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16. Abstract

Recent federal rules place increased emphasis on performance-based management of the multimodal transportation system and require the use of performance based methods in state, metropolitan, and non-metropolitan transportation planning and programming. The Fixing America's Surface Transportation Act and the Moving Ahead for Progress in the 21st Century Act emphasizes seven areas including: safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery. Establishing a common set of performance measures allows for the evaluation and comparison of different projects and transportation corridors for both current and future conditions, and translates data and statistics into a form that the public and decision makers can easily understand. This research developed a framework, performance measures, tools, and guidance to conduct performance-based transportation planning and programming in non-metropolitan areas of the state and support Rural Transportation Planning Organizations.

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PERFORMANCE PLANNING FOR RURAL PLANNING ORGANIZATIONS – FINAL REPORT

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Texas Department of Transportation
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DISCLAIMER

This research was performed in cooperation with the Texas Department of Transportation (TxDOT) and the Federal Highway Administration (FHWA). The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the FHWA or TxDOT. This report does not constitute a standard, specification, or regulation.

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CHAPTER 1: INTRODUCTION

Performance-based transportation planning has existed for many years and has recently gained acceptance and practice as a result of federal rules. It is fast becoming the cornerstone for transportation decision making throughout the country in both metropolitan and nonmetropolitan (rural) areas.

Moving Ahead for Progress in the 21st Century (MAP-21), enacted in 2012, placed increased emphasis on performance-based management of the multimodal transportation system and requires the use of performance based methods in state, metropolitan, and non-metropolitan transportation planning and programming. MAP-21 emphasizes seven areas including: safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery. Establishing a common set of performance measures allows for the evaluation and comparison of different projects and transportation corridors for both current and future conditions, and translates data and statistics into a form that the public and decision makers can easily understand.

In December 2015, the Fixing America's Surface Transportation (FAST) Act was enacted to fund surface transportation programs, authorizing $305 billion for projects for fiscal years 2016 through 2020. Funding provided by the FAST Act will improve mobility on highways across the United States, improve freight movement, and accelerate project delivery (*1*). The FAST Act includes provisions to support and enhance reforms to the metropolitan and statewide transportation planning process required by MAP-21 but additionally requires the planning process to consider projects and strategies to improve the resilience and reliability of the transportation system, enhance travel and tourism, and improve storm water mitigation. The FAST Act also states that if a state fails to meet freight performance goals within two years after establishing target goals, the next performance report must include what actions the state will take to achieve the targets. The FAST Act also decreases the time states and metropolitan planning organizations (MPOs) have to make progress toward meeting National Highway Performance Program (NHPP) performance targets, as well as clarifies the timeline for Highway Safety Improvement Program (HSIP) performance targets. There are 18 provisions in the FAST Act to accelerate project delivery designed to increase innovation, and improve efficiency, effectiveness, and accountability in the planning, environmental review, design, engineering, construction, and financing of transportation projects (*2*).

The purpose of this report is to document the two-year research effort, Project 0-6852 *Framework for Implementing Performance Planning for Rural Planning Organizations*, supporting the development of a simplified guide for Texas Department of Transportation (TxDOT) districts, TxDOT divisions, and regional transportation planning organizations (RTPOs) to use to implement performance based planning in rural areas. In the first year of the project, researchers synthesized existing technical reports and guidance and summarized the state of the practice of performance based planning, developed a framework and process for performance based planning in rural areas, and developed performance measures for use in rural transportation planning. In the second year of the project, researchers developed a guidebook and tool for rural planning organizations (RPOs) for performance based planning and presented the process to counties in the San Antonio region.

The following chapters of this report are organized as follows:

- Chapter 2 summarizes existing technical reports, guidance, and state of the practice for rural transportation planning both at the federal and state level, in selected states, and in Texas.
- Chapter 3 describes the framework for rural performance-based planning developed by the research team.
- Chapter 4 describes the rural transportation performance measures developed by the research team.
- Chapter 5 describes the tool developed by the research team to support rural performance based planning.
- Chapter 6 describes the *Rural Performance Planning Guidebook* developed by the research team.
- Chapter 7 summarizes the results from a series of regional planning workshops.
- Chapter 8 summarizes the main objectives and key factors from the research project.

CHAPTER 2: SYNTHESIS OF EXISTING TECHNICAL REPORTS, GUIDANCE, AND STATE OF THE PRACTICE

This chapter provides a summary of various state and federal databases and resources, as well as a review and synthesis on the current state of the practice in select peer states based on information collected from state departments of transportation (DOTs), RTPOs, RPOs, regional planning commissions, councils of governments, and small MPOs.

This chapter is organized to include the following sections:

- Federal performance measurement guidance.
- Previous Performance Planning Research from the Texas A&M Transportation Institute (TTI).
- State Performance Measure Practices.
- Performance Measurement and the State of the Practice in Texas.
- Current Performance Based Planning at TxDOT.

FEDERAL PERFORMANCE MEASUREMENT GUIDANCE

This section discusses MAP-21 and FAST Act, performance measurement guidelines at the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), notices of proposed rulemaking in the Federal Register, challenges with federal data requirements, national associations, and documents supporting performance based planning.

MAP-21 and FAST Act

The federal government formally recognized RTPOs in July 2012 with MAP-21, the 2012 federal transportation reauthorization bill. This bill established a formal definition of RTPOs, a scope of work for RTPOs, and states' authorization to use federal funding provided for statewide transportation planning for funding RTPOs (*3*). MAP-21 allows states to use federal funds to establish formal RTPOs to effectively capture the needs of nonmetropolitan areas of the state within the statewide strategic long-range transportation plans (LRTPs), transportation improvement programs (TIPs), and state transportation improvement programs (STIPs). Funding for RTPOs is based on distributions from FHWA and FTA to state DOTs to support the Surface Transportation Program (STP) and Transportation Alternatives Program (TAP). State funding may be provided for RTPOs.

The intent of this sub-allocation is to recognize the urban, suburban, and rural characteristics of different regions in the planning process and to allocate funding based on transportation planning needs (*4*). MPOs in small and mid-size regions with a population of 50,000–200,000 are excluded from receiving STP and TAP program funding. This ruling allows regional councils of governments a bigger say in transportation investment as well as performance-based planning programs for these small and mid-size regions.

MAP-21 also enables states to fund RTPOs using the 2 percent set-aside from State Planning and Research (SPR) funding for each state's apportionment of federal programs. However, MAP-21 does not require states to create or fund RTPOs, and states that do not have a system of RTPOs

may simply rely on nonmetropolitan officials to identify projects of regional significance (*2*). A scan conducted by the National Association of Regional Councils (NARC) in 2011 indicated that RTPO activities include assistance to state and regional development organizations with planning, coordination, public involvement, and input of local officials for the LRTPs, STIPs, and TIPs (*5*). Section 5304 of the federal transportation code addresses statewide and nonmetropolitan transportation planning, and is associated with MAP-21 (*6*). The code directs state DOTs responsible for statewide and nonmetropolitan planning to undertake a performance-based approach and include RTPOs in the approach. Specifically, "with respect to the nonmetropolitan areas, the statewide transportation plan shall be developed in cooperation with affected nonmetropolitan officials with responsibility for transportation, or, if applicable, through regional transportation planning organizations" (*4*). A recent report by the United States Government Accountability Office (GAO) indicated that state DOTs bear the responsibility of obtaining performance-based data and meeting target program requirements in nonmetropolitan regions on behalf of RTPOs (*7*).

Section 135 of the Federal Highway Code (*8*) describes a performance-based approach for statewide transportation plans and transportation improvement plans. It refers to performance-based targets described in 23 U.S. Code (U.S.C.) Section 150(c) on national goals and performance management measures, and indicates that state DOTs must:

- Provide a description of the performance measures and targets used.
- Furnish a system performance report with annual updates evaluating the performance of the transportation system and progress achieved.
- Complete a financial plan demonstrating how the TIP can be implemented, what resources are expected, and what financial strategies are needed.

This same section of the Federal Highway Code (23 U.S.C. Section 135) sets up a distinction in the TIP process. It indicates that projects developed in areas of less than 50,000 in population must come from an "approved TIP" in cooperation with RTPOs or nonmetropolitan local officials (*8*). This selection of projects excludes projects carried out under the National Highway System (NHS), Bridge Program, and Interstate Maintenance Program. However, projects carried out in an area with a population of 50,000 or less that includes the NHS, Bridge, and Interstate Maintenance Programs must be selected from the "approved STIP" in consultation with RTPOs or nonmetropolitan local officials. This Federal Highway Code may distinguish between the projects to highlight that state DOTs must "cooperate" with RTPOs on local transportation improvement plan projects exclusive to NHS, Bridge, and Interstate Maintenance Programs (*8*). Then it only requires them to "consult" with RTPOs on improvement plan projects including NHS, Bridge, and Interstate Maintenance Programs as they relate to the STIP (*8*).

Prior to MAP-21, federal legislation passed in the 1970s required the formation of MPOs for any urbanized areas with populations over 50,000. Many MPOs were formed within agencies, such as regional planning organizations and councils of governments, which covered both urbanized and nonurbanized areas. Some states created formal functions for planning activities in nonurban areas starting around the same time. A scan of RTPOs in nonurban areas for the National Association of Development Organizations (NADO) in 2011 (*5*) revealed that:

- As of the report, 30 states used formal agreements between RTPOs and state DOTs.
- Twelve of these agreements were put in place as early as the 1970s.
- The majority of RTPO states began formal agreements between state DOTs and RTPOs in the 1990s, including TxDOT.
- A few New York and Texas RTPOs began without assistance from the state DOT.

MAP-21 uses federal funds to establish formal RTPOs that serve the needs of non-metropolitan areas of the state within the statewide long-range transportation plans (SLRTP) and TIP/STIP. The following are additional requirements and associated changes to the planning process resulting from MAP-21:

- States are not required to create or fund RTPOs but now have the option to use 2 percent of their SPR funds to fund RTPOs.
- State DOTs undertake a performance-based statewide plan and cooperate with RTPOs (where they exist) in nonmetropolitan areas.
- For areas of population 50,000 or less, states must consult with RTPOs for projects that include the NHS, Bridge, and Interstate Maintenance programs.
- States bear the responsibility for obtaining performance-based data and meeting target program requirements in nonmetropolitan regions on behalf of RTPOs.
- State DOTs and MPOs must provide a description of the performance measures and targets used; furnish a system performance report with annual updates; and complete a financial plan demonstrating how the TIP can be implemented.
- Rural transit providers have a chief safety officer position within their organization.
- Public transit agencies, including rural transit providers, develop transit asset management (TAM) plans.

In December 2015, the FAST Act was enacted to fund surface transportation programs, authorizing $305 billion for projects for fiscal years 2016 through 2020. Funding provided by the FAST Act will improve mobility on highways across the United States, improve freight movement, and accelerate project delivery (*9*). The FAST Act includes provisions to support and enhance reforms to the metropolitan and statewide transportation planning process required by MAP-21 but additionally requires the planning process to consider projects and strategies to improve the resilience and reliability of the transportation system, enhance travel and tourism, and improve storm water mitigation. The FAST Act also states if a state fails to meet freight performance goals within two years after establishing target goals, the next performance report must include what actions the state will take to achieve the targets. The FAST Act also decreases the time states and MPOs have to make progress toward meeting NHPP performance targets, as well as clarifies the timeline for HSIP performance targets. There are 18 provisions in the FAST Act to accelerate project delivery designed to increase innovation, and improve efficiency, effectiveness, and accountability in the planning, environmental review, design, engineering, construction, and financing of transportation projects (*10*).

FHWA Guidelines

FHWA is responsible for rolling out the new performance-based data reporting requirements to MPOs, state DOTs, and RTPOs. According to a GAO report, FHWA's role in developing performance-based planning processes is to (*7*):

- Develop performance data reporting requirements.
- Respond to comments on these requirements.
- Create guidelines, definitions, classification systems, and frameworks for meeting these performance-based requirements.
- Host best practice workshops to help stakeholders solve some of the key challenges to meeting these requirements.
- Provide technical assistance.

FHWA prepared the *Performance-Based Planning and Programming Guidebook* to educate RTPOs, state DOTs, and MPOs on the process. It defines performance-based planning and programming (PBPP) as "the application of performance management within the planning and programming processes of transportation agencies to achieve desired performance outcomes for the multimodal transportation system" (*11*). The guidebook includes the following planning activities:

- LRTPs.
- Strategic Highway Safety Plans.
- Congestion Management Process.
- Transit Agency Asset Management Plans.
- Transit Agency Safety Plans.
- State and Metropolitan TIPs.

In the guidebook, FHWA describes a framework that starts with establishing a strategic direction, followed by analysis, programming, and implementation (*11*). Within the framework, RTPOs provide key inputs in the analysis and programming activities. In the analysis activity, they take part in developing investment priorities, and in programming, they take part in establishing investment plans.

Beyond the framework, the guidebook provides details on challenges, best practice workshop activities, guides, web-based resources, and highlighted case studies of PBPP. The case study on the Southeastern Michigan Council of Governments provides key details on its process for PBPP:

- Identify performance measurement goals.
- Identify performance metrics.
- Develop investment scenarios.
- Analyze expected performance of each investment scenario.
- Present performance of scenarios.
- Select preferred scenario.

- Monitor performance (using Asset Manager NT-AASHTOware™ product).
- Display performance results on a website (dashboard) alongside the annual monitoring performance report.

Summary of FHWA Notices of Proposed Rulemaking for Performance-Based Requirements

Several Notices of Proposed Rule-Making (NPRM) were also generated as a result of MAP-21. This includes the Safety Performance Measure NPRM, which requires state DOTs to assess serious injuries and fatalities per vehicle mile traveled (VMT) and a process to establish safety-related performance targets.

The HSIP NPRM resulting from MAP-21 requires that state DOTs establish a subset of roadway data elements useful to the inventory of roadway safety and ensure its use, as well as develop a State Strategic Highway Safety plan with update requirements HSIP performance targets.

The planning NPRM mandates state DOTs and MPOs to develop a new framework for voluntary scenario planning, revises the integration of the planning and environmental review process, and introduces a process for programmatic mitigation plans.

Table 1 summarizes FHWA's NPRM, discussed above, which are aimed at establishing MAP-21's performance management framework. Among other things, these NPRM propose safety performance measures, integration of performance management into the Highway Safety Improvement Program, establishment of RTPOs, and creation of a state asset management plan. FHWA and FTA published an NPRM proposing a coordinated, performance-based transportation planning process (*12*).

The following discussion reveals some of the challenges that entities are facing in reconciling the requirements of MAP-21 and the limitations of their existing processes. The rulemaking process may eventually resolve these challenges.

Table 1. FHWA's Notices of Proposed Rulemaking.

NPRM	Function	Date Proposed	Final Ruling
National Performance Management Measures/Safety (*13*)	Establishes measures for DOT use to: • Carry out the Highway Safety Improvement Program. • Assess serious injuries and fatalities data. Provides: • Process for state DOTs and MPOs to use to establish and report safety targets. • Process FHWA will use to assess progress DOTs have made in achieving safety targets.	March 11, 2014	September 2015
Highway Safety Improvement Program (*14*)	Removes all existing references to: • High Risk Rural Roads Program. • 10 percent flexibility provisions. • Transparency reports.	March 28, 2014	August 2015
Planning (jointly issued with FTA) (*15*)	Establishes: • Mandate for DOT and MPO performance-based approach to planning and programming. • State cooperation with nonmetropolitan local officials or, if appropriate, RTPOs. • Authorization for state to establish RTPOs. • Structural change to membership of the larger MPO to include transit representative. • Authorization to use scenario planning in planning process. • Revisions to the integration of the planning and environmental review process. • Process for programmatic mitigation plans.	June 2, 2014	Not Available

Pavement and Bridge Condition (*16*)	Establishes measures:
	• For DOTs to use to carry out the NHPP.
	• To assess the condition of the following:
	  ○ Pavements on the NHS.
	  ○ Bridges on the NHS.
	  ○ Pavements on the Interstate System.
		January 5, 2015	Not Available

Asset Management Plan (*17*)	Establishes a process for development of a state asset management plan to improve or preserve the condition of the NHS assets and the performance.	February 20, 2015	Not Available

Pavement and Bridge Conditions—Notice of Proposed Rulemaking

The visualizations below describe aspects of MAP-21's pavement and bridge condition performance measures, specifically the relationship between proposed performance goals, measures, and metrics for pavement and bridge conditions (see Figure 1). In this scheme, the performance metrics have threshold values (proposed by FHWA), and the performance measures have target values (specified by each state DOT; see Table 2).

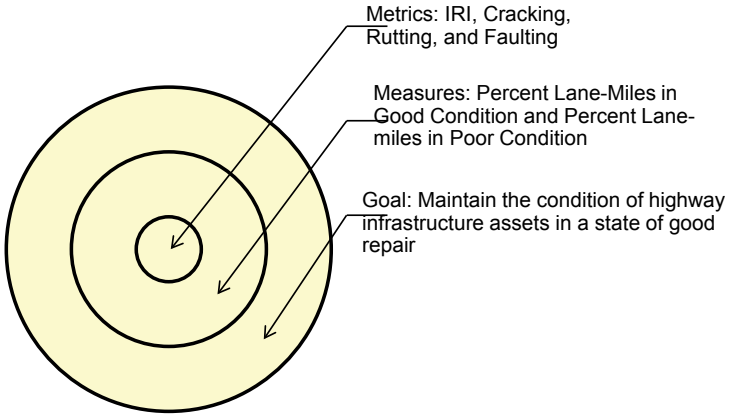


Figure 1. Performance Goal, Measures, and Metrics for Pavement.

Table 2. Performance Measures, Metrics, and Example Targets for Pavement and Bridges.

Performance Measure	Metrics for Defining Performance Measures	Example Target for Interstate System	Example Target for Non-Interstate NHS
Percentage of Pavement Lane-Miles in Good Condition	• Cracking • International Roughness Index (IRI) • Faulting • Rutting	40%	35%
Percentage of Pavement Lane-Miles in Poor Condition	• Cracking • IRI • Faulting • Rutting	4%	7%
Percentage of Bridges in Good Condition*	• Deck Condition Score (CS) in National Bridge Inventory (NBI) • Superstructure CS in NBI • Substructure CS in NBI • Culvert Score	35%	35%
Percentage of Bridges in Poor Condition*	• Deck CS in NBI • Superstructure CS in NBI • Substructure CS in NBI • Culvert Score	10%	10%

*Weighted by bridge deck area.

For pavements, each performance metric is rated as good, fair, or poor based on the threshold values shown in Table 3–Table 5. The ratings of these metrics are then combined using the decision tree shown in Figure 2 to determine the performance measures for the pavement section. Each state DOT is required to submit reports on progress in achieving its established targets to FHWA no later than October 1, 2016, and every two years thereafter.

Table 3. Metrics for Defining Performance Measures for Asphalt Pavement.

Metric	Range	Rating
IRI	< 95 in/mi	Good
	95–170 in/mi	Fair
	> 170 in/mi	Poor
Cracking Percent	< 5%	Good
	5–10%	Fair
	> 10%	Poor
Rutting	< 0.20 in	Good
	0.2–0.4 in	Fair
	> 0.40 in	Poor

Table 4. Metrics for Defining Performance Measures for Jointed Concrete Pavement.

Metric	Range	Rating
IRI	< 95 in/mi	Good
	95–170 in/mi	Fair
	> 170 in/mi	Poor
Cracking Percent	< 5%	Good
	5–10%	Fair
	> 10%	Poor
Faulting	< 0.05 in	Good
	0.05–0.15 in	Fair
	> 0.15 in	Poor

Table 5. Metrics for Defining Performance Measures for Continuously Reinforced Concrete Pavements.

Metric	Range	Rating
IRI	< 95 in/mi	Good
	95–170 in/mi	Fair
	> 170 in/mi	Poor
Cracking Percent	< 5%	Good
	5–10%	Fair
	> 10%	Poor

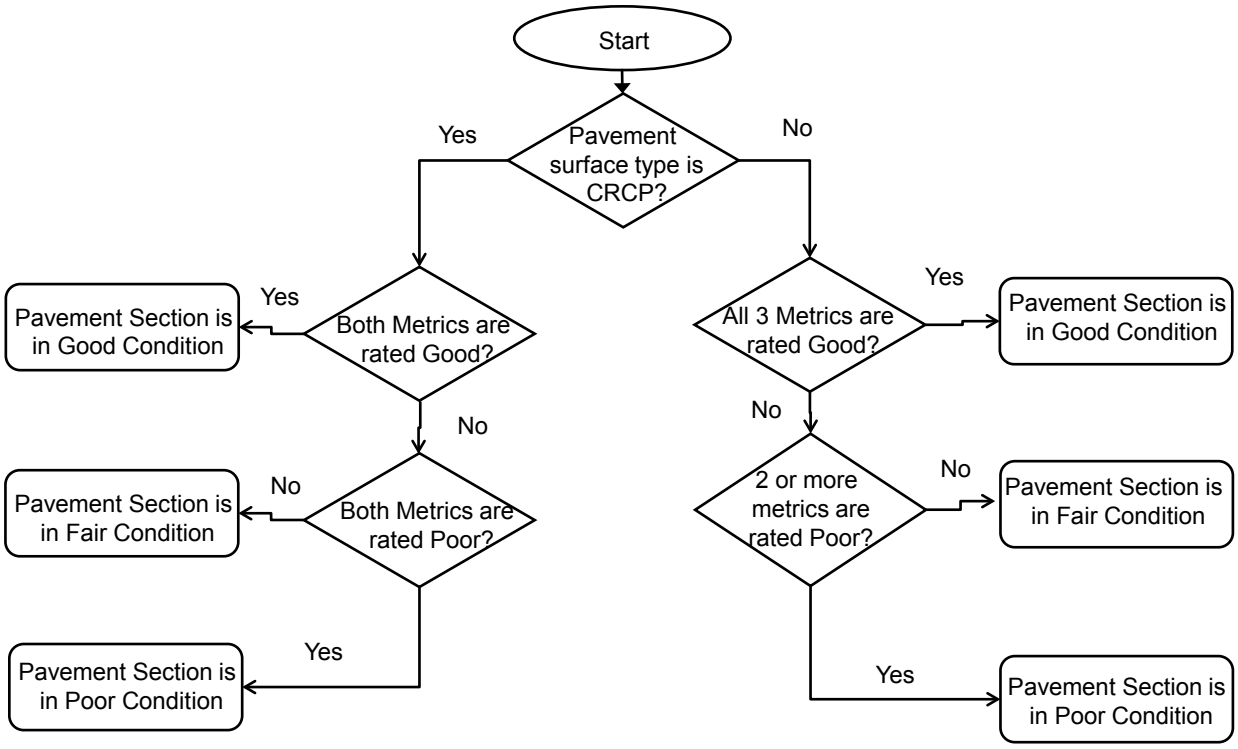


Figure 2. Decision Tree for Determining Performance Measure Values for Pavement Sections.

FTA

FTA is also responsible for rolling out the new MAP-21 performance-based data reporting requirements to MPOs, state DOTs, and RTPOs. According to the FTA Office of Budget and Policy (*18*), FTA's role in developing planning processes focuses on performance-based standards and reporting requirements for the areas of safety and asset management. In rural planning areas, this rule primarily deals with merging reporting outputs from two separate systems—the National Public Transportation Safety Program and the National Transit Asset Management System—into one. Figure 3 displays the proposed budget and planning process framework as part of the new rulemaking developments (*19*).

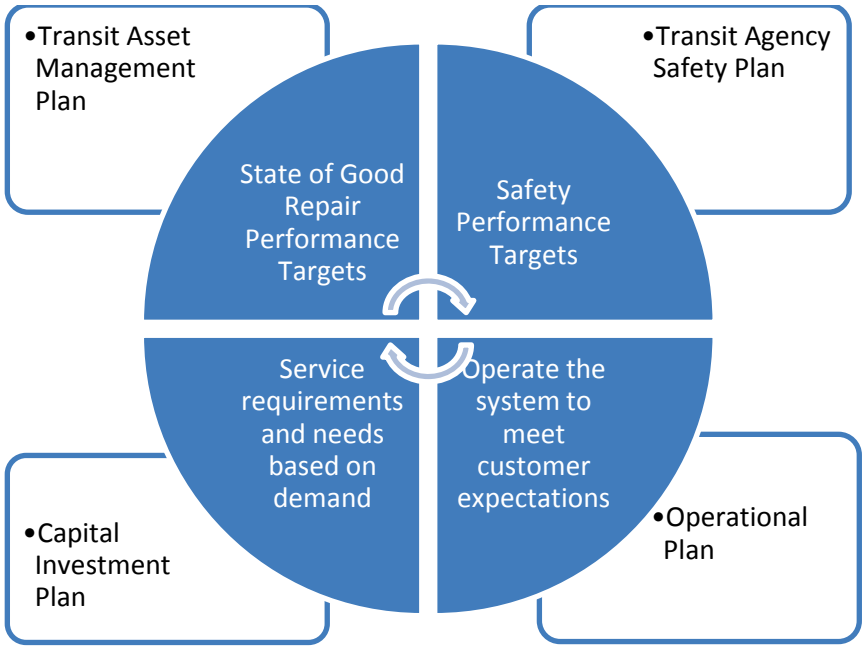


Figure 3. The Transit Agency Budget and Planning Process (*19*).

As part of these developments, FTA proposes a safety management system to help transit agencies with safety policies, risk management, and safety reporting requirements. Under the proposed rulemaking for the National Public Transportation Safety Plan, FTA is developing safety performance criteria and minimum safety performance standards for transit vehicles and requiring transit agencies to develop safety plans and performance targets (*20*). Small rural transit providers receiving funding indirectly from 5307 or 5311 "may have their plans drafted or certified by their state" (*21*). As part of the proposed rulemaking, transit safety requirements insert transit safety officers into regional and MPOs to ensure inclusion of transit service providers in deliberations involving transportation planning and investment prioritization.

FTA Rulemaking

FTA released an Announcement of Proposed Rulemaking on TAM, and the rulemaking closed for public comment in early January 2014. Per MAP-21, FTA is first required to define a state of good repair (SGR). The SGR definition will impact eligible projects for funding and will "form the cornerstone of the entire National Transit Asset Management System envisioned by MAP-21" (*22*). The SGR definition will also provide the foundation for transit agencies to develop their TAM plans.

FTA accepted comments on four different approaches to the SGR definition and therefore TAM. The four approaches were based on:

1. Asset age.
2. Asset condition.
3. Asset performance.
4. A combined approach (age, condition, and performance).

Once SGR is defined, FTA must also set asset condition-measuring standards and define performance measures based on standards.

State DOTs and MPOs are proposed to hold the primary responsibility in defining performance measure targets for SGR. For sub-recipients such as rural transit providers, this means that either the MPO or the state will be responsible for setting the performance targets that they must collect and report on capital assets including equipment, infrastructure, and facilities. Those assets that fall below an MPO or state DOT's SGR performance threshold will be required to be entered into the safety plans for investment prioritization purposes (*21*). Most rural transit providers already collect and report information on transit assets for equipment and infrastructure to the National Transit Database (NTD). The new proposed rulemaking extends this reporting requirement to facilities.

Challenges with Federal Data Requirements for Performance-Based Monitoring

Performance-based monitoring requirements impact multiple agencies and require coordination across these agencies to report data using the stipulated formats. These requirements primarily fall on state DOTs and MPOs as the final arbiters of data quality and formatting. Defining serious injuries per VMT and ensuring that the data align with other states is an example of one of the safety-based performance monitoring requirements that poses a major challenge (*7*).

For example, the Florida DOT defines serious injury per VMT differently from the *Model Minimum Uniform Crash Criteria* (MMUCC) guide. The MMUCC definition of serious injury recommended in the proposed rulemaking requires a police crash report in a certain format to use the definition of serious injury (A) as a severe laceration with multiple results (*23*). In Florida, a long uniform crash report developed in 2011 from the department of Florida Highway Safety and Motor Vehicles puts its data collection effort at odds with outputs required to match the MMUCC definition because injuries are classified in the report as non-incapacitating injury, possible injury, or total injury (*24*). As part of the proposed rulemaking process, FHWA responded to this challenge in February 2015 by providing a request for information to all states to provide their different serious injury reporting mechanisms (*25*). This request will help establish the cost imposed on states to match the federal definition using the MMUCC-provided guidelines and highlights some of the difficulty of standardizing performance-based monitoring across agencies that often operate outside of the jurisdiction of state DOTs.

Another unresolved challenge is a MAP-21 proposal on congestion data requirements and collection of annual average daily traffic (AADT) data on low-volume roads (*7*). These data are often unavailable at the level of detail required. Confusion exists over whether federal standards require AADT for unpaved and gravel roads. Data quality for many state DOTs is inadequate even for paved roads in low-volume areas. New York DOT reported that only 37 percent of its public roads have the adequate level of data required as detailed in the public rulemaking provided by FHWA.

Based on a GAO report, the format of the transit asset data must match the federal requirements, which impose costs on rural transit providers. In addition, there is also concern about the definition of a transit asset (*7*). One example of potential confusion is defining how to set

performance targets and collect data for a shared asset such as a bridge for both highway and transit use (*26*). Another requirement in the proposed rulemaking, beyond data issues, is regarding personnel. MAP-21 requires a chief safety officer position within transportation organizations. Rural transit providers are concerned about the costs associated with this position—one that many agencies argue they cannot afford (*7*).

Most of the challenges with performance-based data requirements fall on FHWA and state DOTs to resolve. However, RTPOs will bear some of the responsibility to collect these data in the correct format if they are granted authority by state DOTs and regional development organizations for planning and forecasting transportation needs in their region. In that case, RTPOs must report these forecast results, associated performance targets, and plan outcomes to their respective regional development organization and/or state DOT to include in the system performance report. Table 6 displays some of the statewide planning requirements from MAP-21 proposed rulemakings.

Table 6. Rulemakings for Selected MAP-21 Performance Requirements (*7*).

Proposed Rulemakings	Requirement	Source of Requirement
Statewide Metropolitan Planning Rule (comment period for rule closed) **Note: The Statewide, Metropolitan, and Nonmetropolitan Planning rulemaking has been developed jointly with FTA.**	MPOs and states to coordinate integration of the goals, objectives, performance measures, and targets into the planning process.	23 U.S.C. §§ 135(d)(2), 134(h)(2); 49 U.S.C. §§ 5303(h)(2), 5304(d)(2)
	Metropolitan and statewide improvement program, to the maximum extent practicable, to include information on how the planned programs will achieve targets set by the state and MPOs.	23 U.S.C. §§ 134(j)(2)(D),135(g)(4); 49 U.S.C. §§ 5303(j)(2)(D), 5304(g)(4)
	MPOs to provide a system performance report to document progress.	23 U.S.C. § 134(i)(2)(C); 49 U.S.C. § 5303(i)(2)(C)
	DOT to establish criteria to evaluate the effectiveness of the performance-based planning process of states, considering the extent to which states are making progress toward achieving their targets and developing appropriate targets.	23 U.S.C. § 135(h)(1); 49 U.S.C. § 5304(h)(1)

National Associations

National organizations such as the American Association of State Highway and Transportation Officials (AASHTO), NADO, and NARC serve to assess state- and regional-level readiness to implement performance-based decision-making and support entities working at those levels to define measures and targets appropriate to their respective areas.

