



Report to the Ranking Member,  
Committee on Environment and Public  
Works, U.S. Senate

---

July 2017

# SURFACE TRANSPORTATION

## A Comprehensive Plan Could Facilitate Implementation of a National Performance Management Approach

Accessible Version

# GAO Highlights

Highlights of [GAO-17-638](#), a report to the Ranking Member, Committee on Environment and Public Works, U.S. Senate

## Why GAO Did This Study

Since 2008, GAO has highlighted the need to demonstrate the outcomes of the billions of dollars the Department of Transportation (DOT) provides to states and other grantees for surface transportation programs. MAP-21 included provisions for DOT and its grantees to move toward a performance-based approach, transforming federal surface transportation programs by holding states and other grantees accountable for results, in many cases for the first time.

GAO was asked to review DOT's implementation of TPM. This report focuses on FHWA, which administers the largest grant program of the three DOT agencies involved, and (1) examines the progress made in developing rules to establish a national performance-based approach and (2) evaluates how FHWA is guiding the transition to TPM, among other objectives. GAO reviewed proposed and final rules and information on rulemaking activities and interviewed FHWA officials, national transportation organizations, and a non-generalizable sample of 10 state departments of transportation, among others. States were selected based on factors such as geographic distribution, population, and urban and rural characteristics.

## What GAO Recommends

FHWA should develop a TPM implementation plan that includes goals and specific actions and timelines, and publicly communicate that plan. DOT concurred with the recommendation. The agency also provided technical comments, which were incorporated as appropriate.

View [GAO-17-638](#). For more information, contact Susan Fleming at (202) 512-2834 or [flemings@gao.gov](mailto:flemings@gao.gov).

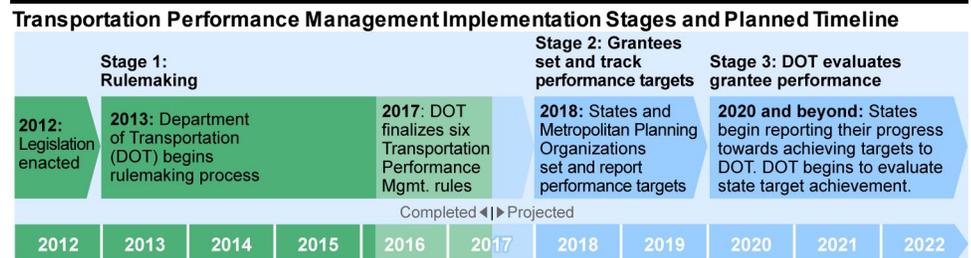
July 2017

## SURFACE TRANSPORTATION

### A Comprehensive Plan Could Facilitate Implementation of a National Performance Management Approach

## What GAO Found

The Federal Highway Administration (FHWA) recently issued the last of six interrelated rules to implement a new performance-based approach to federal surface transportation grant programs. Three of the six rules establish 17 total performance measures in the areas of safety, pavement and bridge conditions, and performance of the surface transportation system (congestion, freight movement, reliability, and air quality). Rulemaking was the first of three stages to implement the transportation performance management (TPM) approach, which was required by the Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2012 (see fig.). The agency issued the first of the six rules in March 2016. In January 2017, the last two final rules were issued and became effective in May 2017, with part of one rule related to greenhouse gas emissions delayed indefinitely.



Source: GAO analysis of DOT transportation performance management implementation rulemakings and activities. | GAO-17-638

Note: Implementation stages and planned timeline for the Moving Ahead for Progress in the 21st Century Act (MAP-21) requirements, including target-setting and evaluation stages for the Pavement and Bridge and System Performance final rules. For the Safety rule only, states are to set and report calendar year 2018 targets in 2017.

FHWA is developing tools and training to help implement TPM but has not yet developed a comprehensive plan to guide implementation. The agency has begun to help states and regional metropolitan planning organizations (MPO) prepare to set targets and begin tracking performance as part of the second implementation stage. However, the agency has not clearly articulated strategic goals for the TPM transition, developed an implementation plan showing how the various efforts under way relate to each other and when they will be completed, or clearly communicated the approach to states and MPOs. For example, the agency has not identified strategic goals describing what each stage of the transformation is intended to accomplish and how the various efforts under way will help accomplish those goals. While FHWA has stated in its rulemaking that it wants to “communicate a national performance story,” it has not identified specific processes or activities that will be essential to achieving these results. Developing, communicating, and reinforcing the goals of a transformation, as well as specific activities and timelines for achieving those goals, are among the key practices that GAO has identified for major organizational transformations. An implementation plan could help the agency better articulate the goals of the transformation, make the best use of the performance information states will begin reporting, and help assess the effects of federal funding to improve investment decision-making.

---

# Contents

---

Letter		1
	Background	6
	FHWA Recently Completed the Rulemaking Stage, Establishing a National Approach to Transportation Performance Management	10
	Most Significant Challenges States Anticipate Are Analyzing and Reporting on Complex Data Required by the System	14
	Performance Rule	14
	DOT Has Taken Steps to Guide the Transition to TPM but Does Not Have a Comprehensive Implementation Plan	20
	Conclusions	27
	Recommendation for Executive Action	28
	Agency Comments	29
<hr/>		
	Appendix I: Performance Management Rules and Performance Measures	30
	Appendix II: Comments from the Department of Transportation	32
	Appendix III: GAO Contact and Staff Acknowledgments	34
	Appendix IV: Accessible Data	35
	Data Tables	35
	Agency Comment Letter	35
<hr/>		
Tables		
	Table 1: Federal Highway Administration’s Performance Management Rules	11
	Table 2: Performance Measures and Performance Areas Supporting National Transportation Goals	30
<hr/>		
Figure		
	Figure 1: Transportation Performance Management Implementation Stages and Planned Timeline	10
	Accessible Data for Highlights Figure and Figure 1: Transportation Performance Management Implementation Stages and Planned Timeline	35

---

---

---

---

### **Abbreviations**

AASHTO	American Association of State Highway and Transportation Officials
DOT	Department of Transportation (or a state's department of transportation)
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
MAP-21	Moving Ahead for Progress in the 21st Century Act
MPO	metropolitan planning organization
NHTSA	National Highway Traffic Safety Administration
NPMRDS	National Performance Management Research Data Set
TPM	Transportation Performance Management

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



July 27, 2017

The Honorable Thomas Carper  
Ranking Member  
Committee on Environment and Public Works  
United States Senate

Dear Mr. Carper:

The nation's surface transportation system moves people and freight, is critical to the economy, and affects the daily lives of most Americans. However, the system is under growing strain, and the cost to repair and upgrade the system to meet current and future demands is estimated in the hundreds of billions of dollars. The U.S. Department of Transportation (DOT) annually provides billions of dollars to states and other grantees to improve the nation's highway and transit infrastructure and safety. DOT provides federal funding to these grantees, including states, transit agencies, and regional metropolitan planning organizations<sup>1</sup> (MPO), primarily through programs administered by three of DOT's operating administrations: The Federal Highway Administration (FHWA), which administers the federal-aid highway program that provides billions to states for highway and bridge projects; the National Highway Traffic Safety Administration (NHTSA), which provides grant funding to support state highway safety programs; and the Federal Transit Administration (FTA), which administers a variety of grant programs that provide funding for the development and expansion of bus, rail and other transit projects, among other things. In fiscal year 2015, DOT provided approximately \$49 billion to grantees for surface transportation projects through the programs administered by FHWA, FTA, and NHTSA, of which FHWA accounted for approximately \$40 billion in formula funding.

We have previously found it difficult to determine whether DOT's federal spending improved the performance of the nation's surface transportation infrastructure because funding was only indirectly related to infrastructure needs and unrelated to outcomes or performance. Beginning in 2008, we

---

<sup>1</sup>MPOs are defined in statute as the designated local decision-making body that is responsible for carrying out the transportation planning process in metropolitan areas. A MPO must be designated for each urbanized area with a population of 50,000 or more. 23 U.S.C. § 134(b),(d) and 49 U.S.C. § 5305(b),(d).

recommended that Congress consider a fundamental reexamination of federal surface transportation programs to clarify federal goals and roles, establish links to performance and outcomes, and improve investment decision making. In particular, we noted that tracking specific state outcomes that are clearly linked to federal program goals could provide a strong foundation for holding grant recipients responsible for achieving federal objectives and measuring the overall performance of these programs. Funding the nation's surface transportation system has been on GAO's High Risk List since 2007.

The Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012, adopted a performance-based approach to funding the federal government's surface transportation grant programs. This approach represents a transformation that, once fully implemented, is expected in many cases to hold grantees—including state departments of transportation and MPOs—accountable for performance for the first time. This approach also represents a significant shift for DOT and its operating administrations, transforming the federal involvement in surface transportation to a more outcome-oriented approach. For example, states that receive FHWA funding will be required to measure and track bridge and pavement conditions, and undertake action should conditions fall below minimum thresholds. Additionally, MAP-21 required that the federal-aid highway program focus on several national goals including goals related to infrastructure condition, transportation safety, and system reliability. For example, one national goal is to maintain highway infrastructure assets in a state of good repair.

