

TRENDS IN STATEWIDE LONG-RANGE TRANSPORTATION PLANS

Core and Emerging Topics

March 2012

Prepared for:
Office of Planning
Federal Highway Administration
U.S. Department of Transportation



Prepared by:
John A. Volpe National Transportation Systems Center
Research and Innovative Technology Administration
U.S. Department of Transportation



Acknowledgments

This report presents the results of a study of statewide long-range transportation plans (SLRPs) completed for the Federal Highway Administration's (FHWA) Office of Planning by the U.S. Department of Transportation's (DOT) Volpe National Transportation Systems Center (Volpe Center). The study also produced an online, searchable companion database with detailed information on important characteristics and attributes of 51 statewide plans. This report and the companion database are available on the FHWA-Federal Transit Administration (FTA) Transportation Capacity Building website at www.planning.dot.gov/stateplans/default.aspx.

William M. Lyons was the Volpe Center project manager of the study team, which included lead analyst Alisa Fine, Gina Filosa, Ken Miller, and Alison Kruger.

The team gratefully acknowledges the support and guidance of Lorrie Lau, FHWA project manager in the Office of Planning, and the assistance of the nine-member statewide plans advisory group, which was convened to advise this research. The advisory group, listed in [Appendix A](#), was largely drawn from the Transportation Research Board's (TRB) Statewide Multimodal Planning Committee (ADA10)¹ and was composed of staff from the Texas Transportation Institute, the Maryland State Highway Administration (MDSHA), High Street Consulting, and the Idaho, Colorado, Delaware, Minnesota, New Mexico, and Oregon DOTs.

For additional information on this project, please contact Lorrie Lau at Lorrie.Lau@dot.gov or William Lyons at William.Lyons@dot.gov.

¹ For more information on ADA10, please see <https://sites.google.com/site/statewideplanning/about>.

Table of Contents

Executive Summary	iv
Introduction	1
Synthesis Topic 1: Plan Types	5
Synthesis Topic 2: Focus on Implementation	15
Synthesis Topic 3: Guiding Principles, Objectives, and Strategies	21
Synthesis Topic 4: Performance Measures	26
Synthesis Topic 5: Financial Planning and Analysis	34
Synthesis Topic 6: Systems Planning	41
Synthesis Topic 7: Livability and Sustainability	47
Synthesis Topic 8: Climate Change	52
Appendix A: List of Advisory Group Members and Affiliations	56

Executive Summary

This report presents syntheses and observations from a comprehensive assessment of 51 current SLRPs from all 50 States and the District of Columbia (D.C.), identifying examples of how individual States approach important transportation planning topics in their plans. This report was developed by the Volpe Center for FHWA's Office of Planning.

The effort builds on earlier in-depth analyses conducted in 2002 and 2005 that reviewed SLRPs to identify national trends and innovative examples of planning practices. The research team developed this report with a companion searchable database containing information on all SLRPs. These products will be complementary resources for peer DOTs and other interested transportation organizations and are available at the FHWA and FTA Transportation Planning Capacity Building (TPCB) website at www.planning.dot.gov/stateplans/default.aspx along with any future updates to the report and database.

Federal legislation under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and implementing regulations require that States develop statewide transportation plans and outline eight factors that States must consider during transportation planning.² However, States have latitude in choosing what to include in the SLRP. This research explores the diversity of State approaches to SLRPs, including responses to Federal regulations and the unique transportation needs and priorities of each State. The intent is to provide insights into continuing and emerging planning trends as reflected in the SLRPs. It is important to note that the research was not based on a comprehensive review of the planning process of each State, including the development and implementation of each SLRP. Instead, it was limited to an in-depth assessment of each SLRP as one key product of the planning process. The Volpe Center study team did some limited review of related plans referenced in SLRPs. To the extent possible, the team also made observations on the planning process based on evaluation of the SLRPs.

This research will serve as a technical resource for State DOTs and their partners, FHWA, and other planners and researchers.

This report includes eight syntheses focusing on different SLRP topics identified as of national interest by the FHWA, the advisory group, and the research team. Each synthesis assesses overall trends from the review of all 51 plans and provides examples of how SLRPs address each topic. The syntheses cover the following topics:

- **Plan type:** explores the approach or orientation States took in developing the plans.
- **Influence of statewide plans:** explores how plans discussed implementation strategies and connected the plan to overall decision-making processes.
- **Guiding principles, objectives, and strategies:** focuses on topics addressed by plans' overall policies, as well as how States defined goals and actions to advance these policies.

² The legislation is available at <http://tinyurl.com/66xr8l5> (search Title 23, part 450).

- **Performance measures:** explores how performance measures are applied in the SLRPs.
- **Financial analysis:** looks at how SLRPs incorporate financial planning and analysis, including fiscal constraint.
- **Systems planning:** details how plans incorporate systems planning through reference to multimodalism, intermodalism, modal connectivity, or network-focused performance measures.
- **Livability and sustainability:** examines how SLRPs reference livability, sustainability, or related issues.
- **Climate change:** focuses on how plans address climate change and related issues.

The companion database provides an easily searchable resource to explore key aspects of the 51 SLRPs in detail. The database includes information on SLRP plan type, modes, and guiding principles addressed, as well as examples with discussion of how SLRPs approach climate change, high speed rail, visualization and scenario planning, and sustainability and livability.

The study team concluded that States are taking a number of approaches to develop SLRPs. Plans vary widely in terms of their content, structure, initiatives and goals, and other factors. Additionally, plans are evolving over time in response to Federal or State transportation planning requirements, changing needs, and the state-of-the-practice in approaches to transportation planning topics. For example, topics such as sustainability and livability, which are current national-level priorities, are more frequently and extensively addressed in SLRPs developed since 2006.

Introduction

Purpose

The purposes of this research, which the Volpe Center conducted for FHWA's Office of Planning, are to provide insights into the content, structure, and approach of SLRPs nationwide and provide a technical resource for State DOTs and their planning partners, as well as a resource for FHWA staff to assist in developing and managing planning programs.

The research team analyzed 51 SLRPs from all 50 States and Washington, D.C., to identify examples of how individual States approach important transportation planning topics in their plans and identify continuing and emerging trends. The research also identified States whose SLRPs referenced planning topics in innovative or noteworthy ways. The review was limited to an assessment of SLRPs and related documents (e.g., technical appendices or other documents) referenced in the plan. This research does not assess or evaluate broader statewide transportation planning processes or the extent to which these processes meet Federal planning requirements. However, the team used the reviews of the SLRPs to reach some limited observations in these areas.

Background

Federal regulations require States to conduct continuing, comprehensive, and collaborative intermodal statewide transportation planning that facilitates the efficient, economic movement of people and goods in all areas of the State, including metropolitan areas. These requirements, which are codified in the United States Code of Federal Regulations (CFR) under Title 23, Section 135 (f)(1), also require that “each State shall develop a long-range statewide transportation plan, with a minimum 20-year forecast period for all areas of the State, that provides for the development and implementation of the intermodal transportation system of the State.”³

State DOTs have latitude in choosing the structure, content, and issues to include in the SLRP; however, SAFETEA-LU outlines eight factors (“planning factors”) that States must consider during transportation planning, including development of the SLRP.⁴ All SLRPs address these factors to some extent, but States take a wide range of approaches in doing so. Exploring the diverse approaches of how States respond to the general SLRP requirement and to SAFETEA-LU planning factors can provide insight into continuing and emerging planning trends.

This report provides synthesis, observations, and insights for peer DOTs based on a comprehensive assessment of SLRPs nationwide. It builds from earlier in-depth analyses conducted by the Volpe Center for FHWA in 2002 and 2005. The 2002 evaluation reviewed all SLRPs to identify national trends and innovative transportation planning practices.⁵ The review also produced a database with detailed information on major characteristics of the SLRPs. The 2005 analysis reviewed a subset of recently updated SLRPs to identify trends and examples of

³ The legislation is available at <http://tinyurl.com/66xr8l5> (search Title 23, part 135).

⁴ The eight factors include safety, security, mobility/accessibility, environmental protection and enhancement, efficient system management and operation, integration/connectivity of the transportation system, economic vitality, and preservation of the transportation system. For more information, see www.fta.dot.gov/documents/SAFETEA_LU_Planning_Factors.doc.

⁵ The 2002 analysis is available at www.fhwa.dot.gov/planning/statewide/evalplans.htm

planning practice in three areas: plan type, multimodal planning, and incorporation of planning factors from SAFETEA-LU.⁶

As part of this study, the project team also collaborated with a statewide plans advisory group convened for the project. The group was composed of members of the TRB statewide Multimodal Planning Committee (ADA10) and representatives of other organizations, including the Texas Transportation Institute, MDSHA, High Street Consulting, and the Idaho, Colorado, Delaware, Minnesota, New Mexico, and Oregon DOTs. Members, listed in [Appendix A](#), provided important advice and feedback on the priority topics to incorporate in the SLRP review and database.

The report includes eight syntheses that focus on different topics from the SLRPs. Each synthesis provides background and context on the topic and details observations and trends from the overall review of all 51 plans. The syntheses also provide examples of SLRPs that address the topic using a noteworthy or innovative approach.

The synthesis topics are:

- **Plan type:** focuses on the approaches States took in developing the plans.
- **Influence of statewide plans:** explores how plans discussed implementation strategies and connections between the plans and States' transportation decision-making processes.
- **Guiding principles, objectives, and strategies:** focuses on the topics addressed by plans' overall policies, as well as approaches that States took to define measurable goals and actions to advance these policies.
- **Performance measures:** highlights how performance measures are addressed in the SLRP and provides examples of the types of performance measures referenced.
- **Financial analysis:** identifies some examples of how SLRPs discussed financial planning and analysis, including overall trends in these discussions and examples of plans that conducted fiscal scenario planning.
- **Systems planning:** provides information on plans that emphasized systems planning; for example, through reference to multimodalism, intermodalism, connectivity, or network-focused performance measures. Examples of plans that emphasized a modal focus are also provided.
- **Livability and sustainability:** examines how SLRPs incorporate livability and sustainability or related topics and themes.
- **Climate change:** highlights plans that addressed climate change or related topics, as well as themes in these approaches.

⁶ The 2005 analysis is available at www.fhwa.dot.gov/planning/statewide/anaswplans.htm#type

Database

This analysis includes a searchable, companion database that provides comprehensive information on the 51 SLRPs reviewed.⁷ The database is organized according to the following categories:

- Basic plan/State attributes.
- Examples of plan type.
- Modes addressed.
- Financial analysis.
- Other plans referenced.
- Performance measures.
- Guiding principles.
- Examples of plans referencing climate change, high speed rail, visualization/land use and transportation scenario planning, and sustainability or livable communities.

FHWA plans to periodically update the database to reflect availability of new SLRPs.

Overall Trends in SLRP Topics

The 2002 and 2005 analyses found great diversity in SLRP approach, content, and emphasis. This analysis led to a similar finding. Most SLRPs vary widely in terms of their structure, initiatives and goals, topics addressed, and other factors. Additionally, SLRP dates vary greatly. At the time of the research, the approval or completion date of the plans ranged from 1994 (Texas) to 2010 (Virginia and West Virginia). Several States were in the process of updating their SLRPs.

There were many topics that were consistently addressed in all plans; examples include the following:

- **Reference to planning factors.** Many plans explicitly referenced Federal planning factors. Others use these factors as a framework to organize plan goals and transportation planning policies.
- **Reference to multiple modes.** The majority of plans consider multiple modes either by incorporating descriptions of the multimodal transportation system; by referencing multimodal goals, recommendations, trends, or challenges; or by referencing modal plans that detailed goals, objectives, and needs for specific modes.
- **Description of major policies, goals, or visions.** The vast majority of plans referenced overarching policies, goals, or visions to guide decision-making. In many cases, these policies and goals were directly related to SAFETEA-LU planning factors (e.g., support mobility and accessibility; improve safety).
- **Reference to financial planning or analysis.** Although Federal regulations do not require SLRPs to present financial analysis or demonstrate fiscal constraint (i.e.,

⁷ The database is available at www.planning.dot.gov/stateplans/default.aspx.

revenues balanced against expenses), many States include or summarize financial plans in a chapter or appendix or else present fiscally constrained SLRPs.

- **Coordination with other stakeholders.** All of the SLRPs reflect some degree of coordination with other stakeholders in developing the plans. This trend is consistent with the 2002 research, which noted that the majority of plans reviewed had referenced a cooperative effort with other agencies. In addition to citing coordination with Federal, statewide, or local agencies, SLRPs reviewed noted that planners had consulted with Tribal governments, transit agencies, the business community, interest groups, and others in developing the plan.

The analysis indicated that plans evolve over time in response to Federal or State requirements, changing needs, and the transportation planning state-of-the-practice. For example, references to topics such as sustainability, livability, or climate change, which have more recently become priorities at the national or State levels, are more frequently and extensively addressed in plans dated 2006 and later. Similarly, the increasing importance of performance measures in transportation planning and policy is reflected in the plans; more than half of the SLRPs discuss or otherwise incorporate performance measures as compared to only a quarter of plans that did so in the 2002 research.

Overall, this report provides a resource to identify examples of SLRPs from around the country that are addressing planning topics in noteworthy ways. In offering insights on planning topics and trends from a comprehensive review of SLRPs, the report will help statewide planners and their partners to understand how SLRPs are evolving nationwide. It will also help these stakeholders to strengthen statewide planning processes, specifically the SLRPs that are key products of these processes.

Synthesis Topic 1: Plan Types

1.1 Overview

States take many different approaches in developing SLRPs. These approaches can generally be organized into seven major types of plans:⁸

- **Policy-based SLRPs:** provide strategies to outline general transportation directions for the State, address transportation needs, or meet projected demands. While all SLRPs reference policies to some extent, policy-based SLRPs are primarily focused on outlining policy directions and typically do not include highly detailed references to elements (e.g., investment scenarios, performance measures, specific projects) that are included in SLRPs representing other plan types.
- **Performance-based SLRPs:** use quantifiable metrics, targets, or timeframes to guide planning, project development, maintenance, and operations decisions.
- **Needs-based SLRPs:** analyze transportation needs for the State by considering available or alternative revenue sources or through reference to demographic or travel demand projections.
- **Project-based SLRPs:** reflect assessment of alternative investments to meet the SLRP's transportation policies or goals.
- **Fiscally realistic/constrained SLRPs:** set long-term directions for the State's transportation system through analysis of projected capital and operating costs.
- **Vision-based SLRPs:** identify an ideal future State transportation system, often through incorporating public input on a preferred vision.
- **Corridor-based SLRPs:** focus on specific transportation corridors (e.g., single modal, multimodal, and intermodal transportation networks within a specific geographic area) through description of major corridors, project needs, consideration of corridor conditions, or description of potential corridor projects.

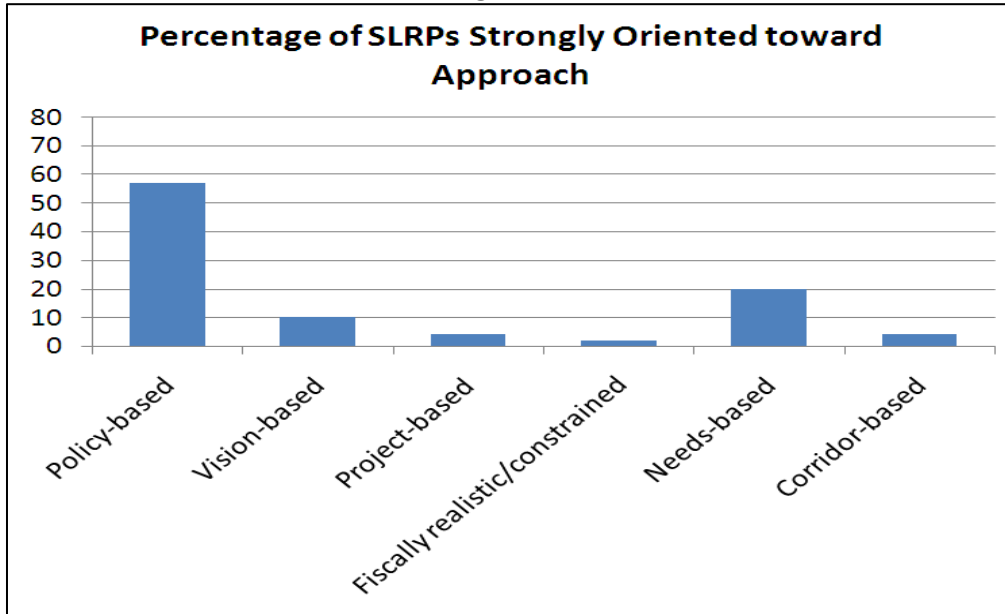
These plan types are described in more detail throughout this synthesis. It is important to note that plan types are not rigid; most SLRPs incorporate a variety of plan types. For this report, plan types are considered as broad characterizations that describe the plan's primary focus, approach, or orientation and allow better understanding of general trends in how States chose to develop the plan.

