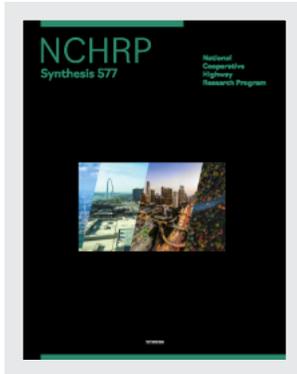


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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP SYNTHESIS 577

**Collaborative Practices for
Performance-Based Asset Management
Between State DOTs and MPOs**

A SYNTHESIS OF HIGHWAY PRACTICE

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2021

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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

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NCHRP SYNTHESIS 577

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ABOUT THE NCHRP SYNTHESIS PROGRAM

Highway administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to highway administrators and engineers. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire highway community, the American Association of State Highway and Transportation Officials—through the mechanism of the National Cooperative Highway Research Program—authorized the Transportation Research Board to undertake a continuing study. This study, NCHRP Project 20-05, “Synthesis of Information Related to Highway Practices,” searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an NCHRP report series, Synthesis of Highway Practice.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

FOREWORD

By Christopher Dunne

Staff Officer

Transportation Research Board

The objective of *NCHRP Synthesis 577: Collaborative Practices for Performance-Based Asset Management Between State DOTs and MPOs* is to document state departments of transportation collaboration with metropolitan planning organizations (MPOs) relative to target setting, investment decisions, and performance monitoring of pavement and bridge assets for performance-based planning and programming. The synthesis focused on the practices of state departments of transportation (DOTs) to initiate and facilitate collaboration with MPOs.

Information in this study was acquired through a review of the literature and a survey of representatives of DOTs. Follow-up interviews were conducted to inform the development of four case examples of state DOT and MPO collaboration and coordination.

Hyun-A Park of Spy Pond Partners, LLC, collected and synthesized the information and wrote the report. Lori Richter and Perry Lubin of Spy Pond Partners, LLC, and Kirk Steudle of Econolite also contributed to the report. The members of the topic panel are acknowledged on page iv. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.



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Note: Photographs, figures, and tables in this report may have been converted from color to grayscale for printing. The electronic version of the report (posted on the web at www.trb.org) retains the color versions.



S U M M A R Y

Collaborative Practices for Performance-Based Asset Management Between State DOTs and MPOs

The American Association of State Highway and Transportation Officials (AASHTO) defines transportation asset management (TAM) as a “strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their life cycle. TAM focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision-making based on quality information and well-defined objectives.” TAM involves an interconnected set of activities for monitoring the state of the assets; monitoring and managing risks; optimizing life-cycle maintenance, rehabilitation, and replacement investments; and allocating resources and prioritizing work to meet both short- and long-term goals.

The Moving Ahead for Progress in the 21st Century Act (MAP-21) and the subsequent Fixing America’s Surface Transportation (FAST) Act established and reinforced a performance-based federal surface transportation program. State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) are required to establish (2- and 4-year) performance targets related to National Highway System (NHS) pavement and bridge asset conditions – as well as safety, air quality, freight movement, and system performance. State DOTs are required to produce Transportation Asset Management Plans (TAMPs) that include 10+ year state of good repair (SGR) objectives and strategies for making progress toward achievement of the established pavement and bridge targets. The Federal Transit Administration’s (FTA) 2016 Transit Asset Management rule (§ 49 CFR Part 625) established requirements for transit providers to set performance targets for their capital assets based on four SGR performance measures and report these targets and the actual asset conditions to the National Transit Database.

Many state DOTs have historically focused investment decision-making for state-owned assets within engineering divisions while planning divisions work in parallel with MPO planning efforts. MAP-21/FAST has prompted DOTs and MPOs to strengthen collaboration on performance-based planning and programming (PBPP) activities, including TAMP development and target setting for bridges and pavements.

NCHRP Project 20-05/Topic 51-05: “Collaborative Practices for Performance-Based Asset Management Between State DOTs and MPOs” examined state DOT collaboration with MPOs relative to asset inventory and condition assessment, target setting, investment decision-making, and performance monitoring of pavement and bridge assets. The project included a literature review, an online survey of state DOTs, interviews with selected state DOTs and MPOs, and documentation of collaboration practices.

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The findings presented in this report are based on survey responses from 43 of the 52 state DOTs (83 percent), interviews with seven state DOTs and four MPOs, and the literature review. District of Columbia DOT responses are included in the overall percentage of state DOT responses.

Key Findings

The degree of state DOT/MPO collaboration on goals and performance targets varies.

- Fifty-five percent of state DOTs included their MPOs in the development of long-range planning (LRP) goals and objectives related to TAM.
- Thirty-six percent of state DOTs asked their MPOs to participate in the development of pavement and bridge performance targets.

Most MPOs deferred to state DOTs for the initial set of Pavement and Bridge NHS performance targets.

- Fifty-one percent of state DOTs developed their 2- and 4-year NHS pavement and bridge targets first and then provided that information to MPOs.
- Thirty-two percent of state DOTs surveyed reported that they included their MPOs throughout the process of developing targets.
- Sixty-one percent of state DOTs surveyed offered assistance to MPOs in analyzing their targets, and 40 percent of states had an MPO accept their offer of help.

State DOTs are leading data collection and analysis tasks supporting target setting for both state and local NHS assets.

- Eighty-one percent of state DOTs reported that they collect data for locally owned NHS assets.
- Forty-six percent of states surveyed included their MPOs in reviewing predicted pavement or bridge conditions.
- Thirteen percent of states surveyed reported that MPOs provide or help coordinate data on current or future asset expenditures in the state TAMP.
- State DOTs generally have more mature TAM modeling and predictive capabilities than their counterparts in MPOs. Most MPOs have limited technical staff resources who tend to be transportation planning generalists, and most MPOs do not own or maintain NHS roads or bridges.

There is currently strong state DOT/MPO collaboration on asset project programming.

- Seventy percent of state DOTs reported that they coordinate TAM programming for bridges and pavements with their MPOs.

Initial collaborative processes for target setting are in place, and there is interest in improvement.

- Eighty-five percent of state DOTs indicated that they plan to follow the same process for future TAM target setting.
- Seventy-two percent of state DOTs expressed interest in collaborating on TAM activities more regularly with their MPOs.

Case Examples

Four illustrative case examples of state DOT and MPO collaboration were identified.

The Michigan DOT/Southeast Michigan Council of Governments (SEMCOG) case example describes how TAM has, over time, evolved from a legislatively mandated process

to a highly functional, collaborative relationship of trust that has become part of the state's culture. TAM has provided a mechanism for bringing together agencies with disparate agency goals and objectives into a unified statewide strategy for investing in infrastructure assets.

The Florida DOT case example illustrates a formal approach to collaboration, appropriate for a state with a large number of MPOs. The Florida DOT has established an MPO advisory council, with policy/governance and operational groups charged with advocating for the state's MPOs. The state DOT developed a consensus document on coordination and used existing MPO liaisons to produce documentation and fact sheets related to the requirements and the state's target-setting process.

The Pennsylvania DOT/Delaware Valley Regional Planning Commission (DVRPC) case example illustrates a bottom-up approach based on longstanding relationships to provide comprehensive TAM support for their MPOs. This case example also describes how DVRPC, as a multi-state MPO, manages the different priorities of the different state DOT partners.

The California DOT (Caltrans)/Metropolitan Transportation Commission (MTC) case example focuses on a series of workshops that Caltrans conducted with their MPOs on TAMP development, which culminated in a target-setting workshop. It also shares lessons learned and opportunities for the next round of target setting.

Conclusions

This synthesis report documents a review and synthesis of state DOT practices to initiate, facilitate, collaborate, and cooperate with MPO partner agencies on TAM activities, including asset inventory and condition assessment, target setting, investment decision-making, and performance monitoring for pavement and bridge assets. The 43 state DOTs responding to the online questionnaire represent each of the four AASHTO regions. Based on the literature review, questionnaire, and subsequent interviews, the following conclusions emerge:

- Given that MPOs generally do not own and maintain assets, they are less empowered to make decisions about asset investments than state DOTs or their local agency members.
- State DOTs are leading TAM-related decision-making for the NHS. Many MPOs value TAM as important and trust their state DOT partners to conduct the analyses needed for the parts of the NHS within the MPO's region.
- State DOTs are generally collecting data and setting 2- and 4-year performance targets for bridges and pavements for the entire state. Many MPOs are supporting statewide performance targets (rather than setting their own targets), and states are providing data needed for computing the national performance measures to MPOs for the NHS assets owned by their member local governments.
- There is a general understanding that TAM's importance will continue to grow as asset management and performance-based investment decision-making are further integrated into local, state, and national funding allocations.

DOTs and MPOs contacted for this synthesis described a number of practices that can be considered to foster collaboration for TAM performance management. These include

- Communication using a mix of formal and informal channels,
- Involvement of MPO members on LRP advisory committees,
- Development and distribution of fact sheets to provide a common understanding of requirements, methodologies, and processes,

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- Technical assistance/capacity-building activities on specific topics, such as target-setting,
- Statewide collection of asset condition information covering state and locally maintained assets,
- Protocols and tools for data sharing across state DOTs and MPOs,
- Standard report cards on asset condition within MPO boundaries,
- Standard asset investment reporting,
- Workshops involving state DOT, MPO, and local agency staff to discuss current practices, challenges, and future collaboration opportunities,
- Formal documentation of collaboration processes,
- Standing coordinating bodies for MPOs and TAM, and
- Development of templates with standard language for MPOs to use within their planning documents [e.g., to establish targets within Metropolitan Transportation Plans (MTPs)].

Introduction

This chapter begins with background information on transportation asset management (TAM) and related performance management topics to provide context for the synthesis results. It outlines the scope and objectives of this synthesis and describes the methodology used to identify and summarize current practices. Finally, it outlines the contents and organization of the remainder of this report.

Background

Transportation asset management is defined by AASHTO as a “strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their life cycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision-making based upon quality information and well-defined objectives.” AASHTO’s *Transportation Asset Management Guide: A Focus on Implementation* (2016) describes some of the benefits of TAM as

- Improved asset condition, performance, resilience, and longevity,
- Improved accountability,
- Increased efficiency and effectiveness,
- More benefit for each dollar invested,
- Reduced risk exposure, and
- Improved coordination and communication.

Over the past two decades, many state DOTs have adopted TAM principles and practices – establishing performance measures, monitoring and reporting on asset condition and performance, and making data-informed decisions to optimize investments. The MAP-21 and FAST Act brought additional attention to performance-based transportation planning, including preservation of transportation assets. The resulting FHWA and FTA regulations established a set of national performance measures related to safety, infrastructure condition, highway and truck travel time reliability, emissions reduction, and congestion. The national performance measures related to TAM (referred to as “PM2” measures) are for the condition of NHS pavements (based on roughness, rutting, cracking, and faulting) and the condition of NHS bridges (based on visual condition ratings). The national performance measures for pavement and bridges were generally different from the measures already in use by states, but they enabled a consistent national picture of NHS performance.

MAP-21 and FAST Acts also included requirements for state DOTs and MPOs to establish 2- and 4-year performance targets for the pavement and bridge measures and periodically report on progress toward achievement of these targets. MAP-21 required each state DOT to develop a risk-based TAMP for the entire NHS (including locally owned and maintained assets). The TAMP must include long-term SGR objectives for NHS pavement and bridge assets that are

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aligned with the 2- and 4-year performance targets. It must document current asset performance, forecast future performance, and present investment strategies for moving towards achievement of established long-term objectives and 2- and 4-year targets.

Among state, regional, and local partner agencies, coordination and collaboration are critical for good asset management, enabling shared or tiered goals and a system-wide approach to optimizing performance. However, agencies must overcome barriers to collaboration, including limited staffing and skillsets and differing strategic priorities.

Synthesis Objectives and Scope

The objective of this synthesis was to document DOT collaboration with MPOs relative to target setting, investment decisions, and performance monitoring of pavement and bridge assets for PBPP.

The scope of the synthesis included collaboration practices with respect to long-range planning, TAMP development and implementation, and performance target setting. The following specific topics were covered:

- TAM-related activities that have prompted DOT and MPO collaboration.
- How development and implementation of the TAMP informs the long-range planning activities at MPOs and DOTs.
- Activities that state DOTs are undertaking to promote asset preservation and target setting at MPOs.
- Efficiencies and innovations generated from the integration of long-range MPO planning and state DOT-led TAM activities.
- Obstacles that have limited state DOT/MPO collaboration in support of TAM (e.g., state and non-state ownership/maintenance or funding constraints).
- Strategies for addressing discrepancies between state and federal performance measures (e.g., challenges with communication or analysis).
- How DOTs and MPOs collaborate and coordinate on asset management (e.g., agreements, special meetings, organizational structure, or governance).
- How outcomes are monitored and reported between MPOs and the DOTs.
- How differing priorities between DOTs and MPOs are influencing trade-off decisions among performance areas (e.g., transit, congestion, or safety).

This synthesis focused on obtaining state DOT perspectives on MPO collaboration. However, MPO inputs were also obtained through interviews to add context and validate the results.

Research Approach

A multifaceted approach was used to document the state of the practice. This approach included (1) a literature review, (2) a questionnaire distributed to the TAM leads at state DOTs, (3) interviews with selected state DOTs and MPOs and documentation of selected case examples, and (4) synthesis of key findings and reported current collaboration practices that may be transferable to other agencies.

Literature Review

The objectives of the literature review were to

- Assess the general state of the practice state DOTs use to initiate and facilitate collaboration with MPOs.

- Identify specific state DOT collaboration practices related to target setting, investment decisions, and performance monitoring of pavement and bridge assets for performance-based planning and programming with their MPO partner agencies.

The documents reviewed included the following:

- Federal TAM regulations,
- Recently completed state TAMPs,
- States' 2018 Baseline Performance Reports submitted to FHWA,
- FHWA TAM guidance,
- FHWA PBPP guidance,
- FHWA TPM National Implementation Review (NIR) Survey Report, 2019,
- AASHTO and TRB TAM Pooled Fund Survey,
- FHWA PM2 target reporting comments,
- AASHTO's *Transportation Asset Management Guide II* (2016),
- Recently published project/synthesis reports and briefing papers, and
- Other transportation organization and agency websites related to TAM.

The research team used a standard format to document the literature review, organized by document name, including

- Publication,
- Summary of the document,
- General collaboration approaches identified,
- Specific performance-based planning practices,
- Specific target-setting practices for pavements and bridges, and
- Specific coordination and collaboration practices on state DOT TAMPs.

The literature review provided a broad overview of collaborative and cooperative relationships among state DOTs and MPOs as well as a deeper understanding of specific practices and issues, including

- DOT/MPO collaboration related to target setting, investment decisions, and performance monitoring of pavement and bridge assets for performance-based planning and programming,
- Collaboration strategies,
- Organizational structures and mechanisms for collaborating,
- Monitoring and evaluation of interagency relationships,
- Efficiencies gained through cross-agency approaches,
- Communication and reporting mechanisms related to collaboration, and
- Barriers to interagency collaboration.

References and Bibliography are included at the end of the report.

Questionnaire

A questionnaire was developed to obtain information on the state of the practice. The literature review results informed development of this questionnaire. The questionnaire was sent to all state DOT representatives from FHWA's state DOT TAM contact list. An email was sent to the state contacts informing them of the upcoming questionnaire. Recipients had the opportunity to seek additional individuals from agencies to provide information for the questionnaire. A copy of the email sent to state DOT contacts is included as Appendix A. The questionnaire instrument is included as Appendix B. The list of responding agencies is included in Appendix C, and the questionnaire results are included as Appendix D. Appendix E provides the sample interview guide.

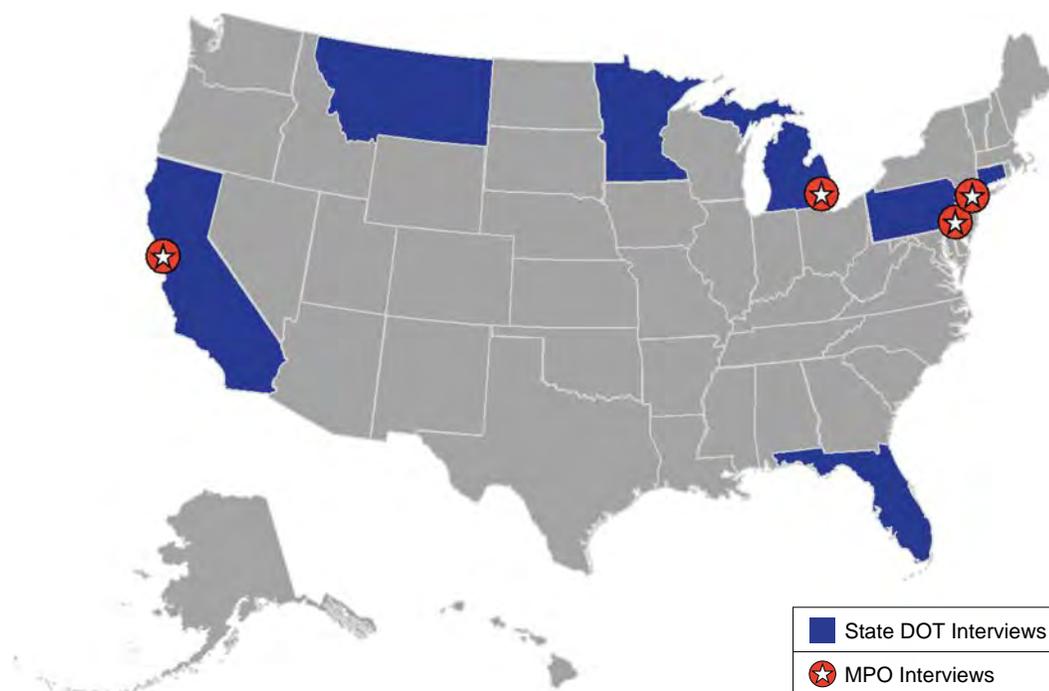


Figure 2. Location of state DOTs and MPOs that were selected for interviews.

also interviewed to add their perspectives to the study. Figure 2 represents the state DOTs and MPOs interviewed. The list of participating agencies is included in Appendix C, and Appendix E provides the sample interview guide.

Based on the interviews, a set of four case examples were developed, documenting collaboration practices in Florida, California, Michigan, and Pennsylvania.

A Note on Timing

This synthesis is based on information gathered between January and April of 2020. By this time, state DOTs had completed their initial and full TAMPs (due October 1, 2018, and June 30, 2019, respectively) with 10-year SGR objectives for NHS pavements and bridges. They had also established 2- and 4-year performance targets for NHS pavement and bridge condition (by May 20, 2018) and submitted their baseline performance reports with these targets (due October 1, 2018) to FHWA. MPOs had established their initial 4-year targets for NHS pavement and bridge condition by November 16, 2018.

As of May 20, 2019, states and MPOs were required to incorporate the new performance-based planning provisions and pavement and bridge performance requirements into any updates or amendments to long-range plans and programs.

Although important initial milestones have been completed, it is important to note that these synthesis results represent a snapshot in time. State DOT, MPO, and local agency TAM and TPM practices will continue to mature as they complete the first full cycle of target setting, monitoring, and reporting. State DOTs are required to report their 2-year progress and adjusted 4-year targets to FHWA in their Mid Performance Period Progress Report by October 1, 2020. Their full-performance period reports are due October 1, 2022.

Synthesis Organization: Outline of the Report

This report is organized into five chapters. This introductory chapter provides the study background, summary approach, scope, and methodology used in this synthesis. Chapter 2 highlights the findings from the literature review, and Chapter 3 presents the questionnaire results. Chapter 4 provides case examples of collaboration practices. Chapter 5 presents conclusions, including key insights, knowledge gaps, possible future research needs, and other actions to advance the practice. There is also a references and bibliography listing, followed by abbreviations and acronyms.

Five appendices provide more detailed information on the questionnaire and interview guide:

- Appendix A: Questionnaire Email. Correspondence sent to state DOTs, providing the background on the synthesis and asking them to participate in the questionnaire.
- Appendix B: Questionnaire. Questions that were included in the online questionnaire.
- Appendix C: List of Participating Agencies. Agencies and roles/business areas that participated in the questionnaire and interviews as part of the study.
- Appendix D: Questionnaire Results. The consolidated results of the questionnaire.
- Appendix E: Sample Interview Guide. A generic version of the interview guide.

Literature Review

Overview

This chapter summarizes the results of a literature review conducted to provide insights into DOT and MPO collaboration related to TAM and TPM. It begins with a summary of relevant federal legislation and then highlights findings related to the following topics:

- DOT and MPO PBPP and TAM collaboration,
- Collaboration strategies,
- Organizational structures for collaborating,
- Communication and reporting mechanisms related to collaboration,
- Efficiencies gained through collaboration,
- Barriers to collaboration, and
- Collaboration gaps.

To identify relevant sources for the literature review, a search was performed using TRB's Transportation Research Information Database (TRID) database. This database provides access to 1.25 million records of active and completed transportation research from a range of sources, including FHWA, AASHTO, and TRB. The TRID search was supplemented with searches of AASHTO, Association of Metropolitan Planning Organizations, and state transportation agency and MPO TAM websites. Additional sources of note included

- State TAMPs compiled on the AASHTO TAM Portal,
- The 2019 FHWA NIR Survey,
- The FHWA PM2 reporting comments,
- States' 2018 Baseline Performance Reports submitted to FHWA, and
- The AASHTO and TRB TAM Pooled Fund Survey.

The review was limited to practices within the United States. See the References and Bibliography section at the end of this report for a full list of sources consulted.

Federal Legislation and Regulations

MAP-21 includes several key provisions related to TAM and PBPP, which were continued in the FAST Act. For state highway programs, MAP-21 defines asset management, requires risk-based TAMPs for NHS assets, and incorporates a number of provisions related to PBPP. The FHWA developed the following definitions relative to PBPP and TAM, as described in *Linking Performance and Asset Management: A White Paper Produced by the Federal Highway Administration Transportation Asset Management Expert Task Group* (FHWA 2019a, page 1):

- “Performance-based planning and programming (PBPP) refers to the application of performance management within the planning and programming processes of transportation agencies to achieve desired performance outcomes for the multimodal transportation system.”

12 Collaborative Practices for Performance-Based Asset Management Between State DOTs and MPOs

- “Asset management means a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on both engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the life cycle of the assets at minimum practicable cost.”

Three sets of interrelated regulations set forth requirements for performance-based planning and TAMPs:

- § 23 CFR Part 490 – National Performance Measures.
- § 23 CFR Part 450 – *Planning Assistance and Standards* – Subpart B (State and Non-Metropolitan Transportation Planning and Programming) and Subpart C (Metropolitan Transportation Planning and Programming).
- § 23 CFR Part 515 – *Asset Management Plans*.

Key provisions related to state/MPO collaboration on TAM performance measurement and monitoring are highlighted.

National Performance Measure regulations establish pavement and bridge performance measures and require state DOTs and MPOs to set statewide and metropolitan area-specific targets, respectively, for these measures. State DOTs are required to coordinate with relevant MPOs on selection (and subsequent adjustment) of targets to ensure consistency “to the maximum extent practical.”

MPOs must establish their targets within 180 days from the date that state DOT targets are set either by

- Supporting the state target, which means agreeing to plan and program projects so that they contribute toward the accomplishment of the relevant state DOT target for that performance measure or
- Setting their own target, which means committing to a quantifiable target for that performance measure for their metropolitan planning area.

Note that by supporting a state target, an MPO is not committing to achieving that same target for their metropolitan planning area. Supporting a state target means that the MPO agrees to plan and program projects to help the state meet the statewide target.

State DOTs must submit biennial reports on statewide targets to FHWA and are required to provide the MPO targets to FHWA on request as those targets are established or adjusted.

Planning assistance and standards regulations for statewide and metropolitan planning reinforce the National Performance Measure regulations with respect to state/MPO coordination on targets. Statewide Long Range Transportation Plans (LRTPs) and Metropolitan Transportation Plans (MTPs) are required to include a description of the national performance measures and associated targets and a system performance report evaluating the condition and performance of the transportation system with respect to the performance targets. MPOs are required to integrate the goals, objectives, performance measures, and targets in the state TAMP into the Metropolitan Transportation Planning Process—either directly or by reference. Other provisions require consultation on planning studies to the maximum extent practicable and cooperative state-MPO development of funding estimates for MTP Transportation Improvement Program (TIP) implementation. MPOs are to develop TIPs in cooperation with the state. States select projects on the NHS for implementation from the approved TIP in cooperation with the MPO.