American Association of State Highway and Transportation Officials

AASHTO provides an essential sounding board for state DOTs and MPOs in the development of the MAP-21 PBPP process (*7*). Under the guidance of its subcommittee on planning, AASHTO

helps in the development of the new formal rulemaking by working in conjunction with FHWA, Association of Metropolitan Planning Organizations, NARC, and NADO in:

- Conducting outreach to state DOTs, MPOs, and RTPOs.
- Hosting workshops.
- Developing *AASHTOWare* supporting performance-based asset management.
- Writing guides and reports on performance-based planning.
- Participating in the selection process that initiates PBPP research in the National Cooperative Highway Research Program (NCHRP) and Transit Cooperative Research Program.

Workshop summaries and a white paper were developed from the 2009 FHWA Executive Roundtable on PBPP, which stated AASHTO's position on the development of a national performance monitoring system and program. As part of the draft proposal framework from the roundtable, AASHTO's stated position was that national rulemaking on PBPP should provide state DOTs and MPOs with strong roles in setting realistic performance targets. Public and political participation is essential in the development of a national program, and each state should have the leeway to craft its performance reporting according to its own needs. One core concern was the overuse of data-driven factors in the national performance review, where state planning efforts consider more qualitative factors for areas like economic prosperity. PBPP areas that were not as well defined were congestion, environment, and economic prosperity. Measures proposed by the Bipartisan Policy Center for economic prosperity include access to jobs and labor, access to non-work activities, and network utility (*27*).

AASHTO literature on PBPP primarily documents the various case studies available and pushes for further research documenting best practices. The 2008 *Primer on Performance-Based Highway Program Management* and *NCHRP 08-36, Task 104, Performance-Based Planning and Programming Pilots* examine cases where PBPP is successfully applied and provide lessons learned (*28, 29*). One case provided was through AASHTO's AASHTOWare program, which cooperatively develops an enterprise software suite that is continually updated by experts from state transportation agencies across the nation, and internationally as well. Use of AASHTOware involving the TRNS*PORT™ software suite is documented in the primer report. TRNS*PORT is used to obtain performance measures from construction projects.

National Association of Development Organizations

NADO provides research and training for the nation's development organizations, which according to Kissel and Gron, include many organizations that house rural transportation planning organizations (5). Concerns documented in the 2011 scan include lack of capacity by RTPOs to be able to confirm that they are receiving performance-based planning data to inform their own investment prioritization process. While 95 percent receive some form of transportation data from state DOTs, 13 percent of RTPOs have access to regional travel demand models. The quality of these data could be better ascertained if RTPOs had more access to travel demand models, as there is a high degree (85 percent) of familiarity with scenario planning and regional visioning, which are outputs of these models (*5*).

Based on a scan of 184 RTPOs, funding comes from state funds, which for some states requires a matching rate of 10–20 percent. Most state funds (nearly 60 percent) supporting RTPOs are FHWA State Planning and Research Funds, but some states also provide their own funding (40 percent), and 10 percent obtain FTA Planning and Research Program funds as well (*5*). Activities for many RTPOs include preparing a regional LRTP, with a majority of respondents reporting quantitative targets developed jointly with state DOTs. RTPOs also reported that they had developed qualitative targets, often in conjunction with the regional planning staff. Furthermore, RTPOs in Virginia report system performance in their long-range plans.

The 2011 scan found that MPOs and RTPOs that are housed within a council of government (COG) or other form of regional development organization tended to work jointly in collecting and reporting performance-based metrics. In some state cases, regional differences were allowed for performance measure reporting, as some regions tended to report different performance areas over others. In the Virginia example, the Hampton Roads planning district favored freight performance metrics, while the Thomas Jefferson planning district favored bicycle and pedestrian performance (*5*).

National Association of Regional Councils

NARC provides outreach, training, workshops, webinars, and research, and it serves as an advocate for regional councils, regional planning and development organizations, MPOs, and other regional planning organizations. In October 2014, NARC provided comments on PBPP for statewide and nonmetropolitan planning as part of the NPRM for 23 U.S.C. Section 135, and 49 U.S.C. Section 5304 (30). A primary concern is that the responsibility for improving performance lies with MPOs and COGs, while the state DOT retains most of the decision-making power on project selection and, therefore, associated impacts of these projects on meeting performance targets. Another concern is the lack of adequate resources to conduct performance-based planning for regional councils.

According to NARC, RTPOs are voluntary organizations of local officials and other transportation stakeholders responsible for developing regional multimodal, LRTPs jointly with the state DOT (*4*). MPOs often maintain separate performance-based planning programs from RTPOs and regional councils of government. One core rule in MAP-21 empowers MPOs to plan the transportation network and set performance targets within a specified metropolitan region. This rule negates some PBPP activities by regional planning organizations that have heretofore managed to develop programs that merge rural, suburban, and urban considerations into a comprehensive program. A concern documented by NARC in a series of roundtable discussions held with NARC members is that this requirement may stifle advanced PBPP programs at the rural and regional level that are ahead of the curve.

One finding on rural planning in nonmetropolitan areas is that MAP-21 does formally recognize RTPOs and enables their funding. Additionally, there is a move to empower COGs to undertake rural planning. In some states, RTPOs are situated within a COG, and in other states, COGs do not have the authority to provide planning resources to RTPOs. Pilots are underway in Oklahoma and Ohio exploring ways to provide rural planning as a service to rural areas that are not funded by the state and cannot afford to create an RTPO (*4*).

Documents Supporting Performance-Based Planning

This section summarizes documents supporting performance-based planning.

NCHRP Report 551: Performance Measures and Targets for Transportation Asset Management

Pavement and safety performance measures are used to manage transportation assets. These performance measures are detailed in the NCHRP Report 551, *Performance Measures and Targets for Transportation Asset Management* (*31*). The ability to analyze infrastructure investments and monitor intended effects is essential in the field of transportation asset management. This report details a framework and provides examples of pavement and safety performance measures and targets that are essential to this analysis of investment tradeoffs in transportation assets and infrastructure. These measures were gathered from multiple system-level performance measures used in agencies across the United States in the agencies' efforts to monitor the impacts of pavement and safety program investments, maintenance, and improvements to maintenance and deployment operations. Performance measure source materials were obtained from a literature review and interviews with 15 transportation agencies, both domestic and international. A review of these measures was undertaken, and those that were the most useful in conducting tradeoff analyses and investment decisions were selected for inclusion within the framework of pavement performance measures. Pavement and safety performance measures considered included:

- Pavement:
    - Pavement condition index: a numerical index between 0 and 100 indicating the general condition of a pavement and requiring a manual survey of the pavement to identify the number and types of distresses in the pavement (low ride quality, alligator cracking, bleeding, block cracking, bumps and sags, corrugations, etc.).
    - Remaining life: expressed as averages such as percent of system length in good, fair, and poor condition.
    - Debt index: ratio of deterioration or lost value to replacement value.
- Safety:
    - Serious crashes per million VMT.
    - Fatalities per 100 million VMT.
    - Number of work zone crashes.
    - Hazard index.
    - Backlog ($) of identified cost-effective safety countermeasures to address high-crash locations.

Many agencies are actively collecting the above performance measures on pavement and safety and applying these to different functions and types of investments in order to determine what aspects of asset management are supported. According to the report, the next steps in the field of transportation asset management for most agencies are relating performance to cost and analyzing tradeoffs across programs, types of investments, or modes.

From a pavement perspective, RTPO projects proposed in the TIP enter the pavement performance management picture based on reported deficiencies in the DOT districts where they have jurisdiction and the system of prioritization for roadways that is used by state DOTs.

Agencies mostly use rural and urban allocations in programming to allocate resources in their efforts to manage existing transportation infrastructure. In Ohio, a funds management committee recommends funding allocations based on a highway system that is prioritized in tiers, with priority given to interstates and rural multilane NHS routes. Pavement funding allocation is based on the tiered system and pavement performance measure reporting needs and deficiencies.

Integrating Safety into the Rural Transportation Planning Process

Rural roads have a consistently higher number of crash-related fatalities and serious injuries compared to urban areas. An FHWA report entitled *Integrating Safety into the Rural Transportation Planning Process* provides methods for how RTPO can integrate safety into the planning process to identify rural regional issues, needs, and strategies and address safety issues on rural roads (*32*). RPO transportation plans rely on:

- Public involvement and outreach.
- Coordination across multiple disciplines.
- Data collection.
- Goal development.
- Performance measure target setting.
- Project prioritization.
- Project/program impact evaluation.

When the RTPO solicits input from stakeholders, it enables a diverse array of participation that includes a multidisciplinary approach. This approach is capable of cementing the role of safety professionals and stakeholders traditionally not included in the transportation planning process, such as law enforcement, emergency medical service professionals, and schools. Data collection enriched by including a diverse array of viewpoints and participation will enable safety goals to be set based on this enriched safety data analysis, which will lead to better informed safety improvement targets. Performance targeting can serve to inform project prioritization and establishment of processes to prioritize HSIP funds. RPOs can also take on the routine monitoring and tracking of safety performance as a result of this integration of safety into the planning process. Safety performance measures include:

- Core:
  - Number of traffic fatalities (three- or five-year moving averages).
  - Number of serious injuries in traffic crashes.
  - Number of fatalities/VMT (rural, urban, total fatalities).
  - Number of unrestrained passenger vehicle occupants, all seat positions.
  - Number of fatalities in crashes involving a driver or motorcycle operator with blood alcohol concentration of 0.08 g/dL or higher.
  - Number of speeding-related fatalities.
  - Number of motorcyclist fatalities.
  - Number of unhelmeted motorcyclist fatalities.
  - Number of drivers age 20 or younger involved in fatal crashes.
  - Number of pedestrian fatalities.
- Infrastructure-related core safety performance measures:
  - Number of run-off-the-road crashes.

    - Number of fixed object crashes.
    - Number of intersection crashes.
- Behavior:
    - Observed seat belt use for passenger vehicles, front seat outboard occupants.
- Activity:
    - Number of seat belt citations issued.
    - Number of impaired-driving arrests made.
    - Number of speed citations issued.
- Infrastructure-related activity safety performance measures:
    - Miles of guard cable installed.
    - Miles of rumble strips installed.
    - Number of medians installed.
    - Number of signs updated or warning signs installed.
    - Number of intersections with improved signal timing.

Typically, community goals and objectives highlight the types of information required for performance measurement. In addition to community-oriented goals, most state and regional planning processes bring with them a set of goals (system preservation, mobility, environment, safety, economic development, etc.). Aligning safety goals and performance measures from the state with those of the community help decision-makers deploy strategies and resulting projects that support the community's values while also focusing on big-picture, network-wide improvements. It also is an essential feedback component to improving existing safety transportation data and safety transportation plans.

Improving FHWA's Ability to Assess Highway Infrastructure Health: Pilot Study Report

This report developed a unified pavement performance measure that provides an overall good/fair/poor assessment by relying on measurements of ride quality, cracking, and rutting obtained from the Highway Performance Management System database (*33*). The report documents how to collect and store the data and how to combine the data into a unified pavement performance measure for both pavement structure and ride quality. The report describes a pilot study that uses the new pavement performance measure and associated methodology on Interstate 90 in South Dakota, Minnesota, and Wisconsin. One benefit of the measure is that it captures both structural deficiency and ride quality in the overall assessment. Structurally stable road systems that offer a rough ride could be perceived by the traveling public as poor quality roads, while structurally deficient roads that offer a good quality ride pose safety risks in poor weather conditions. This measure would capture both public perceptions and hidden risk in providing an overall assessment that combines both considerations.

For each data point to be combined into the single performance measure, an audience and objective were defined based on feedback from a technical working group. For pavement ride quality, this audience was mostly intended to be roadway users. For pavement distresses, this audience was perceived to be those responsible for treatment, intervention, and planning activities. For pavement deflection, the audience was perceived to be those responsible for project/engineering-level planning activities.

Based on the literature review from the report, key performance measures in Canada were proposed as best practices for use in assisting agencies in making asset management decisions in planning, evaluating, and investing. The Canadian literature recommended the IRI and Distress Index as the pavement preservation performance measures.

PREVIOUS RESEARCH FROM TTI

As transportation planning professionals have been tasked to measure and monitor system performance, TTI has responded to that growing need with a number of research projects in recent years.

Incorporating Reliability Performance Measures into the Transportation Planning and Programming Processes, Strategic Highway Research Program (SHRP) 2 Reliability Project L05

TTI provided major support to the SHRP 2 Reliability Project L05, *Incorporating Reliability Performance Measures into the Transportation Planning and Programming Processes* (*34*). The objective of the project was to provide guidance to transportation planning agencies on incorporating reliability into the transportation planning, programming, and budgeting processes. The reliability of the transportation system refers to the uncertainty or variability that system users experience in the time it takes to travel from one place to another—from home to work, from producer to consumer, and from any location to another. The effort produced a planning framework that utilizes a guidebook, a technical reference for the guide, and a final report.

The concepts developed in the planning framework for incorporating reliability are based on the long-standing, traditional, standard, federally mandated planning model.

The framework provides guidance while allowing for the wide variation in how this model is applied in the real world. Three aspects of the framework related to the current project are noted:

- *Incorporation of reliability into technical processes*—The framework provides guidance for transportation agencies to learn the technical aspects of travel time reliability performance measurement (i.e., data collection and modeling); the development and evaluation of non-capacity improvement options; and the methods to incorporate the technical findings into transportation planning.
- *Integration of planning for operations into traditional planning*— The traditional continuing, cooperative, and comprehensive planning process focuses on capacity improvements and does not address the full menu of reliability-oriented strategies, especially operational improvements. This process, for example, does not include operations improvements that target incidents and other nonrecurring traffic disruptions that cause unreliable travel. Operations investments often include procedural changes (e.g., change to an agency's approach incident response) that may not have any capital cost and include staff from agencies that are entirely outside the conventional statewide and metropolitan planning process. The framework provides guidance for incorporating operations in the traditional planning process.
- *Guidance for audiences with different levels of experience with performance measures*—in practice, many states and MPOs are only beginning to use performance measures and

may have limited experience with the data, tools, and techniques required to measure reliability and incorporate it into their planning process. The framework provides guidance for many types of transportation agencies, not just those that have experience with performance measures and reliability (*34*).

The project proposed four areas in which performance measures could be incorporated into current planning processes:

- *Measuring and Tracking Reliability Performance*—Agencies must first understand the reliability of their transportation systems. Doing so requires tracking and monitoring reliability based on quality supporting data. Well-defined reliability performance measures define an important but often overlooked aspect of customer needs. The measures help to support the development of policy language and are critical to making reasoned choices.
- *Incorporating Reliability in Policy Statements*—Agencies should use reliability performance measures and concepts to draft policy statements (vision, mission, goals, and objectives), define the long-term direction of the agency, and make choices when setting program funding levels and prioritizing projects.
- *Evaluating Reliability Needs and Deficiencies*—Agencies should use reliability to estimate and predict transportation needs and deficiencies and to develop lists of projects to address reliability. Estimating reliability deficiencies using well-defined measures will help to define the size and source of the reliability problem and to inform policy. The outputs of this process (maps, charts, and figures) will provide background when developing policies, setting the size of the reliability program, and prioritizing projects.
- *Using Reliability Performance Measurement to Inform Investment Decisions*—Agencies should use reliability performance to set reliability program funding levels and targets, as well as to set the right funding levels for other programs. Without considering reliability, it is more likely that capacity projects will be funded over operations and management projects (*34*).

The *Guide to Incorporating Reliability Performance Measures into the Transportation Planning and Programming Processes* is intended to be a high-level reference document for transportation planners, operators, and system managers. This guide will help planning, programming, and operations managers apply the concept of travel time reliability to balance investment in programs and projects (*35*).

Tool Using Stacked Data (TOSTADA)

A concept paper addressing transportation performance measures based on travel time quantities ultimately led to the development of a planning tool called TOol using STAcked DAta (TOSTADA) in 2014. The tool, developed by researchers at TTI, uses map layers for congestion, safety, pavement condition, bridge quality, and freight value, showing information down to the roadway segment. The maps can be visually stacked to provide analysts with consistent information on several important topics in one view. Each map has a color scale showing performance. Data from 2012 for each factor were used in this concept demonstration (*36*). The following is a summary of each factor used in TOSTADA:

- *Congestion*—Congestion levels on the road segments in the selected area are compared on a scale of good to bad. One can find the most congested roads within a small urban area or see congestion compared to the most congested roads in Texas.
- *Safety*—a comparison between crash rates on each road segment and the average of similar road segments from across Texas is displayed.
- *Pavement Condition*—TxDOT's statewide grading scale for pavement quality is used.
- *Bridge Condition*—the bridge condition comparison uses the bridge with the worst TxDOT condition rating within a road segment (the performance of the entire segment is "only as good as its weakest bridge").
- *Truck Commodity Value Map*—the value of truck commodities carried on road segments within each county is estimated using a combination of national and state sources.

TOSTADA is part of a growing set of tools and techniques that allow the general public and decision makers to understand the full effects of transportation spending. The integrated maps can provide a comprehensive and consistent level of information for informed project comparison and selection, improved public engagement, and awareness of the relationship of transportation concerns. The project demonstrates the visualization power of displaying the layered information and having these data in one location (*36*).

Total Travel Time: A Performance Measure for Multimodal System Evaluations

In 2013, TTI researchers developed a concept paper proposing improvements to travel time research (*37*). Total travel time (the door-to-door sum of all travel times regardless of mode or travel path) is a performance measure that has been used for multimodal system evaluations. This measure is one of the easiest to explain and understand and relates well to the goals for transportation—minimizing the amount of time spent traveling by any mode. A typical before/after analysis of a land use diversification and densification program might, for example, see many trips converted from long-distance travel to short trips to nearby destinations. Those short trips might be more likely to use bike, walk, or transit modes, or to accomplish travel objectives while remaining at home, in the office, etc.

The authors proposed that a main element of a total travel time measure that should be addressed or recognized before inclusion in a typical set of mobility performance measures is that there are insufficient data to estimate all travel by all modes. Roadway inventory and travel datasets contain the information required to estimate several aspects of vehicle and person travel on major roads by private vehicle. Transit agency data may be available to estimate rail, bus, and other public transportation service information. However, there are few datasets at the national or regional level that provide similar information about travel by bicycle and walk modes or the share of work-at-home trips. The ideal data might be obtained from a combination of individual travel surveys for each development pattern type and additional count and travel time/distance data for alternative modes (e.g., sidewalks, bike paths, or lanes). These data can be used to develop or improve travel models that accommodate a broader range of travel modes.

Total peak period travel time can provide additional explanatory power to a set of mobility performance measures by providing some of the desirable aspects of accessibility measures, while at the same time being a travel time quantity that can be developed more frequently using actual travel speeds. There are challenges to a general understanding of the numerical values, but

as one measure in a set of measures, total peak period travel time can improve the information provided to technical and lay audiences—particularly as data improve. The data to estimate the total peak period travel time measure, however, require more research into the definitional inconsistencies or other variations that can explain unusual patterns.

The TTI authors proposed four primary refinement areas that should be investigated in the future:

1. *Collector and Local Street Data*—More data, specifically volume and speeds on collector and local streets, are needed to increase the accuracy of the measure. Additional data would increase the robustness and accuracy of assumptions made in the calculations.
2. *Through-Trip Extraction*—Identifying and removing trips that pass through a region (especially freight trips) will reduce the artificially large VMT values.
3. *Population Estimates*—matching the geographic boundaries of the FHWA and U.S. Census data will increase the accuracy of urban area travel, population, and commuter estimates.
4. *Mode Share*—Estimating the number of commuters and travel time for bike, walk, and public transportation and then deciding on a method to incorporate those who work at home will improve the total travel time measure and show the effect of several non-road solutions.

Improving Intermodal Connectivity in Rural Areas to Enhance Transportation Efficiency: A Case Study

TTI played an important role in analyzing a potential rural intermodal facility in *Improving Intermodal Connectivity in Rural Areas to Enhance Transportation Efficiency: A Case Study* (*38*). The study examined the economic feasibility of investment in an intermodal terminal in West Texas and its implications for reducing roadway maintenance costs, CO_2 emissions, and truck transport in Texas metropolitan areas. The study focused on cotton, which is highly dependent on the international market and truck transport into the Dallas/Fort Worth complex for purposes of accessing containerized railroad transportation to West Coast ports. An intermodal terminal in West Texas would allow cotton to access the intermodal system near its production location, removing the need for truck transport into the Dallas/Fort Worth metropolitan area. Because the transportation of cotton into the Dallas/Fort Worth railroad hubs occurs at distances of up to 335 miles, truck-miles, roadway maintenance, and CO_2 emissions may be significantly decreased with the introduction of a rural intermodal terminal. The analysis suggested that investments in intermodal terminals in rural areas may offer opportunities to improve marketing system efficiency and reduce roadway maintenance costs and vehicle emissions.

TxDOT Performance-Measurement-Based Sustainability Evaluation Methodology

In 2009, TTI developed a performance-measurement-based sustainability evaluation methodology for the TxDOT strategic plan. A set of objectives and performance measures that addressed the five goals of TxDOT's strategic plan, as well as sustainable transportation concerns, were defined. A multicriteria decision-making methodology was developed to evaluate, benchmark, and aggregate the performance measures into a set of sustainability index values. The methodology, applicable at the highway corridor level, was integrated into a

spreadsheet-based analysis tool that provided the sustainability index values (for current and future scenarios) as an output for a particular corridor. This sustainability methodology is applicable only at the corridor level (*39*).

Congestion Monitoring Measures and Procedures for Small- to Medium-Sized Communities

Many TxDOT districts struggle with congestion issues in growing small- to medium-sized communities. Congestion in these communities is often highest along state highways that also serve major local travel functions. While there are extensive resources and literature dedicated to measuring, monitoring, and improving large urban area congestion, there is a need for guidance for small- to medium-sized communities (population < 250,000) to better understand and alleviate congestion before the problems escalate. Potential solutions and performance measure targets necessarily are much different for smaller communities than those identified in the literature for urban areas.

In February 2010, TTI concluded a project whose primary objective was to develop and test a framework for congestion monitoring in small- to medium-sized communities, including economical (low-cost) monitoring techniques and the normal range of improvements for small- to medium-sized communities. The research consisted of two pilot studies of the framework and included numerous outreach materials including a guidebook, PowerPoint presentations, interactive CD, preliminary workshop lesson plans, and research reports.

The project culminated with the delivery of instructional workshops to 13 different communities, introducing both TxDOT staff in small- to medium-sized communities as well as TxDOT's partnering agencies, including MPOs, municipalities, and counties, to the research and to the congestion monitoring and measuring methodologies (*40*).

STATE PERFORMANCE MEASURE PRACTICES

According to the *proposed* rules, state DOTs are required to develop performance measures and targets that follow the United States Department of Transportation's (USDOT's) performance measures previously established in Title 23 U.S.C. 150(c), 49 U.S.C. 5326 and 49 U.S.C. 5329. Additionally, state DOTs are responsible for developing plans that are integrative of other States and rural transit plans (including goals, objectives, performance measure, and targets). Consideration of performance measures and targets is a requirement of the process to develop LRTP and STIP policies, programs, and investment priorities. Before MAP-21, federal level transportation acts required "consultation" between state-level planning and nonmetropolitan jurisdictions. The proposed rules require "cooperation" which is a higher form of engagement than the previous requirement for consultation.

There are approximately 30 states that have RTPOs that assist state DOTs and local officials with regional transportation planning in nonmetropolitan areas. Several states have developed performance measure reporting and guidance. This section summarizes performance measure reporting and guidance from five selected states: Virginia, North Carolina, Pennsylvania, Washington, and California.

Researchers created a matrix that provides an at-a-glance view of the state processes researched for the literature review. Points of comparison include state and regional roles, statewide planning and performance categories, goals and principles, a sample regional methodology, and the program's status. The matrix is included as Appendix A.

Virginia

In 2013, Virginia's Office of Intermodal Planning and Investment (OIPI) updated its Statewide Multimodal Long-Range Transportation Policy Plan with a new performance-based planning framework (*41*). The OIPI is located within the Office of the Secretary of Transportation and was created in 2002 to encourage multimodal and intermodal planning across the various transportation modes. As such, its plans govern the planning activities of the DOTs, Rail and Public Transportation, and Aviation, as well as the Virginia Port Authority, among others (*42*).

How Performance Measures Inform Project Selection

The framework includes instructions, still in the development stage, about using performance measures in the planning process (*41*). First, the framework describes the alignment of transportation planning elements that include the plan's vision and goals, investment priorities, investment strategies, investment priority ratings, and performance reporting. It provides guidelines on the rating process, beginning with a needs evaluation, and traces the process through to project selection and performance measurement of those projects. The results are then reported and fed back into the rating process to determine how well a project aligns with the strategic goals. This process is visually described in a process flow chart (see Figure 4) and explained in accessible terms.

Roles of Government Entities

The framework explains that while the USDOT establishes the measures, the states and regional planning bodies establish appropriate targets (*41*). The update includes specific guidelines for these bodies in Chapter 7 of the Planning Partner's Guide (see Appendix B). The Planning Partner's Guide lists the different planning partners, their roles in the process, and their relationships to each other (*41*).

The Virginia Department of Transportation (VDOT) develops the state's rural, regional LRTP in partnership with 20 planning district commissions (PDCs) throughout the commonwealth. Presumably guided by the goals and investment priorities of the OIPI Multimodal Long-Range Transportation Policy Plan, VDOT and the PDCs will create a regional plan that identifies needs based on goals and objectives established by each region (*43*). Those regional plans will then be incorporated into the State Highway Plan. When completed, that plan will be, along with the state rail, port, transit, and aviation plans, subject to the performance-based planning framework described in the Multimodal Long-Range Transportation Policy Plan (*44*).

Planning Process: Status

Because the framework is fairly new, the planning processes are still in development. The update promises more fully integrated planning processes in the next version of *VTrans*, scheduled for adoption in 2015 (*41*).

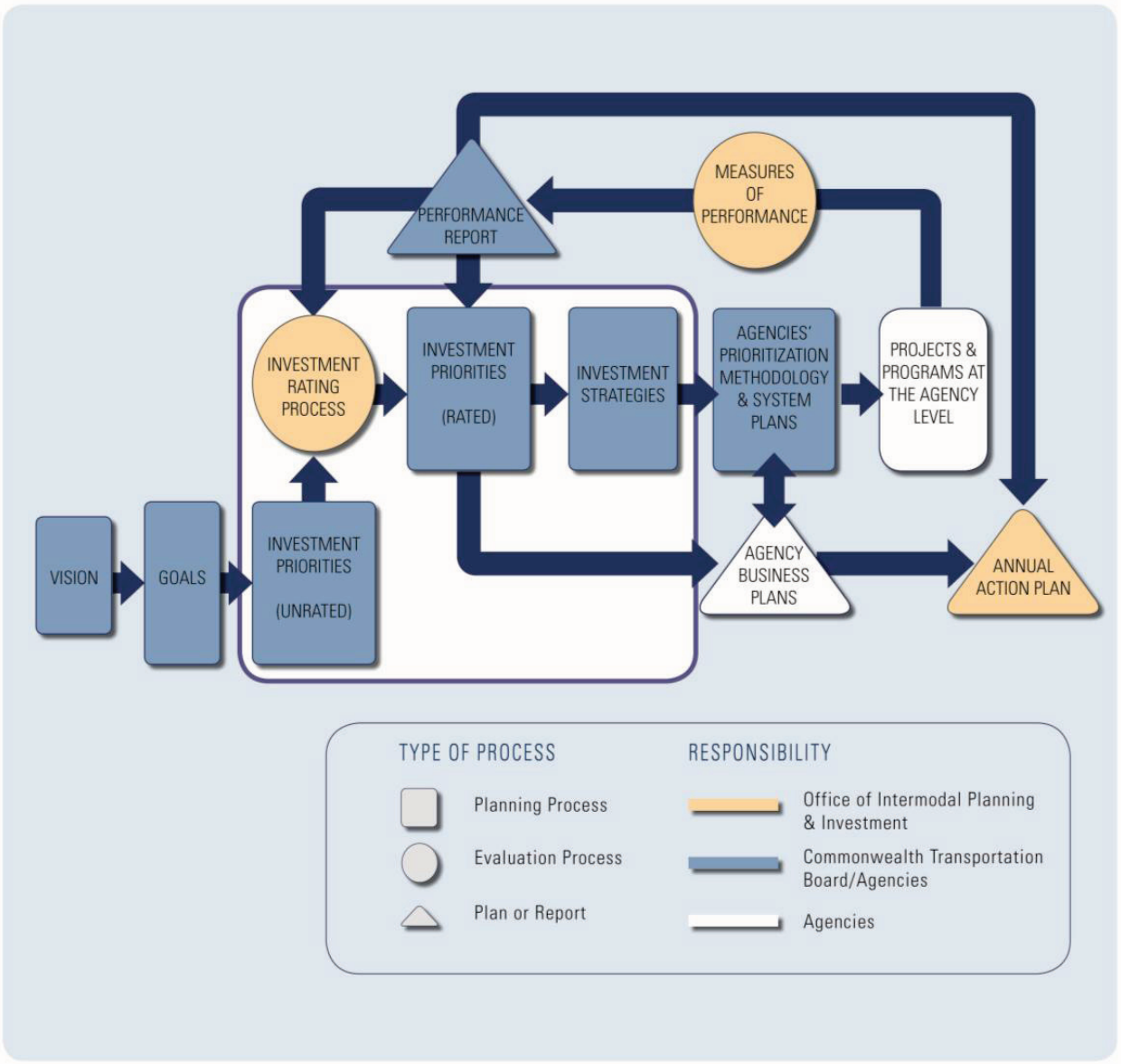


Figure 4. Performance-Based Planning Framework and the *VTrans* Update.

North Carolina

In 2009, the North Carolina Department of Transportation (NCDOT) began development of a new strategic planning process for transportation projects that is focused on DOT goals of safety, mobility, and infrastructure health (*45*). Updated every two years, the plan is called "Policy to Projects" and includes NCDOT's Strategic Plan, Program and Resource Plan, STIP, and Work Program (see Figure 5) (*46*).

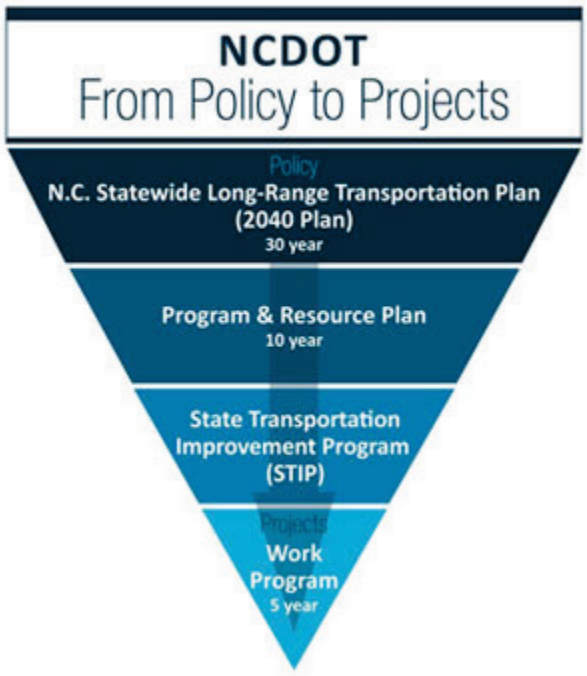


Figure 5. NCDOT's Policy to Projects Plan (*35*).

Reforms Required by Law

These reforms are now codified in North Carolina state law, passed in 2012, requiring that the department of transportation use a data-driven, systematic prioritization process when developing transportation projects and mandating the use of both quantitative data and qualitative and local input (*47*).

