Trends in Statewide Long-Range Transportation Plans: Core and Emerging Topics in 2017

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13. ABSTRACT (Maximum 200 words)

This report synthesizes key findings and trends from the 2017 Statewide Long-Range Transportation Plan (SLRTP) Database, which represents key observations identified through a review of all 52 SLRTPs and Statewide Transportation Improvement Programs (STIPs) published as of December 31, 2016. The research analyzed SLTRPs and STIPs to provide examples of individual States' approaches to incorporating important transportation planning topics and trends into their plans, highlighting planning topics addressed in innovative or noteworthy ways. The research team found diversity in the approach, content, and emphasis of SLTRPs, with plans varying by structure, initiatives and goals, topics addressed, and horizon date. Analyses also revealed consistency among the SLRTPs. For example, the majority of plans referenced multiple modes and the overarching policies, goals, or visions guiding decision-making, and many plans referenced Federal planning factors and financial planning or analysis. This report is intended to be a technical resource for DOTs, statewide planners, and their partners to aid in developing and managing planning programs as they update their SLRTPs by highlight examples of approaches taken by their peers and providing insights to the content, structure, and approach of SLRTPs nationwide.

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Executive Summary

This report presents syntheses and observations from a comprehensive assessment of 52 current SLRTPs from all 50 States, the District of Columbia (D.C.), and Puerto Rico, 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, 2005, and 2012 that reviewed SLRTPs 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 SLRTPs. 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 Fixing America's Surface Transportation (FAST) Act and implementing regulations require that States develop statewide transportation plans and outline ten factors that States must consider during transportation planning.[1] However, States have latitude in choosing what to include in the SLRTP. This research explores the diversity of State approaches to SLTRPs, 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 SLRTPs. 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 SLRTP. Instead, it was limited to an in-depth assessment of each SLRTP as one key product of the planning process. The research team also reviewed all 52 Statewide Transportation Improvement Program (STIPs) for references to performance-based planning elements from the SLRTPs and conducted some limited review of related plans referenced in SLRTPs. To the extent possible, the team also made observations on the planning process based on evaluation of the SLRTPs.

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

This report includes eight synthesis topics focusing on different SLRTP topics identified as of national interest by FHWA. Each synthesis assesses overall trends from the review of all 52 plans and provides examples of how SLRTPs address each topic. The syntheses cover the following topics:

1. **Plan attributes**: focuses on the approaches States took in developing the plans, plan update timeframes, and notable planning products.
2. **Systems planning:** provides information on plans that emphasize systems planning; for example, through reference to multimodalism, intermodalism, modal connectivity, and network-focused performance measures. Examples of plans that emphasize a modal focus are also provided.
3. **Performance-based planning and programming:** explores how plans incorporate performance-based elements such as goals, performance measures, and targets, into their SLRTPs.

[1] The ten planning factors include economic vitality, safety, security, accessibility and mobility, environment, multimodal connectivity, system preservation, resiliency and reliability, and travel and tourism.

4. **Implementation approaches**: explores how plans discuss implementation strategies and connections between the plans and States' transportation decision-making processes.
5. **Financial analysis and funding strategies**: identifies some examples of how SLRTPs discussed financial planning and analysis, including overall trends in these discussions and examples of plans that conducted financial scenario planning. Describes examples of funding strategies SLRTPs describe to address funding shortfalls.
6. **Challenges and trends**: provides information on SLRTPs that discuss particular challenges and trends impacting the transportation systems, with notable examples.
7. **Noteworthy and innovative methods**: provides notable examples of SLRTPs that use methods, such as GIS, data visualization, and scenario planning, to inform and communicate complex planning topics.
8. **Special topics**: provides summaries of special long-range transportation planning topics with notable examples, including travel and tourism, community development, and safety.

The companion database provides an easily searchable resource to explore key aspects of the 52 SLRTPs in detail. The database includes information on SLRTP plan type, modes, performance-based planning and programming, and other goals addressed in the SLRTPs.

The study team concluded that States are taking a number of approaches to develop SLRTPs. 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, SLRTPs have more comprehensive approaches to performance-based planning and programming than the research team observed when reviewing SLRTPs in 2012.

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Introduction

Purpose

This report presents a synthesis of key findings and trends from the 2017 Statewide Long-Range Transportation Plan (SLRTP) Database. The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) developed this database to provide an updated scan of the state of the practice for statewide long-range transportation planning and to inform *Performance-Based Planning: A Report to Congress*, due to Congress in October 2017. This database represents key observations from a review of all 52 SLRTPs and Statewide Transportation Improvement Programs (STIPs) that were published as of December 31, 2016.[2] The research team reviewed a wide range of topics in the SLRTPs but limited the analysis of the STIPs to whether they incorporated performance-based planning elements into project programming.

The purposes of this research are to provide insights into the content, structure, and approach of SLRTPs 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 52 SLRTPs 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 SLRTPs referenced planning topics in innovative or noteworthy ways. The review was limited to an assessment of SLRTPs, a limited review of whether STIPs incorporated performance-based planning elements, and a review of related documents (e.g., technical appendices or other documents) referenced in the SLRTPs. 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 SLRTPs to reach some limited observations on the processes used to develop and implement these plans.

Background

Federal regulations require States to conduct continuing, comprehensive, and collaborative intermodal statewide transportation planning (the "3 C process") 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."

State DOTs have latitude in choosing the structure, content, and issues to include in the SLRTP; however, the Fixing America's Surface Transportation (FAST) Act of 2015 outlines ten factors ("planning factors") that States must consider during transportation planning, including development of the SLRTP.[3] All SLRTPs address these factors to some extent, but States take a wide range of approaches in doing so.

[2] The SLRTPs and STIPs represent all 50 States, Washington, D.C., and Puerto Rico.

[3] The ten planning factors include economic vitality, safety, security, accessibility and mobility, environment, multimodal connectivity, system preservation, resiliency and reliability, and travel and tourism.

Exploring the diverse approaches States take to respond to the general SLRTP requirement and to FAST Act planning factors, and adapt to additional statewide priorities, can provide insight into continuing and emerging planning trends nationwide.

This report provides synthesis, observations, and insights for DOTs and their planning partners based on a comprehensive assessment of SLRTPs nationwide. The report is intended to be a resource for DOTs as they develop and update their SLRTPs based on approaches taken by their peers. It builds from earlier in-depth analyses conducted by the Volpe Center for FHWA in 2002, 2005, and 2012. The 2002 evaluation reviewed all SLRTPs to identify national trends and innovative transportation planning practices. The review also produced a database with detailed information on major characteristics of the SLRTPs. The 2005 analysis reviewed a subset of recently updated SLRTPs to identify trends and examples of planning practice in three areas: plan type, multimodal planning, and incorporation of planning factors from SAFETEA-LU. The 2012 analysis reviewed all SLRTPs and focused on eight synthesis topics:

- Plan types;
- Focus on implementation;
- Guiding principles, objectives, and strategies;
- Performance measures;
- Financial planning and analysis;
- Systems planning;
- Livability and sustainability; and
- Climate change.

This report builds upon the findings from these previous analyses and provides updated insights. The report includes a synthesis of eight different topics from the SLRTPs, most of which are related to topics in the previous reports. The synthesis provides background and context for each topic and details observations and trends from the overall review of all 52 plans. The syntheses also provide examples of SLRTPs that address the topic using a noteworthy or innovative approach.

The synthesis topics in this report are:

1. **Plan attributes**: focuses on the approaches States took in developing the plans, plan update timeframes, and notable planning products.
2. **Systems planning:** provides information on plans that emphasize systems planning; for example, through reference to multimodalism, intermodalism, modal connectivity, and network-focused performance measures. Examples of plans that emphasize a modal focus are also provided.
3. **Performance-based planning and programming:** explores how plans incorporate performance-based elements such as goals, performance measures, and targets, into their SLRTPs.
4. **Implementation approaches**: explores how plans discuss implementation strategies and connections between the plans and States' transportation decision-making processes.
5. **Financial analysis and funding strategies**: identifies some examples of how SLRTPs discussed financial planning and analysis, including overall trends in these discussions and examples of plans that conducted financial scenario planning. Describes examples of funding strategies SLRTPs describe to address funding shortfalls.
6. **Challenges and trends**: provides information on SLRTPs that discuss particular challenges and trends impacting the transportation systems, with notable examples.

7. **Noteworthy and innovative methods**: provides notable examples of SLRTPs that use methods, such as GIS, data visualization, and scenario planning, to inform and communicate complex planning topics.
8. **Special topics:** provides summaries of special long-range transportation planning topics with notable examples, including travel and tourism, community development, and safety.

Background

In addition to this report, the analysis includes a searchable, companion database that provides comprehensive information on the 52 SLRTPs reviewed. The searchable database is organized according to the following categories:

- Plan attributes
- Goals
- Modes Addressed
- Financial and Investment Analysis
- Challenges
- Trends
- Performance-based Planning and Programming
- Innovative Methods
- Special Topics (travel and tourism, community development, and safety)

FHWA plans to continue to update the database periodically to reflect availability of new SLRTPs and emerging planning trends.

Overall Trends in SLRTP Topics

The previous analyses in 2002, 2005, and 2012 analyses found great diversity in SLRTP approach, content, and emphasis. This analysis led to a similar finding. Most SLRTPs vary widely in terms of their structure, initiatives and goals, topics addressed, and other factors. Additionally, SLRTP dates vary greatly. At the time of the research, the approval or completion date of the plans ranged from 2006 to 2016. Several States were in the process of updating their SLRTPs.

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 FAST Act planning factors (e.g., support mobility and accessibility; improve safety).
- Reference to financial planning or analysis. Although Federal regulations do not require SLRTPs to present financial analysis or demonstrate fiscal constraint (i.e., revenues balanced against

expenses), many States include or summarize financial plans in a chapter or appendix or else present financially realistic SLRTPs describing a balance between projected revenues and capital and operating expenses.

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, this analysis shows an increased use of performance-based planning and programming, which reflects both increasing state of the practice by State DOTs and recent requirements in 2012's Moving Ahead for Progress in the 21st Century (MAP-21) Act and 2015's FAST Act.

Overall, this report provides a resource to identify examples of SLRTPs 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 SLRTPs, the report will help statewide planners and their partners to understand how SLRTPs are evolving nationwide, with examples of approaches taken by peer DOTs. It will also help these stakeholders to strengthen statewide planning processes, specifically the SLRTPs that are key products of these processes.

1. Synthesis Topic 1: Plan Attributes

1.1 Plan Type

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

- **Performance-based SLRTPs**: use quantifiable metrics, targets, or timeframes to guide planning, project development, maintenance, and operations decisions.
- **Policy-based SLRTPs**: provide strategies to outline general transportation directions for the State, address transportation needs, or meet projected demands. While all SLRTPs reference policies to some extent, policy-based SLRTPs 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 SLRTPs representing other plan types.
- **Corridor-based SLRTPs**: 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.
- **Needs-based SLRTPs**: analyze transportation needs for the State by considering available or alternative revenue sources or through reference to demographic or travel demand projections.
- **Vision-based SLRTPs**: identify an ideal future State transportation system, often through incorporating public input on a preferred vision.
- **Financially realistic SLRTPs**: set long-term directions for the State's transportation system through analysis of projected capital and operating costs and revenues of the plan's time horizon.
- **Project-based SLRTPs**: reflect assessment of alternative investments to meet the SLRTP's transportation policies or goals.

It is important to note that plan types are not rigid; most SLRTPs incorporate a variety of plan types. The categories, which are adapted from the earlier FHWA SLRTP analyses, are descriptive, and are applied to help DOTs understand the range of approaches taken by peers. For this report, the research team considered plan types 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

Of the 52 SLRTPs reviewed, the majority incorporated a combination of plan types (see Figure 1). This might be due to the fact that States have significant latitude in determining what planning approach to take and what content to include in the SLRTPs, although they must also address several Federally required elements. States likely choose a variety of approaches when developing their SLRTPs to better meet States' complex transportation needs and objectives.

Figure 1 shows the number of plans that apply each plan type. It shows that the most common plan types are policy-based (52 percent of all plans), vision-based (40 percent), needs-based (37 percent), and performance-based (35 percent). Fewer plans include corridor-based (21 percent), financially realistic (15 percent), or project-based (13 percent) approaches.

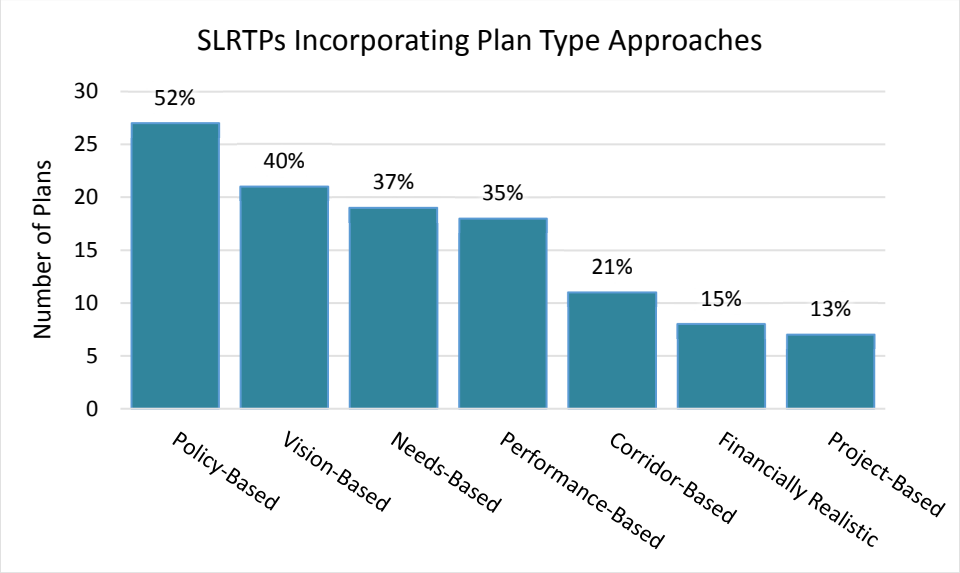


Figure 1: Frequency of SLRTPs incorporating plan type approaches (percentages are out of 52 SLRTPs) (Source: FHWA)

Certain combinations of plan types were more common than others, suggesting that some approaches to developing SLRTPs are complementary. For example, 8 SLRTPs (15%) include elements of a financially realistic approach. Of these, 5 SLRTPs also incorporate elements of a needs-based approach. The frequency with which SLRTPs combine needs-based and financially realistic approaches indicates that States find it important to assess transportation needs as a means to establish a long-term financial direction for the State's transportation system.

SLRTPs Incorporating a Performance Approach

Performance-based SLRTPs 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 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 52 SLRTPs reviewed, twelve percent of plans (six plans) were strongly oriented towards a performance-based approach; but overall, 35 percent of SLRTPs (18 plans) incorporated some elements of a performance-based approach.

Georgia's SLRTP offers an example for incorporating a performance-based approach. This SLRTP details the steps of the performance-based planning process including goals and objectives, performance measures, target setting, resource allocation, and measurement and recording of results. The performance measures in Georgia's plan "reflect a discrete set of evaluation criteria used to evaluate performance tradeoff of potential investment scenarios in context of long-range goals." The plan defines specific tangible measures to evaluate various investment needs. For example, discussion of each element of the highway program (pavement, bridges, roadway capacity, roadway operations, and safety) details specific performance measures:

- Pavement: ratings using the International Roughness Index (IRI)
- Bridge: percent of bridge deck area rated as Structurally Deficient (SD) or Functionally Obsolete (FO)
- Capacity: roadway Level of Service (LOS) ratings
- Operations: monetary user benefits resulting from reduced user delay through traffic signal coordination, incident response, and ramp metering
- Safety: number and rate of fatalities as well as property damage crashes and injuries of varying levels

Each element of the highway program includes a performance curve demonstrating performance impacts in the projected year 2040 at various funding levels.

This SLRTP includes a performance framework (Figure 2) that links plan goals to objectives to performance measures and provides recommendations on funding allocations based on performance measures and targets. The performance management dashboard included in this SLRTP (Figure 3) provides the user with an easy-to-understand guide to the performance measures considered, targets, and monitoring status.

