Congestion Mitigation and Air Quality

Final Performance Plan (2018–2021) and Baseline Report (2022–2025)

SEPTEMBER 2022

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

The Delaware Valley Regional Planning Commission is the federally designated Metropolitan Planning Organization for the Greater Philadelphia region, established by an Interstate Compact between the Commonwealth of Pennsylvania and the State of New Jersey. Members include Bucks, Chester, Delaware, Montgomery, and Philadelphia counties, plus the City of Chester, in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties, plus the cities of Camden and Trenton, in New Jersey.

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DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

DVRPC's vision for the Greater Philadelphia Region is a prosperous, innovative, equitable, resilient, and sustainable region that increases mobility choices by investing in a safe and modern transportation system; that protects and preserves our natural resources while creating healthy communities; and that fosters greater opportunities for all.

DVRPC's mission is to achieve this vision by convening the widest array of partners to inform and facilitate data-driven decision-making. We are engaged across the region, and strive to be leaders and innovators, exploring new ideas and creating best practices.

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DVRPC is funded through a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for the findings and conclusions herein, which may not represent the official views or policies of the funding agencies.

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CHAPTER 1: Introduction

Purpose

The Infrastructure Investment and Jobs Act (IIJA), as well as the preceding Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation Act (FAST Act), have integrated performance measures into many Federal surface transportation programs and required the United States Department of Transportation (USDOT) to establish a set of national measures on which state DOTs must submit targets and report performance or condition. The Federal Highway Administration (FHWA) finalized three performance measures for the purpose of carrying out the Congestion Mitigation and Air Quality (CMAQ) Program. There are two CMAQ Congestion measures and one CMAQ Emissions measure. The CMAQ rule is also known as performance measure 3 (PM3), as it was the third in a series of FHWA rulemaking around transportation performance management. The first two were safety (PM1) and infrastructure condition (PM2).

The CMAQ Congestion measures are peak-hour excessive delay (PHED) and percent of Non-Single Occupant Vehicle (SOV) travel. The PHED measure is the annual hours of peak-hour excessive delay per capita that occurs within the applicable urbanized area (UZA). The percent of non-SOV travel measure is the percentage of travel, in the UZA, conducted by means other than SOV. These measures only apply to the National Highway System (NHS) mileage in urbanized areas with a population over one million for the first performance period (2018–2021) and a population of 200,000 for the second (2022-2025) and subsequent performance periods. The CMAQ Emissions measure is the cumulative estimated emissions reductions for all CMAQ-funded projects obligated during the first two-year and four-year performance period for each applicable criteria pollutant.

State DOTs, in coordination with Metropolitan Planning Organizations (MPOs), are required to provide FHWA with biennial progress reports for the three CMAQ performance measures. This report will serve as the second biennial progress reports for the Philadelphia Urbanized Area, the New York – Newark Urbanized Area, and the Delaware Valley Regional Planning Commission (DVRPC) planning area, demonstrating DVRPC progress toward the four-year CMAQ performance targets that were established in *DVRPC's 2018 CMAQ Baseline Performance Plan* (DVRPC Publication # TM19003). This report will also serve as the baseline report for the second performance period for this area which also includes the congestion measures for the Allentown-Bethlehem-Easton PA-NJ (Allentown) and Trenton, NJ UZAs.

Applicability

The DVRPC region is part of the Philadelphia PA-NJ-DE-MD UZA which has a population of 5,540,199 (2019 one-year ACS) and also includes the Trenton, NJ UZA, as well as small portions of the Allentown-Bethlehem-Easton PA-NJ (Allentown) and New York-Newark NY-NJ-CT (New York) UZAs. The Trenton, NJ UZA has a population of 291,085 (2019 one-year ACS), The Allentown UZA has a population of 844,052 (2019 one-year ACS), and the New York UZA has a population of 18,680,025 (2019 one-year ACS). The DVRPC region includes a complex combination of nonattainment and maintenance areas for two of the National Ambient Air Quality Standards (NAAQS)—ozone and fine particulate matter ($PM_{2.5}$).

