

# CHAPTER 12



*Photo: I-391 Exit 3 in Chicopee, MA*

## PERFORMANCE MEASURES

### A. INTRODUCTION

The FAST Act requires MPOs, in collaboration with the state DOT and transit agencies, to formally establish targets for performance measures aligned with the national goals. Performance Based Planning and Programming (PBPP) refers to the application of performance management within the parameters of the FAST Act to achieve desired outcomes for the multimodal transportation system. It is intended to advance transportation investments based on their ability to meet established goals. This includes setting targets for the measures identified in the FAST Act.

Performance measures are intended to monitor and track performance over time and assess the effectiveness of projects and strategies in meeting the national goal areas. In the Pioneer Valley region, performance based planning methods have been used in the development of the Transportation Evaluation Criteria to program projects as part of the Regional Transportation Improvement Program for many years.

USDOT implemented the federal PBPP requirements through a series of phased rulemakings. At the conclusion of this rulemaking process, the Commonwealth of Massachusetts had twelve months to establish statewide performance targets for each required federal performance measure. The Pioneer Valley MPO then had 180 days from the date of Commonwealth’s adoption of the statewide performance targets to either adopt the statewide targets or establish their own regional performance targets.

The Federal Transit Administration has finalized a rule to define requirements for transit asset management. This rule requires public transportation providers to develop and implement transit asset management (TAM) plans. TAM plans must include an asset inventory, condition assessments of inventoried assets, and a prioritized list of investments to improve the state of good repair of capital assets. This rule also establishes state of good repair standards and four state of good repair performance measures.

**Table 12-1 – Regional Performance Measure Status**

<b>Final Rule</b>	<b>Effective Date</b>	<b>Status</b>	<b>Updated</b>
Safety Performance Measures (PM1)	April 14, 2016	MPO adopted state targets on February 26, 2019	Annually
Pavement/Bridge Performance Measures (PM2)	May 20, 2017	MPO adopted state targets on October 23, 2018	Every Two Years
System Performance Measures (PM3)	May 20, 2017	MPO adopted state targets on September 25, 2018	Every Two Years
Transit Asset Management Plan (TAM)	July 26, 2016	MPO adopted TAM Plan on March 26, 2019	Every Four Years

As can be seen from the above table, the Pioneer Valley MPO has elected to adopt the State performance targets for PM1, PM2 and PM3. The MPO will continue to work in close collaboration with the PVTA to incorporate their TAM performance targets in to the regional transportation planning process. The UPWP includes specific tasks to support the performance based planning and programming for the Pioneer Valley MPO.

## B. SAFETY PERFORMANCE MEASURES (PM1)

Pioneer Valley has chosen to adopt the statewide safety performance measure targets set by MassDOT for Calendar Year (CY) 2019. In setting these targets, MassDOT has followed FHWA guidelines by using statewide crash data and Highway Performance Monitoring System (HPMS) data for vehicle miles traveled (VMT) in order to calculate 5 year, rolling average trend lines for all FHWA-defined safety measures. For CY 2019 targets, four of the five safety measures—total number of fatalities, rate of fatalities per 100 million vehicle miles traveled, total number of incapacitating injuries, and rate of incapacitating injuries per 100 million VMT—were established by extending their trend lines into the 2015-2019 period. All four of these measures reflect a modest decrease in statewide trends. The fifth safety measure, the total number of combined incapacitating injuries and fatalities for non-motorized modes, is the only safety measure for which the statewide trend line depicts an increase. MassDOT's effort to increase non-motorized mode share throughout the Commonwealth has posed a challenge to simultaneously reducing non-motorized injuries and fatalities. Rather than adopt a target that depicts an increase in the trend line, MassDOT has elected to establish a target of non-motorized fatalities and injuries and for CY 2019 that remains constant from the rolling average for 2012–2016. In recent years, MassDOT and the Pioneer Valley have invested in “complete streets,” bicycle and pedestrian infrastructure, intersection and safety improvements in both the Capital Investment Plan (CIP) and Statewide Transportation Improvement Program (STIP) to address increasing mode share and to incorporate safety mitigation elements into projects. Moving forward, Pioneer Valley, alongside MassDOT, is actively seeking to improve data collection and methodology for bicycle and pedestrian VMT counts and to continue analyzing crash clusters and crash counts that include both motorized and non-motorized modes in order to address safety issues at these locations.

In all safety categories, MassDOT has established a long-term target of “Toward Zero Deaths” through MassDOT's Performance Measures Tracker<sup>6</sup> and will be establishing safety targets for the MPO to consider for adoption each calendar year. While the MPO is not required by FHWA to report on annual safety performance targets, FHWA guidelines require MPOs to adopt MassDOT's annual targets or to establish their own each year.

