12.0 Transportation Performance Management, Measures and Targets

12.1 Introduction
Requirements for performance management to promote the most efficient investment of Federal transportation funds increases the accountability and transparency of the Federal-aid highway program and provides for a framework to support improved investment decision-making through a focus on performance outcomes for key national transportation goals. The rules address requirements established by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and reflects passage of the Fixing America’s Surface Transportation (FAST) Act to more effectively evaluate and report on safety, infrastructure condition, on-road mobile source emissions, and surface transportation performance.

An MPO will be required to integrate in the metropolitan transportation planning process, directly or by reference, the goals, objectives, performance measures, and targets described in other State transportation plans and transportation processes, as well as any plans developed by providers of public transportation required as part of a performance-based program including:

- The State asset management plan for the NHS
- The State Transit Asset Management Plan
- Applicable portions of the HSIP, including the SHSP
- The Public Transportation Agency Safety Plan
- Other safety and security planning and review processes, plans, and programs, as appropriate
- The Congestion Mitigation and Air Quality Improvement Program performance plan, as applicable
- Appropriate (metropolitan) portions of the State Freight Plan
- The congestion management process, if applicable
- Other State transportation plans and transportation processes required as part of a performance-based program.

12.2 Transportation Performance Management Framework Background

Highway Safety Improvement Program and Safety Performance Measures Rules

The Federal Highway Administration (FHWA) published the Highway Safety Improvement Program (HSIP) and Safety Performance Management Measures (Safety PM) Final Rules on March 15, 2016, with an effective date of April 14, 2016. The rules implement the performance management requirements, including the specific safety performance measure requirements for the purpose of carrying out the HSIP to assess serious injuries and fatalities on all public roads. It establishes five performance measures as the five-year rolling averages for:

- Number of Fatalities,
- Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT),
- Number of Serious Injuries,
- Rate of Serious Injuries per 100 million VMT, and
- Number of Non-motorized Fatalities and Non-motorized Serious Injuries.

Bridge, Pavement, CMAQ and System Performance Programs and Performance Measures

On May 20, 2017, FHWA finalized six interrelated performance rulemakings to implement the Transportation Performance Management (TPM) framework established by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act. Collectively, the rules address challenges facing the U.S. transportation system, including:
• improving safety;
• maintaining infrastructure condition;
• reducing traffic congestion;
• improving efficiency of the system and freight movement;
• protecting the environment; and
• reducing delays in project delivery.

*The effective date of the portions of the final rule pertaining to GHG measure has been delayed indefinitely.*

The rules establish national performance measures. State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) will establish targets for applicable measures for:

• the performance of the Interstate and non-Interstate National Highway System (NHS) to carry out the National Highway Performance Program (NHPP);
• freight movement on the Interstate system; and
• traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program.

<table>
<thead>
<tr>
<th>Implementation Timeline</th>
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<tbody>
<tr>
<td>Final Rule</td>
</tr>
<tr>
<td>Safety Performance Measures (PM1)</td>
</tr>
<tr>
<td>Pavement/Bridge Performance Measures (PM2)</td>
</tr>
<tr>
<td>System Performance Measures (PM3)</td>
</tr>
</tbody>
</table>

12.2 Performance Management Elements and Framework

FHWA defines Transportation Performance Management (TPM) as a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. Performance management outcomes are grouped into six elements.

**National Goals:** Congressionally established goals or program purpose to focus the Federal-aid highway program into specific areas of performance.

**Measures:** FHWA-established measures to assess performance/condition in carrying out performance-based Federal-aid highway programs.

**Targets:** Targets established by Federal-aid highway funding recipients for the measures to document future performance expectations.
Plans: Development of strategic and/or tactical plans by Federal funding recipients to identify strategies and investments that address performance needs.

Reports: Development of reports by Federal funding recipients that document progress toward target achievement, including the effectiveness of Federal-aid highway investments.

Accountability and Transparency: FHWA-developed requirements for Federal funding recipients to use to achieve or make significant progress toward targets.

National Goals

The National FHWA program performance goals as established by Congress are:

Safety - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

Infrastructure Condition - To maintain the highway infrastructure asset system in a state of good repair.

Congestion Reduction - To achieve a significant reduction in congestion on the National Highway System.

System Reliability - To improve the efficiency of the surface transportation system.

Freight Movement and Economic Vitality - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

Environmental Sustainability - To enhance the performance of the transportation system while protecting and enhancing the natural environment.

Reduced Project Delivery Delays - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

12.3 Safety Performance Measures

FHWA established five performance measures for which State DOTs and MPOS must establish annual safety targets. These safety performance measures are applicable to all public roads regardless of ownership or functional classification.

