



February 2017



Boston Region MPO

## PERFORMANCE-BASED PLANNING AND PROGRAMMING

### WHAT IS PERFORMANCE-BASED PLANNING AND PROGRAMMING?

Performance-based planning and programming (PBPP) applies data to inform decisions aimed at helping to achieve desired outcomes for the region's multimodal transportation systems. The Boston Region Metropolitan Planning Organization (MPO) articulated its desired outcomes for the Boston region's transportation system in its current long-range transportation plan (LRTP), *Charting Progress to 2040*. The overall vision established in *Charting Progress to 2040* is to create

*a modern transportation system that is safe, uses new technologies, provides equitable access, excellent mobility, and varied transportation options—in support of a sustainable, healthy, livable, and economically vibrant region.*

*Charting Progress to 2040* also created a framework to guide the MPO in making investments through its planning and programming processes, namely, the LRTP—an investment plan covering more than 20 years—the Transportation Improvement Program (TIP)—a five-year plan for funding capital infrastructure projects—and the Unified Planning Work Program (UPWP)—which is produced annually to support conceptual plans and research. The LRTP, TIP, and UPWP processes become **PBPP processes** when the MPO takes the following actions:

- Sets **goals** and **objectives** for the transportation system
- Selects **performance measures** and sets **targets** for performance outcomes
- Gathers **data and information** to monitor and analyze trends
- Uses **performance measures** and **data** to make spending decisions
- Monitors, analyzes, and reports **decision outputs** and **performance outcomes**

In many ways, the MPO is already applying PBPP principles when making investment decisions as part of the LRTP, TIP, and UPWP development processes. However, over the next few years, the MPO will need to respond to new federal PBPP requirements. In addition to meeting federal requirements, by enhancing the performance-management elements in its planning and programming activities, the MPO can

- better understand how spending decisions affect the performance of the transportation system as a whole;
- make better decisions, including difficult tradeoffs, by focusing on data and specific performance outcomes;
- increase accountability and transparency in MPO planning processes; and
- better integrate MPO planning and programming activities.

This document describes

- the PBPP process;
- upcoming federal requirements and activities related to PBPP;
- how the MPO uses PBPP practices today; and
- next steps for the MPO to build its PBPP practice, including key decisions the MPO will need to make.