The safety measures MassDOT has established for CY 2019, and that Pioneer Valley has adopted, are as follows:

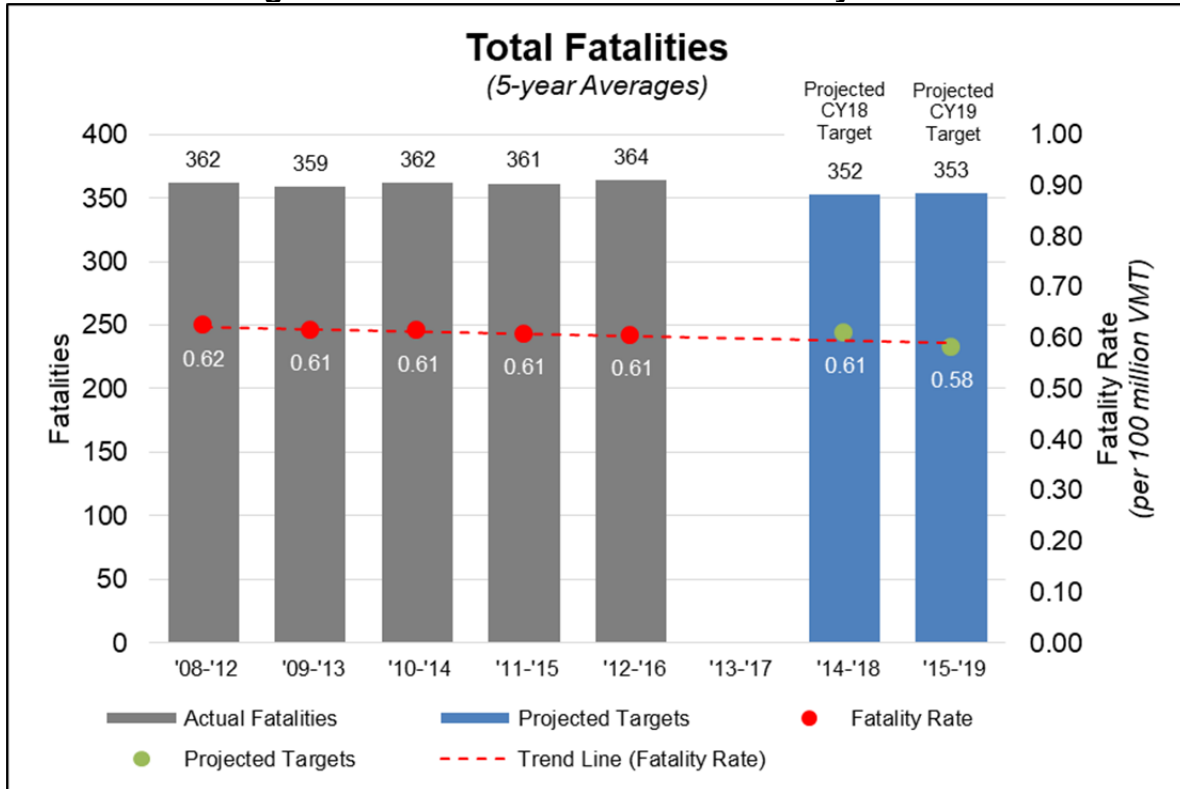
- **Fatalities:** The target number of fatalities for years CY 2019 is 353, down from an average of 364 fatalities for the years 2012–2016. [See Figure 12-1]
- **Rate of Fatalities per 100 million VMT:** The target fatality rate for years CY 2019 is 0.58, down from a 0.61 average for years 2012–2016. [See Figure 12-1]

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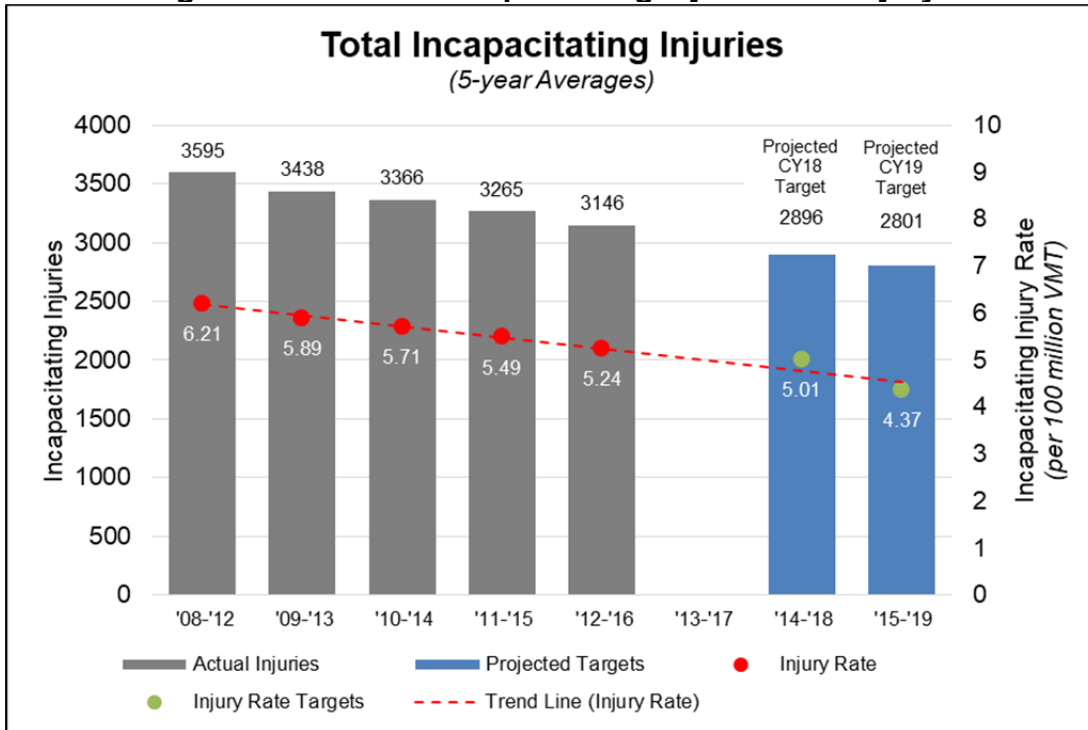
<sup>6</sup> <https://www.mass.gov/lists/tracker-annual-performance-management-reports>