- Number of Fatalities
- Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
- Number of Serious Injuries
- Rate of Serious Injuries per 100 million VMT
- Number of Non-motorized Fatalities and Non-motorized Serious Injuries.

States will establish statewide targets for each of the safety performance measures annually, beginning in August 2017 for calendar year 2018 and report the targets to the FHWA in the HSIP report due on August 31 of each year. MPOs must also set a target for each of the five measures for all public roads in the MPO
planning area within 180 days of the State establishing each target. While States report their HSIP targets to FHWA in their annual HSIP report, MPOs do not report their HSIP targets directly to FHWA. To meet the report due date of August 31, MPOs must establish HSIP targets and report to the State DOT no later than February 27 of each year.

An MPO may adopt and support the State's HSIP targets, develop their own HSIP targets, or use a combination of both. Whether an MPO agrees to support a State HSIP target or establishes its own HSIP target, the MPO must include a report evaluating the condition and performance of the transportation system with respect to the safety performance targets in the Metropolitan Transportation Plan (MTP), including progress achieved by the MPO in achieving safety performance targets. MPOs' targets are reported to the State DOT, which must be able to provide the targets to FHWA, upon request.

FHWA will determine whether a State DOT has met or made significant progress toward meeting HSIP targets, but will not directly assess MPO progress. FHWA will review MPO performance as part of ongoing transportation planning process reviews, including the Transportation Management Area certification review and the Federal Planning Finding associated with the approval of the Statewide Transportation Improvement Program.

A State is considered to have met or made significant progress toward meeting its safety targets when at least 4 of the 5 targets are met or the outcome for the performance measure is better than the baseline performance the year prior to the target year. If FHWA determines the State has not met or made significant progress towards meeting safety targets, the State will be required to use obligation authority equal to the baseline year HSIP apportionment only for safety projects.

12.4 Pavement and Bridge Condition Performance Measures

This Pavement and Bridge Condition Performance Measures final rule establishes measures for State DOTs to carry out the NHPP and to assess the condition of pavements on the non-Interstate NHS; pavements on the Interstate System; and bridges carrying the NHS, including on- and off-ramps connected to the NHS.

Pavement

Pavement Performance Measures set by FHWA include the percent of interstate and non-interstate NHS roads that have good or poor pavement conditions. FHWA defines conditions as Good if no major investment is needed, or Poor if major reconstruction investment is needed.

![Figure 12.2](image-url)
performance period progress report (October 1, 2020). MPOs can choose to either support the relevant State 4-year target or establish their own by 180 days after the State DOT target is established.

If FHWA determines the State DOT’s Interstate pavement condition falls below the minimum level for the most recent year, the State DOT must obligate a portion of National Highway Performance Program (NHPP) and transfer a portion of Surface Transportation Program (STP) funds to address Interstate pavement condition.

**Figure 12.3 Implementation Timeframe**

<table>
<thead>
<tr>
<th>Key Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>May 20, 2017</strong></td>
</tr>
<tr>
<td>Final rule effective date.</td>
</tr>
<tr>
<td><strong>January 1, 2018</strong></td>
</tr>
<tr>
<td>1st 4-year performance period begins.</td>
</tr>
<tr>
<td><strong>May 20, 2018</strong></td>
</tr>
<tr>
<td>State DOT targets must be established.</td>
</tr>
<tr>
<td><strong>January 1, 2018</strong></td>
</tr>
<tr>
<td>State DOTs collect data for Interstate pavements that conform to the final rule (IRI, Rutting, Cracking %, Faulting, and Inventory).</td>
</tr>
<tr>
<td><strong>Within 180 days of relevant State DOT(s) target establishment</strong></td>
</tr>
<tr>
<td>MPOs must commit to support state target or establish separate quantifiable target.</td>
</tr>
<tr>
<td><strong>October 1, 2018</strong></td>
</tr>
<tr>
<td>Baseline Performance Period Report for 1st Performance Period due. State DOTs report 4-year targets for Interstate and 2-year and 4-year targets for non-Interstate NHS; etc.</td>
</tr>
<tr>
<td><strong>April 15, 2019, and each April 15 thereafter</strong></td>
</tr>
<tr>
<td>State DOTs submit first Interstate data that conform to the final rule.</td>
</tr>
<tr>
<td><strong>January 1, 2020</strong></td>
</tr>
<tr>
<td>State DOTs collect data for non-Interstate NHS pavements that conform to the final rules.</td>
</tr>
<tr>
<td><strong>October 1, 2020</strong></td>
</tr>
<tr>
<td>Mid Performance Period Progress Report for the 1st Performance Period due. State DOTs report 2-year condition/performance; progress toward achieving 2-year targets; etc.</td>
</tr>
<tr>
<td><strong>June 15, 2021, and each June 15 thereafter</strong></td>
</tr>
<tr>
<td>State DOTs submit non-Interstate NHS data that conform to the final rule.</td>
</tr>
<tr>
<td><strong>December 31, 2021</strong></td>
</tr>
<tr>
<td>1st 4-year performance period ends.</td>
</tr>
<tr>
<td><strong>October 1, 2022</strong></td>
</tr>
<tr>
<td>Full Performance Period Progress Report for 1st Performance Period due. State DOTs report 4-year condition/performance; progress toward achieving 4-year targets, etc. Baseline Performance Period Report for 2nd Performance Period due. State DOTs report 2-year and 4-year targets for Interstate and non-Interstate NHS; baseline condition; etc.</td>
</tr>
</tbody>
</table>