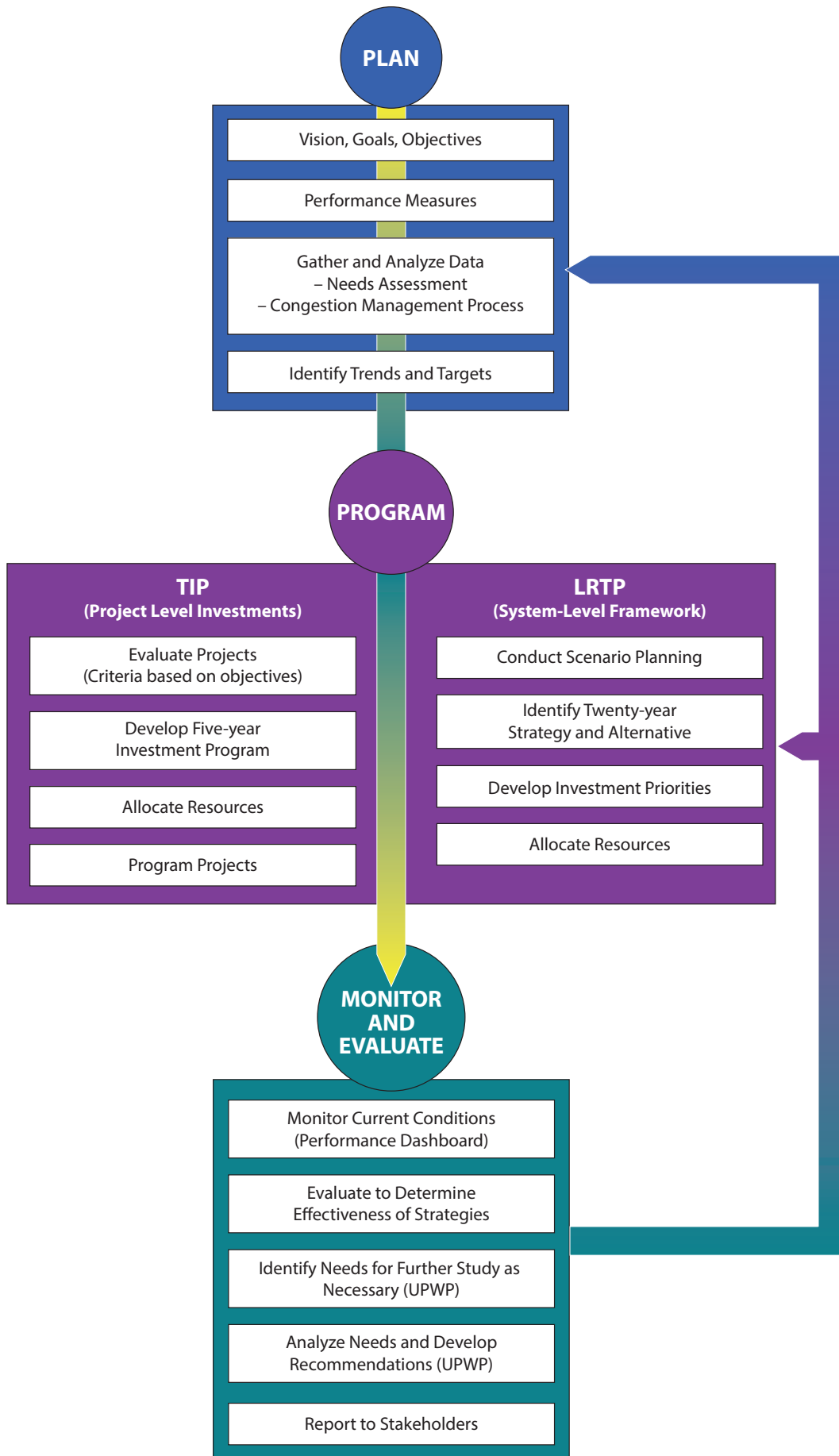
A glossary of PBPP terms and a list of key transportation performance-management rules and requirements are included at the end of this document.

The diagram on the next page illustrates the elements involved in PBPP, and how they relate to some of the MPO's existing plans and activities. The PBPP process, which is cyclical, includes three phases:

- **Plan:** Set the goals, objectives, performance measures, and targets that will guide MPO decision-making, and identify and acquire necessary data. This step involves multiple MPO documents and processes. The figure on page 4 outlines the MPO's goals and objectives established during the *Charting Progress to 2040* planning process.
- **Program:** Use the PBPP framework established in the aforesaid planning phase to create a strategy for investing MPO discretionary funds, specifically in the LRTP and TIP.
- **Monitor and Evaluate:** Review and report on the outcomes of MPO investment decisions with respect to performance measures and targets, and determine what framework or strategy adjustments are needed.

# Creating a Framework

## Boston Region MPO Performance-Based Planning Process



## CENTRAL VISION STATEMENT

The Boston Region Metropolitan Planning Organization envisions a modern transportation system that is safe, uses new technologies, provides equitable access, excellent mobility, and varied transportation options—in support of a sustainable, healthy, livable, and economically vibrant region.

### GOALS

### OBJECTIVES

#### SAFETY

Transportation by all modes will be safe

- Reduce number and severity of crashes, all modes
- Reduce serious injuries and fatalities from transportation
- Protect transportation customers and employees from safety and security threats (Note: The MPO action will be to incorporate security investments into capital planning.)

