Memphis MPO
CMAQ Performance Measures
Engineering and Technical Committee (ETC) Workshop
March 27, 2018
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

Memphis MPO
METROPOLITAN PLANNING ORGANIZATION
Strengthening Regional Transportation
PM3 - PERCENT OF NON-SINGLE OCCUPANCY VEHICLE (SOV) TRAVEL

PM3 - PEAK-HOUR EXCESSIVE DELAY (PHED)
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 PM₂.₅)

*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

Tennessee Department of Transportation

Mississippi Department of Transportation

Arkansas Department of Transportation

Memphis MPO
METROPOLITAN PLANNING ORGANIZATION

West Memphis MPO
CRITTENDEN COUNTY, ARKANSAS
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

Source: US Census Bureau
Percent of Non-SOV Travel

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

Source: US Census Bureau
Percent of Non-SOV Travel

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

Source: US Census Bureau
Percent of Non-SOV Travel

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

Source: US Census Bureau
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 (NOx)
    - 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 (LOTTR) 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** –
  
  \[
  \text{Truck Travel Time Reliability} = \frac{95\text{th Percentile Truck Travel Time}}{50\text{th Percentile Truck Travel Time}}
  \]
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
  - 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

Contact Information

Sajid Hossain
  ▪ Sajid.Hossain@memphistn.gov
  ▪ 901-636-7183

Kate Horton
  ▪ Kate.Horton@memphistn.gov
  ▪ 901-636-7218

Alvan-Bidal Sanchez
  ▪ Alvan.Sanchez@memphistn.gov
  ▪ 901-636-7156

Zylavian Watley
  ▪ Zylavian.Watley@memphistn.gov
  ▪ 901-636-7216

Mavrick Fitzgerald
  ▪ Mavrick.Fitzgerald@memphistn.gov
  ▪ 901-636-7189

Nick Warren
  ▪ Nick.Warren@memphistn.gov
  ▪ 901-636-7146

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