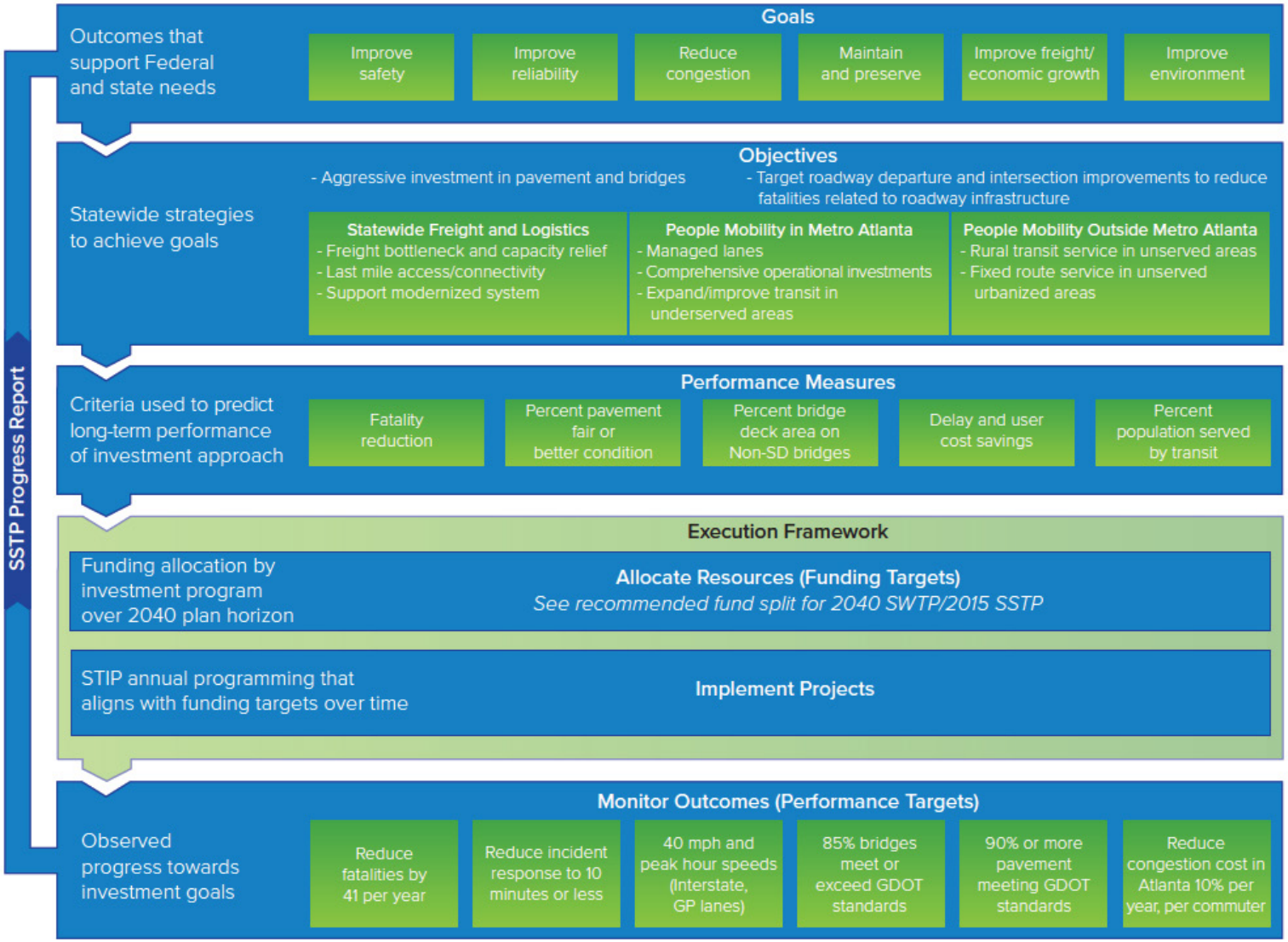


Figure 2: Performance Framework from Georgia's SLRTP (Source: Georgia DOT)

	Performance Measures	Value	Target	Status
SAFETY	**Reduction in Annual Highway Fatalities** AREA: STATEWIDE Year: 2014	19 Fewer Fatalities	≥41 Fewer Fatalities	
	Average HERO Response Time AREA: STATEWIDE Year: 2014	13 Minutes	≤10 Minutes	
MAINTENANCE	**Percent of State-Owned Bridges Meeting GDOT Standards** AREA: STATEWIDE Year: 2014	92%	≥85%	
	Percent of Interstates Meeting Maintenance Standards AREA: STATEWIDE Year: 2014	74%	90%	
	Percent of State-Owned Non-Interstate Roads Meeting Maintenance Standards AREA: STATEWIDE Year: 2014	73%	90%	
PLANNING AND CONSTRUCTION	**Percent of Right-of-Way Authorized On Time** AREA: STATEWIDE Year: 2014	56%	75%	
	Percent of Construction Authorized On Time AREA: STATEWIDE Year: 2014	69%	80%	
	Percent of Projects Constructed On Time AREA: STATEWIDE Year: 2014	76%	80%	
	Percent of Projects Constructed On Budget AREA: STATEWIDE Year: 2014	93.91%	90%	
	Annual Congestion Cost Per Peak Auto Commuter AREA: STATEWIDE Year: 2014	$1,130	≥10% Reduction in Cost per Year	
	Morning Peak-Hour Speeds on General Lanes AREA: METRO ATLANTA Year: 2014	37 mph	≥40+ mph	
	Evening Peak-Hour Speeds on General Lanes AREA: METRO ATLANTA Year: 2014	38 mph	≥40+ mph	

Figure 3: Performance Management Dashboard from Georgia's SLRTP (Source: Georgia DOT)

SLRTPs Incorporating a Policy Approach

Policy-based SLRTPs provide overarching strategies for future directions and discussion of options for how to proceed. Policy-based SLRTPs 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 SLRTP might describe investments, strategies, or programs to accomplish these policies.

Thirty-nine percent of plans (20 plans) were strongly oriented towards a policy-based approach; but overall, 52 percent of SLRTPs (27 plans) incorporated some elements of a policy-based approach. Most SLRTPs developed policies related to the planning factors in the FAST Act.[4] Some, however, developed policies focused on other topics, including social equity, energy conservation and climate change, public health, and partnerships and coordination.

California's SLRTP offers an example for incorporating a policy-based approach. The SLRTP aims to better serve the population of California through effective communication efforts and identification of shared stakeholder interests. Focused around the broader contexts of economy, environment, and quality of life, the policy framework focuses on six core goals:

- Improve multimodal mobility and accessibility for all people;
- Preserve the multimodal transportation system;
- Support a vibrant economy;
- Improve public safety and security;
- Foster livable and healthy communities and promote social equity; and
- Practice environmental stewardship.

The plan details each goal further, including policies and recommendations aimed at achieving the transportation vision, and has strong considerations for the future direction of California's transportation systems (Figure 4). California's SLRTP has a large focus on sustainable growth, highlighting efforts and strategies to reduce greenhouse gas emissions and reduce congestion to better serve the population.

[4] 23 U.S.C 135 (d).

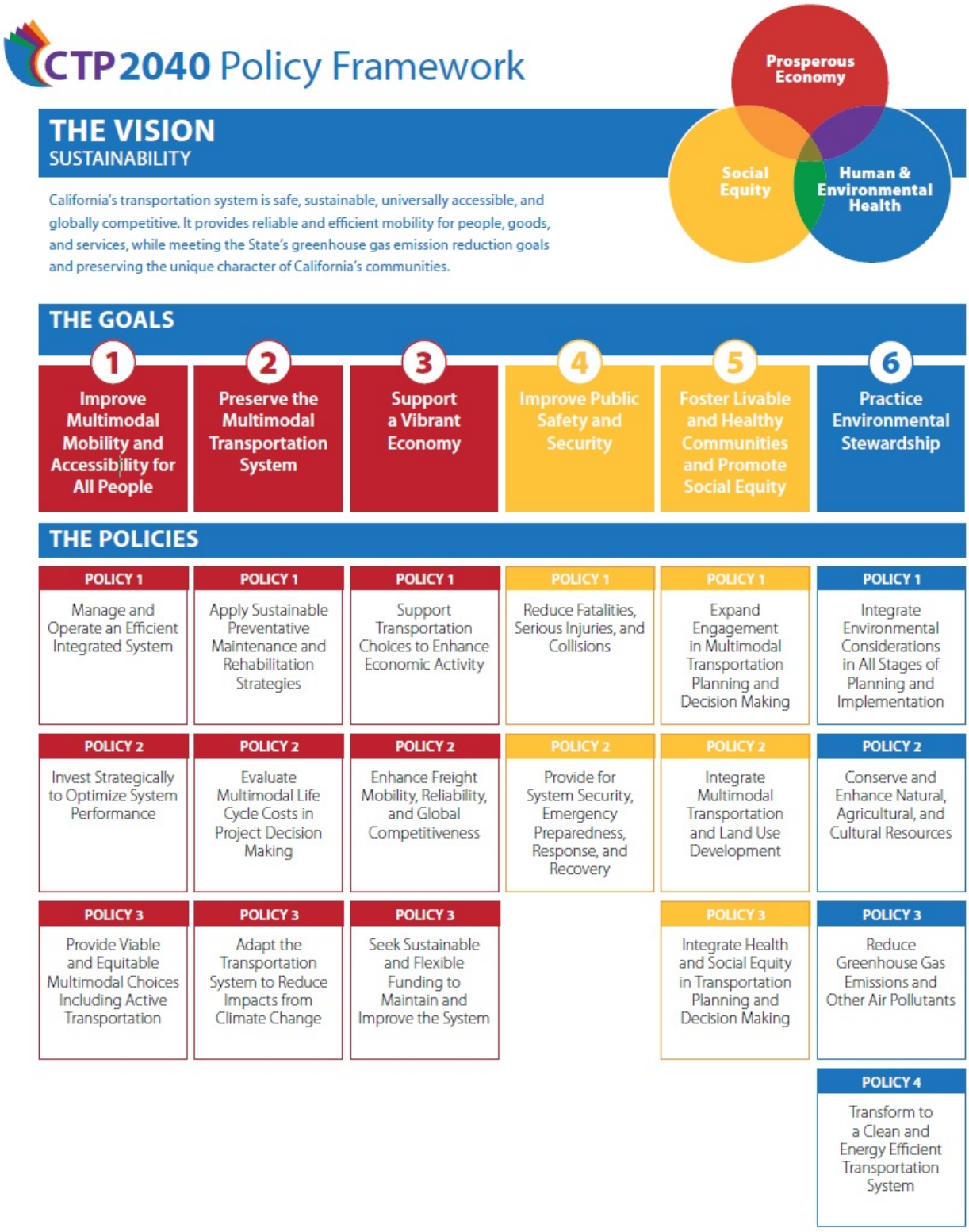


Figure 4: Policy Framework from California's SLRTP (Source: California DOT)

SLRTPs Incorporating a Corridor Approach

Corridor-based SLRTPs 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 SLRTP. Typically, corridors presented in SLRTPs are multimodal and provide a statewide synthesis of major corridors and their condition, projected use, and financing. Corridor-based SLRTPs 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 (2 plans) were strongly oriented towards a corridor approach. Overall, 21 percent of plans (11 plans) incorporated some elements of a corridor approach. Of all 11 plans, most focused on multimodal/intermodal transportation corridors.

Puerto Rico's SLRTP offers an example for incorporating a corridor-based approach. This plan highlights the importance of the multiple transportation modes in Puerto Rico to the island's economy. The plan discusses each mode for trade and travel in detail, including highway systems, public transportation, bicycle and non-motorized pedestrian facilities, seaports, airports, and freight. The plan discusses the interdependency of the modes and the importance of transportation systems on the future of the island and its residents.

The SLRTP elaborates several transportation corridors, especially for highway systems and public transportation. For example, the SLRTP discusses the importance of the PR-2/PR-22 Northwest Corridor and considerations for upgrading the system to increase capacity and operational safety. This corridor serves as a vital connection for trucking freight between San Juan and the western half of the island, though improvements are necessary to upgrade expressway standards. Puerto Rico's SLRTP addresses intermodal connectivity and discusses necessary improvements to accommodate the growth of Rafael Hernández International Airport to support increased tourism and economic development in the west coast.

SLRTPs Incorporating a Needs-Based Approach

Needs-based SLRTPs 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 SLRTP 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. SLRTPs may also include cost projections and considerations of available or alternative revenue sources.

Twenty-seven percent of plans (14 plans) are strongly oriented towards a needs-based approach. Overall 37 percent of plans (19 plans) include elements of a needs-based approach. In most cases, these SLRTPs use financial scenario analysis to identify how different investment levels might impact State DOTs' abilities to address transportation needs.

North Carolina's SLRTP offers an example for incorporating a needs-based approach. The 2040 Plan identifies long-term needs for each mode on a statewide, regional, and sub-regional basis. The plan details each mode of transportation to include projected future growth and economic conditions. The plan

discusses the level of service (LOS) for each mode extensively, providing definitions for each LOS within modes and each mode's target LOS. The 2040 Plan incorporates elements of a financially realistic approach by detailing funding necessary to maintain the current LOS for each mode and to achieve the target LOS, as well as outlining various potential investment scenarios and revenue sources. Additionally, this plan discusses three recommendations to achieve the described improvements and changes: embrace ongoing major policy and process initiatives; pursue focused, strategic investment priorities; and pursue policy, process, and program changes to implement the SLRTP.

SLRTPs Incorporating a Vision Approach

Vision-based SLRTPs 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?" SLRTPs 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 financially realistic approaches to contrast choices, costs, and performance results of alternatives.

Twelve percent of SLRTPs (6 plans) are strongly oriented towards a vision approach. Overall, 40 percent of SLRTPs (21 plans) include elements of a vision-based plan type. Many of these SLRTPs include vision statements that frame subsequent policies, guidelines, or action steps. Others summarized citizens' preferences for paths forward. Many of the vision plans rely on extensive public involvement to articulate elements of the vision, including strategies to obtain public feedback such as scenario planning exercises, focus groups, workshops, and surveys.

Louisiana's SLRTP offers an example for incorporating a vision-based approach. Louisiana DOT engaged stakeholders throughout the development of the SLRTP and utilized a variety of methods to understand the State's transportation needs. These included a legislative questionnaire, public telephone surveys, the plan website, policy committee meetings and advisory council meetings, executive staff interviews, visioning sessions and workshops, and tribal consultation. These outreach activities solicited feedback from a variety of transportation stakeholders at state, regional, and local levels, and ensured that the developed SLRTP would incorporate the needs of individuals living, working, doing business, and visiting the state. Louisiana DOT then held a visioning workshop with a range of stakeholders to "discuss future demographic trends, challenges, and possible growth scenarios, and to assess what the transportation system should look like to realize those possible futures." Feedback received from the various public engagement activities aided in the development of the SLRTP vision, goals, objectives, and performance measures. This SLRTP also incorporated needs-based approaches in addition to the vision-based approach, identifying many needs of the State as well as four different funding scenarios detailing how the needs can be met.

SLRTPs Incorporating a Financially Realistic Approach

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

Four percent of SLRTPs (2 plans) are strongly oriented towards a financially realistic approach. Overall, 15 percent of SLRTPs (8 plans) incorporate elements of this approach. Many of these types of SLRTPs use revenue scenarios as methods to compare and contrast financial alternatives. Other SLRTPs include extensive discussions on funding, financing, or revenue alternatives. A few States incorporate a financial focus throughout the plan, using financial alternatives as a framework for developing guidelines, policies, or action steps.

Iowa's SLRTP offers an example for incorporating a financially realistic approach, as a large portion of the plan discusses the anticipated shortfalls between future costs and revenues, and implications to the future of the state. The plan estimates costs and revenues for each mode, including aviation, bicycle and pedestrian, highway, public transit, and rail, with figures highlighting the funding shortfalls for each mode. The plan also discusses the various consequences for the shortfall for each mode, conveying potential negative or disruptive impacts to the future transportation system in the state.

Since "current revenues are not adequate to maintain and improve Iowa's multimodal transportation system now and into the future," the SLRTP identifies potential options for moving forward. In the SLRTP's implementation plan, Iowa DOT includes three steps to address the funding shortfall:

- finding additional financial revenue sources, with recommendations and suggestions included;
- programming future investments by developing Iowa's Five-Year Transportation Improvement Plan; and
- continuous performance monitoring to determine how the transportation system is performing compared to stated expectations and goals for measurements of safety, efficiency, and quality of life for each mode.

SLRTPs Incorporating a Project Approach

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

Four percent of SLRTPs (two plans) are strongly oriented towards a project approach. Overall, 14 percent of SLRTPs (seven plans) incorporate a project approach. Most SLRTPs closely tie their project focus to financially realistic elements. Most project-based SLRTPs also focus on highway needs and projects rather than multimodal projects.

Rhode Island's SLRTP offers an example for incorporating a project-based approach. Part Three of the plan, Transportation Financing, covers several projects and funding sources available over the long term. For example, the plan discusses five large highway program projects, including the I-195 Relocation, Route 403 Extension, Freight Rail (FRIP), Sakonnet Bridge, and Washington Bridge projects, and the approval for funding through Grant Anticipation Revenue Vehicle (GARVEE) bonds, which "enabled the State to implement five projects critical to rebuilding the infrastructure of Rhode Island, fostering economic development and improving our quality of life." The plan also discusses several transit projects, including bus and bus related transit, fixed guideways for streetcars and rail, and future rail projects needed to meet future commuter rail service demands for Pawtucket, Kingston, Westerly, Cranston, East Greenwich, and West Davisville.

1.3 Plan Update Cycles

The 52 SLRTPs reviewed were published between 2006 and 2016, with the majority of plans (79 percent, 41 plans) published in or after 2010. Figure 5 shows the distribution of plan publication years. The average and median age of the SLRTPs is four years.