Transportation Asset Management Plan regulations require long-term (10+ year) TAMPs to include

- A listing of the pavement and bridge assets on the NHS, including the condition of those assets,
- Asset management objectives,

- Asset management measures and targets (including, but not limited to, those required under § 23 CFR Part 490),
- Performance gap identification,
- Life-cycle planning,
- Risk management analysis,
- Financial planning, and
- Investment strategies for making progress toward performance targets and SGR objectives.

The TAMP regulations do not reference MPO coordination explicitly. However, the regulations do include a provision that states must integrate the TAMP into transportation planning processes that lead to the Statewide Transportation Improvement Program (STIP), and the STIP incorporates metropolitan TIPs.

DOT and MPO PBPP and TAM Collaboration

Integrating Asset Management and Planning: A White Paper Produced by the Federal Highway Administration Transportation Asset Management Expert Task Group (FHWA 2019a) describes how FHWA requirements are necessitating additional collaboration between state DOTs and MPOs related to planning and programming. According to the paper, MPOs are well aware of the condition of their local assets, and many have travel demand models, but they are less involved in planning for assets on the NHS, and few have pavement and bridge management systems. Furthermore, local asset condition is not typically consolidated to provide a regional perspective. The paper describes collaboration examples between state DOTs and MPOs on the development of STIPs, TIPs, LRPs, and MTPs. The paper also predicts wide variation in collaboration approaches across the 52 DOTs and 408 MPOs based on the size of their constituency, the number of lane miles they own, and urban/rural differences. State/MPO collaboration needs are likely to be greater for states and MPOs with relatively greater amounts of locally owned and maintained NHS assets. According to 2015 FHWA data, around 24,000 centerline miles are on the local NHS out of approximately 223,000 on the NHS. Around 75 percent of the local NHS system is in 25 percent of all states. The paper anticipates that the success of TAM in these states hinges on the engagement between state DOTs and MPOs.

A 2017 survey conducted for *NCHRP Synthesis 528: Analyzing Data for Measuring Transportation Performance by State DOTs and MPOs* (Vandervalk 2018) included questions about the extent of collaboration between state DOTs and MPOs. This survey had responses from 40+ state DOTs and 16 MPOs. It found that collaboration between DOTs and MPOs is most prevalent for safety performance measures, followed by mobility, bridge, and pavement conditions. The MPOs responding to the survey indicated that they rely heavily on state DOTs for bridge condition and pavement condition data.

As part of the FHWA TPM Technical Assistance Program (TAP), the NIR Survey was conducted from late 2018 to early 2019 to review progress made by state DOTs and MPOs in implementing TPM and PBPP to identify TPM gaps and capacity-building themes for advancing the TPM state of the practice. This survey was distributed to state DOTs and a sample of small (less than 200,000 population), medium-sized (200,000 to 1 million population), and large (over 1 million population) MPOs. Respondents included 47 DOTs, 18 large MPOs, 39 medium-sized MPOs, and 101 small MPOs. The survey found that collaboration and coordination are rated as valuable tools by agencies. More than three-quarters of state DOTs surveyed reported high or moderately high levels of interaction or collaboration with MPOs in the areas of data sharing and setting goals/objectives/performance measures. The survey asked agencies to rate their level of coordination with other entities on target setting for each performance area. For pavement target setting, 20 percent of DOTs reported high or moderately high levels of coordination. For bridge target setting, 25 percent of DOTs reported high or moderately high levels of coordination. MPO responses to these questions varied by size, but generally a greater percentage of

MPOs reported high or moderately high levels of coordination on target setting: between 46 and 52 percent for pavement and between 30 and 54 percent for bridge. Coordination was highest for safety target setting; 56 percent of state DOTs and between 54 and 64 percent of MPOs indicated high or moderately high levels of coordination.

The NIR survey report identifies several key themes and lessons of relevance to this project, particularly in the areas of collaboration, the use of TPM for decision-making, and obstacles to collaboration. The NIR survey results suggest investigating and communicating the benefits of outward thinking (i.e., considering external partner or stakeholder perspectives) and providing tools to facilitate data sharing. It also recommends additional research on the reasons for lack of greater collaboration on target setting.

Collaboration Strategies

Integrating Asset Management and Planning: A White Paper Produced by the Federal Highway Administration Transportation Asset Management Expert Task Group (FHWA 2019a) provides several examples of DOT and MPO collaboration. The North Central Texas Council of Governments (NCTCOG) and Texas DOT are working together to take NHS and non-NHS bridge conditions relative to targets into account in regional project prioritization, federal funding applications, and MPO planning and programming. The Texas DOT created a web report providing bridge condition information for each MPO region. NCTCOG used these data to seek additional funds to improve the bridges on its NHS network. The Washington State DOT is providing financial incentives to local NHS owners willing to adopt asset management practices to preserve and improve the condition of locally owned NHS pavements and bridges. Both the Cleveland Urban Area MPO in Tennessee and MTC in California are adopting and operating pavement management systems to enable them to improve their planning processes in support of TAM principles. *NCHRP Synthesis 528: Analyzing Data for Measuring Transportation Performance by State DOTs and MPOs* (Vandervalk 2018) looks at state DOT and MPO tools to support federal MAP-21 and FAST Act TPM requirements as well as agency practices. This 2018 report documents the state of the practice, capacity-building, and research needs at that time and describes the effort of several states to develop data business plans to support TAM, TPM, and operations with MPO partners.

Organizational Structures for Collaborating

NCHRP Research Report 920: Management and Use of Data for Transportation Performance Management: Guide for Practitioners (Harrison et al. 2019) describes several practices related to organizational structures for collaborating. A case study on the I-95 Corridor Coalition probe vehicle data procurement demonstrated collaboration on development of a model data use agreement based on lessons learned across participating agencies from prior contracts and agreements. A second case study then documented formation of the Metropolitan Area Transportation Operations Coordination Program that enabled data sharing and more effective incident response by transportation agencies in the Washington, D.C., metropolitan area.

Communication and Reporting Mechanisms Related to Collaboration

NCHRP Synthesis 528: Analyzing Data for Measuring Transportation Performance by State DOTs and MPOs (Vandervalk 2018) highlights Missouri DOT's Excel tracking sheet for coordinating with their MPO partners on all MAP-21/FAST Act reporting deadlines. The FHWA TPM TAP NIR Survey found that the majority of state DOTs and large-area MPOs have TPM reporting websites. However, the NIR survey results indicate that it is more common for state DOTs and

MPOs to use the data they have primarily for reporting and not for future planning and modeling of outcomes. The report cites this as an opportunity for research on ways to align TPM with PBPP and LRP/MTP with STIP/TIP to advance the practice and improve performance forecasting.

Efficiencies Gained Through Collaboration

According to *NCHRP Synthesis 528*, several states are developing data business plans to help state DOTs and local partners understand current data, make efficient use of people, process, and technology for data management, and align data to business objectives and programs. *Integrating Asset Management and Planning: A White Paper Produced by the Federal Highway Administration Transportation Asset Management Expert Task Group* (FHWA 2019a) suggests that collaboration on asset management provides a spark that can inform increasing numbers of MPO members to the benefits of collaboration on target setting, performance reporting, data collection, and programming of projects.

Barriers to Collaboration

The FHWA TPM TAP NIR Survey describes several barriers to interagency collaboration, including

- Available staff, which may limit respondents' capacity to conduct essential functions across all agency types and performance areas. Among agencies, this was deemed the most common limitation on TPM implementation capacity across all agency types and performance areas. Seventy-five percent of agencies reported this limitation, regardless of agency type or performance measure area. In the survey results, both DOTs and MPOs say that a lack of available staffing most significantly limits their ability to conduct TPM provisions.
- Available data, which constrains 60 percent of agencies overall and is an even more limiting factor in the performance measure areas of freight, congestion, system performance, emissions, and transit safety. As reported in the survey, it was not as significant a factor within the asset measures.
- MPOs generally have less mature predictive capabilities than state DOTs. The average MPO capacity is comparatively low in all categories for all performance measure areas relative to DOT average capacity. The report recommends developing supplemental guidance and training in low-capability areas.

As described in *NCHRP Research Report 920: Management and Use of Data for Transportation Performance Management: Guide for Practitioners* (Harrison et al. 2019), lack of data and analysis skills, distrust of data, and organizational siloes can create institutional obstacles that inhibit data sharing. This report provides a checklist for agencies looking to share data.

Collaboration Gaps

Integrating Asset Management and Planning: A White Paper Produced by the Federal Highway Administration Transportation Asset Management Expert Task Group (FHWA 2019a) suggested several future directions for expanded state DOT/MPO collaboration. These included improved integration of financial planning across agencies by linking the TAMP financial plan to financial elements in the LRP, STIPs, MTPs, and TIPs, scoping and prioritization of projects to meet both mobility and asset condition needs, and data sharing and collaboration on performance reporting. It was noted that collaboration on performance reporting to provide both statewide and regional views would provide a greater awareness among state and local officials of system conditions and needs as well as progress they are making toward achieving and sustaining a state of good repair.



CHAPTER 3

Questionnaire on the State of the Practice

This chapter summarizes the current state of the practice as derived from the questionnaire. The questionnaire was used to obtain the information needed to document the state of DOT and MPO collaboration related to asset inventory and condition assessment, target setting, investment decision-making, and performance monitoring of pavement and bridge assets for performance-based planning and programming.

The questions were primarily designed for closed-ended responses with radio buttons or selection boxes, with the option to provide open-ended comments on 88 percent of the questions. Some questions permitted multiple answers, whereas others were limited to a single response.

The team sent an email message to state DOT representatives from FHWA's state DOT TAM contacts. Recipients identified a single agency contact for the questionnaire. The team issued the online questionnaire on January 30, 2020. One response was submitted per agency, with more than one individual completing sections of the questionnaire in several cases. The last survey was completed on April 19, 2020. A total of 43 DOTs responded to the questionnaire (42 states and the District of Columbia), yielding a response rate of 83 percent. Note that not all 43 DOTs responded to every question.

The results are organized below by topic areas. A copy of the survey instrument can be found in Appendix B, and a summary of the results can be found in Appendix D. It should be noted that the survey responses reported below may reflect different interpretations of the questions and that the responses represent a snapshot in time for an evolving set of practices.

TAM and Long-Range Planning

Several questions asked about the integration of TAM into long-range planning and MPO involvement in LRP development related to TAM. As of the time of the questionnaire, around three-quarters of the 43 state DOT respondents had incorporated TAM into their LRP goals and objectives. Several others commented that their LRPs are currently in the process of being revised to incorporate TAM. Twenty respondents said they have integrated TAM performance measures, and 16 have established TAM targets in their LRPs. However, more than one-third of respondents currently have bridge and pavement measures that differ from the required FHWA asset performance measures. Eleven respondents had established TAM investment amounts related to their performance targets. Eighteen percent of respondents had established measures on assets other than pavements and bridges.

Most DOTs responding to the questionnaire indicated some level of MPO involvement in LRP development related to TAM. Specific types of reported MPO involvement are shown in Table 1. Several states, including Georgia and North Dakota, indicated that MPOs participate on LRP advisory committees.

Table 1. Response to: "How are MPOs involved in your LRP development related to TAM?" (42 responses).

Agency	Development of TAM goals in the MPO's MTP	Development of MPO-specific TAM performance measures	Development of MPO TAM performance targets	Determination of MPO TAM investment amounts related to performance targets	LRP update will occur in future, and TAM was not included
Alaska DOT&PF	•	•	•		
Arizona DOT					•
Arkansas DOT	•		•		
California DOT	•		•		
Colorado DOT	•				
Connecticut DOT	•				
Delaware DOT	•			•	
District of Columbia, District DOT					•
Florida DOT			•		
Georgia DOT					
Hawaii DOT			•	•	•
Idaho Transportation Department	•				
Illinois DOT	•				
Indiana DOT	•				•
Iowa DOT	•				
Kansas DOT			•		•
Kentucky Transportation Cabinet					
Louisiana DOTD					•
Maryland DOT State Highway Administration			•		
Michigan DOT					
Minnesota DOT	•				
Mississippi DOT	•	•	•		
Missouri DOT	•				
Montana DOT			•		
Nebraska DOT			•		
Nevada DOT					
New Hampshire DOT	•	•	•		
New Jersey DOT					•
New Mexico DOT	•				
New York State DOT					•
North Dakota DOT					•
Ohio DOT	•	•	•	•	
Oklahoma DOT	•				
Oregon DOT	•	•	•	•	•
Pennsylvania DOT	•				
Rhode Island DOT	•				•
South Dakota DOT					•
Texas DOT	•				

(continued on next page)

Table 1. (Continued).

Agency	Development of TAM goals in the MPO's MTP	Development of MPO-specific TAM performance measures	Development of MPO TAM performance targets	Determination of MPO TAM investment amounts related to performance targets	LRP update will occur in future, and TAM was not included
Utah DOT					
Vermont Agency of Transportation	•		•		
Washington State DOT					•
West Virginia DOT	•				
Wyoming DOT			•		

Note: Survey respondents were allowed to select multiple answers.

Forty-nine percent of state DOTs report that all of their MPOs have incorporated the bridge performance area into their MTPs. Fifty-one percent of state DOTs report that all of their MPOs have incorporated the pavement performance area into their MTPs. Only 15 percent of respondents indicated that none of their MPOs had the bridge area incorporated, and 13 percent indicated that none of their MPOs had the pavement area incorporated. Twenty-one out of the 41 state DOTs responding to this question provided support for the development of TAM goals in their MPOs' MTPs.

Related TAM Activities and TAMP Requirements

Sixty-nine percent of state DOTs reported that they coordinate TAM programming for bridges and pavements with all of their MPO partners, and another 7 percent do so with a subset of their MPOs (see Figure 3). Open-ended responses indicated that this coordination occurs in different ways, including publishing candidate project lists, making specific project recommendations for local consideration, conducting meetings to discuss projects, and involving MPOs in project prioritization and program development.

Based on open-ended comments from respondents, there are a number of additional TAM-related activities on which individual state DOTs and MPOs are collaborating. For example, Oregon DOT is working with its MPOs to refine its data collection practices and policies and

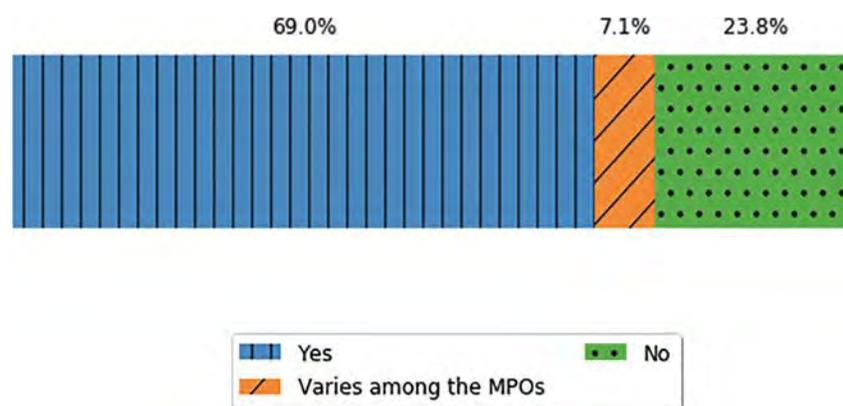


Figure 3. Response to: "Do you coordinate TAM programming for bridges and pavements with your MPOs?" (42 responses).

establish criteria for selecting projects to include in the STIP. They are examining the relationship between federal and state targets for pavements and bridges and considering how to incorporate cost-benefit analysis for large infrastructure projects. The New Jersey DOT is collaborating with its MPOs on how to integrate its TAMP, the statewide LRP, and MPOs' MTPs. The Washington State DOT and its MPOs are collaborating on risk-based approaches to deal with funding constraints.

State DOTs are generally responsible for NHS asset data collection. Specifically, 81 percent of states reported that they collect data for locally owned National Highway System (NHS) assets, and the remaining respondents reported either split responsibilities between the DOT, local agencies, and/or toll authorities or variations in responsibility by asset type. Sixty-five percent of respondents reported that MPOs use the same TAM performance measures that the state uses, which presumably is a factor driving state involvement in data collection for the NHS.

MPO involvement in the state TAMP development process varies. Only three states report that their MPO partners provided or coordinated asset inventory and condition data, and only five states reported that MPOs provided or helped coordinate data on current or future asset expenditures as part of TAMP development. Fifteen respondents said that their MPOs were consulted on TAM goals and objectives, asset life-cycle strategies, risk management, or the state's definition of the desired state of good repair. Forty-six percent of state DOTs asked their MPOs to review predicted pavement or bridge conditions in the state TAMP, and 44 percent offered their MPOs the opportunity to review a draft version of the TAMP before submission to FHWA.

Only six respondents indicated that they rely on MPOs to provide updates on asset inventory and condition, and 13 require MPO updates on TAMP implementation actions. However, several states commented on the value of ongoing engagement with their MPO partners on monitoring to meet performance targets. The Oregon DOT noted, "Oregon MPOs are involved in coordinating the undertaking of pavement and bridge preservation, rehabilitation, construction and maintenance projects that reflect investment strategies supportive of achieving established performance and condition targets for NHS infrastructure within their organizational boundaries."

In general, respondents used a multifaceted approach for coordinating with their MPOs on TAMP development, relying on a combination of face-to-face meetings, conference calls, workshops, formal written communications, and informal person-to-person communications, with several states employing all of these options and only a handful relying on a single communication medium, typically face-to-face meetings. Overall, state DOTs indicated that they are satisfied with their MPO coordination on TAMP development, with 80 percent expecting to follow the same approach for future TAMP updates (see Figure 4).

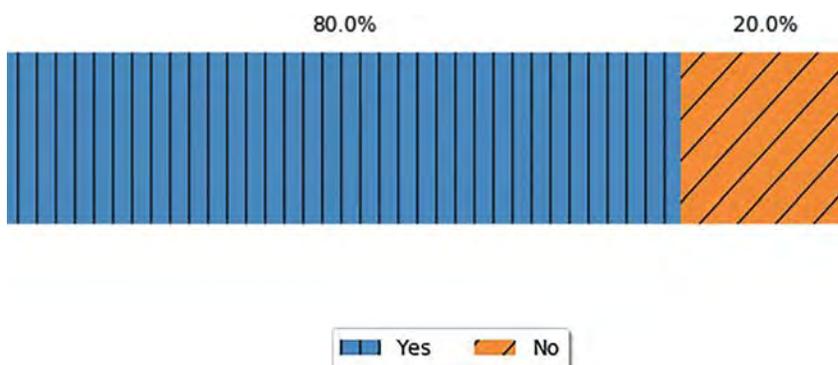


Figure 4. Response to: "Regarding MPO coordination on TAMP development, does the agency expect to follow the same approach for future TAMP updates?" (40 responses).

State DOTs also indicated that they are open to additional collaboration in the future. Seventy-two percent expressed their interest in collaborating on TAM activities more regularly with their MPO partners. For example, New Mexico commented, “We will seek more input from the MPOs before the next update to the TAMP so that they are more aware of the need to review projects to ensure that the projects contribute to the performance targets.”

Activities to Support MPO TAM Planning and Implementation

State DOTs support MPO planning activities in several ways. As mentioned previously, 21 out of 41 state DOTs responding to this question provide support for the development of TAM goals in their MPOs’ MTPs. In addition, 18 states help with developing MPO-specific TAM performance measures and 24 with assisting in setting MPO targets. Only seven states support their MPO partners in determining TAM investment amounts related to performance targets.

States also support local and regional TAMP implementation activities, including providing data to MPOs on asset inventory and condition, supporting MPO implementation actions, and providing funding to MPOs. Table 2 shows which states employ each of these strategies.

State DOT and MPO Coordination on Target Setting

Coordination varies among state DOTs and MPOs in the development of NHS pavement and bridge targets. Fifty-one percent of DOTs surveyed reported that they developed targets and then informed MPOs about these targets (indicating little or no coordination). However, 32 percent of DOTs reported that MPOs were involved throughout the process of developing both MPO and DOT targets. This relatively low level of state/MPO collaboration on target setting may reflect the fact that only one cycle of target setting had occurred at the time of the questionnaire, and many DOTs may have needed time to understand the new requirements and formulate their own strategy prior to engaging with their partners.

State DOTs reported on the various methods they use for coordinating with MPO partners on setting NHS pavement and bridge targets (see Table 3). Of the options provided, face-to-face meetings were considered the most successful, followed by informal person-to-person communications. States also rely on conference calls, workshops, and formal written communication to coordinate with their MPO partners. Only seven of the respondents indicated that they rely solely on one communication method. Of those, six rely on face-to-face meetings as the sole mechanism for coordinating on targets.

Thirty-two percent of state DOTs recommended targets for each of their partner MPOs in support of state targets (see Figure 5). Sixty-two percent offered to assist their MPO partners in analyzing their targets, and 42 percent indicated that at least one MPO accepted the state DOT’s assistance in analyzing their targets.

However, less than 5 percent of state DOTs reported that overall state targets were modified based on MPO targets (see Figure 6). For example, the California Department of Transportation weighted its targets based on the targets established by each MPO and the state DOT relative to their inventory.

The questionnaire asked states if their MPOs (1) adopted the DOT’s targets, (2) set their own targets, or (3) supported the state’s targets by agreeing to plan and program projects that help the state meet its targets. The first option was intended to mean that the MPO established the same target as the state DOT had but committed to achieving that target for their metropolitan area.

Table 2. Response to: “How is the state DOT providing support to MPOs on their TAMP implementation activities?” (39 responses).

Agency	Providing data on asset inventory and condition	Supporting TAMP implementation actions	Providing funding
Alaska DOT&PF			
Arizona DOT			
Arkansas DOT	•		•
California DOT	•		
Colorado DOT	•		
Connecticut DOT	•		•
Delaware DOT	•	•	•
District of Columbia, District DOT			
Florida DOT	•		
Georgia DOT	•		
Hawaii DOT			
Idaho Transportation Department			
Illinois DOT	•	•	•
Indiana DOT		•	
Iowa DOT	•	•	
Kansas DOT	•	•	•
Kentucky Transportation Cabinet			
Louisiana DOTD	•	•	
Maryland DOT State Highway Administration	•		•
Michigan DOT	•		
Minnesota DOT			
Mississippi DOT			
Missouri DOT	•	•	•
Montana DOT			
Nebraska DOT	•	•	•
Nevada DOT	•		
New Hampshire DOT	•	•	•
New Jersey DOT	•		
New Mexico DOT	•		•
New York State DOT	•	•	•
North Dakota DOT	•		
Ohio DOT		•	
Oklahoma DOT	•	•	
Oregon DOT	•	•	
Pennsylvania DOT			•
Rhode Island DOT	•	•	•
South Dakota DOT	•	•	•
Texas DOT	•		
Utah DOT	•		
Vermont Agency of Transportation	•		•
Washington State DOT	•		
West Virginia DOT	•	•	
Wyoming DOT	•		

Note: Survey respondents were allowed to select multiple answers.

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Table 3. Response to: “What forms of coordination between the DOT and MPOs were most successful for setting NHS pavement and bridge targets?” (41 responses).

Agency	Face-to-face meetings	Conference calls	Workshops	Formal written communication	Informal person-to-person communications (e.g., phone calls, emails)
Alaska DOT&PF	•	•	•		•
Arizona DOT	•				
Arkansas DOT	•				
California DOT	•	•	•		•
Colorado DOT	•		•	•	•
Connecticut DOT	•	•	•	•	•
Delaware DOT	•	•	•		•
District of Columbia, District DOT	•	•		•	
Florida DOT	•		•	•	•
Georgia DOT	•			•	•
Hawaii DOT					
Idaho Transportation Department	•				
Illinois DOT	•				•
Indiana DOT	•				
Iowa DOT				•	
Kansas DOT	•	•		•	•
Kentucky Transportation Cabinet	•				•
Louisiana DOTD	•		•		•
Maryland DOT State Highway Administration	•		•	•	
Michigan DOT	•	•	•		
Minnesota DOT	•	•		•	•
Mississippi DOT					
Missouri DOT	•	•	•	•	•
Montana DOT	•	•			
Nebraska DOT	•				
Nevada DOT					
New Hampshire DOT	•	•		•	•
New Jersey DOT	•	•	•	•	•
New Mexico DOT	•		•		•
New York State DOT	•	•		•	
North Dakota DOT	•				
Ohio DOT					•
Oklahoma DOT	•		•		•
Oregon DOT	•	•	•	•	•
Pennsylvania DOT	•		•		•
Rhode Island DOT	•				
South Dakota DOT	•	•			
Texas DOT	•	•	•	•	•
Utah DOT	•	•	•		

Table 3. (Continued).