- **Serious Injuries:** The target number of incapacitating injuries for CY2019 is 2801, down from the average of 3146 for years 2012–2016. [See Figure 12-2]
- **Rate of Incapacitating Injuries per 100 million VMT:** The incapacitating injury rate target for CY2019 is 4.37 per year, down from the 5.24 average rate for years 2012–2016. [See Figure 12-2]

**Figure 12-1 – Total Fatalities and Fatality Rate**



**Figure 12-2 – Total Incapacitating Injuries and Injury Rate**



**C. BRIDGE & PAVEMENT PERFORMANCE MEASURES (PM2)**

Pioneer Valley has chosen to adopt the 2-year (2020) and 4-year (2022) statewide bridge and pavement performance measure targets set by MassDOT. MassDOT was required to adopt a statewide target by May 20<sup>th</sup>, 2018, with MPOs either adopting the statewide target or establishing their own by November 2018. In setting these targets, MassDOT has followed FHWA guidelines by measuring bridges and pavement condition using the 9-point National Bridge Inventory Standards (NBIS); the International Roughness Index (IRI); the presence of pavement rutting; and the presence of pavement cracking. Two year and four year targets were set for six individual performance measures: percent of bridges in good condition; percent of bridges in poor condition; percent of Interstate pavement in good condition; percent of Interstate pavement in poor condition; percent of non-Interstate pavement in good condition; and percent of non-Interstate pavement in poor condition. All of the above performance measures are tracked in greater detail in MassDOT’s Transportation Asset Management Plan (TAMP), which is due to be finalized in July 2019.

Targets for bridge-related performance measures were determined by identifying which bridge projects are programmed and projecting at what rate bridge conditions deteriorate. The bridge-related performance measures measure the percentage of deck area, rather than the total number of bridges.

Performance targets for pavement-related performance measures were based on a single year of data collection, and thus were set to remain steady under the

guidance of FHWA. These measures are to be revisited at the 2-year mark (2020), once three years of data are available, for more informed target setting.

MassDOT continues to measure pavement quality and to set statewide short-term and long-term targets in the MassDOT Performance Management Tracker using the Pavement Serviceability Index (PSI), which differs from IRI. These measures and targets are used in conjunction with federal measures to inform program sizing and project selection.

**Table 12-2 – Bridge and Pavement Performance Measure Status**

Performance Measure	Current (2017)	2-year target (2020)	4-year target (2022)
Bridges in good condition	15.22%	15%	16%
Bridges in poor condition	12.37%	13%	12%
Interstate Pavement in good condition	74.2%	70%	70%
Interstate Pavement in poor condition	0.1%	4%	4%
Non-Interstate Pavement in good condition	32.9%	30%	30%
Non-Interstate Pavement in poor condition	31.4%	30%	30%

#### **D. RELIABILITY, CONGESTION, & EMISSIONS PERFORMANCE MEASURES (PM3)**

Pioneer Valley has chosen to adopt the 2-year (2020) and 4-year (2022) statewide reliability, congestion, and emissions performance measure targets set by MassDOT. MassDOT was required to adopt a statewide target by May 20<sup>th</sup>, 2018, with MPOs either adopting the statewide target or establishing their own by November 2018.

MassDOT followed FHWA regulation in measuring Level of Travel Time Reliability (LOTTR) on both the Interstate and non-Interstate NHS as well as Truck Travel Time Reliability (TTTR) on the Interstate system using the National Performance Management Research Dataset (NPMRDS) provided by FHWA. These performance measures aim to identify the predictability of travel times on the roadway network by comparing the average travel time along a given segment against longer travel times. For LOTTR, the performance of all segments of the Interstate and of the non-Interstate NHS are defined as either reliable or unreliable based on a comparison between the 50<sup>th</sup> percentile travel time and the 80<sup>th</sup> percentile travel time, and the proportion of reliable segments is reported. For TTTR, the ratio between the 50<sup>th</sup>

percentile travel time and the 90<sup>th</sup> percentile travel time for trucks only along the Interstate system is reported as a statewide measure. As this data set has but one year of consistent data, FHWA guidance has been to set conservative targets and to adjust future targets once more data becomes available. To that end, MassDOT’s reliability performance targets are set to remain the same.

Emissions reduction targets are measured as the sum total of all emissions reductions anticipated through CMAQ-funded projects in non-attainment or air quality maintenance areas (currently the cities of Lowell, Springfield, Waltham, and Worcester, and the town of Oak Bluffs) identified in the Statewide Transportation Improvement Program (STIP). This anticipated emissions reduction is calculated using the existing CMAQ processes.