**Bridges**

Condition-Based Performance Measures set by FHWA include the percent of NHS bridges classified as having good or poor deck areas. The classification is based on National Bridge Inventory (NBI) condition ratings for item 58 - Deck, 59 - Superstructure, 60 - Substructure, and 62 - Culvert. Condition is determined by the lowest rating of deck, superstructure, substructure, or culvert. If the lowest rating is greater than or equal to 7, the bridge is classified as good; if it is less than or equal to 4, the classification is poor. (Bridges rated below 7 but above 4 will be classified as fair; there is no related performance measure.) Deck area is computed using NBI item 49 - Structure Length, and 52 - Deck Width or 32 - Approach Roadway Width (for some culverts).
State DOTs must establish targets for all bridges carrying the NHS, which includes on- and off-ramps connected to the NHS within a State, and bridges carrying the NHS that cross a State border, regardless of ownership. Statewide 2- and 4-year targets must be established by May 20, 2018, and reported by October 1, 2018, in the Baseline Performance Period Report. Four-year targets may be adjusted at the mid performance period progress report (October 1, 2020). MPOs can either support the relevant State 4-year targets or establish their own by 180 days after the State target is established.

If for 3 consecutive years more than 10.0% of a State DOT’s NHS bridges’ total deck area is classified as Structurally Deficient, the State DOT must obligate and set aside National Highway Performance Program (NHPP) funds for eligible projects on bridges on the NHS.

State DOT targets should be determined from asset management analyses and procedures and reflect investment strategies that work toward achieving a state of good repair over the life cycle of assets at minimum practicable cost. State DOTs may establish additional measures and targets that reflect asset management objectives.

**Figure 12.5 Implementation Timeframe**

<table>
<thead>
<tr>
<th>Key Dates</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 20, 2017</td>
<td>Final rule effective date.</td>
</tr>
<tr>
<td>January 1, 2018</td>
<td>1st 4-year performance period begins.</td>
</tr>
<tr>
<td>May 20, 2018</td>
<td>Initial 2- and 4-year targets established.</td>
</tr>
<tr>
<td>October 1, 2018</td>
<td>Baseline Performance Period Report for the 1st Performance Period due. State DOTs report 2-year and 4-year targets; etc.</td>
</tr>
<tr>
<td>Within 180 days of relevant State DOT(s) target establishment</td>
<td>MPOs must commit to support State target or establish separate quantifiable target.</td>
</tr>
<tr>
<td>October 1, 2020</td>
<td>Mid Performance Period Progress Report for the 1st Performance Period due. State DOTs report 2-year condition/performace; progress toward achieving 2-year targets; etc.</td>
</tr>
<tr>
<td>December 31, 2021</td>
<td>1st 4-year performance period ends.</td>
</tr>
<tr>
<td>October 1, 2022</td>
<td>Full Performance Period Progress Report for 1st performance period due. State DOTs report 4-year condition/performace; progress toward achieving 4-year targets; etc. Baseline report due for 2nd performance period due. State DOTs report 2- and 4-year targets; baseline condition, etc.</td>
</tr>
</tbody>
</table>
12.5 System Performance

There are two system performance measures:

- % of reliable person-miles traveled on the Interstate
- % of reliable person-miles traveled on the noninterstate NHS

Travel Time Reliability

Level of Travel Time Reliability (LOTTR) is defined as the ratio of the longer travel times (80th percentile) to a “normal” travel time (50th percentile), using data from FHWA’s National Performance Management Research Data Set (NPMRDS) or equivalent. Data are collected in 15-minute segments during all time periods between 6 a.m. and 8 p.m. local time. The measures are the percent of person-miles traveled on the relevant portion of the NHS that are reliable. Person-miles take into account the users of the NHS. Data to reflect the users can include bus, auto, and truck occupancy levels.