Agency	Face-to-face meetings	Conference calls	Workshops	Formal written communication	Informal person-to-person communications (e.g., phone calls, emails)
Vermont Agency of Transportation	•			•	
Washington State DOT		•	•		
West Virginia DOT	•		•		
Wyoming DOT	•		•		•

Note: Survey respondents were allowed to select multiple answers.

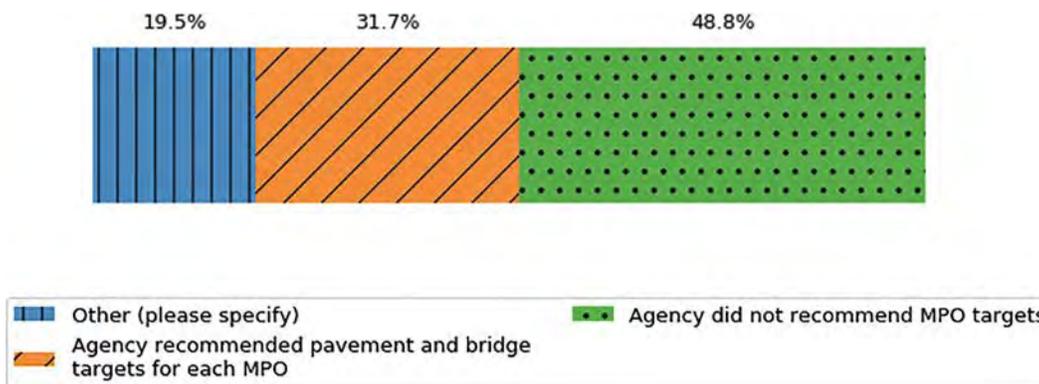


Figure 5. Response to: “Did the agency recommend targets for each MPO in support of state targets?” (41 responses).

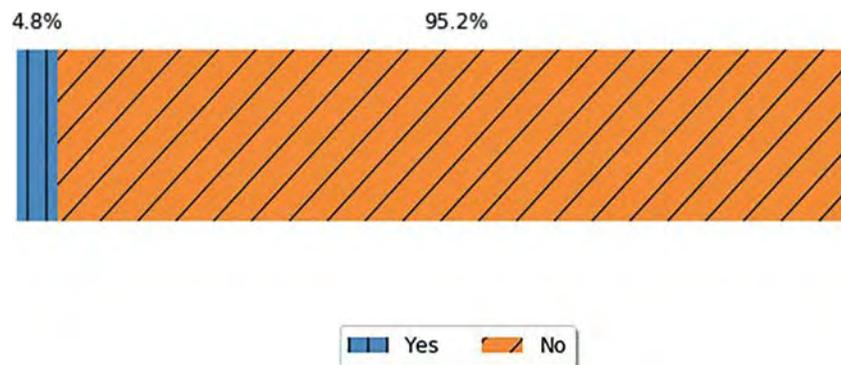


Figure 6. Response to: “Were the overall state targets modified based on specific MPO targets?” (41 responses).

Responses to this question indicated that some states did not understand the intended meaning of adopting the DOT's target and interpreted this as equivalent to supporting the DOT's target.

Twelve states indicated that at least some of their MPOs set their own targets. Twenty-seven respondents said that some or all of their MPO partners adopted the targets recommended by the DOT. Another 27 respondents reported that some or all of their MPO partners supported the state's targets by agreeing to plan and program projects that help the state meet its targets. Fifteen respondents indicated that all of their MPO partners both adopted and supported the DOT's targets, highlighting the confusion surrounding this question.

In general, state DOTs are satisfied with the process they used to collaborate and coordinate with their MPO partners on target setting. Eighty-five percent indicated that they expect to repeat the same approach for future TAM target setting. Several respondents indicated that their experience with the initial target setting period should make it easier to go through the process the next time around, and a few others said they are hoping to increase their engagement in subsequent target setting periods.

Barriers to DOT/MPO Collaboration in Support of TAM

Respondents reported significant barriers to coordination (see Table 4). The most significant from among the options provided in the questionnaire are constraints on DOT and/or MPO staff time and limited interest in coordinating (for example, because a large portion of the NHS assets are state-owned). From the state DOT perspective, issues with data availability or accessibility and issues with planning and programming siloes are less of a concern. One-quarter of respondents indicated that they did not see any barriers to increased coordination between their state DOT and their MPO partners. In terms of other barriers, multi-state MPOs were mentioned in the open-ended comments. For example, four of nine MPOs in Iowa are multi-state, which creates coordination challenges. Several other respondents mentioned software and system challenges as a barrier to engagement. One respondent noted that their MPOs use other metrics to manage their pavements and do not care for the federal measures.

This chapter has summarized the results of a questionnaire completed by 42 states and the District of Columbia. These results provide a snapshot of the current state of the practice with respect to state DOT/MPO collaboration on various aspects of transportation asset management and related performance management processes. The next chapter presents selected case examples of state DOT/MPO practices.

Table 4. Response to: “What, if any, are the most significant barriers to increased coordination between the state DOT and MPOs?” (40 responses).

Agency	Constraints on DOT staff time	Constraints on MPO staff time	Limited interest in coordinating (e.g., because a large portion of the NHS assets are state owned)	Issues with planning/programming siloes	Issues with data availability/accessibility	No significant barriers to coordination
Alaska DOT&PF			•			
Arizona DOT	•		•			
Arkansas DOT	•		•			
California DOT			•			
Colorado DOT	•			•	•	
Connecticut DOT					•	
Delaware DOT	•					
District of Columbia, District DOT			•			
Florida DOT	•	•				
Georgia DOT						•
Hawaii DOT						
Idaho Transportation Department	•	•	•			
Illinois DOT	•		•	•		
Indiana DOT	•	•	•			
Iowa DOT		•	•			
Kansas DOT	•	•	•	•	•	
Kentucky Transportation Cabinet						
Louisiana DOTD	•	•				
Maryland DOT State Highway Administration						•
Michigan DOT		•				
Minnesota DOT		•	•			
Mississippi DOT						
Missouri DOT		•	•			•
Montana DOT						•
Nebraska DOT						•
Nevada DOT	•	•	•	•		
New Hampshire DOT	•	•	•		•	
New Jersey DOT						
New Mexico DOT	•		•	•		
New York State DOT						•
North Dakota DOT	•	•	•			
Ohio DOT	•	•				
Oklahoma DOT	•	•	•	•	•	
Oregon DOT	•	•		•	•	

(continued on next page)

26 Collaborative Practices for Performance-Based Asset Management Between State DOTs and MPOs

Table 4. (Continued).

Agency	Constraints on DOT staff time	Constraints on MPO staff time	Limited interest in coordinating (e.g., because a large portion of the NHS assets are state owned)	Issues with planning/programming siloes	Issues with data availability/accessibility	No significant barriers to coordination
Pennsylvania DOT			•			
Rhode Island DOT	•	•	•			
South Dakota DOT						•
Texas DOT	•					•
Utah DOT		•				
Vermont Agency of Transportation	•		•			
Washington State DOT	•	•		•		
West Virginia DOT						•
Wyoming DOT						•

Note: Survey respondents were allowed to select up to three choices.


CHAPTER 4

Case Examples of State DOT and MPO Collaboration and Coordination

This chapter presents four case examples of state DOT and MPO collaboration and coordination. These case examples were selected based on a series of follow-up interviews with agencies that had responded to the questionnaire. They illustrate different approaches to collaboration and reflect varying legislative, organizational, and transportation system contexts.

In Michigan, the state legislature in 2002 created enabling legislation for the adoption of TAM across all governing bodies in the state. Over time, TAM has evolved from a mandated process to a highly functional, collaborative relationship of trust that has become part of the fabric of the involved agencies' culture. This structure has provided a mechanism for bringing together agencies with disparate agency goals and objectives into a unified statewide strategy for asset management.

The Florida DOT has addressed the challenge of coordinating with a large number of MPOs by establishing an MPO Advisory Council charged with advocating for the state's MPOs. The Council developed a consensus document to satisfy the federal requirement for MPO agreements with the state DOT. The Florida DOT developed methodological, data, and process documentation to assist in decision support, drafted performance-based MTP templates for MPOs, and provided fact sheets related to specific federal requirements and timelines.

The Pennsylvania DOT has developed a comprehensive TAM support network for their MPOs related to asset management. The DOT is developing tools and building capacity to help their MPOs and Regional Planning Commissions (RPCs) to incorporate life-cycle cost strategies going forward. The Delaware Valley Regional Planning Commission (DVRPC) validated this approach and shared the need for multi-state MPOs and RPCs to work together with the state DOTs on regional strategies. They also emphasized the importance of having access to information and data to help them understand TAM choices and make decisions.

The California DOT organized a series of workshops the agency conducted with their MPOs on TAMP development, which culminated in a target-setting session. The DOT offers a number of lessons learned and opportunities for improving the TAMP development process in the future.

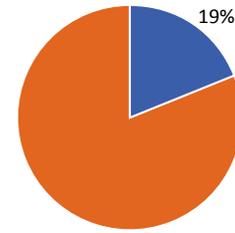
These case examples may be of interest to other state DOTs and their MPO partners seeking to improve PBPP and TAM collaboration going forward.

The NHS tables at the beginning of each case use Highway Statistics figures from 2018.

Michigan DOT and Southeast Michigan Council of Governments (SEMCOG)

Michigan MPO Stats	
Number of MPOs in State	13
Total NHS Miles	6,458
Michigan DOT NHS Miles	5,244 (81%)
Local NHS Miles	1,209 (19%)

Local NHS as a Percentage of Total NHS



Michigan DOT oversees almost 9,700 route miles of roadways and approximately 4,700 bridges. Michigan's performance management and asset management framework preceded the federal requirements by several decades. Figure 7 describes the agency's approach to asset management.

Michigan's Transportation Asset Management Council (TAMC) is an independent body comprised of representatives from county road commissions, cities, townships, regional and metropolitan organizations, and the state DOT. The TAMC provides advice to the Michigan State Transportation Commission on asset management, tools and capacity-building, TAM strategy, and system performance. The council was formalized through Michigan Public Act (PA) 499 of 2002 and has been continuing since that time. TAMC annually publishes a *Roads and Bridges Report* as directed under Michigan Compiled Law (MCL) 247.659a(9).

The Michigan Transportation Planning Association (MTPA) is an association of transportation planners. Although the MTPA does not have a formal role in administering transportation programs, the association provides a coordinating body that includes the members that administer the programs. The TAMC and the MTPA play important roles in the coordination of federal PBPP and TAM requirements.

The Michigan DOT had a good relationship with their MPOs before the MAP-21/FAST Act provisions, which set the stage for TAM success in the coordination of the requirements into the existing DOT and MPO processes. The federal requirements aligned with existing communication channels and processes, so the Michigan DOT was able to bring their MPOs into the process of meeting federal requirements early. During the interview for this project, SEMCOG validated this strong alliance and highlighted the open and honest data-sharing and excellent communication they have experienced with the DOT. Multiple meetings were held in 2018 to coordinate TAMP development with MPOs for the initial statewide TAMP. MPOs had direct influence on the development of the state's targets and chose to align their TAM strategies to the statewide targets.

To facilitate the target-setting process, the DOT has created report cards of the MPO network condition, as shown in Figure 8. The department sees this as a way to encourage regional TAM principles. It uses its analysis for the state TAMP documentation for the annual FHWA consistency review to monitor investment in locally owned NHS assets. The DOT has also included MPO representatives on statewide target development teams. Based on the information that MPOs were provided and the influence they had on the development of statewide targets, the MPOs opted to align with the statewide targets.



Source: Michigan DOT Bureau of Transportation Planning.

Figure 7. Asset Management at the Michigan DOT.

In the future, the DOT plans to monitor MPO programming and improve data sharing using the TAMC Investment Reporting Tool. This tool will provide insight into MPO efforts to align TAM strategies with statewide targets (and possible future MPO targets), particularly those MPOs with the technical capacity to interpret and use the data. The DOT is open to assisting its MPO partners in the development of their own targets. They also plan to continue providing capacity-building support and guidance to improve PBPP. The DOT talked about “building the space for growth to happen . . . It is about empowerment, not thinking about them as a recipient/customer.”

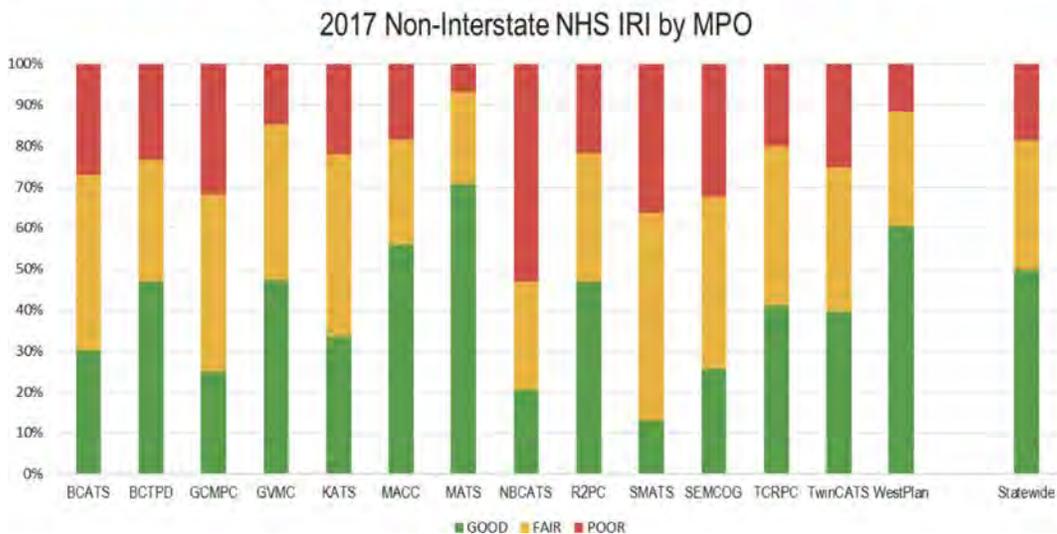
Among the lessons learned, Michigan DOT describes the TAMC as bringing people along, providing a place for different parties to come together to form consensus-building teams. They stress the importance of bringing MPOs into the TAMC development and implementation early and then keeping them involved, so they feel invested in the process and the outcome.

2017 Non-Interstate NHS IRI by MPO				
MPO Name	Good	Fair	Poor	Non-Interstate NHS Thru Miles **
Battle Creek Area Transportation Study	30.0%	42.9%	27.1%	115.2
Bay City Area Transportation Study	46.7%	29.8%	23.4%	136.1
Genesee County Metropolitan Planning Commission	25.0%	43.1%	31.9%	500.5
Grand Valley Metropolitan Council	47.3%	37.9%	14.8%	842.1
Kalamazoo Area Transportation Study	33.5%	44.4%	22.1%	372.7
Macatawa Area Coordinating Council	55.8%	25.6%	18.6%	133.6
Midland Area Transportation Study	70.6%	22.7%	6.7%	300.1
Region 2 Planning Commission	46.8%	31.4%	21.8%	200.0
Saginaw Metropolitan Area Transportation Study	13.0%	50.8%	36.3%	284.6
Southeast Michigan Council of Governments (Entire SEMCOG)	25.6%	42.0%	32.4%	5,914.2
Washtenaw Area Transportation Study*	48.8%	32.2%	19.0%	404.1
St. Clair Transportation Study *	28.1%	52.9%	19.0%	79.2
SEMCOG (without WATS and St. Clair Study Area)	23.8%	42.6%	33.6%	5,430.9
Southwest Michigan Planning Commission (TwinCATS and NATS)	31.8%	31.7%	36.4%	228.6
Niles-Buchanan-Cass Area Transportation Study*	20.4%	26.5%	53.1%	92.1
Twin Cities Area Transportation Study*	39.6%	35.2%	25.2%	136.5
Tri-County Regional Planning Commission	41.1%	38.7%	20.2%	549.3
West Michigan Metropolitan Transportation Planning Program	60.3%	28.1%	11.7%	353.0
Statewide (includes rural)	49.7%	31.7%	18.6%	15,974.4

* Study Area subset

** Thru Miles for Non-Interstate NHS with valid data as of May 11, 2018

IRI Rating Scale (Inches per mile)
Good (<95)
Fair (95-170)
Poor (>170)



Source: Michigan DOT Bureau of Transportation Planning.

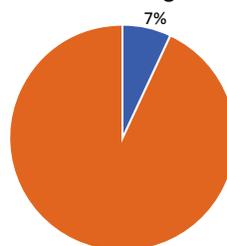
Figure 8. 2017 Report Card: Non-Interstate IRI by MPO.

SEMOG offered a number of success factors related to improving DOT/MPO collaboration in support of PBPP and TAM activities, including attention to applicable regulations, openness and honesty in communications, recognizing inherent limitations of siloes for making progress, and establishment of good base data.

Florida DOT

Florida MPO Stats	
Number of MPOs in State	27
Total NHS Miles	8,779
Florida DOT NHS Miles	8,208 (93%)
Local NHS Miles	571 (7%)

Local NHS as a Percentage of Total NHS



As a decentralized DOT with 27 MPOs, the planning process within the Florida DOT has traditionally started within each of the district offices submitting their District Plans to the central office to roll up to a statewide program. According to the Florida DOT's Administrator for Metropolitan Planning, "Coordination is part of our DNA because our planning is bottom-up." The DOT has staff assigned to work on MPO policy issues, and they also have MPO liaisons assigned to work directly with the MPOs.

Faced with meeting the federal requirements for PBPP and TAM, the DOT worked with its MPO partners to develop an MPO Advisory Council, which now serves as the single point of coordination and advocate for the state's MPOs. This body, with staff housed in the Florida DOT headquarters and funded through the DOT, meets quarterly. The Council consists of an operationally focused group comprised of staff directors from each of the MPOs and a governing body made up of chairs of the boards of each of the MPOs. Early on, the Council and the DOT developed a Consensus Document on coordination with the MPOs. This document satisfies the federal requirement for agreements between the state DOT and MPOs.

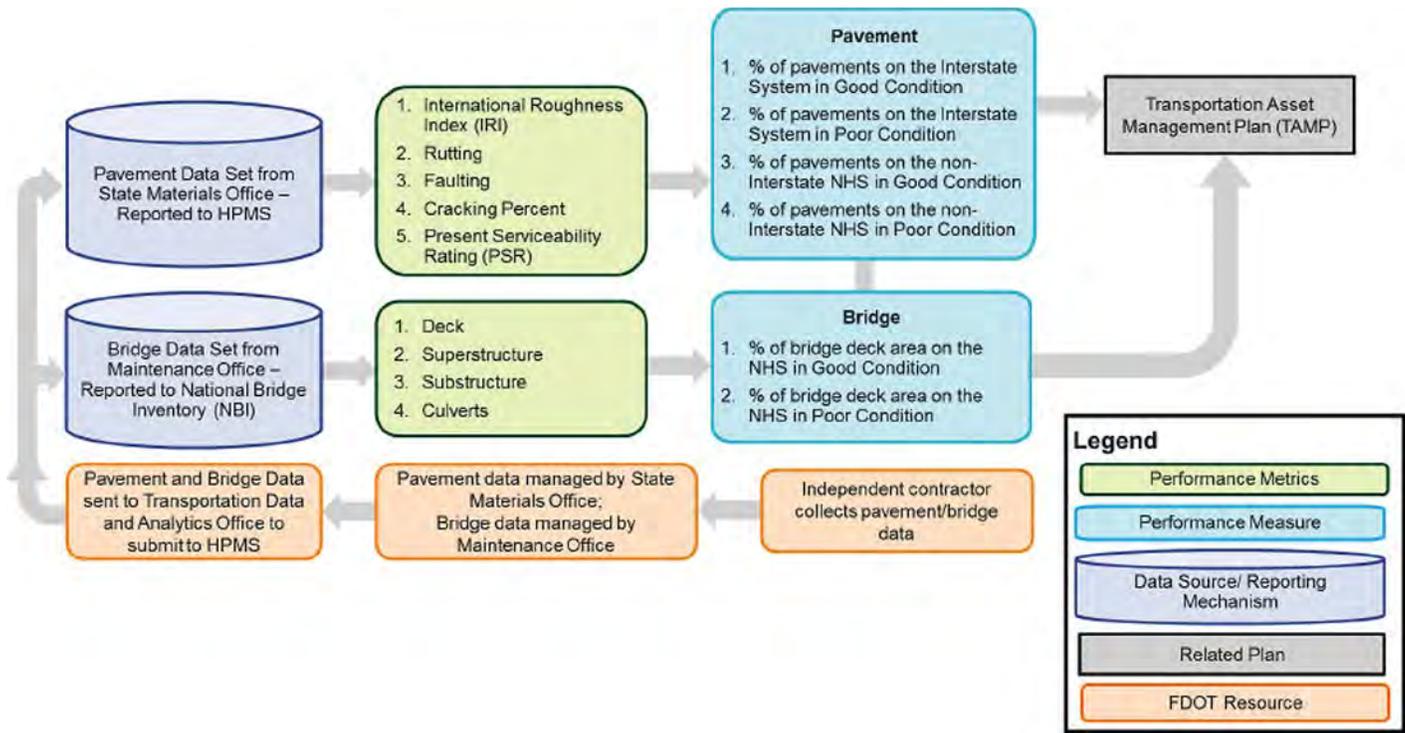
For the development of statewide targets, the planning staff put together guidance documents for their MPOs describing the following:

- Calculation methodologies,
- Data elements and flow, and
- An explanation of the process that the DOT followed to set statewide targets.

An example of the pavement and bridge condition data flow is shown in Figure 9.

Per the National Performance Measure legislation, MPOs had the option of setting their own targets or supporting the DOT's targets. So far, all MPOs have decided to support the statewide pavement and bridge targets. In addition to the methodology and data source documentation, the DOT developed templates that MPOs could use to incorporate performance measures and targets in their MTPs. The templates provide suggested language for MPOs that decide to establish their own targets. Figure 10 shows an example of a section of the pavement template. Almost all MPOs have opted to use the templates.

To make sure that MPOs fully understood the requirements and process, the Florida DOT developed two-page fact sheets for the MPOs. These include DOT and MPO requirements, including target setting, performance reporting, and deadlines. Figure 11 is a copy of the Planning Rule two-pager.



Source: Florida Department of Transportation Office of Policy Planning.

Figure 9. Pavement and bridge condition data flow chart. HPMS is a national high performance monitoring system.

• 4.2 Alternate Language for MPO that Establishes its Own Targets

On [insert date], the [insert MPO name] established the following 4-year pavement and bridge condition targets for the MPO’s planning area:

Table 4.2 [MPO name] Pavement and Bridge Condition Performance Targets

Performance Measure	4-year MPO Target (Jan. 1, 2018 to Dec. 31, 2021)
Percent of Interstate pavements in good condition	xx.x%
Percent of Interstate pavements in poor condition	x.x%
Percent of non-Interstate NHS pavements in good condition	xx.x%
Percent of non-Interstate NHS pavements in poor condition	x.x%
Percent of NHS bridges by deck area in good condition	xx.x%
Percent of NHS bridges by deck area in poor condition	x.x%

In establishing the MPO’s targets for the pavement and bridge condition performance measures, [insert MPO name] considered many factors. [Describe the basis for the MPO-specific targets – the section below should address the considerations that led the MPO to establish its own targets, and the approach it is taking to make investment decisions in the TIP relating to those targets.] A discussion of how the investment decisions in the TIP relate to the MPO’s pavement and bridge condition performance targets follows.

The [insert MPO name] TIP reflects the investment priorities established in the [insert name of the current LRTP].

Pavement and bridge condition [or system preservation] is a consideration in the methodology [insert MPO name] uses to select projects for funding in the TIP. The TIP includes specific investment priorities that support all of the MPO’s goals, including system preservation, using a prioritization and project selection process established in the LRTP.

[Discuss the MPO’s project selection criteria and process related to system preservation/pavement and bridge condition. Note any data-driven, performance based elements, scoring criteria, goals established in the LRTP, etc.]

Source: Florida Department of Transportation Office of Policy Planning.

Figure 10. Excerpt from Template to Address Performance Management Requirements in Metropolitan Planning Organization Transportation Improvement Programs.