Shortly after the enactment of MAP-21 and to meet certain requirements to establish performance measures and standards for transportation performance management (TPM), DOT's operating administrations began developing a number of rules. Among other things, MAP-21 required target setting by states and established reporting requirements for grantees. Under the implementing regulations, states and other grantees must set annual or multi-year targets based on the performance measures and report annually or biennially on the progress in meeting these targets. Finally, for highway safety, MAP-21 requires DOT to evaluate each state's performance on targets states have set in their highway safety plans and biennially report such evaluations to Congress.<sup>2</sup> In 2015, we found that DOT had made progress in moving toward a

---

<sup>2</sup>23 U.S.C. § 402(n).

national performance-based approach to surface transportation, but that states and other grantees anticipated potential data and cost challenges with implementing the new approach.<sup>3</sup>

You asked us to review issues related to DOT's implementation of the national approach to TPM. This report focuses on FHWA because it represents the vast majority of federal surface transportation spending, and this report:

1. examines the progress FHWA has made in developing rules to establish a national performance-based approach to highway transportation and the nature of those rules,
2. identifies challenges states anticipate in implementing the performance-based approach, and
3. evaluates how FHWA is guiding the transition to national transportation performance management.

To determine the nature of FHWA's progress in developing TPM rules and to evaluate the steps the agency is taking to guide the transition, we reviewed surface transportation performance management requirements for DOT and its modal administrations, focusing on FHWA's role in implementing MAP-21 requirements. We focused primarily on the rules related to the condition and performance of the federal highway system, reviewing the six rules specific to FHWA's efforts to carry out performance-based requirements.<sup>4</sup> We also reviewed the 2015 Fixing America's Surface Transportation (FAST) Act, which maintained the performance-based approach. At the time of our review, some of rules were proposed and in the notice and comment period; others were in the process of being issued as final rules; and some were final. Given the ongoing nature of the rulemaking process, we reviewed the most current version of each rule available at the time of our review. In addition, we reviewed agency fact sheets, guidance, presentations, and outreach materials pertaining to the various rules and documents outlining

---

<sup>3</sup>GAO, *Surface Transportation: DOT is Progressing toward a Performance-Based Approach, but States and Grantees Report Potential Implementation Challenges*, [GAO-15-217](#) (Washington D.C.: Jan. 16, 2015).

<sup>4</sup>While FTA and NHTSA have issued final rules related to DOT's overall performance-based approach—the Transit Asset Management, Public Transportation Agency Safety Plan, and State Highway Safety Program Grant rules—we did not include these in our review.

implementation activities as well as planned efforts for the post-rulemaking stages of TPM implementation. We also met with DOT officials and FHWA's TPM office officials to discuss the status of the agency's efforts to meet the performance goals and complete the rulemaking process as well as the plans for the remaining stages of implementation. In addition, we met with representatives from eight national transportation industry associations representing states, transit agencies, MPOs, and other planning entities to discuss their perspectives on FHWA's TPM implementation efforts. This included, for example, representatives from the American Association of State Highway and Transportation Officials (AASHTO) standing committee on performance management. We also met with experts from two academic institutions, selected because they specialize in transportation data analysis, are familiar with the new performance management requirements, and have experience working with multiple state DOTs and MPOs on these issues. We also reviewed our prior work on organizational mergers and transformations and evaluated FHWA efforts against key practices identified in this work, focusing on selected key practices that were directly applicable to the agency's approach to implementing transportation performance management.<sup>5</sup>

To identify states' anticipated implementation challenges, we focused on three of the six FHWA rules that relate to:

- pavement and bridge conditions (Pavement and Bridge rule);
- the performance of the surface transportation system, including freight movement and air quality (System Performance rule); and
- the transportation-planning process involving states and MPOs (Planning rule).<sup>6</sup>

We selected FHWA's Pavement and Bridge and System Performance rules because they contain new performance measures for the states related to infrastructure conditions and performance. We selected the

---

<sup>5</sup>GAO, *Results-Oriented Cultures: Implementation Steps to Assist Mergers and Organizational Transformations*, [GAO-03-669](#) (Washington D.C.: July 2, 2003).

<sup>6</sup>The full titles of these three rules are: Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program; Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program; and Statewide and Nonmetropolitan Transportation Planning; Metropolitan Transportation Planning.

joint FHWA and FTA Planning rule because it outlines the framework states and MPOs must implement to integrate the performance-based approach into their transportation planning processes. This framework directly relates to how states and MPOs will establish specific targets for each of the required performance measures. We excluded another performance measure rule on safety—the only other rule among the six that established performance measures—because states already have experience tracking and reporting similar safety data. In addition, our past work found that states generally do not anticipate significant challenges in this area.<sup>7</sup> For the Pavement and Bridge, Planning, and System Performance rules, we reviewed the final rules, including DOT's summary of significant issues raised and changes made in response to comments. The Pavement and Bridge and Planning final rules included summaries of comments submitted by 42 and 36 state DOTs, respectively, as well as MPOs. For the System Performance rule, which was in the notice of proposed rulemaking phase during the bulk of our engagement, we also reviewed and analyzed comments submitted by the 36 state DOTs that submitted comments. We also met with state DOTs' officials and FHWA's division office officials in 10 selected states to discuss their perspectives on anticipated implementation challenges associated with TPM in general and these three rules in particular. The selected states were Alaska, Arizona, Florida, Illinois, Maine, Mississippi, New York, Rhode Island, South Dakota, and Texas. We selected these states to include a range in terms of geographic distribution, population size, urban and rural characteristics, and experience managing and measuring transportation performance. In addition, we interviewed the eight national organizations and academic experts discussed above. The information gathered from the selected states and industry associations cannot be generalized to all federal surface transportation grantees; however, they provided insight into the types of implementation challenges that some grantees anticipate. We also reviewed recent academic literature from 2013 through 2017—representing the time period since MAP-21 was enacted—as well as our body of work on performance management in the federal government and transportation programs.

We conducted this performance audit from May 2016 to July 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our

---

<sup>7</sup>[GAO-15-217](#).

---

findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

---

## Background

DOT provides billions of dollars to states and other grantees annually to improve the nation's highway and transit infrastructure and safety. Most of this federal funding is provided by FHWA, FTA, and NHTSA. FHWA provides the vast majority of federal surface transportation funds—about \$40 billion each year to states to design, construct, and maintain the nation's roadway and bridge infrastructure through the federal-aid highway program.<sup>8</sup> This program includes the nation's National Highway System, which consists of approximately 220,000 miles of the nearly 1-million miles of roadways eligible for federal aid, including the 47,000-mile Interstate Highway System. Historically, most surface transportation funds are distributed through annual apportionments established by statutory formulas that take into account a number of factors, including the estimated share of taxes highway users in each state contribute to the Highway Trust Fund. We have previously reported that these formulas have only an indirect relationship to infrastructure needs, and many have no relationship to outcomes or grantees' performance.

MAP-21 addresses several of our past recommendations—by articulating national goals and adopting a performance-based approach to funding surface transportation projects. The act established seven national surface transportation goals for the federal-aid highway program:<sup>9</sup>

- *Safety*—to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- *Infrastructure condition*—to maintain the highway infrastructure asset system in a state of good repair.<sup>10</sup>

---

<sup>8</sup>In general, maintenance is the responsibility of the State DOT unless it falls within the preventative maintenance category. 23 U.S.C. § 116.

<sup>9</sup>Pub. L. No. 112-141, § 1203 (2012).

<sup>10</sup>Highway infrastructure assets include physical system assets such as pavements, bridges, signs, culverts and guardrails.

- *Congestion reduction*—to achieve a significant reduction in congestion on the National Highway System.
- *System reliability*—to improve the efficiency of the surface transportation system.
- *Freight movement and economic vitality*—to improve the National Highway Freight Network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- *Environmental sustainability*—to enhance the performance of the transportation system while protecting and enhancing the natural environment.
- *Reduced project delivery delays*—to reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

The act and its implementing regulations set forth a three-stage process for the performance-based surface transportation transformation across multiple modes:

1. *Rulemaking*: DOT must establish performance measures and standards,
2. *Set and track performance targets*: states, MPOs, and other grantees must set annual or multi-year targets based on these performance measures and states report on their progress on meeting such targets to DOT, and
3. *Evaluate performance*: DOT must evaluate whether states have met or made significant progress toward their targets.