In 2013, the North Carolina Legislature strengthened this mandate with the Strategic Transportation Investment (STI) bill, providing new funding formulas for NCDOT's capital expenditures (*48*). The law defines new funding categories and budgetary allocations for each category (see Figure 6). The requirements of each funding category include provision of both quantitative data and qualitative, local input to score the projects. See Figure 7 for the weights assigned to those criteria.

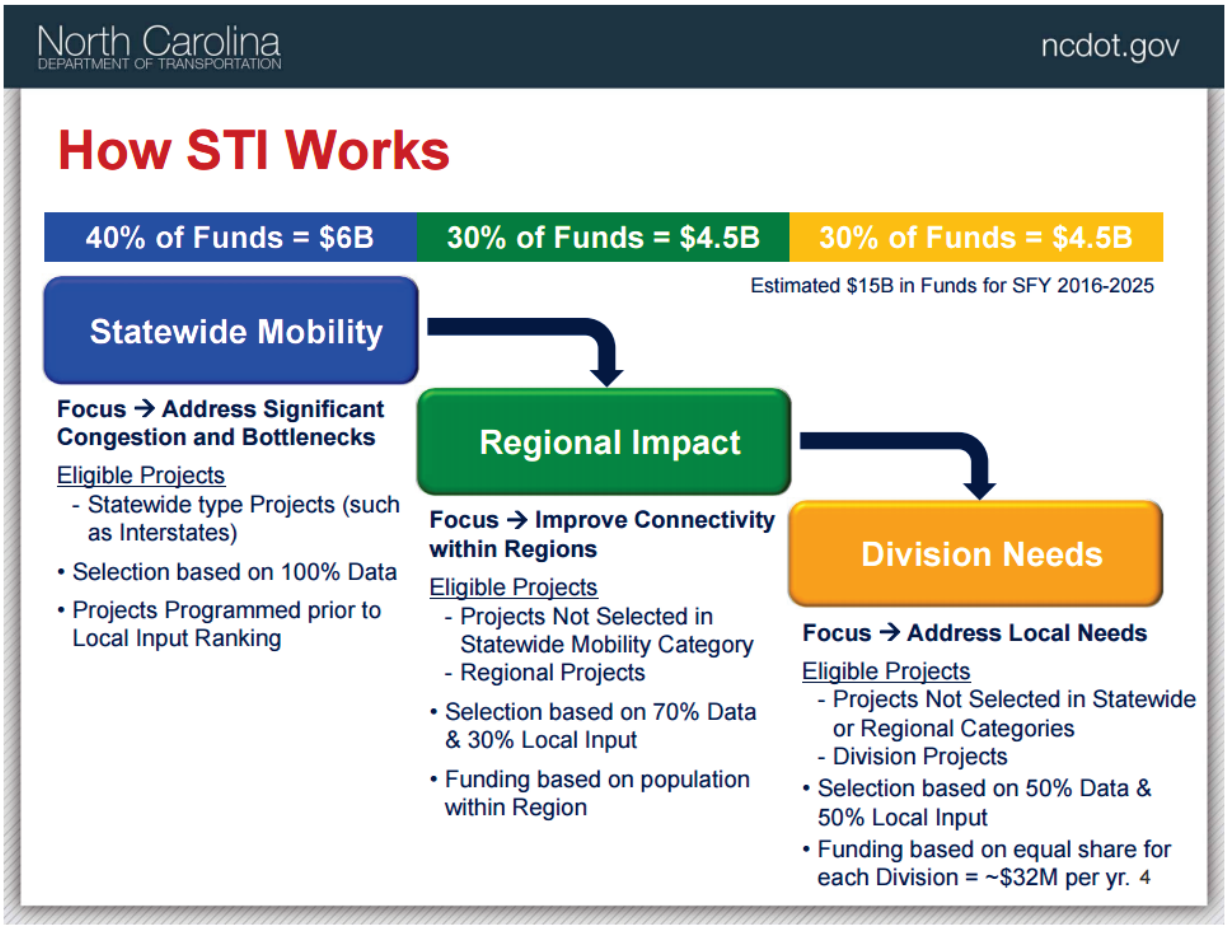


Figure 6. Funding Categories Defined by North Carolina's Strategic Transportation Investments Bill, House Bill 817, Signed into Law June 26, 2013 (*48*).

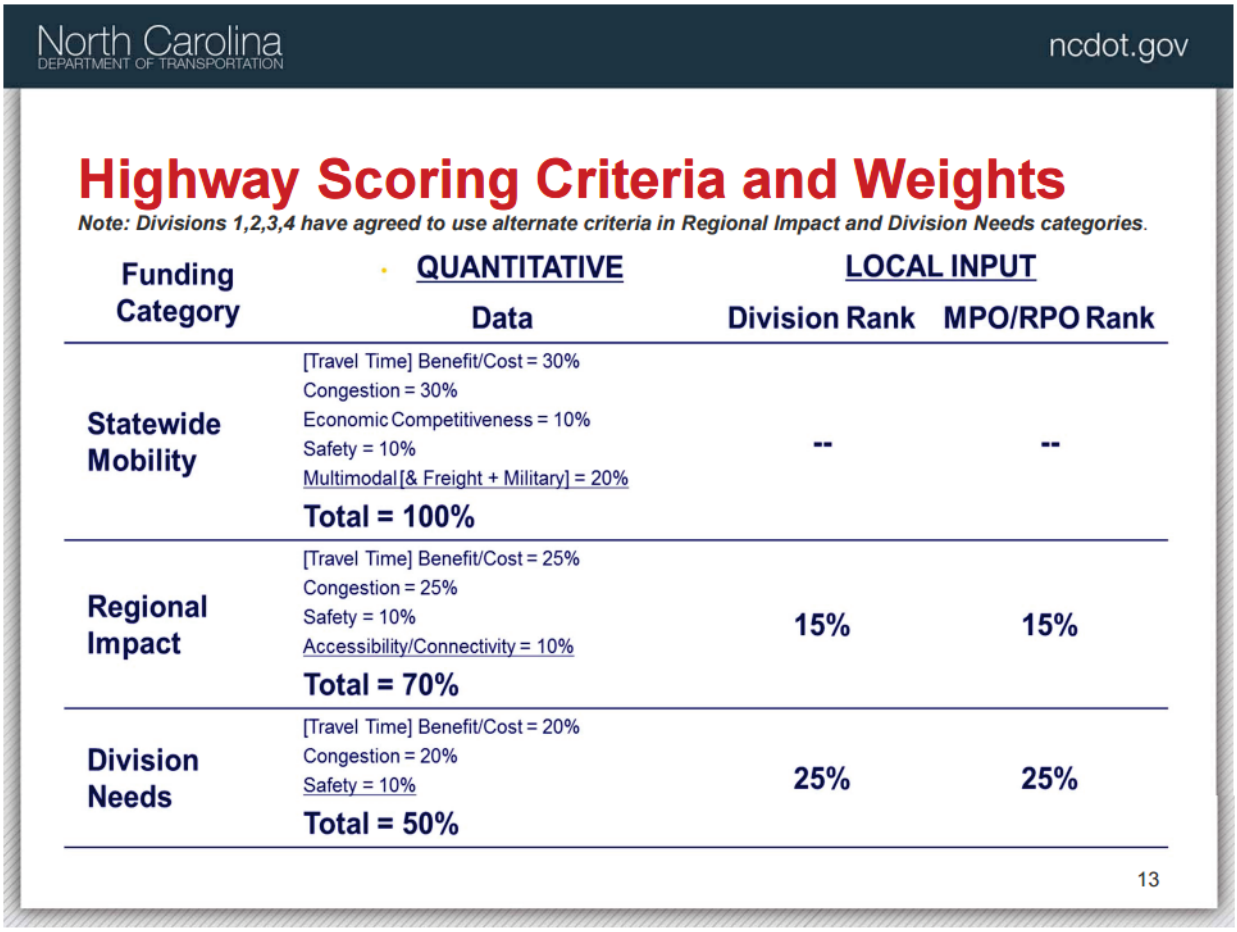


Figure 7. Sample of Weighted Scoring Criteria for Each Funding Category Required by North Carolina's Strategic Transportation Investment Law for Highway Projects (*48*).

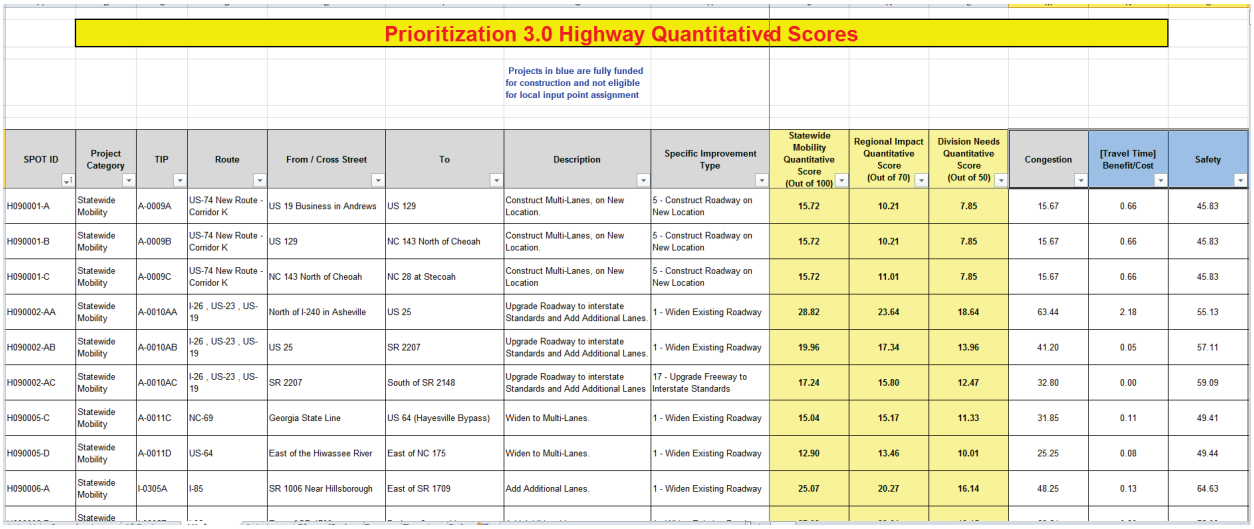
Quantitative and Qualitative Data-Driven Planning Process

The prioritization process that the plan supports is transparent and systematic, and it is driven by both data about pavement condition, traffic condition, and road safety as well as input from local governments and NCDOT staff. Once projects are submitted, NCDOT staff and local officials evaluate and rank according to the department's strategic goals, using the data and input described above (*49*). Projects are then sorted by tier: statewide, regional, and subregional (*5*). Finally, NCDOT staff examines those rankings and apply financial and scheduling constraints, which may include considerations of compliance with state and federal law, air quality standards, and technical readiness. The result is a ranked project list that becomes the draft STIP. Following a public comment period and time for adjustments for those comments, NCDOT finalizes the STIP and submits it for adoption to the Board of Transportation (*49*).

NCDOT publishes project scores in a detailed Excel® spreadsheet organized by project (see Figure 8). The most recent score sheet, published in September 2014, lists 2956 projects, all supported with project description and score information that includes (*50*):

- Project mode.
- Location.
- Funding category (statewide mobility, regional impact, division need).
- Narrative description.
- Improvement type.
- Cost.

Following these information categories are the project scores, listed as total scores, quantitative scores, and local input scores. Local input points provided by MPOs, RPOs, and divisions are provided as well. This level of project information for all projects is provided under the "All Projects" tab. Six more tabs provide project information by mode, including highway, aviation, bicycle/pedestrian, ferry, transit, and rail. These spreadsheets include data on results of ranking by mode-specific criteria. For example, the "Highway" sheet includes project scores on congestion, travel time benefit/cost, safety, multimodal freight and military concerns, economic competitiveness, accessibility and connectivity, lane width, and shoulder width.



Prioritization 3.0 Highway Quantitatived Scores

Projects in blue are fully funded for construction and not eligible for local input point assignment

SPOT ID	Project Category	TIP	Route	From / Cross Street	To	Description	Specific Improvement Type	Statewide Mobility Quantitative Score (Out of 100)	Regional Impact Quantitative Score (Out of 70)	Division Needs Quantitative Score (Out of 50)	Congestion	[Travel Time] Benefit/Cost	Safety
H090001-A	Statewide Mobility	A-0009A	US-74 New Route - Corridor K	US 19 Business in Andrews	US 129	Construct Multi-Lanes, on New Location.	5 - Construct Roadway on New Location	15.72	10.21	7.85	15.67	0.66	45.83
H090001-B	Statewide Mobility	A-0009B	US-74 New Route - Corridor K	US 129	NC 143 North of Cheoah	Construct Multi-Lanes, on New Location.	5 - Construct Roadway on New Location	15.72	10.21	7.85	15.67	0.66	45.83
H090001-C	Statewide Mobility	A-0009C	US-74 New Route - Corridor K	NC 143 North of Cheoah	NC 28 at Stecoah	Construct Multi-Lanes, on New Location	5 - Construct Roadway on New Location	15.72	11.01	7.85	15.67	0.66	45.83
H090002-AA	Statewide Mobility	A-0010AA	I-26 , US-23 , US-19	North of I-240 in Asheville	US 25	Upgrade Roadway to interstate Standards and Add Additional Lanes.	1 - Widen Existing Roadway	28.82	23.64	18.64	63.44	2.18	55.13
H090002-AB	Statewide Mobility	A-0010AB	I-26 , US-23 , US-19	US 25	SR 2207	Upgrade Roadway to interstate Standards and Add Additional Lanes.	1 - Widen Existing Roadway	19.96	17.34	13.96	41.20	0.05	57.11
H090002-AC	Statewide Mobility	A-0010AC	I-26 , US-23 , US-19	SR 2207	South of SR 2148	Upgrade Roadway to interstate Standards and Add Additional Lanes	17 - Upgrade Freeway to Interstate Standards	17.24	15.80	12.47	32.80	0.00	59.09
H090005-C	Statewide Mobility	A-0011C	NC-69	Georgia State Line	US 64 (Hayesville Bypass)	Widen to Multi-Lanes.	1 - Widen Existing Roadway	15.04	15.17	11.33	31.85	0.11	49.41
H090005-D	Statewide Mobility	A-0011D	US-64	East of the Hiwassee River	East of NC 175	Widen to Multi-Lanes.	1 - Widen Existing Roadway	12.90	13.46	10.01	25.25	0.08	49.44
H090006-A	Statewide Mobility	I-0305A	I-85	SR 1006 Near Hillsborough	East of SR 1709	Add Additional Lanes.	1 - Widen Existing Roadway	25.07	20.27	16.14	48.25	0.13	64.63
	Statewide												

Figure 8. Screen Grab from NCDOT's Prioritization 3.0 Highway Quantitative Scores, Highway Spreadsheet (*50*).

The data used for scoring and evaluating projects is generated either by NCDOT or through coordination with local governments. The results are intended for use in NCDOT's strategic prioritization process and for preliminary-level planning, scoring, and evaluation purposes only. Per the STI law, these scores will be used in the development of NCDOT's Draft State Transportation Improvement Program.

Performance Measures

The transportation reform efforts also resulted in development of a performance measurement process to support the project prioritization and selection process (see Table 7). These performance level-of-service (LOS) measures are focused on the quality of service provided to the user. Example measures include criteria for measuring transit, ferry, highway, bicycle/pedestrian projects, and highway projects (*51*).

Table 7. Sample Agency-Level Performance Measures That Support the Transportation Reform Effort (*51*).

Performance Area	Measure
Highway Mobility	Percentage of miles with volume-to-capacity ratio < 0.80
Highway Modernization	Percentage of miles that meet NCDOT's paved shoulder policy where paved shoulders are required
Highway Pavement	Percentage of miles w/ pavement condition rating ≥ 80
Ferry	Number of vehicles left behind at terminals per year
Transit	Passenger trips per year

Who Uses the Process and How

The process is designed for planning use at all levels and acknowledges the differences between rural and urban areas, and between regions, in several ways. Higher-tiered statewide projects receive more heavily weighted data points than do regional and subregional tier projects. Subregional and regional projects, on the other hand, receive more heavily weighted local input points. In addition, while MPOs and RPOs in North Carolina develop transportation improvement processes separately from NCDOT, some of these entities have begun to incorporate elements of the new statewide prioritization process into their local processes (*5*).

Each of North Carolina's 19 RPOs has received conditional approval for their newly developed project solicitation and ranking methodologies, required by law (*52*). Those proposed methodologies, together with MPO and division methodologies, are also publicly posted. The law requires that each entity must develop a data-driven prioritization process. While many have adopted processes that NCDOT has developed for calculating quantitative data, processes for measuring qualitative data tend to be more regionally specific.

The Down East RPO, for example, bases the qualitative score on a project's access and connection to six factors in the RPOs geographic area that promote and foster the communities of Eastern North Carolina: agriculture, education, health care, job centers, military and ports, and tourism. This evaluation is applied to projects across all modes of transportation (*53*). The Isothermal RPO, on the other hand, uses a different list of regional criteria—exiting congestion, crash frequency, transportation plan consistency, destination served, freight volume, and multimodal accommodations—and assigns weighted values to each of those categories, as shown in Figure 9 (*54*).

RANKING PROCESS

Regional Level Projects (1300 points maximum, 100 points maximum per project)

Criteria	0 points	5 points	10 points	15 points	20 points
Existing Congestion	Volume to capacity less than 0.25	Volume to capacity b/w 0.25 and 0.5	Volume to capacity b/w 0.5 and 0.75	Volume to capacity b/w 0.75 and 1.0	Volume to capacity over 1.0
	Ratio of how much traffic is on a road versus the maximum traffic that can be on a road and provide an acceptable level of service.				
Crash Frequency	Less than 5 crashes	6 to 9 crashes	10 to 19 crashes	20 to 39 crashes	40 or more crashes
	Number of automobile crashes over the most recently tabulated 5-year period.				
Transportation Plan Consistency	Project is not in STIP, nor in CTP or other locally adopted plan				Project is in STIP, or in CTP or other locally adopted plan
	Is the proposed project part of an existing, adopted transportation plan?				
Destination Served	No direct access to major destination		Direct access to ≥50 employee business, or ≥ 5,000 annual user recreation		Direct access to school, hospital, ≥100 employee business, or ≥ 10,000 annual user recreation
	Does the project connect directly to a critical educational, health care, employment, or recreation/entertainment destination?				
Freight Volume	Fewer than 100 trucks per day	100 to 499 trucks per day	500 or more trucks per day		
	Average daily number of large freight movers (tractor trailers, etc) on a road.				
Multimodal Accommodations	Project does not include bike/ped facilities or connections		Project includes bike/ped facilities or connections		
	Whether the project includes facilities such as sidewalks, bicycle lanes, etc, or a connection to these type facilities.				

Figure 9. Isothermal RPO Ranking Process for Regional-Level Projects (*54*).

Pennsylvania

Recent Revisions to DOT Performance Measurement System

In 2011, the Pennsylvania Department of Transportation (PennDOT) revamped its long-standing practice of performance measurement in an effort to streamline and update its measures (*55*). In the process of revising that system, PennDOT involved its 26 planning partners in Pennsylvania, including MPOs and RPOs, in establishing performance measures from which they determined a baseline and set targets to drive improvement. Although federal law does not require rural planning processes (*56*), PennDOT also worked with its MPOs and RPOs to ensure performance was considered when choosing projects for its TIPs and LRTPs.

Case Study: North Central Pennsylvania Regional Planning Organization

A new process—the project prioritization process, a two-part system developed to analyze projects proposed for planning initiatives—made its appearance in the North Central Pennsylvania Regional Planning Organization's 2007–2035 LRTP. Prior to the establishment of the project prioritization process, projects were primarily selected through the subjective, qualitative deliberations of RPO and Comprehensive Economic Development Strategy (CEDS) committees. The new process called for and developed for the LRTP is an analytical, rigorous one that combines weighted selection criteria with the newly identified spatial priorities from the Regional Core System, as shown in Figure 10 (*57*).

The process consists of a Regional Core Transportation System composed of a series of modes (links) and nodes identified in the planning processes of the LRTP, CEDS, and Regional Action Strategy (RAS; see Table 8, *57*). These three plans comprise the strategic policy documents for the North Central RPO (*57*). The core system identifies the most important areas in the region where multimodal projects that serve the whole state would be best located.

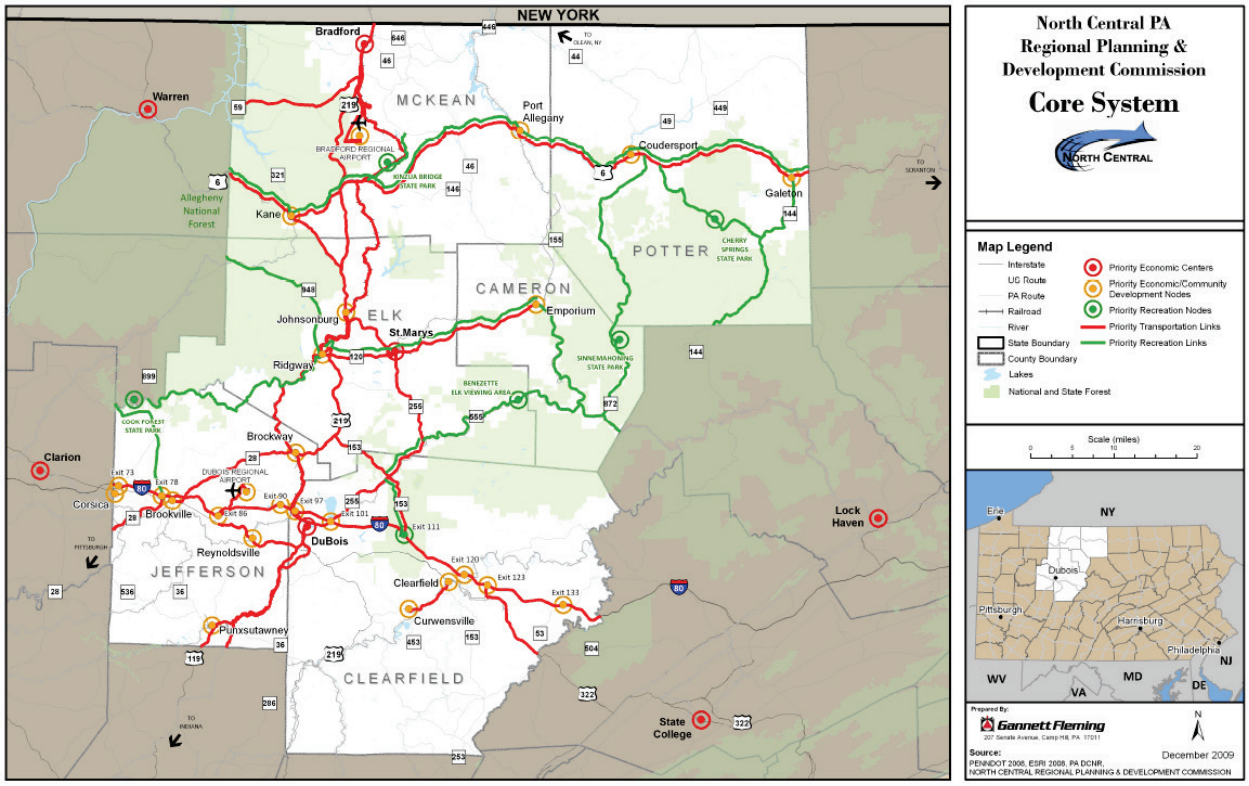


Figure 10. North Central Pennsylvania Regional Core System (*57*).

Table 8. Regional Core System Priority Nodes and Modes (*57*).

Priority Mode/Node	Description
Priority Economic Centers	Economic centers of Bradford, DuBois, and St. Mary's.
Priority Economic/Community Development Centers	Various investment areas that include KOZ sites, the interchanges along I-80, and the region's three largest boroughs: Brookville, Clearfield, and Punxsutawney. They also include the region's two commercial service airports: Bradford and DuBois Regional.
Priority Recreational Nodes	Recognizing the importance that tourism and outdoor recreation have to the North Central region, these nodes have been identified as the Department of Conservation and Natural Resources' primary investment areas, consistent with the PAWilds initiative. Examples include Cherry Springs and Kinzua Bridge State Parks, as well as the Benezette elk viewing area.
Priority Transportation Links	Consist of the highest-order roadway facility that provides a direct connection among regional economic centers (e.g., PA 255 between DuBois and St. Mary's).
Priority Recreation Links	Connect regional economic and community centers to the priority recreational nodes (e.g., PA 555 to the elk viewing area).

Faced with the challenge of identifying the needs of the Regional Core System in an era of constrained resources, the North Central RPO developed the ranking criteria to be applied to projects under consideration for the core system. The weighted project selection criteria fall into six different categories of transportation project types:

- Highway restoration.
- Highway/new capacity.
- State bridges bigger than 8 feet.
- Local bridges smaller than 20 feet.
- Safety.
- Transportation enhancements.

Each of these project types is evaluated using a set of approximately five criteria that have a specific weight associated with them (see Table 9). One example of the North Central RPO weighted criteria for projects is for highway restoration, the most common rural planning project type administered by the North Central RPO.

Table 9. Highway Restoration Criteria and Weighting.

Project Criteria	Rating	Guidelines	Weighting
What network is the project on?	1	Other state routes (or non-network)	31%
	5	Investment areas	
	5	Access to Department of Conservation and Natural Resources investment area (priority recreational routes/green segments)	
	10	Core system (priority transportation routes/red segments)	
What is the AADT?	1	< 2,000 vehicles per day	12%
	5	2,000–4,999	
	7	5,000–9,999	
	10	10,000+	
What is the IRI?	1	< 150 inches per mile	31%
	3	150–199	
	5	200–299	
	10	300+	
Percentage of trucks	1	< 5 percent	14%
	5	5–10 percent	
	10	> 10 percent	
Resurfacing date	1	< 10 years	12%
	5	10–20 years	
	10	20+ years	

Once the initial review is complete, each project undergoes an evaluation against a set of overall transportation criteria, specifically 14 elements grouped into five weighted categories, as shown in Table 9. The prioritized project list then goes into the region's transportation improvement plan (*5*).

Figure 11. Overall Transportation Criteria Categories and Weights.

Coordination between Transportation, Land Use, and Economic Development Planning

The Project Prioritization Committee also evaluates projects that come through the CEDS plan and the Appalachian Regional Commission (ARC). CEDS is the five-year plan that aims to link land use, transportation, and economic development. CEDS and ARC projects typically support economic development or existing growth opportunities (*57*). CEDS and ARC projects are also evaluated according to a newly developed set of weighted criteria, as shown in Figure 11 (*57*).

Projects of Regional Significance Eligible for Additional Funding

Once TIP and CEDS projects are prioritized, these sets of project plans are submitted to a final evaluation process that determines the projects of regional significance, a small handful of projects that provide benefits that transcend county boundaries and will likely draw from several funding sources, both state and federal. The weighted criteria for these projects are also divided into five different categories:

- Regional factors.
- Plan or planning support.
- Existing infrastructure maximization.
- Project readiness.
- Business factors (*57*).

The quantitative measures, introduced into the North Central Pennsylvania planning process in 2011, are intended to complement the subjective deliberation of candidate projects performed by the CEDS and RPO committees (*5*).

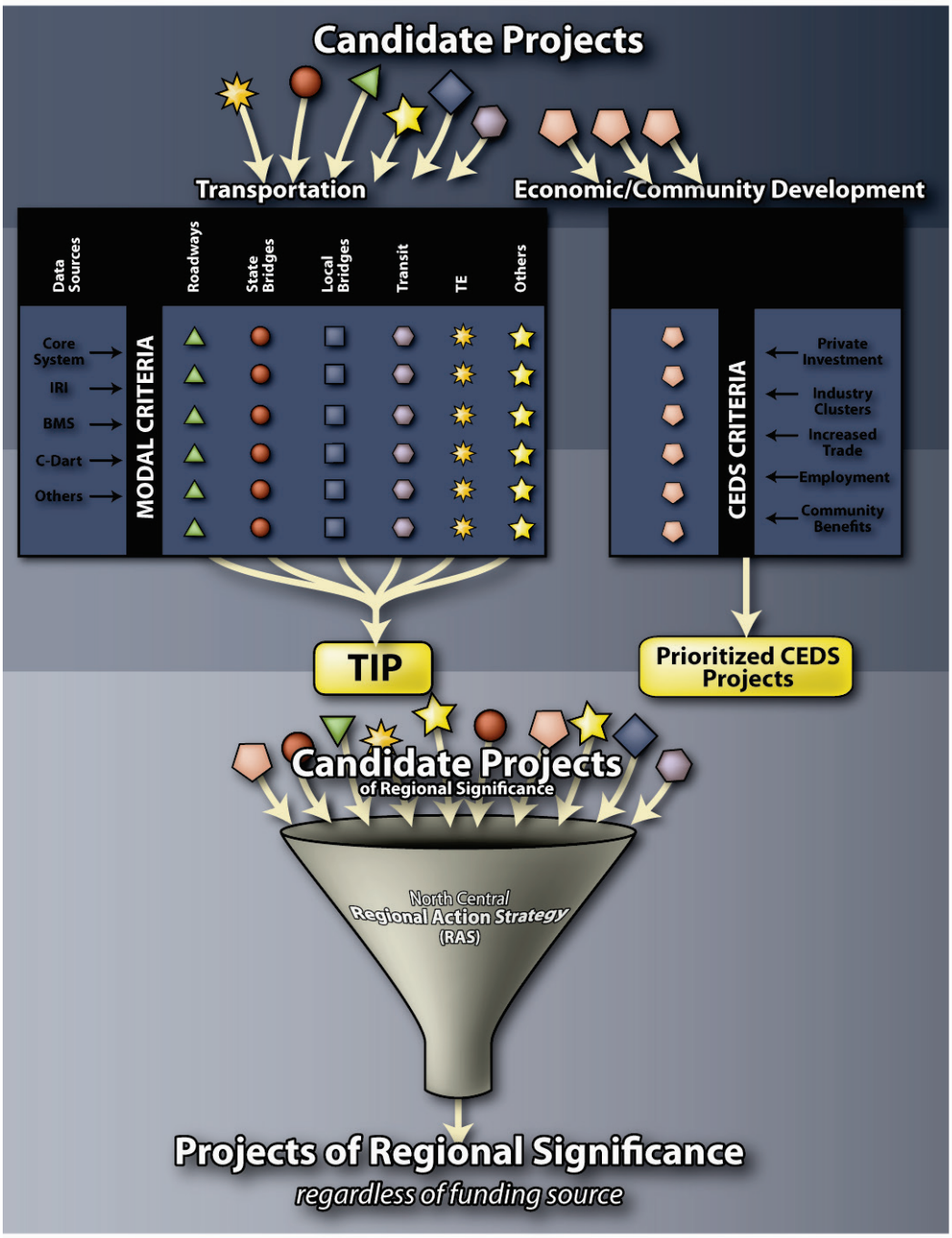


Figure 12. The North Central PA Project Prioritization Process.

Washington State

The Washington State Department of Transportation (WSDOT) was tasked by the legislature in 1990 to administer a grant program to fund the work of RTPOs. While WSDOT does not

prescribe a set of plans or practices that each RTPO must adhere to, the department is expected to establish minimum standards for the development of regional transportation plans statewide. Toward that end, the department provides the *RTPO Transportation Planning Guidebook* (see Appendix B), a planning guidebook and set of "recommended best planning practices" designed to ensure an "optimum level of consistency across the state" while still allowing the flexibility necessary for plans to meet specific regional needs (*58*).