#### SYSTEM PRESERVATION

Maintain the transportation system

- Improve condition of on- and off-system bridges
- Improve pavement conditions on MassDOT-monitored roadway system
- Maintain and modernize capital assets, including transit assets, throughout the system
- Prioritize projects that support planned response capability to existing or future extreme conditions (sea level rise, flooding, and other natural and security-related man-made hazards)
- Protect freight network elements, such as port facilities, that are vulnerable to climate-change impacts

#### CAPACITY MANAGEMENT/MOBILITY

Use existing facility capacity more efficiently and increase healthy transportation capacity

- Improve reliability of transit
- Implement roadway management and operations strategies, constructing improvements to the bicycle and pedestrian network, and supporting community-based transportation
- Create connected network of bicycle and accessible sidewalk facilities (at both regional and neighborhood scale) by expanding existing facilities and closing gaps
- Increase automobile and bicycle parking capacity and usage at transit stations
- Increase percentage of population and places of employment within one-quarter mile of transit stations and stops
- Increase percentage of population and places of employment with access to bicycle facilities
- Improve access to and accessibility of transit and active modes
- Support community-based and private-initiative services and programs to meet last mile, reverse commute and other non-traditional transit/transportation needs, including those of the elderly and persons with disabilities
- Eliminate bottlenecks on the freight network
- Enhance intermodal connections
- Emphasize capacity management through low-cost investments; give priority to projects that focus on lower-cost O&M-type improvements such as intersection improvements and Complete Streets solutions

#### CLEAN AIR/CLEAN COMMUNITIES

Create an environmentally friendly transportation system

- Reduce greenhouse gases generated in the Boston region by all transportation modes as outlined in the Global Warming Solutions Act
- Reduce other transportation-related pollutants
- Minimize negative environmental impacts of the transportation system
- Support land use policies consistent with smart and healthy growth

#### TRANSPORTATION EQUITY

Provide comparable transportation access and service quality among communities, regardless of income level or minority population

- Target investments to areas that benefit a high percentage of low-income and minority populations
- Minimize any burdens associated with MPO-funded projects in low-income and minority areas
- Break down barriers to participation in MPO-decision making

#### ECONOMIC VITALITY

Ensure our transportation network provides a strong foundation for economic vitality

- Respond to the mobility needs of the 25–34-year-old workforce
- Minimize the burden of housing and transportation costs for residents in the region
- Prioritize transportation investments that serve targeted development sites
- Prioritize transportation investments consistent with the compact-growth strategies of MetroFuture

## FEDERAL REQUIREMENTS FOR PERFORMANCE-BASED PLANNING AND PROGRAMMING

The Moving Ahead for Progress in the 21st Century Act (MAP-21) directed MPOs to develop LRTPs and TIPs “through a performance-driven, outcome-based approach to planning.”<sup>1</sup> It required states, MPOs, and operators of public transportation to establish targets for performance measures in key performance areas, and to coordinate with one another when setting these targets. These requirements have been continued under the Fixing America’s Surface Transportation Act (FAST Act), the current transportation funding law.

### HIGHWAY PERFORMANCE

MAP-21 set seven national goals for the nation’s highway systems. The table below lists these goals and shows how they align with the MPO’s goal areas, as outlined in *Charting Progress to 2040*.

#### National Goals

NATIONAL GOAL	MPO GOAL
<b>Safety</b> - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads	● <b>Safety</b>
<b>Infrastructure condition</b> - To maintain the highway infrastructure asset system in a state of good repair	● <b>System Preservation</b>
<b>System reliability</b> - To improve the efficiency of the surface transportation system	● <b>Capacity Management/Mobility</b>
<b>Congestion reduction</b> - To achieve a significant reduction in congestion on the National Highway System	● <b>Capacity Management/Mobility</b>
<b>Freight movement and economic vitality</b> - 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	● <b>Capacity Management/Mobility</b> ● <b>Economic Vitality</b>
<b>Environmental sustainability</b> - To enhance the performance of the transportation system while protecting and enhancing the natural environment	● <b>Clean Air/Clean Communities</b>
<b>Reduced project delivery delays</b>	Not applicable
Not applicable	● <b>Transportation Equity</b>

<sup>1</sup> See 23 USC §134(c)(1) and 49 US.C. §5303(c)(1).



