan*, the Pennsylvania Transportation Advisory Committee (TAC) worked with PennDOT to develop an initial concept for a multimodal "Core PA Transportation System" through a special study completed in August 2006. The purpose was threefold: (1) define an "Illustrative Core System" that recognizes that refinements may occur over time through further evaluation and review; (2) offer other considerations for future refinements of the Core System; and (3) recommend a framework and process for Core System refinement and implementation. The Core System is described as: "An integrated transportation system made up of modal facilities that are of highest importance for moving people and goods between regions within Pennsylvania, as well as between the Commonwealth and other states and nations." This study focused on corridors of statewide significance, but also recognized that future efforts were likely occur to address corridors that have regional or local significance.

As part of the Core initiative, PennDOT was given the responsibility by the TAC to develop the corridor system. A project team, made up of PennDOT staff, was created to fulfill this responsibility. A Project Management Committee was also created to oversee development of the Core System. This Committee was comprised of the Secretary, Deputy Secretary for Highways, Deputy Secretary for Planning, and officials from other modal offices. Outreach for the Core System was accomplished by a Mobility Plan Development Team that had already been specially created for the statewide transportation planning update process that resulted in the *Mobility Plan*.

During the study, five options were considered for defining the Core PA Transportation System:

- Using existing network and modal classifications;
- Using existing classifications, but with usage thresholds;
- Using all transportation facilities, but with usage thresholds;
- Basing it on a percentage of the state system; and
- Defining economic centers and the corridors connecting those centers.

Ultimately, the last option was chosen, and the Core System was defined through a series of iterative steps by:

- Establishing economic centers and criteria;
- Organizing the Core System connections into three layers, or tiers for:
    - Major MPO core cities (metropolitan areas/economic hubs),
    - Smaller economic and activity centers, including activity centers in MPO core cities (hubs, terminals, nodes); smaller economic centers outside the MPO core cities; and core urban clusters in micropolitan statistical areas, and
    - Economic and activity centers in areas of less population and employment;
- Establishing modal criteria, especially for the highest tier; and
- Adjusting the Core System to promote the application of state policy objectives.

This process was still under development at the time of the case study interview. However, specific criteria had been developed for each transportation mode. These were used to determine which modal facilities met those criteria and, therefore, would become part of the Core System. The Core Pennsylvania Transportation System presented in the *Mobility Plan* was considered as an illustrative system still under development, but it is recognized as the first effort to consider the transportation network as an interconnected entity rather than a collection of discrete modes.

Other key elements related to PennDOT's planning process are as follows:

- The *Mobility Plan* recognizes that effectively operating, maintaining, and improving Pennsylvania's aging transportation system requires a tremendous investment – and that resource constraints make it imperative that priorities are assigned to the most essential statewide networks for moving people and goods. Special emphasis areas include (1) safety, (2) traffic operations, and (3) freight.
- The Long Range Transportation Plan is developed in collaboration with the MPOS and RPOs, i.e., the MPOs and RPOs take the lead in developing local and regional transportation plans, with PennDOT providing overall policy guidance and participating as a member of the plan development team. There are transportation planning programs in 15 MPOs, seven RPOs, and one independent county.
- Multimodal and intermodal issues are addressed in the development of the local and regional planning process and incorporated into corridor goals and strategies.
- Intermodal Coordinators have been trained in each of PennDOT's 11 Districts and in the Central Office to ensure that those issues are identified early in the project development process.
- Corridors are looked at on a regional basis, and PennDOT provides oversight for the statewide planning and programming process.