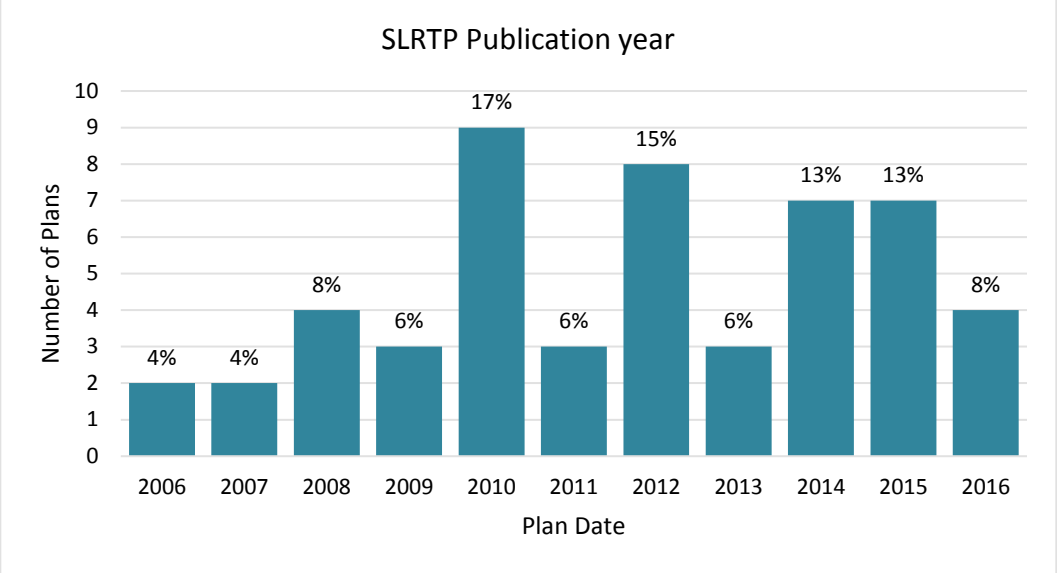


Figure 5: Most recent SLRTP publication year by State (Source: FHWA)

To understand the frequency of updates, the research team was able to locate the previously published plans for 39 SLRTPs. Of these 39 plans, the maximum number of years between plans is 15 years, and the average number of years between plans is 6.8 years. The most common number of years between updates is five years (26 percent, or 10 plans). Figure 6 shows the distribution of the years between plan updates.

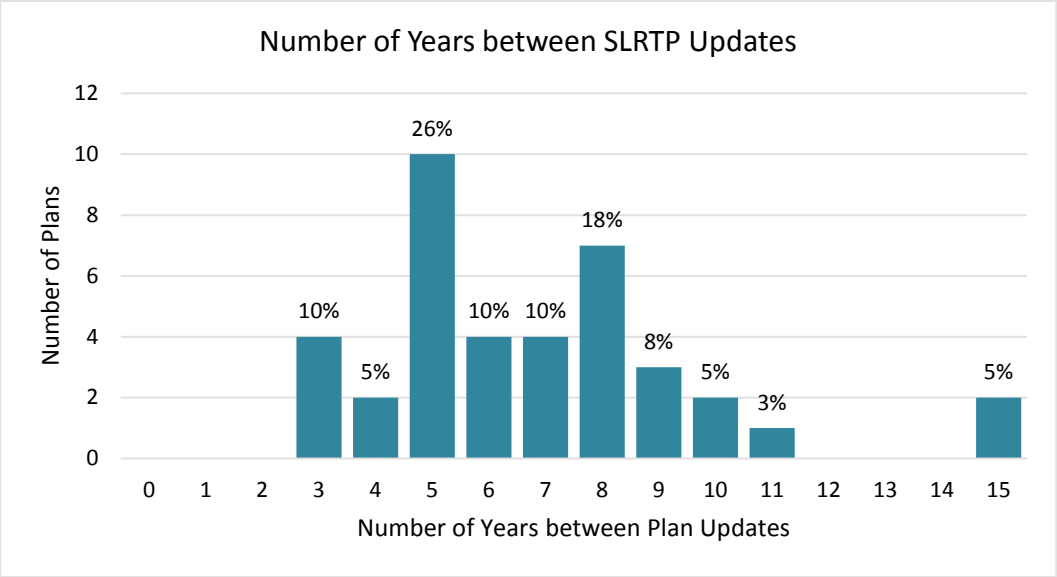


Figure 6: Number of years between SLRTP updates (Source: FHWA)

Figure 7 shows the distribution of plan horizons. Over 60 percent of SLRTPs fell within a planning horizon of 20 to 24 years, and 31 percent fell within a planning horizon of 25 to 29 years.

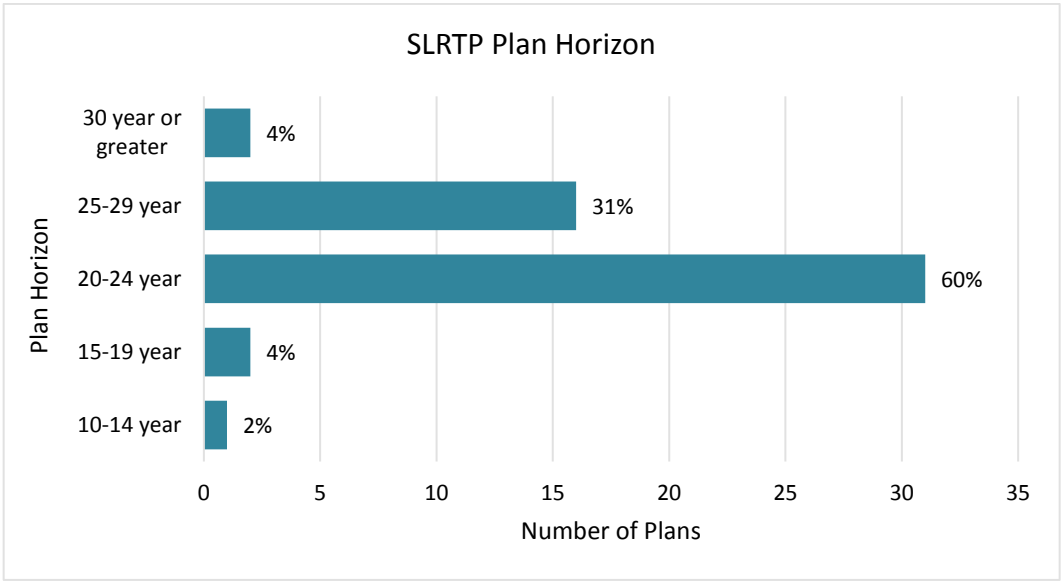


Figure 7: Frequency of SLRTP plan horizons (Source: FHWA)

1.4 Novel Planning Products

SLRTPs use various techniques to communicate SLRTPs to different audiences, including use of plain language, foreign language translations, videos, interactive content, and a performance dashboard/table. Of the 52 SLRTPs reviewed, 64 percent (33 plans) utilize at least one novel planning product (Figure 8).

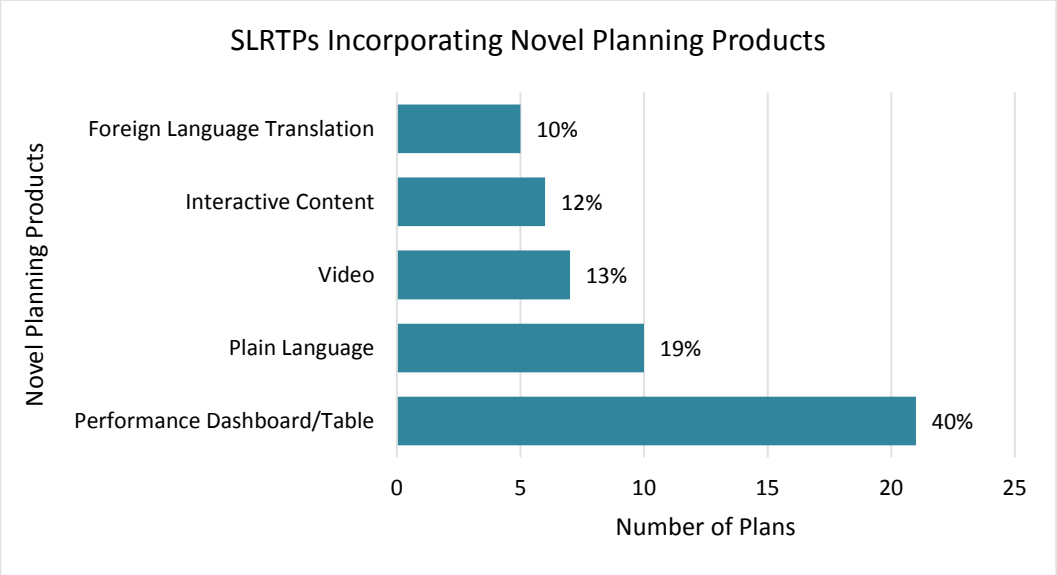


Figure 8: SLRTPs using novel planning products (Source: FHWA)

Nineteen percent of SLRTPs (10 plans) include the use of plain language. For example, the SLRTPs for Iowa, Louisiana, Ohio, Tennessee, Utah, and Washington all contain a summary version that provides an easy-to-understand synopsis of the plan, and Virginia's SLRTP has a public facing version that includes more visuals.

Ten percent of SLRTPs (5 plans) provide foreign language translation. For example, Massachusetts's SLRTP includes fact sheets available in English, Portuguese, Russian, Spanish, Vietnamese, Haitian Creole, and Chinese. Additionally, Puerto Rico's SLRTP is available in both English and Spanish, and the thirty-page executive summary in Wisconsin's SLRTP is available in both English and Spanish.

Fourteen percent of SLRTPs (7 plans) include videos. For example, the SLRTPs for Kentucky, Michigan, and Missouri provide videos explaining the need for a transportation vision and planning.

Twelve percent of SLRTPs (6 plans) include interactive content. For example, New Jersey's SLRTP includes links throughout the plan to provide more information or to direct users to more detailed studies. Other state SLRTP websites provide interactive content, such as Alabama's, which has an interactive site where users can learn more about different modes, and Tennessee's, which provides an overview of the long-range planning efforts and suggestions on ways to be involved.

Forty percent of SLRTPs (21 plans) include a performance dashboard or table. For example, the SLRTPs for both Nebraska and Texas include a clear, easy-to-read performance table. Some state SLRTPs also discuss the progress towards or status of various performance measures and targets, including Florida, Georgia, Michigan, Wyoming.

2. Synthesis Topic 2: Systems Planning

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. Important elements of systems planning include multimodal and intermodal approaches and consideration of linkages between multiple planning processes (e.g., regional planning, economic planning, environmental planning, etc.).[5] To varying extents, all SLRTPs considered multimodal needs and discussed strategies to improve, maintain, or implement a comprehensive transportation system. This synthesis provides examples of SLRTPs that include multimodal systems and corridor planning discussions.

2.1 Modes Covered

All SLRTPs discussed specific modes and related transportation needs, challenges, and opportunities, although the specific approach to these discussions and level of detail vary. Modes covered in SLRTPs include the following, as detailed in Figure 9: highways, freight, public transit, bicycle, pedestrian, aviation, all roads, intercity passenger service (bus and rail), ports, shared mobility, pipelines, and connected/autonomous vehicles. The majority of plans (over 90 percent) covered modes such as highways, freight, transit, bicycle, pedestrian, aviation, and all roads, while only 17 percent (9 plans) discussed connected/autonomous vehicles.

[5] Intermodalism refers to the ability to connect modes of transportation, while multimodalism refers to the availability of transportation options using different modes within a system of corridor.

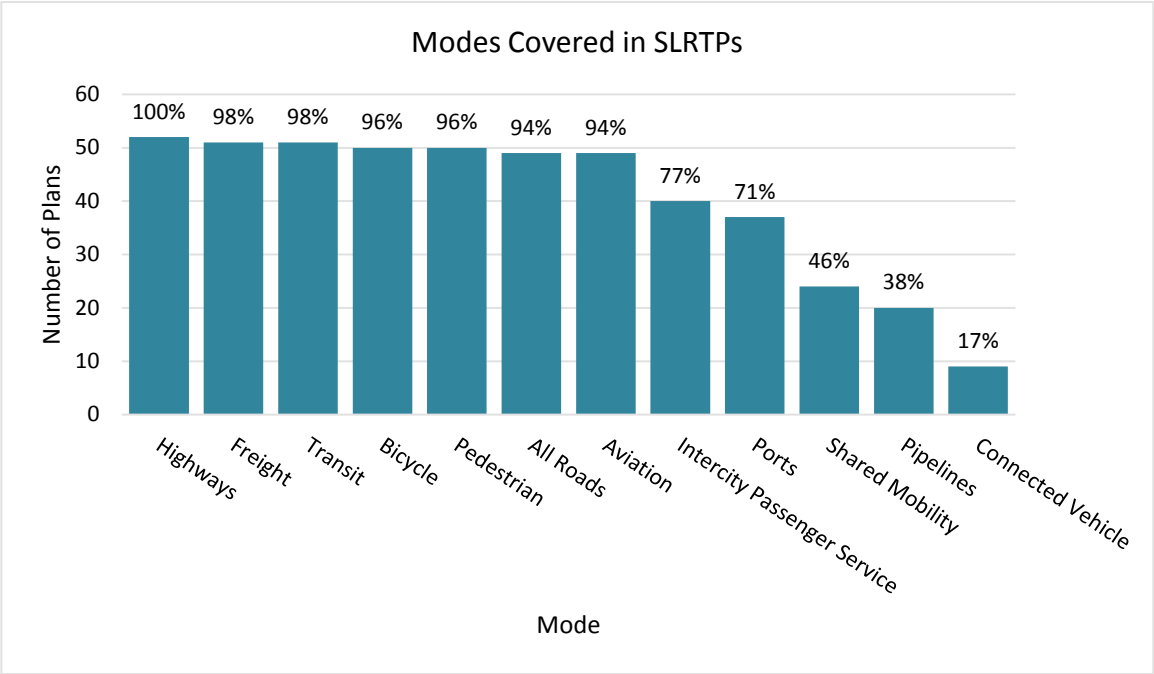


Figure 9: Modes covered in SLRTPs (Source: FHWA)

The discussion below presents notable examples of plans that discuss some of the less commonly addressed modes in their SLRTPs.

Intercity Passenger Service

This analysis found that 77 percent of SLRTPs (40 plans) discuss intercity passenger service. Of the 52 SLRTPs reviewed, 37 plans (71 percent) specifically mention intercity rail services and 17 plans (33 percent) specifically mention intercity bus services. Oklahoma's SLRTP offers an example for addressing intercity rail and bus services. For intercity rail, the plan details an increase in ridership, positive user feedback, and interest in expansion to new routes. For intercity bus transportation, the plan lists intercity passenger bus organizations and considers potential future demand.

Ports

This analysis found that 37 SLRTPs (71 percent) discuss ports as a part of their transportation system. North Carolina's SLRTP offers an example for addressing ports. The plan emphasizes ports' economic importance for the state and describes the ownership and operation status of the state's two seaports and three inland terminals. The plan also outlines port performance, financial needs, and deficiencies. The SLRTP details port-specific investment goals for infrastructure health, mobility, and safety.

Connected/Autonomous Vehicles

Nine SLRTPs (17 percent) discuss connected/autonomous vehicles as a part of the State's transportation system that should be considered in long-range planning. The relatively low number of SLRTPs addressing connected/autonomous vehicles reflects the fact that this is a newly emerging mode that many State

DOTs are beginning to consider. California's SLRTP offers an example for addressing connected/autonomous vehicles. The plan specifically addresses connected/autonomous vehicles and their potential to improve safety, reduce congestion, and reduce emissions and fuel consumption.

2.2 Multimodal and Intermodal Systems Planning

Most SLRTPs do not focus on a single mode but instead plan for the statewide multimodal transportation system. SLRTPs typically discuss systems planning through reference to several recurring topics, including the following listed below. Most SLRTPs include one or more of these themes:

- Intermodalism: ability to connect modes of transportation.
- Multimodalism: availability of transportation options using different modes within a system or corridor.
- 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.

Of the 52 SLRTPs reviewed, 96 percent (50 plans) are multimodal. Twenty-one percent (11 plans) are also corridor-based.

Ohio's SLRTP offers an example of multimodal systems planning. One of the goals listed in the plan's vision relates to accessibility and connectivity, aiming to "increase customer access to Ohio's multimodal transportation system and improve linkages between modes." The plan discusses the state's multimodal system in relation to regional transportation needs, noting that the modal needs analysis approaches varied by mode since modes are unique and distinct from one another. The amount of data available also varied by mode, necessitating differing analysis approaches by mode, with details included on highway, rail, transit, aviation, and maritime modes.

3. Synthesis Topic 3: Performance-Based Planning and Programming

Performance-based planning and programming (PBPP) is a strategic approach that uses data in long-range planning and project programming to support decisions that help to achieve performance goals. In recent years, State DOTs have been transitioning toward performance-based approaches to support decision-making, either voluntarily or in response to State legislation.[6] In 2012, MAP-21 began requiring State DOTs to develop a performance-based approach to transportation planning and programming statewide.[7] These requirements were reauthorized by the FAST Act, which established the nationwide shift to a data driven, outcome-based approach to transportation planning and decision-making for States and metropolitan areas.

A number of common elements are associated with PBPP, which State DOTs adapt to help achieve desired outcomes, some of which include:[8]

- **Goal**: a broad statement that describes a desired end state.
    - Example: A safe transportation system.
- **Objective:** a specific, measurable statement that supports achievement of a goal. A good objective should include or lead to development of a performance measure that can be tracked over time. This allows agencies to assess different investment or policy alternatives.
    - Example: Reduce the total number of highway fatalities.
- **Performance Measure:** an indicator that agencies can use to assess progress toward an objective. Performance measures can be used in strategy analysis to compare different investment or policy alternatives and can be used to track actual performance over time. Under MAP-21 and the FAST Act, DOT established performance measures through rulemaking for the national goal areas that apply to SDOTs, MPOs and public transportation providers.
    - Example: Number of highway fatalities.
- **Target:** a specific level of performance that agencies desire to achieve within a given timeframe. A target can be used as a basis for comparing progress over time to a desired outcome or for making decisions on investments.
    - Example: Reduce fatalities by 5 percent by 2018.