1.2 Overall Trends Related to Plan Type

The majority of SLRPs combined several plan types. Typically, however, one plan type stands out as the SLRP's primary orientation. Figure 1 shows trends in the percentage of SLRPs with a strong orientation to a specific plan type or approach.

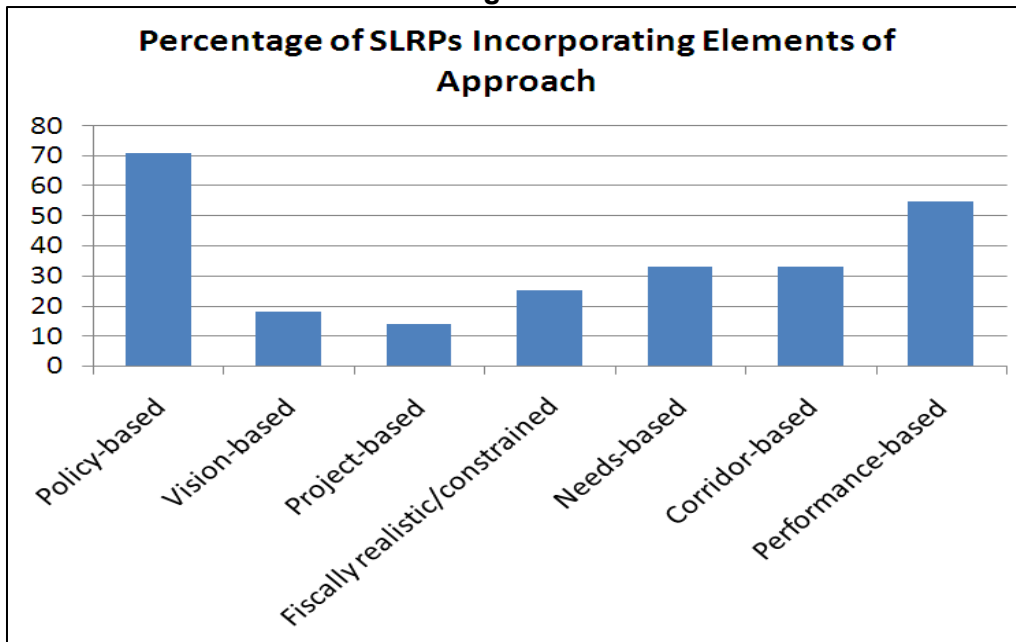
⁸ Information on plans incorporating a modal approach is provided in [synthesis topic six](#), which focuses on systems planning.

Figure 1.⁹



Of the 51 SLRPs reviewed, most incorporated a combination of approaches (see Figure 2). This might be due to the fact that States have significant latitude in determining what content to include in the SLRPs although they must also address several Federally required elements. States likely choose a variety of approaches when developing their SLRPs to better meet States' complex transportation needs and objectives.

Figure 2.



⁹ The review of plans did not include a scan for plans that were strongly oriented towards a performance-based plan type. As such, this category has not been included in the analysis for Figure 1.

Certain combinations of plan types were more common than others, suggesting that some approaches to developing SLRPs are complementary. For example, about 23 percent (12 SLRPs) include elements of a fiscally realistic/constrained approach. Of these plans, seven also incorporate elements of a needs-based approach. The frequency with which SLRPs combine needs-based and fiscal approaches indicates that States find it important to assess transportation needs as a means to establish a long-term fiscal direction for the State's transportation system.

1.3 Noteworthy Practices

SLRPs Incorporating a Performance Approach

Performance-based SLRPs incorporate performance measures in a range of ways, including associating goals with measurable outcomes (e.g., reduction of injuries for a safety goal), setting targets for improved performance through project selection criteria, or setting goals for facility maintenance or operations decisions. A performance-based plan might also describe approaches to or criteria for developing performance measures; it might consider linkages between performance objectives and overall plan goals or policies.

States reference different types of performance measures. For example, plan-related performance measures include project delivery timelines or percentage of projects completed within budget. System-related performance measures include congestion rates or infrastructure conditions.

Of the 51 SLRPs reviewed, 55 percent (28 SLRPs) incorporate performance measures; and 25 percent (13 SLRPs) include recommendations or next steps to develop performance measures. Additional findings and noteworthy practices related to performance-based SLRPs are provided in [synthesis topic four](#), which is focused on performance measures.

SLRPs Incorporating a Policy Approach

Policy-based SLRPs provide overarching strategies for future directions and discussion of options for how to proceed. Policy-based SLRPs might provide official public policies and priorities for solving problems or meeting projected demands related to future provision of the statewide transportation system. Policies could range from improving mobility or accessibility to enhancing safety or addressing environmental protection. In many cases, the SLRP might describe investments, strategies, or programs to accomplish these policies.

Fifty-five percent of SLRPs (28 plans) reflect a strong orientation towards a policy-based approach. Of these, most developed policies related to SAFETEA-LU planning factors. Some, however, developed policies focused on other topics, including climate change, sustainability/livability, asset management, and energy use. For example:

- [Minnesota's SLRP](#) identifies ten policies, one of which is focused on energy and the environment. The SLRP explicitly notes that the State will consider “increased use of alternative fuels and adoption of property and right of way management practices that offset greenhouse gas emissions.”
- The [Nevada SLRP](#) includes an asset management principle to “protect the public's investment in the transportation system.”

- The D.C. DOT's (DDOT) SLRP, which is being modeled from the [DDOT Comprehensive Plan's Transportation Element](#), will likely include policies focused on linking land use and transportation such as promotion of transit-oriented development as well as policies that focus on corridor planning and transformation.
- [Oregon's SLRP](#) includes four policy scenarios that examine the impact of potential policy decisions involving funding levels and sources.

Several SLRPs offer examples of noteworthy practices for incorporating a policy-based approach:

- [Connecticut's SLRP](#), the prior version of which was also cited as a noteworthy example of a policy SLRP in the 2005 analysis, proposes a five-point action plan that includes the following elements:
 - Preservation.
 - System modifications.
 - System productivity.
 - Economic and environmental impact.
 - Strategic capacity improvements.

Connecticut's SLRP is notable in explicitly addressing how its five major strategic actions/policies relate to the eight SAFETEA-LU planning factors. Additionally, the SLRP discusses a set of issues and trends influencing statewide transportation for each requirement, broad policy, and action.

The action plan provides a framework for broad policies and associated actions that help prioritize resources used to manage the transportation system. Each element of the action plan is associated with a requirement, a broad policy, and associated action steps. For example, the requirement for "preservation" is: "emphasize the preservation of the transportation system." The broad policy is: "invest first in projects and initiatives that maintain and improve the transportation system in areas where the infrastructure is already in place." Associated action steps include: "correct hazardous or potentially hazardous situations to avoid magnification of associated safety issues."

- [Delaware's SLRP](#) is composed of a policy framework that identifies activities deemed necessary to realize the State's vision for transportation in Delaware. The policies are related to several topic areas: sustainable development, travel choices/opportunities, cost-effectiveness, quality of life, economic development/growth, and planning/coordination. Similar to Connecticut's plan, Delaware's framework is comprised of principles, a policy statements, and potential actions to implement the policy. For example, principle one is: "direct our programs, services and facilities to support Livable Delaware." The associated policy statement is: "coordinate land use and transportation in a manner that promotes long term transportation efficiency." The potential action to implement this policy is: "explore new ways to better coordinate land use and transportation planning in the future such as strengthening collaboration between land use planning functions and transportation decision-making."

Delaware's SLRP also incorporates a notable practice in outlining timeframes for policy implementation, including short-, medium-, long-term, and ongoing timeframes. The SLRP incorporates elements of a fiscally realistic approach in outlining several financing principles; however, the SLRP focuses on the policy implications of these principles rather than on matching financing principles to capital/operating cost projections (which is characteristic of a fiscally realistic or constrained SLRP).

SLRPs Incorporating a Corridor Approach

Corridor-based SLRPs are organized around specific transportation corridors within the State. In some cases, this could be a compilation of major corridors from regional or district plans incorporated in the SLRP. Typically, corridor SLRPs are multimodal and provide a statewide synthesis of major corridors and their condition, projected use, and financing. Corridor-based SLRPs might also describe analysis methods and results to assign priorities for corridor improvements or expansion based on factors such as unmet or projected future demand.

Four percent of plans (two SLRPs) were strongly oriented towards a corridor approach; but overall, 33 percent of plans (17 SLRPs) incorporated some elements of a corridor approach. Of all 17 plans, most focused on multimodal/intermodal transportation corridors. Notably, [Oklahoma's SLRP](#) also included economic development corridors. Additionally, [Ohio's](#) and [Texas' SLRP](#)¹⁰ reference trade corridors, which refer to key transportation networks offering accessibility to employment centers and major cities. Some examples of corridor-based plans are listed below:

- [Colorado's SLRP](#) is notable in describing a major statewide initiative focused on corridors. The initiative identifies a system of “corridor visions,” an integrated transportation network reflecting long-range local, regional, and statewide travel needs. While the corridor concept was proposed in the Colorado DOT's previous plan, the current plan updates and refines the corridor visions. The SLRP considers recent project accomplishments in the key corridors. It is also notable for including a separate, web-based corridor visions presentation (also available on a compact disc read-only memory [CD-ROM]) that describes goals for both statewide and regional corridors as well as strategies that could meet each corridor's unique transportation needs. The presentation includes an interactive map; users can click on corridors to obtain more information about goals and strategies. The SLRP also incorporates elements of a fiscally realistic/constrained approach, for example, by proposing three fiscal scenarios (forecast revenue, sustain current performance, and accomplish vision) to compare and contrast how various funding levels would affect transportation system performance.
- [Ohio's SLRP](#) includes extensive references to corridors and corridor-based planning. The plan explicitly notes that Ohio DOT's (ODOT's) commitment to investing in corridors and also identifies a strategic system of 26 multimodal travel and trade corridors. The travel and trade corridors consider roadways, air and water ports, transit systems, trails, and rail facilities located within a 20-mile bandwidth around a backbone of core macro highway corridors. These travel and trade corridors provide a framework for identifying ODOT's multimodal transportation needs and project priorities.

¹⁰ The Texas SLRP reviewed in this report dated from 1995, and it was not available online at the time that this research was conducted. However, the updated Texas SLRP is available at www.txdot.gov/public_involvement/transportation_plan/report.htm.

Ohio's SLRP appears to be unique in referencing specific criteria and a quantitative modeling process to define and identify the core large-scale highway corridors. For example, one criterion is that major corridors must have a daily carrying capacity that exceeds 30,000 passenger cars. Using the quantitative process and with input from local government and metropolitan planning organizations (MPOs), Ohio's SLRP recommends 10 new roadway segments for inclusion in the macro highway corridor system.

Additionally, the SLRP includes a separate, standalone document that outlines profiles for each of the travel and trade corridors. The profiles include a summary of existing conditions, objectives, and recommended major multimodal projects. Notably, the profiles also indicate how the project recommendations will address the SLRP's overall goals of transportation safety, economic development, reliable traffic flow, and system preservation.

SLRPs Incorporating a Needs-Based Approach

Needs-based SLRPs analyze the transportation needs forecast for the State by considering demographic trends and available facilities to select policies, strategies, and investments to meet those needs. A needs-based SLRP might assess the travel needs of the State by measuring current travel patterns for all modes, anticipating future needs based on demographic forecasts, and projecting future travel patterns. Current and future performance of the multi-modal system can be specified in terms of levels of service or other measures. SLRPs may also include cost projections and considerations of available or alternative revenue sources.

Twenty percent of plans (10 SLRPs) are strongly oriented towards a needs-based approach but overall 37 percent of plans (19 SLRPs) include elements of a needs-based approach. In most cases, SLRPs use fiscal scenario analysis to identify how different investment levels might impact State DOTs' abilities to address transportation needs. A few noteworthy examples are listed below.

- [North Carolina's SLRP](#) identifies long-term needs for each mode and on a statewide, regional, and sub-regional basis. The plan is composed of modal chapters that describe priority needs for each mode and general observations or trends related to these needs. Four major investment categories of needs, including maintenance, preservation, modernization, and expansion, are addressed throughout the modal chapters. The plan also incorporates elements of a fiscal approach in detailing a recommended investment scenario to establish transportation investment priorities and suggest targeted expenditure levels for specific programs.
- [Tennessee's SLRP](#) consists of three major products: a 25-year vision (described in a standalone modal needs report), a 10-year strategic investments plan, and a three-year project evaluation system. The plan is notable in explicitly using a needs-based approach to develop the 25-year vision, a framework that provides a foundation for Tennessee's strategic decision-making. The process of developing the vision is described in the SLRPs' modal needs report. The report details specific transportation needs in three investment categories for each mode and two "support" elements (intelligent transportation systems [ITS] and travel demand management). Three potential investment scenarios are discussed to determine what investments would best

meet multimodal transportation needs in each of the three categories. Furthermore, the modal needs plan outlines the methodology used to define and identify needs.

SLRPs Incorporating a Vision Approach

Vision-based SLRPs identify an ideal or preferred future State transportation system, considering such questions as: “what should the State’s future be and what transportation system is required to support this vision?” SLRPs incorporating this type of approach might offer visions for economic development, land use, quality of life, environmental protection, or other concerns. These types of plans might also involve active stakeholder and public participation to identify and select alternative scenarios, perhaps contrasting system performance with costs or identifying new revenue sources. One scenario can be selected as an agreed-upon “vision.” Vision-based plans can function to secure public and political support for the selected vision. A vision-based plan might also include needs-based or fiscally realistic/constrained approaches to contrast choices, costs, and performance results of alternatives.

Ten percent of SLRPs (five plans) are strongly oriented towards a vision approach; but overall, 18 percent of SLRPs (nine plans) include elements of a vision-based plan type. Many of these SLRPs include vision statements that frame subsequent policies, guidelines, or action steps. Others summarized citizens’ preferences/goals for paths forward. Although most vision-based SLRPs include visions based around transportation modes, [Idaho’s vision plan](#) (a component of its SLRP) also includes a vision for information technology systems. Many of the vision plans rely on extensive public involvement outreach to articulate elements of the vision. Scenario planning exercises, focus groups, workshops, and surveys are all mentioned as strategies to obtain public feedback. For example, [Missouri’s plan](#) notes that the Missouri DOT (MoDOT) formed six citizen focus groups to gather ideas and opinions on Missouri’s transportation future.

Some noteworthy examples of vision-based SLRPs are provided below.

- [Iowa’s SLRP](#) was developed through a multi-step process that extensively incorporated visioning and public involvement elements. The Iowa DOT solicited public input on future directions for Iowa through the year 2020. From these conversations, three future scenarios were developed: “Two Iowas,” “Rural Revitalization,” and “Metro Explosion.” The scenarios provided a framework to identify key issues, such as resource conservation and reduced spending, and appropriate investment directions to address these issues. Ultimately, a preferred scenario alternative was determined with public input. The SLRP itself includes several modal chapters, each of which details potential future actions to address modal needs and specific projects or improvements that investments will accomplish by the year 2020.
- [Idaho’s vision plan](#) is a component of its SLRP. A prior version of the plan was also cited as a noteworthy example in the 2005 analysis. The plan discusses Idaho DOT’s use of scenario planning exercises and a series of workshops to engage citizens in articulating an overall statewide transportation vision. The vision provides a framework for articulating principles, policies, priorities, opportunities, and actions to chart future operations. Four major principles of the vision include: “Meet the Mobility Need,” “Be Flexible and Responsive,” “Be an Asset to the Community,” and “Be Compatible with the Environment.” Idaho’s vision plan recommends development of performance measures and a project prioritization system consistent with the vision and designed to help measure progress toward it. Furthermore, the vision plan provides a foundation for the goals and objectives incorporated into Idaho’s SLRP.