- Tools that have been utilized in the planning process include:
    - The Statewide Travel Demand Model, using a Cube Voyager platform, which includes a goods movement component that utilizes Global Insight Commodity Flow Data;
    - REMI, for economic analysis of investment decisions (but PennDOT is no longer using this tool);
    - MOBILE6, to calculate emission factors;
    - SCALDS, which estimates land use consumption for alternative scenarios; and
    - An Asset Condition Component which tracks maintenance cycles on highways and bridges.
- *PennPlan* public involvement efforts included input from over 1,800 individuals representing typical residents, business and commercial interests, visitors to Pennsylvania, professional planners, politicians and appointed public officials, transportation visionaries and focus groups. Input was obtained through "town" meetings, classrooms discussions and written surveys. Outreach continued after plan finalization through follow up phone surveys.
- The *Pennsylvania Mobility Plan* continued the strong emphasis on public involvement in the statewide planning process. Over 2,300 Pennsylvanians were consulted through general phone surveys, stakeholder and economic interests' internet surveys, transportation visionaries, regional outreach workshops, focus groups and implementations workshops.
    - One of the unique public involvement initiatives for the Mobility Plan occurred during the regional outreach workshops. A "trade off" exercise was used to determine the priorities of participants across eleven categories of transportation investments. Participants were asked to redistribute funds across the eleven categories in an environment of constrained resources. They were then asked where they would distribute any new resources across the eleven categories.
- PennDOT conducts public hearings every two years in various locations throughout the state to hear testimony as it develops the Twelve Year Program.

Decision-Making Process

At present, there is no direct link between the Core PA Transportation System and the project selection, prioritization, and programming process. That may come at some later time, but there is no intent to do this any time soon. Project prioritization, selection, and allocations occur primarily at the MPO/RPO level. These priorities are then considered by PennDOT during the programming process.

Annual progress reports provide accountability for each objective in the Mobility Plan.

Special Planning Areas

Land Use

In 1997, an Executive Order established an environmental commission and a policy to base decisions on sound land use principles. Since then, PennDOT has been involved in a number of initiatives to carry out this policy.

The latest product of their efforts, the Sound Land Use Implementation Plan, was completed in March 2007. As with previous efforts, this plan is based on "Smart Transportation" principles, which include the following:

1. Money counts;
2. Choose projects with a high value to price ratio;
3. Enhance the local network;
4. Look beyond the level of service;
5. Safety first, and maybe safety only;
6. Accommodate all modes;
7. Leverage and preserve existing investments;
8. Build towns and not sprawl;
9. Understand the context; plan and design within the context; and
10. Develop local governments as strong land use partners.

PennDOT has also developed a Transportation/Land Use Toolkit and a process linking transportation and land use, designated as Smart Transportation (ST). The toolkit contains background information, document and web resources, legal issues and requirements, checklists, and information on linking land use with a variety of transportation initiatives, including those for highways, airports, bicycle and pedestrian travel, transit, and freight.

At the time of the case study interview, PennDOT was undertaking a Smart Transportation pilot project with the New Jersey DOT. This pilot project was being used to create a Smart Transportation template to determine how to develop the best project for a specific location. This template includes community, transportation, and financial considerations.

Environment

PennDOT is working with resource agencies to link NEPA and planning. PennDOT has laid out a 10-step decision process that takes project development from planning to implementation.

Freight

PennDOT has already completed some studies for significant freight corridors. At the time of the survey and interview, PennDOT was working with the Bureau

of Rail Freight, Ports and Waterways to undertake a Freight Economic Plan and a comprehensive Goods Movement Development Plan.

Challenges, Effective Practices, and Lessons Learned

Challenges: Key challenges facing PennDOT include:

- Planning and programming large transportation projects that are either too costly for an individual MPO or RPO to implement or projects that span multiple MPOs/RPOs jurisdictions;
- Effectively communicating the state's direction to diverse stakeholder groups;
- Developing a multimodal transportation network spanning different public and private entities;
- Addressing funding issues, e.g. fuel tax sustainability, sharing funds across modes, and seeking innovative financing techniques;
- Providing leadership with better information from which to make decisions;
- Maximizing the benefits of transportation investments;
- Clearly defining project purpose and need;
- Conserving resources; and
- Enhancing communities.