Implementation Timeframe

Implementation differs for the Interstate and non-Interstate NHS measures for the first performance period. State DOTs must establish 2- and 4-year targets for the Interstate, but only a 4-year target for the non-Interstate NHS, by May 20, 2018. Those targets will be reported in the State’s baseline performance period report due by October 1, 2018. The State DOTs have the option to adjust 4-year targets in their mid performance period progress report, due October 1, 2020. For the first performance period only, there is no requirement for States to report baseline condition/performance or 2-year targets for the non-Interstate NHS before the mid performance period progress report. This will allow State DOTs to consider more complete data. The process will align for both Interstate and non-Interstate measures with the beginning of the second performance period on January 1, 2022.

MPOs must either support the State target or establish their own quantifiable 4-year targets within 180 days of the State target establishment.

Freight Reliability

 Freight movement and travel time reliability on the Interstate System will be assessed by the Truck Travel Time Reliability (TTTR) Index. This measure considers factors that are unique to this industry, such as the use of the system during all hours of the day and the need to consider more extreme impacts to the system in planning for on-time arrivals.

Reporting is divided into five periods: morning peak (6-10 a.m.), midday (10 a.m.-4 p.m.) and afternoon peak (4-8 p.m.) Mondays through Fridays; weekends (6 a.m.-8 p.m.); and overnights for all days (8 p.m.-6 a.m.). The TTTR ratio will be generated by dividing the 95th percentile time by the normal time (50th percentile) for each segment. The TTTR Index will be generated by multiplying each segment’s largest ratio of the five periods by its length, then dividing the sum of all length-weighted segments by the total length of Interstate.

State DOTs and MPOs will have the data they need in FHWA’s National Performance Management Research Data Set (NPMRDS) as data set includes truck travel times for the full Interstate System.
Implementation Timeframes

State DOTs must establish 2- and 4-year targets by May 20, 2018. Those targets will be reported in the State’s baseline performance period report due by October 1, 2018. The State DOTs have the option to adjust 4-year targets in their mid performance period progress report, due October 1, 2020. MPOs must either support the State target or establish their own quantifiable 4-year targets within 180 days of the State target establishment.

Congestion Management and Air Quality (CMAQ) Improvement Measures

There are two CMAQ performance measures:

- Traffic congestion
  - Peak Hour Excessive Delay (PHED) measure: annual hours of PHED per capita
  - Non-Single Occupancy Vehicle Travel (SOV) measure: % of non-SOV travel

- On-road mobile source emissions
  - Total emission reductions

Peak Hour Excessive Delay

Traffic congestion will be measured by the annual hours of peak hour excessive delay (PHED) per capita on the NHS. The threshold for excessive delay will be based on the travel time at 20 miles per hour or 60% of the posted speed limit travel time, whichever is greater, and will be measured in 15-minute intervals. Peak travel hours are defined as 6-10 a.m. local time on weekday mornings; the weekday afternoon period is 3-7 p.m. or 4-8 p.m. local time, providing flexibility to State DOTs and MPOs. The total excessive delay metric will be weighted by vehicle volumes and occupancy.

Initially, the rule applies to urbanized areas of more than 1 million people that are also in nonattainment or maintenance areas for ozone, carbon monoxide or particulate matter. In the second performance period (which begins on January 1, 2022), the population threshold changes to more than 200,000. States and MPOs with NHS mileage within an applicable urbanized area must coordinate on a single, unified target.

The BACTS urbanized area does not meet the thresholds for required applicability of the performance measure, and therefore will not set performance targets related to this measure.

Single-Occupancy Vehicle (SOV)

Non-SOV travel (carpool, van, public transportation, commuter rail, walking, or bicycling as well as telecommuting) will be measured to assist in carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. The program recognizes investments that increase multimodal solutions and vehicle occupancy levels as strategies to reduce both criteria pollutant emissions and congestion.

Initially, the rule applies to urbanized areas of more than 1 million people that are also in nonattainment or maintenance areas for ozone, carbon monoxide or particulate matter. In the second performance period (which begins on January 1, 2022), the population threshold changes to more than 200,000.