**Table 12-3 – Reliability, Congestion and Emissions Performance Measure Status**

Measure	Current (2017)	2-year (2020)	4-year (2022)
Non-Interstate LOTTR	80%	80%	80%
Interstate LOTTR	68%	68%	68%
TTTR	1.85	1.85	1.85
PHED (Boston UZA)	18.31	18.31	18.31
% non-SOV (Boston UZA)	33.6% (2016)	34.82%	35.46%
Emissions Reductions	Baseline (FFY 14–17)	1,622 CO 497.9 Ozone	TBD CO (Springfield) 1.1 Ozone

**Table 12-4 – Performance Measure Linked Investments 2015-2019**

TIP Year	SID	Municipality	Project Description	Total Programmed Funds	PM Rule
2017	608023	Multiple	AMHERST- HADLEY- SIDEWALK & WHEELCHAIR RAMP CONSTRUCTION ON ROUTE 9	\$ 1,204,050	PM1
2015	604035	Hadley	HADLEY- SIGNAL & INTERSECTION IMPROVEMENTS AT ROUTE 9 (RUSSELL STREET) & ROUTE 47 (MIDDLE STREET)	\$ 1,000,000	PM1
2015	604035	Hadley	HADLEY- SIGNAL & INTERSECTION IMPROVEMENTS AT ROUTE 9 (RUSSELL STREET) & ROUTE 47 (MIDDLE STREET)	\$ 1,201,102	PM1
<b>PM 1 Total (3 Projects)</b>				<b>\$ 3,405,152</b>	<b>14%</b>
2019	600513	Agawam	AGAWAM- RECONSTRUCTION OF ROUTE 187 FROM 425 FT. SOUTH OF S. WESTFIELD STREET TO ROUTE 57 (0.3 MILES - PHASE I)	\$ 2,622,622	PM2
2015	606417	Cummington	CUMMINGTON- RETAINING WALL REPLACEMENT ON ROUTE 9 ADJACENT TO C-21-023 OVER WESTFIELD BROOK	\$ 1,500,000	PM2
<b>PM 2 Total (2 Projects)</b>				<b>\$ 4,122,622</b>	<b>17%</b>
2019	PV0001	multiple	P21 Express - Year 2 Operating	\$ 500,000	PM3
2018	PV0005	Multiple	PVTA P21 Express Service Between Union Station in Springfield and the Holyoke Transportation Center	\$ 500,000	PM3
2018	608786	Multiple	AMHERST- HADLEY- NORTHAMPTON- TRANSIT SIGNAL PRIORITY UPGRADES AT VARIOUS LOCATIONS	\$ 1,200,000	PM3
2019	607987	Ware	WARE- INTERSECTION IMPROVEMENTS @ MAIN STREET, WEST STREET, NORTH STREET, SOUTH STREET & CHURCH STREET	\$ 2,475,087	PM3
2018	604203	Agawam	AGAWAM- INTERSECTION IMPROVEMENTS AT ROUTE 187 & ROUTE 57	\$ 3,288,000	PM3
2018	604597	Northampton	NORTHAMPTON- IMPROVEMENTS ON I-91 INTERCHANGE 19 AT ROUTE 9 AND DAMON ROAD	\$ 7,438,490	PM3
2015	604035	Hadley	HADLEY- SIGNAL & INTERSECTION IMPROVEMENTS AT ROUTE 9 (RUSSELL STREET) & ROUTE 47 (MIDDLE STREET)	\$ 1,836,958	PM3
<b>PM 3 Total (7 Projects)</b>				<b>\$ 17,238,535</b>	<b>70%</b>
<b>Total (12 Projects)</b>				<b>\$ 24,766,309</b>	<b>100%</b>

As can be seen in Table 12-4 the PVMPO has invested \$25 million on projects which will help meet the MassDOT Performance Targets. This assessment was made based on the project TEC scoring for performance related categories such as safety, pavement condition, congestion relief, etc. Of these investments, 14% will help achieve PM1, 17% will help achieve PM2, and 70% will help achieve PM3. As more data becomes available it is anticipated that corresponding PM trends should demonstrate that our region is meeting or exceeding our PM Targets.



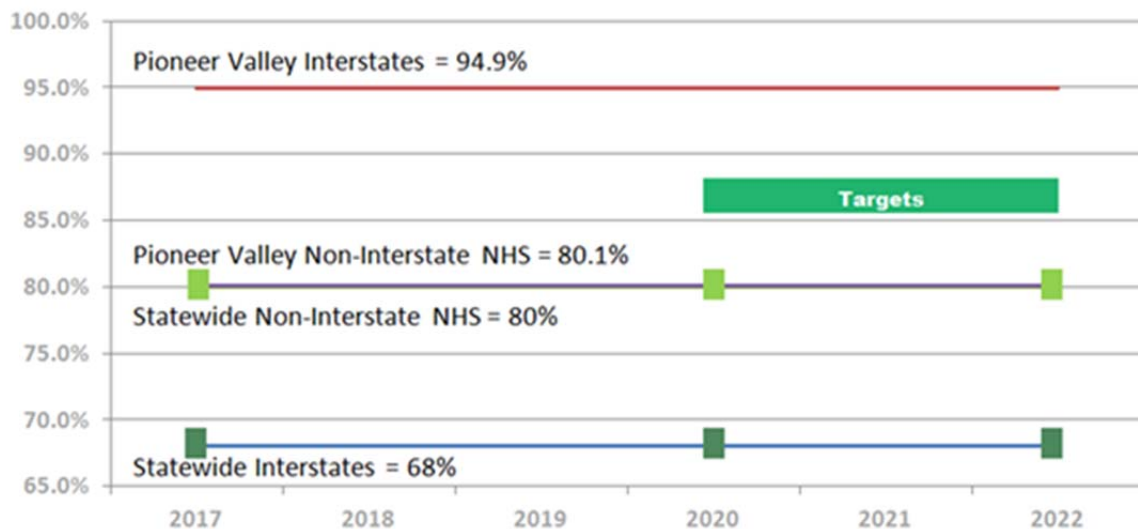
## 1. National Performance Measure Research Data Set (NPMRDS)