This review of the 52 SLRTPs found that a majority of State DOTs have adopted some level of PBPP within their long-range planning process, although the degree to which they have adopted PBPP elements varies, as shown in Table 1 and Figure 10.

[6] Federal Highway Administration (FHWA). September, 2013. *Performance Based Planning and Programming Guidebook*.

[7] 23 USC 134(c)(1), 23 USC 135(f)(7), and 23 USC 150(c)(4).

[8] FHWA, *Performance Based Planning and Programming Guidebook*, September 2013.

Table 1: SLRTP elements associated with PBPP

Plan Element	No. of Plans	Percent of Total Plans
Vision Statement	43	83%
Goals	52	100%
Objectives	43	83%
Performance Measures	41	79%
Targets	20	38%
Total Plans	**52**	**100%**

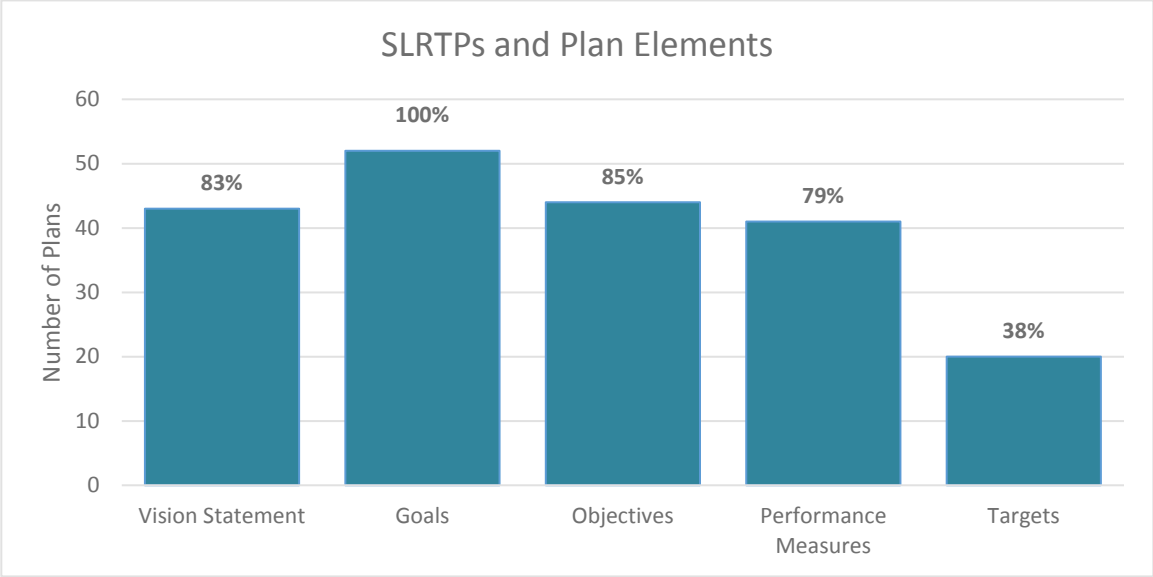


Figure 10: SLRTP with PBPP elements, including vision statement, goals, objectives, performance measures, and performance targets (Source: FHWA)

This review shows that the majority of State DOTs are transitioning to a PBPP approach in their SLRTPs. All State DOTs have adopted some performance-based elements into their planning and programming processes, although the level of adoption varies widely. The data suggest that State DOTs are in different stages in an evolution of PBPP approaches from initial adoption – often drawing from existing data-driven processes and developing limited performance measures based on available resources – to a mature approach that is fully integrated throughout an agency's planning and programming processes and products (

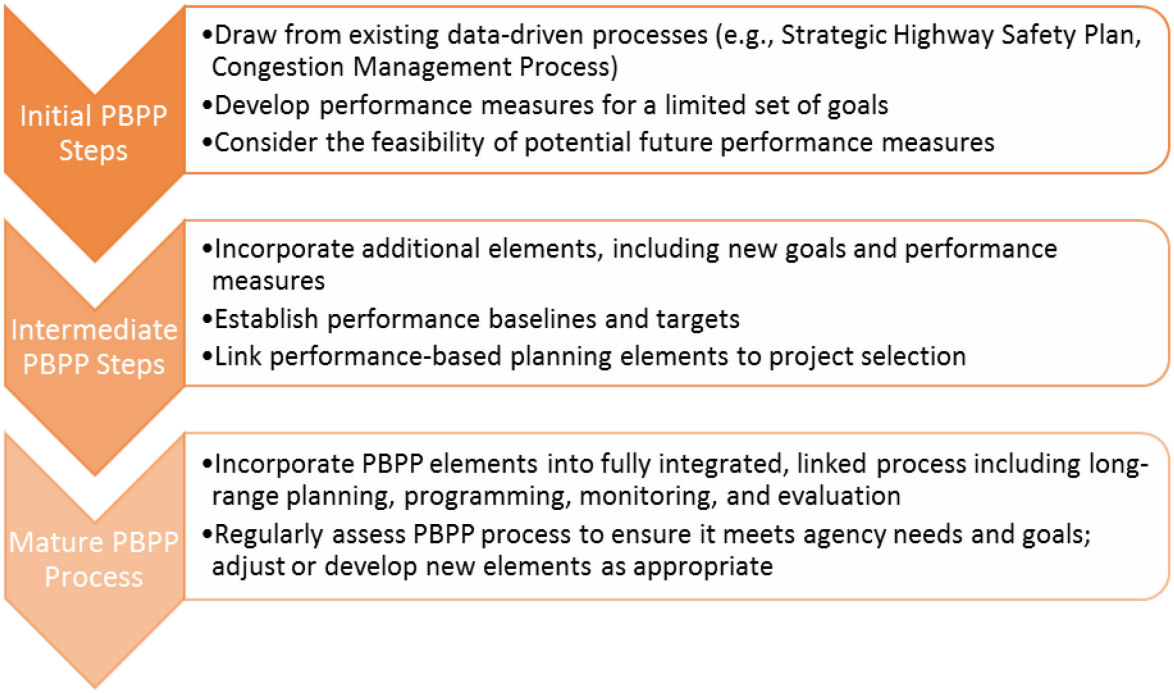


Figure 11: General Model for Evolution of a PBPP Approach (Source: FHWA)

The research team observed this evolution, finding that all of the SLRTPs include goals, and most include objectives and performance measures; however, less than half have established performance targets. Many State DOTs begin by developing goals and performance measures, then establish targets once they have field-tested their performance measures and established baselines of performance related to goals.

Minnesota's approach to PBPP is notable as a holistic, comprehensive process that links the SLRTP to modal plans and programming processes. Minnesota's SLRTP is part of a "family of plans" that address transportation needs with a performance-based approach and create a path for implementation. The State's SLRTP is the highest level policy plan for transportation in the state with a 20-year horizon that contains goals, performance measures, and targets. These PBPP elements feed into the State's modal plans and the overall implementation and investment plan. The set of plans includes a 20-year investment plan, which Minnesota DOT developed to communicate investment priorities for the transportation system that are derived from the PBPP elements of the multimodal transportation plan. The investment plan contains details on investment needs, investment directions, and priorities for additional revenue.[9]

3.1 PBPP Elements by Goal Area

The overall PBPP approach commonly includes a hierarchical relationship between a plan's goals, performance measures, and targets. The transportation planning process generally begins with the development of broad goals that provide a strategic direction. Agencies then develop performance measures to measure progress towards achieving the goal and targets, which identify specific levels of performance that agencies desire to achieve within a given timeframe.

In their SLRTPs, State DOTs have developed PBPP elements for a variety of goal areas, both related to the six national goals in the FAST Act and additional State goals.[10] Figure 12 shows the number of SLRTPs with goals, performance measures, and targets related to each national goal area, and Figure 13 shows the

[9] Minnesota DOT Plans. http://minnesotago.org/index.php?cID=472

[10] 23USC §150(b). The national Federal highway program performance goals as established by Congress are:

- **Safety** - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- **Infrastructure Condition** - To maintain the highway infrastructure asset system in a state of good repair
- **Congestion Reduction** - To achieve a significant reduction in congestion on the National Highway System
- **System Reliability** - To improve the efficiency of the surface transportation system
- **Freight Movement and Economic Vitality** - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- **Environmental Sustainability** - To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- **Reduced Project Delivery Delays** - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

number of SLRTPs with goals, performance measures, and targets related to additional State goals. Goals related to safety (94% of SLRTPs) and infrastructure or asset management (94% of SLRTPs) are the two most common goal areas. This may reflect States' prior experience with data-driven planning for safety and asset management, such as their Strategic Highway Safety Plans and Transportation Asset Management Plans. Of the additional State goals, SLRTPs were most likely to include social equity (65% of SLRTPs), often discussing mobility options to meet the needs of all community members. Social equity is discussed as a part of community development in Synthesis Topic 8: Special Topics.

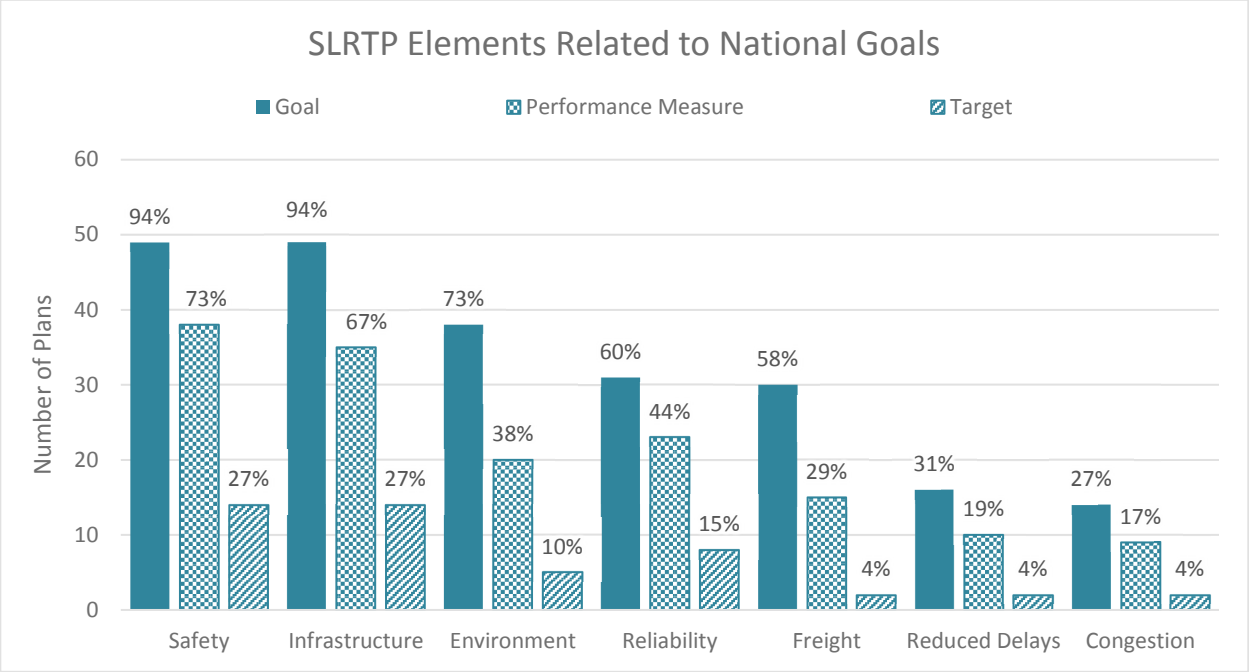


Figure 12: SLRTPs with goals, performance measures, and targets associated with national goals (Source: FHWA)

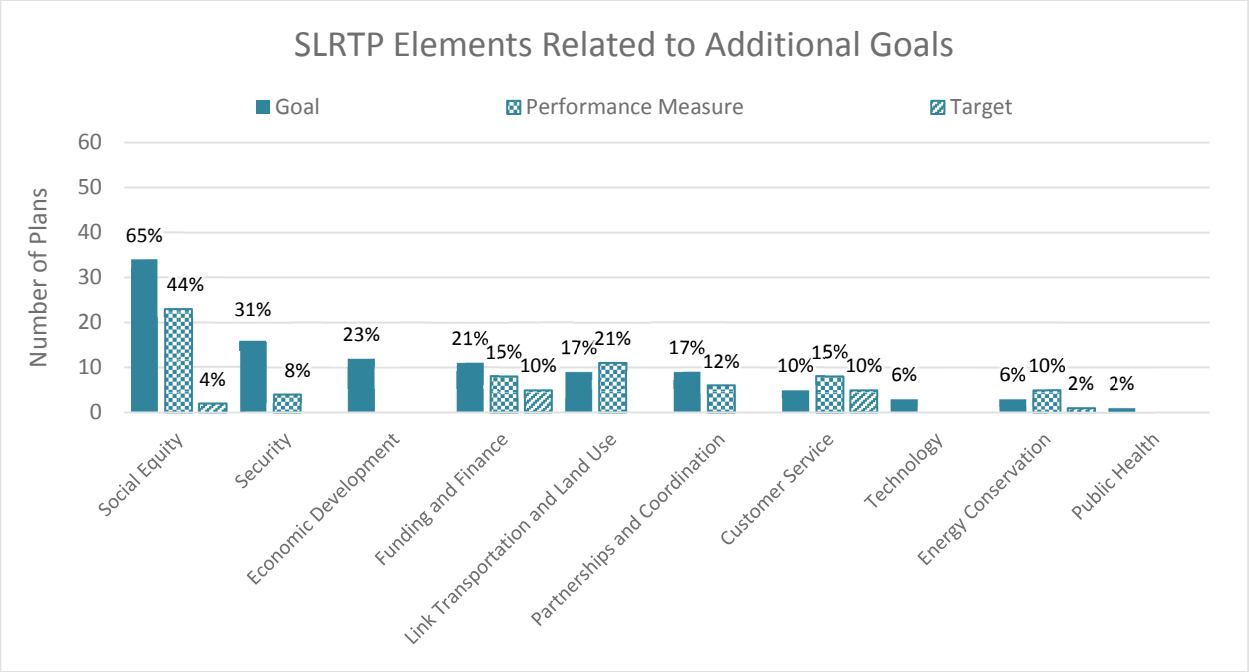


Figure 13: SLRTPs with goals, performance measures, and targets associated with goals in other than the six national goals in the FAST Act (Source: FHWA)

Performance Targets and Monitoring Plans

As States develop their approaches to PBPP, they typically develop targets after they have established goals and performance measures. Only 20 SLRTPs (38%) included performance targets, reflecting this evolution. Just five (10 percent) of the 52 SLRTPs have established monitoring processes for tracking progress on performance measures or targets. Few SLRTPs document progress in a way that reveals whether PBPP has influenced investments and the impacts of these PBPP-guided investments.

Both SLRTPs of South Carolina and Hawaii discuss performance targets and monitoring plans. South Carolina's SLRTP discusses the State's method for monitoring SLRTP targets. Preserving South Carolina's transportation infrastructure is a primary element of South Carolina DOT's mission. The plan's goal aims to minimize infrastructure costs by increasing the useful life of infrastructure assets through asset management. South Carolina's DOT maintains an extensive dataset associated with their infrastructure assets in order to analyze life cycle infrastructure costs. South Carolina's DOT monitors these data, which include the miles of interstate and NHS system rated at "good" or higher condition, the percentage of deficient bridge deck area, and the number and percentage of active duty transit vehicles past designated useful life. Hawaii's SLRTP also discusses the monitoring of targets related to infrastructure condition, including highway pavement and bridge conditions and airfield runway conditions.

3.2 Comprehensive Approaches to PBPP

A comprehensive PBPP approach is one that integrates performance measures or targets that link to specified goals or objectives as well as project screening or selection of investments and strategies. The

majority of State DOTs incorporate performance measures into their long-range planning in some way. A total of 41 SLRTPs (79% of all plans) incorporate performance measures that link to the plan's goals or objectives; 14 SLRTPs (27% of all plans) have a performance measure table or "dashboard" that presents goals, performance measures, and/or targets in graphic form; 7 SLRTPs (13% of all plans) link their performance measures to project screening or selection of investments or strategies (see Table 2). These data show that although most State DOTs have developed performance measures for their SLRTPs, few SLRTPs document development of a comprehensive approach that links performance measures, performance targets, monitoring, and project selection.

Table 2: SLRTPs Comprehensiveness of Approach

Plan Attribute	No. of Plans	Percent of Total Plans
SLRTPs that link performance measures to the plan's goals or objectives	41	79%
SLRTPs with a performance measure table or "dashboard" that presents goals, performance measures, and/or targets in graphic form	14	27%
SLRTPs with performance measures linked to project investment and selection	7	13%

Mississippi's SLRTP contains performance dashboards that present performance measures, targets, and economic impacts that are projected under low and high investment scenarios. This SLRTP features several performance dashboards that correspond to pavement condition, bridge condition, roadway capacity, safety, intelligent transportation systems, freight rail, ports and waterways, aviation, public transportation, and bicycle and pedestrian modes. The dashboards help to visually connect the overarching goal to the performance measures and their targets, along with investment strategies, economic impacts, and the opportunities and challenges associated with achieving these goals (see Figure 14).