Through the federal rulemaking process, the **Federal Highway Administration (FHWA)** has required states and MPOs to monitor the transportation system using specific performance measures to address the national goals and performance areas identified in MAP-21. The table on the next page lists specific measures in various performance areas for roadways and highways.



Federally Required Highway Performance Measures  
(as of January 18, 2017)

NATIONAL GOAL	HIGHWAY PERFORMANCE AREA	PERFORMANCE MEASURE
Safety	Injuries & Fatalities	<ul style="list-style-type: none"> <li>• Number of fatalities</li> <li>• Fatality rate (per 100 million vehicle miles traveled)</li> <li>• Number of serious injuries</li> <li>• Serious injury rate (per 100 million vehicle miles traveled)</li> <li>• Number of non-motorized fatalities and non-motorized serious injuries</li> </ul>
Infrastructure Condition	Pavement Condition	<ul style="list-style-type: none"> <li>• Percentage of pavements on the Interstate System in Good condition</li> <li>• Percentage of pavements on the Interstate System in Poor condition</li> <li>• Percentage of pavements on the non-Interstate National Highway System (NHS) in Good condition</li> <li>• Percentage of pavements on the non-Interstate NHS in Poor condition</li> </ul>
Infrastructure Condition	Bridge Condition	<ul style="list-style-type: none"> <li>• Percentage of NHS bridges classified as in Good condition</li> <li>• Percentage of NHS bridges classified as in Poor condition</li> </ul>
System Reliability	Performance of the National Highway System	<ul style="list-style-type: none"> <li>• Percent of person miles traveled on the Interstate System that are reliable</li> <li>• Percent of person miles traveled on the non-Interstate NHS that are reliable</li> <li>• Percent change in tailpipe carbon dioxide emission levels on the NHS compared to the calendar year 2017 levels</li> </ul>
Freight Movement and Economic Vitality	Freight Movement on the Interstate System	Truck Travel Time Reliability Index
Congestion Reduction	Traffic congestion	<ul style="list-style-type: none"> <li>• Annual hours of peak-hour excessive delay per capita</li> <li>• Percent of non-single-occupant vehicle travel</li> </ul>
Environmental Sustainability	On-Road Mobile Source Emissions	Total emissions reduction

## TRANSIT PERFORMANCE

Recipients of public transit funds—which can include states, local authorities, and public transportation operators—are required to establish performance targets for safety and state of good repair; to develop transit asset management and transit safety plans; and to report on their progress toward achieving targets. Public transportation operators are directed to share information with MPOs and states so that all plans and performance reports are coordinated.

The table below identifies performance measures outlined in the National Public Safety Transportation Plan, released by the **Federal Transit Administration (FTA)**, and in the final rule for transit asset management.

### Federally Required Transit Performance Measures (as of January 18, 2017)

NATIONAL GOAL	TRANSIT PERFORMANCE AREA OR ASSET CATEGORY	PERFORMANCE MEASURE
Safety	Fatalities	Total number of reportable* fatalities and rate per total vehicle revenue miles by mode
	Injuries	Total number of reportable* injuries and rate per total vehicle revenue miles by mode
	Safety Events	Total number of reportable* events and rate per total vehicle revenue miles by mode
	System Reliability	Mean distance between major mechanical failures by mode
Infrastructure Condition (State of Good Repair: Transit Asset Management)	Equipment	Percentage of vehicles that have met or exceeded their Useful Life Benchmark (ULB)
	Rolling Stock	Percentage of revenue vehicles within a particular asset class that have met or exceeded their ULB
	Infrastructure	Percentage of track segments with performance restrictions
	Facilities	Percentage of facilities within an asset class rated below 3.0 on the FTA Transit Economic Requirements Model scale

\* Reportable as defined in the National Transit Database *Safety and Security Reporting Manual*.



