



**West Memphis MPO - CMAQ  
Performance Plan**  
Memphis, TN-MS-AR Urbanized Area  
September 2020

THE CITY OF WEST MEMPHIS AS THE DESIGNATED METROPOLITAN PLANNING  
ORGANIZATION (MPO) FOR THE WEST MEMPHIS-MARION AREA  
TRANSPORTATION STUDY (WMATS)

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Additional agencies cooperating in the planning process of the West Memphis Metropolitan Planning Organization include the U.S. Environmental Protection Agency and the Arkansas Department of Environmental Quality.

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# 1. Overview and Background

In July 2012, Congress passed the Moving Ahead for Progress in the 21st Century Act (MAP-21), which transformed the policy and programmatic framework for making investments that guide the growth and development of the Nation’s surface transportation program and created a performance-based surface transportation program. The Fixing America’s Surface Transportation Act (FAST Act), signed into law on December 4, 2015, continued and refined these efforts.

Prior to MAP-21, there were no explicit requirements for State departments of transportation (DOTs) to demonstrate how their transportation program supported national performance outcomes. Changes under MAP-21 and FAST Act have integrated performance into many Federal surface transportation programs and required the USDOT to establish a set of national measures on which State DOTs must report performance or condition.

To carry out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program, MAP-21 required USDOT to establish measures for State DOTs to use to assess traffic congestion and on-road mobile source emissions. To meet this requirement, FHWA finalized three performance measures (two congestion measures and one on-road mobile source emission reduction measure) in the National Performance Management Measures - Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program Final Rule (PM<sub>3</sub> regulation). Two Subparts of 23 CFR part 490, promulgated through the PM<sub>3</sub> regulation, establish the performance measures for the CMAQ Program required by MAP-21:

- Subpart G (Measures to Assess the CMAQ Program – Traffic Congestion) and
- Subpart H (Measure to Assess the CMAQ Program – On-road Mobile Source Emissions)

**Table 1. CMAQ Performance Measures Associated with the PM<sub>3</sub> Regulation**

Subpart and Measure	Measure Description
Subpart G: Traffic Congestion	PHED Measure: Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita
	Percent of Non-SOV Travel Measure: Percent of Non-Single Occupancy Vehicle (SOV) Travel
Subpart H: On-Road Mobile Source Emissions	Total Emissions Reduction Measure: 2- and 4-year Total Emission Reductions for each applicable criteria pollutant and precursor for all projects funded with CMAQ funds

For Subpart G, the two Traffic Congestion performance measures are the

1. PHED Measure and
2. Percent of Non-SOV Travel Measure



*PHED* Measure is the Annual hours of peak hour excessive delay per capita that occurs within an applicable urbanized area. The *Percent of Non-SOV* Travel measure is the percentage of Non-SOV vehicles travelling within an applicable urbanized area. The traffic congestion measures only apply in certain urbanized areas that include National Highway System (NHS) mileage and have a population over 1 million.