The BACTS urbanized area does not meet the thresholds for required applicability of the performance measure, and therefore will not set performance targets related to this measure.
On-Road Mobile Source Emissions

State DOTs whose geographic boundaries include any part of a nonattainment or maintenance area for ozone, carbon monoxide, or particulate matter will establish separate targets for each of these applicable criteria pollutants and precursors. The measure does not apply to a State that does not have any of these nonattainment or maintenance areas.

Total emissions reduction of on-road mobile source emissions will be measured to assist in carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. Total emissions reduction is calculated by summing 2- and 4-year totals of emissions reductions of applicable criteria pollutant and precursor, in kilograms per day, for all projects funded with CMAQ funds.

The first performance period for this measure begins October 1, 2017 and ends on September 30, 2021. States required to establish 2- and 4- year targets must do so by May 20, 2018, for the first performance period. The targets will be reported in the first State baseline performance period report due October 1, 2018.

MPOs must either support the State target or establish their own quantifiable targets within 180 days of the State target establishment. MPOs with a population more than 1 million population and with designated nonattainment and maintenance areas must develop both 2-year and 4-year quantifiable targets. Otherwise, only 4-year targets are required.

The BACTS urbanized area is in air quality attainment, so does not meet applicability requirements of the performance measure and therefore will not set performance targets related to this measure.

12.6 Transportation Asset Management

State DOTs must complete a Transportation Asset Management Plan as a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost. In simple terms, asset management is a strategic process for managing physical assets in a state of good repair over their lifecycle at minimum practicable cost.

The elements addressed within this Plan must include:

- Summary listing and condition description of the NHS pavements and bridges
- NHS pavements and bridges targets
- Asset management objectives and measures
- Performance gap analysis--State DOTs must include performance gaps that affect NHS pavements and bridges regardless of physical condition or ownership.
- Risk analysis
- Life-cycle planning
- Financial plan (minimum 10 years)
- Developing investment strategies
12.7 Transit Performance Management

Transit Asset Management

The Transit Asset Management final rule was published in the Federal Register on July 26, 2016 with an effective date of October 1, 2016. The purpose of transit asset management (TAM) is to help achieve and maintain a state of good repair (SGR) for the nation’s public transportation assets. The TAM rule develops a framework for transit agencies to monitor and manage public transportation assets, improve safety, increase reliability and performance, and establish performance measures.

All recipients of Federal transit funds that own, operate, or manage capital assets used in the provision of public transportation must collect and report data (for all assets used in the provision of public transportation service, regardless of funding source, and whether used by the recipient or sub-recipient directly, or leased by a third-party) for the following performance measures:

- Equipment/(non-revenue) Service Vehicles
- Rolling Stock
- Facilities
- Infrastructure – applies only to rail fixed guideway, track, signals and systems

The rule requires FTA grantees to develop asset management plans for their public transportation assets, including vehicles, facilities, equipment, and other infrastructure and establish a strategic and systematic process of operating, maintaining and improving public transportation capital assets effectively through their entire life cycle.
**Figure 12.7 Implementation Timeframes**

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1, 2017</td>
<td>Transit Agency establish SGR targets by class for next fiscal year</td>
</tr>
<tr>
<td>June 30, 2017</td>
<td>MPO establish SGR performance targets for next fiscal year</td>
</tr>
<tr>
<td>October 1, 2018</td>
<td>Transit Agency Complete Initial Transit Asset Management Plan</td>
</tr>
<tr>
<td>October 1, 2018</td>
<td>MPO reflects performance measures and targets in MTP and TIP</td>
</tr>
<tr>
<td>October 1, 2018</td>
<td>Reflect performance measures and targets in Statewide LRTP and STIP</td>
</tr>
<tr>
<td>October 30, 2018</td>
<td>Transit Agency submits AIM and FY 19 performance targets to NTD and shares with MPO</td>
</tr>
<tr>
<td>October 30, 2019 and annually thereafter</td>
<td>Transit Agency submit AIM, FY performance targets, and narrative report on changes and progress of performance targets in last fiscal year to NTD and shares with MPO</td>
</tr>
<tr>
<td>September 30, 2022</td>
<td>Transit Agency first update of Transit Asset Management Plan</td>
</tr>
</tbody>
</table>

**Public Transportation Safety**

The final rule relating to establishment of a public transportation agency safety plan is pending final regulation.

**Figure 12.8 Proposed Implementation Timeframe**

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Final Rule plus 1 year</td>
<td>Establish Public Transportation Agency Safety Plan, including Agency safety performance targets</td>
</tr>
<tr>
<td>180 days after Date of Final Rule plus 1 year</td>
<td>Establish MPO performance targets</td>
</tr>
</tbody>
</table>