

Memphis MPO CMAQ Performance Measures

Engineering and Technical Committee (ETC)

Workshop

March 27, 2018



Memphis MPO
METROPOLITAN PLANNING ORGANIZATION

Strengthening Regional Transportation

Agenda

- 1. Welcome and Introductions**
- 2. Performance Measures Overview/Timeline**
- 3. PM3: CMAQ (Tri-State)**
 - a) Percent Non-Single Occupancy Vehicle (SOV) Travel
 - b) Peak-Hour Excessive Delay
- 4. PM3: CMAQ (Individual State)**
 - a) On-Road Mobile Source Emissions
- 5. PM3: Travel Time and Freight Reliability**
- 6. PM2: Pavement and Bridge Condition**
- 7. Questions/Discussion**



Performance Measures – Target Setting - Overview



PM1:
Safety
(COMPLETED)



PM2:
**Infrastructure
Condition**
(UNDERWAY)



PM3:
**System
Performance**
(UNDERWAY)

Performance Measures

PM2:

Infrastructure Condition (Pavement & Bridge)

MPO Due Date: Nov. 16, 2018

State DOT Due Date: May 20, 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*)
- Percentage of Bridges in Good Condition (*NHS*)
- Percentage of Bridges in Poor Condition (*NHS*)

PM3:

System Performance (CMAQ, Travel Time, & Freight)

MPO Due Date: April 19, 2018*

MPO Due Date: Nov. 16, 2018

State DOT Due Date: May 20, 2018

- Percentage of Non-Single-Occupancy-Vehicle Travel
- Annual Hours of Peak Hour Excessive Delay per Capita
- Total Emission Reductions
- Percentage of Person-Miles Traveled that are Reliable (*Interstate*)
- Percentage of Person-Miles Traveled that are Reliable (*Non-Interstate NHS*)
- Truck Travel Time Reliability Index (*Interstate*)

Tri-State Targets



PM3 - PERCENT OF NON-SINGLE OCCUPANCY VEHICLE (SOV)
TRAVEL

PM3 - PEAK-HOUR EXCESSIVE DELAY (PHED)



Background

- **Applies to Areas with the Following Criteria:**

- Area Characteristics**

- ✓ Designated urbanized area,
 - ✓ Contains NHS mileage **AND**
 - ✓ Population over 200,000*



- Nonattainment or Maintenance Area**

- ✓ Ozone (O₃)
 - ✓ Carbon monoxide (CO) **OR**
 - Particulate matter (PM₁₀ or PM_{2.5})

***Phase In** – For the first performance period, the population criteria applies to urbanized areas with populations over 1 million.