## OTHER REQUIREMENTS AND PROVISIONS

The transportation legislation and federal rules that identify performance measures also describe how states and MPOs will need to incorporate these measures into their planning processes. This information is current as of January 18, 2017. MPO staff is awaiting further federal guidance on implementation of these provisions, several of which are described below:

### Target Setting

- MPOs are required to establish performance targets no later than 180 days after the state or public transportation operator sets performance targets.<sup>2</sup>
- For each roadway performance measure, an MPO can decide to commit to support a statewide target, or to establish a quantifiable target specific to its planning area.
- Both state and MPO targets for roadway performance measures will be set at two-year and four-year intervals.
- States, MPOs, and public transit operators must coordinate their respective targets for performance measures with each other to ensure consistency to the maximum extent practicable.

### Reporting

- States and MPOs' LRTPs must describe the performance measures and targets used to assess system performance, evaluate the performance of the transportation system with respect to the federally required performance targets, and report on progress made.
- State Transportation Improvement Programs (STIPs) and MPOs' TIPs must link investment priorities to the targets in their respective LRTPs and describe, to the maximum extent practicable, the anticipated effect of the program toward achieving established targets.
- MPOs must report baseline roadway transportation system condition and performance data and progress toward the achievement of targets to their respective state Departments of Transportation (DOT).

### Federal Assessments

- FHWA will determine whether state DOTs have met or have made significant progress towards meeting targets for the highway system. Progress at the state level would be considered significant if an actual outcome is either equal to or better than the established target, or better than the baseline condition.
- FHWA and FTA will not directly assess MPO progress towards meeting targets for required performance measures. Instead, these agencies will review MPO performance as part of ongoing transportation planning process reviews, including Transportation Management Area certification reviews (required for the Boston Region MPO) and the Federal Planning Finding associated with approval of the STIP.<sup>3</sup>

<sup>2</sup> Specific deadlines for when states and/or public transportation operators need to define their targets vary by measure.



<sup>3</sup> See FHWA, Metropolitan Planning Organization Safety Performance Measures Fact Sheet, [http://safety.fhwa.dot.gov/hsip/spm/docs/mpo\\_factsheet.pdf](http://safety.fhwa.dot.gov/hsip/spm/docs/mpo_factsheet.pdf), p. 1

## BUILDING THE BOSTON REGION MPO'S UNIQUE PERFORMANCE-BASED PLANNING AND PROGRAMMING PROCESS



The MPO is already engaging in activities that support PBPP. The table below lists the steps of the MPO's proposed PBPP process, indicates whether the LRTP and TIP processes are relevant to each step (noted in the table with green shading), identifies activities already underway (noted in the table with a check mark), and those that are planned (noted in green with no check mark).

Steps in the Boston Region MPO's PBPP Process

PHASE	ACTIVITY	APPLIES TO LRTP	APPLIES TO TIP	SUPPORTING OR RELATED MPO ACTIVITIES
Plan	Follow a collaborative process to set goals and objectives, which align with national goals	✓		
	Integrate goals and objectives into planning and programming activities	✓	✓	UPWP development and studies; Congestion Management Process (CMP) development
	Use performance measures for planning and analysis	✓	✓	UPWP development and studies; CMP development
	Select standard performance measures for monitoring outputs and outcomes of MPO processes			UPWP and CMP development
	Display baseline information through LRTP Needs Assessment, CMP Roadway Performance Dashboards, and related applications	✓	✓	CMP monitoring; MPO data collection and management
	Collaborate with other stakeholders (e.g. MassDOT and other MPOs) on setting targets and other PBPP topics	✓	✓	CMP development and monitoring; UPWP studies; MPO data collection and management
	Track trends for performance measures	✓	✓	CMP monitoring