Figure 14: Image of Mississippi's SLRTP performance dashboard related to infrastructure condition (Source: Mississippi DOT)

4. Synthesis Topic 4: Implementation Approaches

As a key product of the statewide planning process, SLTRPs reflect States' decision-making processes, including policy directions, project prioritization, and funding priorities. Because this synthesis report relies on a review of the SLRTPS and aspects of the STIPs, the research team was limited to studying the products of transportation planning and programming and cannot determine the entire process and extent to which a State implements the recommendations and investment decisions beyond the information included in these documents. This synthesis topic discusses SLRTPs' approaches to implementation by examining the content of the SLRTPs and STIPs and their approach to implementation.

States can implement SLRTPs through (1) changes to internal processes (2) new policy directions, and (3) linking planning and investments. The majority of SLRTPs include 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 discuss changes to internal processes. The sections below provide some examples.

4.1 Policy and Practices

Changes to Internal Processes

A few SLRTPs focused on how the plan will lead, or has led, to new internal practices. For example, Minnesota's SLRTP includes a guiding principle to promote accountability, transparency, and communication. 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. New Hampshire's SLRTP is another example of a plan that has made changes to an internal process. In response to a governor's mandate that the State DOT "transition to a new transportation environment," New Hampshire DOT established a Citizen Advisory Committee that created strategic recommendations for investment and resource transparency.

New Policy Directions

SLRTPs can discuss new policy directions or guiding principles to influence the future of the State's transportation system. For example, Connecticut's SLRTP 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 SLRTP 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.

4.2 Investment Strategies

A majority of SLRTPs discuss considerations of alternative investment strategies or new ways to identify investment priorities. In these discussions, State DOTs typically reference new investment policies, strategies, or funding scenarios that will support more effective financial decision-making. This can include linking investments to performance-based elements in the SLRTP or considering investment decisions across individual funding programs to develop a more holistic investment strategy.

Linking Transportation Investments to Performance-Based Planning

By linking planning and programming with a unified set of performance-based elements, PBPP can enhance the link between States' SLRTPs and programming in the STIP. Most State DOTs (79 percent) have established performance measures in some way in their SLRTP; however, a minority (13 percent) have linked performance measures to project screening or selection of investments or strategies in their SLRTP. For this report, the research team reviewed SLRTPs and STIPs, but it is possible that State DOTs publish annual reports or implementation plans that provide additional information on implementation through investments. For example, Nevada's SLRTP refers to the State's "Performance and Implementation Plan," which details strategies and actions for reaching the plan's goals. This is a separate document that assigns responsibility for implementation actions to lead agencies and departments with the partnerships necessary to succeed.

In addition to reviewing all 52 SLRTPs for links between performance based planning and investment decisions, the research team reviewed all 52 STIPs to learn whether the STIPs referenced the performance-based elements from their respective SLRTPs. Thirty four STIPs (65 percent) demonstrate or discuss how PBPP shapes project programming. A total of 21 percent of all STIPs link to their respective SLRTP's goals, 15% link to the SLRTP's performance measures, and 4% link to the SLRTP's targets (see Figure 15).

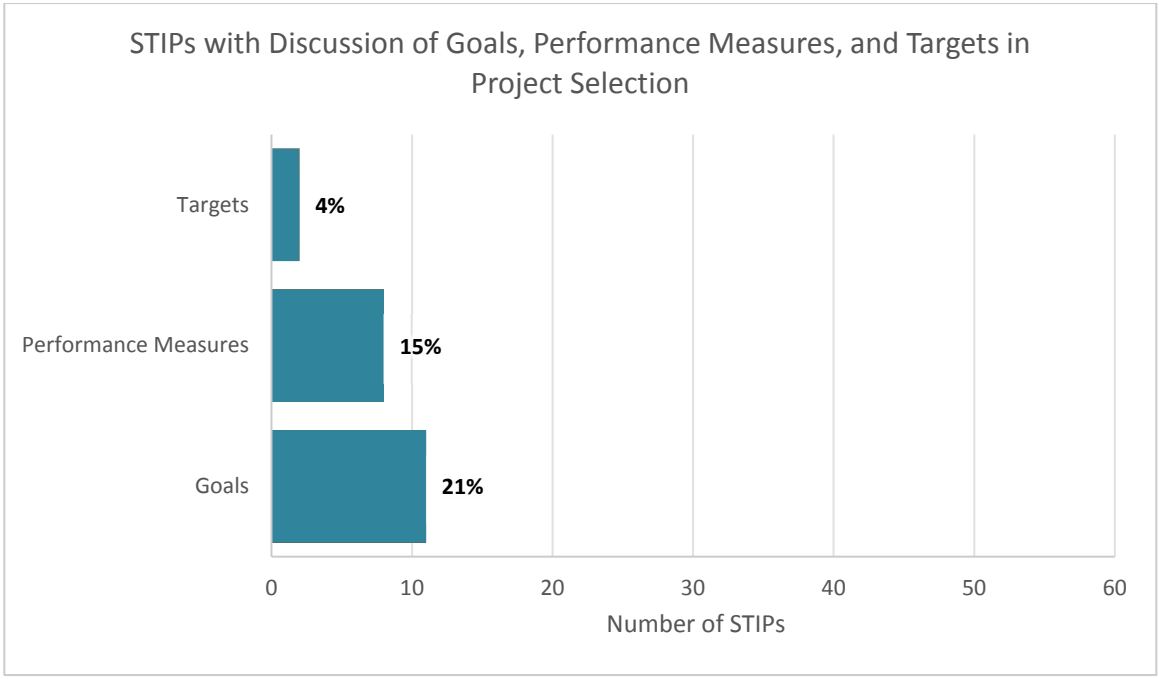


Figure 15: Number of STIPs that reference SLRTP goals, performance measures, and targets in relation to project selection (Source: FHWA)

The analysis of STIPs revealed far fewer documents contained PBPP elements than SLRTPs. Eleven STIPS (21 percent) referenced goals, 8 STIPS (15 percent) referenced performance measures, and only 2 STIPs (4 percent) referenced performance targets.

Cross-program Allocation of Funds

Cross-program allocation refers to an SLRTP that addresses investment decisions for the transportation system holistically rather than through separate modes and funding sources. Instead of planning for each individual funding program or mode, an SLRTP with a more holistic investment strategy would focus investments on the projects with the greatest potential to meet performance targets and determine how to fund the projects with the greatest potential to fulfill the priorities of the overall transportation system without considering some categories of funds as limited to use for specific modal investments.

Arizona's SLRTP discusses transportation investments for the transportation system as a whole. The plan presents a fiscally-constrained Recommended Investment Choice, which is a 25-year capital investment strategy that emphasizes preserving and modernizing the existing highway system with limited investment in new facilities, as well as a steady allocation of funds for expanded travel choice through non-highway modes. Arizona DOT explains that this focus on preservation and expansion of non-highway mode choice are a departure from past investment practices and analyzes the projected performance of this investment strategy in contributing to the plan's goals.

4.3 Implementation Plans

As a part of plan implementation, SLRTPs may describe action steps that outline how the State intends to translate its overall transportation vision into practice. For example, Delaware's SLRTP includes a section that discusses the organizational structure for plan implementation and implementation actions. In this section, Delaware DOT discusses different agencies and other actors that are crucial in implementation, as well as the other planning documents that these agencies produce in partnership with the State's DOT. The section of the plan that discusses implementation actions includes projects within the State on the short-term and long-term horizons.

Several States have moved beyond proposing general action steps to explicitly identify key responsible stakeholders or timeframes for implementing strategies to accomplish the plan's vision. The detail included in these implementation plans indicates strong connections between the SLRTP and the States' decision-making processes. For example, Florida's SLRTP includes five guiding principles and 29 key strategies to address the principles. The plan identifies agencies and other partners responsible for implementing these strategies. 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.

5. Synthesis Topic 5: Financial Analysis and Funding Strategies

For most State DOTs, long-term financial analysis and development of funding strategies are a key part of their SLRTP. A majority of SLRTPs (40 plans, or 77 percent) 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, some State DOTs look at financial trends and extended forecasts or estimated costs based on a desired performance level, such as reduced delays or improved levels of service. Typically, States use asset management systems, such as those developed for bridge, pavement, and congestion systems, to estimate future costs.

Some SLRTPs present 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. Oregon is an example of a State that includes a more detailed breakdown of revenues and expenses: Oregon's SLTRP includes an analysis of transportation needs for the State, regional, and local transportation systems, 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, projected annual needs, and the associated annual funding gap.

5.1 Projection of Funding Needs

Of the 52 SLRTPs analyzed, 35 (67%) discussed the State's projections of funding needed to achieve their transportation goals. States often discuss different funding scenarios in order to identify the amount of funding needed to achieve different performance levels.

For example, Arizona's SLRTP compares three potential funding scenarios with identified needs for all modes to determine the appropriate level of investment needed to achieve the State's transportation vision. The three funding scenarios are:

- Baseline: this scenario occurs under a financially realistic budget that assumes no new funding sources or revisions to existing user fee rates over the plan's 25-year horizon. The investments projected under this scenario are approximately $26.2 Billion.
- Full State Needs: this scenario provides a needs and revenue assessment in the mid-range that improves system performance for needs on the state's transportation system, but excludes local roads. The cost of implementing this scenario is approximately $88.9 Billion.
- Vision: this scenario provides the needs, revenues, and outcomes for implementing the State's SLRTP 2050 vision for both the State system and local roads. The total cost of implementing the SLRTP 2050 vision scenario over the 25-year Plan horizon is approximately $250 Billion in 2009 constant dollars.

This plan acknowledges the funding gaps between the three scenarios and discusses the different policy implications for each scenario.

5.2 Funding Strategies

Of 52 SLRTPs, 42 (81%) discuss funding strategies over this long-term horizon, which often identify possible mechanisms to address funding shortfalls. This includes States that identify a dollar figure for the shortfall amount as well as States that do not estimate the funding shortfall but recognize that current funding sources are insufficient to fund future transportation needs.

Some of the proposed funding strategies to address funding shortfalls include changes to traditional funding sources, such as fuel taxes, property taxes, and motor vehicle excise taxes. Other SLRTPs consider new funding strategies, which include a vehicle miles traveled (VMT) tax, toll financing, congestion pricing, and public-private partnerships (PPPs).

Typically, the SLRTPs 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 SLRTPs discussed more than one new funding source.

Tennessee's SLRTP contains several individual planning documents that discuss program allocation revenue, needs, and funding strategies. Tennessee DOT's 25-Year Policy Plan provides options for increased revenue, including tolls, bond proceeds, state motor fuel taxes, sales and use taxes, oil royalties, severance taxes, corporate income taxes used for highways, specific ownership taxes, traffic impact fees, and proceeds from benefit assessments. Several of these revenue options are based on examples of recent state and national legislative initiatives that are consistent with the guiding principles of the SLRTP. Additionally, the document provides a comparison of specific funding levels, funding strategies, and summaries of proposed or enacted legislation in peer states.

6. Synthesis Topic 6: Challenges and Trends

6.1 Challenges

In their SLRTPs, State DOTs often discuss long-term or emerging challenges, their implications for the transportation system, and potential strategies for addressing them. Five prominent challenges discussed in the SLRTPs include:

- Revenue shortfalls for transportation;
- Inflation (increasing the price of construction and operations);
- Aging infrastructure;
- Aging populations; and
- Climate change.

The majority of SLRTPs discuss the challenge of revenue shortfalls (85 percent, or 44 plans), revealing that most States recognize similar problems of funding their transportation systems to reach their SLRTPs' goals. Nearly half of the SLRTPs (48 percent) discuss the need to provide new transportation options for aging populations. Figure 16 shows the distribution of challenges mentioned in SLRTPs. Ninety-two percent (48 plans) discussed at least one of these challenges in their SLRTPs, with a majority of the plans discussing more than one.

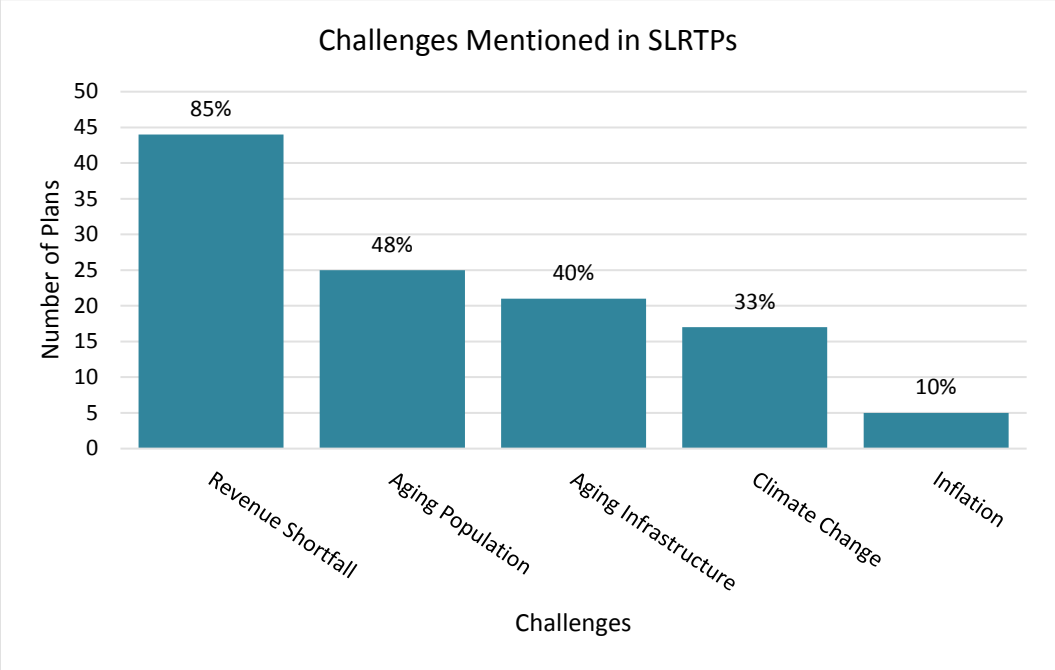


Figure 16: frequency of specific challenges mentioned in SLRTPs (Source: FHWA)

Florida's SLRTP identifies and discusses several examples of challenges, including revenue shortfall, an aging population, aging infrastructure, and climate change. The plan mentions previous trends of

reduced revenues; State transportation revenues reduced significantly during the recession, and Florida DOT expects revenues to decline in the future due to improved fuel efficiency, new technologies, and increasing use of transit and non-motorized modes, which reduce gas tax revenues. The SLRTP suggests that gas tax revenues may not be viable "as the primary state and federal revenue source for transportation improvements." Florida DOT plans to address the challenge of revenue shortfalls through various methods such as identifying alternative revenue and funding sources, using updated, accurate financial forecasting, and prioritizing future transportation investments. Florida's SLRTP also addresses the challenges associated with an aging population, stating that "by 2030, 26 percent of Floridians will be over the age of 65, compared with about 20 percent nationally." The plan recognizes the need to "provide reliable transportation options to meet the unique mobility needs of…older adults." Florida plans to engage citizens to ensure the transportation systems in communities are appropriate for its residents and accommodate users' mobility needs to address this challenge.

Florida's SLRTP addresses the challenge of aging infrastructure, stating "the excellent condition of state transportation facilities will be increasingly difficult to maintain over the next 50 years due to increased travel, rising costs, funding constraints, and aging infrastructure." The plan notes the importance of continually monitoring the condition of the State's transportation systems, prioritizing infrastructure maintenance needs, and minimizing damage to existing systems through enforceable regulations to address this challenge. Lastly, Florida's SLRTP recognizes the need to "reduce the vulnerability and increase the resilience of critical infrastructure to the impacts of climate trends and events" given that "a changing global climate may impact Florida more than any other state due to its many miles of coastline and its low elevation."

6.2 Trends

SLRTPs also discuss a variety of trends, including:

- **Technology**: the use of engineering or applied sciences for practical purposes in transportation;
- **Congestion management**: managing congestion through a systematic approach that provides up-to-date, accurate information on transportation system performance and assesses alternative management strategies that satisfy local and state needs;[11]
- **Demand management**: improving travel reliability by maximizing effective choices provided to travelers;[12]
- **Freight**: transportation of goods and cargo by truck, train, aircraft, or ship;
- **Asset management**: resource allocations and programming decisions aimed at providing increased satisfaction for end users and greater system value by improving system performance and program effectiveness;[13]

[11] "Congestion Management Process." *Federal Highway Administration (FHWA)*, https://ops.fhwa.dot.gov/plan4ops/focus_areas/cmp.htm. Accessed 13 July 2017.
[12] "Transportation Demand Management." *Federal Highway Administration (FHWA)*, https://ops.fhwa.dot.gov/plan4ops/trans_demand.htm. Accessed 13 July 2017.
[13] "Asset Management Overview." *Federal Highway Administration (FHWA)*, https://www.fhwa.dot.gov/asset/if08008/amo_02.cfm. Accessed 13 July 2017.