States have one year from the effective date of the performance measure final rules to establish their own performance targets for those measures. MPOs then have 180 days after the respective state's DOT sets its targets to establish their own targets or agree to support the state's target. If states do not make significant progress toward meeting some targets, they must report action they will undertake to achieve their

targets.<sup>11</sup> Generally, the targets established will cover a 4-year reporting period and will be reported biennially. MAP-21 also mandated that states begin reporting their progress toward targets to DOT no later than October 2016. In addition, the legislation directed DOT to report to Congress in October 2017 on the effectiveness of performance-based planning as a tool for guiding transportation investments and the effectiveness of the performance-based planning process of each state.<sup>12</sup> The performance-based approach remains essentially unchanged in the FAST Act—the most recent surface transportation reauthorization measure—enacted in December 2015.

In administering approximately \$40 billion a year to grantees for the federal-aid highway program, FHWA manages a variety of grant programs that provide funding for the development of infrastructure projects, and jointly with FTA, administers the implementation of the statewide and metropolitan planning requirements carried out by states and MPOs, discussed below. FHWA oversees the federal-aid highway program primarily through its 52 division offices located in each state, the District of Columbia, and Puerto Rico. To help lead the agency's efforts to implement a performance-based approach, FHWA established the office of Transportation Performance Management in 2013 to help oversee the rulemaking process and the agency's implementation efforts.

Regulatory agencies, such as DOT, have authority and responsibility for developing and issuing regulations. The basic rulemaking process is spelled out in the Administrative Procedures Act. Among other things, the act establishes procedures and broadly applicable federal requirements for informal rulemaking.<sup>13</sup> In addition, the act generally requires agencies to publish a notice of proposed rulemaking in the *Federal Register*. After giving interested persons an opportunity to comment on the proposed rule by providing "written data, views, or arguments," and considering those comments, the agency may then publish the final rule. In our prior work, we found that rulemakings can range from 1 to nearly 14 years to

---

<sup>11</sup>MAP-21 also requires states to spend a specified portion of their annual federal funding to improve National Highway System bridges and Interstate-system pavement should conditions fall below minimum standards set by MAP-21 and the Secretary of Transportation, respectively. Pub. L. No. 112-141, § 1106(a).

<sup>12</sup>23 U.S.C. § 135 (h).

<sup>13</sup>The Administrative Procedures Act describes two types of rulemaking, formal and informal. Formal rulemaking includes a trial-type, on-the-record proceeding. Most federal agencies use the informal rulemaking procedures.

complete, depending on a number of factors. More specifically, we found that a rulemaking takes an average of 4 years to complete, based on a sample of 16 major or other significant rulemakings from four federal agencies, including DOT.<sup>14</sup>

TPM will be carried out as part of the transportation planning process prescribed by statute for state DOTs and MPOs. This process addresses both urbanized and nonmetropolitan areas of the state and includes planning and coordination for both highway and transit needs jointly administered by FTA and FHWA. Under this process, states engage in continuing cross-agency coordination and planning that requires periodic updates of specific plans. For example, states develop a variety of plans for overall transportation programs, including a long-range statewide transportation plan and a state transportation improvement program. In urbanized areas, MPOs are also required to produce a long-range transportation plan, referred to as a metropolitan transportation plan, and a transportation improvement program. While MAP-21 left the basic framework of the transportation-planning process largely untouched, the act introduced critical changes to the process by requiring grantees such as states, MPOs, and transit agencies to move toward more performance-based highway and transit programs, and linking investment priorities to the achievement of performance targets. Under the new TPM approach, states and MPOs must coordinate on the target-setting and transportation-planning process, and states are required to integrate performance targets into both existing planning processes and plans.<sup>15</sup> TPM also seeks to ensure that the transportation-planning process provides a performance-based approach to decision-making in support of national goals.

---

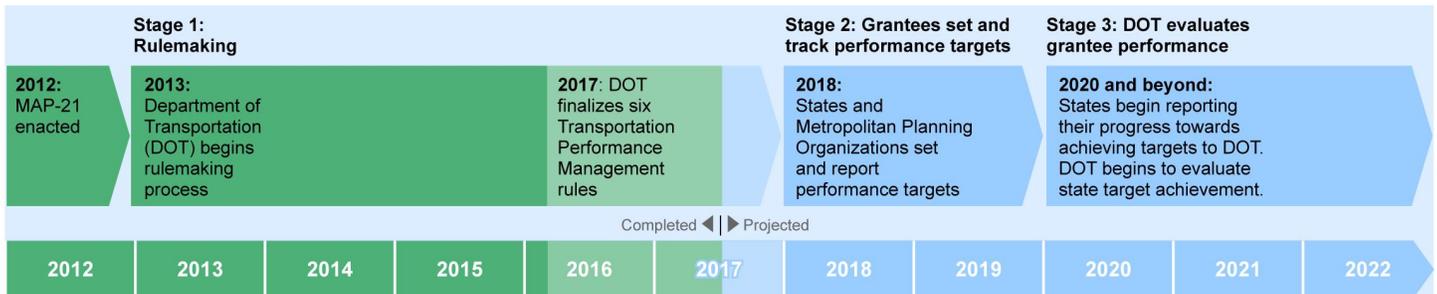
<sup>14</sup>GAO, *Federal Rulemaking: Improvements Needed to Monitoring and Evaluation of Rules Development as Well as to the Transparency of OMB Regulatory Reviews*, [GAO-09-205](#) (Washington, D.C.: Apr. 20, 2009).

<sup>15</sup>See 23 U.S.C. § 134(h)(2), 23 U.S.C. § 135(d)(2).

## FHWA Recently Completed the Rulemaking Stage, Establishing a National Approach to Transportation Performance Management

FHWA has recently completed the first of the three-stage TPM implementation process—rulemaking, setting and tracking performance targets, and evaluating performance—issuing all six interrelated rules that establish both the performance measures focused on the national transportation goals and the overarching performance-management framework (see fig. 1). The agency issued the first of the six rules in March 2016. In January 2017, the last two rules were issued and became effective in May 2017, with part of one rule delayed indefinitely.<sup>16</sup> Completing the rulemaking process was a substantial undertaking for FHWA, as none of the rules had been completed when we last reported on this topic in 2015. With the completion of the six final rules, the framework for a performance-based approach to highway transportation management is now in place.

**Figure 1: Transportation Performance Management Implementation Stages and Planned Timeline**



Source: GAO analysis of DOT transportation performance management implementation rulemakings and activities. | GAO-17-638

Note: Implementation stages and planned timeline for the Moving Ahead for Progress in the 21st Century Act (MAP-21) requirements, including target-setting and evaluation stages for the Pavement and Bridge and System Performance final rules. For the Safety rule only, states are to set and report calendar year 2018 targets in 2017 and MPOs report targets to the state DOT in 2018.

<sup>16</sup>The effective date for two final rules had been delayed in order to give the new administration time to conduct regulatory reviews. Subsequently, these two final rules became effective on May 20, 2017; however, portions of the System Performance final rule pertaining to the greenhouse gases (GHG) measure was delayed indefinitely. 82 Fed. Reg. 22879 (May 19, 2017). FHWA plans to publish another notice of proposed rulemaking regarding the greenhouse gas measure at a later date.

FHWA is responsible for six rules related to the condition and performance of the federal highway system, one of which is administered jointly with FTA (see table 1). These six rules are interrelated because some establish specific performance measures while others relate to the transportation-planning processes or specific federal programs related to the performance measures. For example, three rules established the national performance measures (17 measures in total<sup>17</sup>) to be used by state DOTs and MPOs, including rules focused on specific infrastructure condition measures, while other rules outline how the performance-based approach will be carried out through the transportation-planning process that occurs between states and MPOs.

**Table 1: Federal Highway Administration’s Performance Management Rules**

Rules establishing national performance measures	Description	Agency	Published	Effective date
Safety	Establishes five fatality and serious injury safety measures to assess the number and rate of serious injuries and fatalities and to carry out the Highway Safety Improvement Program.	Federal Highway Administration (FHWA)	3/15/2016	4/14/2016
Pavement and Bridge	Establishes six measures to assess the condition of pavements and bridges and to carry out the National Highway Performance Program.	FHWA	1/18/2017	5/20/17
System Performance	Establishes six measures to assess states’ performance in three areas: National Highway System, freight movement, and air quality measures.	FHWA	1/18/2017	5/20/17 <sup>a</sup>
Planning	Establishes performance-based planning process at metropolitan planning organization and state level, establishes metropolitan reporting requirements, and defines coordination of target-setting.	FHWA/ Federal Transit Administration	5/27/2016	6/27/2016

<sup>17</sup>As previously noted, part of the System Performance final rule pertaining to the greenhouse gas measure was delayed indefinitely. 82 Fed. Reg. 22879 (May 19, 2017). FHWA plans to publish another notice of proposed rulemaking regarding the greenhouse gas measure at a later date. For the purposes of this report, we will not include the greenhouse gas measure in our discussion.