General Transportation Planning Principles

The guidebook articulates that each jurisdiction must decide for itself "what each city, county or region is willing to accomplish and able to afford" (*58*). It characterizes ideal planning processes as being collaborative and regionally defined, and adhering to the following general transportation planning principles:

- Consistency through use of appropriate technical methods.
- Partnering among stakeholders.
- Public involvement throughout the entire process.
- Regional perspective promoted in each plan.
- Continuous improvement through monitoring and adjusting as necessary.
- Short and long-term perspectives evident in each plan.
- Sustainability of financial, economic, environmental, and community resources (*58*).

Performance Monitoring in the Planning Process

While the guidebook leaves the definitions and calculations of performance monitoring to each region, it does strongly recommend that RTPOs collect and maintain transportation-related data for each region and define the specific data needed for its region. The guidebook lists examples of data types that RTPOs can use and mandates that data collection, analysis, and storage must be a part of all RTPO work programs (*58*).

The guidebook specifies that RTPOs must use two different classes of performance monitoring measures for two different phases of the planning process: system performance monitoring and plan implementation performance monitoring. System performance monitoring measures are technical and address the following system aspects:

- Traffic volumes.
- Vehicle miles of travel.
- Established regional LOS standards.
- Fixed screenline parameters.
- Travel time.
- Speed.
- Safety standards.
- Other measure established by the RTPO.

Plan implementation performance monitoring measures involve comparing transportation plans with outcomes on the ground to confirm that what has been planned is what is actually needed. If

a region has developed differently than anticipated at the time of the plan, the plan should be revised. The guidebook provides the following guidance for these measures:

- The RTPO should first look at the general transportation and development strategies for the region as a whole (plan implementation performance monitoring) and determine if plan implementation is successful on a macro scale—whether the plan meets the objectives of the transportation and development strategies.
- The RTPO should monitor a few critical locations on the transportation system (system performance monitoring) using the technical methods suggested above and compare results to the recommended LOS standards adopted for the system.
- The actual process used to monitor performance will depend on the types of data available and on the type of LOS measures adopted for each region.
- Every two years, the results of the performance monitoring review should be documented in a biennial report. A description of this report is included in the implementation section of the *RTPO Transportation Planning Guidebook* (*58*).

The guidebook provides the outline of a planning process that demonstrates the role that performance data should play in any region's planning process and how regional plans fit into statewide plans (see Figure 13).

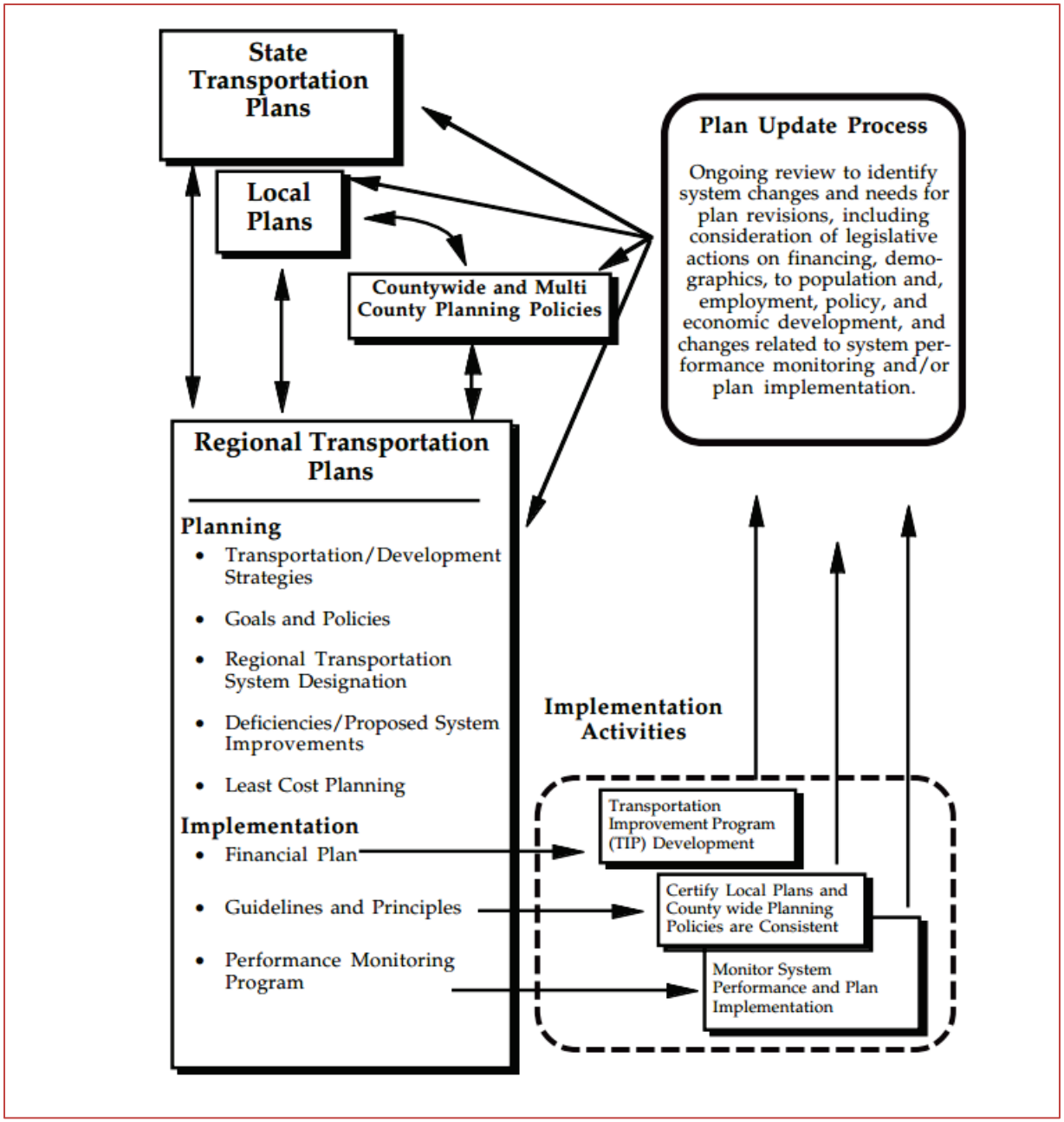


Figure 13. Components of the Washington State Regional Transportation Planning Process (*58*).

Washington State Case Study: Yakima Valley Council of Governments

The Yakima Valley Council of Governments (YVCOG) is the lead agency for the region's MPO and, since 1993, for the RTPO (*59*). The YVCOG functions within the guidelines of federal and state eligibility requirements, and with the guidance of the state department of transportation, in developing project selection criteria. However, MPOs and RTPOs are autonomous and have the authority to develop selection criteria and application procedures at the regional level (*5*). This delegation of authority satisfies the requirement of the State of Washington's Regional

Competitive Program that the Surface Transportation Regional Program (STRP) regional funds be allocated on a regional basis (*5*).

YVCOG characterizes its current planning process, a response to the metropolitan planning requirements of MAP-21, as continuous, comprehensive, and collaborative (*49*). Prior to 2006, this process was defined by a formula-based funding distribution that was not tied to specific need and therefore may not have adequately funded the most needed projects at rates that supported their timely completion (*5*). The previous process was also more subjective than the current, more quantitative one (*5*).

The new process is also not a fixed process. Every year, YVCOG's Technical Advisory Committee reviews the selection criteria and revises the application process as needed to ensure that it meets current regional needs (*5*). The 2010–2011 cycle scoring criteria, for example, reflected an emphasis on jobs that were shovel ready and would produce economic opportunity in the region (*5*). The nine weighted categories from that cycle included criteria measuring:

- Traffic volume.
- Freight mobility.
- Roadside hazards.
- Collision rate.
- Alternative modes.
- Existing surface condition.
- Roadway width deficiency.
- Excess funding match.
- Nonmatching funding investment (*5*).

The application process is less mutable and begins every July with the submission of local jurisdiction and agency TIPs to YVCOG. These plans are compiled into one document for the entire region, and YVCOG then reviews each project for issues such as interagency collaboration, public input, consistency with the regional LRTP, financial constraint, and air quality impacts. Following YVCOG's review is a public review period, an executive review and approval process, WSDOT's review, and, finally, submission to FHWA and FTA for approval (*49*).

California

In an effort to support the standardization of a statewide performance measurement process for transportation, the California Department of Transportation (Caltrans) has created *Performance Measures for Rural Transportation Systems: Guidebook* (*60*) and *Technical Supplement* (*61*). Together, these two manuals function to help rural areas measure, assess, and improve rural transportation systems. The guidebook is organized by seven categories of performance, as shown in Table 10.

Table 10. Performance Categories and Measures That Structure the Caltrans Guidebook (*60*).

Performance Category	Performance Measure
Safety	Accident rate per million VMT
Mobility	Origin-destination (OD) travel times along major corridors
	Actual average speeds (mph)
	Delays (sec or min)
Reliability	Variability of travel times between major OD pairs (percentage of standard deviation/average travel time)
Return on Investment	Life cycle costs (dollars)
	Life cycle benefits (dollars)
	Net present value (dollars)
	Benefit/cost ratio (benefits divided by costs)
	Rate of return on investment (percent return per year)
	Project payback period (years)
	Calculated benefits (dollars)
System Preservation	Pavement condition index (PCI)
Accessibility	Accessibility difference (min): Time from a particular point between the fastest and second-fastest routes to State Highway System access points
Productivity	Vehicle throughput (actual volume/capacity of roadway in percent)
	Lost lane-miles
	System wide (or) per roadway segment

Within each section, the guidebook provides step-by-step instructions for measuring performance. The measures are designed for use with accessible software tools like Microsoft Excel, and the instructions help entities define what level of measurement they need based on the maturity of their own measurement processes. Components of the instructions include:

- Definition of performance measure.
- Complexity of measurement, based on program maturity of a given area's performance measurement system: basic, intermediate or advanced.
- Data needed, from minimal to ideal, to calculate a given measure.
- Formulas for calculating the measure.

The technical supplement provides extensive background information on the topic of rural performance measurement, starting with a definition of "rural" for purposes of program application. The following chapters cover existing performance measurement practices (in California and other states), classification of rural transportation systems, rural-specific performance measures, and case studies demonstrating the process of calculating a measure in each of the seven categories.

Though the Caltrans manuals mention the value of performance measures in the planning process, they do not address those processes or provide guidance about how to use the performance measures in planning decisions. Because each region designs its own planning

process, these processes differ throughout the state and do not use performance measures in the same way. Often, they are used to track completion of the plan elements and the process rather than measure performance of the system itself. In its 2015 review of all long-range plans completed by MPOs and RTPOs, Caltrans may make an effort to formalize the types of measures that RTPOs should be using and how they should be used (*61*).

CURRENT RURAL TRANSPORTATION PLANNING CONTEXT IN TEXAS

TxDOT currently operates a decentralized organizational structure using 25 regional districts to carry out rural transportation planning objectives. Each district has considerable latitude in setting priorities for design and construction projects, maintenance, and operations activities. Decisions about transportation in areas outside the MPO boundaries are made by TxDOT district engineers in consultation with and input from local leaders such as county judges, county commissioners, mayors, and city council members.

Rural Planning Organizations

In some areas of the state rural planning organizations have been established and play an active role in the rural transportation planning process. There are currently thirteen active RPOs in Texas. The location and boundaries of each RPO are presented in Figure 14. In areas without RPOs TxDOT districts work cooperatively (and less formally) with local stakeholders and officials.

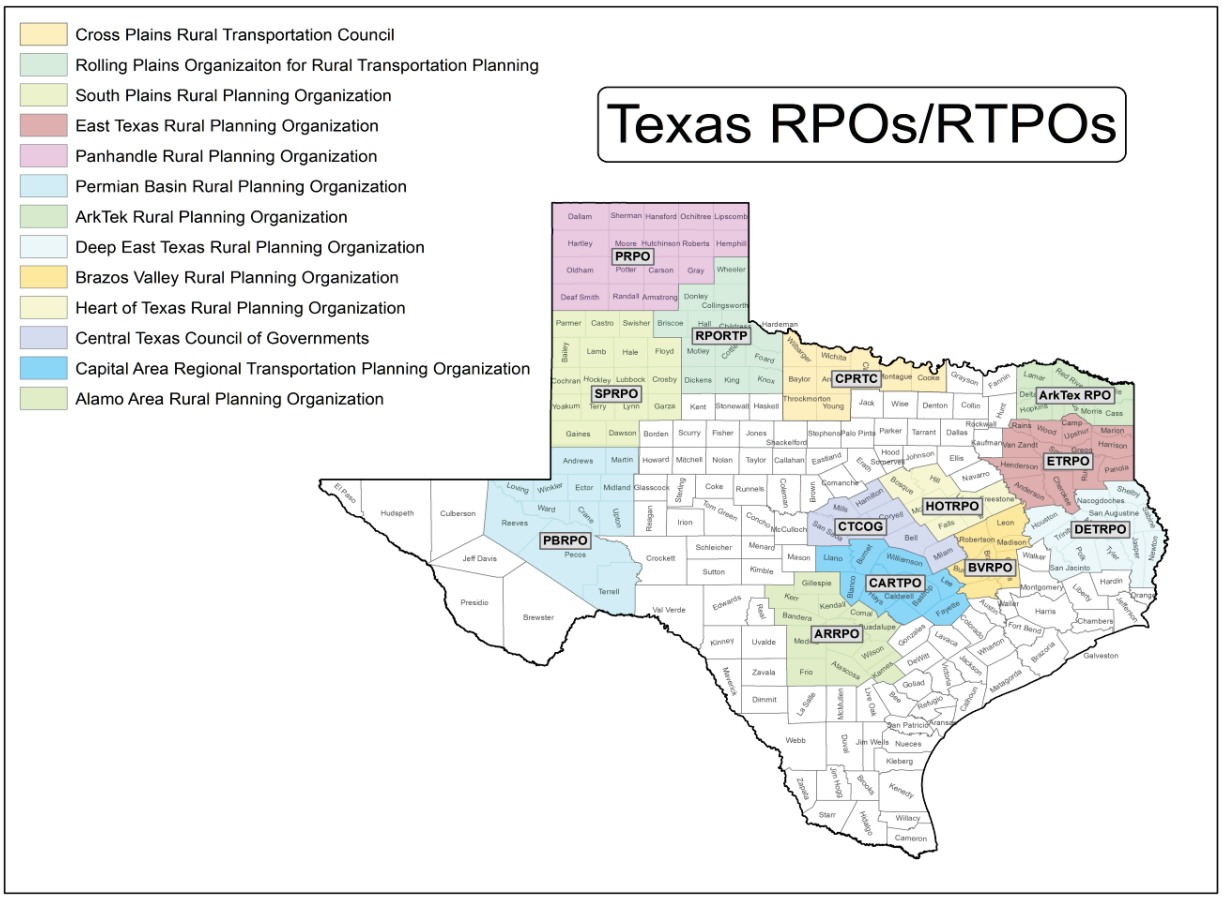


Figure 14. Texas Rural Planning Organizations.

RPOs have existed as voluntary organizations in Texas since 1999. Figure 15 illustrates the boundaries of each RPO in Texas. Initially, RPOs provided recommendations to TxDOT about rural transportation priorities and planning (*62*), but the RPOs' role was formalized in 2012 with the amendment to the Texas Administrative Code requiring that TxDOT develop a rural transportation plan in collaboration with entities outside of metropolitan planning areas, including RPOs (*63*). In compliance with this requirement, the Texas Transportation Commission (TTC) adopted TxDOT's first Texas Rural Transportation Plan (TRTP) in June 2012 (*64*). The TRTP is a component of the 2035 Statewide Long-Range Transportation Plan.

In some areas of the state rural planning organizations have been established and play an active role in the rural transportation planning process. There are currently 13 active RPOs in Texas. Figure 15 presents the location and boundaries of each. In areas without RPOs TxDOT districts work cooperatively (and less formally) with local stakeholders and officials.

The following list provides additional information about RPOs:

- The TAC defines the RPO's role in the transportation planning and programming process (Title 43 TAC, Chapter 16—effective date of January 1, 2011).
- RPOs provide a forum for informed transportation decision making at the local level.

- TxDOT and RPOs develop the Rural Transportation Improvement Program (RTIP) cooperatively—projects are approved by TxDOT.
    - The RTIP rolls-up into the STIP and Unified Transportation Program (UTP).
    - TAC does not set RTPO boundaries and RPOs use existing relationships or boundaries (e.g., COG).
    - RPOs provide a forum for public involvement.
- RPOs are "like" MPOs because they may:
    - Have a policy board and technical committee.
    - Provide Transportation Priorities.
    - Recommend projects for the RTIP.
- In 2014, MAP-21 *proposed* rules that use the term "Regional Transportation Planning Organizations (RTPOs)" to describe what are now referred to as RPOs.
- According to the *proposed* rules for RTPOs, State Governors (or designee) may designate RTPOs as necessary. RPOs that wish to transition to RTPO status must be reconfirmed, but this process is yet to be defined.

RPO Summaries

As part of an interagency agreement with TxDOT Transportation Planning and Programming Division, TTI has conducted outreach and coordination with RPOs across Texas. Although many RPOs were temporarily formed in the period 2007–2011, many had stopped meeting on a regular basis. Brief summaries of selected RPOs based on activity reports and outreach from 2014 are provided in Appendix C.

The most active RPOs are:

- Cross Plains Rural Transportation Council (Wichita Falls District).
- Capital Area Regional Transportation Planning Organization (Austin District).
- Brazos Valley Regional Planning Organization (Bryan District).
- Alamo Regional Rural Planning Organization (San Antonio District).

Non-Metro Areas Outside MPO Boundaries

Figure 15 presents the current MPOs (shaded) and their planning boundaries. The counties depicted in white in Figure 15 are the non-metropolitan areas of the state, and are the counties where a rural planning framework would apply.

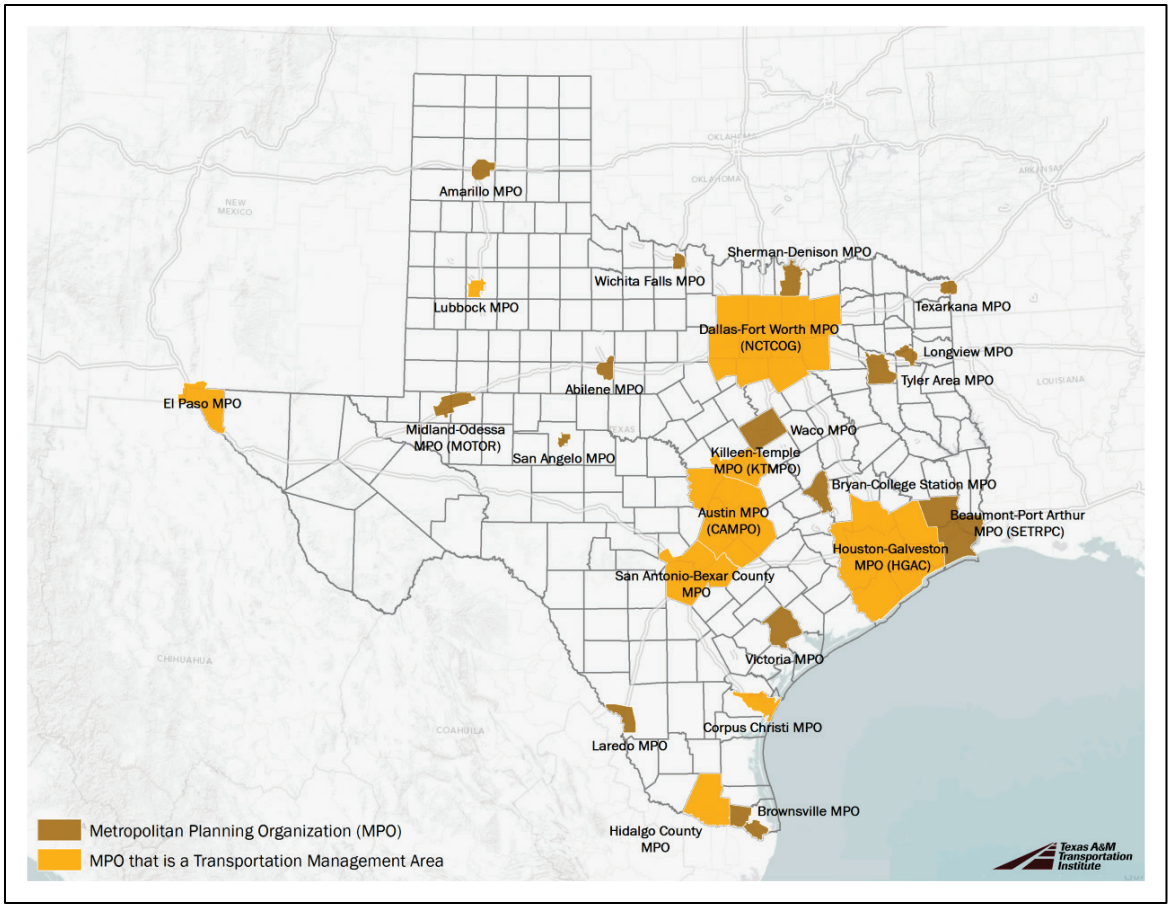


Figure 15. MPOs and Boundaries.

Statewide Transportation Planning and Programming Documents

TxDOT prepares transportation planning and programming documents that are the cornerstones for the performance based framework for rural transportation planning. In addition to consistency with MAP-21 requirements, the rural framework is intended to be consistent with existing plans developed by TxDOT for statewide long range planning and programming. The primary guiding documents include:

- *Texas Transportation Plan 2040*: the statewide LRTP (*65*).
- *TxDOT's Strategic 5-Year Plan.*
- *Texas Rural Transportation Plan (2012)* (*66*).
- *Unified Transportation Program 2015* (*67*).

Texas Rural Transportation Plan

TRTP is the rural component of the Statewide Long Range Transportation Plan 2035. The TRTP defines "rural" as any area outside of MPO boundaries. As part of the SLRTP, the TRTP is a blueprint for the planning process in the rural areas that will guide the collaborative efforts between TxDOT, local, and regional decision makers, and all transportation stakeholders to

reach a consensus on needed transportation projects and services through 2035. It is a standalone document, fully consistent with the SLRTP.

Rural transportation needs tend to be different than the transportation needs encountered in urbanized areas. The TRTP includes an analysis of rural transportation needs for both highways and non-automobile/non-highway modes, which provides for a more consistent approach to statewide multi-modal planning, and presents a more complete analysis of rural transportation.

The TRTP will provide an objective basis for the TxDOT districts to begin project planning when planning funds become available. In addition, the TRTP presents needs for rural non-highway transportation across the state. The TRTP can be found at: http://ftp.dot.state.tx.us/pub/txdot-info/tpp/rural_2035/report/final_0612/adopted_trtp.pdf.

Unified Transportation Program

TTC and TxDOT use the UTP as TxDOT's 10-year plan to guide transportation project development. The UTP is developed annually in accordance with the Texas Administrative Code (TAC §16.105) and is approved by TTC annually prior to August 31. The UTP authorizes projects for construction, development and planning activities and includes projects involving highways, aviation, public transportation, and state and coastal waterways.

The UTP is an intermediate programming document linking the planning activities of the Statewide Long-Range Transportation Plan, the Metropolitan Transportation Plans, and Rural Transportation Plans to the detailed programming activities under the STIP and TxDOT's 24-month (2-year) letting schedule.

Specifically, the UTP is a listing of projects and programs that are planned to be constructed and/or developed within the first 10 years of the 24-year SLRTP. Project development includes activities such as preliminary engineering work, environmental analysis, right-of-way acquisition and design. Despite its importance to TxDOT as a planning and programming tool, the UTP is neither a budget nor a guarantee that projects will or can be built. However, it is a critical tool in guiding transportation project development within the long-term planning context. In addition, it serves as a communication tool for stakeholders and the public in understanding the project development commitments TxDOT is making.

The TAC §16.105.b.2.F states, "the UTP will list all projects and programs that the department intends to develop, or on which the department intends to initiate construction or maintenance, during the UTP period, and the applicable funding category to which a project or program is assigned, after consideration of *the recommendations of rural planning organizations (RPO)* as provided in this subchapter."

Rural Area Projects in the UTP

The UTP contains 12 project funding categories, each with its own allocation formula and approval process. Five of these categories pertain to rural area project selection. Further details on all aspects of the UTP can be found in the 2015 UTP published on the TxDOT website. Table 11 describes the rural UTP funding categories.

Table 11. Rural UTP Funding Categories.

Most Common Rural Funding UTP Categories	UTP Project Selection Used
1. Preventive Maintenance and Rehabilitation	Projects selected by districts. TTC allocates funds through a formula allocation program.
4. Statewide Connectivity	Selections based on engineering analysis of projects on three corridor types: • Mobility corridors—based on congestion. • Connectivity corridors—two-lane roadways requiring upgrade to four-lane divided roadways. • Strategic corridors—strategic corridor additions to the state highway network.
6. Structures Replacement and Rehabilitation Bridge Program, Railroad Grade Separation Program	Projects selected by the Bridge Division based on a listing of eligible bridges prioritized first by Deficiency Categorization: Structurally Deficient, followed by Functionally Obsolete, and then by Sufficiency Ratings. TTC allocates funds through the Statewide Allocation Program.
8. Safety - Federal HSIP, Federal Railway-Highway Crossing Program, Safety Bond Program	Projects selected statewide by federally mandated safety indices and prioritized listing. High Risk Rural Roads projects previously authorized remain in Category 8. Future High Risk Rural Roads projects will be managed under the HSIP if required by special rule. TTC allocates funds through the Statewide Allocation Program.
11. District Discretionary	Projects selected by districts. TTC allocates funds through a formula allocation program. A minimum $2.5 million allocation goes to each district per legislative mandate.

UTP Project Ranking Process

To facilitate the project selection process, a project ranking tool was developed by TxDOT to collect data and receive input from each TxDOT district. This tool is made available to all TxDOT districts and divisions directly involved with programming specific projects. As appropriate, TxDOT district staff coordinates with local stakeholders to gather information pertinent to the scoring. Data from TxDOT's Design and Construction Information System, TxDOT geospatial data sets, and input from TxDOT district/division staff are used to score each applicable project. The scores relate to the following criteria:

- Funding Availability (33 points).
- Project Development (34 points).
- TxDOT's Strategic Goals (33 points).

The scores for these three criteria are summed for a total possible score of 100. Each criterion is sub-divided into various parts with detailed sub-criteria that tally points to the category score. For example, the score for Funding Availability depends on the percentage of funding available at the time of inclusion in the UTP. A higher percentage (e.g., 90 percent) will give a project a higher score closer to the 33 available.

Modal Transportation Plans

This framework recognizes the additional statewide plans for other modes that may play a role in rural performance planning. These include:

- **Texas Freight Mobility Plan –** Goals include: safe and reliable movement of freight; defining policies/investments to enhance freight transportation, and establish process to inform stakeholders and decision makers.
- **Texas Rail Plan** – Investment program for freight and passenger rail (long-term planning effort).
- **Texas Airport System Plan** – Strategies to maximize investments for aviation capital improvements.
- **Texas Ports Capital Program** – Funding requests and economic development projects.

Texas House Bill 20 Overview

House Bill 20 enacted in 2015 by the 84th Texas Legislature requires TxDOT to develop and implement a PBPP process. This process is to be used by the state executive and legislative branches to evaluate how well TxDOT is achieving their established goals and objectives, and to establish a framework to ensure that funding is distributed in an objective, fair, and transparent manner.

This legislation requires performance measures and metrics to be used:

1. In the review of strategic planning in the statewide transportation plan, rural transportation plans, and unified transportation program.
2. To evaluate the process used for the selection of all projects included in the unified transportation program and STIP.
3. To evaluate the project delivery for projects in TxDOT's letting schedule.

Additionally, the measures and metrics developed will be used to continually monitor and assess the performance of the state transportation system and to evaluate the effectiveness of individual projects to support the established goals and objectives.

Local transportation agencies, including MPOs and RPOs, are required to develop and submit to TxDOT funding prioritization guidelines that include project timeframes, project readiness, project viability and sustainability, and the local criteria used to reflect the goals of each area. Prioritization of projects should include short-term and long-term projects and focus on those already in an approved transportation plan. Each local planning agency is also charged with considering the criteria established by TTC.

Implications of HB 20 for Rural Performance Based Planning

The legislation outlines requirements that impact the framework and process for rural performance based planning. These are highlighted below.

- Implementation of performance measures and metrics in counties/county parts outside of designated MPO boundaries will be handled by the TxDOT district that serves those counties.
- Projects to be included in the performance based process include only connectivity or new capacity roadway projects. Projects not included are those related to safety, bridges, federal discretionary actions, maintenance, and preservation.
- Districts with or without an established RPO must develop a 10-year transportation plan that covers the funding allocated to the region, in this case the TxDOT district. The first four years of the plan will meet the requirements for development of the state transportation improvement plan.
- For areas outside of MPO boundaries, TxDOT districts will develop the 10-year transportation plan based on input from municipal and county elected officials or other transportation officials within the area.
- Project recommendation criteria will be developed locally (by districts) but must include:
    - Projected improvements to congestion and safety.
    - Projected effects on economic development opportunities.
    - Available funding.
    - Estimates of environmental impacts, including air quality.
    - Estimates of the socioeconomic impacts, including adverse health or environmental impacts on minority and/or low-income areas.
    - Other factors appropriate for the area.
- Performance criteria should support the statewide strategic goals.
- Locally selected projects that require financial assistance from TTC will be subject to the performance based process and scoring criteria established by TTC. As a result, development of local criteria should consider/reflect the process and scoring established by the Commission.

CURRENT PERFORMANCE PLANNING AT TXDOT

TxDOT, like many other state DOTs, is in varying stages of implementing performance measures. Performance based planning is not new to TxDOT. Many elements of the transportation project development process already include performance measurement and monitoring. To support the framework for rural transportation planning, researchers examined TxDOT Divisions and programs that currently collect and maintain transportation system performance data. Provided below are summaries of current practices for: safety, rural transit, freight, and rural mobility.

In response to the new requirements of MAP-21, TxDOT is taking steps to prepare for performance-based planning. MAP-21 requires states to establish performance targets for the new national measures and report on the condition and performance of NHS and progress in achieving performance targets. The act also requires the statewide and nonmetropolitan

transportation plans to include a description of the performance measures and targets as well as a system performance report.

TxDOT partnered with the Texas Association of Metropolitan Planning Organizations (TEMPO) to monitor the following set of preliminary performance measures for the Texas transportation system to be used by decision makers at the national, state, and local levels. Table 12 shows those preliminary performance measures and the goal areas they are aligned with.

Table 12. Preliminary Performance Measures Monitored by TxDOT and TEMPO and Aligned with MAP-21 Goals.

Goal Areas	Measures
Safety	• Fatality Rate • Number of Fatalities • Serious Injury Rate • Number of Serious Injuries
Freight	• Annual Hours of Truck Delay • Truck Reliability Index
National Highway System Performance	• Annual Hours of Delay—NHS • Annual Hours of Delay—Interstates • Annual Hours of Delay—Non-interstate NHS • Reliability Index—NHS • Reliability Index—Interstates • Reliability Index—Non-interstate NHS
Transit Condition	• Transit Fleet SGR
Bridge Condition	• Structurally Deficient Deck Area Bridges • Bridges with Cyclic Maintenance Needs • Bridges with Preventative Maintenance Needs • Bridges with Rehabilitation or Replacement Needs
Pavement Condition	• Interstate Pavement Condition • Non-interstate NHS Pavement Condition

TxDOT and TEMPO have also endorsed this set of proposed national measures for use in Texas transportation planning efforts (*68*).

