

Memphis MPO Performance Measures

TPB Meeting: November 15, 2018



Memphis MPO
METROPOLITAN PLANNING ORGANIZATION

Strengthening Regional Transportation

Background

- Federal performance-based planning requirements direct MPO's to establish performance measures for **Safety, Pavement, Bridge, Reliability, Freight, CMAQ, and Transit Asset Management and Safety.**
 - **Targets are set by TDOT & MDOT**
- Staff recommends that the Memphis MPO support the established targets of each individual state.
 - **ETC workshop held Oct. 2nd, 2018**
 - **Targets approved by ETC Nov. 1st, 2018**



PM: Target Setting - Overview



PM1:

Safety

*(ROUND 2
UNDERWAY)*



PM2:

**Infrastructure
Condition**

(UNDERWAY)



PM3:

**System
Performance**

(UNDERWAY)

PM1: Safety

ROUND TWO



PM1: Safety (Round 2)

- **Area** – Individual State Targets for all public roads in the state **developed and adopted annually**
- **Data** – Highway Performance Monitoring System (HPMS) and Fatality Analysis Reporting System (FARS)
- **Performance Measures** –
 - Number of Serious Injuries
 - Rate of Serious Injuries per 100 Million VMTs
 - Number of Fatalities
 - Rate of Fatalities per 100 Million VMTs
 - Number of Non-motorized Fatalities and Serious Injuries
- **Calculation** –
 - 5-Year Rolling Average of 5 individual, consecutive points of data.
 - *New Baseline: 2013-17 New Target: 2015-19*
 - *Number Targets – Arithmetic average, rounded to tenths place*
 - *Rate Targets – Average, rounded to the thousandths place*

PM1 Safety: Tennessee

Safety Performance Measure	Round 1		Round 2	
	Baseline (2012-2016)	Target (2014-2018)	Baseline (2013-2017)	Target (2015-2019)
Number of Fatalities	995.6	1021.4	1000.6	1022.0
Fatality Rate	1.358	1.337	1.329	1.291
Number of Serious Injuries	7319.4	7630.8	7227.6	7374.6
Rate of Serious Injuries	9.976	9.982	9.594	9.324
Number of Non-Motorized Fatalities and Serious Injuries	434.6	493.2	467.7	546.8



PM1 Safety: Mississippi

Safety Performance Measure	Round 1		Round 2	
	Baseline (2012-2016)	Target (2014-2018)	Baseline (2013-2017)	Target (2015-2019)
Number of Fatalities	633.8	677.8	655.4	697.3
Fatality Rate	1.606	1.668	1.640	1.706
Number of Serious Injuries	567.6	574.4	550.2	555.5
Rate of Serious Injuries	1.439	1.425	1.378	1.356
Number of Non-Motorized Fatalities and Serious Injuries	111.8	119.8	116.0	131.4



PM2: Pavement & Bridge Condition



PM2: Performance Measures



Subpart C:

Pavement Condition

State DOT Due Date: May 20, 2018

MPO Due Date: **Nov. 16, 2018**

- Percentage of Pavement in Good Condition (*Interstate*)
- Percentage of Pavement in Poor Condition (*Interstate*)
- Percentage of Pavement in Good Condition (*Non-Interstate NHS*)
- Percentage of Pavement in Poor Condition (*Non-Interstate NHS*)



Subpart D:

Bridge Conditions

State DOT Due Date: May 20, 2018

MPO Due Date: **Nov. 16, 2018**

- Percentage of Bridges in Good Condition (*NHS*)
- Percentage of Bridges in Poor Condition (*NHS*)

PM2: Pavement Condition

- **Area** – Individual State 2 & 4 Year Targets for the Non-Interstate NHS and 4 Year Target for Interstate (MPO: 4 Year Target Only)
- **Data** – Highway Performance Monitoring System (HPMS)
- **Performance Measures** –
 - % of Interstate Pavements in Good and Poor Condition
 - % of non-Interstate NHS Pavements in Good and Poor Condition
- **Calculation** –
 - Good and Poor Condition Rating Areas: International Roughness Index (IRI), Cracking, Rutting (Asphalt pavements), and Faulting (Concrete pavements)

PM2: Pavement Condition

Performance Measure	Tennessee (Baseline)	Tennessee (4-Year Target 2021)	Mississippi (Baseline)	Mississippi (4-Year Target 2021)
Percent of Pavement in Good Condition (Interstate)	75.6%	60.0%	75.0%	55.0%
Percent of Pavement in Poor Condition (Interstate)	0.14%	1.0%	0.99%	5.0%
Percent of Pavement in Good Condition (Non-Interstate NHS)	72.7%	40.0%	62.5%	25.0%
Percent of Pavement in Poor Condition (Non-Interstate NHS)	6.7%	4.0%	9.3%	10.0%

PM2: Bridge Condition

- **Area** – Individual State 2 & 4 Year Targets for all bridges carrying the NHS, including on- and off- ramps (MPO: 4 Year Target Only)
- **Data** – National Bridge Inspection Standards (NBIS)
- **Performance Measures** –
 - % of NHS Bridges by deck area classified as in Good or Poor Condition
- **Calculation** –
 - Good and Poor Condition Rating Areas: Deck, Superstructure, Substructure, and Culvert