Rules outlining use of performance-based approach	Description	Agency	Published	Effective date
Highway Safety Improvement Program	Integrates safety performance measures into the Highway Safety Improvement Program, establishes updated cycle for strategic highway safety plan, and updates annual reporting requirements.	FHWA	3/15/2016	4/14/2016
Highway Asset Management Plan	Integrates pavement and bridge condition measures and other content required for highway asset management plans.	FHWA	10/24/2016	10/2/2017 <sup>b</sup>
Planning	Establishes performance-based planning process at metropolitan planning organization and state level, establishes metropolitan reporting requirements, and defines coordination of target-setting.	FHWA/ Federal Transit Administration	5/27/2016	6/27/2016

Source: GAO analysis of FHWA transportation performance management rules. | GAO-17-638.

<sup>a</sup>Part of this rule was delayed indefinitely. FHWA plans to publish a notice of proposed rulemaking regarding the greenhouse gas measure at a later date.

<sup>b</sup>Part of this rule became effective on November 23, 2016.

The 17 performance measures focus on key indicators of (1) safety, (2) pavement and bridge condition, and (3) performance of the surface transportation system (reliability, congestion, freight movement, and air quality). Generally, these performance measures correspond to national federal-aid highway program goals and performance areas set forth in MAP-21. For example, one performance measure—the percentage of pavements on the Interstate System in good condition—corresponds to the “pavement condition on the Interstate System” performance area and to the national goal to “maintain the highway infrastructure asset system in a state of good repair.” See appendix I for additional information on the 17 performance measures and the corresponding goals and performance areas.

Many of these measures are fundamentally new to states while a few other measures are similar to information some states already have experience analyzing and tracking. For example, in 2015 we found that only 20 to 40 percent of states had adopted performance management practices in the areas of congestion, air quality and freight.<sup>18</sup> In contrast, states have been working to develop safety performance measures in highway safety grant programs since 2008. The final System Performance measure rule establishes six measures based on MAP-21

<sup>18</sup>GAO-15-217.

requirements to assess the performance of the Interstate and non-Interstate National Highway System, traffic congestion, freight movement, and emissions. For example, two of these measures are to carry out the National Highway Performance Program, including a measure of the percent of person-miles traveled on reliable Interstate system roadways.<sup>19</sup> The Pavement and Bridge rule establishes six measures and contains minimum thresholds for pavement and bridge conditions, and if a state falls below those thresholds it must spend a portion of its annual federal funding for improvements.

While DOT began the rulemaking process shortly after MAP-21 was enacted, it has taken several years for the rules to be developed and move through the process, resulting in the recent issuance of the final rules. For example, DOT completed the first two rules in March of 2016 and issued the last two of the six rules in January 2017. The last two rules took effect on May 20, 2017. As we noted in 2015, MAP-21 established a deadline for promulgating a rulemaking for five of the rules; however, no such deadlines existed for one of the rules.<sup>20</sup> At that time, we found that DOT had missed five performance-related rulemaking deadlines established in MAP-21; however, given the extent of regulatory changes required and the length and complexity of the rulemaking process, these deadlines may have been ambitious. For example, in response to the proposed System Performance rule, DOT received more than 8,800 public comments, which the agency then had to review and respond to before finalizing the rule.

---

<sup>19</sup>The National Highway Performance Program provides support for the condition and performance of the National Highway System, for the construction of new facilities, and to ensure that investments of federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a state's asset management plan.

<sup>20</sup>Statutory deadlines for promulgating a rulemaking existed for the Safety, Pavement and Bridge, System Performance, Highway Safety Improvement Program and the Highway Asset Management Plan rules. The MPO Planning rule did not have a statutorily established deadline.

---

---

## Most Significant Challenges States Anticipate Are Analyzing and Reporting on Complex Data Required by the System Performance Rule

In their comments on the System Performance, Pavement and Bridge, and Planning rules as well as in interviews we conducted with selected states, states anticipated that the complexity of the data and the capabilities needed to use that data to set performance targets and measure progress under the System Performance rule as the most pressing challenge in implementing the performance-based approach. In contrast, states anticipated few challenges implementing the Pavement and Bridge rule and some challenges related to the Planning rule. According to selected states and others, anticipated data challenges in implementing the System Performance rule include the size of the data set required, the process of combining data sources, and other issues that may result in states facing significant additional costs and difficulties. In the final rule, FHWA took steps to respond to these anticipated challenges, which were raised in public comments, by revising some performance measures and eliminating others. Nonetheless, some stakeholders we spoke to believe that FHWA did not fully address some significant concerns. FHWA officials stated that revisions made in the final rule along with new data improvements and planned technical assistance adequately address data concerns expressed by the stakeholders.

---

## States Identified Various Challenges in Implementing System Performance Rule

In comments in response to the proposed System Performance rule and in our interviews with officials in selected states, states reported that the anticipated costs and difficulties associated with collecting, analyzing, and reporting data associated with the rule was the major challenge affecting TPM implementation. The System Performance rule includes six performance measures related to highway system performance, freight movement, and congestion. Twenty-nine of the 36 state DOTs that commented on the proposed rule and 8 of the 10 states we met with cited the System Performance rule's reliance on an FHWA-prescribed data set as the major source of the anticipated challenges. FHWA provides this data set, the National Performance Management Research Data Set (NPMRDS), to states and MPOs, which will then use it to calculate and set targets and measure progress for four of the six performance

measures established in the rule.<sup>21</sup> FHWA selected this data set to calculate the metrics for travel time and speed-based measures to promote consistency and coverage at a national level.

Specifically, anticipated challenges related to the dataset included: (1) its size, (2) the process necessary to combine disparate traffic volume and speed data, and (3) the quality of the data.

- *Size of the data set*—According to AASHTO representatives and academic experts from two institutions we met with, the sheer size of the data set and server space required will affect their ability to analyze the data and will be a challenge for many states. AASHTO, for example, said reporting on the measures will require states to develop computerized applications to analyze millions, in some cases hundreds of millions of data points, principally in order to identify areas where traffic is congested. Officials from one state’s DOT said their staff does not have the training or experience to conduct the data analysis necessary to report congestion bottlenecks and congestion with a data set as large as NPMRDS. Five of the 10 state DOTs we interviewed raised similar concerns about their ability to analyze the large dataset.
- *Process of combining data sources*—Four of the six measures in the System Performance rule require estimates of delay or estimates of the reliability of person miles traveled or truck travel times.<sup>22</sup> Data will need to be combined from two different data sources before these performance measures can be calculated, and most state officials and academic experts we spoke to agree that this initial step will be challenging. The two data sources include traffic volume data from the

---

<sup>21</sup>The NPMRDS, which FHWA acquired in July 2013, is maintained by a contractor and provides information, including average travel times, on the National Highway System for passenger and freight vehicle traffic. It is available monthly for use by FHWA, state DOTs and MPOs for their performance management activities. While the data have been available since 2013, their use was not required until the System Performance rule took effect. FHWA solicited a new contract for the NPMRDS data in November 2016, and issued a contract to a new provider in April 2017.

<sup>22</sup>The final System Performance rule defines excessive delay as the extra amount of time spent in congested conditions defined by a speed threshold that is 20 miles per hour or 60 percent of the posted speed limit, whichever is greater. Estimates of the reliability of person-miles traveled on the Interstate and on the non-Interstate are designed to assess levels of travel time reliability.

Highway Performance Monitoring System<sup>23</sup>—which states have been using for many years to monitor highway conditions—and the NPMRDS data containing highway traffic speeds. For example, one state said that combining the two sets of data—a process typically called “conflation”—requires manual and highly technical adjustments to the underlying data. This process is particularly challenging because it requires advanced technical expertise. Some state DOTs also emphasized that they have limited experience using the data, which will necessitate significant additional work to perform the required calculations.

- *Data quality*—Some states expressed concerns with the quality and completeness of the NPMRDS data. For example, Michigan DOT officials expressed concerns about the amount of missing travel time data. In the Detroit area in particular, more than 50 percent of the data are missing for some routes. These officials noted they do not believe sound investment decisions will be made if they are based on incomplete data.