Effective Practices: Some of PennDOT's effective practices include:

- The collaborative effort between PennDOT, the MPOs, and RPOs, and the federal government;
- Successful relationships/coordination with MPOs and RPOS, which is recognized as a national model;
- Development of some major documents and resources that are available to all planning participants, including:
    - Developing Regional Long-Range Plans, March 2006,
    - Users Guide – Pennsylvania Mobility Plan, June 2007, and
    - Transportation and Land Use Toolkit, March 2007;
- Efforts to develop financial guidance for all planning participants;
- Creation of the Core System;
- Beginning efforts to link NEPA and planning; and
- The Smart Transportation initiative.

Lessons Learned: By going through the planning process, PennDOT has learned that:

- There is a need to develop better performance measures than those in PennPlan. These attempt to address everything, and there is some disconnect between what is reported and what is actually needed to evaluate DOT performance in meeting transportation goals; and

- Cross-jurisdictional coordination/communication is essential for multi-state/regional planning efforts to ensure similar priorities and funding levels.

Case Study: I-95 Coalition

Early in the development of the Research Plan for this project, it was decided that at least one multi-jurisdictional corridor coalition would be selected as a Case Study transportation agency. Since some of the Case Study DOTs were already involved in the study of I-95, the I-95 Corridor Coalition was selected for a case study review. The current staff consists of three people, including the Executive Director, supported by a consultant team. The information in this case study review was acquired through a telephone conference with the Executive Director of the Coalition in June 2006.

The study for the I-95 Corridor began as an ITS study in the early 1990s. It was later broadened to a Planning Study (known as the Mid-Atlantic Operations Study) to also look at regional rail transportation issues. The current planning study is focused on the I-95 highway corridor. This is a multi-state study, led by the Maryland DOT, with oversight by a coalition of states through which I-95 passes.

According to a recent "Corridors of the Future" Fact Sheet, the entire I-95 corridor is 1,917 miles long with approximately 1,040 miles through urban areas. Among these 1,040 miles, over 60 percent is currently under heavy congestion. The average daily traffic in the entire corridor is over 72,000 with maximum daily traffic reaching as high as over 300,000. Average daily truck traffic is over 10,000 with maximum daily truck traffic reaching as high as over 31,000. Without any further improvements to the corridor, the projected 2035 average daily traffic would be over 133,000, including over 20,000 trucks. In addition, virtually 100 percent of the urban segments would be under heavy congestion. Congestion for non-urban corridors would increase from the current 26 percent impacted to over 55 percent impacted.

Corridor-Based Planning

The purpose of the current study is to identify I-95 bottlenecks and undertake an assessment of needs along the corridor. Other related major facilities that are being considered in the study include I-81, railroads, and connections to the ports. No states are formally using the results from the study for project identification. Once the needs are identified, the method to address the needs is then left to the states.

The most effective aspect of the I-95 planning process is information sharing. How the information is used is left up to the individual states.
A new Integrated Corridor Analysis Tool (ICAT) is being developed by the consultant for the study. Highway networks are linked to the NHS, and linear

referencing is appended to a GIS network. There are some jurisdictional concerns over the ICAT network and data results, since at least state DOT representatives are concerned that the ICAT results do not supersede local state data and analysis. The I-95 coalition states have mutually agreed that the state data and analysis will be the "official data."

A major I-95 Coalition initiative is developing linkages to share information among states to help with emerging transportation issues. Also, the Coalition worked together and was successful in getting recognized by the USDOT in September 2007 as a "Corridor of the Future."

Decision-Making Process

Participation in the study is voluntary. There is no compact or legislation for this study. There is participation from all 16 states in the corridor, with meetings of the state CEOs twice a year. States will include I-95 corridor improvements in their plans and programs on a voluntary basis. There are no formal state "collaboration" requirements, and there is no anticipated change in this status. States seem to prefer the informal relationship.