Proposed Statewide Performance Measures

Table 13 lists the statewide performance measures identified in the Texas 2040 Plan.

Table 13. Texas 2040 Statewide Performance Measures.

Emphasis Area	Texas 2040 Statewide Performance Measure
Safety	Fatality Rate (5-year moving average)
	Number of Fatalities (5-year moving average)
	Serious Injury Rate (5-year moving average)
	Number of Serious Injuries (5-year moving average
Pavement	Interstate Pavement in Good Condition (IRI <95)
	Interstate Pavement in Fair Condition (IRI 95–170)
	Interstate Pavement in Poor Condition (IRI >170)
	Non-Interstate NHS Pavement in Good Condition (IRI <95)
	Non-Interstate NHS Pavement in Fair Condition (IRI 95–170)
	Non-Interstate NHS Pavement in Poor Condition (IRI > 170)
Bridges	% Structurally Deficient Deck Area on NHS Bridges- based on total NHS Deck Area
	% Structurally Deficient Deck Area on non-NHS Bridges- based on total non-NHS Deck Area
	Count of Bridges (Entire Inventory) with Cyclic Maintenance Needs
	% Bridges (Entire Inventory) by Deck Area with Cyclic Maintenance Needs
	Count of Bridges (Entire Inventory) with Preventative Maintenance Needs
	% Bridges (Entire Inventory) by Deck Area with Preventative Maintenance Needs
	Count of Bridges (Entire Inventory) with Rehabilitation or Replacement Needs
	% Bridges (Entire Inventory) by Deck Area with Rehabilitation or Replacement Needs
Freight	Annual Hours of Truck Delay - Interstates (millions)
	Truck Reliability Index
Congestion	Annual Hours of Delay - NHS (millions)
	Annual Hours of Delay - Interstates (millions)
	Annual Hours of Delay - Non-Interstate NHS
	Reliability Index - NHS
	Reliability Index - Interstates
	Reliability Index - Non-Interstate NHS
Transit	SGR average condition. 1 = Bad, 2 = Poor, 3 = Fair, 4 = Good, 5 = Excellent.

Safety Performance Planning

A common goal of SLRTP and TRTP is to maintain a safe system. Generally, rural transportation needs are different from the transportation needs encountered in urbanized areas. While the SLRTP identified capacity needs for many rural highways, capacity is usually not the primary issue as compared with urban areas (*69*). The impact of traffic growth in rural areas creates safety concerns. In TRTP, stakeholders have overwhelmingly indicated that safety (specifically passing on rural highways) is one of their top concerns, particularly given the intermittent high volume of truck traffic. According to FHWA rural planning report, transportation safety is a challenge that should be one of the highest priorities for those developing rural transportation plans (*70*).

Rural Safety Goals

TxDOT has identified statewide safety goals in the *2014 Texas Strategic Highway Safety Plan* (SHSP). The SHSP goals focus on reducing fatal and incapacitating injury crashes in 15 emphasis areas, including the following:

- Run-off-road crashes.
- Head-on crashes.
- Speed-related crashes.

According to the SHSP, TxDOT supports the national "Toward Zero Deaths" strategy and seeks to achieve a reduction in fatal crashes on a year-to-year basis. In years where that primary goal cannot be achieved, TxDOT's secondary goal is to reduce fatal crashes by 2 percent or an amount that is less than the nationwide average. The SHSP also specifies countermeasures that are recommended to address crashes in the various emphasis areas. Some countermeasures for the three previously-listed emphasis areas include:

- Increase the use of paved shoulders on FM roads.
- Continue to install shoulder and centerline rumble strips.
- Install more pavement width to accommodate marked edgelines.
- Provide progressive levels of treatment for curves based on crash experience, including chevrons, speed-activated curve warning devices, and high-friction surface treatments.
- Use the 30-degree Safety Edge on pavement edges.
- Remove, relocate, or protect roadside fixed objects.
- Install concrete and cable median barriers.
- Install passing lanes.
- Widen roads to increase control and recovery areas.
- Conduct speed studies on roads with poor geometrics.
- Use speed-activated feedback or warning signs to increase speed limit compliance.
- Continue to use the Selective Traffic Enforcement Program (STEP) to deter speeding.

In the TRTP, numerous proposed added-capacity highway projects across the state were evaluated and ranked. The ranking was done based on stakeholder and public input, and based on a technical approach involving the use of a tool that ranked 650 projects based on congestion and connectivity criteria. The TRTP indicates that the project rankings do not necessarily indicate their priority for funding or construction, as additional local factors that are not included in the ranking process may need to be considered for prioritization decisions.

On the federal level, the MAP-21 law includes safety directives for the state DOTs. These directives include developing a SHSP, in which a list of high-risk rural roads (HRRRs) is to be identified for funding priority. TxDOT's current TRTP pre-dates MAP-21 and does not contain a HRRR list, but one is anticipated for the next update of the TRTP. Hence, agencies like TxDOT districts and RTPOs will need tools and resources to develop the list of HRRRs, to incorporate safety into the ranking of proposed highway projects, and to prioritize rural highway projects in light of expected safety benefits.

TxDOT Practices

Since the publication of the first edition of the *Highway Safety Manual* (HSM), there has been increased focus on incorporating safety performance into the project development process (*71*).

In TxDOT Research Project 0-4703, guidance was developed on specific methods that could be used to incorporate safety into TxDOT's project development process (*72*). These methods were described in terms of opportunities that occur within the project development process to conduct quantitative analyses to determine the expected crash frequency of a roadway facility.

Incorporating Safety into the Project Development Process

Chapters 4–9 of the HSM provide a roadway safety management process that consists of the following steps:

1. Network screening – conducting an analysis of the roadway network to identify sites (segments or intersections) that would most benefit from safety treatments.
2. Diagnosis – analyzing sites to determine the causes and potential solutions for crash patterns.
3. Select countermeasures – selecting changes in geometry, traffic control, or other roadway characteristics that would improve safety performance by reducing frequency and/or severity of crashes.
4. Economic appraisal – computing economic benefits and costs associated with the selected countermeasures.
5. Prioritize projects – determining which of many proposed projects should be funded.
6. Safety effectiveness evaluation – monitoring the effectiveness of safety treatments.

These steps represent an ongoing, cyclical process, where safety performance becomes a key element in ranking and prioritizing roadway projects, along with considerations of capacity, connectivity, cost, and environmental and community impacts.

The most important issue transportation agencies face when considering performance measures in transportation planning is data availability (*73*). Table 14 illustrates various data sets and sources within TxDOT that rural planning agencies can use for developing a safety performance measure to quantify the potential safety benefit of a proposed roadway projects.

Table 14. Key Existing Resources for Assessing the Safety Performance Measures.

Performance Measure	Data Source (click on source name to access database)	Responsible TxDOT Unit
Crashes	Crash Records Information System® (CRIS)	Traffic Operations Division
Crash Rate	CRIS and Roadway/highway inventory network (RHiNO) (*74*)	Traffic Operations Division, Transportation Planning and Programming Division
Change in Fatality Rate	Crash Statistics	Traffic Operations Division
Bicycle/pedestrian Crashes	Crash Statistics	Traffic Operations Division
Rail Crossing Crashes	CRIS	Traffic Operations Division
DUI (Alcohol) Related Fatalities	Crash Statistics	Traffic Operations Division
Crash Reduction Factor[1]	HSIP	Traffic Operations Division
Cost of a crash	HSIP	Traffic Operations Division

TxDOT's Traffic Operations Division is responsible for the collection and analysis of crash data submitted by law enforcement. It maintains a statewide-automated database for all reported motor vehicle traffic crashes received by TxDOT. Summary reports of various data collected from reportable motor vehicle traffic crashes are published annually. These Texas Motor Vehicle Crash Statistics reports are available for download (*75*). Statistics contained in these reports are generated from data provided by TxDOT's CRIS (*76*).

Another critical dataset is RHiNO, which is maintained by the Transportation Planning and Programming Division to support planning and other functions at TxDOT (*77*). Currently, the RHiNO dataset includes 137 attributes for all public roadways in the state. Example of attributes that can be related to safety performance measures are:

- Highway status and type.
- Functional class.
- AADT for the previous 10 years.
- Truck percentage.
- Urban/rural status.
- Shoulder width.
- Median width.
- ROW width.
- Roadbed width.
- Posted speed limit.
- Surface type and characteristics.
- Load limits.

[1] The reduction factor represents the percentage reduction in crash costs or severity that can be expected as a result of the safety improvement.

The Texas HSIP includes a safety construction program known as the Hazard Elimination (HES) program. The HES program focuses on construction and operational improvements for locations both on and off the state highway system. The HES program is administered by Traffic Operations Division. Each eligible proposed highway safety project is subjected to a benefit-cost analysis using a formula called Safety Improvement Index (SII). The data necessary to calculate each project's SII are provided with HSIP call and are available to all the districts. The crash reduction factor and cost of crash is a dataset that can be used for developing a safety performance measure.

To quantify the potential safety benefit of a proposed roadway project, it is necessary to compute the expected crash frequency of the roadway facility in its current condition and following completion of the proposed project. Crash frequency is computed using safety prediction models like those in Chapters 10-12 and 18-19 of the HSM, which were developed in national research projects; or in the *Roadway Safety Design Workbook*, which was developed in TxDOT Research Project 0-4703. Application of these models requires knowledge of roadway traffic volumes and geometric characteristics, which can be obtained from TxDOT's RHiNO database.

The model estimates can be refined by using crash data from TxDOT's CRIS database. Additionally, a focused examination of run-off-road crashes was conducted in TxDOT Research Project 0-6031, and models were developed to predict these types of crashes (*78*), Safety prediction models were developed in TxDOT Research Project 0-6714 that focus on horizontal curves and incorporate the safety influence of pavement friction (*79*). Models from these three projects can be applied to examine the safety performance of rural highways from multiple perspectives using predictive safety analysis.

Another method for identifying roadway segments for possible safety improvement is that of systemic analysis. The systemic analysis method does not require the use of crash data to identify roadway segments that have elevated risk, so it allows analysts to identify candidate segments for safety treatment in a more proactive manner, and can be applied more easily to parts of the roadway network that are lower in volume and crash frequency, such as county roads. Geedipally et al. have documented a systemic approach for TxDOT's roadway widening efforts, which applies to run-off-road and head-on crashes and accounts for the key variables of lane width, shoulder width, truck percentage, and curvature (*80*).

Bridge and Pavement Performance Planning

In August 2001, TxDOT adopted the following goals for bridge and pavement performance:

- Pavements: 90 percent of the state-maintained pavement lane-miles would be in "good or better" condition by 2012.
- Bridges: 80 percent of on-system and off-system bridges in Texas would be in good or better condition by 2012.

These performance goals are used in TxDOT's 2015–2019 Strategic Plan, among other performance goals for safety, congestion reduction, etc. Table 15 shows the performance measures, targets, and metrics for these goals. For pavements, the term "good or better" is defined based on the CS metric. CS is a computed index that describes the pavement's overall

condition in terms of both distress and ride quality combined. CS ranges from 1 (worst) to 100 (best). For bridges, the term "good or better" is defined based on bridges that are rated as not structurally deficient, not functionally obsolete, and not substandard for legal load.

Table 15. Measures, Metrics, and Targets for TxDOT's Pavement and Bridge Performance.

Performance Measure	Target for Performance Measure	Metrics for Defining Performance Measures	Threshold for Metric
Percentage of on-system Pavement Lane-Miles in Good or Better Condition	90% or more	• CS	70
Percentage of Bridges (both on-system and off-system) in Good or Better Condition	80% or more	• Structurally deficient (SD) • Functionally obsolete (FO) • Sub-standard for load only (SSLO)	Not SD, FO, or SSLO

Key resources for assessing the performance of TxDOT's pavement and bridge networks according to the above criteria are shown in Table 16. These resources include extensive data and regularly-updated reports on the conditions of Texas pavements and bridges. While these condition reports are not specific to rural areas, they can be used to support performance monitoring and asset management planning in rural areas. Two examples of how performance information can be gleaned from these resources for rural areas are provided next.

Table 16. Key Resources for Assessing the Condition of TxDOT's Pavements and Bridges.

Asset Class	Condition Report	Data Source	Responsible TxDOT Unit
Pavement	Condition of Texas Pavements (Annual)	Pavement Management Information System (PMIS)	Maintenance Division, Pavement Preservation Branch
Bridge	Report on Texas Bridges (Biennial)	Bridge Inspection Database	Bridge Division

Example 1: Table 17 compares the condition of Texas pavements in rural areas to the statewide conditions in FY 2014 based on CS. Rural is defined here as roadway sections located outside of Metropolitan Planning Organization boundaries.

Table 17. Performance of Texas Pavements in FY 2014 Based on CS*.

Area	Highway System	Lane-Miles	%Lane-Miles Good or Better (CS ≥ 70)	%Lane-Miles Fair (50> CS >69)	%Lane-Miles Poor (1> CS >49)
Rural	NHS	28,686	90 %	7 %	3 %
	Non-NHS	94,957	90%	7%	3%
Statewide	NHS	59,049	87%	8%	5%
	Non-NHS	115,989	89%	8%	3%

*Target: 90% of lane-miles are in good or better condition (i.e., CS ≥ 70).

Example 2: TxDOT has no formal performance target and no formal thresholds for the IRI. However, IRI is one of the performance metrics used in MAP-21 and is measured annually for TxDOT's entire pavement network. In this example, IRI data from 2014 were obtained from the PMIS database and evaluated to compare the performance of the system in rural areas to that at the statewide level, as shown in Table 18. Similar to Example 1, rural is defined as roadway sections located outside of MPO boundaries. The IRI threshold values proposed in MAP-21 rules were used in this analysis.

Table 18. Performance of Texas Pavements in FY 2014 Based on IRI*.

Area	Highway System	Lane-Miles	%Lane-Miles Good or Better (IRI: 95 in/mi)	%Lane-Miles Fair (IRI: 95-170 in/mi)	%Lane-Miles Poor (IRI > 170 in/mi)
Rural	NHS	28,686	68%	30%	2%
	Non-NHS	94,957	23%	63%	14%
Statewide	NHS	59,049	59%	37%	4%
	Non-NHS	115,989	26%	61 %	13 %

*No performance target is set by TxDOT based on IRI.

The above analysis suggests that the statewide performance measures, targets, and metrics with respect to pavement and bridge condition appear to be applicable to rural areas.

Asset Management and Performance Goals/Assessment

As discussed in the previous section, the performance goals for pavements and bridges are set based on a limited number of metrics that describe the current condition of these assets (i.e., CS for pavements and structurally deficient, functionally obsolete, and substandard for load for bridges). However, past research suggests that infrastructure projects are prioritized and selected based on multiple factors (e.g., traffic volume, functional condition, structural condition, and cost). This discrepancy shows a disconnect between the performance assessment goals/process and the asset management process (i.e., the process in which infrastructure projects are prioritized, selected, and programmed).

In general, asset management plans are developed and implemented in three stages:

- First, needed projects are identified based on the current conditions of the assets.
- Second, competing projects are prioritized and ultimately a group of these projects is selected considering multiple factors.
- Third, selected projects are programmed for implementation.

Asset management plans and performance assessment/goals appear to be in harmony at the stage of identifying needed projects (i.e., both processes are based on the assets current condition). However, a disconnect exists between these two processes at the project prioritization and selection stage.

Past TxDOT research (specifically Projects 0-6683 and 0-6386) found that pavement projects are prioritized and selected considering multiple factors that are deemed important by TxDOT's districts. These factors and their importance weights were identified using a survey of TxDOT's districts (conducted under Project 0-6683). Table 19 shows these factors and their influence on project identification, project prioritization, and system performance assessment/goal. Table 20 illustrates the importance weights given to these factors by TxDOT's districts, delineated by district type (rural, urban, and metro).

Table 19. Factors Considered in Pavement Asset Management and Performance Assessment at TxDOT.

Category of Factors	Specific Factor	Considered in Project Identification?	Considered in Project Prioritization?	Considered in Performance Assessment?	
				Current Practice	MAP-21
Asset Current Condition	CS	Yes	Yes	Yes	No
	Roughness	Yes	Yes	No	Yes
	Distress Score	Yes	Yes	No	Yes*
	Skid Resistance	Yes	Yes	No	No
	Rate of Deterioration	Yes	Yes	No	No
	Structural Evaluation	Yes	Yes	No	No
	Visual Assessment by District Staff	Yes	Yes	No	No
Traffic Volume	AADT	No	Yes	No	No
	Truck AADT	No	Yes	No	No
Costs and Benefits	Project Initial Cost	No	Yes	No	No
	Life-Cycle Cost	No	Yes	No	No
	Long-term Performance	No	Yes	No	No

*Through individual distress types (cracking, rutting, and faulting)

Table 20. Importance Weights for Factors Considered in Pavement Project Prioritization and Selection (from TxDOT Project 0-6683).

Category of Factors	Specific Factor	Metro Districts	Urban Districts	Rural Districts
Asset Current Condition	CS	2.6	5.7	6.8
	Roughness	1-1.1	1.4-1.6	1.9
	Distress Score	2.9	6.8	6.2
	Skid Resistance	4.3-4.6	3.0	4.3-6.5
	Rate of Deterioration	2.7-2.9	3.5-3.8	4.0-4.3
	Structural Evaluation	1.6	3.2	3.4
	Visual Assessment by District Staff	3.2-5.2	10.3-11.9	10.5-12.1
Traffic Volume	AADT	7.3	4.1	5.8
	Truck AADT	14.7	12.9	12.2
Costs and Long-term Performance	Project Initial Cost	22	28	19
	Life-Cycle Cost	16	13	14
	Long-term Performance	24	15	18

Rural Transit Performance Planning

Rural public transportation in Texas is provided by rural transit districts (RTDs) created according to Texas Transportation Code Chapter 458. An RTD is a subdivision of the state that provides and coordinates rural public transportation in its territory. The earliest RTDs began operations in 1980. Today there are 38 RTDs. The RTDs serve rural and urban areas with populations under 50,000. Rural transit operators rely upon federal and state revenues to fund capital and operating expenses. Additional local funds are generated from contract services and support from county and municipal governments.

In the transit industry, performance measures are established to capture key operational, financial and safety characteristics. Through continual data collection and periodically performance assessment, transit providers can monitor the completeness of goals and objectives set in planning documents to improve services.

Rural transit providers differ from urban transit providers because rural providers operate limited transit modes in wide geographic areas with less than 50,000 population. Generally, rural providers:

- Face increasing demands resulting from the aging Baby Boomer generation and post-retirement population shifts.
- Are challenged by decreasing population density in most rural areas.
- Have insufficient funding and tend to focus on maintaining an aging fleet in roadworthy condition to meet service demands.

Performance Measures in Rural Transit Planning

On June 28, 2012, TTC adopted the TRTP 2035 as a component of the Statewide Long-Range Transportation Plan 2035, which was required under Title 23, U.S.C., Section 135 – Statewide Transportation Planning. The TRTP 2035 stated that 24 state planning regions coordinated with the 38 RTDs to update the Regional Public Transportation Coordination Plans during 2011–2012. It was the first time that several SPRs, such as Central Texas SPR and Golden Crescent SPR, incorporated performance measures into their plans to gauge the achievement of goals and objectives.

The Texas Transportation Plan 2040, serving as the latest TxDOT long term plan, was adopted by the TTC on February 26, 2015. The Texas Transportation Plan 2040 is a performance-based plan, reflecting TxDOT's preliminary reaction to the pending rules of the USDOT on national transportation performance management requirements. TxDOT and the Texas Association of Metropolitan Planning Organization jointly developed a preliminary set of performance measures for six areas including transit condition. The performance measure for transit condition is called "transit fleet state of good repair" rating from 1 to 5, bad to excellent. This measure reflects the SGR performance for the TxDOT-funded small urban, rural, and elderly and disabled programs transit fleet. The measure will be adapted when the final federal rulemaking on national performance measures is available.

Rural Transit Performance Data Collection

Typically, rural transit providers in Texas collect operational and financial data to meet reporting requirements of FTA, TxDOT, and other funding agencies. For those agencies operating coordinated services, they may be required to report to the coordinated human service agencies. These reporting requirements, especially from the FTA's NTD and TxDOT's Public Transportation Division (PTN)-128 system, clearly define transit modes and performance data and set a consistent framework for performance measures calculation. The PTN-128 data are applied more frequently by the TxDOT and rural transit agencies in Texas for funding allocation and periodically performance review.

Rural National Transit Database

Rural transit providers that receive the Federal Section 5311 Other than Urbanized Area Formula Program funds are required to report operating and financial data to the FTA through the NTD. Title 49 U.S. Code 5311 (b)(4), as amended by the MAP-21, specifies the legislative requirements of the NTD reporting for Section 5311 recipients and beneficiaries, as follows:

> (4) Data collection.— Each recipient under this section shall submit an annual report to the Secretary containing information on capital investment, operations, and service provided with funds received under this section, including—
>
> (A) Total annual revenue;
>
> (B) Sources of revenue;
>
> (C) Total annual operating costs;
>
> (D) Total annual capital costs;
>
> (E) Fleet size and type, and related facilities;

(F) Vehicle revenue miles; and
(G) Ridership.

PTN-128 System

The TxDOT Public Transportation Division, in partnership with TTI, developed a web-based PTN-128 system to collect financial and operating data of state-funded urban and rural transit districts, large urban transit agencies and specialized transportation agencies. Data collected through the PTN-128 system include actual vehicle hours and revenue hours, actual vehicle miles and revenue miles, unlinked passengers trips, detailed revenue sources, operating costs by function and capital costs and vehicles in the fleet.

TxDOT reports to the Rural NTD on behalf of the RTDs that are not part of an agency that also operates urban transit. The PTN-128 system can automatically generate the funding amounts applied to operating and the amounts applied to capital, of which both are required fields in the NTD reporting form RU-20.

Performance Measures in Funding Allocation

The TxDOT PTN receives the FTA Section 5311 apportionment as a direct recipient, and allocates 83.15 percent of funds to rural areas based on land area and population and the remaining 16.85 percent according to land area, low-income population and revenue miles. In addition, TxDOT PTN is responsible for allocating state funding for RTDs using the Texas Performance-Based Funding Formula. The formula allocates 65 percent of state funding for needs and 35 percent for performance incentives. Performance measures built into the formula include local funds per operating expense, revenue miles per expense and passengers per revenue miles; weighted 33 percent.

Recommended Rural Performance Measures

Currently, rural transit providers in Texas tend to select performance measures tailoring to the agency's specific goals and objectives. Although a consistent performance data source is available for calculating measures, there is no consistent framework for defining and calculating performance measures among rural transit agencies in Texas. Besides, performance measures among typical rural modes, such as fixed-route and demand-response transit, are not always calculated in the same manner.

Researchers provided a list of common performance measures that are used for fixed-route and demand-response systems; and identified five key performance measures for rural transit providers in the report "A Toolkit for Reporting Rural and Specialized Transit Data." Key performance measures are:

- Passenger trips per revenue hour (total passenger trips ÷ total revenue hours).
- Operating cost per revenue hour (total operating cost ÷ total revenue hours).
- Operating cost per revenue mile (total operating cost ÷ total revenue miles).
- Operating cost per passenger trip (total operating cost ÷ total passenger trips).
- Fare recovery ratio (fare revenues ÷ operating expenses).

These five key performance measures can be applied to evaluate a rural transit system's effectiveness, cost-efficiency, cost-effectiveness, and financial independence.

Rural Transit Sources

Information about rural transit performance measures can be found in the following documents:

- Texas Transportation System Performance Results. http://www.txdot.gov/inside-txdot/office/state-affairs/preliminary-performance.html.
- A Toolkit for Reporting Rural and Specialized Transit Data. NCHRP Project 20-65 Task 28.
- Peer Grouping and Performance Measurement to Improve Rural and Urban Transit in Texas: http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/0-6205-1.pdf.

Rural Freight Planning Considerations for RTPOs

The most current comprehensive reference document regarding freight performance measures is National Cooperative Freight Research Project (NCFRP) 10: *Performance Measures for Freight Transportation* which was published in 2011 by the Transportation Research Board (TRB). This report gives an overview of the history of performance measurement in state DOTs and how they interact with MPOs and other planning agencies. The conclusions of this document point out that, currently, freight performance measure practices in states are relatively new and that each state's use of performance measures for freight seemed to vary greatly from others. NCFRP 10 stated (*81*):

> Although the research literature identified hundreds of potential freight performance measures, in practice the minority of states that have freight performance measures use only a handful. Mature performance measurement states such as Washington, Missouri, and Minnesota use between 5 and 10 measures. It was noticeable that no two states had the same measures, and in most cases there were wide differences in the metrics. Although states reported freight performance metrics, most of the metrics were not used to calibrate performance of specific state programs.

The report also points out that while there was little use of freight performance measures by states, that a number of both public and private sector sources for freight system performance were available. Accessing and using these sources is often difficult due to cost or confidentiality of the data, however, resulting in only nominal use. The report states (*82*):

> Much of this information exists as data within federal databases, as reports to federal regulatory agencies, and as published reports by private-sector companies such as railroads. A primary finding is that freight performance measurement is challenged both by an abundance of data and by a lack of complete data for many important freight system performance functions. Sorting and selecting from the voluminous available data sources is one daunting challenge. Closing data gaps is another.

NCFRP 10 includes examples of how freight performance measures in some public agencies have been instituted, but these are generally at the state and national level. GAO and US DOT has recommended improvements in the last few years in the way that states, and consequently MPOs and RTPOs, plan for and develop means to better track freight performance. Few, if any, of these address planning specifically in rural areas, although, freight corridors are generally longer and cross both urban and rural planning boundaries.

MAP-21 Freight Provisions Impacting RTPOs

When the short-term federal transportation authorization act known as MAP-21 was passed in 2012 several specific sections were included that directly dealt with the creation of a more robust national freight planning framework. As was stated earlier, freight planning is one of the specific areas laid out in guidance documents where RTPOs should be engaged. Several provisions of MAP-21 dealing with freight impacted rural freight planning, even though they were not focused exclusively on local/regional planning.

The creation of a National Freight Policy was required by MAP-21 Section 1115. Specific requirements of this section included the designation of a National Freight Network (NFN) as outlined in Section 1115(c), the ability for individual states to designate Critical Rural Freight Corridors (CRFCs) under specific conditions described in Section 1115(e), and the completion of a National Freight Strategic Plan (NFSP) required in Section 1115(f). Several difficulties with the provisions of MAP-21 such as a limitation to a maximum of 35,000 centerline miles total on the NFN made strict compliance to the law difficult and contentious. Subsequent updates to legislative requirements have changed those requirements as outlined in the next section.

FAST Act Changes to MAP-21 Freight Provisions Impacting RTPOs

The most recent federal transportation authorization act (passed in late 2015) known as the Fixing America's Surface Transportation Act or Public Law No. 114-94 repealed several MAP-21 freight planning provisions including the requirement to designate an NFN. Instead, the FAST Act requires that the FHWA Administrator instead establish a National Highway Freight Network (NHFN) upon which federal highway funding resources and policies related to freight can be focused (*83*) According to recent FHWA website information, the newly designated NHFN has the following four subsystems of roadways:

- **Primary Highway Freight System (PHFS):** Most critical highway sections as determined by both measurable and objective national data. This network is 41, 518 centerline miles including 37,436 centerline miles of interstate and 4,082 centerline miles of non-interstate roads.
- **Other Interstate portions not on the PHFS:** All other interstate road sections not included in the PHFS. Inclusion of these sections provides continuity and access to freight facilities. Currently, this subsystem is estimated at 9,511 centerline miles of interstate nationwide which will fluctuate with additions and deletions to the Interstate Highway System.
- **Critical Rural Freight Corridors (CRFCs):** These are public roads outside urbanized areas the provide access and connection to the PHFS and interstate networks as well as important ports, public transportation facilities, and other intermodal freight facilities.

- **Critical Urban Freight Corridors (CUFCs):** These are public roads within urbanized areas providing access and connection to the PHFS and interstate networks as well as other ports, public transportation facilities, or other intermodal transportation facilities.

Together, the current designated NHFN (PHFS plus other interstates) prior to adding designated CRFC and CUFCs therefore adds up to approximately 51,029 centerline miles nationally. FHWA states that in accordance with section 1116 of the FAST Act, "states and, in certain cases, Metropolitan Planning Organizations (MPOs)" are the entities responsible for designating roadways as CRFCs and CUFCs. State designation of CRFCs is limited to a maximum of 150 miles of highway or 20 percent of the PHFS mileage in the state, whichever is greater, while States and MPOs can designate up to 75 miles of highway or 10 percent of state PHFS mileage, whichever is greater (*83*). Final FHWA guidance on designation of CRFCs and CUFCs was released on April 27, 2016, outlining the process for identification, designation, and certification of these corridors (*84*).

Texas' Initial NHFN Locations

In Texas, the initial NHFN (without CRFC or CUFC designations) includes 3652.59 miles of PHFS corridor and 75.18 miles of intermodal connectors for a total of 3727.77 miles on the PHFS system. Table 21 lists the PHFS route locations and length in the state. Table 22 lists the designated intermodal connector locations and their length. An additional 95.01 miles of Interstates not on the PHFS also are included in the initial NHFN. Table 23 lists the non-PHFS Interstate sections that are also included in the initial NHFN.

Table 21. PHFS Route Locations in Texas as of May 2016.

PRIMARY HIGHWAY FREIGHT SYSTEM (PHFS) ROUTES				
State	**Route No**	**Start Point**	**End Point**	**Length (Miles)**
TX	Airway Blvd	TX44A	I10	1.19
TX	C1346	TX36L	I410	0.40
TX	C526	TX185P	I10	0.61
TX	Hawkins Blvd	TX49R	I10	1.63
TX	I10	NM/TX Line	U90/I35	573.43
TX	I10	I410	TX/LA Line	299.64
TX	I110	I10	S375	1.06
TX	I20	I10	TX/LA Line	636.66
TX	I27	I40	S289	124.72
TX	I30	I20	TX/AR Line	223.62
TX	I35	U83	I35E and I35W	368.44
TX	I35	I35E and I35W	TX/OK Line	36.43
TX	I35E	I35	I35	96.36
TX	I35W	I35	I35	85.11
TX	I37	U181	I410	134.58
TX	I40	NM/TX Line	TX/OK Line	177.14
TX	I410	I10	FM1976	10.22
TX	I410	I35	S536	13.60
TX	I45	S87	S366 S	286.30

PRIMARY HIGHWAY FREIGHT SYSTEM (PHFS) ROUTES				
State	**Route No**	**Start Point**	**End Point**	**Length (Miles)**
TX	I610	I10	I10	38.09
TX	I635	S161	I20	30.40
TX	I820	I30	S26	6.03
TX	N Dallas Tollway	I635	Spring Creek Pkwy	10.24
TX	Navigation Blvd	TX162P	S225	3.07
TX	Precinct Line	S121	S26	1.14
TX	S115	U281 S	U83	6.09
TX	S121	I820	S183	5.00
TX	S146	TX56P	S225	5.98
TX	S161	S183	I635	7.18
TX	S178	NM/TX Line	I10	3.31
TX	S183	S121	S161	6.30
TX	S183	TX111L	I35E	4.51
TX	S225	Navigation Blvd	S146	15.13
TX	S26	TX110L	Precinct Line	5.49
TX	S288	Airport Rd	U59	6.54
TX	S4	U77	S48	1.62
TX	S48	TX28P	S4	3.89
TX	S548 S	I45	Gulf Bank	16.50
TX	S552	U60	0.15 Miles West of U60	0.15
TX	U281	S107	E Garriella Ave	11.52
TX	U281 P	U281 S	TX/MX Line	1.07
TX	U287	I20	Kennedale Sublett Rd	2.25
TX	U290	I610	Barker Cypress Rd	17.81
TX	U57	MX/TX Line	I35	98.31
TX	U59	TX18A	I35	1.81
TX	U59	C2218	C1314	53.86
TX	U60	Ross St	I27	2.31
TX	U67	I20	Danieldale Rd	1.97
TX	U75	S366 S	Spring Creek Pkwy	19.84
TX	U77	MX/TX Line	I37	147.89
TX	U77 B	U77	U77	3.56
TX	U80	TX118R	I30	0.66
TX	U80	I635	S352	3.70
TX	U83	MX/TX Line	U77	0.89
TX	U83	S115	U77	35.03
TX	U90 A	TX167R	U59	2.32
Subtotal				**3652.59**

Table 22. Designated Intermodal Connectors in Texas as on May 2016.