SLRPs Incorporating a Fiscally Realistic/Constrained Approach

SLRPs incorporating a fiscally realistic/constrained approach set long-term directions for the State's transportation system based on policies, goals, investments, and strategies, which are matched to projections of associated capital and operating costs. These costs are then typically adapted to reasonably available revenues. Often, a fiscally realistic/constrained plan discusses risks and probabilities of projected costs and revenues, attempting to balance both.

Four percent of SLRPs (two plans) are strongly oriented towards a fiscally realistic/constrained approach; but overall, 24 percent of SLRPs (12 plans) incorporate elements of this approach. Many of these types of SLRPs use revenue scenarios as methods to compare and contrast fiscal alternatives. Other SLRPs include extensive discussions on funding, financing, or revenue alternatives. A few States incorporate a fiscal focus throughout the plan, using fiscal alternatives as a framework for developing guidelines, policies, or action steps.

Some noteworthy practices are listed below.

- [Louisiana's SLRP](#) is fiscally constrained and extensively considers fiscal issues for the State's transportation system. One of the SLRP's overarching goals is to develop stable but flexible funding to support preservation of the transportation system and implementation of new facilities. It develops revenue forecasts for both highway and non-highway modes, identifies funding sources, and considers potential new revenue sources and innovative financing techniques such as credit assistance strategies (e.g., State infrastructure banks). Additionally, four revenue scenarios are advanced to serve as frameworks for project recommendations. The SLRP is also noteworthy in presenting modal project recommendations, cost estimates, and tying this information to the corresponding revenue scenario(s) that would support implementing the recommendations.
- [Washington's SLRP](#) is based on a framework comprised of five investment guidelines, including preservation, safety, economic vitality, mobility, and environmental quality and health. It aligns funding sources with investment guidelines, detailing how much funding is available for projects in each of the five investment categories. Project needs and cost breakdowns are also detailed for the five categories. Several projects in each area are highlighted as well as their costs, funding sources, and benefits to the community. Finally, the SLRP explores major funding sources for the State, describes the Washington DOT's uses of funds (e.g., operating costs), and considers innovative financing techniques.

SLRPs Incorporating a Project Approach

Project-based SLRPs develop and select specific projects to be undertaken over a long-term planning horizon to meet the SLRP's transportation policies or goals. Projects might be grouped by mode or category (e.g., bicycle/pedestrian, freight, port access).

Four percent of SLRPs (two plans) are strongly oriented towards a project approach; but overall, 14 percent of SLRPs (seven plans) incorporate a project approach. Most SLRPs closely tie their project focus to fiscally constrained or fiscally realistic elements. For example, to identify project priorities, [Indiana](#) estimated future project costs, developed new long-range fiscal forecasts, and then applied project priorities to estimated available funding for three time periods. Most project-

based SLRPs also focus on highway needs and projects rather than multimodal projects. However, [Ohio's SLRP](#) includes general capital improvement projects needed for airports, has a list of committed bicycle and pedestrian and regional projects, and recommends transit and rail projects.

Some noteworthy practices are listed below.

- [Utah's plan](#) uses a preferred revenue alternative, which describes a moderate increase in funding above the historical trend to develop a phased project list that addresses priority capacity needs anticipated over at least a 20-year period. There is a strong rural component to Utah's project approach. The list details rural and small urban area projects by county, region, location, length, improvement types (e.g., widening, passing lanes, interchanges), and an estimated cost. Utah's SLRP also addresses rural highway needs, mapping areas in need of interchanges, passing lanes, and capacity increases as well as mapping rural highway projects for each of Utah DOT's four regions.

Projects are listed in one of four categories, including three phases (2007-2015, 2016-2025, and 2026-2030) as well as an unfunded category. The plan also describes multiple components of the project selection process, which include a needs assessment, use of a prioritization matrix, development of implementation plans, and a short-range funding program. The prioritization matrix assesses projects on the basis of three categories: maintenance and preservation, safety, and mobility. Another important aspect of Utah's project approach is tying projects back to four strategic, overarching plan goals. Utah's plan also details project implementation, including a summary list of public comments on proposed projects.

- [Indiana's plan](#) focuses on identifying and prioritizing specific highway expansion projects. Modal needs are examined using a variety of tools and systems. For example, Indiana analyzes unconstrained highway needs using the State project management system, a database containing every project under development by the Indiana DOT. A variety of quantitative tools, including the travel demand model and Highway Economic Requirements System for Indiana, were used to assess impact of potential improvements and system performance results. From these assessments, Indiana developed a list of project priorities for the interstate system, local system, and economic development. The SLRP also details several corridor studies from which project listings were derived. It is noted that a key element of making a transitions from systems planning to project programming is completion of corridor studies.

Indiana also has a unique project funding initiative called the Major Moves Program, a 10-year (2006-2015) program that includes added capacity and rehabilitation/reconstruction projects. All projects included in the Major Moves Program are subject to a systematic scoring process and are tied to overall Indiana goals (e.g., safety, economic development, etc.). Projects are prioritized according to estimated available funding for three time periods: 2016 to 2020, 2021 to 2025, and 2026 to 2030. Key transportation stakeholders, including the public, had opportunities to comment on projects.

Summary

Most SLRPs combine several approaches rather than take only a single direction or orientation. The trend toward combining approaches was also noted in the 2005 research. The most

common plan types are policy- and needs-based approaches but over half of all plans also include elements of a performance-based approach. The common tendency to include a performance-based approach could be related to the increasing importance of performance concepts in transportation planning and management. A relatively small number of SLRPs incorporated a corridor- or vision-based approach. This might be related to the fact that visioning exercises and corridor planning have historically been conducted more often by regional agencies such as MPOs.

Synthesis Topic 2: Focus on Implementation

2.1 Overview

As a key product of the statewide planning process, SLRPs reflect States' decision-making processes, including policy directions, how funds will be allocated, and which projects will be prioritized. As this research was limited to a review of the SLRPs, it is not possible to determine the extent to which a State implements the recommendations and investment decisions included in the plan. However, SLRPs' potential influence on transportation decision-making processes can be more generally discussed by examining the content of the plan, particularly its incorporation of items such as investment scenarios, performance measures, project prioritization criteria, and implementation strategies.

2.2 Types of Influence

States can implement SLRPs through changes to:

- Internal processes through new practices or policies;
- Policy directions or guiding principles; or
- Consideration of alternative investment strategies, including new funding allocations and project prioritization schemes.

The majority of SLRPs included some level of discussion related to the above categories. Of the three categories above, most plans focus on changes to policy directions or alternative investment strategies. Very few plans explicitly discussed changes to internal processes. The sections below provide some examples.

Changes to Internal Processes

A few SLRPs focused on how the plan will lead, or has led, to new internal practices or policies. For example, [Minnesota's plan](#) includes a guiding principle to promote accountability and transparency; an internal goal to address this principle is to develop new approaches to engage stakeholders in the decision-making process at both the project and broader system levels.

Other States highlight new practices in developing the SLRP. For example, [Kentucky's plan](#) notes that it departed from previous plans in electing to solicit input from customers to ascertain the most prominent needs for Kentucky over a 25-year period. [New Hampshire's plan](#) was developed through a Citizen Advisory Committee in response to a governor's mandate that the State DOT "transition to a new transportation environment" that demonstrates more effective inclusion of customers.

New Policy Directions

Some SLRPs discuss how the plan will influence new policy directions. For example:

- [Vermont's plan](#) incorporates, for the first time, a business perspective into the State's long-range transportation planning process. The business perspective involves looking more strategically at the transportation system to identify priorities and how limited resources can be directed toward activities with the greatest return on investment. The

plan discusses several policies and strategies to support this perspective such as giving priority to funding for maintenance and preserving transportation infrastructure.

- [Connecticut's plan](#) notes that the State is in the midst of a paradigm shift in governance, particularly for the transportation system. As part of the shift, “transportation issues are being more broadly defined in terms of how to best meet the mobility needs of people and for freight rather than how to meet transportation needs by means of a specific mode of transportation.” New policy directions in Connecticut's SLRP include a greater recognition of the importance of the role of land use planning in meeting mobility needs as well as new partnerships among State agencies, regional planning organizations, local governments, civic groups, and other interested parties.

Investment Strategies

A majority of SLRPs discuss considerations of alternative investment strategies or new ways to identify investment priorities. In these discussions, States typically reference new investment policies or strategies, performance measures to assess progress on investment goals, project prioritization criteria to identify critical projects, or funding scenarios to support more effective financial decision-making. Examples of SLRPs that include fiscal performance measures and funding scenarios are detailed in [synthesis topic four](#), which is focused on performance measures, as well as [synthesis topic five](#), which is focused on financial analysis. This section focuses on providing examples of SLRPs that reference project prioritization criteria or new investment policies/strategies.

- [West Virginia's plan](#) proposes a two-phased methodology to prioritize transportation projects throughout the State. The methodology involves both qualitative and quantitative analysis. First, projects will be qualitatively screened to ensure that their purpose and need are justified and do not duplicate an existing project. Next, projects will be grouped and sorted. A benefit-cost ratio equation will be applied to the projects. Following this, projects will be grouped geographically and into program areas (e.g., safety). The plan also discusses the benefits of performance measures, considers typical categories included in other States' plans, and recommends that West Virginia DOT expand its current performance measurement framework.
- [Ohio's plan](#) includes a number of prioritization factors and notes that ODOT will revisit prioritization criteria in the next SLRP update. Examples of prioritization factors for transit include safety improvements, demand for service, and inter-modal connectivity.
- [Tennessee's SLRP](#) includes a 10-year strategic investments plan that provides a framework for project priorities and measuring the impact of projects. The investment plan represents the portion of the vision plan that can potentially be achieved within 10 years with an additional \$2 billion in investments. The strategic investments plan contains three investment categories: congestion relief, choices, and corridors. Within each category, specific project types (e.g., transportation demand management or rural highways) are examined as well as the funding needed to complete these projects.
- [Kansas' plan](#) proposes a new programming structure that includes two categories of multimodal projects: core and economic opportunity projects. Core projects will typically be selected on the basis of engineering criteria while economic opportunity projects will take into account the State's economic well-being in addition to engineering criteria. To

support the new programming structure, Kansas' SLRP proposes to expand engagement of local stakeholders through regular and informal dialogue and creation of a Transportation Advisory Panel; additionally, the plan proposes to incorporate economic development criteria as part of the selection of economic opportunity projects.

2.3 SLRPs with Implementation Plans

Some SLRPs describe action steps that outline how the State intends to translate its overall transportation vision into practice. Some examples are provided below.

- [Delaware's plan](#) includes a section on implementation and monitoring. The section outlines a multi-step Departmental Action Plan to provide a framework for guiding Delaware DOT's (DelDOT) implementation efforts and a means for assessing effectiveness of this implementation. The first proposed step is to prioritize the action items identified in the plan and then develop responsibilities, interim milestones, and deadlines. The action plan also noted the importance of feedback from staff with guidance from stakeholders, regular updates, and monitoring and annual reporting of performance through disseminating a status report.
- [Mississippi's plan](#) includes a detailed matrix that links guiding principles to strategies and action steps. For example, a strategy to address the guiding principle that focuses on finance is to establish a balanced funding program to achieve Mississippi DOT's objectives. The associated action step is to “explore alternative funding sources to supplement the traditional surface transportation funds, including various local option taxes, benefit districts, impact fees, and others.”

Several States have moved beyond proposing general action steps to explicitly identify key responsible stakeholders or timeframes for implementing strategies to accomplish the vision. The detail included in these types of discussions indicates strong connections between the SLRP and the States' decision-making processes. Examples are listed below.

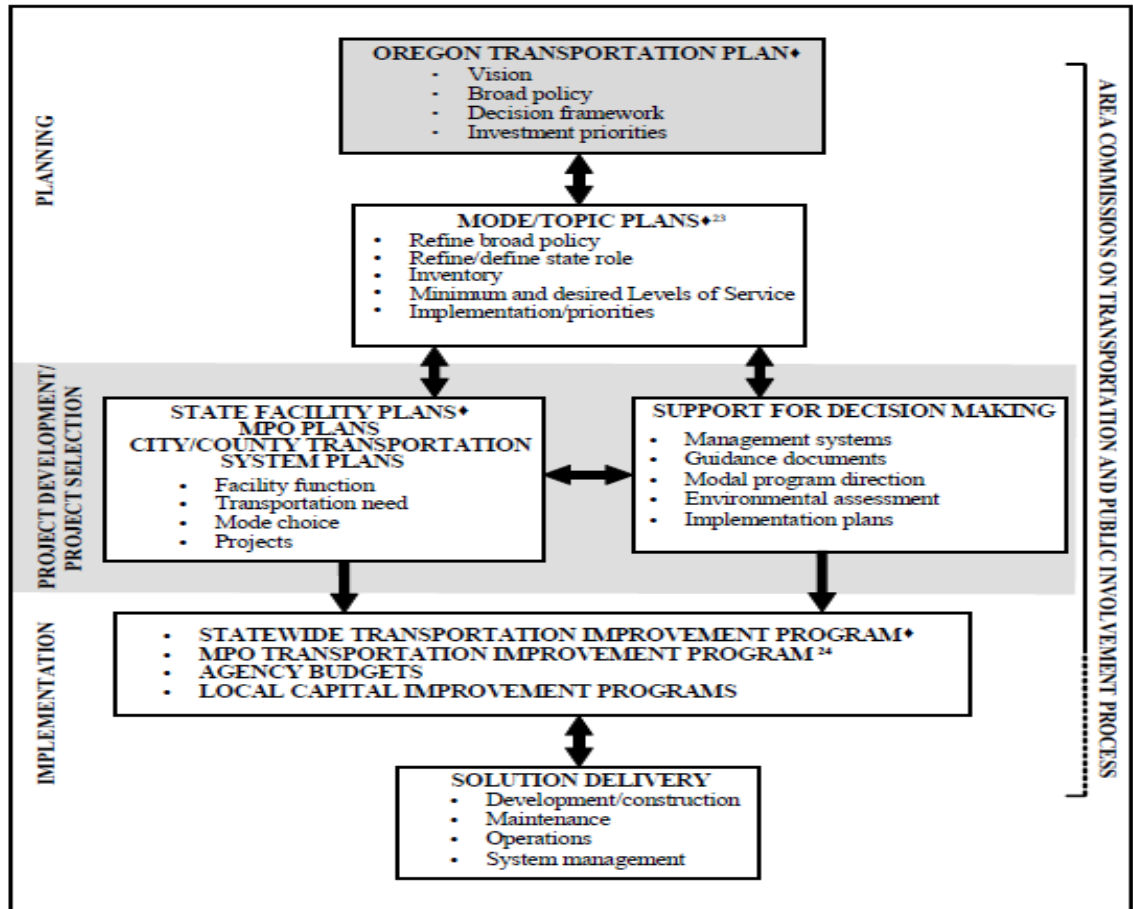
- [Florida's SLRP](#) includes five guiding principles and 29 key strategies to address the principles. Agencies responsible for implementing these strategies are identified; for instance, in addition to the Florida DOT, the Florida Highway Patrol should take a lead role on safety strategies. General stakeholder roles are also discussed. For example, modal partners and authorities will be responsible for operating and managing modal facilities and services. The Governor and legislature will be responsible for ensuring that the State's transportation policy and investments support the State's economic, community, and environmental goals.
- [Vermont's SLRP](#) outlines a series of strategies to support its seven guiding principles. For each strategy, the plan identifies primary, support, and external stakeholders as well as an implementation target. For example, as part of the guiding principle to ensure a safe and secure transportation system, the plan recommends that the State develop and maintain safety plans for all modes of transportation over the next five years. The primary responsible stakeholder is the operations division, the support stakeholder is the policy and planning division, and external stakeholders include transit providers and the Vermont Railway System.