Challenges, Effective Practices, and Lessons Learned

Challenges: The biggest challenge for the I-95 coalition is financing any projects that may arise from the study. As with many other large multi-state corridors that address a national or multi-state regional purpose, a separate federal funding category may be needed to address multi-state corridors with regional benefits.
Some other problems include:

- Conflicts or confusion in making the transition between the original I-95 study purpose and the new purpose of the I-95 group;
- Jurisdictional/institutional issues among the states;
- Some states unwilling or do not have the resources to share information;
- Ensuring that financing/planning officials are represented at coalition meetings;
- Determining multi-state benefits from a "state" project (e.g., can a state get contributions from other states for multi-state impacts – and how do you explain it to legislators);
- Federal "obligation authority" restrictions that create problems in transferring funds if states wanted to subsidize projects in other states; and
- Gaining state support for I-95 widening and tolling.

Effective Practices: The effectiveness of participation from state to state depends on finding (and sustaining) "champions" who recognize the regional importance, not just the value to each state.

Lessons Learned: Including I-95 results in each state's long-range transportation plan should be voluntary, and not federally mandated. This type of effort should be non-threatening to the individual states. The DOT CEOs seem to understand that the study is a mix of traffic operations (ITS) and planning, and those who think regionally try to include the findings of the study into that state's project identification and prioritization process.

The I-95 Coalition is still a work in progress. This group still has to find ways to (1) establish a long-term vision, (2) develop a useful evaluation process, (3) share information, (4) test practices, (5) establish relationships, and (6) implement the results of the study with consistency in each of the member states.

Case Study: East-West Gateway Council of Governments

Early in the development of the Research Plan for this project, it was decided that at least one Metropolitan Planning Organization (MPO) would be selected as a Case Study transportation planning agency. After reviewing the NCHRP 8-58 survey information received from a small number of MPOs, the East-West Gateway Council of Governments was selected based on information provided in the agency survey completed for the NCHRP 8-58 research project.

The reasons for selecting the St. Louis MPO for further Case Study research was due to important characteristics identified in the survey, in that the MPO: (1) adopts a corridor-based long-range transportation plan; (2) incorporates multi-modal planning into its planning process; (3) carries the corridor planning process to the next step (i.e., looking at identified corridors in greater detail); (4) has a very proactive public involvement process; (5) has found an effective way to manage corridor planning cooperatively with multiple jurisdictions; (6) addresses land use and environmental issues as part of the transportation planning process; and, perhaps most important, (7) uses the results of the corridor planning efforts to identify, prioritize, and select projects for future implementation.

The East-West Gateway Council of Governments is recognized by the U.S. Department of Transportation as the designated MPO for the St. Louis, Missouri/East St. Louis, Illinois metropolitan area. As such, under a joint agreement with the states of Missouri and Illinois, the Council has the responsibility for all elements of the metropolitan transportation planning process for the City of St. Louis; the counties of St. Louis, St. Charles, Franklin, and Jefferson in Missouri; and the counties of Madison, St. Clair, and Monroe in Illinois.

The MPO transportation planning process is perhaps the primary focus of the East-West Gateway Council of Governments, but this regional Council of Governments (COG) has also been involved in other activities, such as regional development, housing, and water quality. The COG is overseen by a Board of Directors consisting of 24 members. The membership of the Board has equal

representation from both Missouri and Illinois. With assistance from an Executive Advisory Committee, the COG formulates policy and provides oversight for the metropolitan transportation planning process.
As with other MPOs, the three primary documents of the East-West Gateway Council's metropolitan transportation planning process are the Unified Planning Work Program; Long Range Transportation Plan; and Transportation Improvement Program (TIP).

There are approximately 60 to 65 employees with the East-West Gateway COG, organized into four principal divisions: Administration; Transportation Planning, which develops the long-range plan, TIP, and corridor studies; Planning and Information Systems, which is responsible for demographics, land use, the environment, and GIS; and Policy and Community Development, which deals with research and data management.

The MPO's transportation planning process is primarily funded from federal Planning (PL) and Surface Transportation Program (STP) funds. Additional funding support is provided from a voluntary annual contribution from local government members of the Council of Governments, currently set at 12.5 cents per capita.