The NPMRDS is a monthly archive of average travel times, reported every 5 minutes when data is available, on the National Highway System. The travel times are based on vehicle probe-based data. Separate average travel times are included for “all traffic”, freight and passenger travel. FHWA provides access to the NPMRDS to our State DOT and MPO partners for their performance management activities. Average travel times have been collected monthly since July 2013.

- Level of Travel Time Reliability (LOTTR) on both the Interstate System and non-Interstate NHS.
  - LOTTR is based on the amount of time it takes to drive the length of a road segment.
  - The metric is the percentage of person-miles traveled that are "reliable."
  - Reporting Requirements:
    - Must be on the **statewide** level.
  - MassDOT is required to adopt a target by May 20, 2018 with MPOs either adopting the statewide target or establishing their own by November 2018.
- To compute LOTTR:
  - Collect travel times (NPMRDS)
  - Find the 50<sup>th</sup> pct. and 80<sup>th</sup> pct. times
  - Compute  $LOTTR = \frac{80^{th} \text{ percentile}}{50^{th} \text{ percentile}}$
  - Repeat for 4 periods (see figure on right)
  - If all are below 1.50, segment is reliable.
  - The statewide metric is the % of person miles traveled that are reliable.

Level of Travel Time Reliability (LOTTR) <small>(Single Segment, Interstate Highway System)</small>		
Monday – Friday	6am – 10am	$LOTTR = \frac{44 \text{ sec}}{35 \text{ sec}} = 1.26$
	10am – 4pm	LOTTR = 1.39
	4pm – 8pm	LOTTR = <b>1.54</b>
Weekends	6am – 8pm	LOTTR = 1.31
Must exhibit LOTTR below 1.50 during <b>all</b> of the time periods		<b>Segment is <u>not</u> reliable</b>

**Figure 12-3 – Level of Travel Time Reliability**



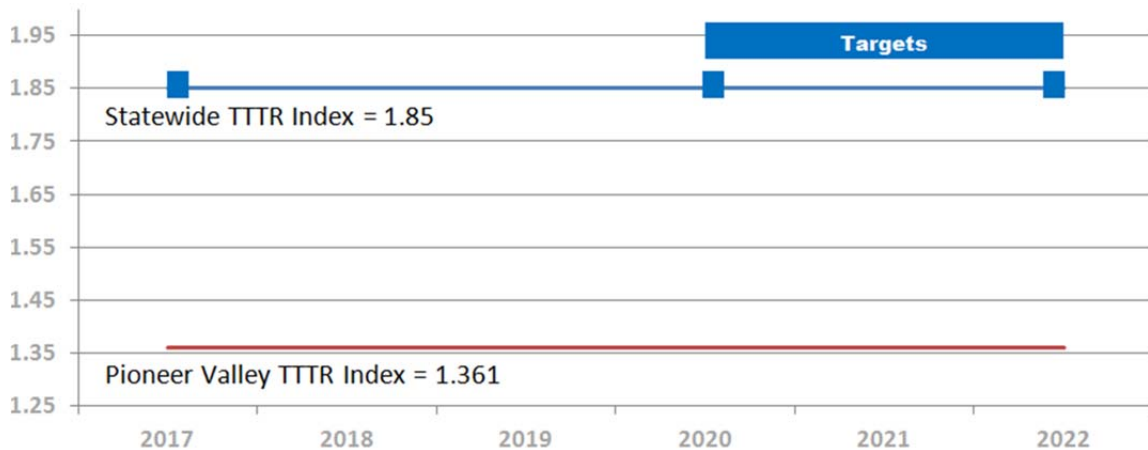
- Level of **Truck** Travel Time Reliability (TTTR)
- TTTR is based on the amount of time it takes trucks to drive the length of a road segment.
- Reporting Requirements:
  - Must be on the **statewide** level.
  - Only required to report on TTTR for the Interstate system.

MassDOT is required to adopt a target by May 20, 2018 with MPOs either adopting the statewide target or establishing their own by November 2018.

- To compute TTTR:
  - Collect travel times (NPMRDS)
  - Find the 50<sup>th</sup> pct. and 95<sup>th</sup> pct. times
  - Compute TTTR = 95<sup>th</sup>/50<sup>th</sup> percentile
  - Repeat for 5 periods (see figure on right)
  - The TTTR Index is generated as a weighted average of the largest period for each segment and its weight.

Level of Truck Travel Time Reliability (LOTTR) <i>(Single Segment, Interstate Highway System)</i>		
Monday – Friday	6am – 10am	TTTR = $\frac{55 \text{ sec}}{35 \text{ sec}} = 1.57$
	10am – 4pm	TTTR = 1.25
	4pm – 8pm	TTTR = 2.52
Weekends	6am – 8pm	TTTR = 1.2
All Days	8pm – 6am	TTTR = 1.05

**Figure 12-4 – Truck Travel Time Reliability**



## E. TRANSIT ASSET MANAGEMENT PLAN (TAM)

The Federal Transit Administration (FTA) defines transit asset management as a strategic and systematic process through which an organization procures, operates, maintains, rehabilitates, and replaces transit assets to manage their performance, risks, and costs over their lifecycle to provide cost-effective, reliable, and safe service to current and future customers.