- **Coordinate on a single, unified target.**

Tri-State Coordination

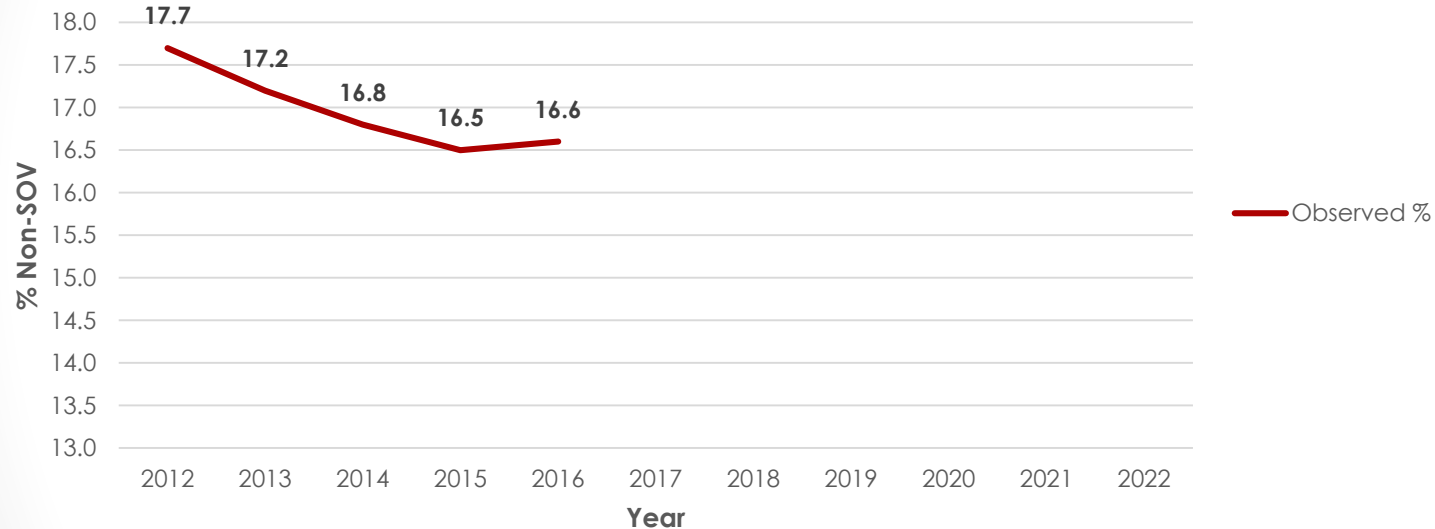


Percent of Non-SOV Travel

- **Area** – Memphis TN-MS-AR Urbanized Area (2 & 4 Year Targets)
- **Data** – Census 5 Year Estimates “Commuting to Work” (Table DP03)
includes data for
 - % Drive Alone OR Single Occupancy Vehicles (SOV)
- **Performance Measures** –
 - Percent of Non-SOV Travel
- **Calculation** –
 - Percent of Non-SOV Travel = **100% - %SOV Travel**