2.4 Noteworthy Examples

The noteworthy examples below demonstrate SLRPs that adopt a combination of implementation approaches, including reference to performance measures, detailed action plans with timeframes for implementation, use or proposed development of project prioritization criteria, and suggested new investment policies.

- [Oregon's plan](#) includes a chapter that describes an implementation framework for the SLRP. The framework calls for the Oregon DOT to improve the planning process by building on existing partnerships and public involvement practices, increasing Federal, State, regional, and local coordination, and presenting a realistic funding structure. It also outlines expectations for how partners can implement the Oregon transportation plan. For example, State multimodal, modal, and topic plans are expected to include a minimum of 20-year forecasts for population and needs and integrate with other modal plans/modes. The implementation plan discusses alternative investment scenarios to assess the level of funding that would be needed for different types of transportation projects. From this scenario analysis, Oregon recommends that one investment scenario, which adds \$1.3 billion annually over 25 years, be pursued incrementally over time. Oregon's SLRP also includes a diagram illustrating how the SLRP connects to project delivery (see Figure 3).

Figure 3. Oregon's Project Delivery Framework.¹¹



- [Pennsylvania's plan](#) includes an implementation document that details actions for implementing plan strategies and a user's guide that assists planning partners and other stakeholders in integrating the SLRP into daily work activities. The implementation plan focuses on the Pennsylvania DOT's (PennDOT's) business decision-making to better align projects with priorities. It lists specific objectives, actions, and timeframes for achieving the SLRP's goals and identifies lead and supporting stakeholders to undertake these efforts. It also proposes a two-phased monitoring approach to evaluate progress towards achieving the SLRP's overall goals. First, PennDOT will develop a state-of-the-system report to assess the transportation system's performance in reaching these goals. Second, implementation of the plan will be tracked using the agency's annual business planning process. A project evaluation framework and sample criteria for each objective are included to ensure that investments meet PennDOT's long-term objectives. The SLRP's clearly defined actions and timeframes as well as the project evaluation framework indicate the State's strong focus on implementation.
- [New Mexico's plan](#) includes several implementation approaches. First, it outlines a responsible office for each of the plan's objectives and strategies. For instance, as part of its guiding principle to address mobility and accessibility, New Mexico DOT's Office of

¹¹ Source: Oregon Transportation Plan, page 103. Available at www.oregon.gov/ODOT/TD/TP/docs/ortransplanupdate/2007/OTPVol1.pdf.

Infrastructure and Programs will be responsible for advertising public transportation options while the Planning Division will prioritize access management by having planners participate in Planning and Environmental Linkage studies. The plan also identifies strategic transportation corridors to help prioritize projects.

Summary

Implementation of SLRPs might be accomplished through changes to internal protocols, policy directions, or investment decisions. Although the study team's limited review of the SLRPs themselves does not support conclusions on the extent to which these plans have been or will be implemented, its review can still lead to useful insights related to implementation. Several plans had the potential for strong links to implementation through their combined use of key planning mechanisms such as incorporation of performance measures, incorporation of detailed frameworks for implementation, or project prioritization criteria allowing a potential bridge to decisions in the State or metropolitan area Transportation Improvement Programs (STIPs and TIPs).

Synthesis Topic 3: Guiding Principles, Objectives, and Strategies

3.1 Overview

Most SLRPs reference a key set of guiding principles or broad policies that frame the plan and the State's transportation direction or vision, including the condition of the transportation network and daily State DOT operations. Additionally, most SLRPs establish objectives and strategies derived from the guiding principles.

While most SLRPs include guiding principles, objectives, and strategies, the terminology used to describe these components greatly varies across the SLRPs. For example, some States use the terms "goals" or "visions" when discussing guiding principles. In addition, SLRPs use the terms "recommendations," "initiatives," and "action steps" to refer to objectives and strategies. Because these terms varied widely and differed across SLRPs, this synthesis topic provides definitions for terms that will be used in this section (see Table 1).

Table 1. Definitions of Terms.

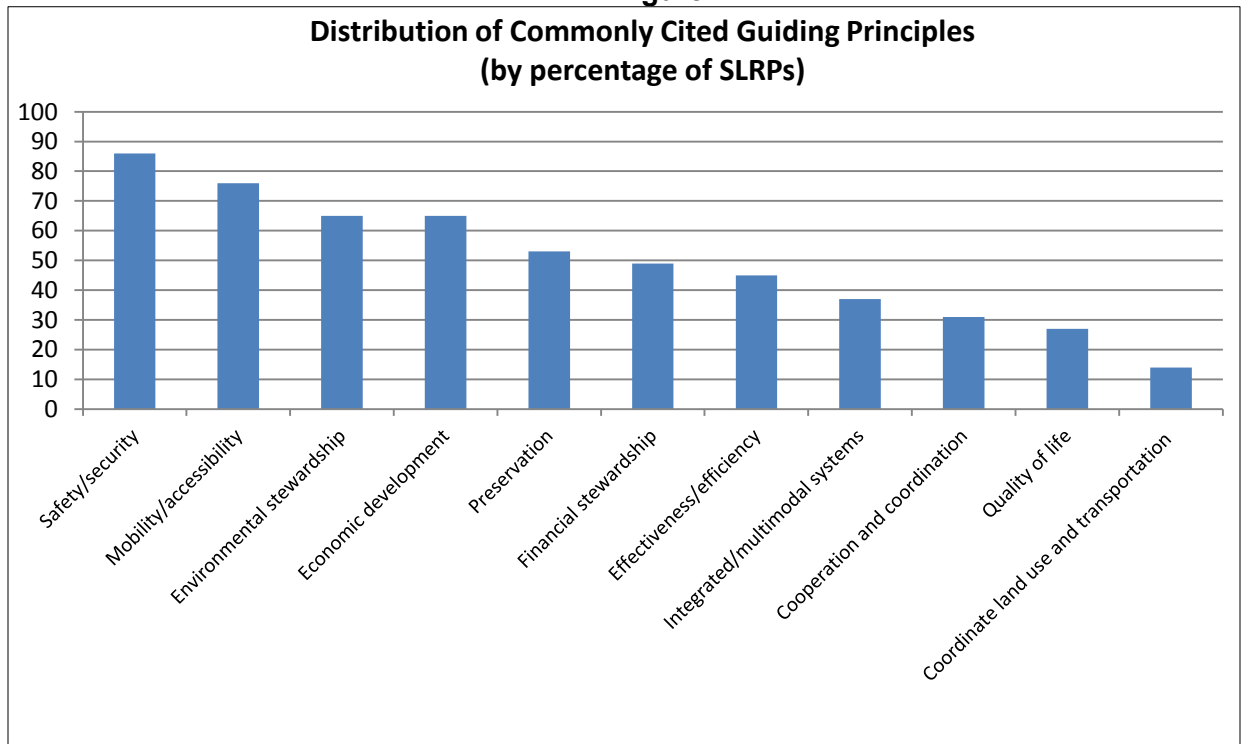
Term	Definition
Guiding principle	Overarching policy framing the plan and the State's transportation direction.
Objective	Measurable result to help State advance a guiding principle and accomplishment a related goal.
Strategy	Proposed or ongoing action to lead a State towards reaching an objective.

3.2 Overall Trends Related to Guiding Principles, Objectives, and Strategies

Focus of Guiding Principles

SAFETEA-LU identifies distinct topics that States should consider when developing transportation plans. As such, many of the guiding principles cited in SLRPs are consistent with SAFETEA-LU planning factors. While SAFETEA-LU planning factors clearly encourage States to identify guiding principles and goals, SLRPs also articulate other principles that are generated at the State level, whether as a reflection of legislative direction, the result of visioning processes, or public or stakeholder involvement. Figure 4 summarizes the range of most commonly cited guiding principles addressed in SLRPs. Plans often include multiple guiding principles.

Figure 4.



As illustrated in Table 1, the five most commonly cited guiding principles are consistent with SAFETEA-LU planning factors of safety, security, mobility/accessibility, environmental protection and enhancement, economic vitality, and preservation of the transportation system. States also identify five additional topics for guiding principles (financial stewardship, effectiveness and efficiency, cooperation and coordination, quality of life, and land use and transportation coordination), which are not explicitly referenced in SAFETEA-LU planning factors. [Synthesis topic five](#), which is focused on financial issues, provides additional discussion about SLRPs' incorporation of financial stewardship guiding principles.

Relatively uncommon topics for guiding principles include customer service and innovation/technology. Examples of each are provided below:

- [Nevada's SLRP](#) includes a customer service guiding principle, which focuses on improving external customer satisfaction to have a positive impact on the traveling public. The principle also addresses internal employee satisfaction and improving relationships with contractors, road crews, local businesses, and developers.
- [Louisiana's SLRP](#) includes a guiding principle (called "value" in the plan) focused on innovation and adaptability. The principle addresses pursuit, implementation, and integration of the best technological and organizational advancements.

Approaches to Developing Guiding Principles, Objectives, and Strategies

States take a range of approaches to develop the SLRPs' guiding principles, objectives, and strategies. Generally, the different approaches can be characterized in four broad categories: 1) responses to Federal or State legislative requirements; 2) responses to public feedback; 3) internal reviews, including needs assessments or review of previous long-range plans, mission

statements, protocols, or business plans; and 4) new challenges or trends, including demographic trends and funding availability.

States likely use all or most of these approaches to develop transportation directions and associated actions. However, some States provided particularly detailed discussions of one or two approaches. Examples of States that provide detail on one approach are identified below.

Responses to Federal or State Requirements

- [Connecticut's SLRP](#) illustrates how a State legislative requirement significantly shapes the plan's guiding principles. Connecticut Public Act 06-136, *An Act Concerning the Roadmap for Connecticut's Future*, authorized \$2.3 billion for transportation initiatives. The act requires the Connecticut DOT to plan and implement for several studies and projects focused on a fix-it-first policy. The policy is incorporated as a major part of Connecticut's guiding principle on preservation and maintaining the system in good repair and forms the basis of objectives and strategies included in the plan. For example, one objective is to conduct capital improvements on the New Haven [rail] branch lines "not to exceed forty-five million." A related strategy is to conduct capacity improvements only after serious consideration of available funding and resource allocations with priority given to "fix-it-first" initiatives." Connecticut's plan is also notable in explicitly referencing numerous external factors that influenced the development of guiding principles, objectives, and strategies, including State and Federal government, demographics, funding, and new information and technology. The SLRP notes that State and Federal government are the most significant of these factors.
- [California's SLRP](#) notes that one of the most significant factors influencing the plan was the shift in transportation planning and project selection responsibilities that resulted from California Senate Bill 45 (SB 45), which divided the STIP into two sub-programs, the regional TIP (comprising 75 percent of TIP funds) and the interregional TIP (comprising 25 percent of TIP funds).¹² While the plan does not draw any explicit links between SB 45 and the SLRP's six guiding principles, it notes the general significance of SB 45 in influencing the content of the plan, the overall California transportation vision, project priorities, and performance measures.
- [Montana's SLRP](#), *TranPlan 21*, amends the State's previous long-range transportation plan in response to SAFETEA-LU requirements. The SLRP includes extensive, detailed discussions of how its guiding principles, objectives, and strategies were shaped by SAFETEA-LU requirements. For example, the plan includes a detailed table that illustrates how specific guiding principles and strategies (called "policies" and "actions" in the plan) were either revised or retained in response to SAFETEA-LU. A guiding principle on access management was updated to emphasize interagency coordination and use of corridor plans. A related strategy to communicate the performance benefits of an access management principle was also updated to emphasize interagency coordination.

Responses to Public Feedback

- [Hawaii's plan](#) notes that its five guiding principles are the result of a comprehensive statewide planning process but were particularly shaped through public outreach. To

¹² For more information on SB 45, see: http://info.sen.ca.gov/pub/97-98/bill/sen/sb_0001-0050/sb_45_bill_19971003_chaptered.html.

solicit input on the guiding principles, the Hawaii DOT formed several citizen advisory committees for each of Hawaii's islands. These committees met several times and used a range of techniques to obtain broad feedback, including telephone surveys and interviews. The committees identified transportation issues and concerns and developed preliminary goals, which were enhanced and refined to develop proposed guiding principles for the SLRP.

- [Missouri's SLRP](#) discusses three guiding principles (called “long-range planning initiatives” in the plan) based on citizen feedback, which was collected through an extensive public participation process. As part of this process, MoDOT conducted interviews with a range of stakeholders, including local elected officials, community leaders, and industry representations, and a telephone survey of 3,100 Missouri residents. MoDOT also formed six citizen focus groups (called “regional working groups” in the plan). Feedback compiled from these outreach opportunities served as the primary basis for developing the three guiding principles.

Internal Processes

- [Tennessee's SLRP](#) includes seven guiding principles. The plan notes the principles were developed by conducting an in-depth study of statewide needs for all transportation modes. Needs were estimated for three categories: maintenance and system preservation, safety and modernization, and system expansion and enhancement. The guiding principles were also shaped by public input. Finally, the principles are consistent with those of Tennessee DOT's (TDOT) planning partners. To ensure consistency with these partners, TDOT reviewed the long-range plans from Tennessee's metropolitan planning organizations and conducted a survey of eight surrounding States.

Challenges and Trends

- [Wisconsin's plan](#) notes that its guiding principles (called “policies” in the plan) were, in part, developed as a response to new trends and challenges affecting the State. One important trend for Wisconsin is aging population; many of the SLRP's guiding principles, strategies, and objectives address this trend through a general recommendation to increase transportation choices. For example, one of the SLRP's guiding principles is promoting mobility/accessibility. A related strategy is to “support public, specialized, and human services transit.” Objectives for this strategy are grouped into three categories: short-term, mid-term, and ongoing for the planning period (2008-2019). A short-term objective is to “seek combined State and Federal funding covering 60 percent of operating costs for large urban transit systems... and 65 percent for small urban systems.”

Hierarchies of Guiding Principles, Objectives, and Strategies

While most SLRPs link objectives and strategies to guiding principles, some SLRPs go beyond this to articulate a clear hierarchy that expresses how each item would lead the State forward to reach its overall transportation direction. In some of these cases, States emphasize the importance of the hierarchy through development of performance measures or candidate measures that track progress toward the transportation direction (additional information on how SLRPs incorporated performance measures can be found in [synthesis topic four](#)). Below are some examples of plans that clearly illustrated this hierarchy.

- [Delaware's SLRP](#) outlines a policy framework that includes six guiding principles (called “policies” in the plan) and associated strategies (called “actions” in the plan). The plan is notable in organizing each strategy into short-, mid-, long-term, or ongoing categories. For example, one guiding principle is to “direct our programs, services and facilities to support Livable Delaware.” The plan describes two strategies to address this guiding principle: “coordinate land use and transportation in a manner that promotes long-term transportation efficiency” and “direct or focus transportation investments in Delaware in a manner that improves awareness and knowledge of sustainable development within designated areas.” As part of the first strategy, DelDOT recommends ongoing collaboration between land use planning functions and transportation decision-making. As part of the second strategy, DelDOT supports development of low-impact projects as mid-term actions. Candidate performance measures are proposed for each guiding principle. For example, a candidate measure for the economic development principle is the percentage of growth in tonnage or value for freight originating from Delaware.
- [Mississippi's SLRP](#) includes seven guiding principles, which are called “goals” in the plan. Each guiding principle is associated with numerous objectives and strategies. For example, one guiding principle is to improve accessibility and mobility for Mississippi's people, commerce, and economy. A related strategy is to improve accessibility and mobility through highway initiatives and provide reasonable access to the State's highway system. The associated objective is to complete construction and open to traffic specific phases of a highway program by the adopted schedule dates.
- [Ohio's SLRP](#) has five guiding principles (called “goals” in the plan): safety, economic development and quality of life, efficiency and reliability, system preservation, and resource management. Each guiding principle is associated with specific strategies. For example, the preservation strategy is to “plan and sustain a manageable and predictable schedule of existing transportation system maintenance within an \$825 million annual system preservation budget.” An associated objective is to “complete the reconstruction of 60 percent of Interstate lane miles and sustain a preventive pavement maintenance program on 5 percent of all appropriate lane miles per year.” Although preservation-focused performance measures are not explicitly stated in the plan, Ohio's plan notes that performance measures have been developed for each guiding principle that identify measurable targets, establish funding levels needed to reach these targets, and evaluate ODOT's success in achieving the overall transportation vision.