Officials we met with in most states, many comments by states on the proposed rule, and the national MPO association stated that they anticipate added costs and burdens related to implementing the System Performance rule, given the technical capabilities and expertise necessary to mitigate these data issues and use the NPMRDS data set. In comments on this rule, AASHTO noted that overall, the measures and calculation methods are considered to be overly complex even by those states that have been viewed as leaders in developing performance measures and related tools, such as Missouri, Texas, and Washington. Similarly, a national MPO association told us that the vast majority of MPOs do not have the capacity to conduct their own analysis of regional system performance and may need to rely on the state to do the required analyses. For example, 28 of the 36 state DOTs that commented on the proposed rule and 7 out of our 10 selected states anticipate technical, human resource, or funding challenges associated with the data requirements. Several states specifically noted they would need outside expertise, such as academic experts or contractors, or additional resources such as training, hardware, or software for staff to address

---

<sup>23</sup>The Highway Performance Monitoring System is the official federal government source of data on the extent, condition, performance, use, and operating characteristics of the nation's highways. These data are used for assessing and reporting highway system performance in a number of required reports and publications. Finally, the data are widely used throughout the transportation community, including other governmental entities, transportation, and industry professionals.

these data challenges, which can be costly responses for states facing limited resources and budget constraints. For example, officials from one state DOT that is considered to be very experienced with transportation performance measurement commented that to implement the rule, state DOTs and MPOs must find additional employees and funding to complete the extensive workload needed to collaborate with other agencies, as the rule requires for the transportation planning process. Officials from another experienced state DOT also commented that the use of NPMRDS requires data-management and statistical-evaluation skills that are not commonly found within DOT and MPO staffs. Thus, these officials noted using these data for analytical and reporting requirements triggers the need to invest in capabilities outside of their organizations, such as working with universities to provide the expertise needed to provide ongoing data analysis and data management of the NPMRDS or contracting for expensive proprietary systems that could handle the computational- and analytical-reporting challenges.

---

### States Anticipate Fewer Challenges with Pavement and Bridge and Planning Rules

In contrast to the System Performance rule, states that commented on the final rules and the selected states we met with generally did not anticipate major challenges in implementing the Pavement and Bridge final rule. According to AASHTO, the impact on states' implementing the Pavement and Bridge rule will be less significant and onerous because most states have been measuring pavement and bridge conditions for years. FHWA has also previously reported that most states are already actively involved in preparing to implement legal requirements in these more mature program areas. According to FHWA, states have historically expended a large amount of funds and resources collecting and analyzing pavement and bridge data, and they are more experienced with the analyses necessary to calculate these measures than they are for the new System Performance rule.

Because the TPM rules are interrelated, elements of the final Planning rule also affect implementation of the System Performance rule. Given this effect, states and MPOs expressed some general concerns in their comments on the final rules and in interviews with how state and local planning activities will be carried out. Under the state transportation planning process, setting and agreeing upon performance targets for the

17 performance measures necessitates coordination between a state and MPOs in the state.<sup>24</sup> Once states set their performance targets, generally MPOs will have 180 days to decide whether to set their own targets based on conditions and priorities in their respective planning areas, or to agree to the state-level targets. Thirteen of 36 state DOTs and the MPO national organization expressed concern with the level of coordination required to set and agree on targets.<sup>25</sup> Three state DOTs commented on the Planning rule that setting performance targets will be a significant challenge for interstate MPOs that have membership in multiple states.<sup>26</sup> This is due to each state's having different resources and different transportation policies, goals, and priorities. According to FHWA, commenters also said that it is not uncommon for states, MPOs, and operators of public transportation to have different priorities that may conflict with each other, potentially leading to conflicts when setting performance targets and attempting to implement them. In response to these comments, FHWA and FTA emphasize in the final Planning rule the importance of state DOTs and MPOs engaging in early and ongoing interagency coordination during their performance-based planning and programming. Given that states and MPOs are just beginning the target-setting process for the Pavement and Bridge and System Performance rules, the extent to which engaging in early and ongoing coordination throughout the planning process will help resolve situations where states and MPOs may have differing priorities driving their preferred performance targets is not yet clear.

---

### FHWA Took Steps to Address Challenges in the Final System Performance Rule, but Concerns Remain

In response to comments received on the proposed System Performance rule, FHWA stated that it had taken steps to reduce the complexity of the requirements, including eliminating, revising and simplifying measures, and reducing the burden of compliance. FHWA eliminated some

---

<sup>24</sup>23 U.S.C. §§ 134(h)(2)(B)(i)(II), 135(d)(2)(B)(i)(II).

<sup>25</sup>This includes state DOTs that made comments in the System Performance proposed rule related to the planning and coordination process.

<sup>26</sup>According to FHWA officials, the TPM rules provide for flexibilities in setting targets for multistate MPOs, and except where noted, MPOs may choose different target establishment options for the portion of the planning area within each state and/or agree to plan and program projects that contribute toward state DOT targets for the portion of the planning area within each state.

measures and merged others in the final rule. For example, four of the six measures in the final rule require the use of data derived from NPMRDS, compared to seven in the proposed rule. FHWA also took steps to simplify the required data processing and calculation of the metrics, including changes to specific data requirements such as how travel time intervals are calculated, which agency officials say effectively reduces the amount of data analysis necessary.<sup>27</sup> The agency also stated its commitment to working with state DOTs and MPOs to establish a joint effort to acquire services and tools that will help with activities such as data processing, analysis, measure calculation and reporting.

According to transportation industry association representatives and some states we met with, the changes made in the final System Performance rule do not address most of the expected data challenges associated with the process of combining data sources, the size of the data, and states lack of experience with the data. Specifically, AASHTO representatives told us that while the final rule made some technical changes to specific data requirements, overall, significant data challenges—related to both the size of the data set and the process of combining the speed and volume data sets—remain. AASHTO representatives also said that the new measures in the final rule are not responsive at all to their comments and although FHWA made changes to the rule—such as changing the weighting of the travel time measures from system miles to person-miles traveled, which is an adjustment to the measure itself—overall, the final rule is ultimately more complicated. After the final System Performance rule was issued, officials from two state DOTs we met with said that the final rule did not substantively change the concerns identified in the original comments and that many of the challenges in implementing the rules remain.

In response to these concerns, FHWA officials said that they made significant alterations in the final rule to the measures in direct response to the extensive and substantive comments received on the proposed rule. The officials also stated that revisions made in the final rule along with new NPMRDS improvements, planned joint efforts with the states, and technical assistance adequately address data concerns expressed by the stakeholders. For example, FHWA officials stated that the changes

---

<sup>27</sup> Other changes made in the final System Performance rule included making time periods consistent for all travel time-derived measures and removing the requirement to “fill” missing data with travel times at posted speeds.

made reduce the size of the data set by approximately two-thirds.<sup>28</sup> In addition, after issuing the final System Performance rule, FHWA executed a new contract in April 2017 containing updates to the NPMRDS data that officials said would also help address anticipated data challenges. According to agency officials, the new NPMRDS data will substantially reduce the workload and complexity for state DOTs and MPOs. This new data set will help simplify the initial step of combining the two data sources necessary to begin calculating four of the System Performance measures, reducing the technical burden on the states. FHWA officials stated that data provided under this new contract will be available for states' use in July 2017. Recognizing that some states have limited experience with the type of data analysis that will be necessary to calculate the performance measures, officials stated that FHWA is committed to providing technical assistance to help alleviate burdens associated with states' lack of experience with the data.

---

## DOT Has Taken Steps to Guide the Transition to TPM but Does Not Have a Comprehensive Implementation Plan

To guide the transition to national transportation performance management, FHWA has engaged in extensive outreach with states and MPOs throughout the initial, rulemaking stage of TPM implementation and continues to develop a range of tools, trainings, and workshops to help prepare states and MPOs for key activities related to the second stage—setting and tracking performance targets. The agency has also begun to determine its internal roles and responsibilities for both the target-setting and evaluation stages of the transition and has taken steps to meet its congressional reporting requirements in the interim. However, the agency has:

- not clearly defined its overarching goals for the transition,
- not developed an implementation plan showing how the various efforts underway relate to each other and when they will be completed, nor

---

<sup>28</sup>We did not independently verify the change in the size of the dataset. At the time of our review, states had not yet used the data set because the System Performance final rule had only recently taken effect.

- 
- clearly communicated its approach to states and MPOs.

Without these elements, states and MPOs may struggle to fulfill their performance management responsibilities and FHWA may find it challenging to effectively use its resources to assist states with implementation challenges, to evaluate their performance, and ultimately to use that information, as the final performance measure rules state, to “communicate a national performance story” and assess the impacts of federal funding.

---

## DOT Continues to Develop Tools and Training for Implementation

As we found in 2015, during the initial rulemaking stage of TPM implementation, FHWA engaged in extensive communication and outreach with states and MPOs.<sup>29</sup> FHWA is currently developing tools and training to advance the second—setting- and tracking-performance targets—and third—evaluating performance—stages of TPM implementation. These efforts build upon the agency’s earlier communication and outreach efforts. While the agency continues to use the webinars, workshops, and trainings employed during the rulemaking stage, DOT has changed the substantive focus of these efforts to address the second implementation stage. For example, the focus has shifted to helping states and MPOs understand and implement specific performance measure requirements, data-management approaches, and target-setting practices. FHWA’s efforts include the following:

- *Webinars*: Beginning in 2012, FHWA used webinars to communicate information related to the rulemaking process. More recently, the agency has begun hosting webinars focused on data use and target setting. For example, FHWA conducted a webinar in July 2016 on the basics of target setting that defined key terms, explained the five steps in the target-setting process, and provided a preview of a new course on effective target setting. In addition, a target-setting webinar on the final safety rule in September 2016 included an overview of FHWA’s recommended process for coordination on safety targets.
- *Workshops*: In June 2015, FHWA began facilitating peer-to-peer workshops, including a 2016 data management session, a topic that will play a critical role in TPM implementation as states use data to set

---

<sup>29</sup>[GAO-15-217](#).

appropriate targets and track progress toward them.<sup>30</sup> In addition, FHWA has conducted workshops on safety target setting and coordination and has begun to conduct workshops that focus on how to implement technical aspects of the Pavement and Bridge and System Performance rules now that they are in effect.