There are minimal state funds involved in the MPO's planning efforts, although in-kind funding support is provided from the Missouri DOT through their participation in the planning process. Some state funding is sometimes made available for special studies, activities, and/or projects, e.g., the use of Congestion Mitigation and Air Quality Improvement (CMAQ) funds or Surface Transportation Enhancement (STP-E) funds.

The following summarizes input from the MPO transportation research survey, a face-to-face interview, and a review of relevant planning documents.

Corridor-Based Planning

The most recent long range transportation plan produced by the Council is entitled Legacy 2030. This MPO transportation plan, completed in August 2005, is a corridor-based plan in which the MPO defines major corridors and uses major corridor studies to identify investments for inclusion in the long-range plan.

The MPO has developed a partnership in recent years with the Missouri DOT and engages in what is described as a "real interaction" in the decision-making process on project identification and selection. However, the relationship with the Illinois DOT is not as strong.

In the Missouri portion of the metropolitan planning area, the MPO has created a "Transportation Corridor Improvement Group" (TCIG) to oversee major corridor studies. This group is managed by the MPO and includes staff from the MPO, the Missouri DOT, and Metro, the regional transit operator. No such body exists for

corridor studies in Illinois. The members of the TCIG enter into a formal Memorandum of Understanding (MOU) with regard to planning principles, as well as the roles and responsibilities of each participant. Consideration has been given to bringing in Regional Planning Councils (RPCs) as members of the TCIG for some studies, as needed, to better address corridor issues on a regional scale. The East-West Gateway Council of Governments has no pre-established criteria to define corridors of regional significance. Rather, the MPO defines corridors based on the identification of needs.

Through the transportation planning process, the MPO undertakes a systems analysis to identify problem areas for both highways and transit. From this analysis, the locations of major needs are identified along all routes in the study area, and these needs are then examined in greater detail for corridors where problems exist, if warranted. Any route or facility may be identified as a corridor for this more detailed analysis.

The systems analysis is completed for both transit and highways. For the transit systems analysis, the MPO has worked with the regional transit provider, Metro, to identify a dozen potential light-rail lines located in six corridors. In addition to the typical factors used in transit analysis (such as capacity, ridership, travel times, service area, etc.), the transit systems analysis also recognizes transit limitations and addresses potential economic development impacts.

Although transit and other modes are considered, the MPO's primary focus is on highways. The highway systems analysis addresses six focus areas or factors, with safety and congestion considered the most important. The other four focus areas include systems preservation, access to opportunity, goods movement, and sustainable development. Through the systems analysis process, problems and needs are identified, and these are then linked to specific corridors on the highway network.

Some of the data and analysis used by the MPO for each of the six factors include:

- Safety Analysis: Crash rates, crash fatality rates, and crash injury rates;
- Congestion Analysis: Travel time, travel delays, aerial survey of peak hour congestion spots, percentage of delay per trip;
- Preservation Analysis: Condition of pavement, bridges, and transit fleet;
- Access to Opportunity Analysis: Job accessibility in peak and off peak hours (percentage of jobs within 45 Minutes of auto travel time), percentage of jobs within 60 minutes of transit travel time (on and off peak), dispersal of job growth, job accessibility for minority and low-income populations, commuting patterns;
- Freight Analysis: National truck flow data, freight volume, intra-regional truck movements, density of tractor-trailer trucks on highways, aerial survey of traffic in peak hours, location of truck generators (shippers and receivers); and

- Sustainable Development Analysis: Population and land use consumption growth patterns, air quality and VMT trends, journey to work by mode, commuting patterns.

Many needs are addressed through corridor planning studies, which involve the public, define the problem, identify possible solutions, and typically look at the same factors as the systems analysis to identify transportation, economic, social, and environmental impacts, both positive and negative. From this analysis, projects are defined and carried forward for consideration in the development of the long-range plan and the TIP. At this point, projects are prioritized and selected through mutual cooperation among MPO committee members and Board members.