Summary

The guiding principles, strategies, and objectives referenced in SLRPs focus on a variety of topics although most are related to the Federal planning factors. Although States also take different approaches to developing these principles and actions, several factors were particularly important in shaping these approaches, including Federal and State requirements, public participation, internal processes, and the need to address new challenges and trends. States with highly developed hierarchies, which clearly linked guiding principles to strategies and objectives, sometimes emphasized the importance of these hierarchies through development of performance measures.

Synthesis Topic 4: Performance Measures

4.1 Overview

In recent years, performance measurement has emerged as an important component of transportation planning and decision-making. Transportation agencies increasingly utilize performance measures to guide planning, project development, maintenance, and operations decisions. Reauthorization of the Federal transportation bill is likely to further the importance of performance measures through emphasizing performance-based planning, a process where goals and related measures and targets guide future transportation investments and other decisions. The aim of performance-based planning is to provide tools throughout the transportation planning process, such as project selection criteria, to help identify and assess how programs, projects, services, and strategies influence or further the State's transportation goals and objectives.

The following sections provide information on how SLRPs addressed performance measures. It is important to note that the discussion below is not an exhaustive representation of the use of performance measures in the State planning process. Many States have robust performance measurement programs but did not directly reference these programs in the SLRP. This research focused only on how the SLRPs discuss or describe performance measurement.

4.2 Overall Trends Related to Performance Measures

Currently, many States discuss performance measures within SLRPs. Of the 51 SLRPs analyzed:

- Twenty-one SLRPs (41 percent) tie performance measures to the State's transportation goals and objectives.
- Nine SLRPs (18 percent) establish performance measures to evaluate, prioritize, or select projects.
- Twenty-eight SLRPs (54 percent) identify specific performance measures related to the transportation system.
- A small subset of the 28 SLRPs include measures related to agency performance.

In the 2002 analysis, 12 plans included specific performance measures, indicating that there has been a significant nationwide shift toward performance-based planning.

Of the 28 SLRPs that reference specific performance measures, four general types of measures are mentioned: 1) measures used to evaluate an agency's progress towards achieving statewide transportation goals and objectives (as outlined in the SLRP); 2) measures used to evaluate, prioritize, or select projects; 3) measures used to evaluate aspects of the transportation system; and 4) measures used to assess agency performance, including financial stewardship, communication procedures, or timelines for project delivery. Examples of each of these types, as well as non-traditional measures and multimodal measures, are provided in the section below.

4.3 Noteworthy Practices

Performance Measures Used to Evaluate Progress Toward Meeting States' Transportation Goals and Objectives

Most performance measures specifically referenced in the subset of 28 SLRPs were focused on gauging progress towards achieving specific transportation goal(s) or objectives or evaluating the effectiveness of strategies proposed to meet these goals and objectives. Listed below are examples of SLRPs that use performance measures to evaluate progress toward reaching transportation goals or objectives:

- [Nevada's SLRP](#) identifies seven guiding principles that support the State's transportation mission, vision, and goals. For each of the guiding principles, the plan outlines numerous strategies that the Nevada DOT (NDOT) will undertake to meet the intent of the principle, as well as performance measures and associated target. Targets are both quantitative and qualitative. Examples of NDOT's transportation performance measures and targets are listed in Table 2.

Table 2. Examples of NDOT's Transportation Performance Measures and Targets.

Guiding Principle	Objective (Performance Measure)	Target
Fiscal Responsibility: Secure the highest amount of funding possible for our State and ensure that it is invested responsibly and properly.	Percentage of projects completed within range of established cost estimate and schedule after environmental process	2010 = reduce by 25% 2015 = 100% 2020 = 100%
Mobility/Accessibility: Provide a statewide, multimodal, interconnected, efficient transportation system that enhances Nevada's economic competitiveness	Rural transit ridership per year	2010 = 1,200,000 2015 = 1,500,000
Freight Movement: Improve the safety and mobility of freight movers.	Vehicle (truck) size and weight enforcement certification report issued on time	Yes/No

- [Nebraska's SLRP](#) includes three goal areas: mobility, safety, and environmental stewardship. Corresponding objectives are identified for each goal. The plan includes performance targets and specific strategies that the Nebraska Department of Roads (NDOR) will undertake to meet the goals and objectives. An example of a safety objective, measure, and strategy is provided in Table 3.

Table 3. Example of NDOR Safety Objective, Performance Measure, and Strategy.

Safety Goal	Objective	Performance Measure	Strategy
Provide a transportation system that minimizes loss of life, health and property	Reduce fatalities, injuries, and property damage on the State's transportation system	Reduce the fatality rate on the State and local highway system to below one per 100 million vehicle miles of travel	Improve data collection, management, and analysis to target safety actions.

- [Vermont's SLRP](#) provides a strategic management approach to track progress and performance against key goals and objectives. As part of the approach, the SLRP cites specific performance objectives directly related to the plan's overarching goals. The SLRP notes that a prevailing theme since 2002 is the development of and continuing refinement of a performance-based approach to programming, planning, and asset management. To support this effort, all of the updated modal policy plans identify performance measures related to their stated goals and policies. However, the SLRP does not provide details on the specific performance measures included in those modal plans.

Performance Measures Used to Evaluate, Prioritize, and Select Projects

Nine of the 28 SLRPs that include specific performance measures did so as a method to evaluate, prioritize, and select projects. These plans tended to include elements of a policy- or project-based approach. Listed below are examples of plans that use project-related measures.

- [Louisiana's SLRP](#) uses performance measures as criteria to evaluate megaprojects, which are high-cost projects or efforts of statewide significance, and to determine what projects to include in the plan. Criteria include transportation efficiency, economic development, environment, and safety. Priority projects are included in the plan as recommended improvements.
- [Kentucky's SLRP](#) uses performance measures to evaluate three alternative investment scenarios. The scenarios are evaluated based on four criteria: number of crashes prevented, number of fatalities prevented, direct user costs, and time in traffic.
- [Arizona's SLRP](#) is strongly oriented towards a performance-based approach. The SLRP provides the Arizona DOT with tools to help decision-makers select transportation projects to build in the future. The SLRP provides a process to evaluate the long-term impacts of capital projects as linked to the plan's strategic direction. Potential projects are evaluated against 14 performance measures. The measures are assigned factor weights, indicating the relative priority of the performance factor. Performance results are designed to show the improvement that a given project might provide over a base scenario for the year 2025.

A small number of SLRPs incorporate the first two types of performance measures: 1) those used to evaluate progress towards achieving transportation goals and objectives; and 2) those to evaluate, select, or prioritize projects. For example:

- [Tennessee's SLRP](#) uses performance measures to gauge how well the department achieves its plan goals. The SLRP identifies 12 key transportation system performance measures that correspond to the goals and objectives developed in the plan. For each measure, the SLRP identifies the current baseline condition as well as the desired target. In addition, the SLRP also outlines a performance-based multimodal project evaluation and prioritization process that will use performance measures to assist the State in developing its three-year program of projects. For each mode, the SLRP outlines evaluation criteria related to congestion, economic opportunity, safety and security, public and community support, environmental impacts, and funding considerations.

Performance Measures Related to the Transportation System

Twenty-eight SLRPs include performance measures focused on the transportation system and operations. The most cited measures were related to safety, mobility, conditions, economic development, and the environment. Examples in each category are provided in Table 4.

Table 4. Examples of System Measures and Categories.

Category	Example	State
Safety	Number of fatalities	West Virginia
Mobility	Travel time within key regional travel corridor	California
Condition	Percent of bridges in at least “fair” structural condition	Washington
Economic	Number of jobs supported by department expenditures	Michigan
Environment	Transportation related greenhouse gas emissions	Maryland

Performance Measures Related to Agency Performance

Of the 28 plans that specify performance measures, a small subset also includes measures related to an agency's planning process or the organization's performance, including financial stewardship, project delivery timelines, or communications/accountability. Examples in each category are provided in Table 5.

Table 5. Examples of Organizational Measures and Categories.

Category	Example	State
Communications/ Accountability	Percentage of departmental action plan items completed	Delaware
Process	Percentage of employees trained in accordance with prescribed training plan	Nevada
Project delivery	Percent of STIP projects let by the end of the fourth year	Minnesota
Financial stewardship	Limits for project cost overruns	Rhode Island

Non-Traditional Performance Measures

A majority of SLRPs that include specific performance measures focus on traditional topics related to the condition of the transportation system (e.g., congestion) and operations (e.g., maintenance) or progress towards meeting statewide transportation goals. However, some SLRPs include non-traditional measures. Listed below are noteworthy examples of SLRPs that discussed non-traditional measures:

- [California's SLRP](#) outlines indicators to measure the extent of coordinated transportation and land use. The key indicators for this measure are the percentage of workers located within 15, 30, 45, and 60 minutes of their jobs and the percentage of the population located within one-quarter to one-half mile of a transit station/stop or bus corridor.
- [Georgia's SLRP](#) includes a number of performance measures to evaluate the public involvement process used to update the SLRP. For example, to evaluate the success of the Georgia DOT's website as an information-sharing strategy, the Georgia DOT measures the number of visitors accessing the website and the number of comments received through the website. Other measures include the number of fact sheets distributed and reader feedback on those materials.
- [Rhode Island's SLRP](#) establishes performance measures for land use. The SLRP outlines a goal of continuing to integrate land use and transportation planning using a travel corridor framework and promote responsible development practices in the public and private sectors. The corresponding performance measure for this goal is for growth in the State's urbanized land area (as defined by the U.S. Census) to increase no more than the rate of population growth.

SLRPs that Include Multimodal Performance Measures

Multimodal performance measures are those that track activities across the transportation system (e.g., a safety measure that tracks injuries that occur across multiple modes). The extent to which a SLRP includes multimodal performance measures is closely correlated to whether the overall plan addresses multiple modes. Additional information on SLRPs that incorporated a systems planning approach (through references to multimodalism, intermodalism, or

interagency partnerships) are provided in [synthesis topic six](#), which focuses on systems planning.

Examples of plans incorporating multimodal performance measures are listed below.

- [California's SLRP](#) identifies six goal areas: improve mobility and accessibility, preserve the transportation system, support the economy, enhance public safety and security, reflect community values, and enhance the environment. Each goal area includes strategies for multiple modes, including highway, transit, aviation, and bicycles and pedestrians. In addition, multimodal performance measures are also outlined for each goal area. For example, performance indicators associated with the goal of preserving the transportation system include the:
 - Number of structurally deficient or functionally obsolete bridges for highways;
 - Miles between service calls for transit and passenger rail; and
 - General runway pavement condition for aviation.

- [Michigan's SLRP](#) contains a technical report on goals and performance measures.¹³ The report identifies eight performance measure areas that assess the transportation system's performance as a whole, including:
 - Preserve the quality and condition of all transportation system elements;
 - Reduce fatality, injury, and crash/incident rates on all modes;
 - Reduce the vulnerability of transportation facilities to terrorist attacks, natural disasters, and other unexpected events;
 - Expand intermodal connectivity and the number of modal options for freight and passengers;
 - Address system bottlenecks and weaknesses to reduce congestion, enhance continuity, and improve modal connections;
 - Improve existing system capacity through the application of new technologies and strategies;
 - Coordinate transportation services supplied by both public and private sector providers; and
 - Address institutional barriers to inter-jurisdictional cooperation.

Primary and secondary measures are proposed for each category. For example, customer satisfaction rating is suggested as a primary measure to address institutional barriers to inter-jurisdictional cooperation and coordination of transportation services. Hours of delay and percentage of system meeting the target level of services are the two primary suggested measures for improving system capacity.

Several SLRPs identified performance measures for multiple modes but might not have necessarily combined these measures to evaluate the multimodal transportation system as a whole. An example is listed below.

- [Rhode Island's SLRP](#) establishes performance measures for each of the modal objectives outlined in the SLRP. Objectives and corresponding performance measures are provided for multiple modes, including bicycles, pedestrians, highways, and transit.

¹³ The technical report is available at www.michigan.gov/documents/mdot/MDOT_SLRP_rept_Goals_Objectives_Performance_Report_11-17-06I_180916_7.pdf

For instance, a measure for bicycles is to increase mode share of bicycle commuters from 1 percent to 1.5 percent in 2020 and 1.7 percent in 2030.

Approaches to Develop Performance Measures

Most SLRPs do not detail the process used to develop performance measures. Examples of SLRPs that did reference these processes are listed below:

- [Tennessee's SLRP](#) describes a performance measures technical committee, which led to developing performance measures for the TDOT's SLRP. The technical committee was responsible for developing an initial set of performance measures, which will be refined and enhanced over time. To develop the initial measures, the committee identified existing data and performance measures currently in use for each of the agency's modal programs. The committee also reviewed peer State performance measures to understand the state-of-the-practice in transportation system performance measurement. Through interviews with key TDOT personnel in the major programs, the committee determined and documented current transportation system performance for the respective program or mode; this was considered the baseline from which to compare progress towards desired targets. Once the initial list of performance measures was developed, the committee shared the list with the Regional Work Group and statewide Steering Committee members for review and comment.
- [Idaho's vision plan](#), a component of the SLRP, describes a process by the Idaho Transportation Department (ITD) to organize a Performance Measures Workshop. Prior to the workshop, the ITD project team developed a draft set of performance measures. Participants at the workshop built on existing measures to define mechanisms for assuring the measures were used. They also developed a list of barriers to successful implementation of performance measures and approaches to overcoming these challenges. This information was integrated into the draft SLRP and refined by ITD leadership and stakeholders.

Formal Performance Measurement Programs Outside the SLRP Process

It is important to note that a review of the SLRPs does not provide a complete picture of the extent to which State DOTs are using performance measures. Many States have formal and robust performance measure programs but do not incorporate detailed specific measures within their SLRPs; in some cases, the SLRPs reference broader performance measure programs that are documented in other State planning documents. For example:

- [Washington's SLRP](#) notes that the Washington DOT (WSDOT) produces a quarterly report, *Measures, Markers, and Mileposts*, or the Gray Notebook, which provides in-depth reviews of the agency and transportation system performance. The Gray Notebook reports on project delivery and provides system and program performance information. While some of the measures regularly assessed in the Gray Notebook correspond to goals included in the SLRP, the reporting system is not specifically integrated into the transportation planning approach.
- [Missouri's SLRP](#) describes MoDOT's utilization of *Tracker*, a tool to assess how well MoDOT delivers services and products to its customers. *Tracker* includes measures for

18 areas. The SLRP references the *Tracker* process but does not identify the measures that are included in the performance measure system.

Summary

Performance-based management is becoming an increasingly important element of transportation planning as indicated by the prevalence of performance measures within SLRPs. More than half of the 51 SLRPs reviewed include specific performance measures as compared to only 12 that did so in the 2002 review of statewide plans. While these SLRPs differ in the types of performance measures discussed and the extent and manner to which they are applied, most have established measures to evaluate progress to achieving stated transportation goals and objectives.