 PBPP activity applies to this document
  Work on PBPP activity is underway

PHASE	ACTIVITY	APPLIES TO LRTP	APPLIES TO TIP	SUPPORTING OR RELATED MPO ACTIVITIES
Plan	Set targets for a designated set of performance measures			
	Collect, organize, and analyze data to support performance monitoring	✓	✓	UPWP metropolitan planning funding allocation; MPO data collection and management
Program	Create and analyze scenarios to explore potential performance measure outputs and outcomes	✓		UPWP studies; travel demand modeling
	Identify strategies and policies for allocating funding to address goals and objectives	✓	✓	UPWP development and studies
	Use a performance- and criteria-driven process to support the MPO in selecting infrastructure projects or study locations for funding	✓	✓	UPWP studies
Monitor and Evaluate	Report baseline data, trends, and MPO performance outputs and outcomes	✓	✓	CMP monitoring; MPO data collection and management; travel demand modeling
	Determine the effectiveness of MPO strategies and policies on performance outcomes	✓	✓	UPWP studies
	Identify transportation needs and issue areas for further study	✓	✓	UPWP studies
	Review and adjust the MPO's PBPP framework as needed	✓	✓	UPWP and CMP development

 PBPP activity applies to this document
  Work on PBPP activity is underway

## GOING BEYOND FEDERAL REQUIREMENTS

The requirements in MAP-21 and the FAST Act establish the backbone of the MPO's PBPP process. In response to the existing federal mandate, over the next several years, the MPO will continue to set targets for specific required performance measures and coordinate on PBPP activities with the Massachusetts Department of Transportation (MassDOT), the MBTA, other MPOs, and other stakeholders. However, the MPO can exceed these requirements to create a PBPP process that meets the MPO's specific needs and interests. The following options are available:

- The MPO can decide to select any number of performance measures for its six goal areas in addition to those required by federal legislation. Specific performance targets could be set for these measures to track performance. The table on the opposite page includes **examples** of performance measures that could be incorporated into the MPO's PBPP process. The MPO has already used some of these performance measures for the LRTP Needs Assessment, scenario planning, LRTP and TIP performance reports, and for air-quality related evaluations.
- The MPO can use scenario planning exercises during the development of the LRTP to explore different performance measures for use in planning and programming.
- The MPO could explore different approaches and tools to update the public on performance measurement and progress toward achieving goals.

Over the coming months, MPO staff will collect information for use in performance measurement, monitor updates in federal and state PBPP processes, explore tools and data, and recommend methods, performance measures, and performance targets to the MPO board. This work is designed to help the MPO make key decisions that will create an effective, integrated, and informative PBPP process for the Boston Region MPO.



## Examples of New Performance Measures for the Boston Region MPO

GOAL	EXAMPLE OF FEDERALLY REQUIRED MEASURE	POTENTIAL ADDITIONAL MPO MEASURE
● <b>Safety</b>	Number of fatalities	Number of “Top 200” high-crash intersection locations improved through programmed projects <sup>4</sup>
● <b>System Preservation</b>	Percentage of NHS bridges classified as in good condition	Number of sidewalk miles improved through programmed projects
● <b>Capacity Management/ Mobility</b>	Annual hours of peak-hour excessive delay per capita	Percentage of population within a quarter mile of a transit stop or station
● <b>Clean Air/Clean Communities</b>	Total emissions reduction	Percentage of population with access to bicycle facilities
● <b>Transportation Equity</b>	<i>Not applicable (no federally required measure)</i>	Number of programmed projects serving areas with Title VI and/or environmental-justice populations
● <b>Economic Vitality</b>	Percent of the Interstate System mileage providing for reliable truck travel times	Number of projects that provide access to targeted development areas

<sup>4</sup> MassDOT uses Equivalent Property Damage Only (EPDO) scoring to identify the top 200 high-crash intersection locations in the state. EPDO scoring is a method for assessing the frequency and severity of crashes at a given location over a period of time. The method involves applying weighting factors to indicate the severity of a crash.



## GLOSSARY

The definitions below are adapted from FHWA's glossary, Transportation Performance Management Terms.