PHFS INTERMODAL CONNECTORS				
State	**Facility ID**	**Facility Name**	**Facility Description**	**Length (Miles)**
TX	TX103L	GATX Terminals Corp.	Jefferson (Facility to SH 225).	1.53
TX	TX105L	Star Enterprise/Texaco	Quitman between the US 59 and Stevens [0.30 mi]; Stevens between Quitman and the terminal [0.05 mi].	0.29
TX	TX108A	Alliance Airport (Dallas-Ft Worth)	Harmon Rd between Westport and Terminal. . .	1.16
TX	TX110L	Diamond Shamrock Corp. Bulk Fuel Facility (DFW)	Brumlow Ave between the Facility and SH 26 (Colleyville Blvd).	0.26
TX	TX111L	Exxon Bulk Fuel Facility (DFW)	Carl Rd between the Facility and SH 183 (Airport Freeway).	0.47
TX	TX118R	Union Pacific Intermodal Facility (DFW)	South Parkway between US 80 and Forney [0.040 mi]; Forney between South Parkway and Sam Houston [1.172 mi]; Sam Houston between Forney and Terminal [0.409 mi].	0.98
TX	TX119R	Fort Worth Amtrak	St. Louis between (US 75) Central Expressway to IH 30. . .	0.19
TX	TX120R	Santa Fe Railway Intermodal Facility (DFW)	Westport Road between IH 35W to Terminal.	2.29
TX	TX12P	Port of Corpus Christi #1	Upriver Rd, beginning at IH-37 and FM 2292 (Morgan Mill Road) to the Citgo Plant.	7.02
TX	TX13P	Port of Corpus Christi #2	Corn Products Rd between IH-37 and the termini at Valero.	0.69
TX	TX14P	Port of Corpus Christi #3	Navigation Blvd between IH-37 and the Corpus Christi Public Elevator Terminal. . .	3.76
TX	TX153A	Dallas Love Field Airport	Mockingbird Ln between the Airport and I-35.	2.70
TX	TX15P	Port of Corpus Christi #4	Buddy Lawrence between IH-37 and the Termini at American Chrome and Chemical.	0.80
TX	TX162P	Houston Barge Terminal	Navigation Blvd between Engle and US90A (Wayside).	1.11
TX	TX164R	UPS Sweetwater Lane Facility, Houston	W Canino (IH 45 to Sweetwater Ln) [0.1 mi]; Sweetwater Ln (Terminal gate to W. Canino) [0.1 mi].	0.20
TX	TX165R	UPS Mykawa Road Facility, Houston	Mykawa Rd (IH 610 to Wayside).	1.32
TX	TX166R	Empire Truck Lines Container Yard, Houston	Wallisville Rd (IH 610 to Oates).	1.43
TX	TX167R	UPS Stafford Facility, Houston	Stafford Rd (US 90A to Ellis).	0.30

PHFS INTERMODAL CONNECTORS				
State	**Facility ID**	**Facility Name**	**Facility Description**	**Length (Miles)**
TX	TX168P	Bulk Materials Handling Plant	Penn City Rd (IH 10 FR to 3100 Block).	2.36
TX	TX16P	Port of Corpus Christi #5	Port Ave between IH-37 and US 181 the Termini at Corpus Christi Public Compress.	1.49
TX	TX170L	Shell Deer Park Chemical Plant & Refinery, Houston	Center Rd (Shell Oil to SH 225).	1.17
TX	TX174P	Care Terminal, Houston	Jacinto Port Blvd Between Beltway 8 to Terminal.	2.83
TX	TX185P	Richardson Steel Yard	Industrial Blvd between Federal and the Terminal.	2.42
TX	TX18A	Laredo International Airport	Bartlett St between Saunders St (US 59) and Maher Ave [0.111 mi]; Maher Ave between Bartlett St. and Pappas [0.4 mi].	0.52
TX	TX21R	Port of Laredo (Union Pacific RR)	I-35 Frontage Rd between Del Mar and the Facility/Test Track. . .	8.77
TX	TX25R	McAllen EC Dev. Corp. & Foreign Trade Zone	FM 1016 between Ware Rd and Spur 115.	1.02
TX	TX26A	McAllen Miller International Airport	Bicentennial Blvd between Jackson Ave @US 83 and the Airport.	0.90
TX	TX28P	Port of Brownsville	SH 48 between the Entrance to the Fishing Harbor and FM 511.	5.40
TX	TX33A	San Antonio International Airport	Airport Blvd between the Airport Terminal and I-410.	1.18
TX	TX34R	Southern Pacific (San Antonio)	Pine St between I-35 and Sherman [0.300 mi]; Sherman between Pine Street and the Terminal [0.360 mi].	0.77
TX	TX35L	Diamond Shamrock Terminal (San Antonio)	US 281 between the Terminal Entrance and I-410.	1.32
TX	TX36L	Koch Refining Company (San Antonio)	Pop Gunn between Houston and the Terminal Entrance.	0.24
TX	TX37L	Coastal States Terminal (San Antonio)	Boatman Rd between I-410 and the terminal Entrance.	0.36
TX	TX44A	El Paso International Airport	Terminal Dr between the Airport and Airway Blvd.	0.93
TX	TX49R	Southern Pacific RR Alfalfa Yard (El Paso)	Dodge Rd between SH 20 and FM 76.	0.57
TX	TX50L	Chevron Refinery (El Paso)	Trowbridge Dr between I-10 and FM 76.	1.81
TX	TX55P	Turning Basin Terminal (S Houston)	75th St between Navigation Blvd and the Terminal.	0.46
TX	TX56P	Bayport Terminal (Houston)	Port Rd between SH 146 and the Terminal. . .	0.68

PHFS INTERMODAL CONNECTORS				
State	**Facility ID**	**Facility Name**	**Facility Description**	**Length (Miles)**
TX	TX57P	Jacintoport Terminal (Houston)	South Sheldon Rd between I-10 and the Terminal. South Sheldon Rd between I-10 and the Terminal	1.97
TX	TX58P	Manchester Terminal Corp. (Houston)	Manchester between East Loop 610 and the Terminal	0.78
TX	TX70R	S.P. Houston Intermodal Hub	Lockwood between I-10 and Wallisville [0.875 mi]; Wallisville between Lockwood and the Terminal [0.15 mi].	1.07
TX	TX71R	U.P. Settegast Yard (Houston)	Kirkpatrick Blvd between the Terminal and I-610.	1.25
TX	TX72R	M.P. GMAC Yard	Hardy Rd between the Terminal and FM-1960 (Humble Westfield Rd).	1.27
TX	TX73A	Houston Intercontinental Airport	Served by Existing NHS Route.	7.13
Subtotal				**75.18**
PHFS Total				**3727.77**

Table 23. Non-PHFS Interstate Sections That Are Also Included in the Initial NHFN as of May 2016.

INTERSTATE NOT ON THE PHFS				
State	**Route No**	**Start Point**	**End Point**	**Length (Miles)**
TX	I10	I35	I410 (East)	8.37
TX	I110	MX/TX Line	0.02 Miles North of S375	0.06
TX	I35	U83	U81	0.13
TX	I37	I410 (South)	I35	9.24
TX	I410	I410 (West)	U281 (South)	24.53
TX	I410	S13	I35	2.19
TX	I44	0.08 Miles South of U277	TX/OK Line	15.27
TX	I635	S161	S121	6.55
TX	I820	I20 (West)	0.48 Miles West of I35W (North)	16.24
TX	I820	I35W (North)	S26	5.79
TX	I820	I30 (East)	I20 (East)	6.65
INTERSTATE NON-PHFS Total				**95.01**

Figure 16 is a December 2015 FHWA map of the initial NHFN routes in Texas (PHFS plus interstates only). As can be seen from this map, many of these initial designated NHFN miles fall within RTPO regions. As CRFCs are determined, the RTPOs should work with the state to make sure that any high priority or freight used roadways or connections to ports or intermodal freight facilities are included in the future CRFC designations/additions to the NHFN.

Figure 16. FHWA Map of Initial NHFN in Texas (December 2015).

Designation of Critical Rural Freight Corridors (CUFCs)

Given NHFN mileage designations of these lengths and their basis as a percentage of PHFS miles, Texas has an estimated maximum limit of 745.55 miles for CRFCs and 372.78 miles for CUFCs that it may designate in the upcoming months ([84]). FHWA guidance further states that such corridor designations be in compliance with the rules laid out in 23 USC 167(e) for CRFCs and 23 USC 167(f) for CUFCs. In the case of CRFCs, one or more of the following seven elements must apply to the corridor for it to be considered:

> (A) is a rural principal arterial roadway and has a minimum of 25 percent of the annual average daily traffic of the road measured in passenger vehicle equivalent units from trucks (Federal Highway Administration vehicle class 8 to 13);
> (B) provides access to energy exploration, development, installation, or production areas;
> (C) Connects the PHFS or the Interstate System to facilities that handle more than:
>
> 1. 50,000 20-foot equivalent units per year; or
> 2. 500,000 tons per year of bulk commodities;
>
> (D) Provides access to:
>
> 1. A grain elevator;
> 2. An agricultural facility;
> 3. A mining facility;
> 4. A forestry facility;
> 5. An intermodal facility;
>
> (E) Connects to an international port of entry;
> (F) Provides access to significant air, rail, water, or other freight facilities in the State; or
> (G) Is determined by the State to be vital to improving the efficient movement of freight of importance to the economy of the State.

FHWA guidance dictates that the State (in the case of CRFCs) must certify that the corridor meets one or more of these criteria, then submit the prescribed certification to the FHWA Division Office for review and forwarding to FHWA Headquarters within 10 days of receipt to have it added to the NHFN. The State, in providing its certification, should also indicate that the designated corridor(s) have been or how it will be added to the State's Freight Plan under 49 USC 70202(b) prior to the December 4, 2017, deadline to have the freight plan in place (*84*). Additional requirements for the certification to occur are described in the FHWA guidance. RTPOs are not specifically mentioned in the guidance, however, they should play a strong coordination role in helping State (i.e., TxDOT) personnel in determining such routes as certain FAST Act and potentially other future transportation authorization-based funding for freight improvements may be restricted to use only on NHFN designated routes.

Designation of the National Multimodal Freight Network (NMFN)

The FHWA guidance for CRFC and CUFC includes a discussion of the FAST Act requirement that the Under Secretary of Transportation for Policy establish an interim National Multimodal Freight Network by June 4, 2016, for a public comment period with designation of the final NMFN by December 4, 2016. The interim NMFN is required to include the following:

- The NHFN (including designated CRFCs and CUFCs).
- Freight rail systems of Class I railroads.
- Public ports of the United States that have total annual foreign and domestic trade of at least 2,000,000 short tons.
- Inland and intra-coastal waterways of the United States.
- The Great Lakes, the St. Lawrence Seaway, and coastal and ocean routes along which domestic freight is transported.
- The 50 airports located in the United States with the highest annual landed weight.
- Other strategic freight assets. (49 U.S.C. 70103(b) (2)) (*84*).

The FAST Act then requires that the Under Secretary re-designate the NMFN every 5 years in 49 U.S.C. 70103(d). This re-designation would allow growing areas the ability to move up in ranking to become part of the NMFN.

Freight "Capacity Building" for RTPOs

Other efforts in recent years by the US DOT have focused on the development of freight planning awareness at the state and MPO-levels. This same effort should be extended further into reaching planners at the RTPO level who must regularly deal with issues such as hazardous materials transportation, energy sector freight traffic, working with DOTs to ensure that, as freight traffic grows, new engineering requirements are met for roadways and bridge structures, and increased rail and pipeline transportation through rural areas. Making sure that rural planners understand both freight carrier/shippers needs and requirements is key to improving the performance of the overall freight network. Publications such as *Building Freight Professional Capacity in the 21st Century* published by the FHWA's Office of Freight Management and Operations in 2009 list National Highway Institute classes related to freight and a number of other growing lists of resources for agencies to use in building professional knowledge concerning freight movement needs and implications (*85*). These courses should be reviewed by RTPO staff seeking additional information and expertise in freight planning.

In Texas, the adoption of the Texas Freight Mobility Plan (TFMP) by TxDOT in early 2016 provides another opportunity for local/regional planners at RTPOs to become more aware and involved in freight-related planning activities. As this plan is implemented, additional training opportunities for both urban and rural planners related to freight are expected to be provided or offered at the state level to raise awareness of the TFMP and the implications of increased freight movement in the state.

Rural Mobility Performance Planning

Traditionally, TxDOT has not conducted rural mobility analyses at a statewide level or even at a regional scale. Rural mobility has been addressed on an individual case-by-case basis usually associated with project development. As projects are vetted, their effect on mobility has been included in the analysis. Generally, mobility has not been a significant issue when it comes to project development in rural areas as other characteristics such as pavement quality, bridge condition, or safety.

With the new federal legislation (MAP-21) in place, both system and truck mobility performance measurement in rural areas is being required. This monitoring will be primarily focused on NHS, which includes the interstate highway system as well as many of the key U.S. and state highway facilities. Smaller roadways such as the Texas Farm-to-Market network and other local roadways may not be included in this monitoring effort.

As of mid-2015, the rules describing the system performance and freight performance measures that will be required for submittal by the state DOT's to satisfy MAP-21 have not been released. Despite not having the final notice from FHWA on these rules, the Transportation Planning and Programming Division of TxDOT is making preparations to submit statewide mobility measures. A set of recommended mobility performance measures was presented to FHWA by the AASHTO Standing Committee on Performance Measures (SCOPM) in 2014. These measures are being considered by TxDOT for both urban and rural regions:

- Annual Hours of Truck Delay on Interstate Highways.
- Truck Reliability Index on Interstate Highways.
- Annual Hours of Delay on NHS.
- Annual Hours of Delay on Interstate Highways.
- Annual Hours of Delay on non-Interstate Highway portion of NHS.
- Reliability Index on NHS.
- Reliability Index on Interstate Highways.
- Reliability Index on non-Interstate Highway portion of NHS.

TTI helps TxDOT produce these annual mobility performance measures using the datasets utilized in the production of the Texas 100 Most Congested Road Sections list which includes the Roadway-Highway Inventory dataset from TxDOT and a speed dataset from a private vendor. Current plans are to produce these measures at the statewide level with no plans to produce them for smaller regions.

CHAPTER 3: FRAMEWORK FOR RURAL PERFORMANCE-BASED PLANNING

A framework establishes an organizational structure and process that directs users through the important considerations and tasks needed to develop and implement a particular program. For this project, the proposed framework is based on recent federal and state legislation and the current structure of rural transportation planning within Texas. It is designed to implement performance based planning, programming, and monitoring for rural counties in Texas under the direction of the TxDOT Districts.

The proposed framework supports and is consistent with performance based planning requirements found under the Federal MAP-21, FAST Act, Texas Administrative Code (TAC) Chapter 16, and Texas House Bill 20 (HB 20) legislation. Additionally, the framework is constructed to be consistent with TxDOT planning documents such as the SLRTP, the TRTP, and unified transportation program. Final rules under MAP-21, FAST, and HB 20 have not been completed, and therefore, the proposed framework and process may be modified as final rules and guidance are published.

The process for preparing this framework involved reviewing key TxDOT planning documents, current transportation planning and project development practices for the various transportation development disciplines, including but not limited to safety, pavements, bridges, maintenance, freight, mobility/congestion, and rural transit mentioned in Chapter 2. Many of these disciplines are functionally organized by TxDOT as separate divisions. The purpose of this cross-sectional review of these disciplines is to ensure consistency with existing TxDOT project development processes, information systems, and data resources maintained by the TxDOT divisions.

This chapter describes the rural framework and outlines the major elements and activities for each of the six steps.

RURAL FRAMEWORK

The framework is built upon a series of fundamental activities used in performance based planning that are presented here as steps:

- Step 1. Identify Rural Area Needs, Strategies, Goals and Objectives.
- Step 2. Prepare Monitoring Plan and Performance Measures.
- Step 3. Assess the Rural Multimodal Transportation System.
- Step 4. Prioritize Projects and Funding Scenarios.
- Step 5. Prepare Regional Transportation Plan to Communicate Recommended Project and Investment Strategies.
- Step 6. Implement Projects and Monitor System Performance.

The framework is intended to be an iterative process and is not a one and done sequence (see Figure 17). Each step is a fundamental element of performance based planning, and more than one step can be conducted simultaneously with another, or the sequence of steps may vary. Additionally, each step should result in a planning product or output. The major outputs for this

framework will be a 10-year regional multimodal transportation investment plan including a 4-year program of projects that is monitored over time.

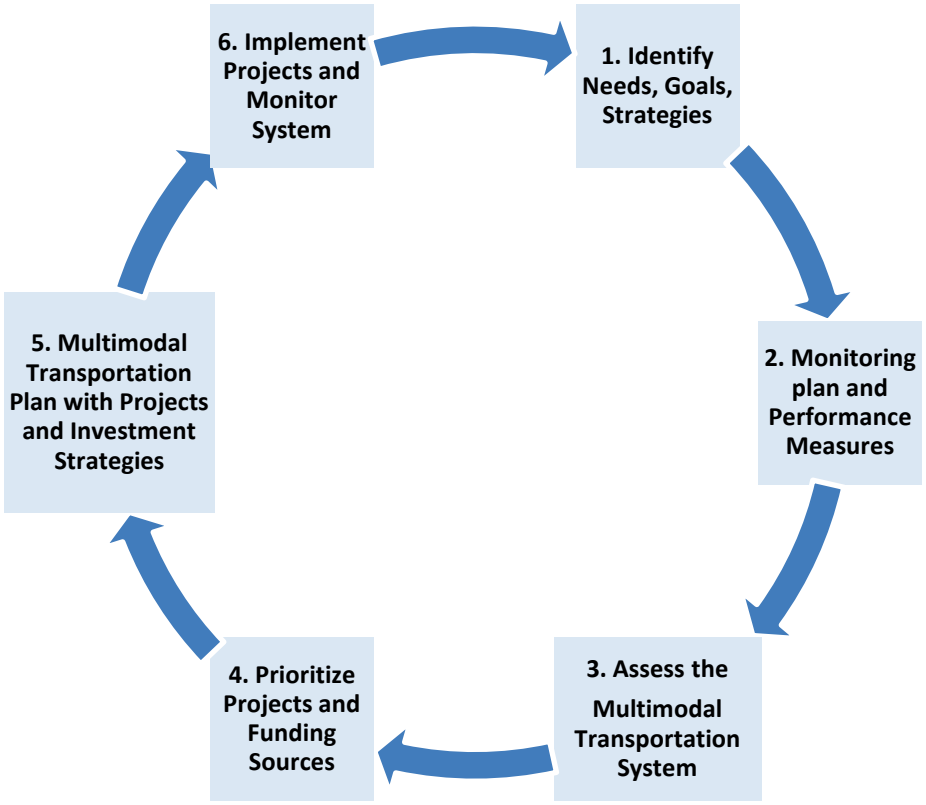


Figure 17. Framework for Rural Performance Planning.

The individual steps are described in the following sections. These are high-level descriptions outlining general activities and work products resulting from the framework. Table 24 summarizes each step and its activities and products.

Table 24. Summary of Rural Performance Based Planning Framework.

Step	Who Develops	Who Approves	Time Horizon	Activities / Content	Products	Update
1.Identify Needs Strategies, Goals and Objectives	RPO/TxDOT	TxDOT District	On-going	- Coordinate with existing plans. - Public involvement and stakeholder activities. - Process for identifying transportation needs and priorities.	- Public & stakeholder involvement record. - Prioritized list of specific rural needs, strategies, goals, objectives.	On-going, as needed. Changes in economy, demography, disaster response, etc.
2. Prepare Monitoring Plan and Performance Measures	RPO/TxDOT	TxDOT District	Multi-year	Collect system performance data from existing resources and information systems.	Monitoring plan. Performance measures and metrics.	Annually, as needed.
3. Assess the Rural Multimodal Transportation System	TxDOT with RPO	TxDOT District	On-going	Document the state of existing conditions Identify future needs and costs Conduct outreach and education.	Description of current conditions and needs Funding sources and investment scenarios	As needed.
4.Prioritize Project and Funding Scenarios	TxDOT with RPO	TxDOT/ RPO	4 years	4-yr prioritized program of projects. Constrained funding scenarios.	Rural TIP. UTP. Recommendations.	Annually
5.Prepare 10-Year Plan Recommended Project and Investment Strategies	TxDOT with RPO	TxDOT/ RPO	10 years	Communication plan. Investment scenarios.	Investment Strategies 10 year plan of projects.	4-5 years
6. Implement Projects and Monitor System Performance	TxDOT/ RPO	TxDOT District	On-going	Design PS&E, letting, construct, maintain, monitor.	PS&E, letting, monitoring data reporting.	On-going

STEP 1. IDENTIFY RURAL AREA NEEDS, STRATEGIES, GOALS AND OBJECTIVES

Rural counties in Texas (counties located outside MPO boundaries) have a wide range of transportation issues and needs to be addressed through short- and long-term planning. The objective of this step is to evaluate key considerations early and carry them forward in the planning process in answering the question: "Where do we want to go?" This step establishes the PBPP process that will address the local area needs and how the TxDOT District staff will cooperate with the RPO/RTPO and rural stakeholders.

The major elements and activities of this step include:

- Establish the local area process for identifying transportation needs and priorities.
- Present the performance based planning, programming, monitoring requirements, and how to:
    - Use it to meet local area needs and support statewide goals and objectives.
    - Use it to communicate with public.
    - Determine how completed projects achieve/do not achieve local goals and objectives.
- Identify and prioritize local area needs, goals, and objectives.
- Review strategic plans, Texas Transportation Plan 2040, MAP-21, UTP 2015, and HB 20 for consistency in planning emphasis areas and goals with local rural goals and priorities.
- Identify funding sources and relevant programs.

STEP 2. PREPARE MONITORING PLAN AND PERFORMANCE MEASURES

The objective of this step is to identify performance measures and metrics and prepare the monitoring plan that will be used for the district (or RPO region). There may be a wide range of issues, needs, goals, and objectives across the districts. There are also existing TxDOT performance measures and monitoring plans from TxDOT division and information systems that can be referenced.

The goals and objectives identified through discussions with local area officials will be used to:

- Establish a range of appropriate performance measures and metrics covering the legislative required areas and the areas identified through local area coordination which support the statewide goals.
- Identify data resources to be used to monitor performance.
- Identify measures and metrics that support the goals and objectives
- Assign weighting or method to reflect priorities.
- Develop a method using the selected performance measures and metrics to assess the current system to create a baseline for assessing future projects.
- Identify existing monitoring methods (and develop additional methods as needed) to monitor the system and evaluate individual projects.

STEP 3. ASSESS THE RURAL MULTIMODAL TRANSPORTATION SYSTEM

The objective of Step 3 is to have an accurate picture of existing conditions (a baseline) using the monitoring plan and performance measures established in Step 2. The system assessment should be communicated to stakeholders to describe: "…where we are, and what do we need to do." The system assessment should be communicated to stakeholders to describe the state of the rural multimodal transportation system. Generally, the needs exceed the funding available to fill that gap. This step should allow for enough information to develop investment scenarios that reflect the priorities. The goals and objectives in Step 3 are to:

- Use the selected performance measures, metrics and established process to perform an initial assessment of the transportation system. This assessment is used to establish a baseline from which individual projects are evaluated and from which the transportation system is monitored to identify future needs.
- Communicate the results of the system assessment to the RPO, RTPO, counties, and cities.
- Based on the initial system assessment and identified goals and objectives, work with RPO, RTPO, counties, and cities to identify candidate projects to be included in the rural transportation plan.
- Create investment scenarios and financial estimate forecasts.
- Assess connectivity to adjacent regions.
- Identify funding sources and availability.
- Identify project readiness and project development timelines.

STEP 4. PRIORITIZE PROJECTS AND FUNDING SCENARIOS

The objective of this step is to prioritize and program projects based on the results of the assessment conducted in Step 3. This is not a wish-list, but a list of real projects with cost estimates, limits, and funding sources in answer to the question: "…What will it take?" The output from this would be the RTIP, or similar programming document. The goals and objectives of Step 4 are:

- Districts will use the performance measures/ metrics, and initial baseline system assessment to conduct analyses for specific projects identified as candidates for inclusion in the plan.
- Based on the above analyses and anticipated funding, the district will prioritize projects.
- Present the results of the prioritization to RPOs, counties, and cities, and obtain feedback on projects.
- Identify projects to be included in the first four years of the RTIP, showing a fiscally constrained approach to reaching goals and objectives.
- Identify projects to be included in the last six years of the RTIP. The RTIP is part of the 10-year regional multimodal plan, which includes four year program of projects that is monitored over this time.
- Investment and resource allocation based on project prioritization and selection criteria.
- Project selection consistent with system performance expectations.

STEP 5. PREPARE PLAN TO COMMUNICATE RECOMMENDED PROJECT AND INVESTMENT STRATEGIES

The objective of this step is to prepare a regional multimodal transportation planning document that includes the results of Steps 1–4 (or a summary of key information from these steps) that communicates to stakeholders the needs, strategies, projects and funding needed to address the region's transportation priorities. It is intended to answer the question: "How are we going to get there?" TxDOT districts will prepare these 10-year plans and present the results to RPOs, counties, and cities. The 10-year plan should include:

- Identification of current trends, performance expectations, and targets.
- Strategies consistent with Strategic Plan and LRTP goals, and UTP.
- A 10-year regional multimodal transportation plan of projects.
- Recommendation for investment scenarios and priorities based on needs and available funding.
- Communicate the recommended projects and investment priorities to stakeholders.
- Performance results from previous implementation and monitoring.

STEP 6. IMPLEMENT PROJECTS AND MONITOR SYSTEM PERFORMANCE

This step is an on-going process of implementation and monitoring intended to answer the question: "How did we do?" Implementation and monitoring is intended to use existing TXDOT monitoring and information system resources. This step should include:

- Monitoring and reporting.
- Communication of performance outcomes.
- Collaborative evaluation to improve strategies.

CHAPTER 4: RURAL TRANSPORTATION PERFORMANCE MEASURES

Performance measures must cover a broad range of goals and objectives that support planning goals and emphasis areas from applicable plans and legislation. With guidance from a technical advisory group comprised of subject matter experts (SMEs) in the various emphasis areas, the research team developed rural performance measures which are "SMART"—Specific, Measurable, Attainable, Realistic, and Timely—and focus on issues pertinent to rural areas and statewide long range planning.

Table 25 lists planning goals and emphasis areas for the various plans and legislation. The emphasis areas among the various TxDOT transportation planning products and legislation are identified to show that planning emphasis areas are similar in subject matter but do not match exactly across all areas. It is also important to note, that in some cases, performance measures can be used in multiple emphasis areas.

Table 25. Planning Emphasis Areas for Texas.

TxDOT Plan Emphasis Area		Legislative Emphasis Area	
TxDOT Strategic 2019	**TxDOT TTP 2040**	**HB 20**	**MAP-21**
Safe System	Safety	Safety	Safety
	Asset Management		Infrastructure Condition
Address Congestion	Mobility & Reliability	Congestion	Congestion - Reliability
Connect Communities	Multimodal Connectivity		Freight Mobility
Best in Class Agency	Stewardship	Economic Development	
		Available Funding	
		Environmental Impact	Environmental Sustainability
		Socioeconomic Impact	
	Customer Service	Other	

This chapter identifies and describes the performance measures, data, and in some cases, calculations in identified emphasis areas. The performance measures, to the extent possible, optimize currently collected and available data and are consistent with current TxDOT's statewide plans and programs.

RURAL PERFORMANCE MEASURES BY EMPHASIS AREA

The following sections describe the performance measures for the emphasis areas: safety, pavement and bridges, rural mobility, freight, and rural transit.

Safety

TxDOT supports the national "Toward Zero Deaths" strategy and seeks to achieve a reduction in fatal crashes on a year-to-year basis. In years where that primary goal cannot be achieved, TxDOT's secondary goal is to reduce fatal crashes by 2 percent or an amount that is less than the nationwide average. The *Texas Strategic Highway Safety Plan* goals focus on reducing fatal and incapacitating injury crashes in 15 emphasis areas, including the following:

- Run-off-road crashes.
- Head-on crashes.
- Speed-related crashes.

On the federal level, the MAP-21 law includes safety directives for the state DOTs. These directives include developing a SHSP, in which a list of HRRRs is to be identified for funding priority. If the fatality rate on rural roads in a State increases over the most recent two year period, the State must dedicate a specified amount of funds under HRRR safety projects. Furthermore, if the traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65 in a state increase over the most recent two year period, the state must detail in its next Strategic Highway Safety Plan how it intends to address increases in those rates.

The SHSP also specifies countermeasures that are recommended to address crashes in the various emphasis areas. Some countermeasures include:

- Increase the use of paved shoulders on FM roads.
- Continue to install shoulder and rumble strips.
- Install more pavement width to accommodate marked edgelines.
- Provide progressive levels of treatment for curves based on crash experience, including chevrons, speed-activated curve warning devices, and high-friction surface treatments.
- Use the 30-degree Safety Edge on pavement edges.
- Remove, relocate, or protect roadside fixed objects.
- Install concrete and cable median barriers.
- Install passing lanes.
- Widen roads to increase control and recovery areas.
- Conduct speed studies on roads with poor geometrics.
- Use speed-activated feedback or warning signs to increase speed limit compliance.
- Continue to use the STEP to deter speeding.

Table 26 contains the performance measures, data, and calculations for the safety emphasis area.

Table 26. Safety – Performance Measures.