Synthesis Topic 5: Financial Planning and Analysis

5.1 Overview

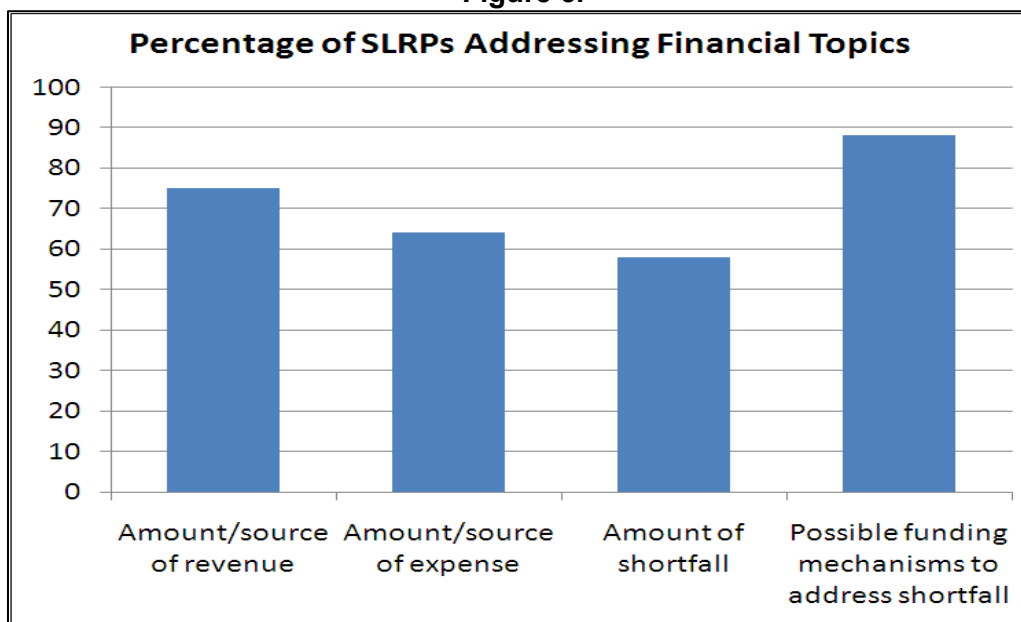
According to the statewide transportation planning final rule at 23 USC 135, a SLRP “may include a financial plan that demonstrates how the adopted statewide transportation plan can be implemented, indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan, and recommends any additional financing strategies for needed projects and programs.”¹⁴ While most SLRPs include some form of financial analysis, they differ in the approach, level of analysis, and detail included in these discussions. Unlike MPOs, States are not required to incorporate fiscal constraint into SLRPs to demonstrate the likelihood that funds will be available to cover all proposed projects.

The following sections provide information on how the reviewed SLRPs address financial planning and analysis. It is important to note that this synthesis does not provide an exhaustive representation of financial planning in the transportation planning process. Some States may have robust financial planning programs or conduct analysis but do not reference these activities in the SLRP. This review focuses only on the how the SLRPs present the results of financial planning.

5.2 Overall Trends Related to Financial Planning and Analysis

Most SLRPs include information on financial planning or analysis to some extent. The specific topics most commonly discussed in the SLRPs include anticipated revenues, expenses, funding gaps, and strategies to address these gaps. Most SLRPs address more than one topic. Examples of SLRPs that include more detailed financial analysis are described later in this synthesis. Figure 5 provides information on the percentage of SLRPs that discuss financial topics, such as by providing revenue information or identifying strategies to address shortfalls.

Figure 5.



¹⁴ The legislation is available at <http://tinyurl.com/66xr8l5> (search Title 23, part 135).

Revenues and Expenses

A majority of SLRPs identify both the amount and source of current and future estimated revenues and expenses. However, States differ in how they develop and present this information. For example, in developing cost estimates, States look at financial trends and extended forecasts or estimated costs based on a desired performance level such as improved system performance in terms of reduced delay or improved levels of service. States typically use asset management systems, such as bridge, pavement, and congestion systems, to develop future estimated costs.

Some SLRPs present the information on revenues and expenses at the macro level, simply noting a total revenue and total cost estimate for the entire transportation system, while others provide a more detailed level of analysis for individual modes or programs. Wyoming is an example of a State that provided a macro-level analysis:

- [Wyoming's SLRP](#) includes a chapter on funding that provides information on Federal, State, local, and other revenue sources. The plan includes an overall dollar amount needed to maintain the existing highway system and its infrastructure needs but does not provide details.

Oregon is an example of a State that includes a more detailed breakdown of revenues and expenses:

- [Oregon's SLRP](#) includes an analysis of transportation needs for the State, regional, and local transportation system, including both publically and privately owned elements, through the year 2030. Modes analyzed include air freight and passenger air, intermodal connectors, local roads and bridges, pipelines, ports and waterways, public transportation, rail freight and passenger rail, and highways. For each mode, the plan provides information on transportation funding sources as well as details on current annual expenditures, annual average feasible needs, and the associated annual funding gap.

Funding Issues

Many SLRPs identify issues and challenges with funding the future transportation system. In fact, nearly every SLRP noted that the costs of future transportation system needs will outpace expected revenue; and about two-thirds of SLRPs specifically identified shortfall amounts. Some of the most commonly cited reasons for these shortfalls, as described in SLRPs, include:

- **Rising cost of construction.** Over the past 10 years, the costs of construction materials, such as steel and asphalt, have increased significantly.
- **Aging infrastructure.** The age of existing infrastructure is contributing to the deterioration of the transportation system. As a result, additional funding will be needed in the future to bring the infrastructure up to engineering standards and conditions.
- **Increased costs to address needs such as demand, congestion, safety, etc.** Many States anticipate growth in population and vehicle miles traveled (VMT). Such growth can lead to increased congestion and demand on the transportation system. Additional funding will be needed in the future to meet these demands.

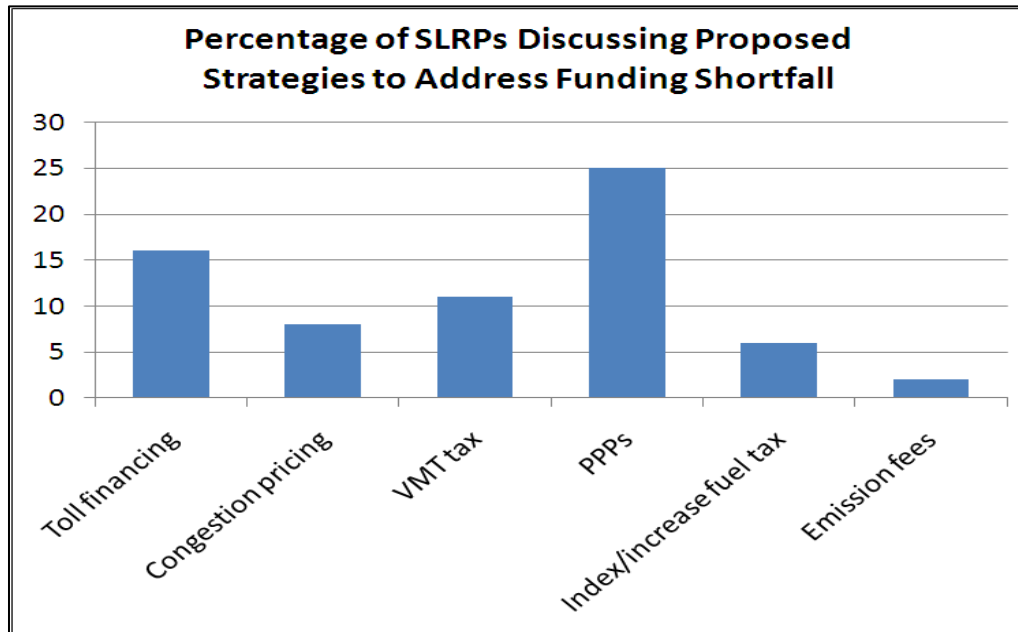
- **Dwindling fuel tax revenues.** Many States noted that fuel taxes—State fuel taxes in particular—have become increasingly unreliable as a stable revenue source and are likely to remain unstable. In many cases, the State fuel tax is a fixed amount and does not change to match inflation rates. This has typically resulted in a loss of purchasing power since current revenue generated from the fuel tax is less than revenue generated in the past. In addition, increased use of fuel efficient vehicles and alternative fuels are also reducing revenues generated by the fuel tax.
- **Uncertainty in Federal funding levels.** At the time of this research, the amount and structure of Federal funding programs for States under the next Federal transportation funding bill were uncertain. While many States assume that the next transportation funding bill will include an increase in revenue, the SLRPs reflect a common concern that this increase will be less than what it has been in previous years. As a result, many States are using conservative growth rates of one percent when projecting future Federal funding levels.

Possible Strategies to Address Funding Shortfalls

The vast majority of SLRPs (88 percent; 45 plans) identified possible mechanisms to address funding shortfalls. This includes States that identify a dollar figure for the shortfall amount as well as additional States that do not estimate the funding shortfall but recognized that current funding sources would be insufficient to fund future transportation needs.

Some of the proposed funding techniques identify changes to traditional funding sources such as fuel taxes, property taxes, and motor vehicle excise taxes. Other SLRPs consider new funding strategies. Some of the more commonly referenced strategies, such as toll financing, congestion pricing, and public-private partnerships (PPPs), are highlighted in Figure 6. Typically, the SLRPs do not project the amount of revenue that can be expected from these funding sources; rather, they discuss the benefits and challenges associated with establishing new funding sources. Several SLRPs discussed more than one new funding source.

Figure 6.



Financial Goals and Objectives

As noted in [synthesis topic three](#) (see Figure 4), just under half of the SLRPs (25 plans) include a major goal or overarching principle related to financial stewardship. For example:

- [Nevada's SLRP](#) establishes seven guiding principles, one of which is fiscal responsibility. In line with this principle, NDOT seeks to secure the highest amount of funding possible for the State and ensure that the funding is invested responsibly and properly. The SLRP outlines a number of strategies that the agency will pursue to meet this goal. To assess progress in meeting this stated goal, NDOT established financial performance measures for several of its divisions.
- [Louisiana's plan](#) includes seven goals for the transportation system, one of which is “to develop stable but flexible transportation financing that provides adequate funds for both the preservation of existing and the construction/implementation of new facilities and services.” In line with this goal, the Louisiana SLRP is fiscally constrained. The plan focuses on analysis of four funding scenarios and their programmatic implications.

5.3 Noteworthy Practices

While many plans identify the source of funds that can reasonably be expected to fund the transportation system, only 37 percent of SLRPs (18 plans) were fiscally constrained. Plans that are fiscally constrained demonstrate that policies, strategies, and projects identified in the plan can be implemented using revenues that are currently available or that can reasonably be expected for the future.

Many of the fiscally constrained SLRPs present financial scenarios to guide investment decisions. The funding scenarios allow transportation agencies to align priorities with the revenues that can be reasonably expected. In most cases, at least one of the funding scenarios

is based on a projection of current available funding while other scenarios describe programming that could be achieved with additional revenues.

The following section describes two of the ways that States use financial scenarios in their SLRP: 1) to prioritize projects; and 2) to identify funding needs.

Use of Financial Scenarios to Prioritize Projects

Several SLRPs develop financial scenarios to provide a detailed list of prioritized projects that can be implemented. The following examples describe States that use financial scenarios for this purpose.

- [Washington's SLRP](#) identifies a combined need of \$67 billion in transportation investments (including both funded and unfunded needs). Two previously approved funding packages provide approximately \$29 billion for transportation investments through the year 2021. An additional \$38 billion in unfunded needs is projected. The SLRP identifies projects that have secured funding from existing sources. Of the proposed unfunded projects, the SLRP identifies which are high-priority transportation investments (totaling \$26 billion) and which are medium- and low-priority projects (totaling \$12 billion).
- [Ohio's SLRP](#) includes a financial strategy for the year 2004 through 2030. The financial strategy includes three elements:
 - A 12-year (2004 through 2015) financial strategy for the Ohio DOT (ODOT). The 12-year strategy considers State and Federal income sources and anticipates revenue levels as well as the level of spending for basic system maintenance programs, district projects, major new construction program, and other programs. The 12-year financial strategy is financially constrained.
 - Financial projects and gap analysis for the highway program for the 14-year period from 2016 through 2030. The analysis uses two revenue projections based on two different methods as well as funding needs projected using two different scenarios. The SLRP calculates potential funding available for new highway needs, showing this as the difference between expected revenues and needs for each scenario. Based on the gap analysis, ODOT assumes it will take three to 10 years beyond 2015 to address the projected needs that are currently identified.
 - A summary of unmet modal funding needs from the year 2004 through 2030. The summary includes estimated costs to construct projects identified in the SLRP for non-highway modes, including transit, rail, aviation, and trails. Because many of these non-highway modal facilities are owned by other governmental agencies or the private sector, only a limited amount of information can be projected. As a result, the SLRP's information on modal funding needs includes many estimates and is not financially constrained.
- [Arizona's SLRP](#) discusses funding scenarios as part of its performance evaluation process. As part of the SLRP, proposed projects are evaluated against 14 performance measures. The results of the project evaluations are organized into three funding scenarios, each based upon varying estimates of State and Federal funds available to

construct major State transportation projects. The three scenarios are:

- **Constrained:** a projection of currently available funding sources through the year 2025. This scenario includes projects that scored highest in the performance evaluation.
- **Reasonably anticipated revenues:** an increase above the constrained scenario based on a projected increase in revenues that could be derived from Federal or State sources. This scenario includes all projects listed in the constrained scenario as well as additional projects that could be built if the Arizona DOT were to identify new funding sources.
- **Unconstrained:** no financial constraints. This scenario includes all projects that address specific needs on the State highway transportation system as identified in previous planning processes.

Financial Scenarios to Identify Funding Needs

Several SLRPs analyzed different funding scenarios in order to identify the appropriate amount of funding needed to achieve a certain performance level. Two examples are described below.

- [Michigan's SLRP](#) compares four potential funding scenarios with identified needs for all modes to determine the appropriate level of investment needed to achieve the State's overall transportation vision. The four funding scenarios are:
 - **Business as usual:** assumes no additional revenue beyond existing anticipated revenues and historical funding trends. This scenario allocates funds among State programs in a way that is consistent with current allocations.
 - **Change the mix:** assumes no additional revenue beyond existing anticipated revenues and historical funding trends but considers a different funding allocation. This scenario considers reducing highway preservation revenue to allocate more funds to multimodal systems.
 - **Move ahead:** explores the implications of raising additional revenue beyond those associated with the business as usual revenues. This scenario also considers investing the additional revenue into multimodal preservation and highway modernization programs without taking projected revenues away from existing programs.
 - **Flexible new revenue:** entails increasing overall State transportation revenues by 42 percent over 25 years to preserve existing assets and investing in multimodal preservation and highway modernization programs. Even with the additional funding revenue outlined in this scenario, the SLRP notes that Michigan DOT (MDOT) will face a \$28 billion revenue shortfall.

Based on the analysis of the four funding scenarios, MDOT identified a preferred funding scenario: Investing to Achieve the Vision. This scenario builds from the Flexible New Revenue scenario and adds additional revenue for aviation and transit. The additional funding will bring the agency closer to achieving the transportation vision outlined in the SLRP.

- [Kentucky's SLRP](#) analyzed three alternative investment scenarios, each of which considers a different level of investment and the associated effects on the transportation system over a 20-year period. The three investment scenarios analyzed are:
 - **Existing funding levels:** based on historic and current fiscal data.
 - **Full engineering needs:** explores the level of investment needed to bring facilities for which the Kentucky Transportation Cabinet is responsible up to full design standards and conditions.
 - **Derived investment level for maintaining current user costs:** considers the level of annual funding required over a 20-year period to minimize increases in direct user costs.

The SLRP's analysis of the three funding scenarios determines that existing investment levels are insufficient to meet future needs of the State's highway network. Furthermore, investment levels needed to achieve and maintain an optimal highway system or to minimize user cost increases are unachievable in the current fiscal climate. The analysis demonstrates that modest increases in the overall level of investment could produce direct and indirect benefits for highway users and market sectors that are positively impacted by a safer, smoother, less congested transportation system.

Summary

States face numerous challenges to funding their transportation systems over the SLRP period. The costs of future transportation system needs will outpace traditional revenue sources; as a result, many State transportation agencies are investigating new funding mechanisms to address budget shortfalls. In light of the limited funding environment, many SLRPs include detailed financial analysis on projects that can be funded based on existing and anticipated funding sources. Though not required by Federal planning requirements, discussion of financial planning in the SLRP can help ensure that limited resources are efficiently and effectively invested to meet a State's transportation objectives. A clear description of financial considerations provides transparency for readers and can help build a case for increased funding based on a clear picture of expected performance at a specific level of investment.