- *Web-based assessment tools:* In December 2016, FHWA released a new web resource and guidebook that state and local transportation agencies can use to assess their transportation performance management approach and identify steps they might take to implement or improve that approach. The web resource includes a self-assessment tool states and MPOs can use to determine their level of maturity in TPM areas such as target setting, performance-based planning, and data usability and analysis. It also provides additional resources states and MPOs can use to strengthen their approach where needed in these areas.
- *Trainings:* FHWA and the National Highway Institute are developing 8 training courses covering topics such as the target-setting process for specific TPM elements, but many of these are new or were delayed due to the regulatory review. For example, the “Steps to Effective Target Setting for TPM” and the “Performance-based Programming and Planning” trainings are newly available and being delivered in summer 2017. According to FHWA, trainings pertaining to the rules that took effect in May 2017—“TPM for Pavement” and “TPM for Bridges”—will be available in the fall of 2017. As of July, 2017, 5 of the 8 courses were available.

FHWA also has efforts under way to guide its internal TPM agency activities. These efforts are designed to organize its staff, ensure the agency is prepared to make its statutorily mandated report to Congress on the status of TPM efforts by October 2017, and to lay the groundwork for receiving and displaying information from states and MPOs when the time comes for them to report their targets and for DOT to evaluate states’ performance.

- *Developing internal guidance:* FHWA issued internal guidance describing the roles and levels of responsibility headquarters, division office, and resource center staff will assume, including assuring data quality and influencing target setting. This document outlined

---

<sup>30</sup>Peer-to-peer workshops, also known as peer exchanges, offer transportation planning staff opportunities to interact, share information and lessons learned from the field and develop approaches to overcome shared transportation planning challenges.

preliminary responsibilities in February, 2015 and FHWA officials acknowledged more work remains to be done to solidify these roles as TPM evolves.

- *Preparing to meet mandatory reporting requirements:* Despite delays in the rulemaking process, FHWA has taken steps to assist states in meeting their statutory reporting requirements. For example, to assist states in reporting progress toward achieving targets to DOT by October 1, 2016, as mandated, the agency issued guidance to states on how to submit preliminary information to meet requirements in the absence of the finalized Pavement and Bridge and System Performance rules.<sup>31</sup> According to FHWA officials, they have also developed two web portals for states to use to report on progress for the Highway Safety Improvement Program performance requirements and other measure areas.
- *Planning to assess state readiness:* FHWA also planned and developed a draft survey that would both provide the agency with information on the status of TPM practice across the states and provide specific examples that would enable FHWA to meet its 2017 requirement to report to Congress. Officials said they also planned to use the survey results to identify further assistance and guidance needs. The officials also told us that they want to administer a similar survey in 2 years to assess states' ability to meet TPM requirements and identify the major challenges that have arisen. While the survey was initially planned for the end of 2016, it was delayed during the review process and remained under review as of June 2017. Agency officials were unsure when the survey would ultimately be administered, but said they had identified alternate sources of information to use to assess states' progress in order to meet congressional reporting requirements. For example, FHWA has been collecting information from its division offices on how states and MPOs have been working on TPM-related issues.
- *Planning web-based performance reporting tools:* FHWA is also in the preliminary stages of planning a web portal that states and MPOs can use to submit their performance reports to the agency and a website that the agency plans to use to publicly display state and MPO targets and actual performance data. Both the Pavement and Bridge and System Performance final rules state that the website will "likely include infographics, tables, charts, and descriptions of the

---

<sup>31</sup>FHWA has collected and reviewed state-submitted information. This process is an internal effort, and there is no publicly available report.

---

performance data that state DOTs report to FHWA.” Agency officials said the site will show both targets and actual performance numbers and will eventually be expanded to a DOT-wide site incorporating performance figures from other modes of transportation. The officials said that they plan to share prototypes of the web portal and website for states’ comments and review during fall 2017 and to have design completed by October 2018.

---

## DOT Has Not Developed a Comprehensive Plan to Guide Implementation Efforts

The new performance-based approach to transportation is a transformational shift, impacting billions of dollars in federal transportation funds, including almost \$40 billion in FHWA grant funding to states and holding states and grantees accountable for results, many for the first time. In 2003, we identified key practices from major private- and public-sector organizational mergers, acquisitions, and transformations that federal agencies could implement to successfully manage a transformation.<sup>32</sup> We found that several key practices can help federal agencies implement needed transformational changes, such as transforming to a more results-oriented culture. Some of these key practices are applicable to FHWA’s approach to implementing TPM. In particular, establishing a coherent mission and integrated strategic goals that are clear to both agency employees and grantees from the outset is critical to guide a successful transformation and involves determining strategies and resources to effectively accomplish the goals of the transformation. Developing, communicating and constantly reinforcing the mission and strategic goals of the transformation gives employees a sense of what the organization intends to accomplish and helps them determine what they must do differently to help the organization achieve success. In 2003, we also identified setting implementation goals and a timeline as a key practice, given that transformations are lengthy processes that can take years to complete, and noted the importance of focusing on a set of principles and priorities at the outset of the transformation. In addition, we noted that identifying the processes that will be used to achieve results should focus attention clearly on critical stages of the transformation and determine essential activities that must be completed by certain dates. Furthermore, our past work on organizational transformations found that early, effective, and ongoing

---

<sup>32</sup>[GAO-03-669](#).

---

communication is essential to implementing a successful transformation, as it engages employees and stakeholders and builds an understanding of the purpose of planned changes. As principles of internal control in the federal government, management should internally and externally communicate the necessary quality information to achieve objectives.<sup>33</sup>

While FHWA has developed tools and trainings to advance both the rulemakings and implementation, the agency has not pulled all of this together into a comprehensive plan to guide its efforts through the final two stages of implementation. Specifically, DOT has not:

- *Articulated a mission and overarching goals to guide the transition:* While national goals for the transportation system were established in MAP-21, FHWA has not coherently articulated the mission of TPM or specific strategic goals related to each stage of the TPM transition in a comprehensive manner. For example, the agency has not identified strategic implementation goals describing what the transformation is intended to accomplish and how the various efforts the agency has underway will help accomplish those goals. Each of the final performance measure rules states that TPM will provide FHWA the ability to “better communicate a national performance story” and to assess the impacts of federal funding. MAP-21 also provided that performance based planning and programming will improve project decision-making, thereby ensuring efficient investment of federal funds. However, FHWA has not identified specific processes or essential activities that will be used to achieve these results. For example, the agency has not explained the process it will use to analyze states’ performance data to assess the impacts of federal funding on the surface transportation system. Furthermore, FHWA has not described how the individual tools and trainings it has been developing contribute to a comprehensive approach to achieving the national goals and planning outcomes. If FHWA does not provide a sense of what it intends to accomplish or determine what must be done differently to help achieve successful TPM implementation, states may not see how TPM is intended to help them improve their transportation planning and decision-making processes.
- *Developed an implementation plan and timelines:* FHWA has not developed and made public a comprehensive plan describing specific deliverables or actions the agency intends to take to address its

---

<sup>33</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington D.C.: September, 2014).

ultimate goals, identified how these planned activities will help move the agency and its grantees through the two remaining stages of the transition, or established timelines for when these activities will be carried out. For example, FHWA did not make clear at the outset of the transition how it would prepare grantees or focus on a key set of principles and priorities for implementation, a key practice for successful transformations. As a result, states have not had a plan that lays out the various efforts that FHWA is taking and plans to take to help address anticipated challenges. While FHWA has begun to develop individual plans to outline implementation efforts for some specific rules, the agency has not developed an overarching plan that would describe the range of efforts across the six rules or explicitly stated what actions it plans to take to facilitate the implementation of these rules. For example, officials from one state DOT told us that they were unsure how the transition would work in practical terms because all the presentations FHWA provided concerning future plans had been very general. While DOT will begin assessing states' performance in the third implementation stage, the agency has not described how it will evaluate performance nationwide. For example, while FHWA officials told us they are developing a website to display state targets and performance data, they have not outlined specific plans for analyzing, displaying, or using the data in a way that will provide practical insights into the condition of the nation's surface transportation system or better communicate a national performance story. Furthermore, the agency has not developed a timeline identifying when it will initiate and conclude specific activities, making it difficult for state and MPOs to know when the tools, training, and guidance FHWA is developing to help them meet the new requirements will be available. For example, officials from one state DOT told us they struggled to begin complying with new requirements after rules were finalized because they had to wait months for specific subject-matter guidance to be released.