As part of the Moving Ahead for Progress in the 21st Century (MAP-21) Act and the subsequent Fixing America’s Surface Transportation (FAST) ACT, the FTA enacted regulations for transit asset management that require transit service providers to establish asset management performance measures and targets and to develop a TAM Plan. The final TAM rule was published on July 26, 2016 and went into effect on October 1, 2016.

The Pioneer Valley Transit Authority (PVTA) manages a range of assets that include a fleet of heavy duty transit buses, paratransit vehicles, support vehicles, and nine facilities, plus other capital assets required to support operations across a service territory encompassing 24 communities. PVTA recognizes that an effective approach to asset management incorporates the people, processes, technology, data and information and continual improvement needed to support better management of assets over their entire lifecycle. PVTA has developed their TAM Plan as a roadmap to systematically identify and address assets and asset management practices in need of improvement; establish a benchmark for where their inventory and policies stand; identify gaps in their practice; establish new, measurable key performance indicators and use a data-driven approach to achieve its goals.

PVTA has developed the TAM plan, not as an end, but instead as the beginning of an on-going effort to develop and integrate asset management practices throughout the entire organization. Over the coming years PVTA plans to continue to build upon this foundation and will work to implement successful and effective policies, practices and processes that reinforce and complement the goals and objectives outlined in the TAM plan. PVTA expects the TAM plan to be a living document that is updated annually.

**Table 12-5 – PVTA TAM Plan Performance Measures and Targets**

<b>Rule</b>	<b>Performance Measure</b>	<b>State Target</b>
TAM	Percent of revenue vehicles by asset class that have met or exceeded their Useful Life Benchmark (ULB)	Articulated Bus = 0%, Bus = 20%, Minibus = 100%, Cutaway Bus = 25%, Minivan = 30%, Trolleybus = 100%
TAM	Percent of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	Automobiles = 25% Trucks and other Rubber Tire Vehicles = 25%
TAM	Percent of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Administrative and Maintenance = 25% Passenger and Parking = 0%

**Table 12-6 – TAM Investments 2015-2019**

TIP Year	RTA	Capital Project	Total Programmed	PM Rule
2019	PVTA	Buy Replacement 40' Diesel Bus (4)	\$ 2,226,480.00	TAM
2019	PVTA	Buy Replacement 35" Bus (4)	\$ 2,203,970.00	TAM
2019	PVTA	Purchase Replacement Vans (27)	\$ 1,836,620.00	TAM
2018	PVTA	Replacement Vans (4)	\$ 283,795.00	TAM
2018	PVTA	Replace Mini Buses for Shuttles (3)	\$ 270,000.00	TAM
2018	PVTA	Replacement 40' Buses (4)	\$ 2,161,631.00	TAM
2017	PVTA	Purchase - Replacement: Vans (12)	\$ 781,298.00	TAM
2017	PVTA	BUY REPLACEMENT VAN (7)	\$ 436,948.00	TAM
2016	PVTA	BUY 40-FT BUS FOR EXPANSION (4) - Match for FY 15	\$ 395,640.00	TAM
2016	PVTA	BUY REPLACEMENT 40-FT BUS (6) Match for FY 15	\$ 593,460.00	TAM
2016	PVTA	BUY REPLACEMENT 35-FT BUS (5) - Match for FY15	\$ 489,549.00	TAM
2016	PVTA	BUY 40-FT BUS FOR EXPANSION (2) (Match for FY15)	\$ 203,195.00	TAM
2016	PVTA	BUY 40-FT BUS FOR EXPANSION (2) (Match for FY15)	\$ 196,805.00	TAM
2015	PVTA	PVTA Bus Replacement	\$ 887,221.00	TAM
2015	PVTA	Buy replacements 35ft) bus (5)	\$ 2,017,556.00	TAM
2015	PVTA	Buy <30ft bus for expansion (4)	\$ 380,000.00	TAM
2015	PVTA	ADA operating projects	\$ 1,479,468.00	TAM
2015	PVTA	Purchase - Buses for expanded service, 40'	\$ 1,528,810.00	TAM
2015	PVTA	Buy , 30' mini bus, replacement (4)	\$ 280,000.00	TAM
2015	PVTA	BUY REPLACEMENT 40-FT BUS (6) - Match in FY 16	\$ 2,373,838.00	TAM
2015	PVTA	BUY REPLACEMENT 35-FT BUS (5) - Match in FY16	\$ 1,958,199.00	TAM
2015	PVTA	BUY 40-FT BUS FOR EXPANSION (4) Match in FY16	\$ 1,582,559.00	TAM
2015	PVTA	BUY 40-FT BUS FOR EXPANSION (2) - Match in FY 16	\$ 635,220.00	TAM
2015	PVTA	BUY 40-FT BUS FOR EXPANSION (2) - Match in FY 16	\$ 757,970.00	TAM
2015	PVTA	Purchase - Replacement: Vans (6)	\$ 391,988.00	TAM
			<b>\$ 26,352,220.00</b>	

Table 12-6 shows the PVTA capital investment which will help our region meet their TAM Targets. Over the past 5 years, PVTA has invested \$26 million on buses, vans, and mini buses. PVTA spends approximately 30% of their annual capital budget on fleet replacement in order to meet TAM Targets.