The region's ozone nonattainment area encompasses the entire nine-county DVRPC region, while the $PM_{2.5}$ maintenance areas encompass various portions of the region. The region also includes former carbon monoxide (CO) maintenance areas in Pennsylvania and New Jersey and those areas have achieved their 20-year Maintenance Plans (New Jersey on July 10, 2016 and Pennsylvania on December 4, 2017). According

to the CMAQ performance measure applicability tables published by FHWA in October 2019, the DVRPC region is no longer required to report on CO emissions reduction measures.[1]

Reporting Requirements

Performance Plan (2018–2021)

Federal performance measure regulations (23 CFR 490) require that MPOs serving over one million people, and representing ozone, $PM_{2.5}$, or CO nonattainment or maintenance areas must report progress on attaining the congestion and emissions reductions four-year targets set out in the MPO's baseline CMAQ Performance Plan for the first reporting period which included the years 2018–2021.

The MPOs final performance plan must include the PHED and Percent Non-SOV values for each UZA in the MPO planning area, for calendar years 2018–2021. All of the MPOs and states serving a common UZA must adopt common congestion targets and report a unified performance value for the UZA. The DVRPC planning area includes two UZAs with over one million people. DVRPC has coordinated with each MPO and state DOT that serve portions of these UZAs to adopt common performance measures and targets.

The performance report must also include the cumulative emissions reductions for CMAQ-funded projects in the MPO's service area for federal fiscal years 2018 through 2021 as they are reported in the FHWA CMAQ Public Access System (PAS). Targets and performance are reported for CMAQ-funded projects separately for each state served by the MPO. DVRPC coordinated with each state DOT to develop the emissions reduction targets. The emissions reductions performance from CMAQ projects in the DVRPC region are included in each relevant state's performance plan and targets. The report also includes updates to the project lists from the baseline report that identifies CMAQ-funded projects that were expected to contribute to the four-year targets, including additions, deletions, changes in scope, and emissions reductions estimates in kilograms/day (kg/d) for each of the applicable pollutants.

The performance plan must list the MPO's CMAQ-funded projects and include an assessment of the progress of projects identified in both the baseline and mid-period performance reports. This assessment should include the project status, funding status, and delays. The performance plan should also identify how those projects contribute to the achievement of the four-year targets for traffic congestion and on-road mobile source emissions, including measurable impacts on congestion and emissions reductions.

This performance report covers the following nonattainment and maintenance areas within the DVRPC planning area:

- the DVRPC portion of the Philadelphia–Wilmington–Atlantic City Ozone Nonattainment Area;
- the DVRPC portion of the Philadelphia–Wilmington, Pennsylvania–New Jersey–Delaware (PA–NJ–DE) Annual $PM_{2.5}$ Maintenance Area;
- the DVRPC portion of the Philadelphia–Wilmington, PA–NJ–DE 24-Hour $PM_{2.5}$ Maintenance Area;
- the DVRPC portion of the New York–Northern New Jersey–Long Island, New York−New Jersey−Connecticut (NY–NJ–CT) Annual $PM_{2.5}$ Maintenance Area;
- the DVRPC portion of the New York–Northern New Jersey–Long Island, (NY–NJ–CT) 24-Hour $PM_{2.5}$ Maintenance Area; and
- the Delaware County, PA Annual $PM_{2.5}$ Maintenance Area.

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1 www.fhwa.dot.gov/environment/air_quality/cmaq/measures/cmaq_applicability/october_2019/#toc494364458

Baseline Report and Targets for Second Performance Period (2022-2025)

In addition to serving as the first reporting performance report. This document will also serve as the baseline report for the second performance period. This baseline report will address the aforementioned PM3 requirements for the DVRPC planning area for the period 2022-2025 and will establish new two- and four-year targets for PHED, Percent Non-SOV travel, and CMAQ emissions measures.