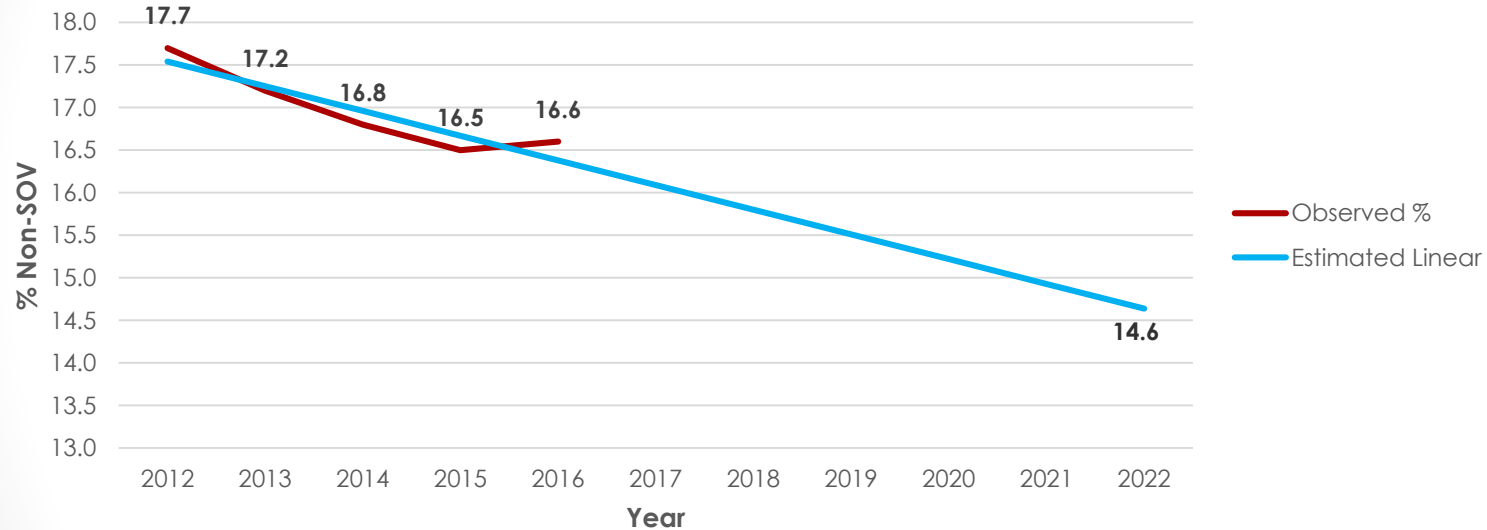
Percent of Non-SOV Travel

Memphis, TN-MS-AR-% Non-SOV



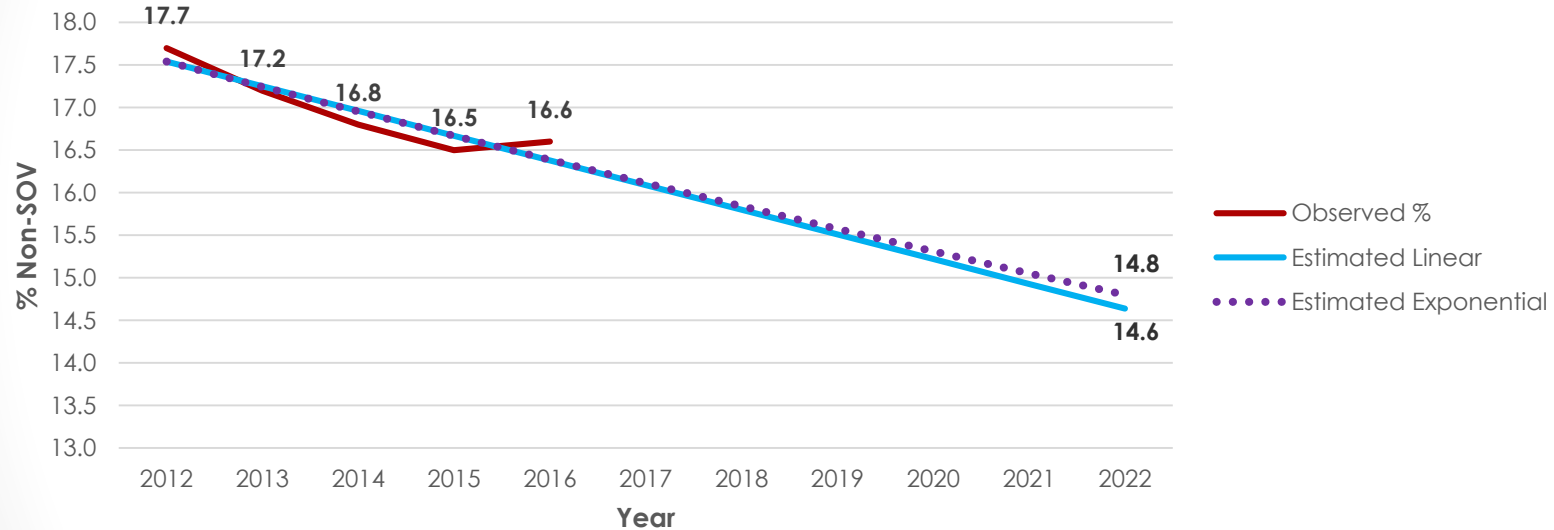
Percent of Non-SOV Travel

Memphis, TN-MS-AR-% Non-SOV



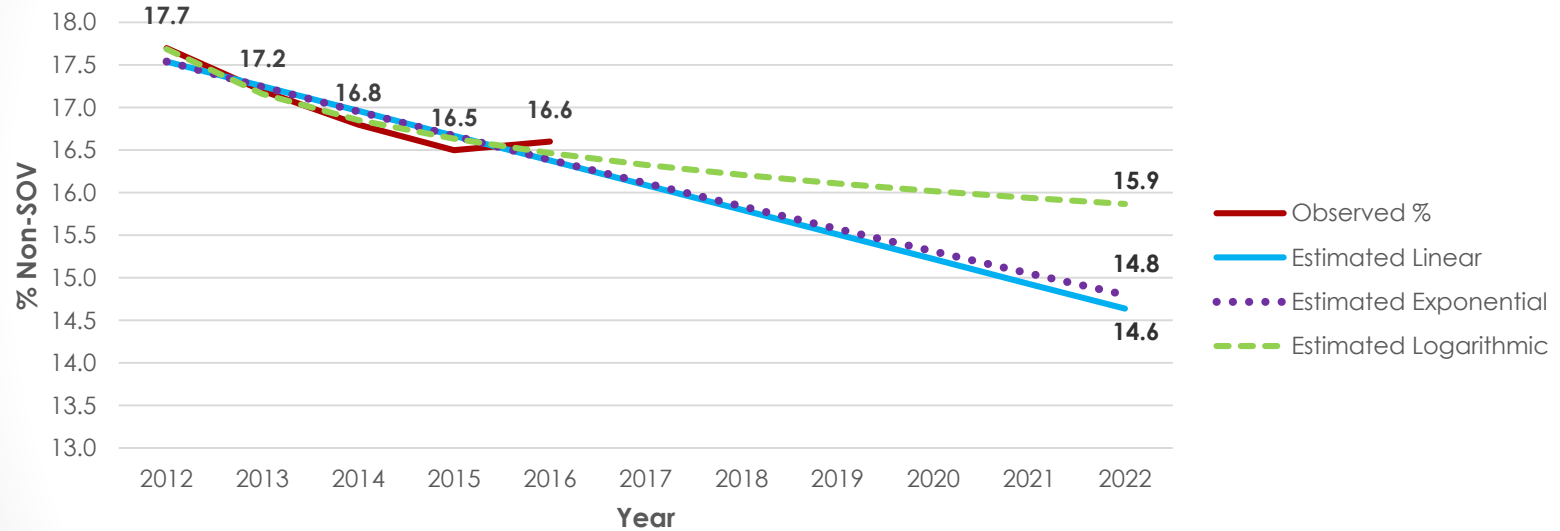
Percent of Non-SOV Travel

Memphis, TN-MS-AR-% Non-SOV



Percent of Non-SOV Travel

Memphis, TN-MS-AR-% Non-SOV



Influencing Factors - Percent of Non-SOV Travel

- Uncertainty in cause of Percent Non-SOV Increase in 2016
- Regional development patterns geared toward low density development
- Initial Reporting Period – Conservative Approach to Target Setting

Proposed Target - Percent of Non-SOV Travel

% Non-SOV Travel Target

- 2-Year Tri-State Target: **16.5%**
- 4-Year Tri-State Target: **16.5%**

Consensus Between:

TDOT, MDOT, ARDOT, West Memphis MPO, & Memphis MPO

Future Target Setting:

Opportunity to revisit the targets every **Two**-years.

Peak Hour Excessive Delay

- **Area** – Memphis, TN-MS-AR Urbanized Area –
 - 4 Year Target only for first performance period (2 & 4 target after)
- **Data** – National Performance Management Research Data Set (NPMRDS) – Vehicle/Passenger Probe Data
- **Performance Measure** –
 - Annual Hours of Peak Hour Excessive Delay per Capita
- **Calculation** –
 - Dr. Lee Han, University of Tennessee, Knoxville

PHED Analysis

Dr. Lee Han, University of Tennessee



Proposed Target – Peak-Hour Excessive Delay

Peak Hour Excessive Delay Per Capita

- 4 Year Tri-State Target: **PENDING**
 - *Inrix Tool– evaluation of 2016 / 2017 data for target setting (potential)*

Coordination Between:

TDOT, MDOT, ARDOT, West Memphis MPO, & FHWA-TN, MS, AR

Future Target Setting:

Opportunity to revisit the targets every **Two**-years.

UPCOMING PERFORMANCE MEASURES

PM3 – ON-ROAD MOBILE SOURCE EMISSIONS

PM3 – TRAVEL TIME RELIABILITY

PM3 – FREIGHT MOVEMENT

PM2 – PAVEMENT CONDITION