## F. SYSTEM PERFORMANCE REPORT

The System Performance Report developed for the RTP 2016 was updated for the 2020 RTP to assess the progress made in achieving targets established during the previous report. Each performance target was assessed on an evaluation ranking of excellent, good, or needs improvement. The definition of each of the three evaluation rankings are summarized below:

- **Excellent** – The performance measure currently meets or exceeds its performance target.
- **Good** – The performance measure is on track to meet its performance target by the established deadline.
- **Needs Improvement** – The performance measure is not on track to meet its performance target by the established deadline, or the data is not yet available for the performance measure.

### a) Structurally Deficient Bridges

Performance Target = Reduce the number of structurally deficient bridges below 2014 levels.

**Table 12-7 – Structurally Deficient Bridges in the Pioneer Valley Since 2009**

	2009	2010	2011	2012	2014	2018
Structurally Deficient Bridges	75	69	63	65	53	50
Total Bridges	674	674	669	676	678	685

Source: MassDOT Bridge Data

The percentage of structurally deficient bridges in the region was reduced from 7.8% to 7.2%

- RTP Assessment: **Excellent**

### b) Overall Condition Index

Performance Target = Increase the average Overall Condition Index (OCI) for federal aid eligible roadways by 5% by 2025.

**Table 12-8 – Regional OCI By RTP Year**

	<b>2012</b>	<b>2016</b>	<b>2019</b>
Overall Condition Index	77.6	71.1	76

Source: PVPC

The average OCI has increased by 4.9% since 2016. This trend shows there is improvement in the pavement quality and the region is well placed to likely achieve the targeted improvement of 5% by the year 2025.

- RTP Assessment: **Good**

### c) Motor Vehicle Fatalities

Performance Target = Reduce motor vehicle fatalities by 20% over five years.

**Table 12-9 – Fatal Crashes in the Pioneer Valley**

**RTP 2016 Table**

<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
35	41	37	34	44

**RTP 2020 Update**

<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
42	43	36	51	41

Source: MassDOT Crash Portal

The number of fatalities in the region has marginally reduced from the year 2012 to 2017; however this reduction is far less than 20%. Over the last five years the annual fatalities were below the 2012 threshold with an exception of the calendar year 2016.

- RTP Assessment: **Needs Improvement**

#### d) Roadway Fatalities and Serious Injuries

Performance Target = Reduce the number of roadway fatalities and serious injuries by 50% by 2030.

**Table 12-10 – Fatal and Serious Injury Crashes in the Pioneer Valley**

##### RTP 2016 Table

2008	2009	2010	2011	2012
277	249	269	514	486

##### RTP 2020 Update

2013	2014	2015	2016	2017
408	362	333	356	264

Source: MassDOT Crash Portal

The spike in the number of fatal and serious injury crashes from 2010 to 2011 are a result of improvements in crash data reporting by local communities and more accurate data on the severity of the injury. The number of fatal and serious injury crashes decreased by nearly 45% from 2012 to 2017. The region is expected to achieve more than a 50% reduction by 2030 if similar trends continue.

- RTP Assessment: **Good**

#### e) Safety Studies

Performance Target = Complete at least one safety study per year as part of the UPWP.

**Table 12-11 – Safety Studies Completed Over the Past 7 Years**

2012	2013	2014	2015	2016	2017	2018
4	1	2	1	2	2	2

Source: PVPC

Currently, the region is exceeding the target to complete at least one safety study per year as part of the UPWP.

- RTP Assessment: **Excellent**

**f) Average Driver Delay**

Performance Target = Reduce the average regional travel time index to less than 1.5 by 2025.

**Table 12-12 – Average Regional Travel Time Index by CMP Analysis Year**

2010	2015	2019
1.56	1.71	Data Collection Method is being updated

Source: PVPC

Currently the PVPC is in the process of updating the data collection method to determine travel times, congestion, and driver delays in the region.

- RTP Assessment: **Needs Improvement**

**g) Congestion Improvement Projects**

Performance Target = Fund at least one congestion improvement project through the TIP every 5 years.

**Table 12-13 – Completed Congestion Improvement Projects**

2011	2012	2013	2014	2015	2016	2017	2018
1	1	1	2	2	1	1	3

Source: PVPC

Historically, the Pioneer Valley region has completed at least one congestion improvement project through the TIP over the last 8 years.

- RTP Assessment: **Excellent**

**h) Congestion-related Planning Studies**

Performance Target = Complete one planning study to reduce congestion per year as part of the UPWP.

**Table 12-14 – Completed Congestion Planning Studies**

2012	2013	2014	2015	2016	2017	2018
1	0	2	1	1	1	1

Source: PVPC

PVPC has consistently conducted at least one study per year that addresses congestion and/or safety improvement at different locations within the region.

- RTP Assessment: **Excellent**



**i) On-road Bicycle Facility Mileage**

Performance Target = Increase the total mileage of on-road bicycle facilities by 10% by 2025.