MPO Requirements

Florida Department of Transportation Office of Policy Planning

MAP-21 Performance Management

April 2020

OVERVIEW

This document highlights key provisions of Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) performance management requirements for state Departments of Transportation, Metropolitan Planning Organizations, and transit providers, including target setting, performance reporting, and deadlines.

PLANNING RULE FRAMEWORK

FHWA and FTA jointly issued a Planning Rule to document changes in the statewide and metropolitan planning processes consistent with the Moving Ahead for Progress in the 21st Century (MAP-21) Act and the Fixing America's Surface Transportation (FAST) Act. Among other changes, this rule specifies the requirements for state DOTs and MPOs to implement a performance-based approach to planning and programming. Under this framework, the three FHWA performance measures (PM) rules and the FTA transit asset management and transit safety rules established various performance measures to assess roadway safety (PM1), pavement and bridge condition (PM2), system performance and freight movement (PM3), transit asset management (TAM), and transit safety. The Planning Rule and the performance measures rules also specify how MPOs should set targets, report performance, and integrate performance management into their Long-Range Transportation Plans (L RTP) and Transportation Improvement Programs (TIP).

PM1 HIGHWAY SAFETY	PM2 BRIDGE AND PAVEMENT	PM3 SYSTEM PERFORMANCE AND FREIGHT MOVEMENT	TRANSIT ASSET MANAGEMENT	TRANSIT SAFETY
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Long-Range Transportation Plans

The Planning Rule specifies how performance management is incorporated into the MPO's L RTP. The L RTP must:

- » Describe the performance measures and performance targets used in assessing the performance of the transportation system.
- » Include a System Performance Report that:
 - Evaluates the condition and performance of the transportation system with respect to performance targets.
 - Documents the progress achieved by the MPO in meeting the targets in comparison to performance recorded in past reports.
- » Integrate the goals, objectives, performance measures, and targets described in all the plans and processes required as part of a performance-based program.

*Please refer to the five accompanying fact sheets to obtain key information for the three FHWA performance measures rules and FTA transit rules.

Transportation Improvement Programs

The TIP must:

- » Reflect the investment priorities established in the current long-range transportation plan.
- » Be designed such that once implemented, it makes progress toward achieving the performance targets established.
- » Include, to the maximum extent practicable, a description of the anticipated effect of the TIP toward achieving the performance targets identified in the L RTP, linking investment priorities to those performance targets.

FDOT and the Metropolitan Planning Organization Advisory Council (MPOAC) have developed model language for inclusion of performance measures and targets in the L RTPs and TIPs

TIMELINE

PM1

MAY 27, 2018: Updates or amendments to the L RTP and TIP after this date must be developed according to the FMI Rule.
 : BY FEBRUARY 27 (ANNUALLY): Last day for MPOs to establish safety (PM1) targets; (180 days after state DOT establishes annual targets).

PM2 & PM3

BY NOVEMBER 14, 2018: 4-year targets established by MPOs for first performance period.
 MAY 20, 2019: Updates or amendments to the L RTP and TIP after this date must be developed according to the PM2 and PM3 Rules.
 : BY APRIL 1, 2023: 4-year targets must be established by MPOs for second performance period.

TRANSIT ASSET MANAGEMENT

OCTOBER 1, 2018: Updates or amendments to the L RTP and TIP must be developed according to the TAM Rule.
 : WITH TIP OR L RTP UPDATE: MPOs may choose to update targets for their planning area.

TRANSIT SAFETY

BY JULY 20, 2020: Transit providers must develop Public Transportation Agency Safety Plan and establish transit safety targets.
 BY JANUARY 16, 2021: Safety targets must be established by MPOs.
 JULY 20, 2021: Update or amendments to the L RTP and TIP after this date must be developed according to the Transit Safety Rule.
 : WITH TIP OR L RTP UPDATE: MPOs may choose to update targets for their planning area.

TARGET SETTING OPTIONS

The Florida Department of Transportation (FDOT), the MPOs, and providers of public transportation set their respective performance targets in coordination with one another. Each MPO establishes a target for each applicable performance measure. MPOs should propose, seek comment on, and establish their targets through existing processes such as the TIP. For the PM1, PM2, and PM3 measures, each MPO establishes targets by one of two options:

Support the statewide target established by FDOT.

If the MPO chooses to support the statewide target, the MPO provides documentation to FDOT stating that the MPO agrees to plan and program projects so that they contribute toward the accomplishment of FDOT's statewide target for that performance measure.

OR

Establish own target.

If the MPO chooses to establish its own target, the MPO coordinates with FDOT regarding the approach used to develop the target and the proposed target prior to establishing a final target. The MPO provides documentation to FDOT that includes the final target and the date the MPO established the target.

MPOs must establish their targets no later than 180 days after FDOT sets its target.
 For the transit asset management and safety measures, MPOs may support the targets established by transit providers or establish their own targets. Initial action by the MPO must take place within 180 days of the transit provider action to establish targets. MPOs may then update these targets when they update their TIP or L RTP.

ASSESSMENT OF SIGNIFICANT PROGRESS

FHWA will not assess MPO target achievement. However, FHWA and FTA will review MPO adherence to performance management requirements as part of periodic transportation planning process reviews, including the Transportation Management Area (TMA) MPO certification reviews, reviews of adopted and amended L RTPs, and approval of MPO TIPs.

FOR MORE INFORMATION PLEASE CONTACT

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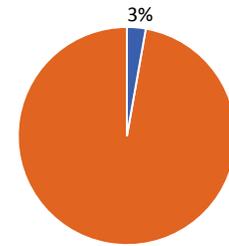
Source: Florida Department of Transportation Office of Policy Planning.

Figure 11. MPO Requirements: MAP-21 Performance Management Planning Rule.

Pennsylvania DOT and Delaware Valley Regional Planning Commission

Pennsylvania MPO Statistics	
Number of MPOs in State	19
Total NHS Miles	7,158
Pennsylvania DOT NHS Miles	6,369 (89%)
Local NHS Miles	221 (3%)

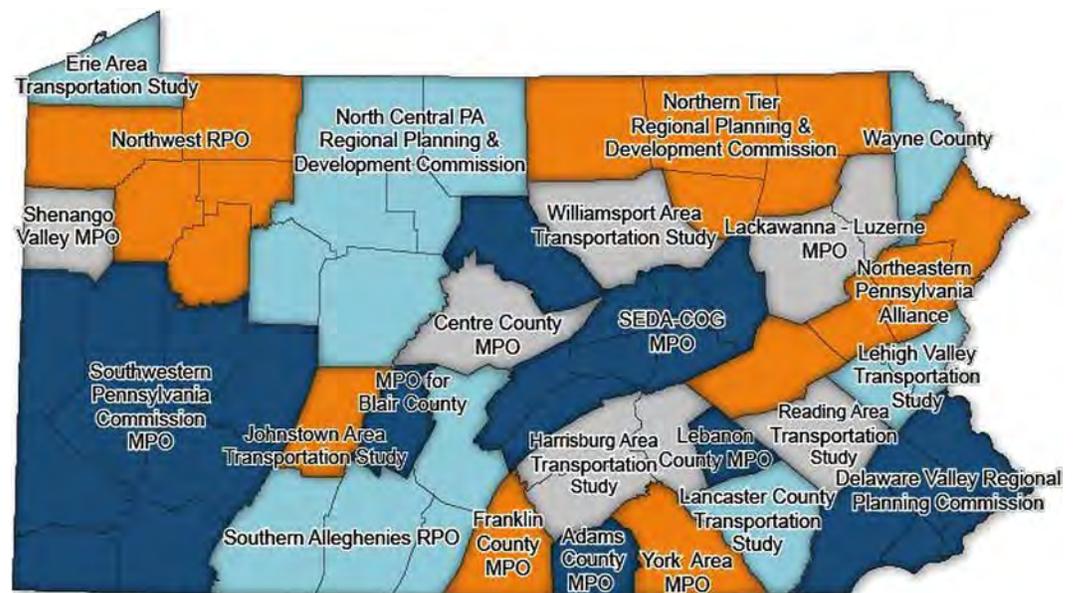
Local NHS as a Percentage of Total NHS



The Pennsylvania DOT is responsible for almost 40,000 miles of roads and more than 25,000 bridges. The average bridge is more than 50 years old. Owing among the oldest infrastructure in the nation, the Pennsylvania DOT has been challenged to keep up with asset deterioration. In the preamble to the agency’s 2019 TAMP, the Secretary of the Pennsylvania DOT indicated that the department will need to focus on Interstate investments in the absence of additional federal funding. This approach will result in a shortfall for the rest of the system over the short term and will eventually impact the NHS system when the non-NHS can no longer be compromised.

The Pennsylvania DOT has long-established working relationships with its 19 MPOs, four RPCs, and one independent county. Figure 12 displays Pennsylvania’s Regional Planning Organizations.

The DOT owns 89 percent of the NHS and more than 80 percent of the bridge deck area in the state. The Pennsylvania Turnpike owns and operates approximately 7 percent of the NHS mileage. To date, the DOT has largely taken care of regional asset management for its partners. The MPOs have adopted the targets recommended by the state for pavements and bridges. Each MPO/RPC develops an MTP, and MPOs are involved in the development of the state’s LRP goals and objectives, including those for TAM. The MPOs/RPCs work with the DOT to assess candidate projects based on statewide and regional goals.



Source: Pennsylvania DOT.

Figure 12. Pennsylvania’s Regional Planning Organizations.

The Pennsylvania DOT's Asset Management Section Chief shared information about the department's Bridge Care management system. He described the department's desire to develop a decision-making tool that their partner agencies can use that incorporates performance management. It would help them project what happens to infrastructure based on investment scenarios and select the best projects based on available funding. He commented, "We've solved lowest cost decision-making, but we still haven't integrated highway (pavement) dollars and bridge dollars yet. If we're looking to make the best decisions, we need integrated systems to help us make appropriate forecasts." He believes that once they have this system in use, it will be much easier for them to communicate seamlessly across organizational boundaries. Until they can build processes around an enterprise system, they are educating their partners on lowest life-cycle cost and how it helps them (as shown in Figure 13).



Source: Pennsylvania DOT.

Figure 13. Lowest Life Cycle Cost infographic.

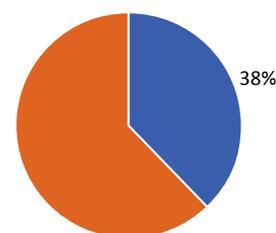
36 Collaborative Practices for Performance-Based Asset Management Between State DOTs and MPOs

The Delaware Valley Regional Planning Commission (DVRPC) representative reported that the agency is generally satisfied with how the Pennsylvania DOT works with them. A representative of DVRPC's Office of Capital Programs described the DOT as bottom-up in their investment decision-making process and engaged with their MPOs. As a multi-state (shared with New Jersey) MPO, DVRPC would like additional tools to help them understand current conditions and how to make their best decisions for their constituents on both sides of the border. They would also like the different program areas within the two state DOTs to coordinate and include them in that process so that they have additional insight into the decision-making process on a regional level.

California DOT (Caltrans) and Metropolitan Transportation Commission (MTC)

California MPO Stats	
Number of MPOs in State	19
Total NHS Miles	14,171
California DOT NHS Miles	8,712 (61%)
Local NHS Miles	5,439 (38%)

Local NHS as a Percentage of Total NHS



The NHS in California comprises around 56,000 lane miles and almost 11,000 bridges. California has 19 MPOs, regional transportation agencies, and other coalitions (counties with their own sales tax as a source of transportation funding). Caltrans includes all of these stakeholders in the TAMP development process. The DOT collects all of the bridge and pavement data for the national performance measures, including data on the locally owned NHS system. In addition to the federal requirements, the development of a risk-based TAMP has been mandated at a statewide level, defined as a “document assessing the health and condition of the state highway system with which the department can determine the most effective way to apply the state’s limited resources.”

The state’s Asset Management Engineer described a set of seven workshops that they conducted with their partner agencies to help them understand the federal requirements and make decisions for the building of the TAMP. A major takeaway from the workshop discussion was that it would not be possible to develop a single statewide target that would be applicable to each MPO region individually. Each MPO is in a very different place in terms of managing its asset inventory and asset conditions (pavement and bridge). Ultimately, the workshops culminated in the development of inventory-weighted bridge condition targets.

The MTC representative noted that the DOT inspects all of the state and local bridges, maintains the bridge inventory, and runs models for predicting future conditions. They expressed confidence in these future projections and satisfaction with the process for bridge target setting under Caltrans’s leadership.

Pavement condition, on the other hand, has presented a unique challenge for MTC. The MPO has a long history of strong pavement management and uses a pavement management system called StreetSaver to store and analyze pavement condition data and develop the agency’s capital program. MTC would like to continue to use this program, which is based on the PCI (pavement condition index); however, this methodology does not capture the federally required IRI (International Roughness Index). Caltrans has committed to collecting the required pavement

data supporting the national measure for the local NHS in the short term and will use these data for reporting purposes. This will create a disconnect between the pavement targets (based on the national measures) and the performance measure that MTC uses for their asset investment decision-making.

Going into the 2022 TAMP development process, California DOT does not anticipate the need for as many workshops as they facilitated in the first round of TAMP development. Instead, they intend to conduct focused meetings with their partners to discuss ways to make the process more meaningful to them and to create a connection between the projects funded in the state's regional transportation plans and the statewide TAMP. Other opportunities Caltrans has identified include improving coordination, increasing transparency in sharing information, improving data and software tools, improving expenditure reporting, and developing more robust modeling capabilities.

One challenge that Caltrans faces is in tracking planned local NHS asset investments given the lack of consistent data definitions and established reporting protocols. This information would enable Caltrans to better predict future NHS pavement and bridge conditions and would support the annual FHWA TAM consistency determination. Caltrans is investigating existing local expenditure coding methods to determine ways of overcoming this challenge.

This chapter has presented four case examples of state DOT/MPO collaboration. These case examples illustrate specific practices as well as lessons learned and challenges. The final chapter of this synthesis report presents overall conclusions from the literature review, from questionnaire results, and from case examples. Based on these conclusions, knowledge gaps and research that might be pursued in the future to close these gaps are summarized.



CHAPTER 5

Conclusions and Knowledge Gaps

NCHRP Project 20-05/Topic 51-05 examined the state of the practice for state DOT and MPO collaboration and coordination on TAM. Although many state DOTs and MPOs have long-standing partnerships, collaboration has often been strengthened as a result of the MAP-21 and FAST Act requirements. This legislation brought additional attention to creating an aligned and integrated system of performance-based planning at the local, state, regional, and national levels, requiring communication across agencies with transportation responsibilities, including state DOTs and MPOs. This report synthesizes the available information on this topic and serves as a baseline for future developments in this area.

This synthesis involved a literature review, an online questionnaire, and a series of case examples. Key insights from these three activities are summarized as follows.

Insights from the Literature Review

PBPP Process

- MPOs generally have less mature TAM and PBPP analysis capabilities than state DOTs.
- There are differences in asset performance measures used at the state and local levels, which can create collaboration challenges.

Target Setting

- There is variation in the maturity of target-setting processes across performance areas, and state-local collaboration is relatively stronger for the more mature areas (safety, bridge and pavement).
- MPOs often rely on state DOTs for bridge and pavement condition data.
- MPOs are aware of the condition of assets within their member jurisdictions but don't tend to separate out NHS asset conditions as part of their planning activities.

Obstacles to Collaboration

- Staff availability and capacity.
- Availability of reliable and accessible data.

Future Opportunities for Collaboration

- Coordination of financial plans through the TAMP; using information from the TAMP financial plan to inform LRP financial plans.

- Taking both capacity and asset management into account in scoping and prioritizing projects to meet mobility needs and replace assets.
- Use of TAM to make MPOs aware of investment needs, shared regional goals, and other PBPP needs, including progress toward sustaining a state of good repair.

Insights from the State DOT Survey

PBPP Process

- Eighty-one percent of state DOTs surveyed stated that they collect data for locally owned NHS assets. The remaining DOTs reported either split responsibility for data collection across state and local agencies and toll authorities or variations in practice across assets.
- Seventy percent of state DOTs coordinate TAM programming for bridges and pavements with their MPOs.
- Fifty-five percent of state DOTs included their MPOs in the development of LRP goals and objectives related to TAM.
- Thirty-six percent of state DOTs asked their MPOs to participate in the development of TAM performance targets.
- Twelve percent of state DOTs asked their MPOs to participate in the development of performance measures in their statewide LRP.

Target Setting

- MPOs were not typically involved in target setting for infrastructure assets.
- Fifty-one percent of DOTs reported that they developed performance targets and then informed MPOs about these targets (indicating little or no coordination). However, almost 32 percent of DOTs reported that MPOs were involved throughout the process of developing both MPO and DOT targets.
- Sixty-one percent of state DOTs offered assistance to MPOs in analyzing their targets; more than 40 percent of states had an MPO accept their offer of assistance.
- Eighty-five percent of state DOTs indicate that they plan to follow the same target-setting process of collaboration and coordination with their MPO partners for future TAM target setting.
- Ninety-five percent of state DOTs felt that face-to-face meetings were the most successful form of coordination for setting NHS pavement and bridge targets.

Transportation Asset Management Plan (TAMP) Development

- Forty-six percent of states surveyed include their MPOs in reviewing predicted pavement or bridge conditions.
- Thirteen percent of states had MPOs provide or help coordinate data on current or future asset expenditures in the state TAMP.
- Forty-four percent of states offered their MPOs the opportunity to review a draft version of the TAMP before submission to FHWA.
- As with target setting, state DOTs reported that they are satisfied with their collaboration and cooperation with MPO partners, with 80 percent of states planning to follow the same approach for future TAMP updates.
- Seventy-two percent of state DOTs are interested in collaborating on TAM activities more regularly with their MPOs.

Insights from the Case Examples

DOT/MPO Collaboration Practices

- Communication using a mix of formal and informal channels.
- Involvement of MPO members on LRP advisory committees.
- Development and distribution of fact sheets to provide a common understanding of requirements, methodologies, and processes.
- Technical assistance/capacity-building activities on specific topics, such as target setting.
- Statewide collection of asset condition information covering state and locally maintained assets.
- Protocols and tools for data sharing across state DOTs and MPOs.
- Standard report cards on asset conditions within urban area/MPO boundaries.
- Standard asset investment reporting.
- Workshops involving state DOT, MPO, and local agency staff to discuss data, current practices, challenges, and future collaboration opportunities.
- Formal documentation of collaboration processes.
- Standing coordinating bodies for MPOs and TAM.
- Development of templates with standard language for MPOs to use within their planning documents (e.g., to establish targets within MTPs).

Agency Perspectives on Future Improvement Needs

- Make the TAMP more meaningful to MPOs.
- Move beyond coordination to real partnership.
- Create stronger linkages between the statewide TAMP and the regional MTPs and TIPs.
- Increase transparency in information sharing.
- Improve data sharing and software tools.
- Share expenditures/investment levels across agencies.
- Develop more robust modeling capabilities coordinated across states and MPOs.

Knowledge Gaps and Future Research Needs

Based on the results of the literature review, questionnaire, follow-up interviews, and case examples, the research team has identified several potential areas for TAM capacity building, knowledge sharing, and future study. These topics can be considered for incorporation into future research projects, as well as incorporated into knowledge exchange, training, and capacity-building initiatives involving MPOs and local agencies.

- **Data Collection, Analysis Sharing:**
 - Practices for coordinating data collection across state DOTs, MPOs, and local agencies.
 - Practices for sharing roadway, asset, and project data across state DOTs, MPOs, and local agencies.
 - Practices for applying geospatial analysis to segment and summarize asset performance data for individual MPOs.
- **TAMP Development:**
 - Practices for engaging MPO partners in the TAMP development process.
 - Approaches to aligning state and local asset improvement strategies.
 - Approaches to integrating use and communication of national, state, and local performance measures (which may all be different).
 - Understanding and communicating approaches to developing a risk-based TAMP.
 - Understanding and communicating approaches to asset life-cycle planning.
- **Target Setting:**
 - Practices for state DOTs to engage MPO partners in target setting.
 - Practices for MPOs to engage local agencies in their regions in target setting.

- Ways to address challenges associated with the fact that MPOs have target-setting responsibilities but do not own local NHS assets and have indirect responsibility for their performance and condition.
- Practices for coordinating on performance dashboards and other ways of communicating performance targets and results across state DOTs, MPOs, and local agencies.
- Data requirements and technical approaches available for setting targets.
- Understanding and communicating the purpose and benefits of target setting from national, state, and local perspectives.
- Understanding and communicating the relationship between long-term SGR objectives (in TAMPs) and short-term (2- and 4-year) performance targets.
- Understanding and communicating the difference between aspirational and realistic targets.
- Understanding and communicating the implications of an MPO “supporting” a state target; reasons why an MPO might want to set their own target.
- **Financial Planning and Programming:**
 - Practices for coordinating asset investment strategies in State Long Range Plans and Metropolitan Transportation Plans.
 - Practices for coordinating asset investment strategies in state and MPO transportation investment programs.
 - Practices for project scoping and prioritization that combine consideration of asset condition, safety, and mobility objectives.
 - Practices for risk-based approaches for dealing with funding constraints.
- **Project Tracking:**
 - Methods and tools for tracking past, present, and planned investments on both state and locally owned assets.
 - Methods for distinguishing pavement and bridge work on larger projects.
 - Approaches for establishing uniform work categories consistent with those required for the TAMP (initial construction, maintenance, preservation, rehabilitation, and reconstruction).
 - Approaches for sharing project data across local agencies, MPOs, and state DOTs to enable integration “roll-ups” of local and DOT projects.
- **Asset Condition Forecasting:**
 - Methods and tools for pavement and bridge condition forecasting to account for planned and programmed projects.
 - Approaches for coordinating pavement and bridge forecasting methods across state DOTs, MPOs, and local agencies.
 - Approaches to use of scenario analysis to inform financial plans and target setting at state and MPO levels.
- **Monitoring and Adjustment:**
 - Approaches for modifying targets based on observed performance results, performance projections, and other relevant indicators.
 - Approaches for analyzing variance between predicted and observed results and for improving predictions to incorporate what was learned.

Recognizing that this synthesis represents a snapshot in time at a relatively early stage of the TAMP and TPM evolution, future follow-up surveys and/or syntheses can be considered to track future evolution in the state of the practice. The timing of these follow-ups should consider key federal TPM reporting milestones, including the mid-performance report (October 2020) and the first full-performance period report (October 2022).

- **Follow-Up Tracking of Practice:** A follow-up survey and synthesis to assess advances in practice from the time of the baseline questionnaire (May-June 2020) to the mid-performance report (October 2020) to the first full-performance period report (October 2022).

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Abbreviations and Acronyms

AMPO	Association of Metropolitan Planning Organizations
CFR	Code of Federal Regulations
DVRPC	Delaware Valley Regional Planning Commission
ETG	expert task group
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
LRP	long-range planning
L RTP	long-range transportation plan
MAP-21	Moving Ahead for Progress in the 21st Century Act
MODA	multi-objective decision analysis
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Commission (San Francisco Bay Area)
MTP	Metropolitan Transportation Plan
NHS	National Highway System
NJTPA	North Jersey Transportation Planning Authority
NPMRDS	National Performance Management Research Data Set
PBPP	performance-based planning and programming
RPC	Regional Planning Commission
SEMCOG	Southeast Michigan Council of Governments
SGR	state of good repair
STIP	Statewide Transportation Improvement Program
TAM	Transportation Asset Management
TAMP	Transportation Asset Management Plan
TIP	Transportation Improvement Plan
TPM	Transportation Performance Management
TRID	Transportation Research Information Database
USC	United States Code



APPENDIX A

Questionnaire Email

Dear State DOT TAM Representative,

The Transportation Research Board (TRB), NCHRP Cooperative Research Program is conducting a synthesis on Practices for Coordinating Asset Management Performance Measurement and Monitoring between State Transportation Agencies and Metropolitan Planning Organizations. This work is being performed by TRB's contractors Spy Pond Partners and Econolite as part of NCHRP Project 20-05, Synthesis Topic 51-05.

The purpose of this questionnaire is to identify and summarize state department of transportation (DOT) collaboration with metropolitan planning organizations (MPOs) relative to asset inventory and condition assessment, target setting, investment decision-making and performance monitoring of pavement and bridge assets for performance-based planning and programming (PBPP). The results of the survey will be incorporated into a synthesis of highway agency practice, with the intent of helping agencies identify state DOT practices to initiate and facilitate collaboration with MPOs.