The MPO uses a variety of analysis tools. Economic impacts are addressed through input from local economic development experts. A major initiative for the MPO is the creation of an integrated land use transportation model, which is expected to also provide a more substantive economic analysis tool, although it will not be an input/output econometric model. An activity-based travel demand model is used in a CUBE environment for forecasting and evaluating future travel and travel impacts for congestion, mobility, access, etc. GIS is another analytical tool that is used extensively for various project impact analyses.

Comparisons and conflicts among different transportation users in a corridor are also identified and worked out, if possible, within the context of corridor studies through extensive outreach to stakeholders and system users.

The "Problem Statement" is perhaps the most important part of the St. Louis MPO's corridor planning process. Extensive proactive public outreach and input are major elements of the process and, particularly, the creation of a corridor Problem Statement to frame the development of alternatives and the subsequent analysis. Through active participation in defining the problems in the corridor, the public is given the opportunity to better understand proposed projects and can more fully support the outcome of the corridor planning process. Ultimately, the Problem Statement will form the basis for the Purpose and Need for proposed projects which arise from the corridor study.

While corridor studies are usually mode-specific, major transit corridor studies have been undertaken through a Major Transportation Investment Analysis (MTIA) that looks not only at transit options (for both light-rail and bus), but also highway alternatives in the corridor. There have been significant efforts during the last decade to study and implement light-rail service, but highway options have always been considered as an alternative solution in these transit studies. Similarly, highway studies give consideration to public transit and bicycle/pedestrian movements within a corridor, but the emphasis is almost always on highway improvement solutions, not on comparisons or trade-offs between modes.

Decision-Making Process

Since the MPO Policy Board is comprised of the chief local officials in the metropolitan area, politically sensitive issues are resolved in that forum.

Jurisdictional issues are given consideration in the project selection process through a geographic distribution of resources. For example, in the TIP process, STP-S funded projects are evaluated, and the selection process includes providing funds for the highest rated project in each county. Thereafter, all other priorities are established according to the results of the evaluation process.

The MPO's funding policy is that planning should not take place if there is no idea how projects and programs will be financed. History has proven that the East-West Gateway COG's decision-making process is very personality-driven, i.e., changes in leadership almost always have an effect on plans and priorities. While this may affect long-term consistency, it is desirable to try to build and sustain public expectations over time. Therefore, since plans may create community expectations that may not be fiscally possible, it is also important to continually evaluate these plans to determine if and when planning "appetites" should be curbed.

Within the MPO, final decisions on projects and priorities are made by the East-West Gateway COG Board of Directors, based on information and recommendations provided by the MPO staff. At the Board level, project selection and prioritization are negotiated among the Board members so as to balance regional interests with a fair and equitable geographic distribution among all governmental units. As indicated previously, the even distribution of Board representation has been designed to make cooperation a necessity.

The MPO is largely dependent on the state DOTs to provide funds for major projects in the region, so the relationship and communication with state DOTs is critical.

Since many transportation decisions on regional and local needs and priorities are made by the MPO, public scrutiny and pressure on the state DOTs are reduced, which is viewed favourably by the DOTs.

The Missouri DOT consistently requests MPO priorities and integrates their needs into the state's planning and programming process, working with the MPO to develop a project evaluation process and to negotiate project funding. However, a similar relationship does not exist with the Illinois DOT for the portion of the MPO region on the east side of the Mississippi River.

Special Planning Areas

The MPO has also addressed other special planning elements, including the following initiatives:

Land Use

The East-West Gateway Council of Governments does not have a direct role in land use planning for the region. Land use planning is done at the local level by the governmental units that make up the organization. As part of its "Gateway Blueprint" initiative to encourage long-term regional planning and design by local communities, the MPO has worked with the University of Illinois at Urbana Champaign to develop a Land-use Evolution and Impact Assessment Model (LEAM). The LEAM is a GIS-based tool to identify where pressures for development are high. This tool helps the MPO better understand: (1) the magnitude and pattern of physical and economic growth in the region; (2) the relationships between local land-use decisions and decisions about transportation, regional land use, and other infrastructure systems; (3) the relationship between transportation and land use; and (4) the relationship between land use development and redevelopment.