**Goal:** A broad statement of a desired end condition or outcome (e.g. "transportation by all modes will be safe").

**Metric:** An indicator of performance or condition (e.g. number of fatalities during a particular year).

**Objective:** A specific, measurable statement that supports achievement of a goal (e.g. increase the percentage of the Boston region's population and places of employment with access to bicycle facilities, which enhances capacity management and mobility).

**Outcome:** Intended results or consequences of carrying out a particular program or activity, which are often of most interest to system users (e.g. number of serious injuries reduced).

**Output:** Goods, services, or activities produced by a program or project that are delivered to the public (e.g. miles of pavement improved). Outputs can be process oriented, and they help agencies track a program's progress toward reaching desired outcomes.

**Performance Measure:** A metric used to monitor and report on a [transportation] characteristic. These measures are used on an ongoing basis to track progress toward goals, objectives, and achievement of targets (e.g. number of fatalities, tracked over time to assess progress in improving transportation safety).

**Performance-based Planning and Programming:** A strategic process, or series of processes, that apply data to inform decisions aimed at helping to achieve desired outcomes for the region's multimodal transportation systems.

**Strategy:** A plan of action for achieving a target, goal, or objective (e.g. programming more Complete Streets projects to support more non-motorized travel).

**Target:** A level of performance that an entity seeks to achieve within a specific time frame (e.g. a five percent reduction within two years of crashes that result in serious injuries to bicyclists and pedestrians).

## KEY RULES AND REQUIREMENTS

(as of January 18, 2017)

- 23 US Code §134 – Metropolitan transportation planning
- 23 US Code §135 – Statewide and nonmetropolitan transportation planning
- 23 US Code §150 – National goals and performance management measures
- 23 Code of Federal Regulations Part 450 – Planning assistance and standards
- 23 Code of Federal Regulations Part 490 – National performance management measures
- 49 US Code §5303 – Metropolitan transportation planning
- 49 US Code §5326 – Transit asset management
- 49 Code of Federal Regulations Part 625 – Transit asset management
- 49 US Code §5329 – Public transportation safety program
- FTA, National Public Transportation Safety Plan (2017)