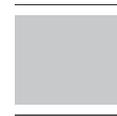
This survey is being sent to the lead contact for each state DOT transportation asset management (TAM) program. If you are not the appropriate person at your organization to complete this questionnaire, please forward it to the correct person.

Please complete and submit this survey by [insert date the questionnaire is sent via survey instrument]. We estimate that it should take no more than 20 minutes to complete the survey. It is designed so you can exit and return to the survey if you need to allocate your time over several days. Please complete this survey by (enter date). If you have any questions or problems related to this questionnaire, please contact the Principal Investigator for the research, Hyun-A Park, at (617) 875-9614 or hpark@spypondpartners.com.

Questionnaire Tips

- If you are unable to complete the questionnaire, you can return to the questionnaire at any time by reentering through the survey link as long as you access the questionnaire through the same computer. Reentering the survey will return you to the last completed question.
- Survey navigation is conducted by selecting the “prev” (previous) or “next” button at the bottom of each page.

Thank you for your time and expertise in completing this important questionnaire.



APPENDIX B

Questionnaire

A. General

- A1. Name (enter text)
- A2. Agency (enter text)
- A3. Title (enter text)

B. Performance Based Planning and Programming

B1. Which of the following best describes how TAM is integrated into your current long range statewide transportation plan (LRP)? Select all that apply.

- In the LRP goals and objectives
- TAM performance measures
 - Bridge and pavement measures that differ from FHWA measures
- TAM performance targets
 - Bridge and pavement targets in addition to FHWA targets
- TAM investment amounts related to performance targets
 - Investment amounts for bridges and pavements in addition to what is needed by FHWA
- TAM created before required update to LRP and not included
- Other (please describe)

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B2. How are MPOs involved in your LRP development related to TAM? Select all that apply.

- Development of LRP goal(s) and objectives related to TAM
- Development of TAM performance measures in the LRP
- Development of TAM performance targets
- Determination of TAM investment amounts related to performance targets
- LRP update will occur in future and TAM wasn't included
- Other (please describe)

B3. Does the state support MPOs in their MPO planning activities? Select all that apply.

- Development of TAM goal(s) in the MPO's metropolitan transportation plan (MTP)
- Development of MPO-specific TAM performance measures
- Development of MPO TAM performance targets
- Determination of MPO TAM investment amounts related to performance targets
- Other (please describe)

B4. Do the MPOs use the same performance measures that the state uses?

- Do they have the bridge performance area in their MTP?
- Do they have the pavement performance area in their MTP?

B5. Do you coordinate TAM programming for bridges and pavements with your MPOs?

- If yes, describe how you coordinate? (enter text)

C. Coordination in Setting National Highway System (NHS) Pavement and Bridge Targets

C1. Who is responsible for collecting data for locally-owned NHS assets?

- DOT collects data for all NHS assets, including locally-owned assets
- Local agencies collect data for locally-owned NHS assets

DOT and local agencies split responsibility for data collection

Other (please describe)

C2. What was the extent of coordination with MPOs in development of NHS pavement and bridge targets?

MPOs were involved throughout the process in developing both MPO and state targets

MPOs were involved in developing MPO targets, but were uninvolved in developing state targets

The DOT developed targets and provided information to MPOs following target development

Other (please describe)

C3. What forms of coordination between the DOT and MPOs were most successful for setting NHS pavement and bridge targets? (check all that apply)

Face-to-face meetings

Conference calls

Workshops

Written communication

Informal person-to-person communications (e.g., phone calls, emails)

Other (please describe)

C4. Did the agency recommend targets for each MPO in support of state targets?

Agency recommended pavement and bridge targets for each MPO

Agency recommended pavement targets but not bridge targets

Agency recommended bridge targets but not pavement targets

Agency did not recommend MPO targets

Other (please describe)

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- C5. Did the agency offer to assist MPOs in analyzing their targets?
- Yes, agency offered assistance for pavement and bridge targets
 - No, agency did not offer assistance
 - Other (please describe)
- C6. Did any MPO accept State assistance in analyzing its targets?
- Yes
 - No
 - Other (please describe)
- C7. Did the MPOs adopt the targets recommended by the DOT or set its own targets, or support the state's targets by agreeing to plan and program projects that help the state meet its targets?
- MPOs adopted the targets recommended by the DOT for both pavement and bridges (select from the following choices)
 - All
 - Some
 - None
 - MPOs developed their own pavement and bridge targets (select from the following choices)
 - All
 - Some
 - None
 - MPOs used a mix of targets recommended by the DOT and their own targets – (please describe)
- C8. Were the overall state targets modified based on specific MPO targets?
- Yes (please describe)
 - No
 - Other (please describe)

D. TAMP Development and Implementation

- D1. What was the extent of coordination with MPOs in development of the TAMP?
(check all that apply)
- MPOs provided (or helped coordinate) asset inventory and condition data (from non-state NHS owners).
 - MPOs provided (or helped coordinate) data on current and/or future asset expenditures.
 - MPOs were consulted on TAM goals and objectives, asset life cycle strategies, risk management and/or the State's definition of the desired state of good repair.
 - MPOs reviewed predicted pavement and/or bridge conditions.
 - MPOs reviewed a draft version of the TAMP prior to submission to FHWA.
 - Other (please describe)
- D2. What forms of coordination were most successful for TAMP development?
(check all that apply)
- Face-to-face meetings
 - Conference calls
 - Workshops
 - Written communication
 - Informal person-to-person communications (e.g., phone calls, emails)
 - Other (please describe)
- D3. How are MPOs involved in the implementation of your TAMP?
- Providing updates on asset inventory and condition
 - Providing updates on TAMP implementation actions
 - Other (please describe)

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D4. How is the State DOT providing support to MPOs on their TAMP implementation activities? (check all that apply)

- Providing data on asset inventory and condition
- Supporting TAMP implementation actions
- Providing funding
- Other (please describe)

D5. Please describe any other TAM-related activities that the State DOT and MPOs are collaborating on.

E. Other Questions

E1. For future TAM target setting, does the agency expect to repeat the same approach?

- Yes
- No (please describe)

E2. Regarding MPO coordination on TAMP development, does the agency expect to follow the same approach for future TAMP updates?

- Yes
- No (please describe)

E3. Is your agency interested in expanding the collaboration with MPOs TAM activities?

- Yes (please describe briefly)
- No

- E4. Are you interested in lessons learned and sharing of successes, failures, and noteworthy practices regarding TAM collaboration between state DOTs and MPOs?
- Yes. What form would be best for you? (rank order the items that you want to have)
- Peer exchange
 - Webinar
 - Printed documents
 - Video summary
 - Presentation at your organization
 - Other (enter description)
- No
- E5. Who would you prefer to hear from related to success stories and noteworthy practices? (select all that apply)
- Peer DOT
 - FHWA
 - Pairing of MPO and Peer DOT
 - Researcher
 - University
- E6. What, if any, are the most significant barriers to increased coordination between the State DOT and MPOs? (select up to 3)
- Constraints on DOT staff time
 - Constraints on MPO staff time
 - Limited interest in coordinating (e.g., because a large portion of the NHS assets are state-owned)
 - Issues with planning/programming siloes
 - Issues with data availability/accessibility
 - No significant barriers to coordination
 - Other (please describe)



APPENDIX C

List of Participating Agencies

Table C-1 lists the agencies that contributed to the synthesis through their participation in the questionnaire and/or the interviews. Each row in the table includes the location of the agency, the name of the agency, and the department or role of each participating individual.

Table C-1. Participating agencies.

State	Agency	Department or Role	Questionnaire	Interview
Alaska	Alaska DOT&PF	Chief Engineer	x	
Arizona	Arizona DOT	Performance/Asset Manager	x	
Arkansas	Arkansas DOT	Division Engineer - System Information & Research	x	
California	California DOT	State Asset Management Engineer	x	x
California	California Metropolitan Transportation Commission	Street Saver Program Manager		x
Colorado	Colorado DOT	Performance and Asset Management Branch Manager	x	
Connecticut	Connecticut DOT	Transportation Supervising Engineer	x	x
Delaware	Delaware DOT	Assistant Director, Division of Planning	x	
Delaware, Pennsylvania	Delaware Valley Regional Planning Commission	Manager, Capital Project Development/Office of Capital Programs		x

State	Agency	Department or Role	Questionnaire	Interview
Florida	Florida DOT	Administrator for Metropolitan Planning	x	x
Georgia	Georgia DOT	Assistant Office Head - Office of Performance-based Management and Research	x	
Hawaii	Hawaii DOT	Highways Division Planning Manager	x	
Idaho	Idaho Transportation Department	State Asset Management Engineer	x	
Illinois	Illinois DOT	Bureau Chief, Planning	x	
Indiana	Indiana DOT	Managing Director of Asset Management	x	
Iowa	Iowa DOT	Transportation Asset Management Administrator	x	
Kansas	Kansas DOT	Asset Management / Performance Measures Manager	x	
Kentucky	Kentucky Transportation Cabinet	Assistant State Highway Engineer	x	
Louisiana	Louisiana DOT and Development	Asset Management Engineer	x	
Maryland	Maryland DOT State Highway Administration	Chief of Innovative Planning and Performance	x	
Michigan	Michigan DOT	Transportation Planner	x	x
Michigan	Southeast Michigan Council of Governments	PASER Program, Transportation Planning and Programming		x
Minnesota	Minnesota DOT	Asset Management Planning Director, Investment Planning Director, Director of Performance, Risk and Investment Analysis	x	x

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State	Agency	Department or Role	Questionnaire	Interview
Mississippi	Mississippi DOT	Planner	x	
Missouri	Missouri DOT	Organizational Performance Specialist	x	
Montana	Montana DOT	Policy, Program & Performance Analysis Chief	x	x
Nebraska	Nebraska DOT	Roadway Asset Management Engineer	x	
Nevada	Nevada DOT	Chief Maintenance and Asset Management Engineer	x	
New Hampshire	New Hampshire Department of Transportation	Administrator: Office of Asset Management, Performance & Strategy	x	
New Jersey	New Jersey DOT	Project Manager	x	
New Jersey	North Jersey Transportation Planning Authority	Manager, Data Analysis and Forecasting		x
New Mexico	New Mexico DOT	Capital Program and Investments Director	x	
New York	New York State DOT	Director, Office of Policy, Planning and Performance	x	
North Dakota	North Dakota DOT	Planning/Asset Management Division Engineer	x	
Ohio	Ohio DOT	Administrator, Office of Technical Services	x	
Oklahoma	Oklahoma DOT	Assistant Division Manager	x	
Oregon	Oregon DOT	Transportation Economist	x	
Pennsylvania	Pennsylvania DOT	Bridge Asset Management Section Chief, Asset Management Engineer	x	x
Rhode Island	Rhode Island DOT	Principal Economic & Policy Analyst	x	
South Dakota	South Dakota DOT	Transportation Programs Administrator	x	
Texas	Texas DOT	Pavement Asset Management Section Director	x	

State	Agency	Department or Role	Questionnaire	Interview
Utah	Utah DOT	Asset Manager for Maintenance	x	
Vermont	Vermont Agency of Transportation	Director - Asset Management Bureau	x	
Washington	Washington State DOT	Highway Asset Manager	x	
Washington D.C.	District Department of Transportation	Civil Engineer	x	
West Virginia	West Virginia DOT	TAMP Manager/Acting Assistant Director: Strategic Performance Management Division	x	
Wyoming	Wyoming DOT	State Planning Engineer	x	

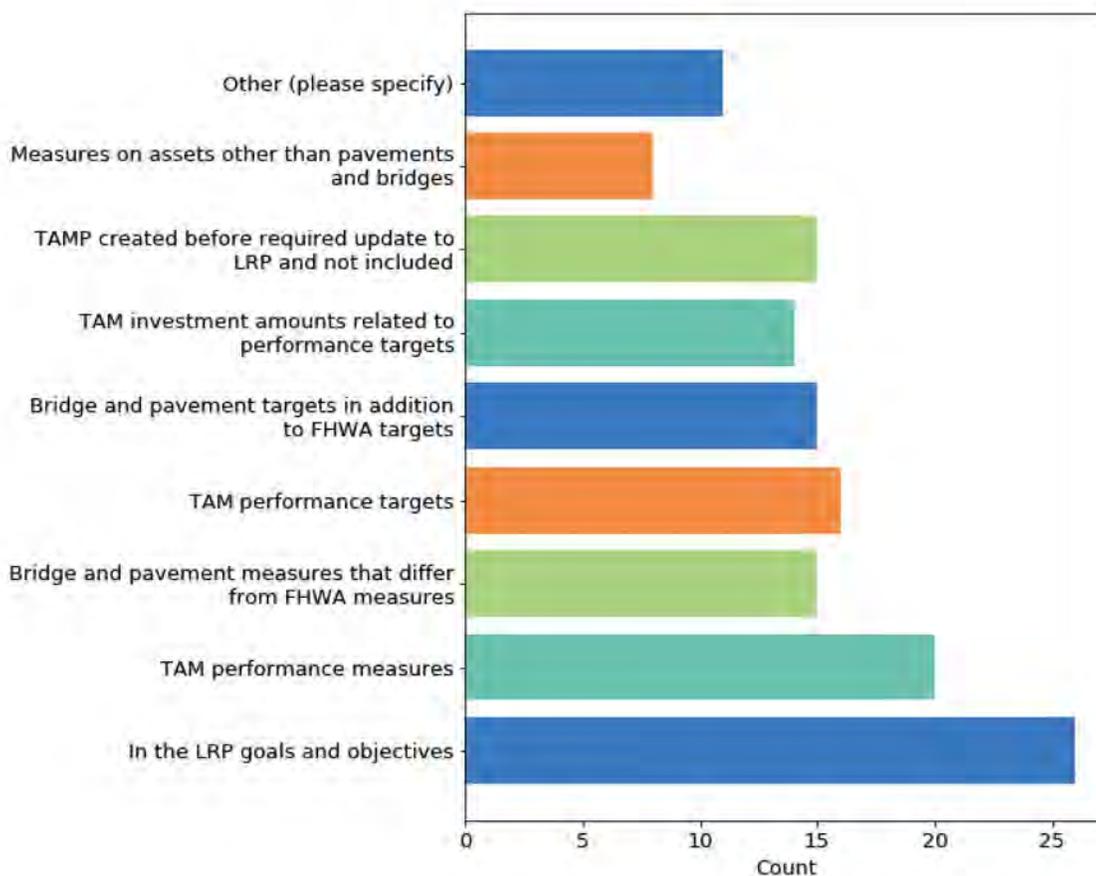


APPENDIX D

Questionnaire Results

1. Which of the following best describes how TAM is integrated into your current long range statewide transportation plan (LRP)? Select all that apply.

Responses: 43

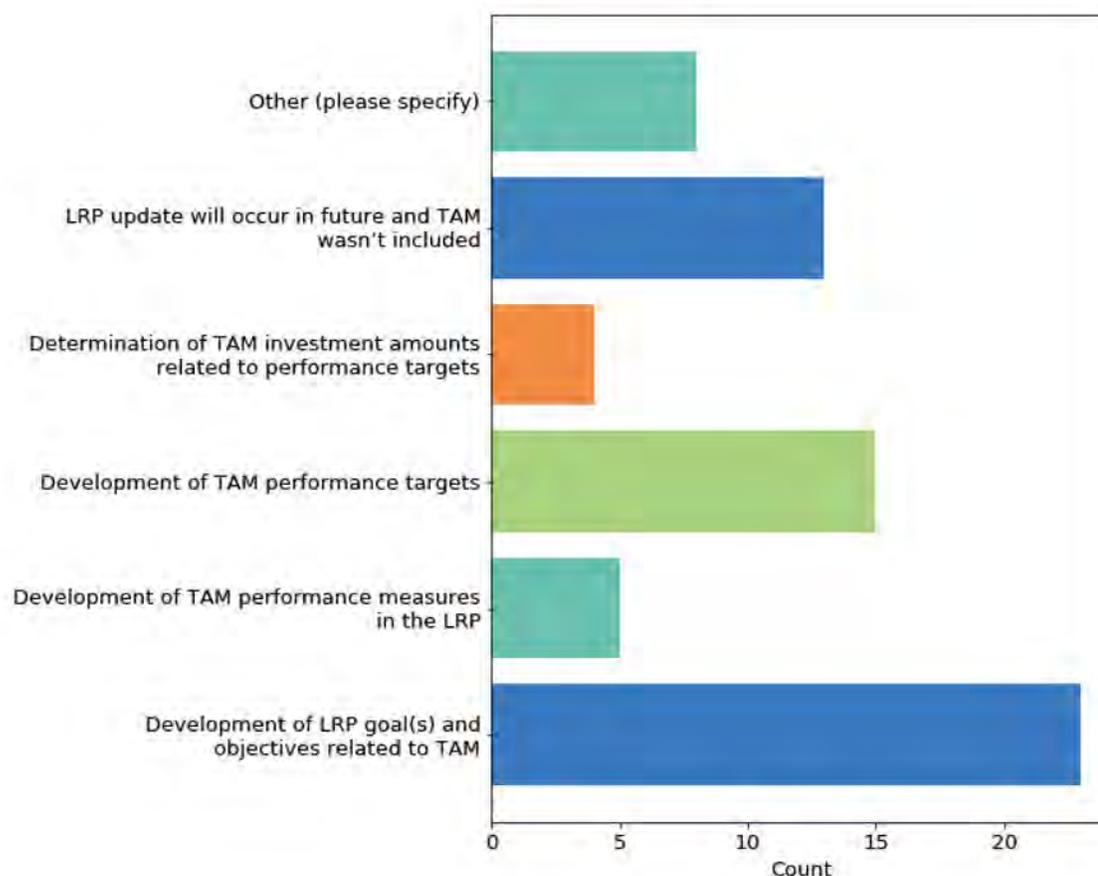


Comments:

- Our LRTP is currently under revision and will include concepts from the Nebraska DOT 2019 Transportation Asset Management Plan. [Nebraska DOT]
- Other: Our LRP was submitted prior to the Agency's TAM. However, all FHWA targets established at the time of the LRP being drafted were included. [Connecticut DOT]
- LRP was completed prior to the TAM, so it's not included. It will be in the next LRP update. [Hawaii DOT]
- We talk about TAM alignment with LRTP and the Strategic Plan and the Capital Plan. We have visually tied these documents together by using similar covers to show intentional connection and alignment. [Vermont Agency of Transportation]
- New Jersey DOT will update of its LRP beginning 2020 to incorporate the items listed above since current plan predates TAMP. LRP due to be completed in 2022. [New Jersey DOT]
- LRTP was revised before the FHWA TAMP was final. [Missouri DOT]
- We are currently updating our LRP and plan to include performance measures and long-range goals desired from public/stakeholder input. [North Dakota DOT]
- The LRP draft includes the goals, objectives, description of the measures, targets, and investment amounts for NHS and for the rest of the state system. [Wyoming DOT]
- Currently updating our LRP. [Colorado DOT]
- Our current statewide LRP was adopted in 2017, prior to the initial certified TAMP. Our next update, scheduled for 2022, will be developed parallel to our 2022 TAMP update and will more fully integrate TAMP elements. [Iowa DOT]
- Goal 3: Preserve and Maintain our Transportation Assets for the Long Term. There is no definition of state of good repair or the metrics. [New Mexico DOT]

2. How are MPOs involved in your LRP development related to TAM? Select all that apply.

Responses: 42



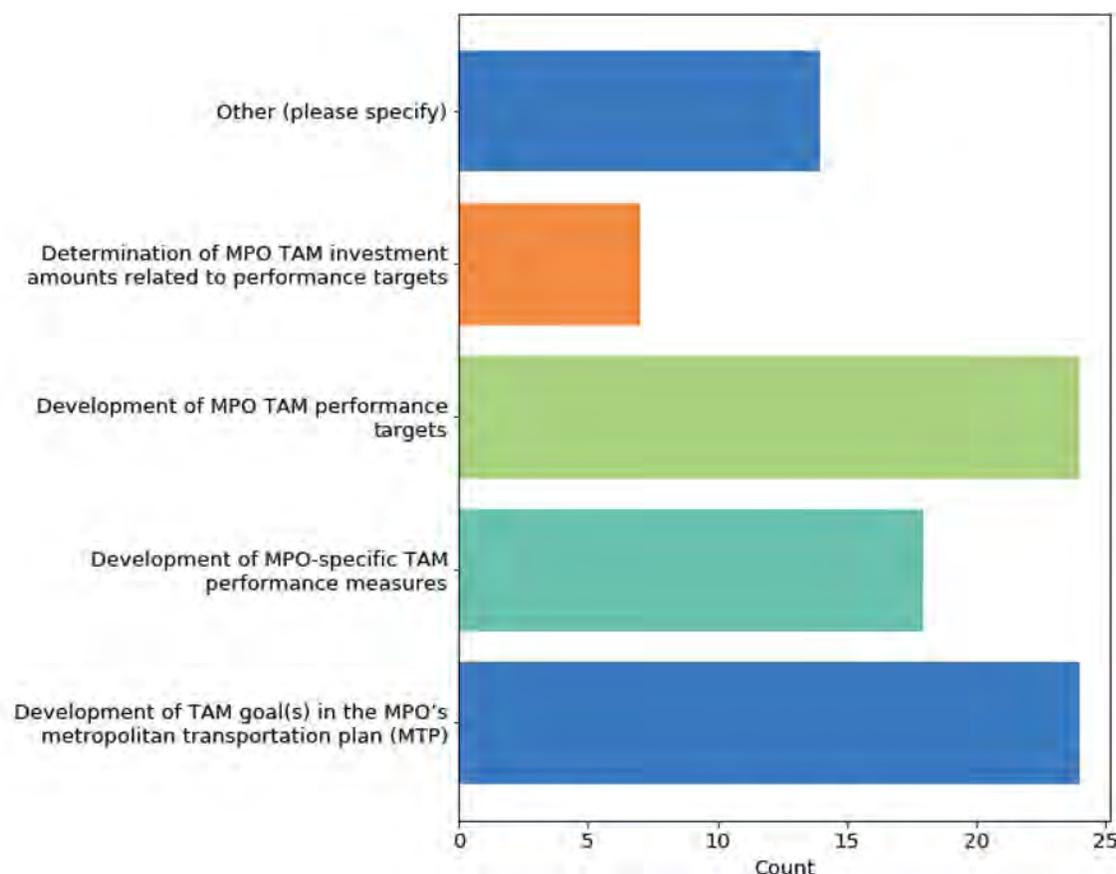
Comments:

- MPOs not involved related to TAM. [Nevada DOT]
- MPOs are a stakeholder in the LRP development and updates. [Montana DOT]
- GAMPO is on the Stakeholder Advisory Committee for the SWTP. FHWA/GDOT PBPP info is transmitted via GAMPO email distribution list. The Georgia Association of MPOs (GAMPO) provides a forum for the Metropolitan Planning Organizations (MPOs) in the state of Georgia to exchange information and experiences, enhance the practice of metropolitan planning, provide educational opportunities, and discuss issues relative to local, state and federal policies. [Georgia DOT]

- MPOs are involved in the TAM target process, independent of the LRP development process. The LRP development process involves periodic MTPA updates for the inclusion of MPOs. [Michigan DOT]
- MPOs are not included in our Long Range Plan but are included in the unified plan. [Utah DOT]
- MPOs do not own any assets in the state. [Minnesota DOT]
- An MPO representative, selected by the 3 MPOs, sits on the executive-level advisory committee for the LRP update. Also, we plan to specifically invite all 3 MPOs to comment during all public input phases of the update. [North Dakota DOT]
- MPOs were part of the stakeholder process for the last LRP development, but since there are not any defined/quantifiable metrics included in the LRP, ours is very generic. [New Mexico DOT]