- *Communicated its approach:* FHWA has not communicated its overall approach to TPM to states and MPOs—the grantees that are responsible for carrying out several of the performance management requirements. While the majority of state DOT officials we met with were generally appreciative of the communication the agency provided during the rulemaking stage and found the various webinars to be valuable in conveying the status of agency efforts in the first stage of implementation, the agency's broader plans for full TPM implementation were unclear. For example, officials we spoke with from 9 out of the 10 states said they were not aware of FHWA's plans for TPM beyond the rulemaking process. As such, states and MPOs

may not have a sense of the purpose behind the significant changes they will need to make to support this transformation of the surface transportation system or know how to support the agency's objectives of communicating a national performance story and assessing the impacts of federal funding. For example, officials from one state DOT said they were not aware of any FHWA documentation that would constitute a concrete plan for developing a framework that would provide an in-depth look at the nation's infrastructure.

FHWA officials stated they have not developed an implementation plan with goals and timeframes because they have been focused on completing the rulemakings. Agency officials stated that any efforts to formalize an implementation plan would need to come after all the rules took effect—which happened in May 2017—as well as completion of the previously discussed survey effort.<sup>34</sup> Agency officials also acknowledged that an implementation plan would be helpful, but challenging to develop. In the absence of a timely developed implementation plan, DOT may not be ideally positioned to coordinate its technical assistance activities or address implementation challenges anticipated by states—such as the data-related challenges discussed earlier. An implementation plan could also help the agency make the best use of the performance information states will begin reporting to improve transportation decision-making, communicate a national performance story, and assess the impacts of federal funding. If grantees do not have a clear understanding of the specific implementation goals and processes that their TPM efforts will contribute to or how FHWA plans to use their performance information, it may be difficult for them to support implementation.

---

## Conclusions

As our past work has demonstrated, it is increasingly important to improve the effectiveness of surface transportation programs by establishing links to performance and measuring progress toward clear national goals in order to maximize the use of available resources. TPM represents a fundamental transformation in the way the agency will hold grant recipients responsible for achieving congressionally established

---

<sup>34</sup>As previously noted, part of the System Performance final rule pertaining to the greenhouse gas measure was delayed indefinitely. 82 Fed. Reg. 22879 (May 19, 2017). FHWA plans to publish another notice of proposed rulemaking regarding the greenhouse gas measure at a later date.

goals and measure overall program performance. While the first stage of implementation, the rulemaking process, took nearly 5 years to complete, FHWA is now at a critical junction, preparing for the second and third implementation stages—target setting and performance evaluation. States and other grantees anticipate significant challenges associated with implementation of these new requirements, including specific challenges related to the complexity of the data and the processes necessary to calculate and track certain performance measures. It remains to be seen whether and to what extent revisions made to the final rule and other actions by FHWA adequately addresses concerns expressed by the stakeholders.

As the states begin the process necessary to agree upon and set performance targets for each of the required TPM performance measures, they could benefit from a plan outlining the agency's overarching approach to TPM and how the various actions the agency has taken during the initial stage of implementation are related to one another and will help prepare states for implementation. Without a formal implementation plan guiding and coordinating FHWA's efforts, FHWA may struggle to articulate the goals and purpose of the transformation, tell a national performance story, and identify and address the activities best suited to help states and MPOs overcome anticipated implementation challenges or identify future efforts to pursue to help achieve specific TPM implementation goals. With the issuance of the interrelated final rules and of states' beginning the target-setting process, there is an opportunity for FHWA at this critical junction to articulate an overarching approach to TPM, including specific steps the agency plans to take to operationalize the transformation, time frames for key activities and efforts, and specific actions the agency will take to help states and other grantees address anticipated challenges.

---

## Recommendation for Executive Action

To better position DOT and FHWA to effectively guide the transformation of federal surface transportation programs to a more performance-oriented approach, and to help states and MPOs overcome anticipated challenges, we recommend that the Secretary of Transportation direct the Administrator of FHWA to take the following two actions:

1. Develop a formal TPM implementation plan to include overarching implementation goals, specific actions FHWA plans to take to help

---

states and MPOs successfully implement TPM, and corresponding timelines.

2. Publicly communicate this plan and approach to build a shared understanding of the goals and purpose of the transformation with its grantees.

---

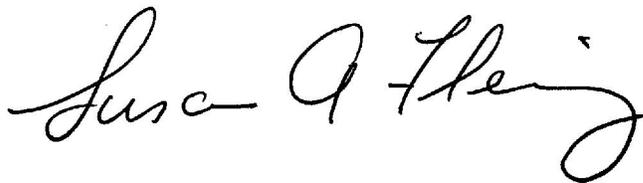
## Agency Comments

We provided a draft of this report to DOT for review and comment. In its comments, reproduced in appendix II, the agency concurred with our recommendation. DOT also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the Secretary of Transportation and the Administrator of the Federal Highway Administration. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or [flemings@gao.gov](mailto:flemings@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Sincerely yours,



Susan A. Fleming  
Director, Physical Infrastructure

# Appendix I: Performance Management Rules and Performance Measures

**Table 2: Performance Measures and Performance Areas Supporting National Transportation Goals**

Safety Rule		
National Goal	Performance Area	Performance Measures
<i>Safety</i> : To achieve a significant reduction in traffic fatalities and serious injuries on all public roads	<ul style="list-style-type: none"> <li>• Serious injuries per vehicle miles traveled (VMT)</li> <li>• Fatalities per VMT</li> <li>• Number of serious injuries</li> <li>• Number of fatalities</li> </ul>	<ol style="list-style-type: none"> <li>1. Number of fatalities</li> <li>2. Rate of fatalities per VMT</li> <li>3. Number of serious injuries</li> <li>4. Rate of serious injuries per VMT</li> <li>5. Number of combined non-motorized fatalities and non-motorized serious injuries</li> </ol>

Pavement and Bridge Rule		
National Goal	Performance Area	Performance Measures
<i>Infrastructure Condition</i> : To maintain the highway infrastructure asset system in a state of good repair	<ul style="list-style-type: none"> <li>• Pavement condition on the Interstate System</li> <li>• Pavement condition on the non-Interstate National Highway System (NHS)</li> <li>• Bridge condition on the NHS</li> </ul>	<ol style="list-style-type: none"> <li>1. Percentage of pavements on the Interstate System in good condition</li> <li>2. Percentage of pavements on the Interstate System in poor condition</li> <li>3. Percentage of pavements on the NHS (excluding the Interstate System) in good condition</li> <li>4. Percentage of pavements on the NHS (excluding the Interstate System) in poor condition</li> <li>5. Percentage of NHS bridges classified as in good condition</li> <li>6. Percentage of NHS bridges classified as in poor condition</li> </ol>

System Performance Rule		
National Goal	Performance Area	Performance Measures

**Appendix I: Performance Management Rules  
and Performance Measures**

<b>System Performance Rule</b>		
<b>National Goal</b>	<b>Performance Area</b>	<b>Performance Measures</b>
<p><i>Congestion Reduction:</i> To achieve a significant reduction in congestion on the National Highway System</p> <p><i>System Reliability:</i> To improve the efficiency of the surface transportation system</p> <p><i>Freight Movement and Economic Vitality:</i> To improve the National Highway Freight Network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development</p> <p><i>Environmental Sustainability:</i> To enhance the performance of the transportation system while protecting and enhancing the natural environment.</p>	<ul style="list-style-type: none"> <li>• Performance of the Interstate System</li> <li>• Performance of the non-Interstate NHS</li> <li>• Freight movement on the Interstate System</li> <li>• Traffic congestion</li> <li>• On-road mobile source emissions</li> </ul>	<ol style="list-style-type: none"> <li>1. Percent of person-miles traveled on the Interstate that are reliable</li> <li>2. Percent of person-miles traveled on the non-Interstate NHS that are reliable</li> <li>3. Truck travel time reliability index</li> <li>4. Annual hours of peak-hour excessive delay per capita</li> <li>5. Percent of non-single occupancy vehicle travel</li> <li>6. Total emission reductions</li> </ol>

Source: GAO Analysis of Safety, Pavement and Bridge, and System Performance Rules and 23 U.S.C. § 150. | GAO-17-638

Note: For reporting purposes, the full titles of the three transportation performance management rules containing performance measures have been shortened as follows: Highway Safety Improvement Program (Safety); Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program (Pavement and Bridge); and Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement (System Performance). These rules were created in response to the Moving Ahead for Progress in the 21st Century Act (MAP-21), which required the Secretary of Transportation to establish measures states could use to assess their performance in the 12 areas listed in this table. These performance measures are intended to create a framework to support the seven national goals established by MAP-21. Part of the System Performance final rule pertaining to the greenhouse gas measure was delayed indefinitely. 82 Fed. Reg. 22879 (May 19, 2017). FHWA plans to publish another notice of proposed rulemaking regarding the greenhouse gas measure at a later date.