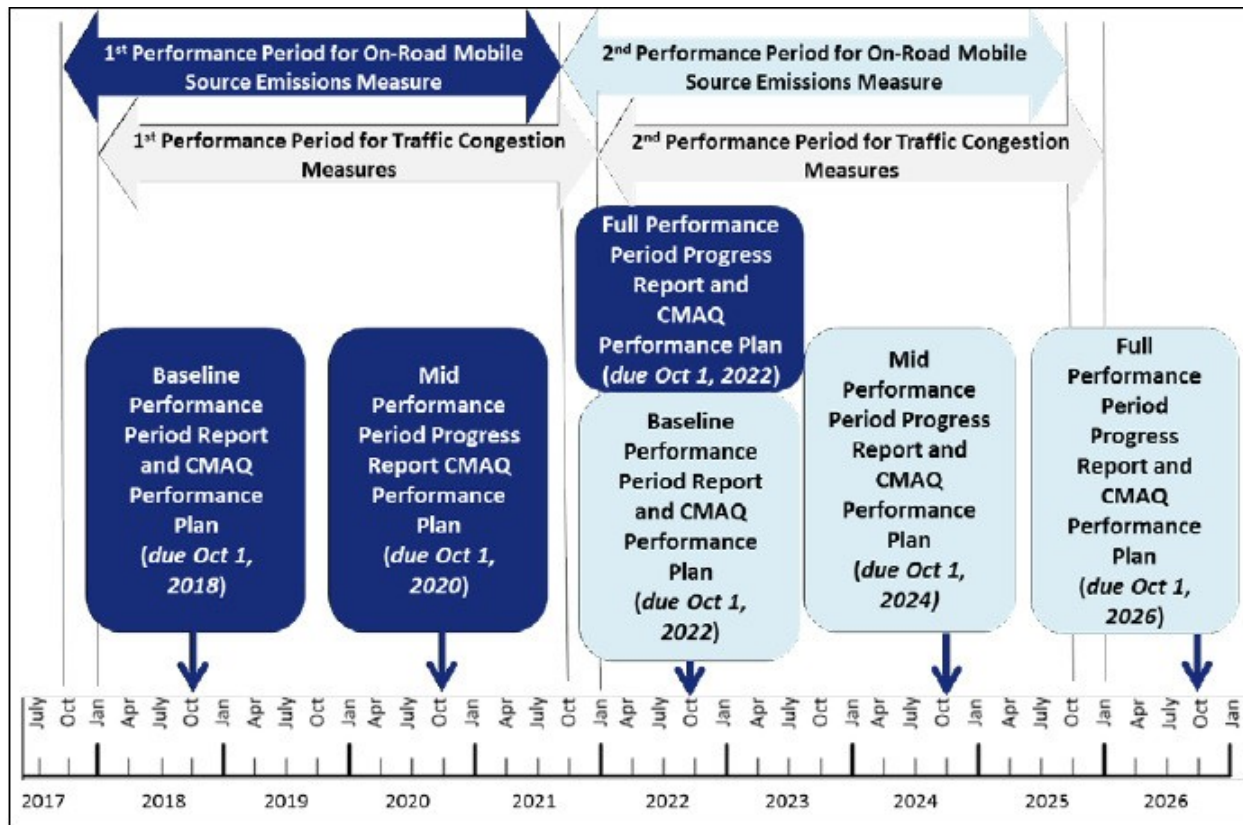
For Subpart H, the *On-Road Mobile Source Emissions* performance measure is the Total Emissions Reduction measure. The Total Emission Reduction Measure is the 2-year and 4-year cumulative estimated emission reductions, for all CMAQ funded projects, of each applicable criteria pollutant (ozone (O<sub>3</sub>), carbon monoxide (CO), and particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) and precursor (volatile organic compounds (VOC) and oxides of nitrogen NO<sub>x</sub>) for which the area is designated nonattainment or maintenance.

In addition to the reporting required by the PM<sub>3</sub> regulation, 23 United States Code (U.S.C) 149(l) requires each metropolitan planning organization serving a transportation management area (as defined in section 134) with a population over 1,000,000 people representing a nonattainment or maintenance area shall develop a performance plan that:

- includes an area baseline level for traffic congestion and on-road mobile source emissions for which the area is in nonattainment or maintenance.
- describes progress made in achieving the performance targets described in section 150(d); and
- includes a description of projects identified for funding under this section and how such projects will contribute to achieving emission and traffic congestion reduction targets.

In the CMAQ Performance Plan and its biennial updates, these MPOs report 2 and 4-year targets, describe how they plan to meet their targets, and detail their progress toward achieving the targets over the course of the performance period.