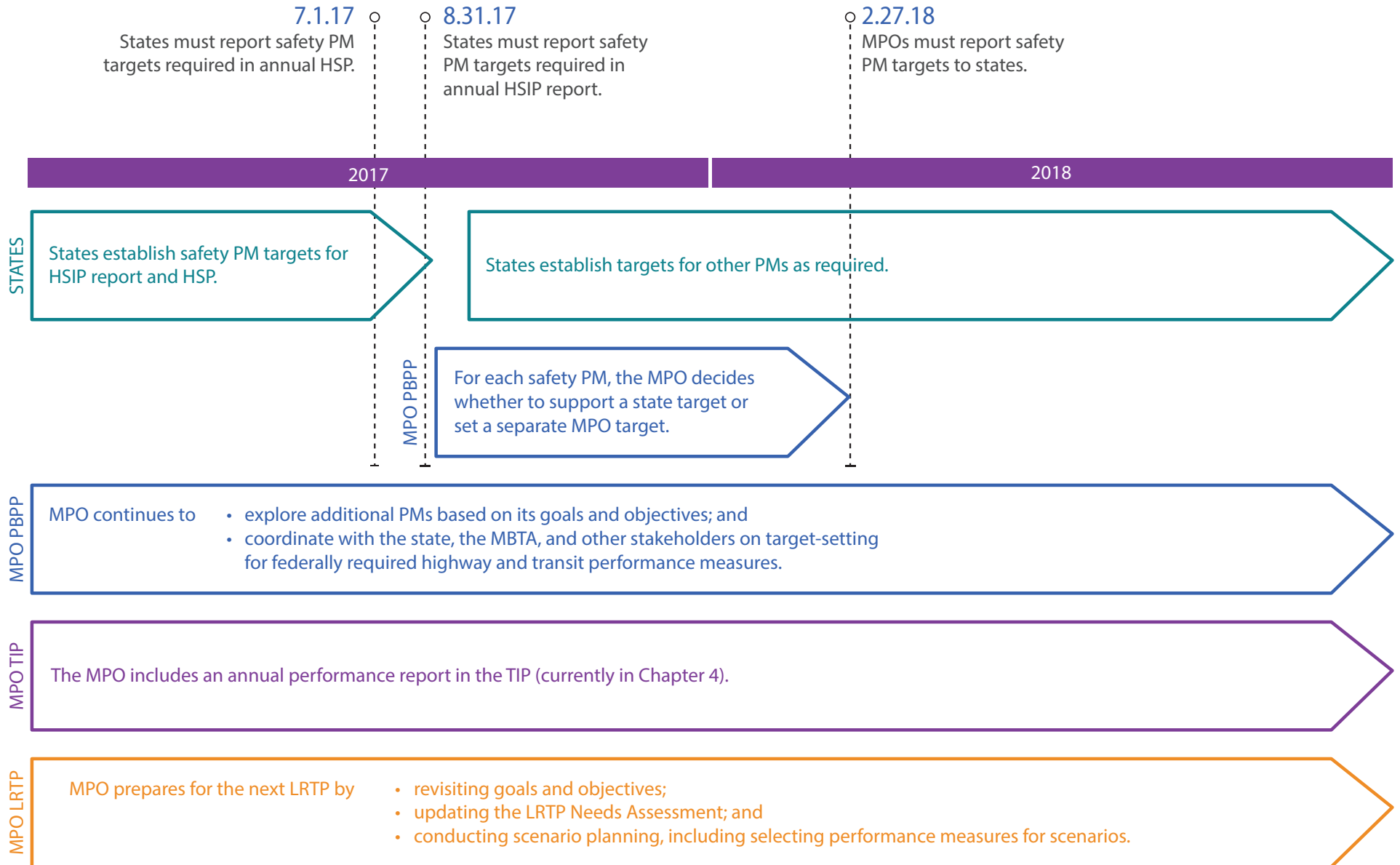
**performance-based  
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## SHORT-TERM TIMELINE

*This page will be updated periodically to reflect new activities and decisions as the MPO's performance-based planning and programming (PBPP) process evolves. This information is current as of January 18, 2017. MPO staff is awaiting further federal guidance on implementation of PBPP requirements.*

For reference, the graphic below depicts the major activities and milestones that need to occur in 2017 and 2018.



# Boston Region MPO

## PERFORMANCE-BASED PLANNING AND PROGRAMMING

February 2017

### KEY DECISIONS FOR THE MPO

The table and paragraph below highlight some key upcoming MPO decisions related to PBPP. The federal rule for safety performance measures has been finalized, and the FHWA set the schedule for states and MPOs to respond to requirements. This table will be updated as other rules are finalized.

DECISION(S)	FEDERAL OR STATE REQUIRED?	DEADLINE
Identify scenarios to study, and associated measures to track.	No	Spring 2017
Decide whether the MPO will support state targets or develop its own targets for federally required safety performance measures		
Federally required safety performance measures include the following: <ul style="list-style-type: none"> <li>• Number of fatalities</li> <li>• Fatality rate (per 100 million VMT)</li> <li>• Number of serious injuries</li> <li>• Serious injury rate (per 100 million VMT)</li> <li>• Number of non-motorized fatalities and serious injuries</li> </ul>	Yes	2/27/2018 (pending information on state deadlines)
Choose whether to establish other safety performance measures and targets for tracking performance	No	Winter 2017/2018

VMT: Vehicle miles traveled.

In the future, the MPO will also need to decide whether it will support state targets or set its own targets for other federally required performance measures related to infrastructure condition, system reliability, congestion reduction, freight movement and economic vitality, and environmental sustainability. MPO staff will provide updated information as timelines for these other federally required performance measures are established. The MPO will also choose whether to establish other (non-federally required) performance measures for other goal areas, and whether to develop targets for these measures.