PM2: Bridge Condition

Performance Measure	Tennessee (Baseline)	Tennessee (4-Year Target 2021)	Mississippi (Baseline)	Mississippi (4-Year Target 2021)
Percent of Bridges in Good Condition	39.5%	36.0%	61.7%	60.0%
Percent of Bridges in Poor Condition	3.5%	6.0%	2.1%	5.0%

PM3: System Performance



Performance Measures



Subpart G: Traffic Congestion

State DOT & MPO Due Date: **May 20, 2018**

- Annual Hours of Peak-Hour Excessive Delay
- Percentage of Non-Single Occupancy Vehicle Travel



Subpart H: Total Emissions Reduction

State DOT Due Date: May 20, 2018

MPO Due Date: **November 16, 2018**

- Total Emissions Reductions (VOC) kg/day
- Total Emissions Reductions (CO) kg/day
- Total Emissions Reductions (NOx) kg/day




Subpart E: Travel Time Reliability

State DOT Due Date: May 20, 2018

MPO Due Date: **November 16, 2018**

- Percentage of Person Miles Traveled that are Reliable (Interstate)
- Percentage of Person Miles Traveled that are Reliable (Non-Interstate NHS)



Subpart F: Freight Reliability

State DOT Due Date: May 20, 2018

MPO Due Date: **November 16, 2018**

- Truck Travel Time Reliability Index

PM3: On-Road Mobile Source Emissions

- **Area** – Individual State 2 & 4-Year Targets (Applies to Memphis & Knoxville)
- **Data** – FHWA CMAQ Public Access System (UPACS)
- **Performance Measure** –
 - Total Emissions Reduction
- **Calculation** –
 - Cumulative 2 and 4-Year Emissions Reduction for CMAQ funded projects of reduced emissions for:
 - Nitrogen Oxides (NO_x)
 - Volatile Organic Compounds (VOCs)
 - Carbon Monoxide (CO)
 - *Not applicable to Mississippi target*

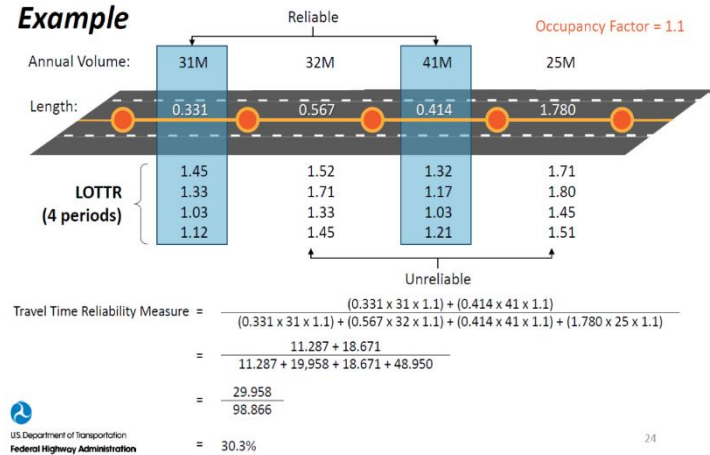
PM3: Emissions Targets - Approved

	Total Emissions Reduction Performance Measures	Baseline (FY 14-17)	2-Year Target (FY 18-19)	4-Year Target (FY 18-21)
TN	Total Emissions Reductions (VOC) kg/day	230.025	30.698	61.396
	Total Emissions Reductions (CO) kg/day	530.282	75.000	150.000
	Total Emissions Reductions (NOx) kg/day	363.399	62.840	125.680
	Total Emissions Reduction Performance Measures	Baseline (FY 14-17)	2-Year Target (FY 18-19)	4-Year Target (FY 18-21)
MS	Total Emissions Reductions (VOC) kg/day	28.000	> 0	> 0
	Total Emissions Reductions (CO) kg/day	N/A	N/A	N/A
	Total Emissions Reductions (NOx) kg/day	85.000	> 0	> 0



PM3: Travel Time Reliability

- **Area** – Individual State 2 & 4 Year Targets for Interstate and 4 Year Target for Non-Interstate (MPO: 4 Year Target Only)
- **Data** – National Performance Management Research Data Set (NPMRDS) & Highway Performance Monitoring System (HPMS)
- **Performance Measures** –
 - Percent of the Person Miles Traveled on the **Interstate** that are reliable
 - Percent of the Person Miles Traveled on the **Non-Interstate NHS** that are reliable
- **Calculation** –
 - $Level\ of\ Travel\ Time\ Reliability = \frac{80th\ Percentile\ Travel\ Time}{50th\ Percentile\ Travel\ Time}$
 - *Level of Travel Time Reliability (LOTR) for the reporting segment must be less than 1.50 to be considered reliable*