Synthesis Topic 6: Systems Planning

6.1 Introduction

Systems planning is a comprehensive approach to considering the transportation needs of people and goods. It focuses on planning efficient and effective multimodal transportation networks as opposed to planning each mode as a separate component of the network.¹⁵ Important elements of systems planning include multimodalism, intermodalism, and consideration of linkages between multiple planning processes (e.g., regional planning, economic planning, environmental planning, etc.). To varying extents, all SLRPs considered multimodal needs and discussed strategies to improve, maintain, or implement a comprehensive transportation system. This synthesis provides relevant examples of SLRPs that include multimodal and systems planning discussions. Discussion of SLRPs that include multimodal performance measures is also provided in [synthesis topic four](#).

6.2 Modal Planning

All SLRPs discussed specific modes and related transportation needs, challenges, and opportunities although the specific approach to these discussions and level of detail vary. For example, [Missouri's plan](#) considers the unique characteristics and challenges associated with each transportation mode such as safety challenges on highways, decreases in passenger aviation enplanements, and the primary commodities handled by Missouri's 13 ports. Similarly, [Georgia's plan](#) describes current conditions for each transportation mode. It also considers “no build” and “build/financially unconstrained” scenarios for both the highway system (including bridges, pavement, and miscellaneous expenses) as well as the intermodal system (transit, passenger and freight rail, aviation, and bicycles/pedestrians).

A few plans are primarily oriented toward a modal planning approach although most of the SLRPs in this subset still reference multimodalism, intermodalism, or other themes that are related to systems planning. A few examples of SLRPs oriented toward a modal planning approach are provided below.

- [Iowa's plan](#) is modally focused although it acknowledges the importance of intermodalism in contributing to increased efficiency and better economic prospects. The plan includes modal chapters that describe trends related to aviation, bicycle and pedestrian, highway, intermodal facilities, pipelines, rail, transit, and waterway modes. Each chapter also discusses how Iowa plans to invest in that mode's infrastructure and services over the next 25 years. The chapters additionally describe modal needs, estimated costs for investment actions, and desired outcomes of these actions. For example, the rail chapter notes that priority actions will include investments in rail branch lines, rail crossing safety, and intercity passenger rail service. These actions are estimated to cost \$9.4 million per year but a shortfall is estimated to total \$98.5 million over the 25-year period.
- [Wyoming's plan](#) includes guiding principles oriented toward a systems planning approach (e.g., Wyoming should “enhance safety on the transportation system” and “provide for the efficient transportation of people and goods in Wyoming”). However, the plan tailors discussions of future conditions and strategies to specific modes. The plan

¹⁵ For more information, see *Summary of Roundtable on System Performance Measurement in Statewide and Metropolitan Transportation Planning*. Available at www.planning.dot.gov/Peer/PerfMeasRT/PerfMeasRT.asp.

also notes that the focus of transportation planning for the State is “on highways and this will probably remain so in the future.”

6.3 Systems Planning

SLRPs typically discuss systems planning through reference to several recurring topics, including:

- **Intermodalism:** ability to connect modes of transportation.¹⁶
- **Multimodalism:** availability of transportation options using different modes within a system or corridor.¹⁷
- **Corridor-based planning:** planning multimodal and intermodal transportation within a specific geographical area.
- **Intermodal and interagency partnerships:** coordination and cooperation between multiple modal stakeholders or across multiple transportation jurisdictions, agencies, or offices.
- **System performance measurement:** evaluating performance of all modes or the transportation agency itself to assess the comprehensive transportation system.

Most SLRPs include one or more of these themes. The sections below provide examples of each theme as it was reflected in a small sample of SLRPs.

Intermodalism and Multimodalism

- [Vermont's SLRP](#) includes a guiding principle to “Improve and Connect All Modes of Vermont's Transportation System to Provide Vermonters with Choices.” The plan notes that the Vermont Agency of Transportation has a responsibility to promote multimodal connectivity between local road systems, across modes, and through improved access to intermodal freight and passenger facilities.
- [Wisconsin's SLRP](#) includes a chapter on mobility and transportation choices. The chapter suggests strategies to increase multimodal options, including support for public, specialized, and human services transit; increasing intercity travel options; improving air services; support for bicycle facilities and plans; and facilitation of intermodal passenger connections. Transportation demand management is cited as another strategy to support improved system efficiencies. Chapter 8 examines each strategy in detail and notes specific timeframes (e.g., five years, 15 years, entire planning period) suggested for implementation. To implement the strategies and improve system efficiencies, the plan calls for increased coordination of existing transportation programs and collaborative partnerships.
- The transportation element of [DDOT's comprehensive plan](#) notes that “a well-balanced and multi-modal [sic] transportation system is integral to the city's efforts to sustain and enhance the quality of life and key to its future economic growth and its role as the

¹⁶ From FHWA's planning glossary at www.fhwa.dot.gov/planning/glossary/search_result.cfm

¹⁷ From FHWA's planning glossary at www.fhwa.dot.gov/planning/glossary/search_result.cfm

nation's capital.”¹⁸ To promote this principle, the plan suggests a number of strategies. For example, the plan suggests adopting multimodal standards to assess the transportation impacts of development projects, developing multimodal performance measures such as a systems level of service standard, and improving system connectivity (e.g., by expanding commuter rail).

- [North Carolina's plan](#) introduces a new planning framework called the North Carolina Multimodal Investment Network (NCMIN) to support a systems-level approach to identifying and addressing future transportation needs and solutions. The NCMIN identifies needs in four categories (maintenance, preservation, modernization, and expansion) for transportation facilities, which are organized into three tiers (statewide, regional, sub-regional) that reflect the primary function of the facility. The plan also considers implementation steps that support systems planning such as adding mechanisms to incorporate input and analysis from modal staff earlier in the transportation planning process.

Corridor-Based Planning

Corridor-based planning provides a framework to consider multimodal and intermodal movements within a particular geographic area. Corridor planning therefore supports a systems planning approach and vice versa. [Synthesis topic one](#), which focuses on plan type, provides specific examples of plans that incorporated a corridor-based approach.

Intermodal and Interagency Partnerships

Coordination through intermodal and interagency partnerships supports systems-level planning in providing opportunities to obtain multiple viewpoints of the transportation network. Examples of how SLRPs discuss intermodal and interagency partnerships are provided below:

- [New Jersey's plan](#) notes one long-range planning effort focused on promoting coordinated transportation. As part of this effort, New Jersey seeks to improve director-level coordination of the State's various transportation agencies through regular committee meetings.
- [New Mexico's plan](#) includes a guiding principle to support economic vitality by promoting global competitiveness, productivity, and efficiency. To advance this guiding principle, the SLRP suggests a strategy to “pursue and maintain partnerships and increase cooperation with Federal and State agencies in the U.S. and Mexico, as well as the neighboring States of Chihuahua (Mexico), Sonora (Mexico), Arizona, and Texas by expanding programs and agreements to specifically improve local, regional, and international transportation planning.” As part of this strategy, New Mexico intends to expand a border technology exchange program, participate in the Texas/New Mexico/Chihuahua Border Master Plan, and coordinate with the Mexican government on truck and rail freight services for a potential new Pacific seaport.
- [Pennsylvania's plan](#) explicitly notes that it is system oriented and supports all modes. The SLRP includes a user's guide (also described in [synthesis topic two](#)) designed to outline a framework for implementing the plan. The guide notes that effective implementation strategies must link transportation activities conducted by various

¹⁸ DDOT's plan is being drafted and will be modeled from the transportation element of DDOT's comprehensive plan.

stakeholders throughout the State and strengthen linkages between the Pennsylvania SLRP and other internal and external planning, programming, and project development activities. The user's guide also details the benefits of coordination as it pertains to a systems-level approach to planning. For example, by linking the SLRP to the long-range or strategic plans of modal operators, modal partners will be able to better understand PennDOT's long-range transportation system vision and make supportive investment decisions.

- [Virginia's plan](#) includes a technical report focused on institutional aspects of transportation decision-making.¹⁹ The report explores potential models for transportation decision-making in Virginia, including multi-State, regional, or local models. The local model, for example, is one in which local organizations such as counties, cities, and towns take primary responsibility for managing and implementing State or Federally funded roadway projects. The report concludes that Virginia has exhibited a trend towards the local decision-making model, which could challenge systems-level transportation planning. The report suggests that the State consider several steps to respond to the local decision-making trend and ensure that transportation planning is achieving network benefits. For example, some potential strategies include providing financial incentives for stakeholder cooperation and identifying components of the transportation system that provide overall network benefits.

Systems Performance Measures

A number of SLRPs incorporate performance measures that focus on assessing the transportation system as a whole. Some examples are also provided and discussed in [synthesis topic four](#).

6.3 Noteworthy Practices

Several plans are noteworthy in their use of multiple methods to incorporate a systems planning approach such as adopting guiding principles or performance measures focused on systems planning, proposing multimodal or intermodal strategies to address systems needs, or exploring ways to integrate modes through strategies that increase system-wide connectivity, mobility, and accessibility.

- [Ohio's plan](#) significantly incorporates elements of both modal and systems planning. The SLRP includes a series of modally focused chapters, each of which describes the current modal system and summarizes related initiatives. For example, the SLRP's public transportation chapter presents a profile of State rural and urban transit systems, discusses two fiscal scenarios for transit, notes transit performance measures, and describes several major transit programs. In addition to these modal elements, Ohio's SLRP also demonstrates a strong orientation toward systems planning. For instance, the SLRP considers how public transit will support Ohio's transportation guiding principles.

Additionally, the plan notes that investment in public transportation creates jobs, "puts dollars back into the community," and connects workers to jobs, promoting the overall economic health of Ohio. The SLRP also includes several systems-focused objectives and strategies to advance transportation guiding principles. An example of a systems-

¹⁹ The technical report is available at www.vtrans.org/resources/VTrans2035_Decisionmaking_FINAL.pdf

focused strategy is “improve inter-modal connectivity to reduce congestion, improve safety, and preserve the environment.” Finally, the plan identifies a strategic system of 26 multimodal travel and trade corridors (also detailed in [synthesis topic one](#)). These corridors provide a framework to consider and promote overall systems mobility.

- [Arizona's plan](#) focuses on the system performance impacts of major capital projects. The plan discusses a multi-step evaluation process (also described in [synthesis topic four](#)) to quantify current and future transportation system performance. While some performance measures are modally focused, such as number of bus turnouts to quantify accessibility, others are more comprehensive and oriented toward the transportation system as a whole. For example, the mobile source emissions measure will gauge system-wide environmental performance. Arizona's plan also demonstrates systems planning in extensively considering linkages to other planning processes. To develop the plan, Arizona reviewed and evaluated previous planning processes in Arizona, including regional and local plans as well as planning documents developed by other State agencies that focused on a range of topics, including economic development, land use, and commerce.
- [Michigan's plan](#) includes a guiding principle focused on “system improvement.” Objectives that support this guiding principle focus on articulating “improvements to modernize, expand, and connect the system to support economic growth and better facilitate the movement of goods, people, and services.” The plan notes that “all transportation providers will work together to address the system's needs holistically. All modes will be maintained, preserved, operated, and protected as one system.” Other proposed strategies include “integrate the transportation system” by ensuring connectivity between modes and a greater array of transportation choices as well as “focus improvements” on significant corridors. Projects on nationally significant corridors will improve highway, intermodal freight, airports, and rail facilities and infrastructure to encourage more efficient and effective system operations as a whole. Notably, Michigan's plan also includes a technical report focused on integration.²⁰

The report also serves to link together a series of additional technical reports, each of which describes a separate aspect of the transportation system (for example, security, freight, or finance). This report presents decision principles and activities that support a holistic, integrated approach to transportation planning such as developing performance measures focused on all modes. Examples of measures are included in the SLRP's technical report on goals and performance measures; see also [synthesis topic four](#) for additional details.

- [Virginia's plan](#) notes the principle of “regional accessibility,” a variation on the theme of systems planning. The plan defines regional accessibility as “the ability to move from point A to point B within a defined region” and identifies characteristics of accessible communities. The plan includes a guiding principle focused on mobility, connectivity, and accessibility to “facilitate the easy movement of people and goods, improve interconnectivity of regions and activity centers, and provide access to different modes of transportation.” The SLRP also identifies corridors of statewide significance “to focus on multimodal solutions to move people and goods within and through Virginia.”

²⁰ The report is available at www.michigan.gov/documents/mdot/MDOT_SLRP_TR_Integration20061116_198572_7.pdf

In addition to focusing on mobility issues, Virginia's plan demonstrates a systems planning approach in noting findings from a 2007 assessment of the State's transportation system. The assessment evaluated various components of the system, including the extent to which it promoted mobility, connectivity, and accessibility as well as program delivery, economic vitality, and coordination of transportation and land use. Finally, the plan demonstrates a strong systems planning approach in organizing needs and opportunities according to four investment categories. Modal strategies are presented within each category (e.g., "plan for and invest in high speed rail"), yet the focus is on how the strategies combine to improve comprehensive network performance.

Summary

All the SLRPs reviewed include aspects of modal and systems planning. SLRPs that emphasized a systems approach to planning also typically reference themes such as intermodalism, multimodalism, interagency and intermodal partnerships, corridor planning, and mobility/accessibility. Use or discussion of system performance measures is also important in some SLRPs.

Synthesis Topic 7: Livability and Sustainability

7.1 Overview

Livability and sustainability are emerging as important themes in current SLRPs. These topics are considered in over half of the SLRPs, representing a marked increase over the level of interest the study team identified in the 2002 and 2005 evaluations of SLRPs. This synthesis topic will identify examples of plans that specifically attempt to incorporate livability and/or sustainability practices within the statewide planning process.

Recently, new Federal programs have provided a high level of support to encourage and complement a long-developing interest in the role of transportation in livability and sustainability at the State and local levels. Planners, including transportation planners, have leveraged and expanded the concept of livability to guide more effective use of resources. Thoughtful planning has led to the development of communities that are gaining national recognition as attractive places to live. Public demand for livable communities has increased as examples of these communities are shared through the media. For example, many residents now desire improved transportation choices, better commutes, community green spaces, and access to healthy and local food. The SLRPs studied appear to be reflecting this increasing attention to livable and sustainable communities, recognizing livability-related transportation goals, policies, and investments at the State level.

The concept of livability can be understood as a set of flexible principles that can guide transportation decision-making, including:

- **Access:** refers to the ability to provide community members with abilities to reach (via transportation and land use planning) work opportunities as well as home, school, and recreational locations, expanded access to affordable housing, particularly housing located near transit, and businesses with access to markets.
- **Flexibility:** refers to enabling community members as much choice as possible in how they reach their destination (via multiple transportation options).
- **Quality of life:** refers to people's overall well-being (including health, social, economic, and other types of well-being) within particular communities.

On a national level, the Federal Interagency Partnership for Sustainable Communities has outlined six livability principles to improve access to affordable housing, provide more transportation options, and reduce transportation costs.²¹ Members of the partnership²² are designing collaborative policies and funding programs that support more livable communities by:

- Providing more transportation choices;
- Expanding access to equitable, affordable housing;
- Enhancing economic competitiveness;
- Supporting existing communities;
- Leveraging Federal investment; and
- Valuing communities and neighborhoods, whether urban, suburban, or rural.

²¹ Additional information on the Partnership is available at www.epa.gov/smartgrowth/partnership/.

²² The partnership is led by the U.S. DOT, the U.S. Environmental Protection Agency, and the U.S. Department of Housing and Urban Development.

Sustainability, or sustainable development, refers to the practice of balancing economic, environmental, and equity considerations during planning, decision-making, and project implementation. Sustainable development specifically aims to meet the needs of people today without compromising the ability of future generations to meet their own needs.²³ At the Federal level, the Partnership for Sustainable Communities is developing guidelines and strategies to help communities meet housing and transportation goals “simultaneously while protecting the environment, promoting equitable development, and helping to address the challenges of climate change.”²⁴

SLRPs vary in the terms they use to reference livability- and sustainability-related themes. For example, SLRPs might use related terms such as complete streets, transit-oriented development, smart growth, integrated land use and transportation planning, affordability, mobility, walkability, and bikeability. The use of varying terminology reflects ongoing discussions around various interpretations of livability and sustainability.