**Figure 1. Reporting Time for State Biennial Performance Report and the MPO CMAQ Performance Plans**




### 1.1 Content of a CMAQ Performance Plan

23 CFR 490.107 requires that the CMAQ Performance Plans include the following four key components:

- **Condition/Performance:** A baseline level of condition/performance at the beginning of the performance period for each of the CMAQ measures. Throughout the performance period, the CMAQ Performance Plan reports on the actual 2-year and 4-year condition/performance for each of the applicable CMAQ measures in 23 CFR 490.707 and 23 CFR 490.807.
- **Targets:** The targets that the MPOs establish for each of the applicable CMAQ performance measures, including any updates at the midpoint of the performance period, if applicable.
- **Description of Projects:** A description of projects scheduled for CMAQ funding that will contribute toward achieving their targets.
- **Assessment of Progress:** For the mid and full performance period report, updates to the CMAQ Performance Plan include an assessment of how the CMAQ projects contribute toward achieving the targets.

**Table 2. Components of the CMAQ Performance Plan and Biennial Updates**

Key Component	State DOT Baseline Performance Period Report	State DOT Mid-Performance Period Progress Report	State DOT Full Performance Period Progress Report
Condition/Performance	Baseline Condition/Performance	2-year Condition/Performance	4-year Condition/Performance
Targets	Applicable 2-year and 4-year targets, if available	n/a/16.5% SOV 	8.0 PHED (annually)/15.9% (SOV)
Description of Projects	n/a	Description of Current Projects	Description of Projects Contributing to Achieving 4-year Target
Assessment of Progress	n/a	Assessment of Current Projects	Assessment of Projects Contribution to Achieving 4-year Target
Due Dates for First Performance Period	October 1, 2018	October 1, 2020	October 1, 2022

## 2. CMAQ Performance Plan – West Memphis MPO

Title 23 U.S.C. 149(l) requires MPOs that serve a TMA with a population over one million for which the boundaries of that TMA overlap a nonattainment or maintenance area for at least one of the transportation-related criteria pollutants to biennially prepare and submit a CMAQ Performance Plan. The West Memphis MPO, which covers part of Arkansas is subject to that requirement and must submit the plan to the Arkansas DOT, which will include it as a separate section of the biennial reports submitted to FHWA.

West Memphis MPO CMAQ Performance Plan Applicability:

- Serves a portion of a TMA > 1 Million Population
- Includes Maintenance for Ozone (O<sub>3</sub>) in Crittenden County, Arkansas

### 2.1 Baseline Condition/Performance for Traffic Congestion Measures

The Memphis, TN-MS-AR Urbanized Area, which covers parts of Tennessee, Mississippi, and Arkansas, including Memphis Urban Area MPO (MMPO) and West Memphis MPO (WMPO), meets the threshold set in Subpart G:

- a) Population – 1,074,615 (Census 2016)
- b) NAAQS Designation
  - i. Entire Shelby County TN – Maintenance for O<sub>3</sub>
  - ii. Entire Crittenden County, AR – Maintenance for O<sub>3</sub>
  - iii. Partial DeSoto County, MS – Maintenance for O<sub>3</sub>
  - iv. Entire Shelby County TN – Attainment for CO (reached on December 26, 2017)

Thus, requiring the Tri-State Urbanized Area is to establish single, unified targets for the following two measures under Subpart G:

- a) The annual hours of Peak Hour Excessive Delay (PHED) per capita, and
- b) The percent of Non-Single Occupancy Vehicles (SOV) travel

In consultation with WMPO, the MMPO established a working group which included the following representatives:

- a) Tennessee Department of Transportation (TDOT)
- b) Arkansas Department of Transportation (ARDOT)
- c) Mississippi Department of Transportation (MDOT)
- d) Memphis Urban Area MPO
- e) West Memphis MPO
- f) Federal Highway Administration (FHWA) – TN
- g) Federal Highway Administration (FHWA) – AR
- h) Federal Highway Administration (FHWA) – MS

Additional coordination efforts were done individually by each of the State DOTs and MPOs by engaging and updating their leadership on the ongoing efforts related to target setting.