- **Emerging mobility**: new uses of the current transportation system, such as car-sharing and transportation network companies, that allow users to travel in faster or more cost-efficient ways; and
- **Megaregions**: a collection of areas and/or geographic locations grouped based on mutual interests and similar characteristics.[14]

Half of the plans (26 SLRTPs) mention technology as an emerging trend, which illustrates States DOTs' attention to developing intelligent transportation systems (ITS) and other emerging technologies in the long term horizons of the plans. While technology the most commonly referenced trend, several SLRTPs focused on congestion management and demand management. Ten SLRTPs (19 percent) discussed congestion management, and 9 SLRTPs (17 percent) discussed demand management. This analysis revealed that 21 SLRTPs (40 percent) discuss one of these emerging trends, and 17 plans (33 percent) discuss two or more of these emerging trends in transportation (Figure 17).

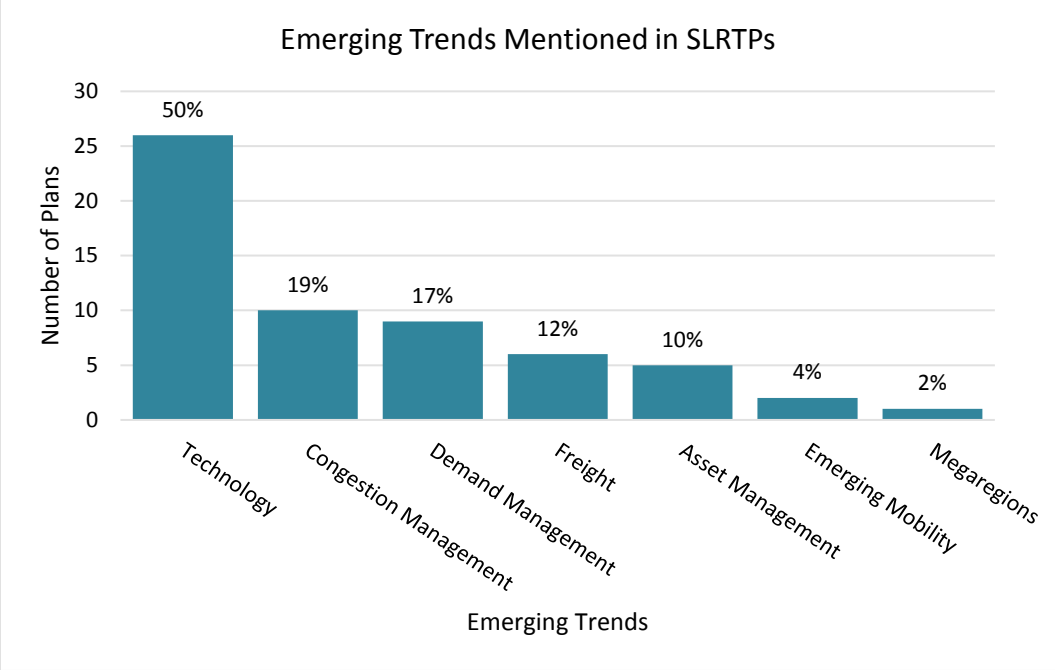


Figure 17: Emerging trends mentioned in SLRTPs (Source: FHWA)

Washington D.C.'s SLRTP identifies and discusses several emerging trends, including technology, demand management, freight, and asset management. This SLRTP includes recommendations for transportation technology integration policies. One such recommendation is to "encourage open data to stimulate public and private collaboration in data exchange and creation of valuable information for

[14] "Megaregions." *Federal Highway Administration (FHWA)*, https://www.fhwa.dot.gov/planning/megaregions/. Accessed 13 July 2017.

operators and consumers" since "getting data out of systems and having it available for use in analytical and operational purposes can have tremendous benefits in terms of delivering more effective and efficient transportation solutions." The other technology recommendation is to "support autonomous vehicle implementation and connected vehicle research, using D.C. as a test bed for the nation." This SLRTP addresses freight, emphasizing the importance of designated, strategic freight routes. The plan also details its approach to transportation demand management (TDM) throughout, stressing that "the entire transportation network operates best when supply and demand are managed… TDM seeks to maximize travel opportunities within the transportation system through strategic programs, policies, and services."

7. Synthesis Topic 7: Noteworthy and Innovative Methods

Several SLRTPs included noteworthy and innovative methods, such as analyses using Geographic Information Systems (GIS), data visualization, and scenario planning. GIS provides spatial data and cartographic presentation of information. In an SLRTP, the use of GIS could include maps presenting trends related to demographics, transportation, the economy, and other spatial trends that affect the State's transportation network. Data visualization refers utilization of visual imagery to clearly, effectively, and instantly provide information to decision makers or the public in an easy-to-understand style,[15] including visualizations of non-spatial data, such as financial data, population trends, or asset condition. Scenario planning analyzes forces that affect growth, such as health, economic, transportation, land use, environmental, and others, to assist in developing a shared vision of the future. Scenario planning uses multiple potential scenarios to account for uncertainty and address future community and State needs, actively engaging community members and incorporating feedback from the public, local businesses, and elected officials.[16]

Figure 18 shows the distribution of noteworthy and innovative methods mentioned in the SLRTPs. Over a quarter of the SLRTPs (27 percent, or 14 plans) discuss the use of GIS. Because transportation systems serve populations and economies in a geographic region, GIS analysis and spatial visualizations are a powerful way to communicate a transportation system's importance to the State, the importance of viewing the multimodal system as a connected whole, as well as its needs and challenges. SLRTPs use data visualizations (17 percent) and scenario planning (15 percent) less frequently than GIS; this offers an opportunity for States to develop these planning methods in future SLRTP updates.

[15] "Visualization in Transportation." *Federal Highway Administration (FHWA)*, https://www.fhwa.dot.gov/visualization/. Accessed 13 July 2017.
[16] "Scenario Planning." *Federal Highway Administration (FHWA)*, https://www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/. Accessed 13 July 2017.

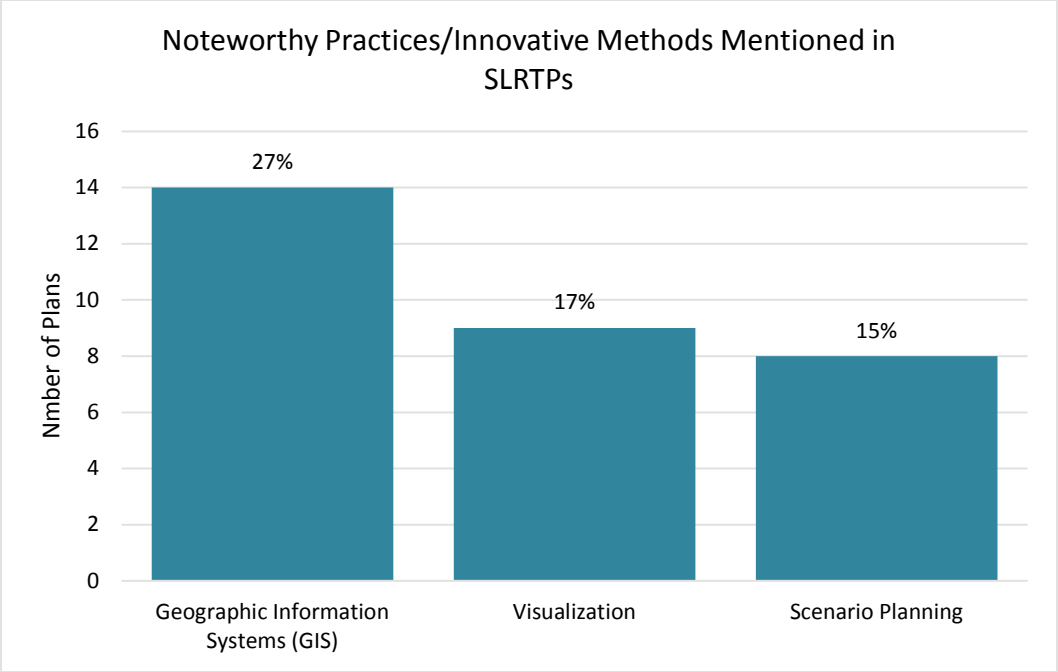


Figure 18: Noteworthy and innovative methods mentioned in SLRTPs (Source: FHWA)

Geographic Information Systems (GIS)

Washington D.C. uses GIS effectively throughout its SLRTP. The plan includes several maps to communicate complex topics affecting transportation, such as forecasted changes in population density (see Figure 19), forecasted trip flows (see Figure 20), transportation network plans (see Figure 21), and topics.

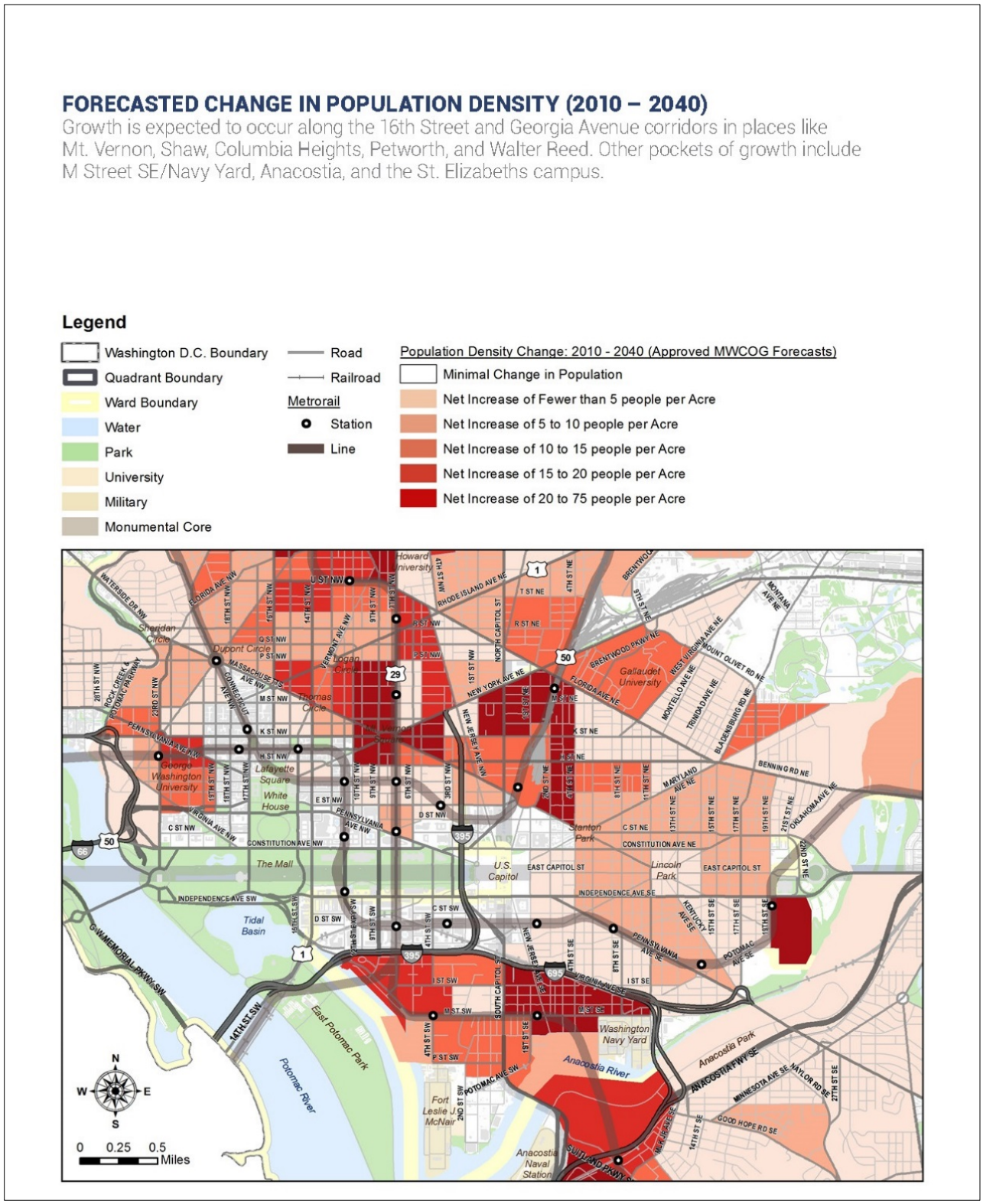


Figure 19: GIS map of forecasted changes in population density from Washington D.C.'s SLRTP (Source: District DOT)

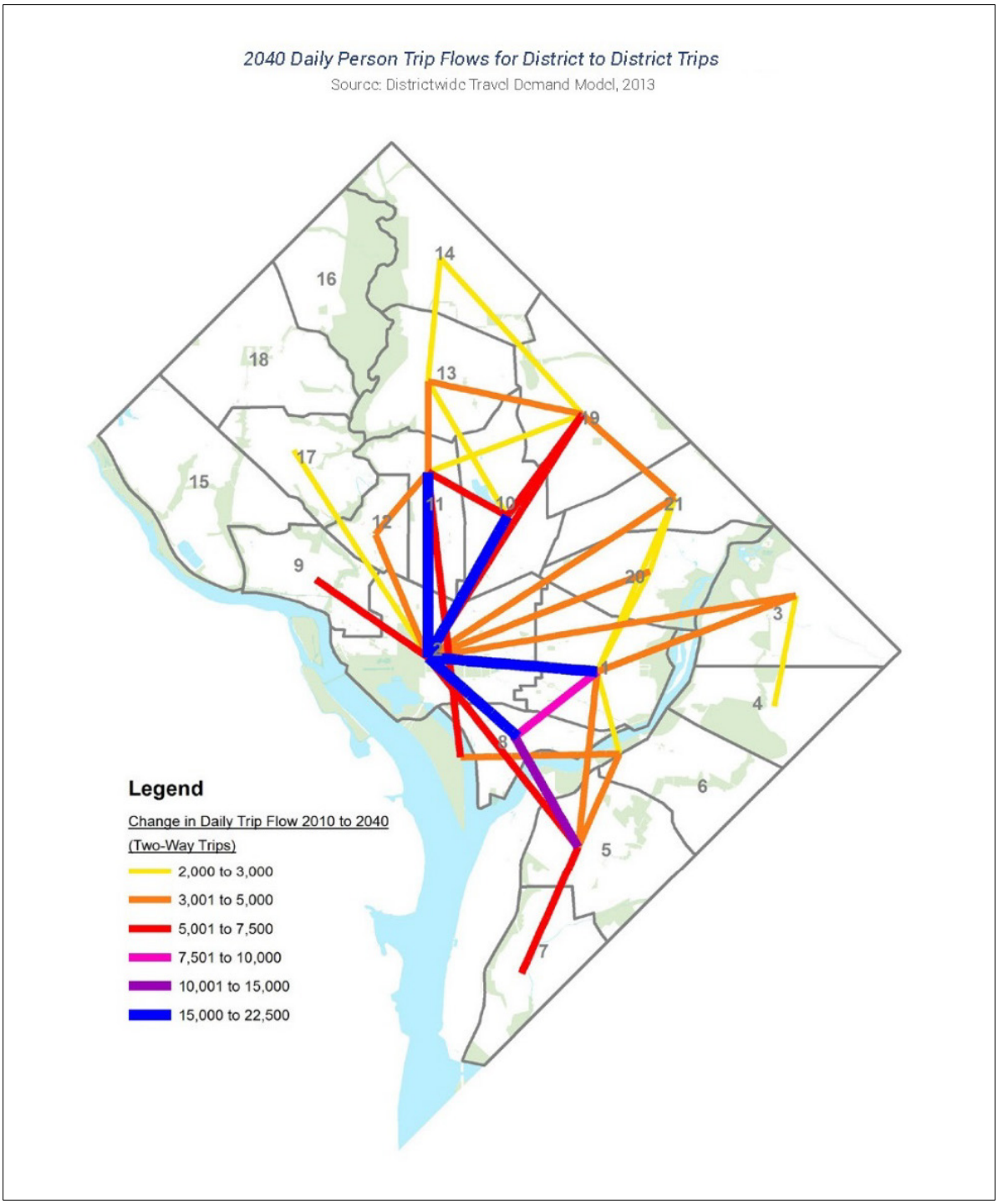


Figure 20: GIS map of forecasted trip flows from Washington D.C.'s SLRTP
(Source: District DOT)