PM3: Travel Time Reliability Targets

Travel Time Reliability Performance Measures	Tennessee (TDOT)		Mississippi (MDOT)	
	Baseline (2017)	4-Year Target (2021)	Baseline (2017)	4-Year Target (2021)
Percentage of Person Miles Traveled that are Reliable (Interstate)	87.7%	83.0%	99.3%	90.0%
Percentage of Person Miles Traveled that are Reliable (Non-Interstate NHS)	N/A	87.5%	N/A	85.0%

PM3: Freight Movement

- **Area** – Individual State 2- and 4-Year Targets (MPO: 4 Year Target Only)
- **Data** – National Performance Management Research Data Set (NPMRDS)
- **Performance Measure** –
 - Percent of the Interstate System Mileage providing for Reliable Truck Travel Times (Truck Travel Time Reliability Index)
- **Calculation** –
 - *Truck Travel Time Reliability* =
$$\frac{95\text{th Percentile Truck Travel Time}}{50\text{th Percentile Truck Travel Time}}$$



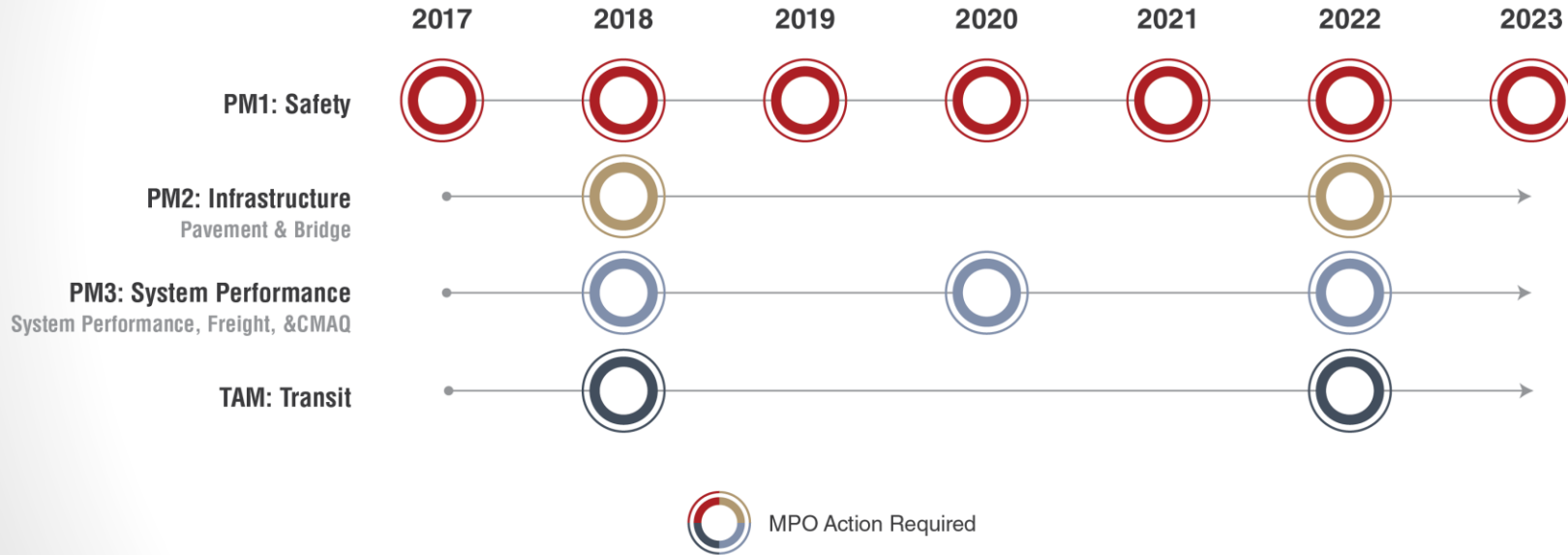
	1.50	2.10	1.45	1.56
	1.38	1.83	1.71	2.30
TTTR	1.70	1.79	1.62	2.12
	1.30	1.42	1.22	1.82
	1.21	1.03	1.01	1.27

$$\begin{aligned}
 \text{TTTR} &= \frac{(1.70 \times 1,562) + (2.10 \times 2,572) + (1.71 \times 1,843) + (2.30 \times 3,171)}{(1,562 + 2,572 + 1,843 + 3,171)} \\
 &= \frac{2,655 + 5,401 + 3,152 + 7,293}{9,148} \\
 &= 2.022
 \end{aligned}$$

PM3: Freight Reliability Targets

Freight Reliability Performance Measures	Tennessee (TDOT)		Mississippi (MDOT)	
	Baseline (2017)	4-Year Target (2021)	Baseline (2017)	4-Year Target (2021)
Truck Travel Time Reliability (TTTR) Index	1.35	1.33	1.13	1.50

PM: Target Setting - Timeline



PM1

TN	Round 1		Round 2	
	Baseline (2012-2016)	Target (2014-2018)	Baseline (2013-2017)	Target (2015-2019)
Number of Fatalities	995.6	1021.4	1000.6	1022.0
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PM2

	TN (Base.)	TN (4-Yr Target 2021)	MS (Base.)	MS (4-Yr Target 2021)
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PM3

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