3. What MPO planning activities does the state DOT provide support for? Select all that apply.

Responses: 41

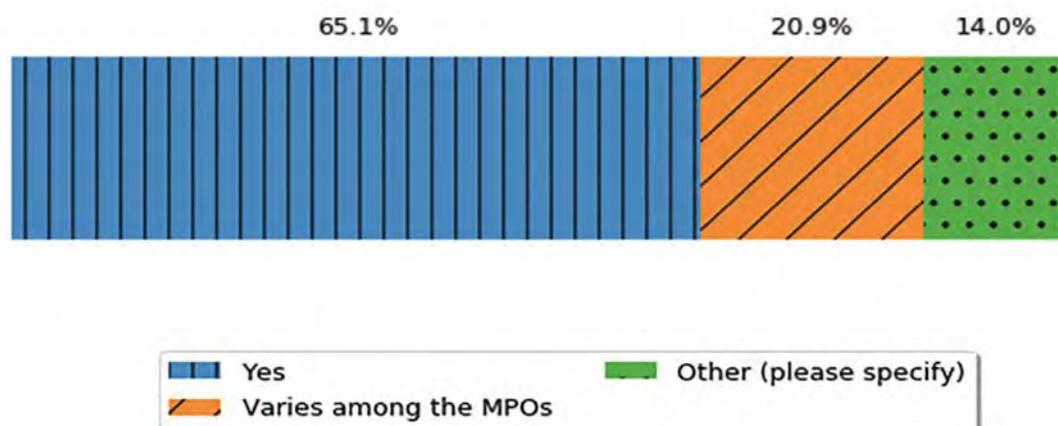


Comments:

- Our network has less than 5 percent of local NHS. [Nevada DOT]
- Similar goals, but not formally TAM. [Oklahoma DOT]
- MPOs to date have adopted the state targets, but presentations were conducted providing details regarding how the performance targets were developed during GAMPO meetings. [Georgia DOT]
- MPOs in South Dakota adopted the goals developed by the South Dakota DOT. [South Dakota DOT]
- MPOs chose between supporting State TAMP PM Targets or developing their own from data provided by DOTD. [Louisiana Department of Transportation and Development]
- Connecticut's MPOs do not set their own targets. The Connecticut DOT establishes all TAM goals and PM targets in collaboration with MPOs, and each MPO adopts the TAM objectives and PM targets. [Connecticut DOT]
- Goals and targets were discussed with MPOs, and MPOs adopted the Hawaii DOT's. [Hawaii DOT]
- Provide MPO-specific TAM performance data for NHS within MPO boundary where requested. [Kentucky Transportation Cabinet]
- We have one MPO in Vermont, and they used the PMs that we developed. We involved them in the target setting process for the development of our measures, which helped them in their decision. [Vermont Agency of Transportation]
- We share condition/performance data as per the New Jersey DOT Data-sharing MOU and the written procedures per 23 CFR Part 450. [New Jersey DOT]
- With the small amount of NHS system off of the state-maintained system, the MPOs have not really provided much support in development besides going along with state recommendations. [Utah DOT]
- Minnesota DOT supports MPO development of PM2. [Minnesota DOT]
- We indirectly support all of the above for the MPOs by providing information, training opportunities, and data. [North Dakota DOT]
- Coordination on development of STIP. [Arizona DOT]

4. Do the MPOs use the same TAM performance measures that the state uses?

Responses: 43



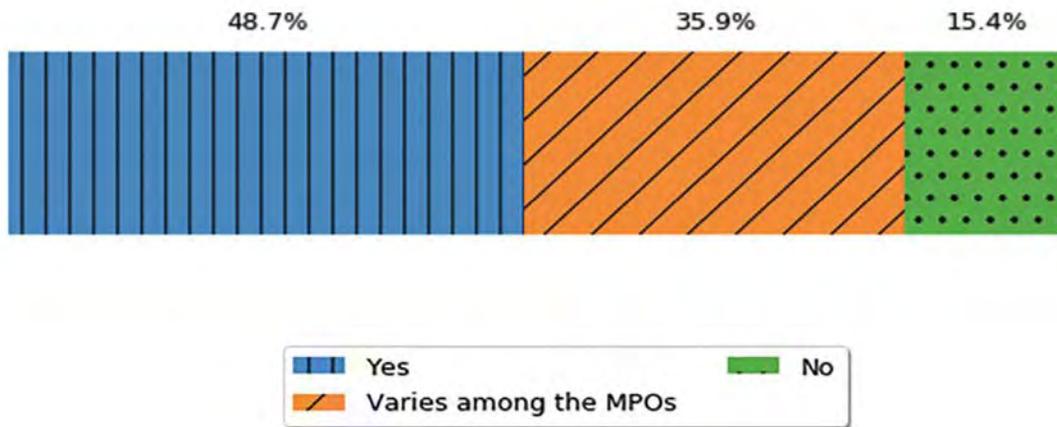
Comments:

- With the exception of the State's largest MPO, all other Oregon MPOs adopted Oregon DOT performance measures and targets for NHS pavements and bridges. [Oregon DOT]
- Mostly MPOs use same TAMP PMs as State. [Louisiana Department of Transportation and Development]
- http://www.ecosproject.com/wp/wp-content/uploads/2017/09/ECOSPlan_MTPSupplement5_Final_20180615.pdf. [Vermont Agency of Transportation]
- MPOs use a variety of performance measures, including the Federal Pavement Condition Measure, the Michigan DOT's Remaining Service Life (RSL), and the more locally applicable Pavement Surface Evaluation and Rating (PASER). The state pavement measure RSL is collected only on trunkline pavements; therefore, its MPO use is limited by that restriction. MPOs otherwise use PASER. [Michigan DOT]
- Yes, for PM2. [Minnesota DOT]
- 2- and 4-year performance measures - yes. Arizona DOT determines the state-of-good-repair measure and targets for the TAMP. [Arizona DOT]

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5. Do the MPOs have the bridge performance area in their MTP?

Responses: 39

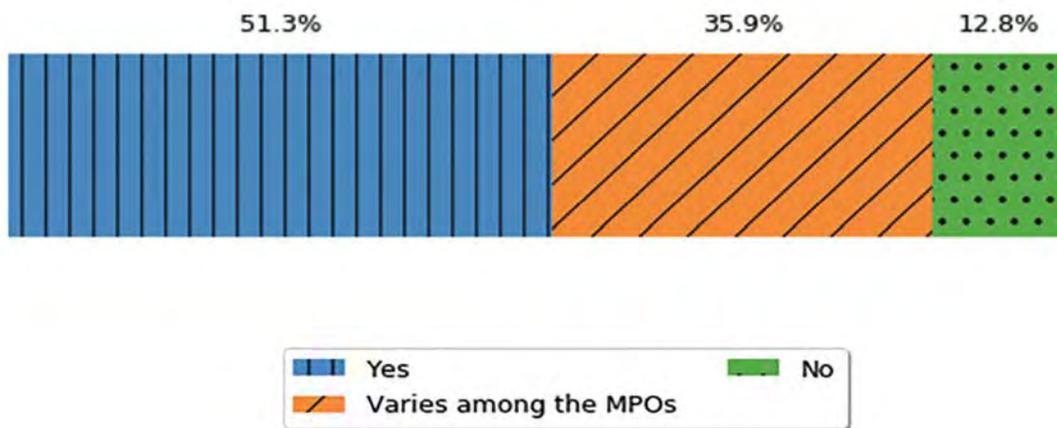


Comments:

N/A

6. Do the MPOs have the pavement performance area in their MTP?

Responses: 39

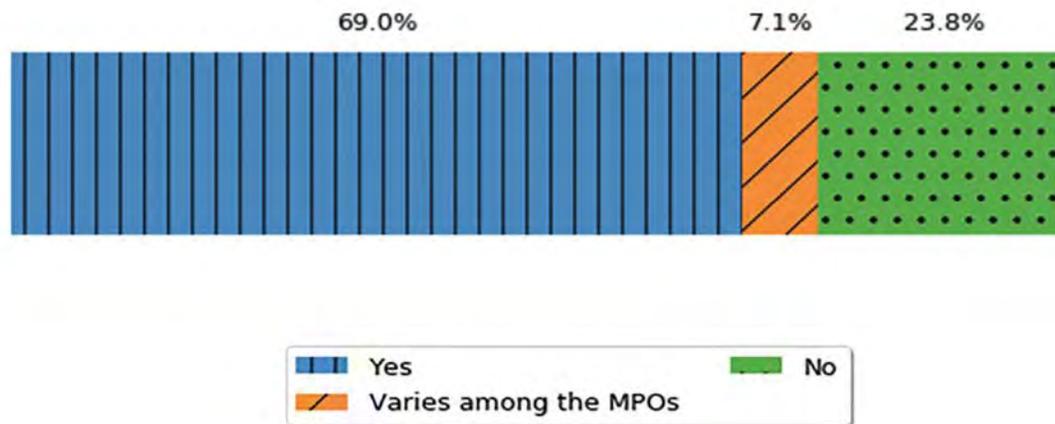


Comments:

Not applicable

7. Do you coordinate TAM programming for bridges and pavements with your MPOs?

Responses: 42



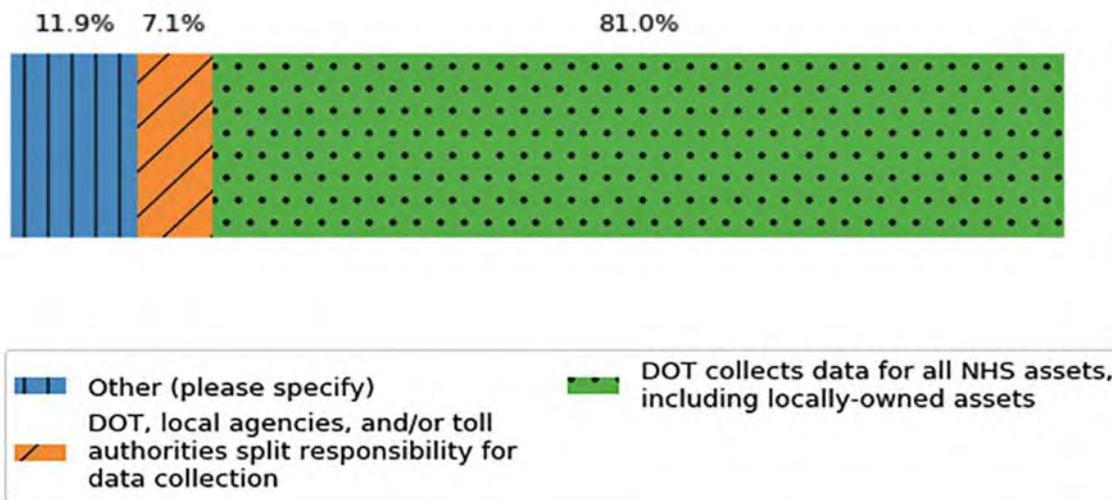
Comments:

- Nebraska DOT provides a suggested 10-year pavement and bridge project candidate list for the local NHS routes as a tool to aid in the decision-making process. [Nebraska DOT]
- Through the MPO planning processes, including LRTP/TIP processes. It should be noted that Montana DOT controls and manages nearly all of the NHS pavements and bridges in Montana, including those in MPO area. [Montana DOT]
- Kansas DOT programs TAM for assets owned by the state, even in metro areas. We provide input for locally owned NHS assets in some metro areas. [Kansas DOT]
- I hesitate to select yes. I would say it is very minimal. We recommend that MPOs select projects that improve the condition of the NHS so we can achieve our goals. All state projects in urban areas are in the LRTP and TIP, as required, and those are planned through our TAM programming process. [Illinois DOT]
- The state DOT publishes all State Highway System Projects and works closely with MPOs on projects with joint involvement. [California DOT]
- Pavement and bridge team meetings 3-4 times a year. [Indiana DOT]
- Connecticut DOT produces existing TAM programming based on bridge and pavement management systems, presents the findings to the MPOs, and then cooperatively establishes targets. [Connecticut DOT]

- MPOs and Florida DOT District Offices coordinate on the selection of projects that will help influence progress toward meeting the TAM targets. [Florida DOT]
- During the TIP and STIP development processes, MPO committees and governing councils have the opportunity to review and approve all capital programming, including bridge and pavement programs. [Delaware DOT]
- We have had project prioritization processes since 2007 that has helped move projects through the project development pipeline. Recently, we have been revising this process, and it is becoming more of a project selection and prioritization process. MPOs have a role in selecting the “right” transportation projects. [Vermont Agency of Transportation]
- Question for our Capital Investment & Program Development staff. [New Jersey DOT]
- Coordination occurs through an internet-based project database system – Jobnet. [Michigan DOT]
- See our statewide asset management process:
http://epg.modot.org/index.php/121.5_Asset_Management. [Missouri DOT]
- Coordination has done on the unified plan, and that has been the only time. [Utah DOT]
- MPOs have representatives on our Area Transportation Partnerships (ATPs). Also, MPOs work closely with Minnesota DOT staff on the development of their TIPs. [Minnesota DOT]
- On the NHS, Wyoming DOT performs the bridge and pavement inspections and coordinates for the projects. [Wyoming DOT]
- Colorado DOT focuses investment on state-owned and -operated structures and pavements. [Colorado DOT]
- The 5-Year Program is developed in coordination with stakeholders, including MPOs. There is additional coordination specifically with TMAs. [Iowa DOT]
- The New Mexico DOT district staff are aware of pavement and bridge conditions and work required on state-maintained facilities and provide that information and recommendation for DOT-led projects. Locally maintained infrastructure conditions and decisions are worked out between local and MPO. [New Mexico DOT]
- New York State DOT provides its strategic direction for TAM programming to the MPOs, and they implement it to the extent practicable. [New York State DOT]

8. Who is responsible for collecting data for locally-owned NHS assets?

Responses: 42

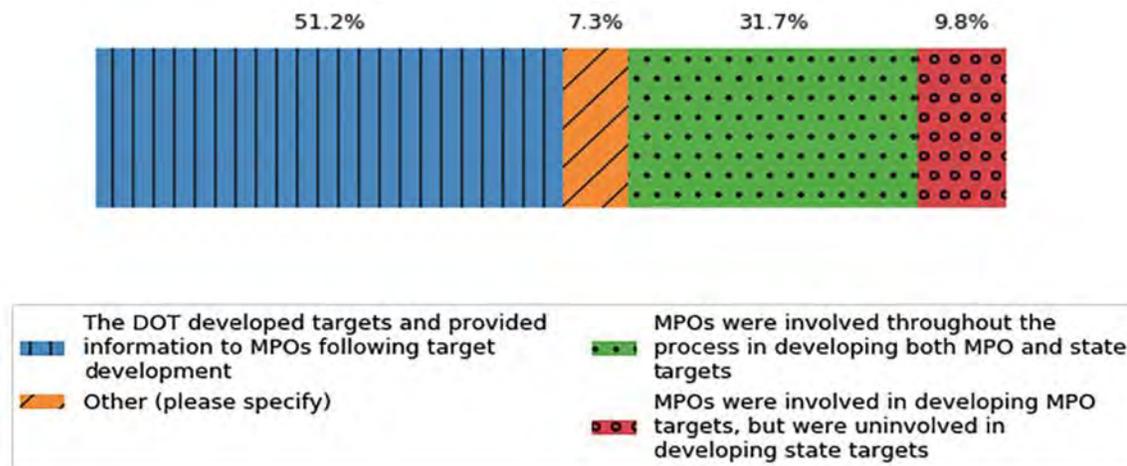


Comments:

- Illinois DOT collects all NHS except the tollway. [Illinois DOT]
- Not sure. Not my area of responsibility. [Florida DOT]
- New Jersey DOT collects state, local, and authority owned NHS pavement condition data except for New Jersey Turnpike, which they collect. New Jersey DOT collects all bridge condition data. [New Jersey DOT]
- DOT collects all asset types through lidar but does not capture other assets besides pavement and bridges. [Utah DOT]
- The DOT collects pavement data for all paved roadways in the state, including the NHS, and inspects all state-owned bridges. Local agencies are responsible for inspecting their own bridges. [Iowa DOT]

9. What was the extent of coordination with MPOs in development of NHS pavement and bridge targets?

Responses: 41

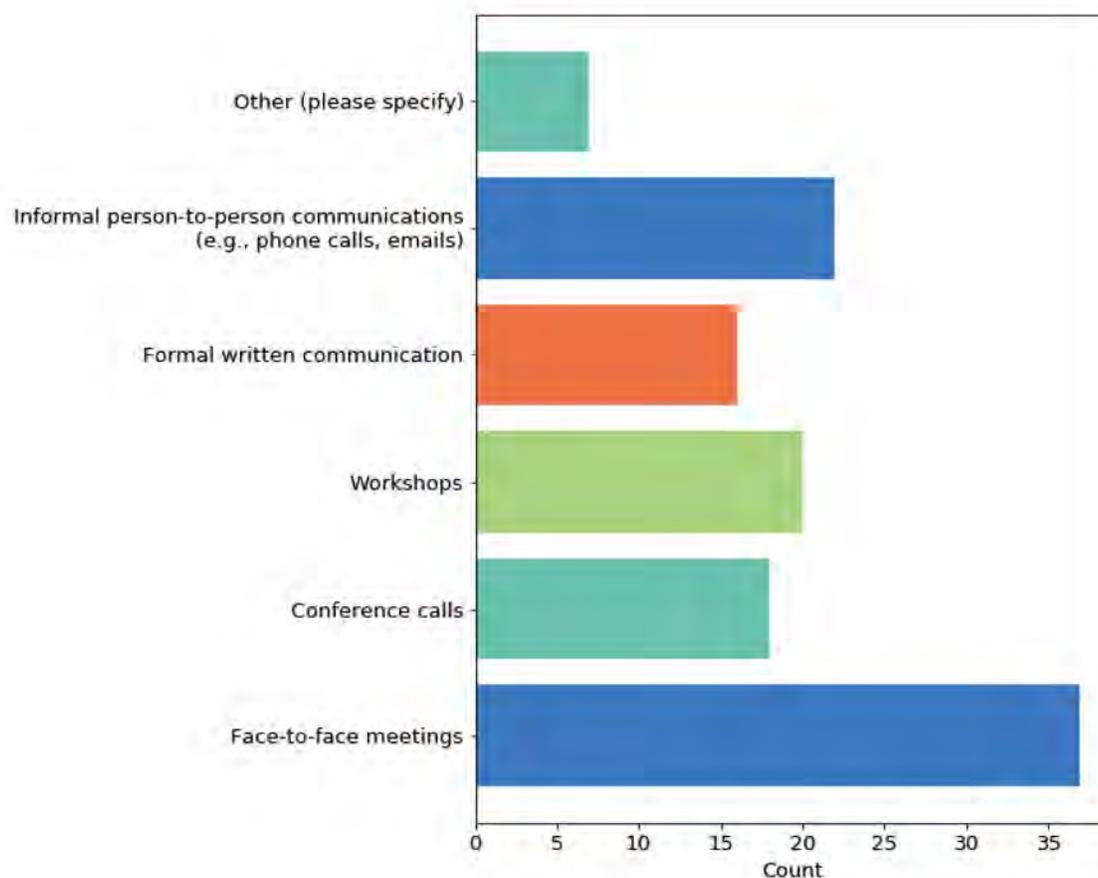


Comments:

- New Jersey DOT developed state targets, presented them to MPOs, and requested input/feedback from MPOs. [New Jersey DOT]
- DOT provided draft targets and other considered scenarios to the MPOs for comment. DOT executives made the final decision. [North Dakota DOT]
- MPOs were involved in developing MPO targets and had limited involvement in developing state targets. They were provided updates during the target-setting process and had an opportunity to provide comments on draft targets. [Iowa DOT]

10. What forms of coordination between the DOT and MPOs were most successful for setting NHS pavement and bridge targets? (check all that apply)

Responses: 41



Comments:

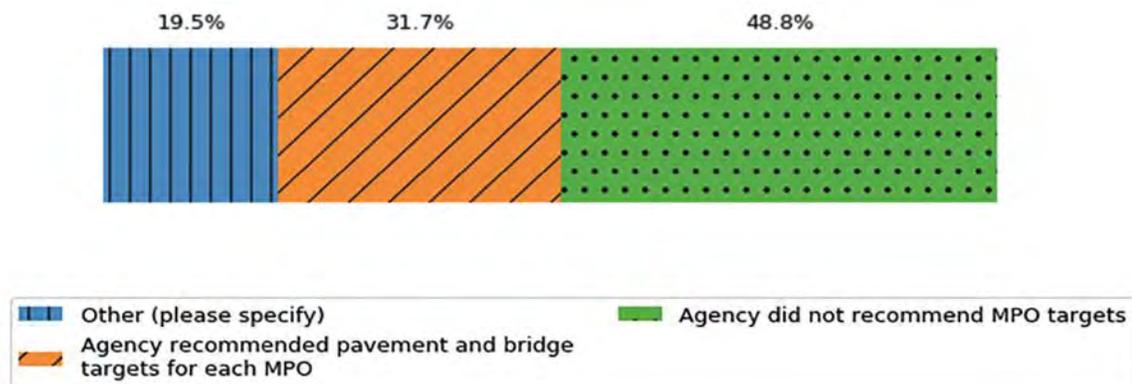
- MPOs were not involved in developing the targets. [Nevada DOT]
- The MPOs agreed to follow DOT recommendations because of the resources required to collect and analyze asset condition data and little of the NHS is on local networks. DOT staff met with the MPOs and presented the current pavement and bridge conditions and explained how the targets were developed. [Arkansas DOT]
- Emails. [Delaware DOT]
- See FHWA Noteworthy Practice: <https://www.fhwa.dot.gov/tpm/noteworthy/mo.pdf>. [Missouri DOT]
- Over communication was key. [Colorado DOT]

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- Updates at standing MPO quarterly meetings. [Iowa DOT]
- Pavement management staff met with the MPOs and the New Mexico DOT District office to go over the data and provide recommendations on pavement targets. [New Mexico DOT]

11. Did the agency recommend targets for each MPO in support of state targets?

Responses: 41



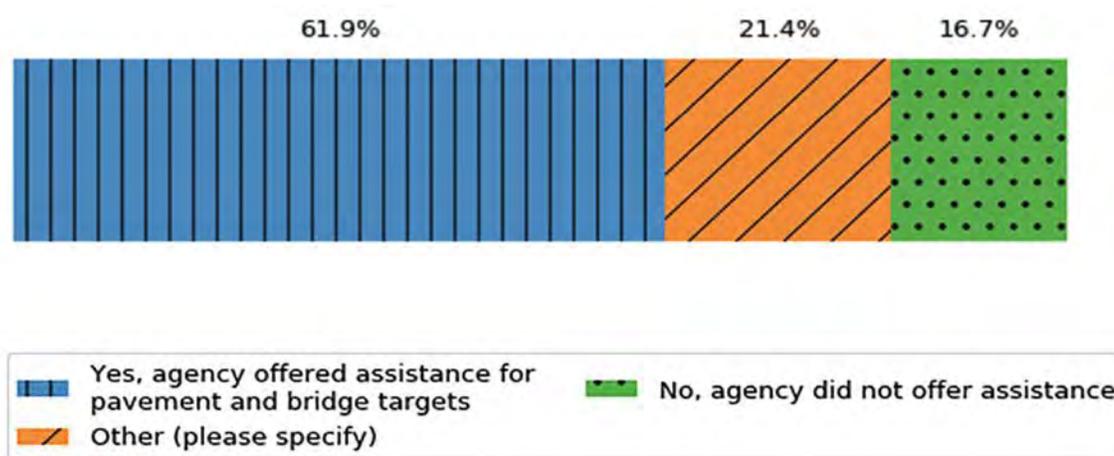
Comments:

- Montana DOT did not recommend MPO targets but provided the state targets and discussed them with the MPO. This includes consideration that the Montana DOT controls/manages nearly all NHS pavements and bridges in the state. [Montana DOT]
- Oregon DOT noted the ability of MPOs to establish their own targets and involved MPOs in discussions leading up to the adoption of state targets. [Oregon DOT]
- The MPOs adopted the state target. [South Dakota DOT]
- Washington State DOT recommended statewide bridge and pavement targets for review and consideration by MPOs (Washington State DOT did not recommend individual MPO district targets). [Washington State DOT]
- The state DOT presented pavement and bridge performance broken down by MPO and recommended they support state targets; no specific, separate MPO target was set (this was one of the two options for MPOs). [Connecticut DOT]
- MPOs chose to adopt the DOT targets. [Arkansas DOT]

- It is not the role of the state DOT to recommend targets. We provided the MPO by MPO data as well as the statewide targets to facilitate their decision to support the state targets or establish their own. [Missouri DOT]
- DOT recommended that all MPOs support state targets in lieu of setting their own targets. [North Dakota DOT]

12. Did the agency offer to assist MPOs in analyzing their targets?

Responses: 42



Comments:

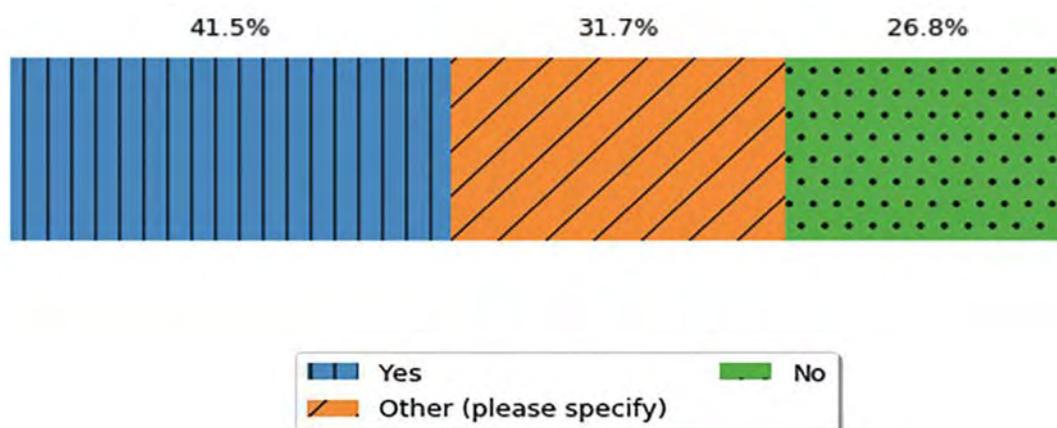
- Invited MPOs to participate in training classes and workshops. [Nevada DOT]
- Yes. Some MPOs had questions about the targets and target setting. Montana DOT provided those that requested information data on these facilities so that they could consider if they wanted to set their own targets. [Montana DOT]
- The agency recommended targets for MPOs. [District DOT]
- The MPOs did not want to set their own targets. [South Dakota DOT]
- The state provided data and statewide methodology to assist the MPOs. [California DOT]
- Washington State DOT and MPOs collaboratively worked through the target-setting process through the target-setting framework groups created for that specific intent. Each MPO was represented through the process, but as the effort was a statewide effort, individual assistance was not provided. [Washington State DOT]

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- Minnesota DOT provided current pavement and bridge data to MPOs for their MPO areas. [Minnesota DOT]
- Yes. As we collected and analyzed the data, we met with all MPOs together, and then we had separate meetings with each MPO to go into detail on whether they should adopt the state target or whether they should set their own target. [New Mexico DOT]
- No separate MPO bridge or pavement targets. [Arizona DOT]

13. Did any MPO accept State assistance in analyzing its targets?

Responses: 41



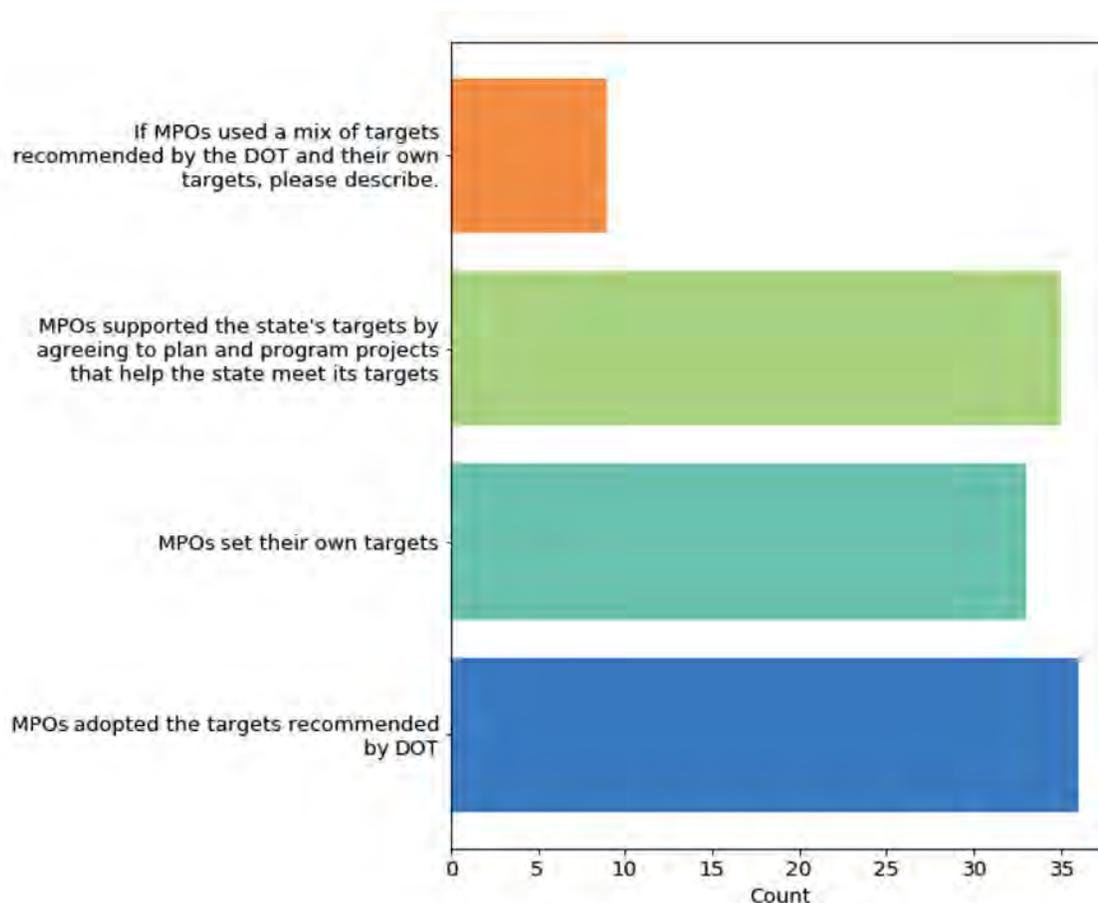
Comments:

- Unsure. [Ohio DOT]
- A few participated in FHWA-offered training and workshops. [Nevada DOT]
- Yes, but at a very cursory level. Upon the Montana DOT providing the data and discussing that Montana DOT controls nearly all NHS routes, the MPOs deferred to the state targets. [Montana DOT]
- N/A; no assistance was requested. [Georgia DOT]
- The MPOs accepted the state targets. [South Dakota DOT]
- Please see response to Question 12. [Washington State DOT]
- All MPOs adopted the statewide targets as their own. [Florida DOT]
- Assistance was not offered. However, the DOT does provide condition data for NHS pavements and bridges to the MPOs. [Arkansas DOT]

- The MPOs accepted state DOT-provided data and assistance with target-setting questions. [Michigan DOT]
- Minnesota DOT provided current pavement and bridge data to MPOs for their MPO areas. [Minnesota DOT]
- MPOs adopted state targets and didn't set their own targets. [West Virginia DOT]
- No separate MPO bridge or pavement targets. [Arizona DOT]

14. Did the MPOs adopt the targets recommended by the DOT, set their own targets, or support the state's targets by agreeing to plan and program projects that help the state meet its targets? Select one option per row.

Responses: 41



Comments:

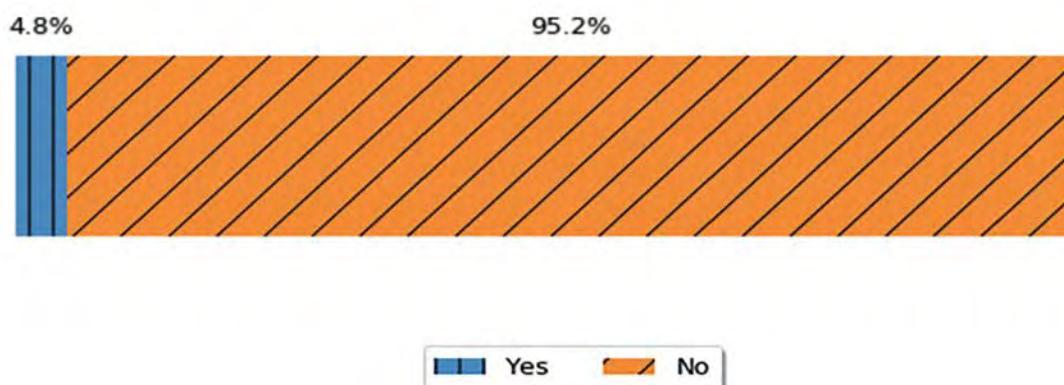
- In my mind, inherently, if they accepted our targets they are agreeing to plan and program projects that help the state meet its targets. [Illinois DOT]

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- With the exception of the state's largest MPO, which elected to establish its own targets for NHS pavements and bridges, Oregon MPOs adopted the state-adopted targets. [Oregon DOT]
- MPOs have expressed interest in developing their own complementary targets but have yet to do so. [Delaware DOT]
- Michigan DOT did not recommend targets to the MPOs; the MPOs elected to adopt the state's established targets. [Michigan DOT]
- Some of the bi-state MPOs took data from both states to set targets for their region. [Missouri DOT]
- One set their own targets for all PM2 measures, and one set their own targets for Interstate pavement measures. [Minnesota DOT]
- MPOs felt that there was no change needed to support and achieve state targets. [Colorado DOT]
- For both the pavement and bridge targets, eight of nine MPOs supported the state's targets. One MPO set their own targets in each case. [Iowa DOT]
- One MPO had existing bridge conditions that were significantly lower, and they did not have any bridges in %good, and there was no way that they could do anything to improve that bridge to get it into the "good" category, so we recommended a different %good for that MPO. They adopted the state target for %poor. [New Mexico DOT]

15. Were the overall state targets modified based on specific MPO targets?

Responses: 42

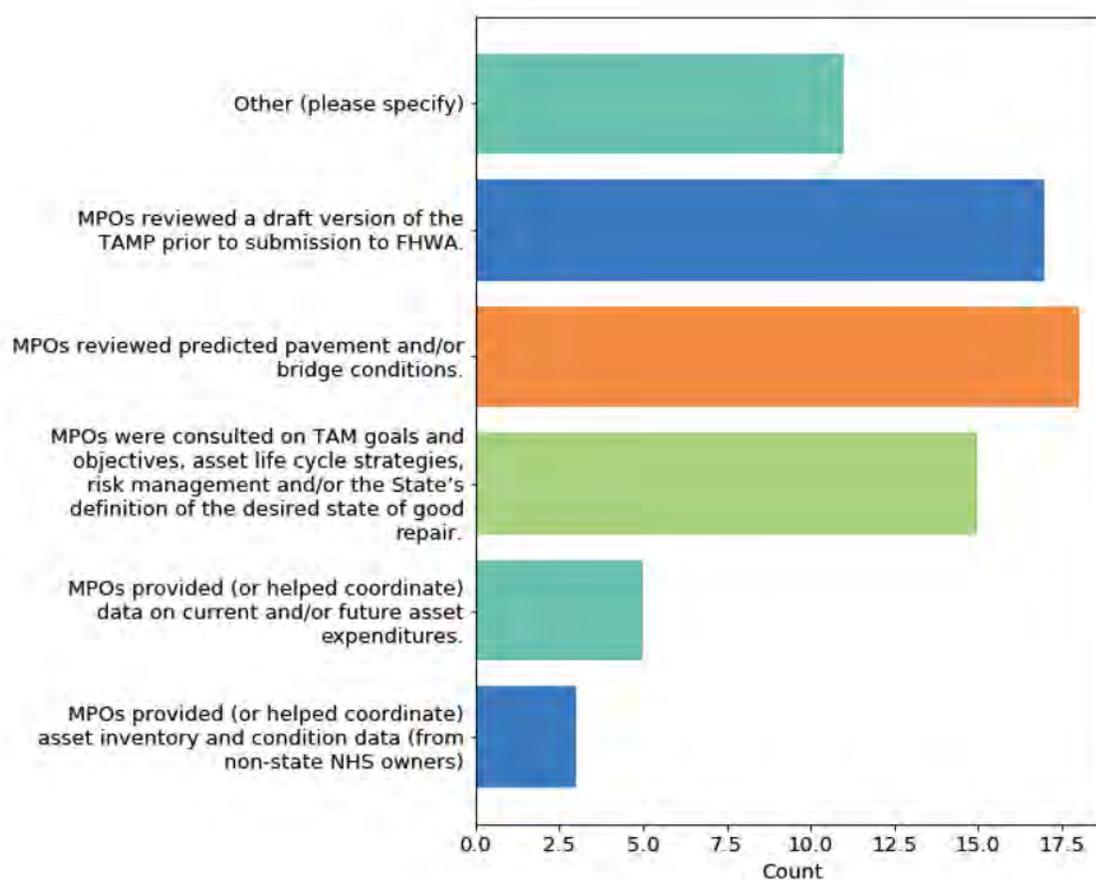


Comments:

- The state's targets were weighted based on the targets established by each MPO and the state DOT relative to their inventory. [California DOT]
- Draft safety targets were adjusted based on MPO input. No other targets received recommended adjustments from the MPOs. [North Dakota DOT]

16. What was the extent of coordination with MPOs in development of the TAMP? (check all that apply)

Responses: 39



Comments:

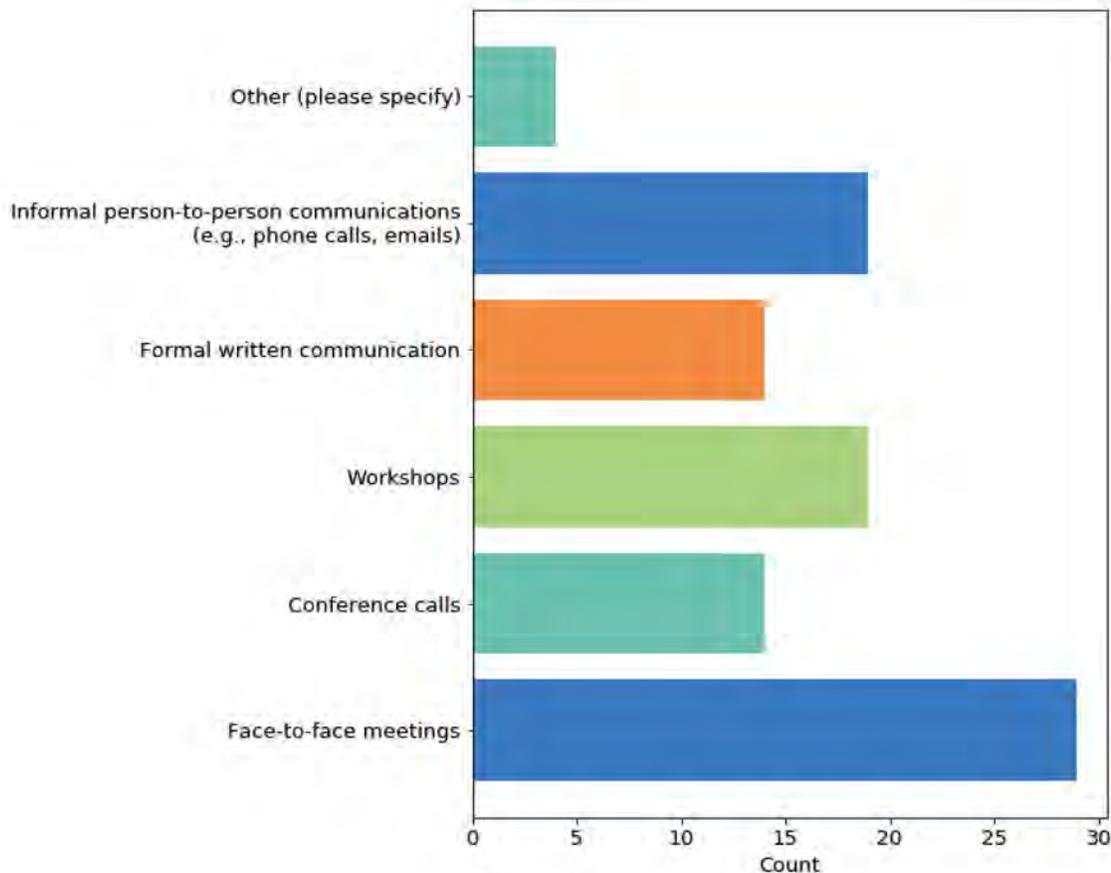
- Nebraska DOT collects all asset inventory and submits it to the MPOs. [Nebraska DOT]
- DOT developed TAMP largely independent of MPO. [Rhode Island DOT]

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- Montana DOT coordinated the development of the TAMP with the performance target discussion, which included discussions with the MPOs. Montana DOT controls and manages nearly all NHS pavements and bridges in Montana, and we inventory and manage investments on all of these facilities. [Montana DOT]
- None. [Idaho Transportation Department]
- MPOs were briefed on the progress and status of the development of the state TAM. [Connecticut DOT]
- Florida DOT is the keeper of all the bridge and pavement data for Florida. The data are shared with the MPOs. [Florida DOT]
- See our statewide asset management process: http://epg.modot.org/index.php/121.5_Asset_Management; and our Award Winning Planning Framework: http://sp/sites/tp/planpol/Shared%20Documents/Drupal/MO_Transportation_Planning_Framework.pdf. [Missouri DOT]
- No involvement in reviewing plan. MPOs are following state targets, and collection is done by the state on NHS routes. [Utah DOT]
- MPOs assisted in obtaining data on current expenditures for the two largest cities. [Colorado DOT]
- MPOs were provided an opportunity to comment on draft pavement and bridge targets. MPOs had limited involvement in the development of the TAMP, as the vast majority of the NHS (over 97 percent of lane miles and bridge deck area) is state-owned. [Iowa DOT]
- Not much coordination in this area. More coordination is planned for the future. [Arizona DOT]

17. What forms of coordination were most successful for TAMP development?
(check all that apply)

Responses: 40

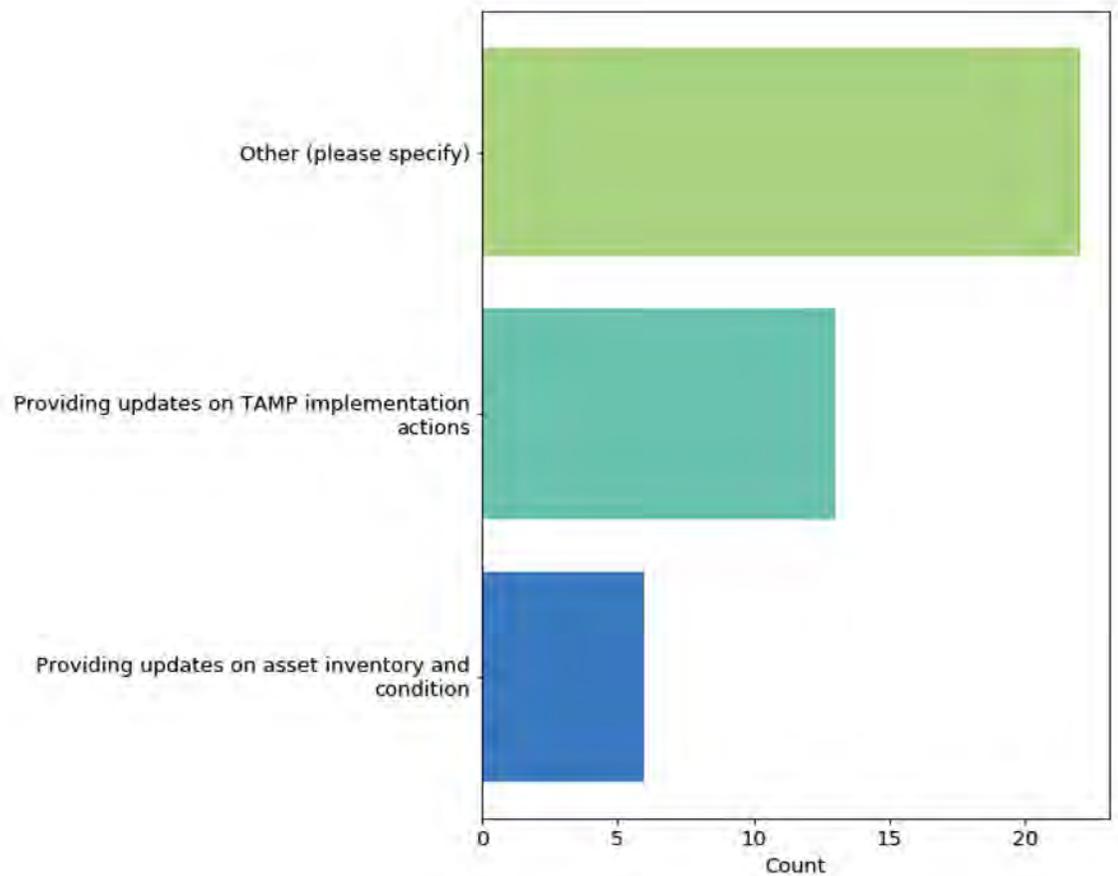


Comments:

- See FHWA Noteworthy Practice: <https://www.fhwa.dot.gov/tpm/noteworthy/mo.pdf>. [Missouri DOT]
- None. [Utah DOT]
- [Done] over communication. [Colorado DOT]
- Workshops are planned for future TAMP updates. [Arizona DOT]

18. How are MPOs involved in the implementation of your TAMP?

Responses: 37



Comments:

- Being part of the planning process, including the 10-Year Plan, TIPs, and STIP. [New Hampshire DOT]
- Not involved. [Nevada DOT]
- Montana DOT manages the TAMP implementation. Investment projects identified through the TAMP are coordinated thru the MPO via the planning processes. [Montana DOT]
- None. DOT owns/operates almost all NHS bridges and pavement. Only 20 miles. [Alaska DOT&PF]
- Not heavily involved in implementation. [Oklahoma DOT]
- Monitoring implementation. [Georgia DOT]

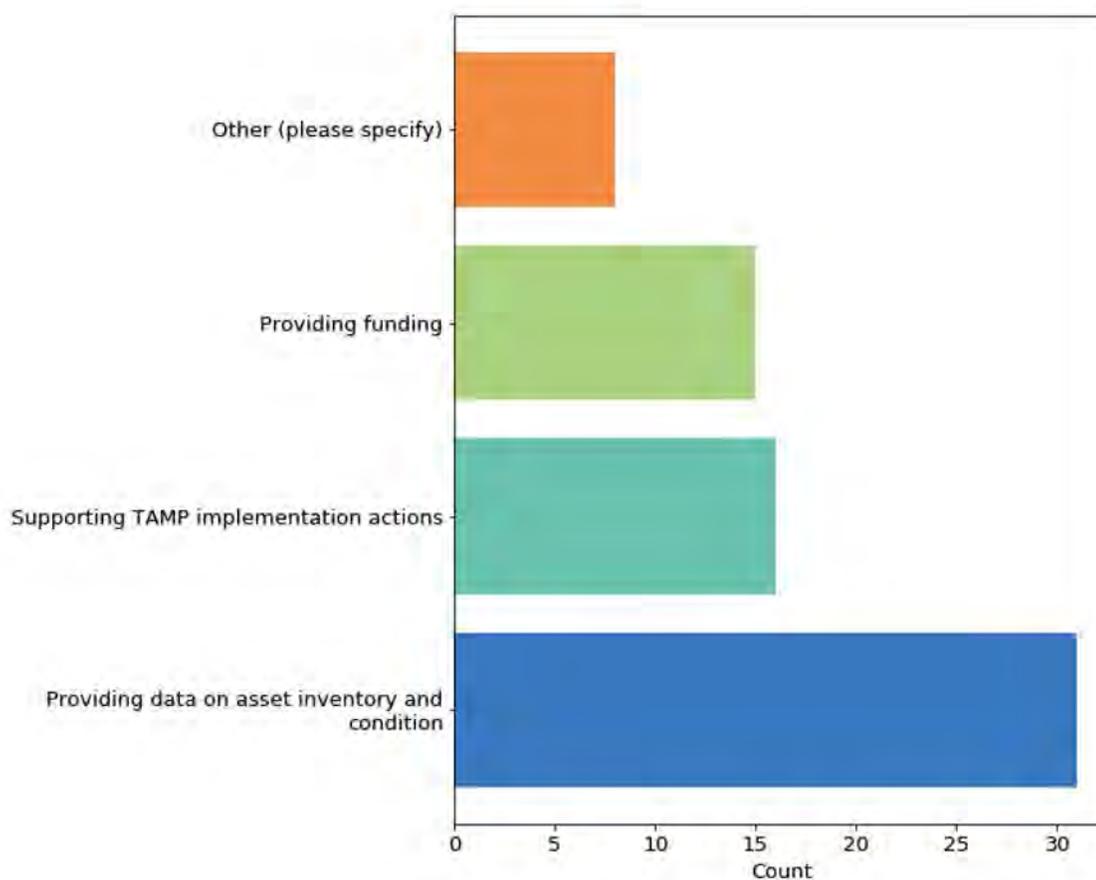
- We ask that they program projects on the local NHS to support attainment of our targets. [Illinois DOT]
- Oregon MPOs are involved in coordinating the undertaking of pavement and bridge preservation, rehabilitation, construction, and maintenance projects that reflect investment strategies supportive of achieving established performance and condition targets for NHS infrastructure within their organizational boundaries. [Oregon DOT]
- They are not. [Idaho Transportation Department]
- The TAMP encompasses a small portion of the MPO's pavement and bridge assets (~6%) statewide. The minimal coverage limits the usefulness of the TAMP for MPOs. We have yet to see significant changes from our MPOs as a result of the TAMP development. [California DOT]
- MPOs are aware of the TAMP and the performance targets associated with it. MPOs support implementation of the TAMP through their work in supporting the statewide bridge and pavement targets. [Washington State DOT]
- TAM updates are included as an item in regularly scheduled quarterly meetings. [Connecticut DOT]
- They are not directly involved. [Florida DOT]
- MPOs include asset performance in their MTPs. [Arkansas DOT]
- Assisting the agency in selecting/prioritizing the right projects. MPO has limited mileage, and so the TAMP implementation is largely on the DOT. [Vermont Agency of Transportation]
- By helping to educate local asset owners on TAM requirements, practices, and strategies. [New Jersey DOT]
- None. [Utah DOT]
- MPOs do not own any assets in the state. [Minnesota DOT]
- In Wyoming, the percentage of non-Wyoming DOT-owned NHS is very low, so implementation was fairly simple. [Wyoming DOT]
- TAM and TPM still have an agenda item for a monthly meeting with MPOs. Currently working with us to refine mid-evaluation period target changes. [Colorado DOT]