PM2 – BRIDGE CONDITION

Memphis MPO



PM3: On-Road Mobile Source Emissions

- **Area** – Individual State 2- & 4- Year Targets (Applies to Memphis & Knoxville)
- **Data** – FHWA CMAQ Public Access System
- **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)

PM3: On Road Mobile Source Emissions – Timeline

- **Baseline Performance Period – October 1, 2018**
 - CMAQ Projects from Fiscal Years 2014-2017
- **Mid Performance Period – October 1, 2020**
 - Federal Fiscal Years 2018 & 2019
 - 2 Years of Data
- **Full Performance Period – October 1, 2022**
 - Federal Fiscal Years 2018 through 2021
 - 4 Years of Data



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** –
 - $$\text{Level of Travel Time Reliability} = \frac{\text{80th Percentile Travel Time}}{\text{50th Percentile Travel Time}}$$
 - *Level of Travel Time Reliability (LOTR) for the reporting segment must be less than 1.50 to be considered reliable*



PM3: 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** –
 - $$\text{Truck Travel Time Reliability} = \frac{\text{95th Percentile Truck Travel Time}}{\text{50th Percentile Truck Travel Time}}$$

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: 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

Next Steps

- April 19th ETC/TPB Meetings ← **ACTION**
 - Percent of Non-SOV Travel - **Tri-State**
 - Peak-Hour Excessive Delay Per Capita - **Tri-State**
- May 20, 2018 – State DOTs Due Date
- Upcoming Performance Measures
 - ETC Workshop Summer 2018
 - MPO Deadline November 16, 2018 (180 days after State DOT)
- Regular Review of Targets (similar to Safety Targets)

Questions/Discussion

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Webpages

FHWA's Transportation Performance Management Webpage:

- www.fhwa.dot.gov/tpm/

Memphis MPO's Performance Measure Webpage:

- <http://memphismpo.org/resources/trends/performance-measures>