**Table 3. Memphis, TN-MS-AR Urbanized Area 23 CFR 490.707 Subpart G Report**

SUBPART G			
	Memphis, TN-MS-AR Urbanized Area		
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)
Annual Hours of Peak-Hour Excessive Delay per Capita	N/A	N/A	18.8
Percentage of Non-Single Occupancy Vehicle Travel	16.6%	16.5%	16.5%

**Table 4. Arkansas (ARDOT) Baseline, 2-Year, and 4-Year Targets for VOC and NO<sub>x</sub>**

SUBPART H			
	Baseline (FY 2014-17)	2-Year Target (FY 2018-19)	4 – Year Target (FY 2018-2021)
Total Emissions Reductions (VOC) kg/day	0.629	0.003	0.014
Total Emission Reduction (NO <sub>x</sub> ) kg/day	0.422	0.014	0.014

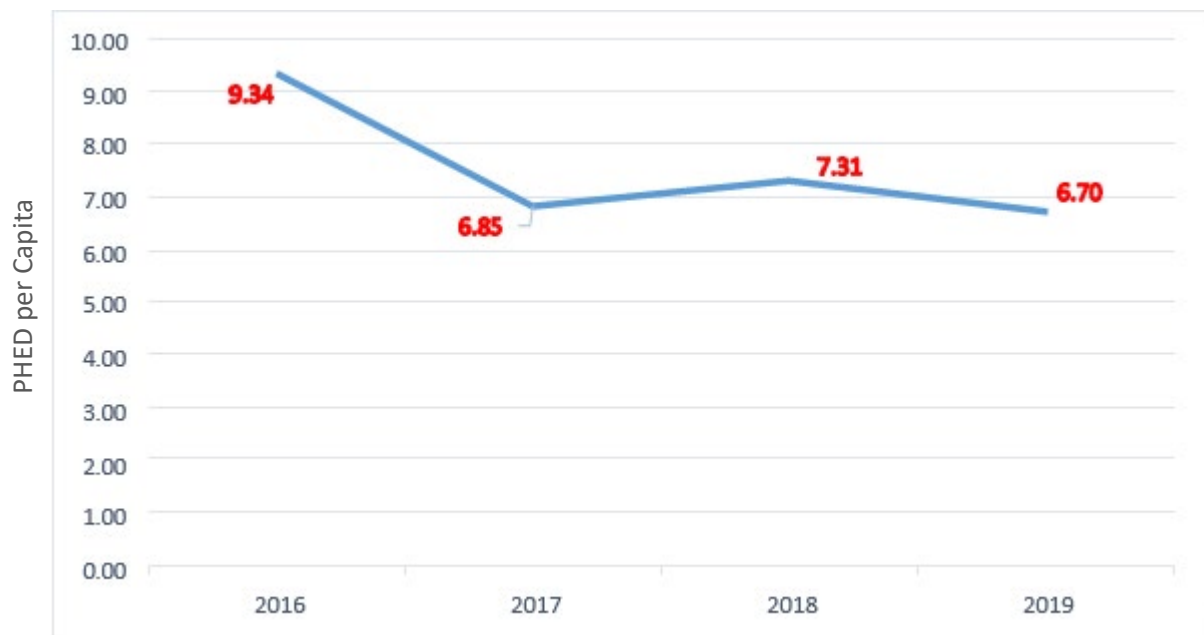
**2.1.1. Peak Hour Excessive Delay Measure (PHED)**

All state entities have provided the most up to date speed data and variation factors for calculating the PHED within the Memphis Urbanized Area (MDOT, TDOT, and ArDOT). Concluding that the low frequency of construction and travel limitations due to the COVID-19 Pandemic, the Memphis Metropolitan Planning Organization has calculated a significantly lower 4-year target (2021) for PHED, 18.8, and the midpoint being 6.7 hours, as shown below.