**Table 12-15 – On-road Bicycle Facility Mileage in the Pioneer Valley**

2000	2005	2010	2015	2019
4.50	7.25	8.95	17.95	43.12

Source: PVPC

The region has exceeded expectations and has already increased the bicycle facilities mileage by more than 140%.

- RTP Assessment: **Excellent**

**j) Passengers per Trip and Passengers per Revenue Hour**

Performance Target = Meet the minimum number of Passengers per Trip and Passengers per Revenue Hour for fixed route transit service consistent with PVTA’s established tiers of service.

**Table 12-16 –Passengers per Trip and Passengers per Revenue Hour Standards**

	September 2014 – April 2015	July 2018 – April 2019
Number of Routes that Meet Minimum Performance Standards	34	15
Total PVTA Routes	47	41

Source: PVPC

The number of routes that meet the PVTA performance standards has decreased since 2015. Factors such as uncertain funding environment, service cuts, increasing use of Uber and Lyft, increased rates of car ownership, stagnant/declining urban population, and fare hikes in the past two years could have contributed towards this decline.

- RTP Assessment: **Needs Improvement**

**k) Transportation Sector Green House Gas Emissions**

Performance Target = Reduce greenhouse gas emissions from the transportation sector by 25% by 2020 and 80% by 2050.

**Table 12-17 – Statewide GHG Emissions from the Transportation Sector**

2008	2009	2010	2011	2012	2015	2016
33.6	30.8	30.8	31.0	30.4	39%	43%

Source: Massachusetts Annual Greenhouse Gas Emissions Inventory, July 2014

The greenhouse gas emissions from the transportations sector have increased rather than decrease since 2012.

- RTP Assessment: **Needs Improvement**

**l) Air Quality Improvement Projects**

Performance Target = Fund at least one air quality improvement project through the TIP each year.

**Table 12-18 – Air Quality Improvement Projects Completed Over the Past 5 Years**

2011	2012	2013	2014	2015	2016	2017	2018
1	1	1	2	3	1	0	2

Source: PVPC

The region has been successful in achieving a project per year target for the majority of the TIP years assessed.

- RTP Assessment: **Good**

**m) Weight Restricted, Height Restricted, and Closed Bridges**

Performance Target = Minimize the impact of weight restricted, height restricted, and closed bridges.

**Table 12-19 – Restricted and Closed Bridges**

	2011	2014	2018
Weight Restricted Bridges	92	63	78
Bridges with Vertical Clearance Restrictions (Under 15ft)	73	65	110
Closed Bridges	14	13	6

Source: MassDOT

There is an increase in number of restricted bridges for both weight and height limitations; however the number of closed bridges has declined.

- RTP Assessment: **Needs Improvement**

### n) Average Park and Ride Lot Use

Performance Target = Increase average park and ride lot use by 5% by 2025.

**Table 12-20 – Average Park and Ride Lot Occupancy 2011 -2015**

2011	2012	2013	2014	2015	2016	2017	2018
136	138.6	118.3	99.9	76.5	42.5	42.7	38

Source: PVPC

The Park and Ride lots usage has been declining in the region. Rideshare is not a popular option for the inhabitants of the region and increased popularity of Lyft and Uber also decreases the necessity for people to consider this alternative.

- RTP Assessment: **Needs Improvement**

### o) Regional Bike Path Usage

Performance Target = Demonstrate an overall annual increase in the use of regional bike paths.

**Table 12-21 – Historic Use of the Springfield Riverwalk**

2012	2013	2014	2018
56	100	189	Bikepath closed due to construction

Use of the Springfield Riverwalk was steadily increasing over the period when data was collected which is a trend with a majority of bike paths in the region. PVPC has collected data along this path over a period of time and has been working towards developing an ongoing data collection program to track bike path use for all facilities in the Pioneer Valley region.

- RTP Assessment: **Good**

**p) PVTA and FRTA Ridership**

Performance Target = Demonstrate an overall annual increase in PVTA and FRTA ridership.

**Table 12-22 – PVTA and FRTA Total Annual Ridership**

	2013	2014	2015	2016	2017	2018
PVTA	11,128,713	11,415,923	12,074,280	12,154,880	11,466,707	10,902,207

Source: PVPC

Transit ridership increased between 2013-2016, however the last 2 years have seen a decline in number of PVTA users across majority of the routes. PVTA reduced services along some routes and increased fares system wide which strongly contributed to the decline in number of riders.

- RTP Assessment: **Needs Improvement**

**q) Bicycle and Pedestrian Infrastructure Mileage**

Performance Target = Increase the total mileage of all bicycle and pedestrian infrastructure by 10% by 2025.

A complete breakdown of existing pedestrian infrastructure mileage is not available for the entire region at this time. PVPC has performed sidewalk inventory for communities such as Granby, Palmer, Holyoke, Springfield, and South Hadley over past few years. Existing efforts will need to be focused to develop an accurate baseline to allow for tracking of this performance target over time.

- RTP Assessment: **Needs Improvement**

**1. Overall System Performance Assessment**

Based on the results of the system performance assessment, 9 of the 17 defined regional performance targets are either currently met or are on track to be met by established deadlines. Eight targets require additional data or are currently not being met. This information is summarized in Table 12-23.

**Table 12-23 – Summary of System Performance Assessment**

Excellent	Good	Needs Improvement
5	4	8