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- We have not engaged them and need to. The initial consistency determination and demonstration of implementation took time for New Mexico DOT to complete due to some communication challenges with our FHWA Division. [New Mexico DOT]
- Supports a program of projects that meets TAMP goals. Involved in 2- and 4-year target development. [Arizona DOT]

19. How is the State DOT providing support to MPOs on their TAMP implementation activities? (check all that apply)

Responses: 39



Comments:

- Montana DOT manages the inventory and investments in all of the NHS pavements and bridges. [Montana DOT]
- None. We take care of all resources. [Alaska DOT&PF]
- Funding is no greater than what was already received. [Illinois DOT]

- Oregon DOT has a number of agreements and policies that make additional federal funding available (which could be used by MPOs for TAMP implementation activities). MPO planning funds are held harmless for limitation impacts, and the state provides required non-federal match. Federal Surface Transportation Block Grant Program funds are made available to MPOs under 200,000 based on a distribution formula developed in cooperation with local jurisdictions and FHWA; Congestion Mitigation and Air Quality Improvement Program funds are made available to eligible MPOs and other eligible local jurisdictions based on a cooperatively developed distribution methodology. [Oregon DOT]
- It does not provide support. [Idaho Transportation Department]
- NHS is information being passed back to MPOs. [Utah DOT]
- MPOs do not own any assets in the state. [Minnesota DOT]
- Plan to provide inventory and condition, life-cycle analysis, and optimum life-cycle treatment recommendations for future TAMP updates. [Arizona DOT]

20. Please describe any other TAM-related activities that the State DOT and MPOs are collaborating on.

Responses: 18

Comments:

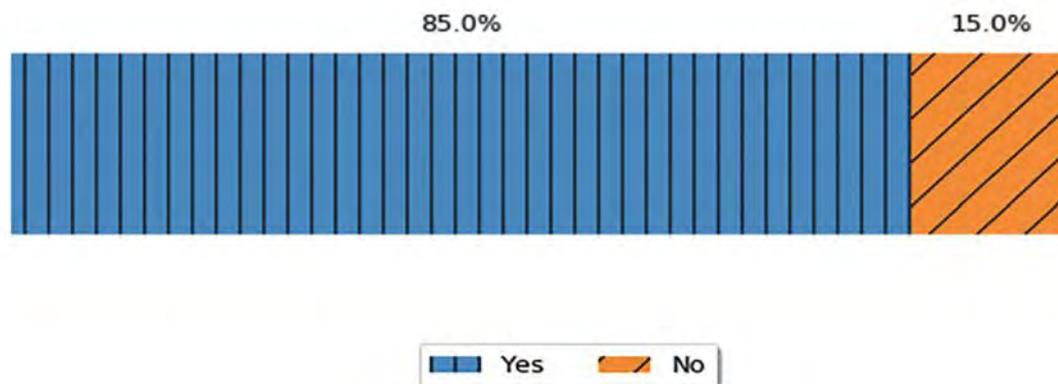
- LRTP is currently under revision. [Nebraska DOT]
- None. [Alaska DOT&PF]
- Data collection practices and policies. Criteria used to select projects for inclusion in the Statewide Transportation Improvement Program. Relationship of federal and state targets for the condition and performance of pavements and bridges. Performance of cost/benefit analysis of infrastructure projects costing more than \$15 million. [Oregon DOT]
- Washington State DOT and MPOs are actively working together to discuss the risks to the bridge and pavement networks relative to the current funding environment and that Washington State DOT will not be able to perform lowest life-cycle cost strategies and may have to prioritize routes that negatively impact local agencies and the overall performance of the network. [Washington State DOT]

82 Collaborative Practices for Performance-Based Asset Management Between State DOTs and MPOs

- All performance-based planning and programming (PBPP) and TAM reporting are coordinated with our MPO partners. [Delaware DOT]
- Revising project selection and prioritization activities. Asset condition is one of eight criteria. [Vermont Agency of Transportation]
- Integration of TAMP, LRTP, and MPOs' MTPs. [New Jersey DOT]
- The state DOT provides guidance and material regarding development of TAMP Plans. The state DOT directly supports the Transportation Asset Management Council in their effort to aid MPOs through this process. [Michigan DOT]
- Our statewide asset management plan is used by our planning partners to review, prioritize, and program projects in the TIP/ STIP. [Missouri DOT]
- Just finished our unified plan with all of Utah's MPOs. Coordination on goals and objectives were accomplished with this plan. [Utah DOT]
- One MPO has asked the Minnesota DOT to talk to their local agencies on how to support TAM. [Minnesota DOT]
- N/A. [North Dakota DOT]
- While not TAM, we are coordinating closely on crash locations. [Wyoming DOT]
- Providing all data and tools to assist MPOs in analyzing their own data and possibly set their own targets. [West Virginia DOT]
- Continue to partner up on training and peer exchange opportunities. [Colorado DOT]
- There's a strong relationship between the DOT and MPOs for asset condition data. The DOT provides pavement condition data for all paved roads in the state on a regular basis and helps fund technical support for these data for local public agencies. The DOT also provides access to bridge inspection records and software. [Iowa DOT]
- The challenge was to determine how the MPOs could modify their existing MTPs that weren't due for updates by creating some draft language all five MPOs could use and to include that in our Planning Procedures Manual so that we did not have to open up the planning agreements again. [New Mexico DOT]
- Technical assistance on use of NPMRDS data. [New York State DOT]

21. For future TAM target setting, does the agency expect to repeat the same approach?

Responses: 40



Comments:

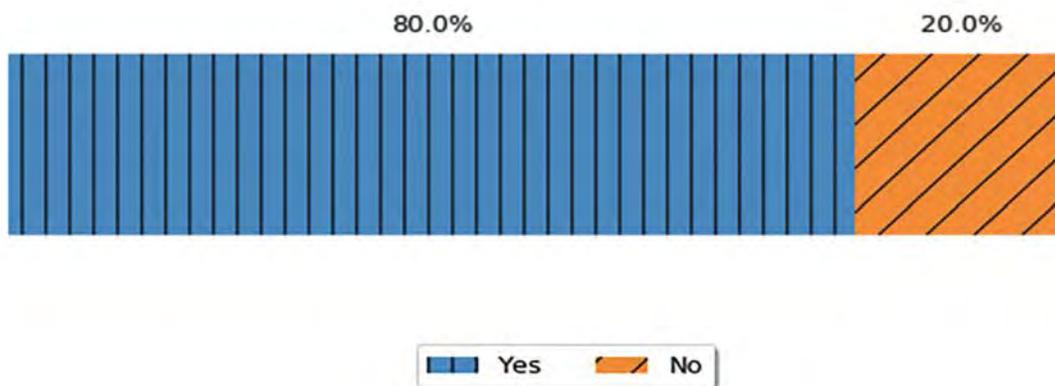
- There will be more collaboration, as there will be more data history and experience. [Kansas DOT]
- The agency plans to do more coordination with MPO. [District DOT]
- More information and data will be available. [Illinois DOT]
- Generally yes. Expectations are that consideration will be given to a review of what worked well during the target setting; where there were problems and what actions could be expected to reduce problems, what additional information has become available during the interim that could prove useful (lessons learned and examples of best practices). [Oregon DOT]
- Subsequent re-setting of targets should be easier the second time around and may not require the same level of effort that the first run-through did. [California DOT]
- Washington State DOT plans on continuing to use the MAP-21 target setting framework to make recommendations for future target-setting efforts. Currently, the Washington State DOT is working through the analysis of the PM2 4-year measures and has a plan to begin engaging the target-setting technical group in the spring of 2020. [Washington State DOT]
- Connecticut DOT provided NHS bridge and pavement conditions to each MPO along with projected performance targets (and the process to which Connecticut DOT followed) and let them decide if they wanted to set their own. [Connecticut DOT]

84 Collaborative Practices for Performance-Based Asset Management Between State DOTs and MPOs

- Will be more inclusive in the future. [Florida DOT]
- Plan to use same basic approach but will modify process accordingly to provide more opportunity for engagement next time. [New Jersey DOT]
- More rigorous data analysis of historical trends and system performance required. [Michigan DOT]
- Yes, for PM2. [Minnesota DOT]
- However, LRP public input will play a key role in long-range goal setting, which will drive short- and mid-range target setting. [North Dakota DOT]
- Colorado DOT also plans to start developing more Interstate/NHS-specific data products. [Colorado DOT]
- We will do a better job and working with the MPOs upfront before setting targets. The initial targets required a great deal of education within the New Mexico DOT to gain consensus before we could talk with the MPOs. [New Mexico DOT]
- In general, but more coordination is planned for the future with regard to locally owned NHS bridge and pavement projected conditions and potential local NHS targets. [Arizona DOT]

22. Regarding MPO coordination on TAMP development, does the agency expect to follow the same approach for future TAMP updates?

Responses: 40



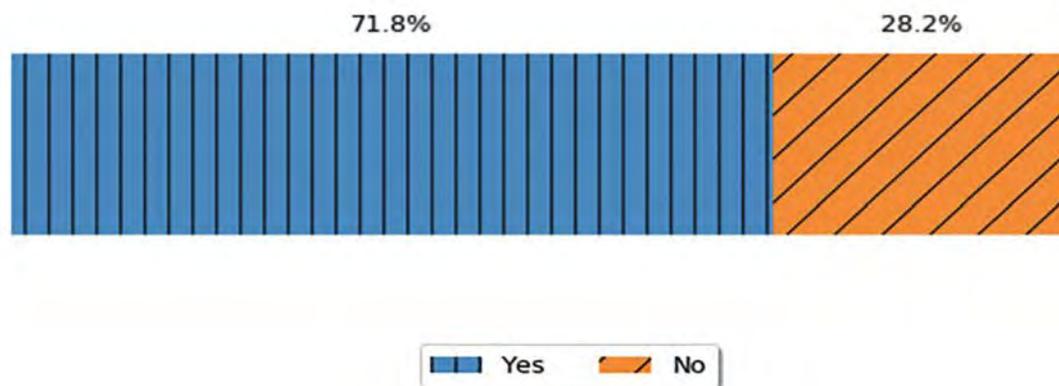
Comments:

- Additional coordination with MPO could result in more robust, actionable TAMP. [Rhode Island DOT]

- We will more actively involve our local partners. [Kansas DOT]
- The agency plan to do more coordination with MPO. [District DOT]
- More collaboration is needed with the MPOs, as well as consideration of capital funding tied to implementation of TAMP. [Illinois DOT]
- Generally, yes. Oregon DOT has a proud history of cooperation and collaboration with Oregon MPOs. There is every expectation that this will continue in the future. Lessons learned by other states and best practices will be reviewed and adopted where appropriate. [Oregon DOT]
- While there is always opportunity to improve coordination, the Washington State DOT intends to use the same approach in the future. There will be a need for additional coordinating activities to assist with receiving better estimates of planned expenditures on the locally owned sections of the NHS, but the framework and process of working to compile that information will likely remain the same. [Washington State DOT]
- Presented the TAMP at regular Connecticut DOT/MPO quarterly meetings and collaborated on MPO feedback, comments and direction. [Connecticut DOT]
- Will be more inclusive. [Florida DOT]
- Yes, for the most part but also anticipate refining/enhancing process. [New Jersey DOT]
- The state DOT will continue to engage with MTPA and intends to further include MPO input in the TAMP process. [Michigan DOT]
- Coordination on NHS maintained by MPO. [Utah DOT]
- It has been indicated by MPOs that once they become more familiar with the NPM data sets, they will be able to mature enough to establish their own targets. No specific timeline has been provided. [Colorado DOT]
- We will seek more input from the MPOs before the next update to the TAMP so that they are more aware of the need to review projects to ensure that the projects contribute to the performance targets. [New Mexico DOT]
- More coordination is planned in future TAMP updates. [Arizona DOT]

23. Is your agency interested in collaborating on TAM activities more regularly with MPOs?

Responses: 39



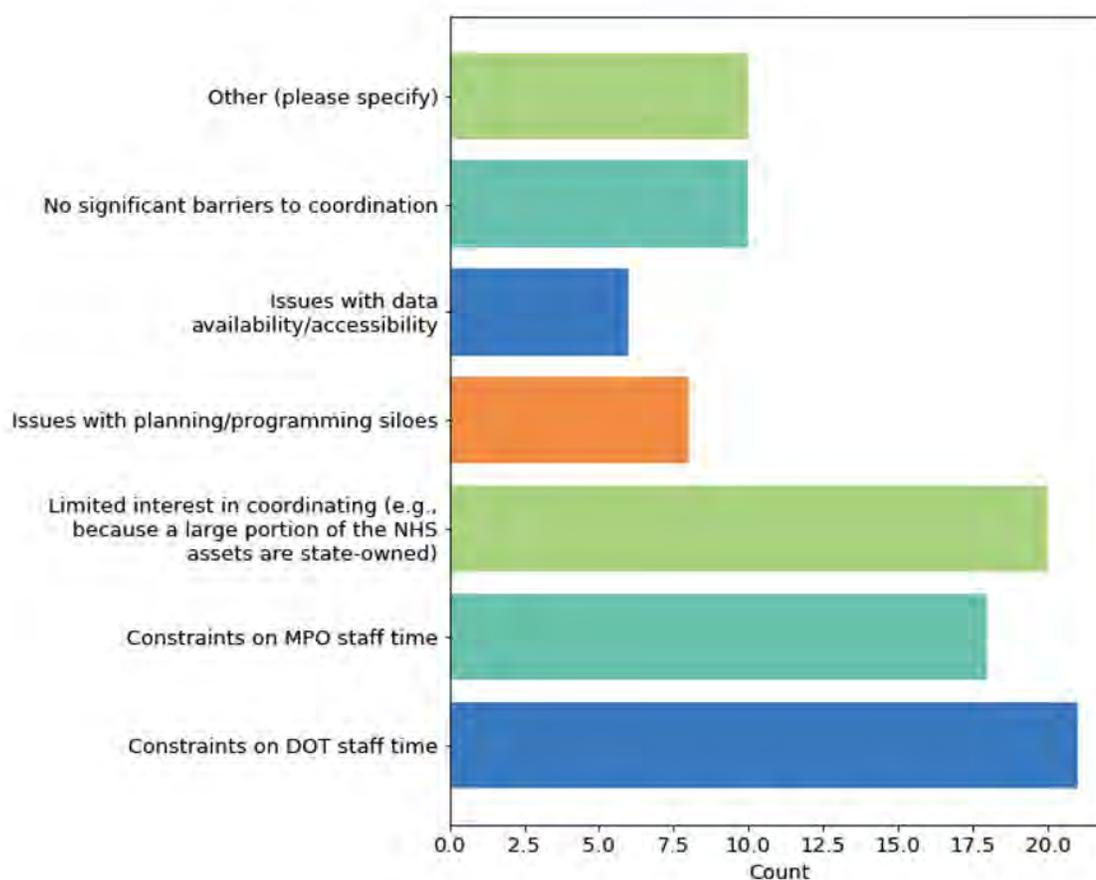
Comments:

- We're open to more coordination with MPOs. [Georgia DOT]
- Oregon DOT and Oregon MPOs routinely collaborate on infrastructure condition and performance issues. The agency is very interested in collaborative activities and actions that will enhance infrastructure condition and performance and contribute to agency and MPO progress in the achievement of national and state goals. [Oregon DOT]
- We are already collaborating on TAM activities. [South Dakota DOT]
- As appropriate. The TAMP is seen mainly as a document impacting the state DOT. [California DOT]
- Washington State DOT and MPOs actively collaborate on a regular basis. I don't believe additional collaboration opportunities are necessary at this time. [Washington State DOT]
- As Connecticut DOT's TAM update process becomes a more streamlined process, the collaboration process is expected to become more regular too. [Connecticut DOT]
- I think we will naturally gravitate toward more interaction. The new VPSP2 (project selection/prioritization) processes will define these touch points. [Vermont Agency of Transportation]
- With the exception of the TAMP, the state recognizes the current level of coordination as adequate. [Michigan DOT]
- Varies by MPO, depending on their level of interest. [Minnesota DOT]

- Currently, pavement and bridge data is gathered annually, so annual coordination will continue to be used. [Wyoming DOT]
- The District Staff have regular contact with the MPOs, and the Asset Management staff responsible for the TAMP need to have more interaction with the MPO staff. [New Mexico DOT]
- There is already active and ongoing collaboration. [New York State DOT]
- This is a work in progress that is expected to evolve in the next couple of years. [Arizona DOT]

24. What, if any, are the most significant barriers to increased coordination between the State DOT and MPOs? (select up to 3)

Responses: 40

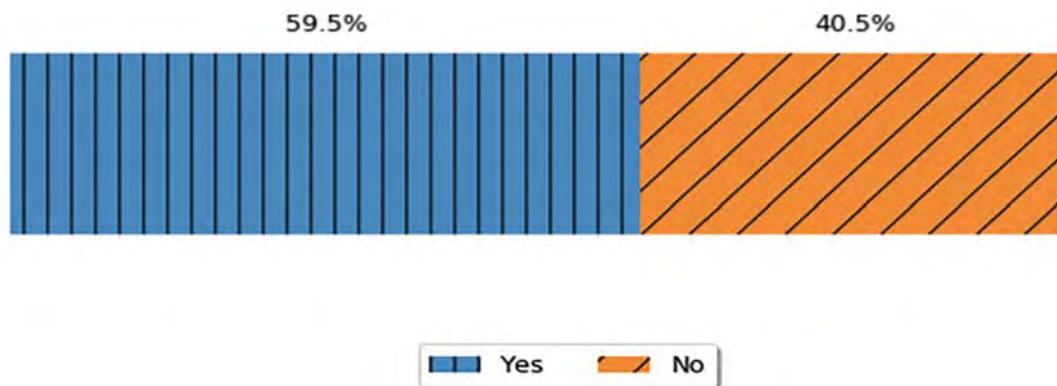


Comments:

- Montana DOT manages inventory and investments in NHS pavements and bridges in Montana, including in MPO areas. [Montana DOT]
- Differing priorities and technical resources. [Oregon DOT]
- MPOs do not care for the MAP-21 pavement condition measures. They use other metrics to manage their pavement. [California DOT]
- The data are not yet regularly available to MPOs, but the Connecticut DOT is developing a Transportation Enterprise Database (TED) to make inventory and condition data more readily available by MPO instead of reports run by the DOT with information. Projection information is not part of the plan for TED at this time. [Connecticut DOT]
- We have 27 MPOs in Florida. Coordinating with so many is a challenge. [Florida DOT]
- Since we only have one MPO and that MPO is one of 11 regional planning commissions, our approach is to view the lone MPO as one of 11 RPCs. We strive to take a balanced approach considering both the rural and more urban transportation needs. [Vermont Agency of Transportation]
- Existing coordination appears to be sufficient but will explore enhancements. [New Jersey DOT]
- Majority of the NHS system is maintained by the state. They review plans and give suggestions on what changes, but DOT gives draft plans for NHS routes. [Utah DOT]
- Four of our nine MPOs are multi-state, so coordination of data and information across state lines creates additional challenges for them. [Iowa DOT]
- It has been more difficult than expected to implement the Arizona DOT's bridge and pavement management systems and our automated data collection process, so we have not had all of the information we need to fully engage the MPOs. [Arizona DOT]

25. Are you interested in, or able to participate in, an interview regarding case examples?

Responses: 37





APPENDIX E

Sample Interview Guide

Interview Guide

Practices for Coordinating Asset Management Performance Measurement and Monitoring between State Transportation Agencies and Metropolitan Planning Organizations

Overview

You are being contacted as part of National Cooperative Highway Research Program (NCHRP) Synthesis 20-05 (51-05), Practices for Coordinating Asset Management Performance Measurement and Monitoring between State Transportation Agencies and Metropolitan Planning Organizations, which includes documenting state DOT and MPO collaboration regarding Transportation Asset Management (TAM) implementation, measurement and monitoring. As part of this project, Spy Pond Partners, LLC (SPP), along with Econolite Systems, is performing a literature review and documenting case examples of exemplary practices with respect to this topic. The information will be incorporated into a synthesis of practices to initiate and facilitate collaboration with MPOs. As your agency is well respected in this area, we would like to include a description of your agency's practices in the review.

The following pages describe the topics we would like to address. We hope to cover these areas in a teleconference interview, with any additional follow-up questions handled via email or teleconference call. We appreciate your participation in this project.

For more information, please contact:

Spy Pond Partners, LLC

<Name, Phone and Email removed>

Contact Information

1. Name
2. Position
3. Organization
4. Overview of responsibilities

Performance Based Planning and Programming

1. What is your agency's biggest lesson learned in coordinating with MPO partners on long range planning to incorporate TAM, and how will you apply this learning in the future?
2. What, if any, modifications are your agency currently making or planning to make to your long range transportation plan (LRTP) or other planning documents to incorporate TAM?
3. What exemplary practices can you share in coordinating with MPO partners on long range planning to incorporate TAM?
4. How does your agency support MPO planning activities, and do you expect this to change in the future?
5. How do your agency and MPO partners coordinate on TAM performance data, and do you expect this to change in the future?

Coordination in Setting National Highway System (NHS) Pavement and Bridge Targets

1. What is your agency's biggest lesson learned in coordinating with MPO partners on NHS pavement and bridge targets, and how will you apply this learning in the future?
2. (If applicable) How do you coordinate with MPO partners on collecting data and setting targets for locally-owned NHS assets, and do you expect this to change in the future?
3. (If applicable) Do you have any lessons learned or exemplary practices for coordinating on target-setting with multi-state MPOs?
4. What exemplary practices can you share in coordinating with MPO partners on NHS pavement and bridge target setting?

Transportation Asset Management Plan (TAMP) Development and Implementation

5. What has been your agency's biggest lesson learned in coordinating with MPO partners on TAMP development and implementation, and how will you apply this learning in the future?
6. What, if any, modifications are [is] your agency currently making or planning to make in coordinating with MPO partners on TAMP development and implementation?
7. What exemplary practices can you share in coordinating with MPO partners on TAMP development and implementation?

Additional Questions

8. Please describe any additional changes your agency expects to make to existing data, systems and/or processes related to: 1) planning or programming related to TAM; 2) coordination with your MPOs on target setting; or 3) TAMP development and implementation to facilitate coordination.
9. What has been your agency's biggest barrier to coordinating with your MPO partners on: 1) planning or programming related to TAM; 2) target setting; and 3) TAMP development and implementation, and how do you plan to address this issue in the future?
10. Do you have any other noteworthy practices you haven't mentioned already that you would like to share?
11. Please describe any other issues or relevant factors you feel we should consider in performing this research.

Abbreviations and acronyms used without definitions in TRB publications:

A4A	Airlines for America
AAAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI-NA	Airports Council International-North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation Act (2015)
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHSA	Governors Highway Safety Association
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TDC	Transit Development Corporation
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S. DOT	United States Department of Transportation

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