7.2 Overall Trends Related to Livability and Sustainability

Over half of all SLRPs reference livability and sustainability and the related issues that fall within the scope of these themes. The examples below highlight SLRPs that include notable livability- and sustainability-related elements.

Livability

- [Pennsylvania's plan](#) links livability and sustainability planning principles to actionable policy. The SLRP references the Commonwealth's Keystone Principles for Growth, Investment and Resource Conservation,²⁵ which connect transportation policy to visible elements of livable communities. Considerations for fostering sustainable economic development include how transportation projects can support:
 - Other State investments and community partnerships;
 - Mixed residential, commercial, and institutional uses within development or area adjacent by walking;
 - Public transit access; and
 - Access between affordable housing and jobs.
- Delaware's Governor prioritizes managing growth and promoting coordinated land use and transportation. Delaware's Governor initiated *Livable Delaware*, a framework to protect farms and open spaces, revitalize urban areas, and enhance access to economic opportunity. [Delaware's plan](#) includes several guiding principles tied to policies and actions throughout the document. Examples are listed below:
 - **Principle:** Direct programs, services and facilities to support Livable Delaware.
 - **Policy:** Coordinate land use and transportation in a manner that promotes long-term transportation efficiency.

²³ From the report of the Brundtland Commission, *Our Common Future*. 1987. Available at www.un-documents.net/wced-ocf.htm

²⁴ From HUD, DOT, and EPA Partnership: *Sustainable Communities*. 2009. Available at www.epa.gov/dced/pdf/dot-hud-epa-partnership-agreement.pdf

²⁵ Available at www.phmc.state.pa.us/bhp/pkp.pdf

- **Action:** Strengthen collaboration between land use planning functions and transportation decision-making.
- [Tennessee's plan](#) includes a guiding principle focused on building partnerships for livable communities. Strategies to support this principle include encouraging planners to partner with local public and private planning efforts, coordinating land use and transportation planning working with community and regional partners to link employment, commerce, and other activity centers, and strengthening partnerships with safety agencies, advocates and legislative leaders.
- [Florida's plan](#) notes that “transportation decisions should be made with the goal of livable communities in mind” and that projects should be compatible with a community's interests, which may include providing more transportation options, coordinating among agencies, across government, the private sector, and the public, protecting natural resources, and conserving non-renewable resources.

Rural Livability

- [Georgia's plan](#) focuses on meeting the current needs of rural transit residents and plans for future transportation choices. Georgia DOT (GDOT) has a rural public transit program utilized by 97 of its 159 counties to offer demand-response services through subscription and advance reservation. GDOT set the goal of expanding service to all rural counties at current per-capita service levels. To support the expansion of rural transportation options, GDOT contracts with regional development centers to develop bicycle plans for all rural areas in the State. In this context, the rural classification is applied to areas without an MPO.

Additionally, the plan presents data and similar types of decision-supporting information, within three categories (“Atlanta,” “other MPO,” and “rural”), acknowledging the differing needs of communities that have different population densities. The plan also indicates that local government funding for rural transit primarily comes from revenues derived from a municipality's or a county's general fund. Several counties fund transit through revenues from a special local options sales tax.²⁶

- [Oklahoma's plan](#) notes that the State has an extensive rural transit network that enables rural passengers to reach employment and medical services. The SLRP also includes policy considerations, short- and long-term actions, economic development opportunities, and strategies for the provision of rural and rural-to-urban mobility options. Oklahoma DOT is working to facilitate better connections between rural transit services and intercity bus connections but is also considering the overall declining rural population. The SLRP includes an objective to improve distribution of economic activity statewide, including new employment in rural areas. One of the agency's public transportation policies involves supporting new services through creative partnerships.

²⁶ The Volpe Center has recently completed a report on the role that statewide transportation planning plays in supporting improved rural transit. The study, the 2011 Transit @ the Table III, includes eight best practices case studies and a section on rural livable communities. The study will be available on the TPCB website at <http://planning.dot.gov/>.

Sustainability

- [Washington's plan](#) identifies environmental quality and health as one of five priority issues for transportation infrastructure improvements. The plan includes a discussion of challenges and proposed courses of action to improve water and air quality and people's physical health through prioritized, strategic investments. The plan notes that collaborative partnerships are leading to improvements in the development and implementation of transportation systems.

The also states that several Washington communities have identified and benchmarked indicators of healthy communities that are directly and indirectly related to transportation, including pedestrian and bicycling activity, creative storm water management, and improved air quality.

- [Arizona's plan](#) prioritizes transportation for smart growth, particularly for areas that are less developed but rapidly growing. The plan interprets smart growth initiatives as attempts to “improve planning to avoid the adverse consequences of unplanned growth.” It calls for the Arizona DOT to work with local, State, regional, and Tribal planning processes. Several laws passed in the State in the past decade have focused on preservation of open space. Arizona's “Growing Smarter” Acts require the inclusion of open space preservation in most local general plans and the establishment of infrastructure service boundaries.²⁷
- Some SLRPs consider the energy needs of current and planned transportation systems, explore opportunities for energy conservation and efficiency, or aim to reduce environmental impact of transportation's energy consumption in part through greenhouse gas reduction strategies. For example, [Colorado's SLRP](#) mentions that the State is beginning to identify strategies and actions focused on climate and sustainable transportation, including:
 - Improving vehicle efficiency;
 - Modifying transportation systems (via mass transit and congestion relief);
 - Recognizing community excellence in land use and transportation; and
 - Expanding low-carbon and no-carbon fuel options.
- [Virginia's plan](#) recommends an integrated land use and transportation grant program. The program would provide funding to local governments to make transportation improvements in conjunction with land use plans that encourage compact development.

Summary

State transportation planners are increasingly integrating the concepts of livability, sustainability, and related goals, policies, and issues into long-range planning as reflected in the SLRPs. The examples in this synthesis topic show that States are using diverse strategies to develop livable and sustainable communities. Notably, many SLRPs encourage collaboration across organizations as a way to leverage resources in a cost-constrained transportation environment.

²⁷ Additional information on how the Arizona DOT addresses rural transportation as part of its statewide transportation planning can be found in the 2011 Transit @ the Table III study of statewide transportation planning and rural transportation. The study will be available on the TPCB website at <http://planning.dot.gov/>.

Community engagement supports a more comprehensive and multidisciplinary planning process and is a significant component of some livability planning initiatives.

Synthesis Topic 8: Climate Change

8.1 Overview

Federal transportation planning factors do not specifically require that a State consider climate change in its planning process, including when developing its SLRP.²⁸ However, climate change is emerging as an important planning issue as State DOTs work to adapt to and mitigate both existing and potentially future impacts to transportation systems. States are likely to experience the effects of climate change in different ways. The approach that States take in addressing climate change within SLRPs also varies widely, ranging from in-depth discussions on transportation's contribution to climate change to no reference to the issue. Overall, the study team's research indicates that climate change is an emerging topic of interest to States.

The following synthesis provides information on how SLRPs address climate change; the review focuses only on the information included in the SLRPs.

8.2 Overall Trends Related to Climate Change

Twenty SLRPs (39 percent) discuss the issue of climate change in some capacity, typically through reference to the transportation sector's contribution to greenhouse gas (GHG) emissions and/or strategies to reduce GHG emissions. All of the plans in this subset date from 2005 or later, which corresponds to the time period when climate change became an increasingly important issue in the statewide planning process. The following section highlights the various ways in which the 20 SLRPs discuss the issue of climate change.

Adapting the Transportation System to Climate Change

A number of SLRPs discussed challenges related to impacts of climate change on the transportation system. As part of this discussion, several States acknowledged the need for strategies focused on adaptation; i.e., adapting existing transportation infrastructure to withstand the future impacts of climate change. Several examples of SLRPs that discuss climate change adaptation are listed below.

- [Kansas' SLRP](#) notes that “prudent risk management suggests that KDOT should pay close attention to the design consequences of potential climate change impacts, including wider temperature variations, increased precipitation, more powerful wind loads, and storm surges. Revised engineering standards and practices may be needed to ensure infrastructure is built to withstand these forces.”
- [Maine's SLRP](#) identifies climate change impacts such as sea-level rise and higher intensity storms as a growing challenge. The plan notes that these impacts will create new infrastructure demands that the Maine DOT will need to address. For example, major storm events might render vital transportation links inoperable for long periods of time and require unplanned and high-cost infrastructure replacements.
- [Oregon's SLRP](#) identifies global warming as one of the major transportation challenges facing the State. Specifically, the SLRP identifies rising sea levels and increased wave

²⁸ For a review of how State transportation policy can support goals to reduce GHG emissions, see the Natural Resources Defense Council's *Getting Back on Track: Aligning State Transportation Policy with Climate Change Goals*. 2010. Available at www.nrdc.org/smartgrowth/files/GettingBackonTrack_report.pdf.

heights as two climate change impacts that could have severe effects on coastal roadways, ports, and other transportation infrastructure.

Climate Change Incorporated into Vision and Guiding Principles

Several of the plans that address climate change do so by explicitly incorporating the topic into vision statements or guiding principles. For example:

- [New York's SLRP](#) outlines five priority result areas that comprise the plan's guiding principles. One of the five guiding principles is environmental sustainability. As part of this priority result area, the SLRP states that transportation investments “must help conserve New York State's use of non-renewable energy resources and reduce fuel emissions and greenhouse gases.”
- [Virginia's SLRP](#) recognizes climate change in its overall vision statement: “an effective strategic planning exercise must start with a vision for the future. The outlook for the future has changed since the last strategic plan was completed. The world is dealing with a major economic crisis, climate change has become a nationally recognized issue, and fuel prices are on their way upward again after topping \$4 a gallon last year.” The SLRP also discusses the challenges that climate change will place on the transportation system and notes increase focus on rail and transit investments as a means to reduce GHG emissions.

Statewide Climate Action Plans

Of the 20 plans that discuss climate change, eight of the plans do so in the context of the State's climate action plan. Typically, the statewide climate action plan outlines goals and targets for emissions reductions as well as the steps that the State will take to meet those targets. The State's transportation agency typically has a role to play in meeting those targets. For example, the [Massachusetts SLRP](#) references the State's climate protection plan, which identifies actions that State agencies can take to reduce the emissions of carbon dioxide and other heat-trapping gases. Additionally, the climate protection plan charges State transportation agencies with implementing a number of actions to reduce fuel consumption, thereby helping to reduce GHG emissions. These actions (e.g., encouraging public transit authorities to purchase only vehicles that use cleaner, lower-carbon fuels and advanced fuel technologies) are incorporated into the SLRP's strategies for fostering a sustainable transportation system.

Climate Change-Related Performance Measures

Relatively few States reference development of climate change-related performance measures in their SLRPs. Listed below are a few examples of States that do have climate-change related performance measures:

- [Rhode Island](#):
 - Reduce GHG emissions to 1990 levels by 2010 and to 90 percent of 1990 levels by 2020; and
 - Reduce gallons of gasoline purchased from 400,000,000 gallons in 2002 to 379,000,000 gallons (1990 levels) in 2010, 341,000,000 gallons (10 percent below 1990 levels) in 2020, and 320,000,000 gallons in 2030.

- [California's SLRP](#) includes a performance measure related to the extent of fossil fuel use per passenger miles traveled (this is a measure for transportation sector's intensity of energy consumption).

8.3 Noteworthy Practices

Of the 20 plans that address climate change, most provide a general discussion of climate change issues or reference climate change as a challenge or uncertainty. However, several plans discuss climate change more extensively in their SLRPs. These States include specific strategies to minimize the transportation sector's contribution to climate change. The following examples illustrate SLRPs with detailed discussions on climate change mitigation strategies.

- [Rhode Island's SLRP](#) includes an environmental analysis section that discusses the State's natural resources and identifies strategies to mitigate adverse impacts on a system-wide basis. As part of this section, the SLRP also notes that "it is becoming increasingly important...to reinvigorate our efforts to drastically reduce our fossil fuel consumption and develop more reliable and renewable sources." As such, the plan includes several strategies aimed at reducing GHG emissions from mobile sources, including:
 - Continue to add alternative fuel technology vehicles to State and local vehicle fleets while promoting diesel retrofitting of older vehicles;
 - Continue to replace or upgrade older transit vehicles with clean fuel vehicles;
 - Support passage of legislation establishing a vehicle efficiency incentive program that provides rebates to purchasers of new fuel efficient vehicles funded by fees charged to purchasers of inefficient vehicles; and
 - Encourage the use of solar energy as well as "green" design and construction practices in transportation projects.

In addition to its goal of reducing GHG emissions, the Rhode Island SLRP also considers impacts to transportation infrastructure from sea-level rise. The plan includes a map showing the potential road segments vulnerable to sea level rise of one to three meters. One strategy is to obtain the best available digital elevation data on sea-level rise and assess climate change effects on State and local transportation infrastructure.

- [California's SLRP](#) identifies two approaches that the California Department of Transportation is taking to lower fossil fuel consumption and GHG emissions: 1) make transportation systems more efficient through smart land use, operational improvements, and ITS; and 2) institutionalize energy efficiency and GHG emission reduction measures into planning, project development, operations, and maintenance of State transportation facilities, fleets, buildings, and equipment.

The plan also includes a number of strategies to reduce GHG emissions from the transportation sector, including:

- Expand market share of cleaner vehicles and supporting fueling infrastructure;
- Enhance education, planning tools, and performance standards on energy efficiency, air quality, and climate implications of transportation decision-making;

- Seek legislative, regulatory, and policy support to advance clean and efficient transportation, including low-emission vehicles and the necessary fueling infrastructure; and
 - Implement measures to lower GHG emissions and air pollutants from transportation sources.
- [Vermont's SLRP](#) notes that it is important to incorporate climate change considerations into transportation plans, facility designs, maintenance practices, operations and emergency response plans. In addition, the SLRP notes that climate change considerations will need to become a fundamental part of land use planning, as one effective strategy for reducing the risks of climate change is to avoid placing people and infrastructure in vulnerable locations. Within its SLRP, the Vermont Transportation Agency (VTrans) establishes a series of guiding principles and policy-level strategies to advance over time. Several pertain to climate change (see Figure 7).

Figure 7. VTrans' Guiding Principle and Strategies Pertaining to Climate Change.

Guiding Principle	Strategy
Preserve the condition of the State's existing transportation system.	Assess design and engineering standards necessary for transportation infrastructure to accommodate climate change impacts (e.g., extreme weather conditions) and evaluate inventory of facilities to determine vulnerabilities and adaptation priorities.
Preserve and enhance the State's economic vitality and Vermonters' quality of life.	Implement the June 2008 VTrans climate change action plan.
	Monitor and, as appropriate, participate in research on climate change impacts that identify changes or improvements necessary to maintain system operability and statewide mobility.
	Increase the use of and support additional access to and development of alternative fuels that could reduce Vermont's reliance on fossil fuels.
	Encourage the development and use of transportation construction and operations technologies that reduce emission of GHGs.

Summary

A minority of the SLRPs reviewed address the topic of climate change. Of the subset of SLRPs that do address the topic, an even smaller number include specific strategies to minimize the transportation sector's contribution to GHGs. As the impacts of climate change become increasingly critical to the planning, operations, and maintenance of transportation infrastructure, it is anticipated that more agencies will address this issue within their SLRPs, moving from high-level policies and goals to implementation of investments and other actions.

Appendix A: List of Advisory Group Members and Affiliations

Jerri Bohard

Oregon DOT

Sandi C. Kohrs

Colorado DOT

Sonna Lynn Fernandez

Idaho Transportation Department

Reena Mathews

MDSHA

Claude Morelli, AICP

New Mexico DOT

Peggy A. Reichert, AICP

Minnesota DOT

Kyle Schneweis

High Street Consulting

Michael Strange

Delaware DOT

Montie Wade

Texas Transportation Institute