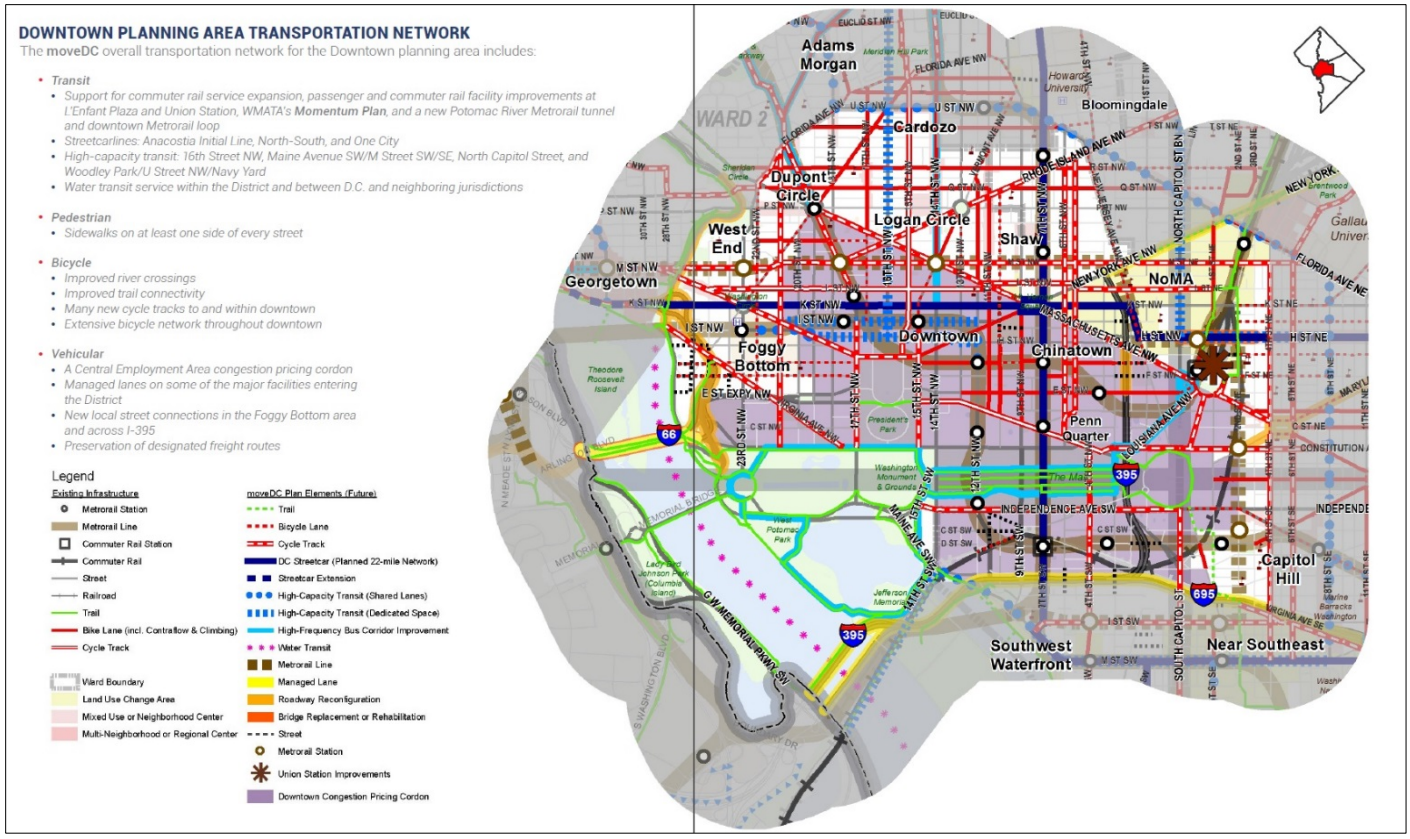
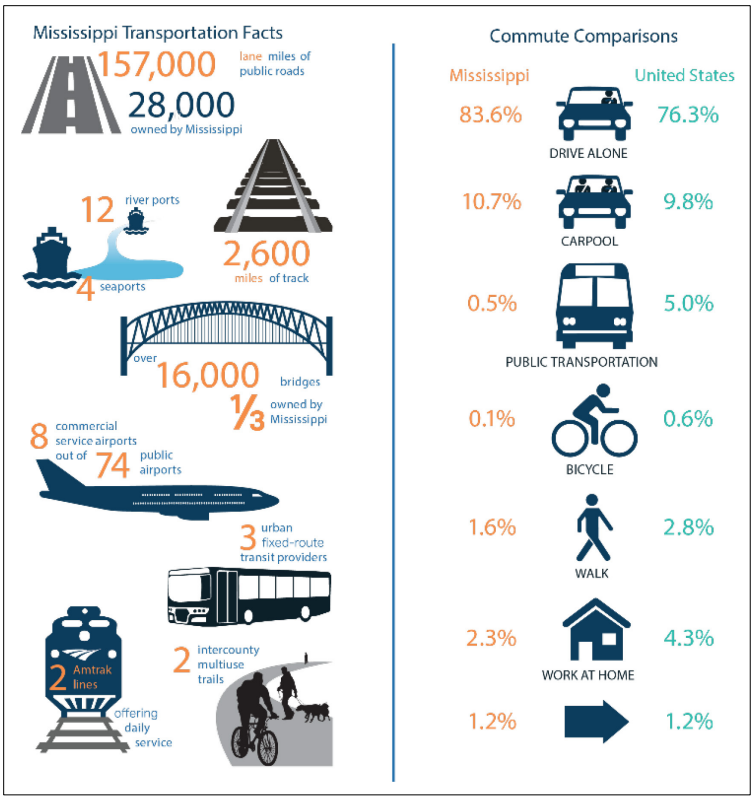


Figure 21: GIS map of transportation network plan from Washington D.C.'s SLRTP
(Source: District DOT)

Visualization

Mississippi's SLRTP is a noteworthy example for incorporating data visualization. The plan provides useful visualizations throughout the document that assist the user in understanding the data behind the goals, objectives, and performance measures of the SLRTP (see Figure 22).



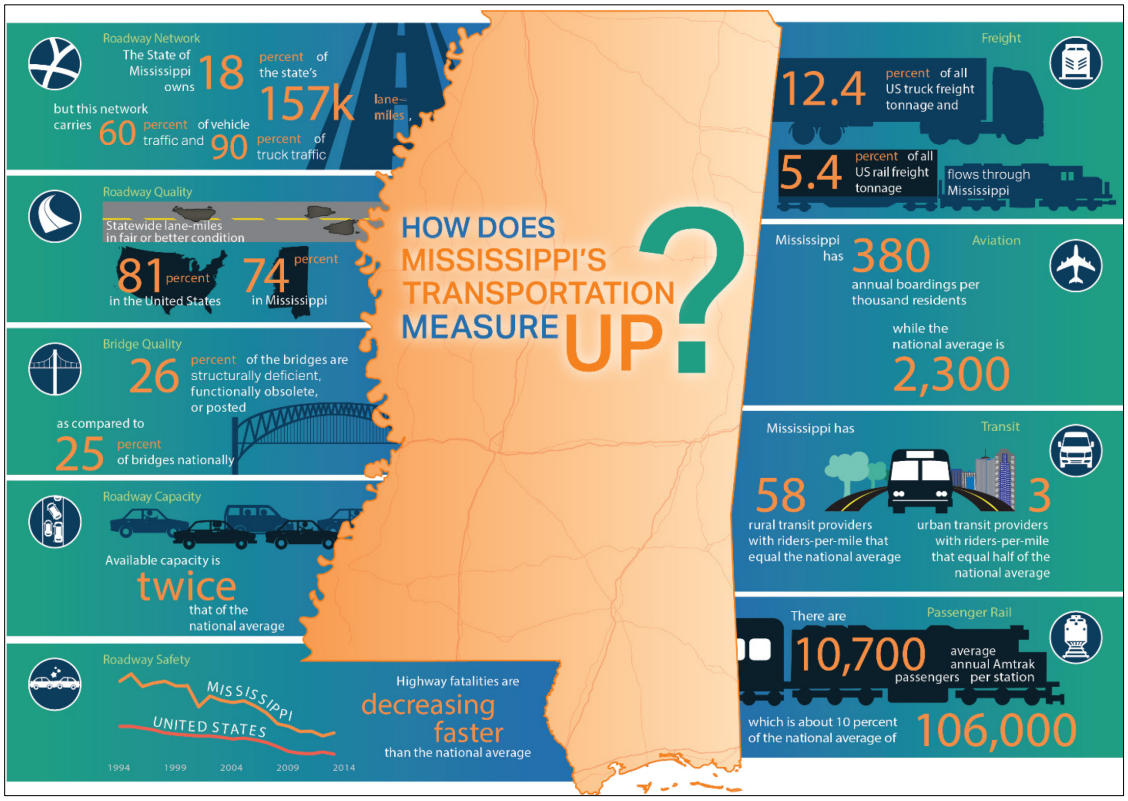


Figure 22: Examples of visualization from Mississippi's SLRTP (Source: Mississippi DOT)

Scenario Planning

Washington D.C.'s SLRTP is also noteworthy for its use of scenario planning. The plan discusses how D.C. DOT carried out a scenario planning process that involved stakeholders and the public to understand the transportation needs of the District's daytime population (residents, workers, and visitors) and evaluated the impacts of three potential strategies across several modes. This process helped D.C. DOT understand the needs and perspectives of diverse transportation users and develop a set of prioritized strategies for its SLRTP.

Wyoming's SLRTP also incorporates scenario planning to analyze the potential impacts of three different funding strategies: Current Trend (uses current funding projections); Preserve the Investment (focuses on maintaining existing infrastructure); and Improve the System (includes transportation investments and improvements of the existing system). Each scenario clearly details the funding amounts and sources, and analyzes projected statewide system performance indicator ratings for pavement, bridges, safety, and mobility, and discusses budget advantages and challenges.

8. Synthesis Topic 8: Special Topics

8.1 Travel and Tourism

The FAST Act added travel and tourism to statewide planning factors.[17] Although most of the 52 SLRTPs were developed before the passage of the FAST Act, 34 SLRTPs (65 percent) discuss travel and tourism with either a qualitative description and/or quantitative statistics. Many SLRTPs note that travel and tourism influence travel patterns, often in a seasonal manner. Several SLRTPs describe travel and tourism as a crucial sector of the State's economy that relies on transportation infrastructure.

Washington D.C.'s SLRTP discusses travel and tourism within its boundaries as an industry that has a significant benefit to Washington, D.C., and a tremendous impact on the transportation system. This document contains "Visitor Statistics" that discuss the annual number of visitors and impact of tourism on the economy. The SLRTP's vision discusses the need to create an easier to understand and easier to use transportation system with more choices that serve people in travel and tourism.

Utah's SLRTP also discusses travel and tourism, mainly focusing on outdoor recreation. The SLRTP discusses recreation and tourism as a major consideration, because Utah is home to a diverse landscape including five national parks, seven national monuments, two national recreation areas, 44 state parks, and several other recreational places. Utah DOT also includes travel and tourism trips in its travel-demand forecasting model, the Utah State Travel Model (USTM).

8.2 Community Development

SLRTPs broadly address community development as a topic in SLRTPs that refers to transportation facilities and services that help to achieve broader community goals. These goals often include increasing travel choices, improving economic competitiveness, and enhancing unique community characteristics. Often, SLRTP content related to community development directly benefits people who live in, work in, or visit an area; this topic within SLRTPs touches upon a range of transportation modes, including walking, bicycling, public transit, and automobiles, by creating balanced multimodal transportation networks (see Synthesis Topic 2.2 on Multimodal Systems Planning). Community development within a transportation system may often be related to reliable and timely access to jobs, community services, affordable housing, and schools, while helping to create safe streets and expand business access to markets.

This synthesis report focuses on plan goals and their applicability to community development. Goals that touch upon community development include public health, social equity, economic development, partnerships and coordination, and linking transportation and land use. Of the 52 SLRTPs, 41 (79 percent) contained goals or performance measures related to community development topics (see Figure 23).

- **Public health:** this goal focuses on developing transportation options that promote and improve access to healthy and active lifestyles for all transportation system users.

[17] Federal Register Statewide and Nonmetropolitan Transportation Planning; Metropolitan Transportation Planning. https://www.federalregister.gov/documents/2016/05/27/2016-11964/statewide-and-nonmetropolitan-transportation-planning-metropolitan-transportation-planning.

- **Social equity:** this goal seeks to provide mobility options to meet the needs of all community members. Social equity in transportation facilitates social and economic opportunities through access to affordable and reliable transportation options based on the needs of the populations being served, particularly populations that are traditionally underserved.
- **Economic development:** this goal often focuses on how a State's transportation network can support local economic development. Economic development can involve an increase in the number of jobs, the number of business establishments, gross domestic product, property values, or tax bases.
- **Partnerships and coordination:** this goal aims promote the growth of partnerships between government agencies, private entities, and community groups in order identify and support mutually beneficial actions or leverage different partner funding sources.
- **Link transportation and land use:** this goal aims to preserve and enhance valued natural and cultural resources and facilitate sustainable communities and neighborhoods. Linking transportation and land use usually adopts a balance of mixed uses, including housing, educational, employment, recreational, retail, and service opportunities. It also helps communities coordinate their land use plans and transportation plans to ensure that planned transportation systems meet community needs.

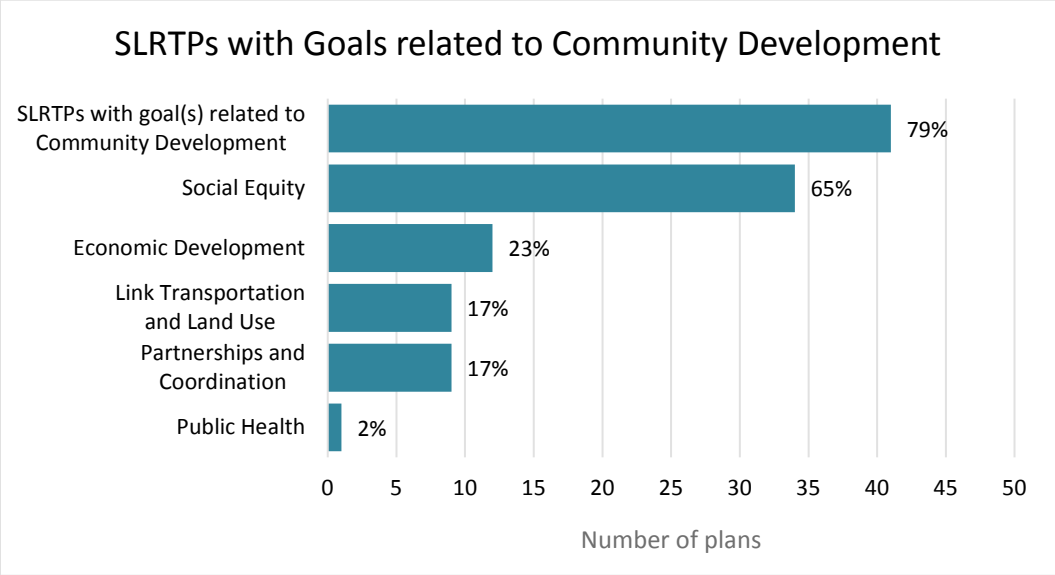


Figure 23: SLRTPs with Goals related to Community Development (Source: FHWA)

New Hampshire's SLRTP contains several goals that relate to community development, such as partnerships and coordination, social equity, economic development, and linking transportation and land use. The SLRTP discusses partnerships and coordination in a goal that aims to establish collaborative partnerships with local, State, and regional governments, along with the private sector to meet transportation needs with a transparent decision-making process. The SLRTP discusses social equity in a goal that aims to improve mobility and modal choice to meet existing and future needs of the

community. The SLRTP discusses economic development and linking transportation and land use in a goal that aims to integrate local, regional and state land use and economic development goals with transportation investment decision-making, planning, system management, and project design.

8.3 Safety

Safety has long been a key component of statewide long-range transportation planning. Beginning in 2012, MAP-21 enhanced requirements for SLRTP safety planning by requiring the U.S. DOT to develop national performance measures for safety and a requirement for DOTs and MPOs to work together to integrate performance measures, monitoring and target-setting into their long-range plans.

In 2014, FHWA reviewed 51 of the most recently published SLRTPs to create a baseline dataset to understand the status of performance-based planning for safety at that time.[18] The findings from this study are detailed in the forthcoming report, *Performance Based Planning for Safety: A 2015 Benchmark Review of Statewide Long-Range Plans*.[19] Because the research team for this SLRTP database and synthesis report reviewed all SLRTPs available as of December 31, 2016, the SLRTP database provides the opportunity to review progress over the two years since FHWA conducted this baseline study to understand the level of progress in incorporating performance-based planning for safety into SLRTPs.

Table 3: Performance-based plan components in the 2014 and 2017 SLRTP analyses

Performance-based Plan Component	Previous SLRTP Analysis (2014)*	Current SLRTPs Analysis (2017)	Percent Change
Safety Goals	43	49	14%
Safety Performance Measures	22	38	73%
Safety Performance Targets	13	14	8%
Safety Investments linked to Performance Measures	4	4	0%
Total Plans in Analysis	51	52	-
*The performance-based plan components from the 2014 SLRTP analysis were reviewed and adjusted under the same criteria as the 2017 SLRTP analysis.			

Table 3 shows that as a part of the 2017 analysis, the majority of SLRTPs have safety goals (49 of 52 SLRTPs) and performance measures (38 of 52 SLRTPs). However, based on this SLRTP analysis, less than a third of SLRTPs (14 of 52 SLRTPs) contain safety performance targets. Likewise, only 4 SLRTPs of 52 explicitly link their safety goals or performance measures to project investments.

Figure 24 illustrates that the number of safety goals, performance measures, and targets have increased between the 2014 analysis and 2017 analysis. Furthermore, safety performance measures have seen the largest increase, from 22 SLRTPs in the 2014 analysis to 38 SLRTPs in the 2017 analysis. However, State DOTs have shown less progress in developing safety targets, and there was no change in the number of State DOTs explicitly linking investments to safety performance. This benchmarking update suggests that State DOTs are making progress in incorporating performance measures for safety, but there are

[18] The dataset included the 51 SLRTPs available as of December 31, 2014. At the time one State DOT's SLRTP was not available.

[19] FHWA. Forthcoming. *Performance Based Planning for Safety: A 2015 Benchmark Review of Statewide Long-Range Plans*.

opportunities to improve the development of safety targets and implementation through investment strategies.