Performance Measure	Data	Calculations	Responsible TxDOT Unit
Fatality Rate (in recent 2-years)	CRIS and Crash Statistics	(Fatalities in particular year * 100)/ Average of VMT in Millions	Traffic Operations Division
Fatality Rate (in recent 2-years) for Pedestrian and Drivers Over age of 65	CRIS and Crash Statistics	(Pedestrian or old driver fatalities * 100)/ VMT in Millions	Traffic Operations Division
Crashes	CRIS	No. of Crashes	Traffic Operations Division
Crash Rate	CRIS and RHINO	(Total Crashes * 10^6)/ (AADT* 365* No. of Years of Data * Length of Segment)	Traffic Operations Division, Transportation Planning and Programming Division
Change in Fatality Rate	Crash Statistics	Difference in Fatality Rates between years	Traffic Operations Division
Bicycle/Pedestrian Crashes	Crash Statistics	No. of Bicycle/pedestrian crashes	Traffic Operations Division
Rail Crossing Crashes	CRIS	No. of Rail Road Crossing Related Crashes	Traffic Operations Division
DUI (Alcohol)-related Fatalities	Crash Statistics	No. of DUI-related fatal crashes	Traffic Operations Division
Crash Reduction Factor	HSIP		Traffic Operations Division
Cost of a Crash	HSIP		Traffic Operations Division
Fatality Rate (5-year Moving Average)	CRIS and Crash Statistics	Five-year moving average of the Number of Fatalities divided by the VMT for a calendar year.	
Number of Fatalities (5-year Moving Average)	CRIS and Crash Statistics	Five-year moving average of the count of the number of fatalities on all public roads for a calendar year	
Serious Injury Rate (5-year Moving Average)	CRIS and Crash Statistics	Five-year moving average of the Number of Serious Injuries divided by the VMT for a calendar year	
Number of Serious Injuries (5-year Moving Average)	CRIS and Crash Statistics	Five-year moving average of the count of the number of serious injuries on all public roads for a calendar year	

Pavement and Bridges

MAP-21 also lists its primary goal for pavement and bridges as to "Maintain the highway infrastructure asset system in a state of good repair." The objective for states is to maintain "X percent of pavement lane-miles in "good" condition, where X is defined by the state DOT. TxDOT's primary goal for pavement and bridges is to "Preserve the Transportation System."

The performance goals used in TxDOT's 2015–2019 Strategic Plan, among other performance goals for safety, congestion reduction, etc., are as follows:

- Pavements: 90 percent of the state-maintained pavement lane-miles would be in "good or better" condition by 2012.
- Bridges: 80 percent of on-system and off-system bridges in Texas would be in good or better condition by 2012.

For pavements, the term "good or better" is defined based on the CS metric. CS is a computed index that describes the pavement's overall condition in terms of both distress and ride quality combined. CS ranges from 1 (worst) to 100 (best). For bridges, the term "good or better" is defined based on bridges that are rated as not structurally deficient, not functionally obsolete, and not substandard for legal load.

Table 27 contains performance measures, data, and calculations for the pavement and bridge emphasis area.

Table 27. Pavement and Bridge-Performance Measures.

MAP-21 Focus Area	Performance Measure	Data	Calculations	Responsible TxDOT Unit
Pavement	Percentage of Pavement Lane-Miles in Good Condition (TxDOT)	1-PMIS 2-Condition of Texas Pavements (Annual report)	1-Classify pavement condition into "Good or better" based on a pre-defined threshold value the CS metric (Good or Better = CS is greater than 70) 2-Calculate percent of network lane-miles in "Good or better" condition as the total lane-miles in good or better classification divided by the total lane-miles of the pavement network.	Maintenance Division, Pavement Preservation Branch
	Percentage of pavement lane-miles in good condition (MAP-21)	1-PMIS 2-Condition of Texas Pavements (Annual report)	1-Classify pavement condition into good, fair, or poor based on pre-defined threshold values for specific metrics (cracking, IRI, faulting, and rutting). 2-Calculate the percent of network lane-miles in good conditions as the total lane-miles in good classification divided by the total lane-miles of the pavement network.	Maintenance Division, Pavement Preservation Branch
	Percentage of pavement lane-miles in poor condition (MAP-21)	1-PMIS 2-Condition of Texas Pavements (Annual report)	1-Classify pavement condition into good, fair, or poor based on pre-defined threshold values for specific metrics (cracking, IRI, faulting, and rutting). 2-Calculate the percent of network lane-miles in poor conditions as the total lane-miles in poor classification divided by the total lane-miles of the pavement network.	Maintenance Division, Pavement Preservation Branch
Bridges	Percentage of bridges in good condition or higher (TxDOT)	1-Bridge Inspection Database 2-Report on Texas Bridges (Biennial Report)	Total number of on-system and off-system bridges not identified as structurally deficient, functionally obsolete, or substandard for load in the Bridge Inspection Database divided by the total number of on-system and off-system bridges in the Bridge Inspection Database, expressed as a percentage.	Bridge Division
	Percentage of bridges (weighted by deck area) in good condition (MAP-21)	1-Bridge Inspection Database 2-Report on Texas Bridges (Biennial Report)	1-Classify bridge condition into good, fair, or poor based on deck, super structure, and substructure ratings in NBI. For culverts, the Culvert rating in NBI is used. 2-Calculate percent of bridge in good conditions as total deck area in a classification divided by total deck area of bridges in the state. Note: NHS and non-NHS bridges are treated separately.	Bridge Division
	Percentage of bridges (weighted by deck area) in poor condition (MAP -21) Current NPRM proposes X percentage to be 10%.	1-Bridge Inspection Database 2-Report on Texas Bridges (Biennial Report)	1-Classify bridge condition into good, fair, or poor based on deck, super structure, and substructure ratings in NBI. For culverts, the Culvert rating in NBI is used. 2-Calculate percent of bridge in Poor conditions as total deck area in a classification divided by total deck area of bridges in the state. Note: NHS and non-NHS bridges are treated separately.	Bridge Division

Rural Mobility and Reliability

The most common measures for mobility include data on travel time, speed, and delay. The measures shown below, which were identified in Task 3, are being considered by TxDOT for both urban and rural regions:

- Annual Hours of Truck Delay on Interstate Highways.
- Truck Reliability Index on Interstate Highways.
- Annual Hours of Delay on NHS.
- Annual Hours of Delay on Interstate Highways.
- Annual Hours of Delay on non-Interstate Highway portion of NHS.
- Reliability Index on NHS.
- Reliability Index on Interstate Highways.
- Reliability Index on non-Interstate Highway portion of NHS.

TTI helps TxDOT produce these annual mobility performance measures using the datasets utilized in the production of the Texas 100 Most Congested Road Sections list which includes the Roadway-Highway Inventory dataset from TxDOT and a speed dataset from a private vendor. Current plans are to produce these measures at the statewide level with no plans to produce them for smaller regions.

Freight

The most current comprehensive reference document regarding freight performance measures is NCFRP 10: *Performance Measures for Freight Transportation* which was published in 2011 by TRB. This report gives an overview of the history of performance measurement in DOTs and how they interact with MPOs and other planning agencies. The conclusions of this document point out that, currently, freight performance measure practices in states are relatively new and that each state's use of performance measures for freight seemed to vary greatly from others. The report indicated that only a minority of states have freight performance measures. Mature performance measurement states such as Washington, Missouri, and Minnesota use between 5 and 10 measures. The list below includes freight performance measures:

- Annual Hours of Truck Delay on Interstate Highways.
- Truck Reliability Index on Interstate Highways.
- Annual Hours of Truck Delay on NHS Highway Routes/Connectors.
- Truck Reliability Index on NHS Highway Routes/Connectors.
- Annual Hours of Truck Delay on FHWA-designated Primary Freight Network Routes.
- Truck Reliability Index on State Designated Critical Rural Freight Corridors.

Rural Transit

The statewide performance measure for transit condition is called "transit fleet state of good repair" rating from 1 to 5, bad to excellent. This measure reflects the SGR performance for the TxDOT-funded small urban, rural, and elderly and disabled programs transit fleet. The measure

will be adapted when the final federal rulemaking on national performance measures is available. (SGR average condition. Ratings are 1 = Bad, 2 = Poor, 3 = Fair, 4 = Good, 5 = Excellent).

Additional performance measures for ridership (e.g., passenger per capita), availability (e.g., hours of service), and quality are also available in data from state-funded urban and rural transit districts collected through the PTN-128 system at the TxDOT Public Transportation Division. The PTN 128 system data include actual vehicle hours and revenue hours, actual vehicle miles and revenue miles, unlinked passengers trips, detailed revenue sources, operating costs by function, and capital costs and vehicles in the fleet.

Researchers provided a list of common performance measures that are used for fixed-route and demand-response systems; and identified five key performance measures for rural transit providers in the report "A Toolkit for Reporting Rural and Specialized Transit Data." Key performance measures are listed in Table 28 are used to measure a rural transit system's effectiveness, cost-efficiency, cost-effectiveness, and financial independence.

Table 28. Rural Transit – Performance Measures.

Performance Measure	Calculation
Passenger trips per revenue hour	total passenger trips ÷ total revenue hours
Operating cost per revenue hour	total operating cost ÷ total revenue hours
Operating cost per revenue mile	total operating cost ÷ total revenue miles
Operating cost per passenger trip	total operating cost ÷ total passenger trips
Fare recovery ratio	fare revenues ÷ operating expenses

PEER STATE PERFORMANCE MEASURES

Five diverse state programs were profiled for this project, each with its own unique approach to balancing state-wide guidance and regional differences and decision-making. These five approaches provide a number of models at both the state and regional level for developing performance measures designed to integrate into a systematic project selection system that is compatible with federal requirements and simultaneously tailored to the needs of a given region. This section highlights three of the states with programs most applicable to Texas. The table containing performance measures from all five peer states is listed in Appendix B.

- California's comparable size and geographic diversity make it one of Texas' peer states. Their program designs must often be tailored to similar scales of budget, population, and transportation projects as Texas program designs and make for helpful comparisons. In addition, they have streamlined the coordination between state-level performance measurement and rural application of those measures in a way that acknowledges different levels of program robustness at the RTPO level, yet provides consistency state-wide. Their program is also designed to be used with off-the-shelf software and includes step-by-step instructions and formula for developing and measuring system performance.
- Washington State has one of the most mature and robust performance measurement and reporting systems in the country. In their performance reporting in The Grey Notebook, WSDOT provides a general set of performance measures that RTPOs may use in

developing their transportation plans and selecting projects. However, WSDOT requires only that RTPOs follow an enumerated set of principles to use as guidance in project selection; they may develop their own metrics according to the needs of their regions. This combination of guiding principles, available measures, and regional discretion is yet another model that TxDOT might consider in structuring its relationships with regional planners.

- The Virginia DOT contributes a particularly detailed example of a relatively new project selection process. This framework is informed by the requirements of MAP-21 and includes detailed instructions about using performance measures in the planning process. North Carolina's "Policy to Projects" process is a new program built in response to a recent legislative mandate that the DOT use a data-driven, systematic prioritization process when developing transportation projects and mandating the use of both quantitative data and qualitative and local input. The North Central Pennsylvania RPO's unique approach of pairing geographically identified needs in a "core system" with a set of weighted selection criteria applied to projects under consideration for the core system is a model of a regionally built approach that readies that area to comply with MAP-21's performance measure requirements.

CHAPTER 5: USER TOOL FOR RURAL PERFORMANCE BASED PLANNING

The performance-planning tool developed as part of this project is intended for use with the guidebook for establishing and using rural performance based transportation system assessment, monitoring, planning and programming to support the RTPO, TxDOT's districts, and statewide long-range planning effort. The analyst is encouraged to read the user manual to understand the tool. The tool is developed based on users' needs and data availability. It provides two types of scoring work sheets for user to select:

- Quantitative Scoring Worksheet (based on value of performance measures)
- Qualitative Scoring Worksheet (based on subjective ranking of performance measures)

QUANTITATIVE SCORING WORKSHEET

This worksheet is appropriate for users that have detailed data on various performance measures for projects. The worksheet considers two safety performance measures (fatality rate and serious injury rate), a pavement performance measure (pavement CS), freight performance measure (truck travel time reliability index) and transit performance measure (SGR).

In addition, the tool allows users to enter weights for each of these performance measures and helps ranking various projects based on each of these performance measures or their combination.

QUALITATIVE SCORING WORKSHEET

The qualitative worksheet is appropriate for users who do not have complete performance measure data to support the project but have general assessment of each of the performance measures including safety, pavement, freight, and transit. The tool also considers connectivity and mobility aspects of the project.

For each performance measure, the user clicks on the cell under each performance measure and chooses the qualitative value from dropdown (i.e. high/medium/low). The performance measure connectivity and mobility suggest increases in connectivity and mobility due to proposed project. If the user believes the project will increase connectivity, they can rate it high. If a user thinks the project will not add to existing mobility, they can rank it low.

The users are provided an option to weigh each of these performance measures in terms of importance assigned to them, and a combined weighted score is calculated based on users' subjective input and weights assigned to each of these performance measures.

CHAPTER 6: GUIDEBOOK FOR RURAL PERFORMANCE BASED TRANSPORTATION PLANNING

The research team developed a user-friendly guidebook that directs the reader through a framework for conducting a rural transportation system assessment, monitoring progress, and improving project planning and programming based on individual goals and objectives, selected performance measures, and weights. The guidebook explains how to compile and analyze the data over multiple competing areas and also explains how to analyze the data at a statewide level for use in long-range planning and programming.

GUIDEBOOK ORGANIZATION

The guidebook follows the framework discussed in Chapter 3 and is organized into the following chapters:

1. Introduction: a discussion of the overall theme and project, the objective and purpose of the guide, an explanation of the framework, targeted audiences, and additional materials to use to supplement the material presented in the guide.
2. Background: a brief overview of statewide transportation planning and programming, documents that guide planning in Texas and an overview of rural transportation planning.
3. Step 1 – Identify Rural Area Needs, Strategies, Goals, and Objectives: a step-by-step guide how to identify an area's vision, goals, objectives, and performance measure for rural planning.
4. Step 2 – Prepare Monitoring Plan and Performance Measurements: a discussion on what data are needed and how and where to gather the information.
5. Step 3 – Assess the Rural Multimodal Transportation System: how to assess the rural transportation system and develop scenarios to reflect priorities of an area.
6. Step 4 – Prioritize Projects and Funding Sources: a step-by-step guide for using the tool to determine which projects are priorities for an area.
7. Step 5 – Prepare Plan to Communicate Recommended Project and Investment Strategies: how to determine the best method of communication and how to develop effective communication.
8. Step 6 – Implement Projects and Monitor System Performance: how to monitor performance measures and their outcomes.

CHAPTER 7: SUMMARY OF RURAL PLANNING WORKSHOPS

A series of workshops were conducted in TxDOT's San Antonio District in cooperation with the Alamo Regional Rural Planning Organization (ARRPO). The workshops were conducted to assist TxDOT's San Antonio District and ARRPO in rural transportation planning and to act as a test-bed for future rural transportation planning processes. The workshops involved key TxDOT district staff, key rural county stakeholders including county judges, county commissioners, rural mayors, and rural city and county officials.

The Alamo Area Council of Governments (AACOG), TxDOT, and TTI worked with ARRPO to conduct workshops in the following counties:

- Atascosa County.
- Bandera County.
- Frio County.
- Gillespie County.
- Karnes County.
- Kendall County.
- Kerr County.
- McMullen County.
- Medina County.
- Wilson County.

The workshops facilitated work with County Judges, County Commissioners, and members of the public to identify the most important transportation needs for each county. The following sections detail the activities that attendees participated in during the county planning workshops.

Key exercises from the planning section of the workshops include:

- Identify RPO key issues.
- Describe programming and project prioritization.
- Define goals, objectives, and performance measures.
- Describe how RPOs fit into the transportation planning process.
- Describe successful public involvement (*51*).

TRANSPORTATION PLANNING 101

The workshops began with a presentation that provided attendees with an overview of transportation planning in the State of Texas and the role that Rural Planning Organizations play in the transportation planning process ("Transportation Planning 101"). The presentation also covered transportation funding and the project development process. The slides used for the Transportation 101 presentation can be found in Appendix D.

COUNTY CHARACTERISTICS AND TRENDS

In addition to an overview of the transportation planning process, the workshops provided attendees with an overview of existing demographic and transportation conditions and trends in their county. County demographic characteristics and trends included:

- County Historic and Projected Population (1960–2040).
- ARRPO Regional Population (1960–2013).
- Median age in ARRPO and AAMPO Region (2013).
- Current (2010) and Projected (2040) County Population by Sex and Age Cohort.

In addition, the following transportation characteristics were presented:

- Employment Location of County Workers (2010).
- Commute Times of County Workers (2013).
- Average Daily Traffic in County (2013).
- Average Daily Heavy Truck Traffic in County (2013).
- County Pavement Conditions (2013).
- Incapacitating and Fatal Crashes in County (2010–2015).
- County Projects in the Statewide Transportation Improvement Plan (2016–2018).

NEEDS IDENTIFICATION

Finally, workshop attendees participated in break out groups to identify transportation needs and issues within the county. Participants were asked provide input on the following three transportation areas:

- Mobility and Connectivity.
- Safety and Maintenance.
- Bicycle, Pedestrian, and Transit.

For the Mobility and Connectivity exercise, attendees were provided a map of the county and asked to mark and/or note directly on the map issues or needs that would improve mobility and/or connectivity in the county and throughout the region. Examples included additional lanes, new routes, passing lanes, etc. Figure 18 is an example of a Mobility and Connectivity exercise.

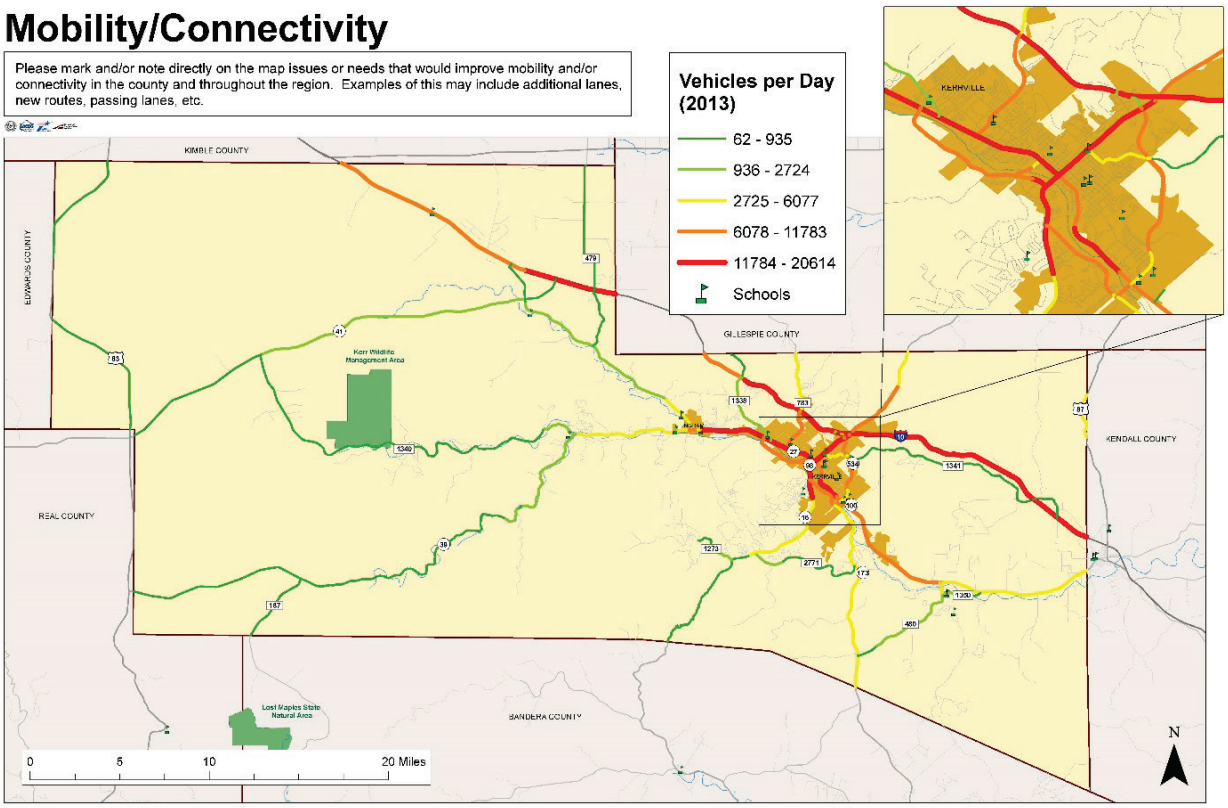


Figure 18. Example of Mobility and Connectivity Exercise Map.

For the Maintenance and Safety exercise, attendees were provided a map of the county and asked to mark and/or note directly on the map issues or needs related to maintenance and/or safety in the county and throughout region. Examples included the need for shoulders or passing lanes, places where the pavement needs improvement, etc. Figure 19 is an example of a Maintenance and Safety activity exercise.

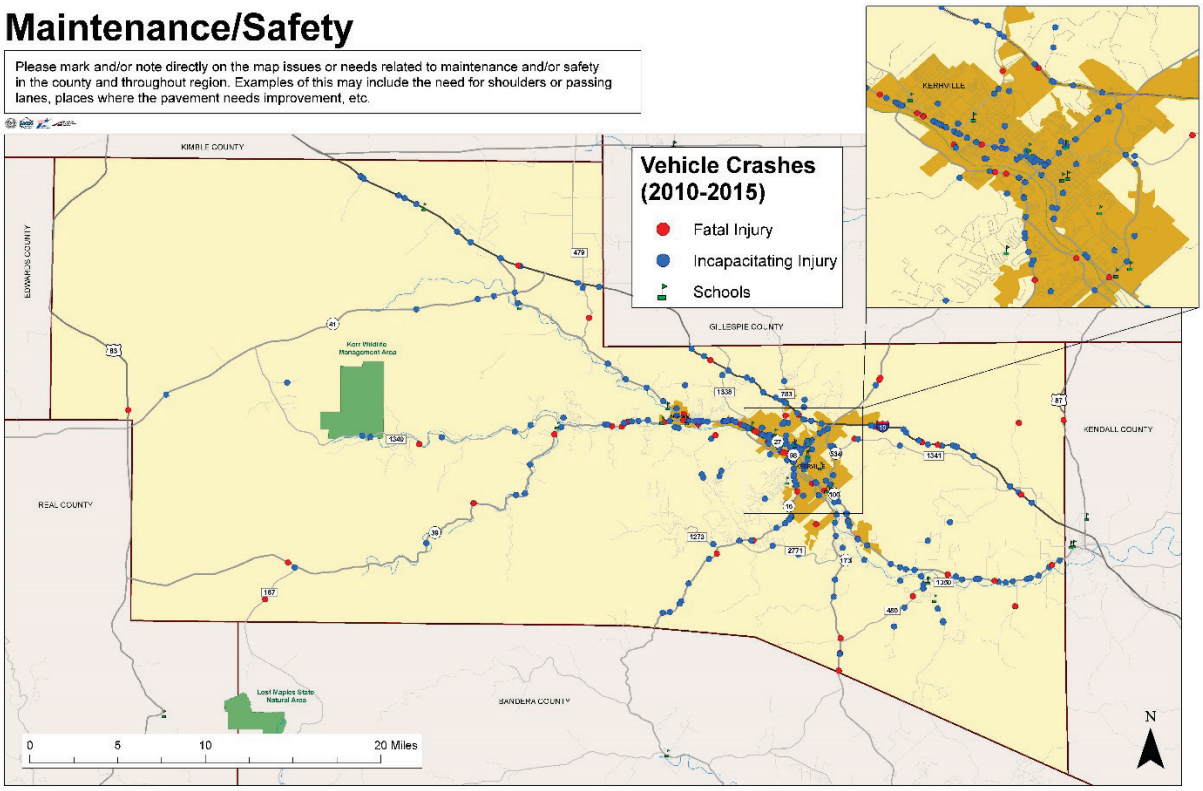


Figure 19. Example of Maintenance and Safety Exercise Map.

For the Bicycle, Pedestrian and Transit exercise, attendees were provided a map of the county and asked to mark and/or note directly on the map issues or needs related to bicycle, pedestrian or transit improvements in the county and throughout the region. Examples of this included the need for a sidewalk where several pedestrians currently walk, the need for transit from rural locations to urban centers, new bike lanes to connect trails to roadways, etc. Figure 20 is an example of a Mobility and Connectivity exercise.

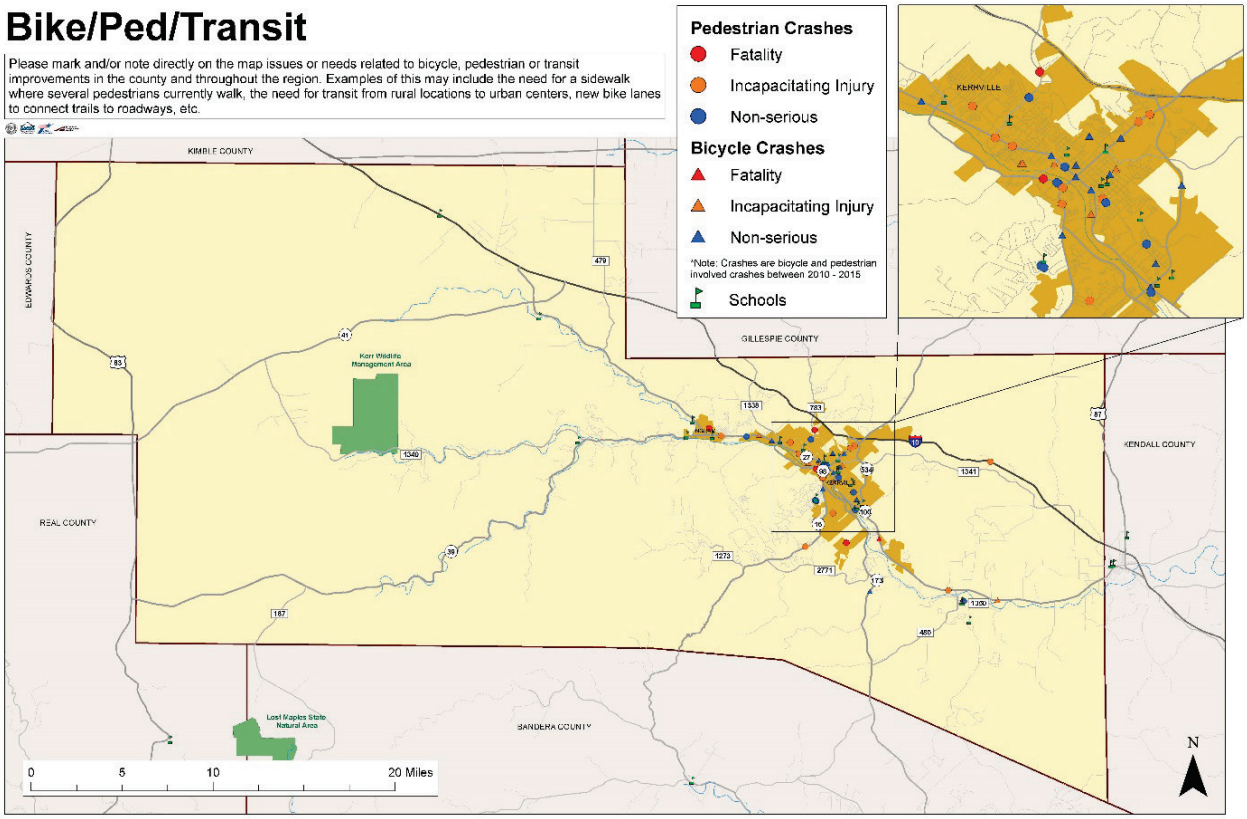


Figure 20. Example of Bicycle, Pedestrian and Transit Exercise Map.

MEETING WRAP-UP

Once participants had the opportunity to provide input on all three transportation areas they were provided with next steps in the ARRPO planning process, and the workshop was adjourned.

WORKSHOP LOCATIONS AND DATES

The following section details the location and date of, number of attendees, and photographs (if available) of each of the ARRPO county planning workshops. Table 29 summarizes the planning workshop locations and dates.

Table 29. Locations and Dates for ARRPO Planning Workshops.

County	Date	Location	Number of Participants
Atascosa	December 8, 2015	Jourdanton Library, Jourdanton, TX	19
Bandera	November 29, 2015	Silver Sage Community Center, Bandera, TX	29
Frio	January 21, 2016	Frio Community Room, Frio, TX	5
Gillespie	October 21, 2015	Hill County University Center, Fredericksburg, TX	40
Karnes	November 22, 2015	Karnes County Courthouse, Karnes City, TX	7
Kendall	January 21, 2016	Boerne Civic Center, Boerne, TX	45
Kerr	December 1, 2015	County Youth Event Center, Kerrville, TX	29
McMullen	November 16, 2015	McMullen County Courthouse, Tilden, TX	9
Medina	November 10, 2015	South Texas Regional Training Center, Hondo, TX	33
Wilson	December 16, 2015	Commissioner's Courtroom, Floresville, TX	9

Atascosa County Workshop

The Atascosa County Workshop was held on Tuesday, December 8, 2015, from 1:00 p.m. to 3:00 p.m. at the Jourdanton Library and Community Center in Jourdanton. Nineteen people attended the workshop.

Bandera County Workshop

The Bandera County workshop was held on Monday, November 9, 2015, from 1:30 p.m. to 4:30 p.m. at the Silver Sage Community Center in Bandera. Twenty-nine people attended the workshop. Figure 21 shows the attendees of the Bandera County workshop.

Figure 21. Bandera County Workshop Attendees.

Frio County Workshop

The Frio County workshop was held on Thursday, January 21, 2016, from 9:00 a.m. to 11:00 a.m. at the Frio Community Room in Frio. Five people attended the workshop.

Gillespie County Workshop

The Gillespie County Workshop was held on Wednesday, October 21, 2015, from 9:30 a.m. to 12:00 p.m. at the Hill County University Center in Fredericksburg. Forty people attended the workshop. Figure 22 shows the attendees of the Gillespie County workshop. Figure 23 shows the attendees participating in the needs exercise at the Gillespie County workshop.

Figure 22. Gillespie County Workshop Attendees.

Figure 23. Gillespie County Workshop Attendees Participating in Transportation Needs Exercise.

Karnes County Workshop

The Karnes County Workshop was held on Tuesday, November 11, 2015, from 9:30 a.m. to 12:00 p.m. at the Karnes County Courthouse in Karnes City. Seven people attended the workshop. Figure 24 shows the attendees of the Karnes County workshop.

Figure 24. Karnes County Workshop Attendees.

Kendall County Workshop

The Kendall County workshop was held on Thursday, January 21, 2016, at the Boerne Civic Center in Boerne. Forty-five people attended the workshop. Figure 25 shows the attendees of the Kendall County workshop. Figure 26 shows Kendall County workshop attendees participating in the transportation needs exercises.

Figure 25. Kendall County Workshop Attendees.

Figure 26. Kendall County Workshop Attendees Participating in Transportation Needs Exercise.

Kerr County Workshop

The Kerr County workshop was held on Tuesday, December 1, 2015, at the County Youth Event Center in Kerrville. Twenty-nine people attended the workshop. Figure 27 shows the attendees of the Kerr County workshop participating in the transportation needs exercises.

Figure 27. Kerr County Workshop Attendees Participating in Transportation Needs Exercise.

McMullen County Workshop

The McMullen County workshop was held on Monday, November 16, 2015, from 5:30 p.m. to 7:30 p.m. at the McMullen County Courthouse in Tilden. Nine people attended the workshop.

Figure 28 shows attendees of the McMullen County workshop. Figure 29 shows McMullen County workshop attendees participating in needs exercises.

Figure 28. McMullen County Workshop Attendees.

Figure 29. McMullen County Workshop Attendees Participating in Transportation Needs Exercise.

Medina County Workshop

The Medina County workshop was held on Tuesday, November 10, 2015, from 1:00 p.m. to 4:00 p.m. at the South Texas Regional Training Center in Hondo. Thirty-three people attended the workshop. Figure 30 shows attendees of the Medina County Workshop.

Figure 30. Medina County Workshop Attendees.

Wilson County Workshop

The Wilson County workshop was held on Wednesday, December 16, 2015, from 9:00 a.m. to 11:30 a.m. at the Commissioner's Courtroom in Floresville. Nine people attended the workshop. Figure 31 shows Wilson County workshop attendees participating in the transportation needs exercises.