**Table 5: Memphis Quarterly PHED**

<b>Memphis PHED</b>					
	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Yearly</b>
2016	2.08	2.46	2.57	2.22	9.34
2017	1.61	1.74	1.70	1.80	6.85
2018	1.74	1.93	1.78	1.86	7.31
2019	1.60	1.70	1.70	1.80	6.70

**Figure 2. Memphis Yearly PHED**

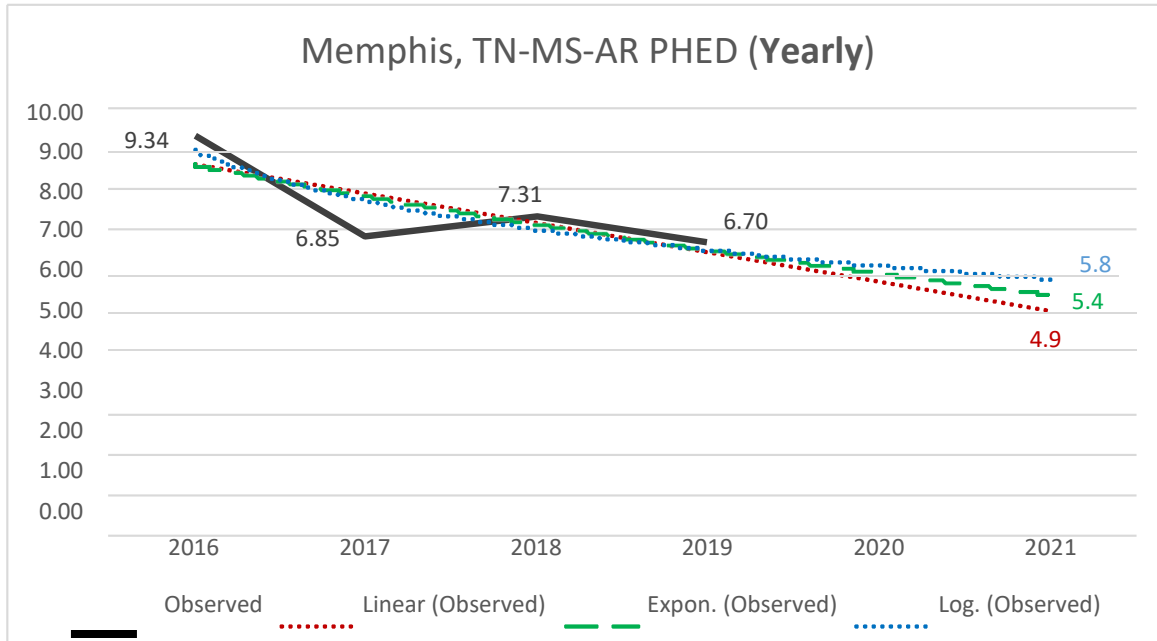


Memphis MPO staff calculated the linear, exponential, and logarithmic for analyzing the PHED trend using data that is provided yearly, as shown in **Figure 3** and the INRIX data, as shown in **Figure 4**. Using the INRIX data, all projections produced lower values as opposed to the values calculated in 2018:

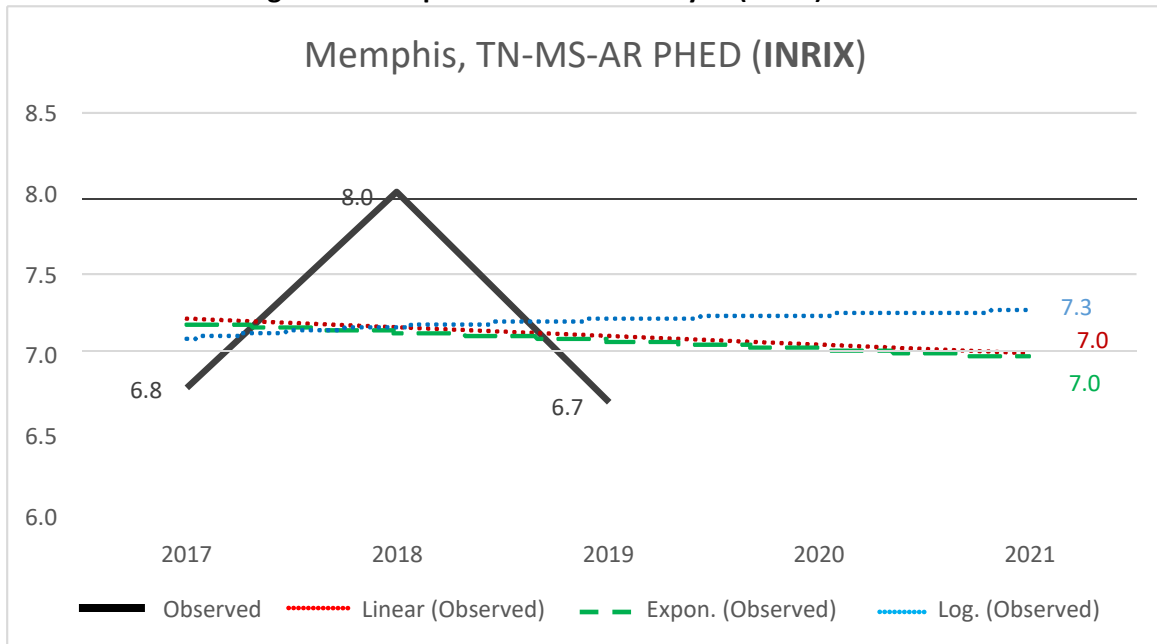
- Linear: 7.0 hours
- Exponential: 7.0 hours
- Logarithmic: 7.3 hours