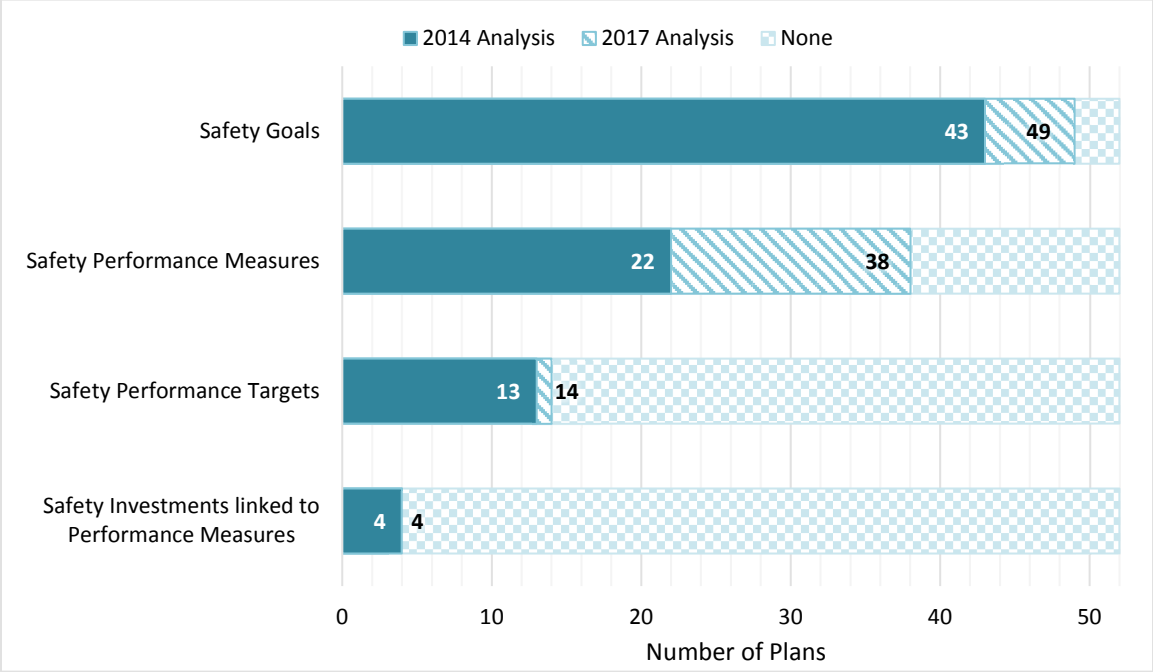


Figure 24: Performance-based Plan components of SLRTPs (Source: FHWA)

Missouri's SLRTP references the Missouri Department of Transportation's (MoDOT) Tracker, a quarterly publication of performance data. The SLRTP also directly links each SLRTP goal, including safety, to performance measures tracked in the Tracker report. The Tracker report for safety discusses performance measures and targets, the purpose of these performance measures, details of the data collection, current trends, and desired outcomes/trends.

9. Conclusion

As with the previous analyses in 2002, 2005, and 2012, the research team in 2017 found great diversity in SLRTP approach, content, and emphasis. Most SLRTPs vary widely in terms of their structure, initiatives and goals, topics addressed, and other factors. Additionally, SLRTP dates vary greatly. At the time of the research, the approval or completion date of the plans ranged from 2006 to 2016. Several States were in the process of updating their SLRTPs, which will be available for future analyses.

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 Federal planning factors.
- Reference to financial planning or analysis. Although Federal regulations do not require SLRTPs to present financial analysis or demonstrate fiscal constraint (i.e., revenues balanced against expenses), many States include or summarize financial plans in a chapter or appendix or else present financially realistic SLRTPs describing a balance between projected revenues and capital and operating expenses.

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, this analysis shows an increased use of performance-based planning and programming, which reflects both increasing state of the practice by State DOTs and recent requirements in 2012's Moving Ahead for Progress in the 21st Century (MAP-21) Act and 2015's FAST Act.

Overall, this report provides a resource to identify examples of SLRTPs 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 SLRTPs, the report will help statewide planners and their partners to understand how SLRTPs are evolving nationwide, with examples of approaches taken by peer DOTs. It will also help these stakeholders to strengthen statewide planning processes, specifically the SLRTPs that are key products of these processes.

Directions for Future Study

In future reviews of SLRTPs, FHWA can build upon the findings in this report to track trends in statewide long-range transportation planning. For example, the research team observed substantial progress since 2012 in developing performance-based planning and programming in SLRTPs. In future analyses, FHWA can evaluate how States' approaches to performance-based planning and programming continue to evolve based on the USDOT's performance management rulemakings and technical assistance to States. Future versions of this report can also track the evolution of SLRTPs in addressing new requirements in future transportation legislation, such as new planning factors or other emerging trends.

Appendix A: State Long-Range Transportation Plans

The following lists the plans, publication date, and URL for the plan as of the database cut-off date, December 31, 2017. For plans where that link is no longer active due to website reorganizations or SLRTP updates, the appendix notes that the URL is no longer active.

Table 4: SLRTPs Included in the 2017 SLRTP Database

State	Plan	Publication Date
Alaska	Let's Get Moving 2030: Alaska Statewide Long-Range Transportation Policy Plan	2010
Arkansas	Arkansas Statewide Long-Range Intermodal Transportation Plan	2007
Alabama	Alabama Statewide Transportation Plan	2008
Arizona	ADOT Long Range Transportation Plan	2011
California	California Transportation Plan 2040	2016
Colorado	Moving Colorado: Vision for the Future 2035 Statewide Transportation Plan	2011
Connecticut	Connecticut Strategic Long-range Transportation Plan	2009
Washington D.C.	Move DC: The District of Columbia's Multimodal Long-Range Transportation Plan	2014
Delaware	Delaware Long Range Transportation Plan *(URL no longer active)*	2010
Florida	2060 Florida Transportation Plan	2010
Georgia	2040 Statewide Transportation Plan/2015 Statewide Strategic Transportation Plan	2015
Hawaii	Hawaii Statewide Transportation Plan: Hawaii's Multi-modal and Inter-modal Network	2011
Iowa	Iowa in Motion: 2040 State Transportation Plan	2012
Idaho	Idaho on the Move: A Long-Range Plan to Improve Safety, Mobility, and Economic Vitality	2010
Illinois	Transforming Transportation for Tomorrow: Illinois State Transportation Plan 2012	2012
Indiana	Indiana's 2013-2035 Future Transportation Needs Report: Keeping Indiana Moving	2013
Kansas	Long Range Transportation Plan	2008
Kentucky	Kentucky's Long-Range Statewide Transportation Plan: Planning to Make a Difference in America's Tomorrow	2014
Louisiana	Louisiana Statewide Transportation Plan	2015
Massachusetts	We Move Massachusetts: Planning for Performance	2014
Maryland	2035 Maryland Transportation Plan: Moving Maryland Forward	2014
Maine	Connecting Maine: Planning Our Transportation Future	2010

State	Plan	Publication Date
Michigan	MI Transportation Plan: Moving Michigan Forward *(URL no longer active)*	2012
Minnesota	Minnesota: Statewide Multimodal Transportation Plan	2012
Missouri	A Vision for Missouri's Transportation Future	2014
Mississippi	2040 Mississippi Unified Long-Range Transportation Infrastructure Plan	2016
Montana	TranPlan 21	2007
North Carolina	North Carolina Statewide Transportation Plan	2012
North Dakota	Transaction III: North Dakota's Statewide Strategic Transportation Plan 2012	2012
Nebraska	Vision 2032 Mapping Nebraska's Future	2012
New Hampshire	NH Long Range Transportation Plan 2010-2030	2010
New Jersey	New Jersey's Long-Range Transportation Plan	2008
New Mexico	The New Mexico 2040 Plan: NMDOT's Long Range, Multi-Modal Transportation Plan *(URL no longer active)*	2015
Nevada	Statewide Transportation Plan – Moving Nevada Through 2028 *(URL no longer active)*	2008
New York	Strategies for a New Age: New York State's Transportation Master Plan for 2030	2006
Ohio	Access Ohio 2040	2014
Oklahoma	Oklahoma Long Range Transportation Plan (2015-2040)	2015
Oregon	Oregon Transportation Plan	2006
Pennsylvania	PA On Track, PA's Long Range Transportation and Comprehensive Freight Movement Plan	2016
Puerto Rico	Puerto Rico 2040 Islandwide Long Range Transportation Plan	2013
Rhode Island	Transportation 2035 State of Rhode Island	2012
South Carolina	South Carolina 2040 Multimodal Transportation Plan	2014
South Dakota	South Dakota Statewide Long Range Transportation Plan	2010
Tennessee	TDOT 25-year Long-Range Transportation Policy Plan	2016
Texas	Texas Transportation Plan	2015
Utah	2015-2040 Long-Range Transportation Plan: Transportation in Utah's Rural Areas	2015
Virginia	2035 Update Vtrans	2013
Vermont	Vermont Long Range Business Transportation Plan	2009
Washington	Connecting Washington Communities for a Healthy and Prosperous Future *(URL no longer active)*	2015
Wisconsin	Connections 2030: Statewide Long-Range Transportation Plan	2009

State	Plan	Publication Date
West Virginia	West Virginia Multi-Modal Statewide Transportation Plan	2010
Wyoming	Long Range Transportation Plan Wyoming	2010

Appendix B: Synthesis Topics

This Appendix provides the number and list of States with SLRTPs that address each of the key topics addressed in this report.

Table 5: SLRTPs addressing each synthesis topic

Synthesis Topic	Number of States	List of States
Synthesis Topic 1: Plan Attributes		
Performance Approach	18	CA, DC, GA, FL, ID, KY, MA, MD, MN, MS, NE, NM, NV, OK, PA, SC, TX, WA
Policy Approach	27	AR, CA, CT, DC, DE, FL, MD, MT, NY, WI, TN, HI, KY, MN, NV, IL, NH, OH, OR, SD, PR, IA, RI, UT, VA, VT, PA
Corridor Approach	11	AL, CO, PR, ME, MI, MT, NJ, NY, VA, WI, WY
Needs-Based Approach	19	AK, AL, AZ, HI, KS, LA, ME, MI, MO, MS, ND, NC, NE, OK, PR, TX, SC, WY, WV
Vision Approach	21	DE, FL, ID, IL, IN, VA, NH, NJ, LA, MA, MO, MT, NC, NE, NM, OH, PA, SC, VT, WA, WY
Fiscally Realistic Approach	8	GA, IA, MO, AZ, ND, TN, AK, WV
Project Approach	7	AK, IN, KS, MD, RI, UT, WV
Synthesis Topic 2: Systems Planning		
Multimodal System	50	AK, AR, AL, AZ, CA, CO, CT, DC, DE, FL, GA, HI, IA, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY
Highways	52	AL, AK, AZ, AR, CA, CO, CT, DE, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, MO, MT, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VT, VA, WA, DC, WV, WI, WY
All Roads	49	AL, AK, AZ, CA, CT, DE, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, MT, MO, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OR, PA, PR, RI, SC, SD, TN, TX, UT, VT, VA, WA, DC, WV, WI, WY

Synthesis Topic	Number of States	List of States
Transit (includes ferries)	51	AK, AL, AR, AZ, CA, CO, CT, DE, FL, GA, HI, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, MT, MO, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VT, VA, WA, DC, WV, WI, WY
Bicycle	50	AK, AL, AR, AZ, CA, CO, CT, DC, DE, FL, GA, HI, IL, ID, IN, IA, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VT, VA, WA, WI, WY
Pedestrian	50	AK, AL, AR, AZ, CA, CO, CT, DC, DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, ME, MD, MA, MN, MO, MS, MT, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VT, VA, WA, WI, WY
Freight Modes	51	AL, AK, AR, AZ, CA, CO, CT, DE,DC, FL, HI, IA, ID, IL, IN, GA, KS, KY, LA, MD, ME, MI, MN, MT, MS, MO, NE, NH, NJ, NV, NM, NY, NC, ND, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY
Intercity Passengers	40	AL, AZ, CA, CO, CT, DC, FL, IL, IN, IA, KY, LA, MA, MD,ME, MI, MN, MO, MS, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, RI, SC, TX, VT, VA, WA, WI, WV, WY
Connected / Autonomous Vehicles	9	CA, DC, FL, NM, OK, PA, UT, VA, WA
Aviation	49	AK, AL, AR, AZ, CA, CO, CT, DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY
Shared mobility	24	AL, CO, DC, FL, IN, KS, LA, MN, MO, MS, NH, NJ, NM, NV, NY, OK, PA, PR, RI, TN, UT, VA, VT, WI
Ports	37	AK, AL, AR, ND, MT, GA, HI, WV, CT, IL, IA, KY, MD, NE, NC, OH, OR, SC, CA, WA, PR, TN, IN, LA, MN, MS, MO, NJ, NY, RI, VT, WI, OK, FL, PA, VA, TX
Pipelines	20	AK, CA, HI, IA, IL, IN, LA, MT, NE, ND, NY, OK, OR, PA, SC, SD, TN, TX, UT, WY

Synthesis Topic	Number of States	List of States
Synthesis Topic 3: Performance-Based Planning and Programming		
Goals	52	AL, AK, AZ, AR, CA, CO, CT, DE, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, , MN, MS, MO, MT, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VT, VA, WA, DC, WV, WI, WY
Performance Measures	41	AR, AL, AZ, CA, CO, DC, DE, FL, GA, HI, IA, IL, IN, KY, LA, MA, MD, ME, MI, , MI, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OH, OK, PA, RI, SC, TN, TX, UT, WI, WV, WY
Performance Targets	20	AR, AL, CA, CO, DC, GA, HI, IN, KY, MA, MD, MI, MS, NC, NV, NY, OK, TN, TX, WY
PBPP Dashboard	14	CO, DC, GA, MD, MI, MS, NE, NM, NV, OH, OK, SC, TX, WY
Target Monitoring	5	DC, GA, KY, MI, WY
Synthesis Topic 4: Implementation Approach		
Linked performance measures to project screening or selection of investments or strategies	7	DC, DE, GA, KY, MI, MS, WY
STIPs reference PBPP elements	34	AK, AL, AZ, CO, IA, IL, IN, KY, LA, MA, MD, ME, MI, MO, MS, MT, ND, NH, NJ, NV, NY, OH, OK, OR, PA, PR, RI, SC, TN, TX, VT, WA, WV, WY
STIPs reference goals, performance measures, and/or targets specifically in project selection	12	AL, CO, GA, IN, MD, MI, NJ, OH, OK, PA, VA, WA
Synthesis Topic 5: Financial Analysis and Funding Strategies		
Revenue Estimates	40	AK, AR, AL, AZ, CA, CO, CT, DC, DE, FL, GA, HI, IN, KS, KY, LA, MA, ME, MI, MN, MO, MS, NC, NE, NM, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VT, WI, WV, WY
Needs Estimates	35	AK, AR, AL, AZ, CO, DC, FL, GA, IA, KS, KY, LA, MA, ME, MI, MN, MO, MS, NC, NE, NJ, NV, OH, OK, OR, PA, PR, RI, SC, TN, UT, VT, WI, WV, WY
Funding Strategies	42	AK, AR, AL, AZ, CO, CT, DC, DE, FL, GA, HI, IA, IL, IN, KS, KY, LA, MA, MD, ME, MN, MS, NC, NH, NM, NV, NY, OH, OK, OR, PA, PR, RI, SC, SD, TN, UT, VT, WA, WI, WV, WY

Synthesis Topic	Number of States	List of States
Synthesis Topic 6: Challenges and Trends		
Aging population	25	CO, CT, DE, FL, HI, IL, IN, KS, LA, MO, MN, NC, NJ, NM, PA, PR, RI, SD, TN, VA, VT, WA, WI, WY, WV
Revenue shortfalls	44	AK, AR, AL, AZ, CA, CO, CT, DC, DE, FL, GA, HI, IA, IL, IN, KS, KY, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, PR, RI, SC, TN, TX, VA, VT, WA, WI, WY, MN
Inflation	5	KS, MS, NE, VT, WV
Aging infrastructure	21	AK, AL, AZ, CA, DC, DE, FL, GA, HI, IA, IN, IL, MD, ME, MN, MS, NC, NJ, WY, VT, WA
Climate change	17	AK, CA, CO, FL, HI, IA, IN, KS, ME, MN, NV, RI, SD, TX, WA, WI, WY
Synthesis Topic 7: Noteworthy and Innovative Methods		
GIS	14	AR, AL, DC, MN, OK, PA, PR, RI, SD, TX, WI, LA, KS, WY
Visualization	9	CO, FL, GA, KS, MO, MS, WY, DC, MN
Scenario Planning	8	CA, DE, LA, MA, VT, KS, WY, DC
Synthesis Topic 8: Special Topics		
Goals related to Safety	49	AK, AR, AL, AZ, CA, CO, CT, DC, DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, MT, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WY
Goals related to Community Development	41	AK, AR, AL, AZ, CA, CO, DC, DE, FL, HI, IA, IL, KY, LA, ME, MN, MO, MS, MT, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, PR, RI, SC, SD, TX, VA, VT, WI, WV, WY
Goals related to Travel and Tourism	34	AL, CO, DC, FL, HI, IA, IL, IN, KY, LA, MD, ME, MT, NC, ND, NE, NH, NJ, NM, NV, NY, OR, PR, RI, SC, SD, TX, UT, VA, VT, WA, WI, WV, WY
Intercity Bus Travel	17	AL, AZ, CT, IL, LA, ND, NE, NH, NY, OH, OK, OR, PA, RI, SC, VT, WI