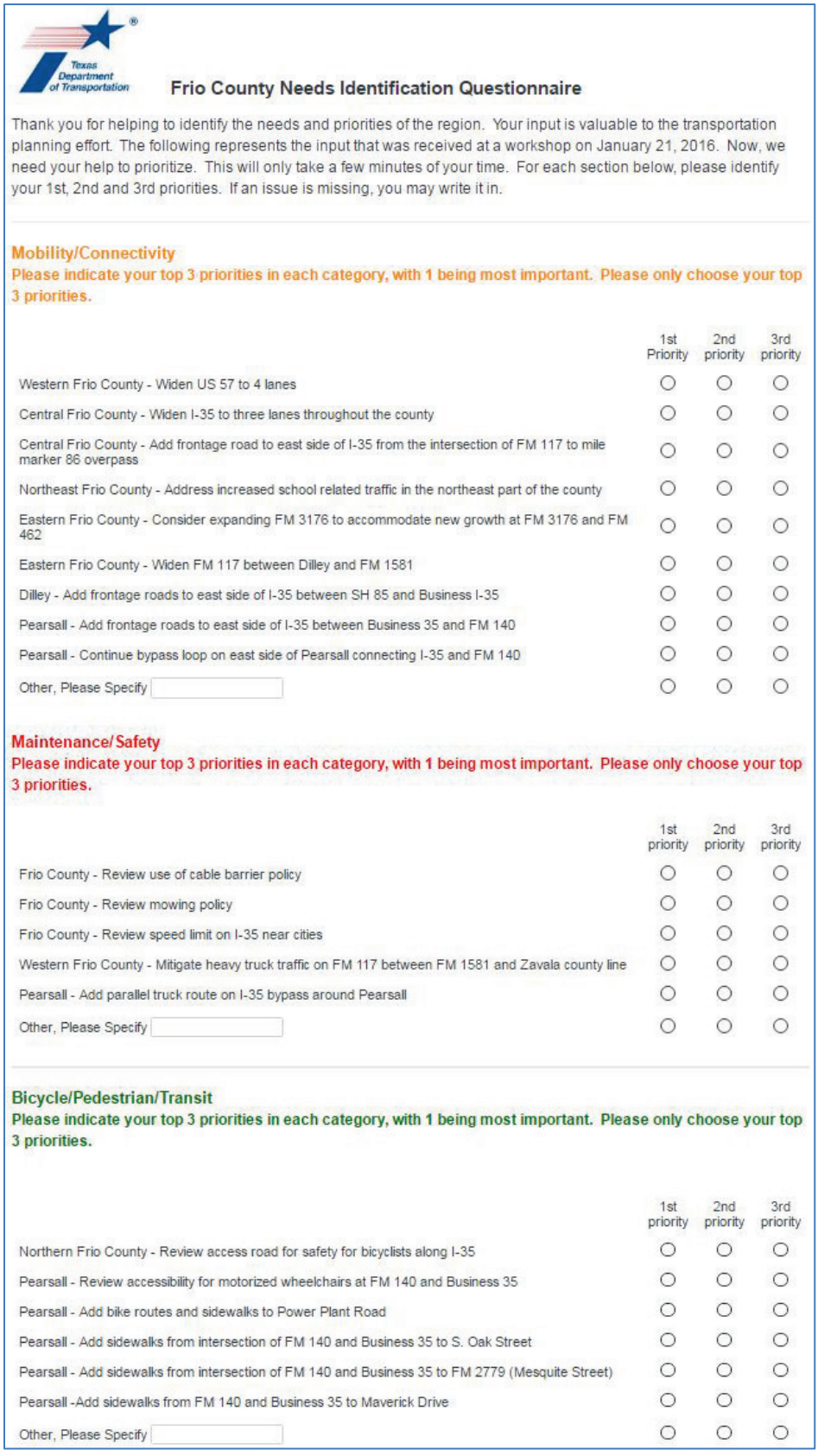
Figure 31. Wilson County Workshop Attendees Participating in Transportation Needs Exercise.

OUTCOMES

The following section summarizes the outcomes of the ARRPO county workshops.

Transportation Needs Prioritization Process

TTI staff compiled the needs and issues that workshop attendees provided during the transportation needs exercises and then developed a list of transportation needs for each of the three transportation areas (Mobility and Connectivity, Safety and Maintenance and Pedestrian, Bicycle and Transit) for each of the counties in the ARRPO region. TTI staff then developed Transportation Needs Prioritization surveys for each of the counties. The web-based surveys were distributed to all workshop attendees, and TxDOT requested that recipients distribute the survey to as many individuals as they please. Respondents were asked to rank their top three priorities from the list of transportation needs developed through the workshops for each of the three transportation areas. Figure 32 shows an example of one of the county needs surveys.



Texas Department of Transportation

Frio County Needs Identification Questionnaire

Thank you for helping to identify the needs and priorities of the region. Your input is valuable to the transportation planning effort. The following represents the input that was received at a workshop on January 21, 2016. Now, we need your help to prioritize. This will only take a few minutes of your time. For each section below, please identify your 1st, 2nd and 3rd priorities. If an issue is missing, you may write it in.

Mobility/Connectivity

Please indicate your top 3 priorities in each category, with 1 being most important. Please only choose your top 3 priorities.

	1st Priority	2nd priority	3rd priority
Western Frio County - Widen US 57 to 4 lanes	○	○	○
Central Frio County - Widen I-35 to three lanes throughout the county	○	○	○
Central Frio County - Add frontage road to east side of I-35 from the intersection of FM 117 to mile marker 86 overpass	○	○	○
Northeast Frio County - Address increased school related traffic in the northeast part of the county	○	○	○
Eastern Frio County - Consider expanding FM 3176 to accommodate new growth at FM 3176 and FM 462	○	○	○
Eastern Frio County - Widen FM 117 between Dilley and FM 1581	○	○	○
Dilley - Add frontage roads to east side of I-35 between SH 85 and Business I-35	○	○	○
Pearsall - Add frontage roads to east side of I-35 between Business 35 and FM 140	○	○	○
Pearsall - Continue bypass loop on east side of Pearsall connecting I-35 and FM 140	○	○	○
Other, Please Specify	○	○	○

Maintenance/Safety

Please indicate your top 3 priorities in each category, with 1 being most important. Please only choose your top 3 priorities.

	1st priority	2nd priority	3rd priority
Frio County - Review use of cable barrier policy	○	○	○
Frio County - Review mowing policy	○	○	○
Frio County - Review speed limit on I-35 near cities	○	○	○
Western Frio County - Mitigate heavy truck traffic on FM 117 between FM 1581 and Zavala county line	○	○	○
Pearsall - Add parallel truck route on I-35 bypass around Pearsall	○	○	○
Other, Please Specify	○	○	○

Bicycle/Pedestrian/Transit

Please indicate your top 3 priorities in each category, with 1 being most important. Please only choose your top 3 priorities.

	1st priority	2nd priority	3rd priority
Northern Frio County - Review access road for safety for bicyclists along I-35	○	○	○
Pearsall - Review accessibility for motorized wheelchairs at FM 140 and Business 35	○	○	○
Pearsall - Add bike routes and sidewalks to Power Plant Road	○	○	○
Pearsall - Add sidewalks from intersection of FM 140 and Business 35 to S. Oak Street	○	○	○
Pearsall - Add sidewalks from intersection of FM 140 and Business 35 to FM 2779 (Mesquite Street)	○	○	○
Pearsall -Add sidewalks from FM 140 and Business 35 to Maverick Drive	○	○	○
Other, Please Specify	○	○	○

Figure 32. Transportation Needs Prioritization Survey.

Questionnaires were distributed in early April and rural stakeholder recipients were provided approximately four weeks to complete them. Table 30 provides a summary of the number of responses for each county survey.

Table 30. Summary of Response Rate for ARRPO County Transportation Need Prioritization Surveys.

	Number of Respondents
Atascosa County	4
Bandera County	11
Frio County	3
Gillespie County	23
Karnes County	6
Kendall County	147
Kerr County	9
McMullen County	1
Medina County	10
Wilson County	3

Questionnaire Outcomes

Once the questionnaire period ended, TTI staff compiled the results. TxDOT district staff focused primarily on the Mobility and Connectivity area for the ARRPO planning process and worked with TxDOT area engineers to develop the three top-ranked needs into projects. The remaining list of needs for the Safety and Maintenance area and Pedestrian, Bicycle, and Transit were provided to TxDOT staff, transit agencies, as well as county and city staff that focus on these areas (e.g., bicycle needs and issues were provided to staff working on the San Antonio District Bicycle Plan). The result is a list of three prioritized projects for each of the ARRPO counties participating in the AARPO workshops. The outcomes from the workshops will be used moving forward to plan and program rural projects for the San Antonio District.

CHAPTER 8: SUMMARY

Performance-based transportation planning has existed for many years and has recently gained acceptance and practice as a result of federal rules. It is fast becoming the cornerstone for transportation decision-making throughout the country in both metropolitan and nonmetropolitan (rural) areas. Establishing a common set of performance measures allows for the evaluation and comparison of different projects and transportation corridors for both current and future conditions and translates data and statistics into a form that the public and decision makers can easily understand.

This research effort developed a framework, performance measures, tool, and guidance to conduct performance-based transportation planning and programming in non-metropolitan areas of the state and support Rural Transportation Planning Organizations. A framework establishes an organizational structure and process that directs users through the important considerations and tasks needed to develop and implement a particular program. The framework is intended to be an iterative process, and each step is a fundamental element of performance-based planning. More than one step can be conducted simultaneously with another or the sequence of steps may vary.

Performance measures must cover a broad range of goals and objectives that support planning goals and emphasis areas from applicable plans and legislation. The research team developed rural performance measures that are SMART—Specific, Measurable, Attainable, Realistic, and Timely—and focus on issues pertinent to rural areas and statewide long range planning while staying consistent with current statewide plans and programs.

The guidebook directs the reader through the framework for conducting a rural transportation system assessment based on individual goals and objectives and selected performance measures and weights. The planning tool developed as part of this project is intended for use with the guidebook for establishing and using rural performance-based transportation system assessment, monitoring, planning, and programming consistent with statewide plans and programs.

APPENDIX A: PEER STATE RPO MATRIX

Issues	California	Washington State	Pennsylvania	North Carolina	Virginia *Performance Based Planning Framework*
Approach	• DOT guides regions in identifying areas of performance and detailed systems of measurement • Regions incorporate PMs into regional planning processes	• DOT provides framework for incorporating PMs in planning process • Regions identify, define and monitor performance measures	• DOT works with MPOs and RPOs to ensure performance is considered when choosing projects for their TIPs and their LRTPs	• DOT provides guidance in *Policy to Projects* strategic plan that supports data-driven planning process, designed for use at all levels • NC state law requires DOT to use a data-driven, systematic prioritization process when developing transportation projects and mandates use of both quantitative data and qualitative and local input. • Regions develop separate processes; some have begun using new process	• Secretary of Transportation intermodal planning office provides statewide performance-based planning framework • Regions and DOT develop long-range plan together using Investment Priority Rating Process

Issues	California	Washington State	Pennsylvania	North Carolina	Virginia *Performance Based Planning Framework*
State role	• Defines performance areas • Provides standardized calculation formulas	• Establishes minimum standards and consistency for regional transportation plans • Defines PMs for both system and plan implementation • Lists examples of data types that RTPOs can use • Mandates that data collection, analysis and storage must be a part of all RTPO work programs	• DOT consults and coordinates with RPOs	• NCDOT uses new process at statewide planning level • NCDOT reaches out to regional and local partners to support improvements to their project prioritization processes • NCDOT uses developed a Level of Service performance measurement process focused on the quality of service provided to the user	VDOT and Planning District Commissions work together to develop rural long-range plans: • OIPI provides planning outline with start-to-finish instructions about aligning regional plans to statewide goals, and feeding performance results back into next planning cycle in order to direct investments • VDOT/PDCs determine regional needs and objectives, apply a ranking system, resulting in regional plans • VDOT incorporates regional plans into State Highway Plan.
Region role	• Identifies level of maturity of program measurement system • Designs project planning and selection process • Determines how performance measures will be used in planning process	• Defines and calculates performance monitoring • Develops selection criteria and project application procedures	• Develops spatial priorities and selection criteria for prioritization process		

Issues	California	Washington State	Pennsylvania	North Carolina	Virginia *Performance Based Planning Framework*
Statewide Planning & Performance Categories/Goals/Principles	• Safety • System preservation • Mobility • Accessibility • Reliability • Productivity • Return on Investment	• Consistency (technical) • Partnering (stakeholders) • Public Involvement • Regional Perspective • Continuous Improvement through monitoring and adjusting • Short and Long-Term Perspectives • Sustainability (financial, economic, environmental, and community resources)	• Safety • Mobility • Preservation • Accountability • Funding	• Safety • Mobility • Infrastructure Health	• Safety and security • System maintenance and performance • Mobility, connectivity and accessibility • Environmental stewardship • Economic vitality • Coordination of transportation and land use • Program delivery

Issues	California	Washington State	Pennsylvania	North Carolina	Virginia *Performance Based Planning Framework*
Sample Regional Methodology		Yakima Valley COG: Selection criteria more quantitative since 2006. 2010–2011 cycle emphasized shovel ready projects that would produce economic opportunity. Measures included: • Traffic volume • Freight mobility • Roadside hazards • Collision rate • Alternative modes • Existing surface condition • Roadway width deficiency • Excess funding match • Non-matching funding investment	North Central Pennsylvania Regional Planning and Development Commission: Developed project prioritization process with 2 parts: 1. Regional core system providing geographic priorities 2. 6 categories of weighted project selection criteria • highway restoration • highway/new capacity • state bridges bigger than eight feet • local bridges smaller than 20 feet • safety • transportation enhancements		VDOT Lynchburg District: Developed own priority ranking matrix that ranks planned projects using weighted attribute data as specified in MAP-21 and VTrans2035, used to prioritize 2012 process of Rural LRTP projects. Selection criteria: • Safety • Operations and Maintenance • Capacity
Program Status			• RPO System finalized in 2008 • Complete RPO System first used in the 2011 TIP	• Plan elements codified in NC state law in 2011. • NCDOT continues to develop the process by engaging partners and seeking input from them on a biannual basis	• Re-evaluated PMs to add measures more clearly related to VTrans Investment Priorities • Developing new reporting system to make the PMs more transparent and easier to update more frequently basis, and more closely aligned with MAP-21 requirements

APPENDIX B: PEER STATE PERFORMANCE MEASURES BY STATE

The following pages contain performance measures from Virginia, North Carolina, Pennsylvania, Washington, and California.

References for peer state performance measures:

- **Virginia**: 2011 Transportation Performance Scorecard, http://www.vtrans.org/resources/StatewidePerformanceReport_2011.pdf, pp. 3–5.
- **North Carolina**: N.C. Department of Transportation, Policy to Projects, September 5, 2012, p. 37, http://www.ncdot.gov/download/performance/ncdot_2012_policy_to_projects_web_draft.pdf, last accessed September 25, 2015.
- **Pennsylvania**: North Central RPO Long Range Transportation Plan, 2040, 2012, p. 6, Executive Summary http://www.ncentral.com/trans/wp-content/uploads/2014/01/Final-executive-summary_v4812.pdf, last accessed September 25, 2015.
- **Washington**: WsDOT, Statewide Transportation Policy Goals, GNB Edition, June 30, 2015, http://wsdot.wa.gov/publications/fulltext/graynotebook/DB_Jun15.pdf.
- **California**: Caltrans, *Performance Measures for Rural Transportation Systems GUIDEBOOK*, June 2006, http://www.dot.ca.gov/perf/library/pdf/RSPMGuidebook.pdf.

Virginia	Goal	Performance Measure
Safety	Safety and Security	Highway Fatalities
		Fatality Rate
		Highway Crashes
		Crash Rate
		Aviation Crashes
		Transit Crashes
		Compliance with Maritime Transportation Security Act
		Airports Participating in Voluntary Security Certification Plan
		Updated Safety and Security Plans
Bridge and Pavement		Average Transit Vehicle Age
		Percentage Interstate Pavement in Fair or Better Condition
		Percentage Primary Pavement in Fair or Better Condition Percentage
		Secondary Pavement in Fair or Better Condition
		Percentage of Bridges in Fair or Better Condition
Rural Mobility	Mobility, Accessibility, and Connectivity	Hours of Delay Northern VA
		Hours of Delay Hampton Roads
		Hours of Delay Richmond
		HOV Use Northern VA
		HOV Use Hampton Roads
		Park and Ride Spaces
		Transit Trips Per Capita
		Transit Revenue Miles
		Intercity Rail Service
		Bicycle Travel
		Pedestrian Travel
		Percentage Freight Shipped by Rail or Barge
Economy	Economic Vitality	Gross State Product – Transportation Sector
		Freight Through the Port of Virginia
		Number of Enplanements
		Percentage of Discretionary Expenditures with Small, Women, and Minority owned (SWaM) Businesses
		Transportation Sector Employment
		Port of VA East Coast Market Share
Environment	Environmental Stewardship	Fuel Usage Per Capita
		Greenhouse Gas Emissions
		Wetlands Replaced as a % of Consumed
		Total Mobile Source Emissions
Transportation and Land Use	Transportation and Land Use	Daily Miles Traveled Per Capita
		Teleworking Statewide
		Population Density Statewide
		Jobs-Housing Balance
Operation and Program		DMV Customer Service Wait Times
		Transit Operating Cost Per Trip
	Program Delivery/Organizational Performance	VDOT Admin/Total Expenditures
		VDOT Projects Completed On-Time/ On-Budget
		VDOT Customer Satisfaction

North Carolina	Goal	Performance Measure
Safety	Make our transportation network safer	Statewide network crash rate; target 234 or less
		Percentage of surveyed North Carolina drivers using a safety belt*; target: 90.0% or greater
Bridge and Pavement	Make our infrastructure last longer	Percentage of bridges rated in good condition; target: 65.0% or greater
		Percentage of pavement miles rated in good condition*; target: 70.0% or greater
		Average highway feature CSs (excluding pavement and bridges)*; target: 84 or greater
		Average rest area CSs; target: 90 or greater
Rural Mobility	Make our transportation network move people and goods more efficiently	Average statewide accident clearance time; target: 70 min. or less
		Travel time index for surveyed interstates; target: 1.04 or less
		Percentage of planned ferry runs completed as scheduled; target: 95.0% or greater
		Percentage of passenger trains arriving on schedule; target: 80.0% or greater
		Percentage change in public transit ridership; target: +5% or greater
		Percentage change in Port Authority cargo movements (container and breakbulk cargo); target: +5% or greater
Economy		
Environment		
Transportation and Land Use		
Operation and Program		Percentage of work program projects (STIP) on schedule a. Percentage of centrally managed STIP projects on schedule b. Percentage of division managed STIP projects on schedule c. Percentage of municipal and locally managed STIP projects on schedule; target: 85% or greater
		Percentage of division-managed projects (non-STIP) on schedule; target: 85% or greater
	Make our organization a place that works well	Percentage of construction projects completed on schedule; target: 85% or greater
		Total budget overrun for completed construction projects; target: 5% or less
		Percentage of NCDOT's total budget expended on external goods, materials and services; target: 80.0% or greater
		Percentage of the overall budget for administrative costs; target: 7.6% or less
		Percentage of the total program budget paid to minority- and women-owned businesses; target: 10.7% or greater
		Average customer wait-time at DMV facilities that track transactions; target: 24 min. or less
		Average statewide environmental compliance score on construction and maintenance projects; target: 7.5 or greater
		Percentage of surveyed customers satisfied with transportation services in North Carolina*; target: 75% or greater
		Percentage of employees retained after three years; target: 90% or greater
		Employee safety index; target: 6.16 or less
	Make our organization a great place to work	Percentage of employees retained after three years; target: 90% or greater
		Employee safety index; target: 6.16 or less

Pennsylvania	Goal	Performance Measure
Safety	1. Reduce the rates of transportation-related fatalities and injuries 2. Expand the use of compatible land use practices in regard to transportation 3. Implement safety initiatives for all transportation modes	Crashes (total, fatal, injury) · · · N ·
		Number of roadway safety projects implemented
		Number of roadway safety audits completed
		Number of educational campaigns (e.g., aggressive driving, drunk driving, red light running)
		Safety Management Plan implementation
	Participate in PennDOT District ITS and incident management planning activity	Number of projects improving security (e.g., lighting at park and rides, etc.)
Bridge and Pavement	Give Priority to Preservation; Address deficiencies in the region's transportation system	Share of TIP allocated to maintenance
		Road roughness indicators
		Number of state/local bridges posted and closed
		Average age of ATA and DuFAST fleet
Rural Mobility	Improve Accessibility and Mobility: 1. Expand aviation services, connecting the region to multiple hubs; 2. Improve the coordination and efficiency of transit and paratransit systems, 3. Mainstream bicycle, pedestrian, and public transportation as part of planning and programming	Public transit ridership (fixed-route and demand responsive)
		Shipper and carrier satisfaction with regional logistics
		Commercial air service destinations served
		Number of projects and dollar value targeted against the regional core system
	Enhance Connectivity: 1. Maintain a regional core transportation system connecting local and regional facilities with the state's system; 2.Expand bulk transfer capabilities for rail truck movements	Number of disconnects or gaps in core system closed
		Shipper and carrier satisfaction with regional intermodal connections
		Number of segments completed to regional greenway network
	Promote Efficient Management and Operation: Expand the use of technology for improved system management	Survey satisfaction with roadway surface quality
		Mileage of posted and bonded roadways and bridges
		Number and dollar amount of ITS projects/installations
		Number of traffic signals with LED and pre-emption
Economy	Support Economic Vitality: 1. Expand employment opportunities; 2. Diversify the region's economic base; 3. Promote tourism and resource extraction as regional economic priorities	Change in total employment
		Jobs generated by transportation investment
		Number of (TIP) projects enhancing goods movement and logistics
		Percent of regional employers sampled satisfied with regional transportation system meeting their needs
Environment	Protect the Environment: 1. Promote the use of alternative modes of transportation; 2. Involve public officials to better integrate land use and transportation	Municipal comprehensive plans adopted · ·
		Number of greenway projects funded
		Number of municipal access management ordinances
		Number (and dollar amount) of TE projects
Transportation and Land Use		

Washington	Goal	Performance Measure
Safety		Rate of traffic fatalities per 100 million VMT statewide
		Rate of recordable incidents for every 100 full-time WSDOT workers
Bridge and Pavement		Percentage of state highway pavement in fair or better condition by VMT
		Percentage of state bridges in fair or better condition by bridge deck area
Rural Mobility		Highways: Annual (weekday) vehicle hours of delay statewide at maximum throughput speeds2
		Highways: Average incident clearance times for all Incident Response program responses
		Ferries: Percentage of trips departing on time3
		Rail: Amtrak Cascades on time performance
Economy		
Environment		Number of WSDOT storm water management facilities constructed
		Cumulative number of WSDOT fish passage improvement projects constructed
Transportation and Land Use		
Operation and Program		Cumulative number of Nickel and TPA projects completed, and percentage on time
		Cumulative number of Nickel* and TPA* projects completed and percentage on budget
		Variance of total project costs compared to budget expectations

California	Goal	Performance Measure
Safety		Accident rate per million VMT
Bridge and Pavement		Pavement condition index (PCI)
Rural Mobility	Mobility	Origin-destination (OD) travel times along major corridors
		Actual average speeds (mph)
		Delays (sec or min)
	Accessibility	Accessibility Difference [min]: Time from a particular point between the fastest and second-fastest routes to State Highway System access points.
	Reliability	Variability of travel times between major OD pairs [% of standard deviation / average travel time]
	Productivity	Vehicle throughput [actual volume/capacity of roadway in %]
		Lost lane miles
		System wide (or) per roadway segment
Economy	Return on Investment	Life-cycle costs [dollars]
		Life-cycle benefits [dollars]
		Net present value [dollars]
		Benefit/cost ratio [benefits divided by costs]
		Rate of return on investment [percent return per year]
		Project payback period [years]
		Calculated benefits [dollars]
		Travel time savings
		Vehicle operating cost savings
		Accident cost savings
		Emission cost savings
Environment		
Transportation and Land Use		
Operation and Program		

APPENDIX C: TEXAS RPO SUMMARIES

Appendix C contains information about select RPOs in Texas.

ALAMO REGIONAL RURAL PLANNING ORGANIZATION

The AACOG drafted a resolution to establish an RPO in August 2008. The Alamo Regional Rural Planning Organization has been in operation since approximately 2011. ARRPO concentrates its effort on the provision of information to local stakeholders. A focus of the RPO is assisting rural communities to understand TxDOT's practices for budgeting and project prioritization so that these communities can productively participate in the transportation planning process. According to RPO representatives, the organizational and educational efforts of the RPO have helped the COG, TxDOT, and the County Judges work together productively.

ARK-TEX RURAL PLANNING ORGANIZATION

The Ark-Tex Council of Governments drafted a resolution to establish the COG as an RPO in February 2001. Since then, the RPO has met regularly. Ark-Tex RPO serves nine counties (eight in Texas and one in Arkansas): Bowie, Cass, Delta, Franklin, Hopkins, Lamar, Morris, Red River, and Titus Counties in Texas and Miller County in Arkansas. RPO committee members actively discuss TxDOT plans and initiatives that affect their jurisdiction as well as other relevant transportation planning issues that affect their area.

BRAZOS VALLEY REGIONAL PLANNING ORGANIZATION

Brazos Valley Council of Governments (BVCOG) established itself as an RPO in April 2008 to support transportation planning. The COG Board (Policy Committee) combines with the Regional Transportation Planning Committee (staff level representatives from participating counties, municipalities, and resource agencies) to administer the RPO process. BVCOG furnishes support staff for the rural planning effort and considers COGs to be the logical centers to conduct this planning inside their boundaries. Most actions taken by the RPO have been in the form of resolutions and agreements. They have not engaged in any formal transportation planning or project prioritization processes.

CAPITAL AREA REGIONAL TRANSPORTATION PLANNING ORGANIZATION

The Capital Area Council of Governments (CAPCOG) formed the Capital Area Regional Transportation Planning Organization (CARTPO) in 1999 to address the transportation planning needs of the rural areas within the COG. CARTPO shares the CAPCOG boundaries. CARTPO was originally created as a response to federal legislation (TEA-21) which called for state DOTs to work with officials in non-metropolitan areas for transportation decision-making. CARTPO re-evaluated its role in the transportation planning process in 2006 and formalized its structure and objectives into an adopted set of bylaws in April of 2007.

CARTPO membership is composed of voting, non-voting ex-officio, non-voting associate, and staff members. Each county in the 10-county CAPCOG region may choose three elected officials to serve as voting members. Individual counties are encouraged to include at least one municipal representative in their voting membership. Nine other stakeholder organizations participate as

non-voting members. CAPCOG provides staff and administrative support for all CARTPO activities. According to representatives, CARTPO serves as a forum for elected officials to come together on transportation issues to recommend changes in policy and practice, recommend legislation, recommend regional priorities, direct certain planning and data initiatives, oversee the federally-prescribed local consultation process, and collaborate with the Capital Area Metropolitan Planning Organization (CAMPO). CARTPO has developed a project evaluation and priority establishment process enabling them to evaluate and recommend projects with a regional impact to TxDOT.

CENTRAL TEXAS RURAL PLANNING ORGANIZATION

In the Waco District, the Central Texas Council of Governments (CTCOG) established the Central Texas Rural Planning Organization (CTRPO) in April 2002. The organization has not been active or scheduled meetings.

COASTAL BEND COUNCIL OF GOVERNMENTS

The Coastal Bend Council of Governments (CBCOG) has investigated the potential for becoming an RPO. The CBCOG boundaries encompass portions of five TxDOT districts. Because of this fact the COG board of directors determined that managing an RPO that has such a large scope and the potential for a high degree of variability would not be efficient use of staff time. As of September 2014, CBCOG has not participated in transportation planning activities at any level since its inception in 1966.

CONCHO VALLEY COUNCIL OF GOVERNMENTS

The Concho Valley Council of Governments (CVCOG) drafted a resolution to establish the COG as an RPO in April 2005. In November 2009, CVCOG approved an additional resolution outlining the RPOs desire to be formally recognized by congress, in accordance with the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users reauthorization legislation. During the time between 2009 and 2014, the RPO was inactive. In September 2014, CVCOG's executive director stated interest in renewing RPO efforts in the region.

CROSS PLAINS RURAL TRANSPORTATION COUNCIL

According to a representative, the Cross Plains Rural Transportation Council (CPRTC) provides advice, strives to influence the planning and development of rural transportation projects, participates in the planning of important transportation corridors passing through the region, and acts as a cohesive entity, communicating those needs and recommendations to all levels of government. This process allows counties, cities, and rural communities the opportunity to be involved in the early stages of transportation planning. Nonmetropolitan areas of nine counties and more than 50 incorporated municipalities in North Central Texas are represented by the council.

TxDOT and local officials have realized significantly improved mutual understanding of future rural transportation planning needs and have improved ability to modify plans and project construction schedules to meet the needs of the rural areas represented by CPRTC. Identifying locally important projects outside of major metropolitan areas and creating regional unity for

priority projects through the development of a regional consensus are positive products of CPRTC. A project prioritization process was developed and is being used for project selection recommendations. CPRTC has provided effective assistance to TxDOT regarding public involvement in decision-making within the planning and programming processes. Members of CPRTC coordinate with their constituents, chambers of commerce and business leaders to make representative decisions for their local areas. CPRTC is one of the most active RPOs in Texas.

DEEP EAST TEXAS RURAL TRANSPORTATION PLANNING ORGANIZATION

The Deep East Texas Council of Governments (DETCOG) drafted a resolution to create the Deep East Texas Rural Transportation Planning Organization (DETRTPO) in June 2008. DETRTPO was founded around a mission to "enhance regional mobility through education, coordination and advocacy." DETCOG provides all staffing and funding for DETRTPO activities. DETRTPO has not been active in recent years.

ROLLING PLAINS ORGANIZATION FOR RURAL TRANSPORTATION PLANNING (RPORTP)

RPORTP was established as an RPO in October 2007. It is located in the Childress District and encompasses 13 counties. The RPO boundaries match TxDOT's Childress District boundaries and include three COGs—NORTEX, Panhandle RPC (Amarillo) and South Plains Area COG (Lubbock). The RPO was formed following success in neighboring Wichita Falls District and the CPRTC. The membership structure includes an elected Chairperson and Vice-Chairperson that serve a two-year term. There are currently no structured by-laws, no funding, and TxDOT provides all of the administrative functions. The group does not have any published goals or strategies. The RPO is managed by 13 County Judges (with voting privileges) and a single member from each of the 26 municipalities that are within the RPO boundaries (without voting privileges).

TEXOMA COUNCIL OF GOVERNMENTS

The Texoma Council of Governments (TEXOMA) has been attempting to establish an RPO for over two years. Conceptually, the RPO boundaries would consist of Fannin County in its entirety and the rural areas of Grayson County that are not within the Sherman-Denison MPO boundaries. Despite Cooke County being a member of TEXOMA, the county is already part of the Cross Plains Rural Transportation Council and not planned to be part of the TEXOMA RPO, however Cooke County supports the efforts of TEXOMA and has stated interest in participating in as much of the RPO activities as possible. Fannin County and the rural towns in Grayson County have registered additional support for the creation of a TEXOMA RPO. TEXOMA representatives stated that the COG is hoping that a supportive Grayson County judge will be elected in January 2015 so that TEXOMA can proceed with drafting a resolution to create an RPO within the COG's jurisdiction.

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