The Memphis, TN-MS-AR Tri-State Committee looked over the calculations and discussed that future projects that may be under construction in 2021, and expressed that using the 2018 INRIX data would not exceed the peak hour excessive delay but would allow for approximately a 1.0-hour buffer from the linear and the exponential 2021 projections.

**Figure 3. Memphis PHED Trend Analysis (Yearly) for Memphis, TN-MS-AR PHED.**



**Figure 4. Memphis PHED Trend Analysis (INRIX) TN-MS-AR PHED.**



### 2.1.2. Target

The Tri-State Committee including the Tennessee, Mississippi, Arkansas, the West Memphis Area MPO and Memphis MPO agreed by vote to update the 4-year target for the Peak-Hour Excessive Delay (PHED) to 8.0 hours.

- 4-Year Tri-State Target: **8.0 Hours (2021)**

### 2.1.3. Percentage of Non-Single Occupancy Vehicle (Non-SOV) Travel

The current 2-Year (2019) and 4-Year (2021) target for Percent of Non-SOV Travel is 16.5% (Table 6). After review of 2017 and 2018 American Community Survey, the working group decided the historical data of commuting to work of 7-year estimates from 2012-2018 was analyzed. Other influencing factors were also reviewed for the same amount of time, which included gas prices, economy, etc.

**Table 6. Percent of Non-SOV 2012 to 2018 (7-year trends) for Commuting to Work**

	% SOV	% Non-SOV
	Memphis, TN-MS-AR	Memphis, TN-MS-AR
2012	82.3	17.7
2013	82.8	17.2
2014	83.2	16.8
2015	83.5	16.5
2016	83.4	16.6
2017	82.9	16.0
2018	84.1	15.9
	Average 7 years	16.7
	Average 5 years	17.0

### 2.1.4. Target

A hybrid approach was used in selecting this target, beginning with analysis, and ending with consensus for choosing the lowest value over the 7 years. The data has shown over the past few years that the percentage has been declining from 16.5% in 2015 to 16% in 2017, and down to 15.9% in 2018. The data was then evaluated for a trend analysis for the 4-year target. All three observations revealed the lowest value from the linear analysis (14.5%). (Exponential: 15.5%, Logarithmic: 15.8%)

- 4-Year Tri-State MPO Target: **14.5% (2021)**



### 3. 2-Year Condition/Performance for On-Road Mobile Source Emission Measures

MPOs that contain a portion or complete part of any one or more area(s) designated as nonattainment or maintenance for ozone, CO, or PM10 and PM2.5 NAAQS are required to set targets for the on-road mobile source emissions measure. The West Memphis MPO as a part of the Memphis TN-MS-AR Urbanized Area, is designated as Nonattainment or Maintenance Area for Ozone (O<sub>3</sub>) and is required to establish targets for the on-road mobile source emissions measure. The MPO is also required to report on progress made toward achieving those targets in their CMAQ Performance Plan every two years. This performance measure applies to projects that receive or are programmed for CMAQ funding.