# Appendix II: Comments from the Department of Transportation



U.S. Department  
of Transportation  
**Office of the Secretary  
of Transportation**

Assistant Secretary  
for Administration

1200 New Jersey Avenue, SE  
Washington, DC 20590

Susan Fleming  
Director, Physical Infrastructure Issues  
U.S. Government Accountability Office  
441 G Street NW  
Washington, DC 20548

July 12, 2017

Dear Ms. Fleming:

The Federal Highway Administration (FHWA) planned and implemented changes required by the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21) aimed at improving safety, rebuilding highways and bridges, focusing on freight policy, accelerating project delivery, and moving toward a performance-driven program. To communicate new requirements or programmatic changes, FHWA developed, advertised, and delivered 26 informational, nationwide webinars to an estimated 10,000 participants, including State departments of transportation (DOT), Metropolitan Planning Organizations (MPO), local governments, and other stakeholders. The FHWA also issued approximately 30 guidance documents and 360 questions and answers, most of which were completed before MAP-21 took effect.

The cornerstone of MAP-21's Federal highway program transformation is increased accountability and transparency through the implementation of a performance driven, outcome-based program. To meet the needs of our Nation's aging highway and bridge infrastructure amidst fiscal challenges, MAP-21 focused on national transportation goals through State DOT and MPO investment decision making. In accordance with MAP-21 and the performance-based approach continued in the Fixing America's Surface Transportation Act, FHWA took proactive steps to prepare the Agency and its State and local partners to move toward a more performance-based Federal highway program. We appreciate the Government Accountability Office's (GAO) recognition that FHWA's completion of the rulemaking process was a substantial undertaking. Specifically, FHWA:

- Completed and published six Transportation Performance Management (TPM) final rules — the most recent to implement the new Title 23 performance provisions was effective on May 20, 2017. These regulations reflect MAP-21's goals related to infrastructure condition, transportation safety, congestion reduction, freight movement, environmental sustainability, and system reliability.
- Engaged with State and local governments and other stakeholders in advance of, during, and after the rulemaking process to share TPM best practices and to better understand implementation challenges. Since 2012, FHWA has conducted over 150 TPM outreach and training sessions. For example, FHWA's "Let's Talk Performance" webinars with

State DOTs, MPOs, transit providers, and other stakeholder agencies covered topics including transportation data analytics and usability, predictive modeling, and target setting. The FHWA's TPM training courses, technical guidance, and data tools are available on its Web site and have been included in presentations and implementation workshops delivered to the public.

The Department concurs with both of GAO's recommendations and by building upon its existing activities, we are committed to developing a formal TPM implementation plan and publicly communicating this plan. We appreciate the opportunity to respond to the GAO draft report. Please contact Madeline M. Chulumovich, Director, Audit Relations and Program Improvement, at (202) 366-6512 with any questions or if you would like to obtain additional details.

Sincerely,



Bryan Slater  
Assistant Secretary for Administration

---

# Appendix III: GAO Contact and Staff Acknowledgments

---

## GAO Contact

Susan A. Fleming, (202) 512-2834, or [Flemings@gao.gov](mailto:Flemings@gao.gov)

---

## Staff Acknowledgments

In addition to the individual named above, Steve Cohen (Assistant Director); Maria Wallace (Analyst in Charge); Delwen Jones; Alex Lawrence; Crystal Wesco; Sarah Wilson; and Elizabeth Wood made key contributions to this report.

---

# Appendix IV: Accessible Data

---

## Data Tables

---

### Accessible Data for Highlights Figure and Figure 1: Transportation Performance Management Implementation Stages and Planned Timeline *Completed*

**2012:** MAP-21 enacted

Stage 1: Rulemaking

**2013:** Department of Transportation (DOT) begins rulemaking process

**2017:** DOT finalizes six Transportation Performance Management rules

Stage 2: Grantees set and track performance targets

**2018:** States and Metropolitan Planning Organizations set and report performance targets

*Projected*

Stage 3: DOT evaluates grantee performance

**2020 and beyond:** States begin reporting their progress towards achieving targets to DOT. DOT begins to evaluate state target achievement.

Source: GAO analysis of DOT transportation performance management implementation rulemakings and activities. | GAO-17-638

---

## Agency Comment Letter

---

### Accessible Text for Appendix II: Comments from the Department of Transportation

Page 1

U.S. Department of Transportation

Assistant Secretary for Administration  
1200 New Jersey Avenue, SE  
Washington , DC 20590  
Office of the Secretary of Transportation  
Susan Fleming  
Director, Physical Infrastructure Issues  
U.S. Government Accountability Office  
441 G Street NW  
Washington, DC 20548

July 12, 2017

Dear Ms. Fleming:

The Federal Highway Administration (FHWA) planned and implemented changes required by the Moving Ahead for Progress in the 21st Century Act (MAP-21) aimed at improving safety, rebuilding highways and bridges, focusing on freight policy, accelerating project delivery, and moving toward a performance-driven program. To communicate new requirements or programmatic changes, FHWA developed, advertised, and delivered 26 informational, nationwide webinars to an estimated 10,000 participants, including State departments of transportation (DOT), Metropolitan Planning Organizations (MPO), local governments, and other stakeholders. The FHWA also issued approximately 30 guidance documents and 360 questions and answers, most of which were completed before MAP-21 took effect.

The cornerstone of MAP-21's Federal highway program transformation is increased accountability and transparency through the implementation of a performance driven, outcome-based program. To meet the needs of our Nation's aging highway and bridge infrastructure amidst fiscal challenges, MAP-21 focused on national transportation goals through State DOT and MPO investment decision making. In accordance with MAP-21 and the performance-based approach continued in the Fixing America's Surface Transportation Act, FHWA took proactive steps to

prepare the Agency and its State and local partners to move toward a more performance-based Federal highway program. We appreciate the Government Accountability Office's (GAO) recognition that FHWA's completion of the rulemaking process was a substantial undertaking.

Specifically, FHWA:

- Completed and published six Transportation Performance Management (TPM) final rules -the most recent to implement the new Title 23 performance provisions was effective on May 20, 2017. These regulations reflect MAP-21's goals related to infrastructure condition, transportation safety, congestion reduction, freight movement, environmental sustainability, and system reliability.
- Engaged with State and local governments and other stakeholders in advance of, during, and after the rulemaking process to share TPM best practices and to better understand implementation challenges. Since 2012, FHWA has conducted over 150 TPM outreach and training sessions. For example, FHWA's "Let's Talk Performance" webinars with

## Page 2

State DOTs, MPOs, transit providers, and other stakeholder agencies covered topics including transportation data analytics and usability, predictive modeling, and target setting. The FHWA's TPM training courses, technical guidance, and data tools are available on its Web site and have been included in presentations and implementation workshops delivered to the public.

The Department concurs with both of GAO's recommendations and by building upon its existing activities, we are committed to developing a formal TPM implementation plan and publicly communicating this plan. We appreciate the opportunity to respond to the GAO draft report.

Please contact Madeline M. Chulumovich, Director, Audit Relations and Program Improvement, at (202) 366-6512 with any questions or if you would like to obtain additional details.

Sincerely

Bryan Slater

---

Assistant Secretary for Administration

---

---

## GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

---

## Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's website (<http://www.gao.gov>). Each weekday afternoon, GAO posts on its website newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to <http://www.gao.gov> and select "E-mail Updates."

---

## Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <http://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

---

## Connect with GAO

Connect with GAO on [Facebook](#), [Flickr](#), [LinkedIn](#), [Twitter](#), and [YouTube](#).  
Subscribe to our [RSS Feeds](#) or [E-mail Updates](#). Listen to our [Podcasts](#).  
Visit GAO on the web at [www.gao.gov](http://www.gao.gov) and read [The Watchblog](#).

---

## To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

---

Website: <http://www.gao.gov/fraudnet/fraudnet.htm>  
E-mail: [fraudnet@gao.gov](mailto:fraudnet@gao.gov)  
Automated answering system: (800) 424-5454 or (202) 512-7470

---

## Congressional Relations

Katherine Siggerud, Managing Director, [siggerudk@gao.gov](mailto:siggerudk@gao.gov), (202) 512-4400,  
U.S. Government Accountability Office, 441 G Street NW, Room 7125,  
Washington, DC 20548

---

## Public Affairs

Chuck Young, Managing Director, [youngc1@gao.gov](mailto:youngc1@gao.gov), (202) 512-4800  
U.S. Government Accountability Office, 441 G Street NW, Room 7149  
Washington, DC 20548

---

## Strategic Planning and External Liaison

James-Christian Blockwood, Managing Director, [spel@gao.gov](mailto:spel@gao.gov), (202) 512-4707  
U.S. Government Accountability Office, 441 G Street NW, Room 7814,  
Washington, DC 20548