Environment

The GIS-based LEAM can also be used to evaluate the environmental impacts of the regional long-range transportation investment plan on natural, cultural, and historic resources by utilizing existing state databases for a variety of resources. This model provides an "environmental stress analysis" in five-year "snapshots" of transportation investments by identifying where environmental stress is high due to development pressures. The "high stress areas" will then be evaluated to determine potential impacts on environmentally sensitive areas, such as wetlands and historic sites; protected lands (e.g., nature preserves and conservation areas); protected wildlife areas and habitats; and regional greenways. To better implement this effort, the MPO has begun establishing a working relationship with an environmental resource agency group to better integrate environmental considerations within the transportation planning process.

Through the MTIA transit corridor studies, the MPO has successfully incorporated the NEPA process into corridor planning. When the studies began, a legal notice was published, as required by NEPA regulations and guidelines; and a notice was placed in the Federal Register to announce that the NEPA scoping process was underway. NEPA principles were applied throughout the process in the development, analysis, and evaluation of alternatives; and one of the final products of the corridor planning study was a NEPA document for Federal approval.

In other studies, particularly highway studies, the corridor planning process for each study is also consistent with NEPA requirements and principles so the decisions made during the study can serve as a "jumping off point" to the environmental assessment in the next phase of a project.

Freight

The East-West Gateway Council has identified a Primary Goods Movement Network (PGMN) as a framework for evaluating freight movement. This network

includes all highway, rail, water, and air freight facilities needed for goods movement in the region. Highways on the PGMN include all NHS routes and NHS connectors, plus major and minor arterials that provide access to and between ports, major airports, and other intermodal facilities. Facilities for shippers and receivers are included if they employ 100 employees or more.

The MPO developed a regional freight plan in the late 1990 that was focused primarily on intermodal transportation. However, the study was limited because of difficulties in getting data and because there is little the MPO can do on its own. Nonetheless, freight movement issues and needs are given strong consideration in highway corridor planning studies. The MPO is planning a new freight planning initiative starting with the creation of freight focus groups. As with many other MPOs, the East-West Gateway COG planners know that addressing freight transportation issues is important, but they are uncertain about what to do.

Bicycle and Pedestrian Transportation

Bicycle and pedestrian planning are done independently of the corridor planning process as a special activity, although both are considered in planning for both highways and transit.

Challenges, Effective Practices, and Lessons Learned

Challenges: The following challenges were identified by the MPO during the Case Study research:

- Creating a sound understanding of the land use implications of proposed transportation investments;
- Clarifying the principles on which priorities are established and evaluating projects according to those priorities;
- Finding ways to address freight transportation in the transportation planning process;
- Building and sustaining realistic community expectations; and
- Developing a strong working relationship between the MPO and the state DOTs.

Effective Practices: Some of the effective practices used by the East-West Gateway COG in the MPO transportation planning process include:

- Creation of the Transportation Corridor Improvement Group (TCIG) as a joint partnership of the MPO, state, and Metro transit agency to ensure coordination and cooperation in corridor planning;
- Extensive and proactive public outreach as part of the corridor planning process;
- Efforts in corridor planning studies to develop a “community vision” and, of special importance, a corridor “problem statement” in cooperation with members of the corridor community;

- Developing the Land-use Evolution and Impact Assessment Model (LEAM) to address the relationship between transportation and land use; and
- Incorporating NEPA and environmental analysis into the planning process.

Lessons Learned: Key "lessons learned" by the East-West Gateway Council staff include:

- The use of corridor studies as the foundation for project inclusion in the long-range plan is an effective element of the transportation planning process.
- For multi-jurisdictional planning efforts, the keys to a successful outcome are:
    - Balancing the composition of the study policy committee, which should reflect a broad range of interests, not just elected officials or their appointees, and
    - Educating this committee on the larger issues involved with the study.
- While it is important to build and sustain public expectations, it is also important to build and sustain public trust and support. Therefore, it is critical that promises are kept and commitments are honored as each project moves toward final implementation.

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