In Arkansas, this performance measure applies to the West Memphis MPO Area. To calculate the Base Data for CMAQ funded projects, 2014-2017 CMAQ Public Access System Data as specified in the federal rulemaking, was used. The base emission reductions values were based on the only CMAQ project listing emission reductions in the CMAQ Public Access System for the MPO Area from 2014 to 2019.

**Table 7. Annual Emission Reductions for the West Memphis Area MPO**

Annual Emissions Reductions (kg reduced/day - Sum 2014 -2017)					
	VOC	CO	NOx	PM10	PM2.5
2014	0.000	N/A	0.000	NA	NA
2015	0.000	N/A	0.000	NA	NA
2016	0.629	N/A	0.421	NA	NA
2017	0.000	N/A	0.000	NA	NA
2018	0.003	N/A	0.014	NA	NA
2019	0.00	N/A	0.00	NA	NA

- Base Line: VOC: 0.629 kg/day; NOx: 0.421 kg/day

#### 3.1 Goals

The West Memphis MPO 2-year targets and 4-year targets for each of the criteria pollutants are based on the only CMAQ funded project that is in the current 2019-2022 TIP. Other available CMAQ funds are shown in the TIP on a generic project basis and are disbursed when an eligible, qualified project is requested and then approved by the MPO as per the funding criteria and emissions reductions requirements. These projects, when assigned, will be assessed, and updated in the Performance Progress reports.

**Table 8. Baseline, 2-Year, and 4-Year targets for the West Memphis Area MPO**

Targets Based on TIP Projects (kg/day)					
	VOC	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Baseline Sum ('14-'17)	0.629	-	0.421	-	-
2-Year Cumulative Target '18-'19 (kg/day)	0.003	-	0.014	-	-
4-Year Cumulative Target '18-'21 (kg/day)	0.003	-	0.014	-	-

#### 4. Description of Projects

Included in the table below are the CMAQ project category types that are identified by the West Memphis MPO for the years 2018-2021 projects. Other CMAQ projects that may be funded during this period have not been identified but eligible projects when requested will be added as approved by the MPO and will be assessed and updated in the Performance Progress Reports.

**Table 9. Approved Projects for 2018-2021, Used for Arkansas State's Targets**

Fiscal Year	Project Category			VOC kg/day	NO <sub>x</sub> kg/day	PHED Benefit	Non-SOV Benefit
	Bicycle/Pedestrian Projects	Traffic Flow Improvements	Travel Demand Initiatives				
2018	0	0	0	0.000	0.000	N/A	N/A
2019	0	1	0	0.003	0.014	Yes	No
2020	0	0	0	0.000	0.000	N/A	N/A
2021	0	0	0	0.000	0.000	N/A	N/A
Emissions Reduction Targets				VOC kg/day	NO <sub>x</sub> kg/day		
2-Year Total (2018-2019)				0.003	0.014		
4-Year Total (2018-2021)				0.003	0.014		

**Table 9. Summary of the PM<sub>3</sub>**

SUBPART G			
Congestion Mitigation & Air Quality Performance Measures	Memphis, TN-MS-AR Urbanized Area		
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)
Annual Hours of Peak-Hour Excessive Delay per Capita	8.42	NOT APPLICABLE	8.0
Percentage of Non-Single Occupancy Vehicle Travel	16.6%	16.5%	14.5%
SUBPART H			
Congestion Mitigation & Air Quality Performance Measures	Arkansas (ARDOT)		
	Baseline (FY 2014-17)	2-Year Target (FY 2018-19)	4-Year Target (FY 2018-21)
Total Emissions Reductions (VOC) kg/day	0.629	0.003	0.003
Total Emissions Reductions (NOx) kg/day	0.421	0.014	0.014