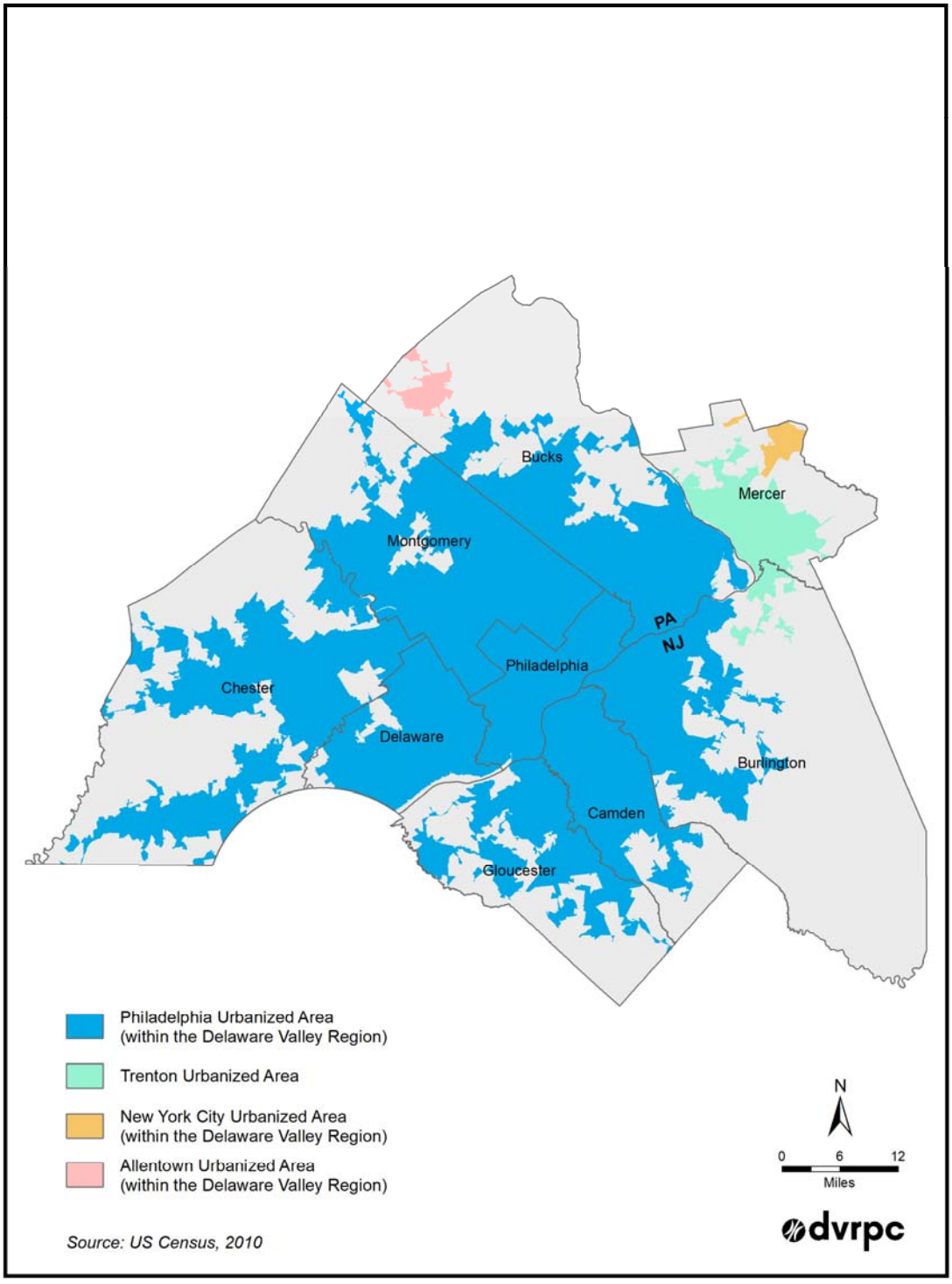
For the second performance period, the Federal performance requirements also apply to UZAs with a population over 200,000 people. This means that this baseline report will also include baseline conditions, two- and four-year targets for PHED and Percent Non-SOV travel for the Allentown and Trenton UZAs.

DVRPC's Board adopted the PM3 Congestion Measures for each of the UZAs with populations greater than 200,000 in the DVRPC Planning area at the July 28, 2022 Board meeting.

DVRPC presented the CMAQ Baseline and Performance Plan, which includes the adopted targets for the congestion measures and MPO targets for the CMAQ emissions measures at the DVRPC Board meeting on September 22, 2022. The DVRPC Board adopted this performance plan and supports the relevant state PM3 Emissions targets and approved the submission of the performance plan to FHWA by the October 1, 2022 deadline.

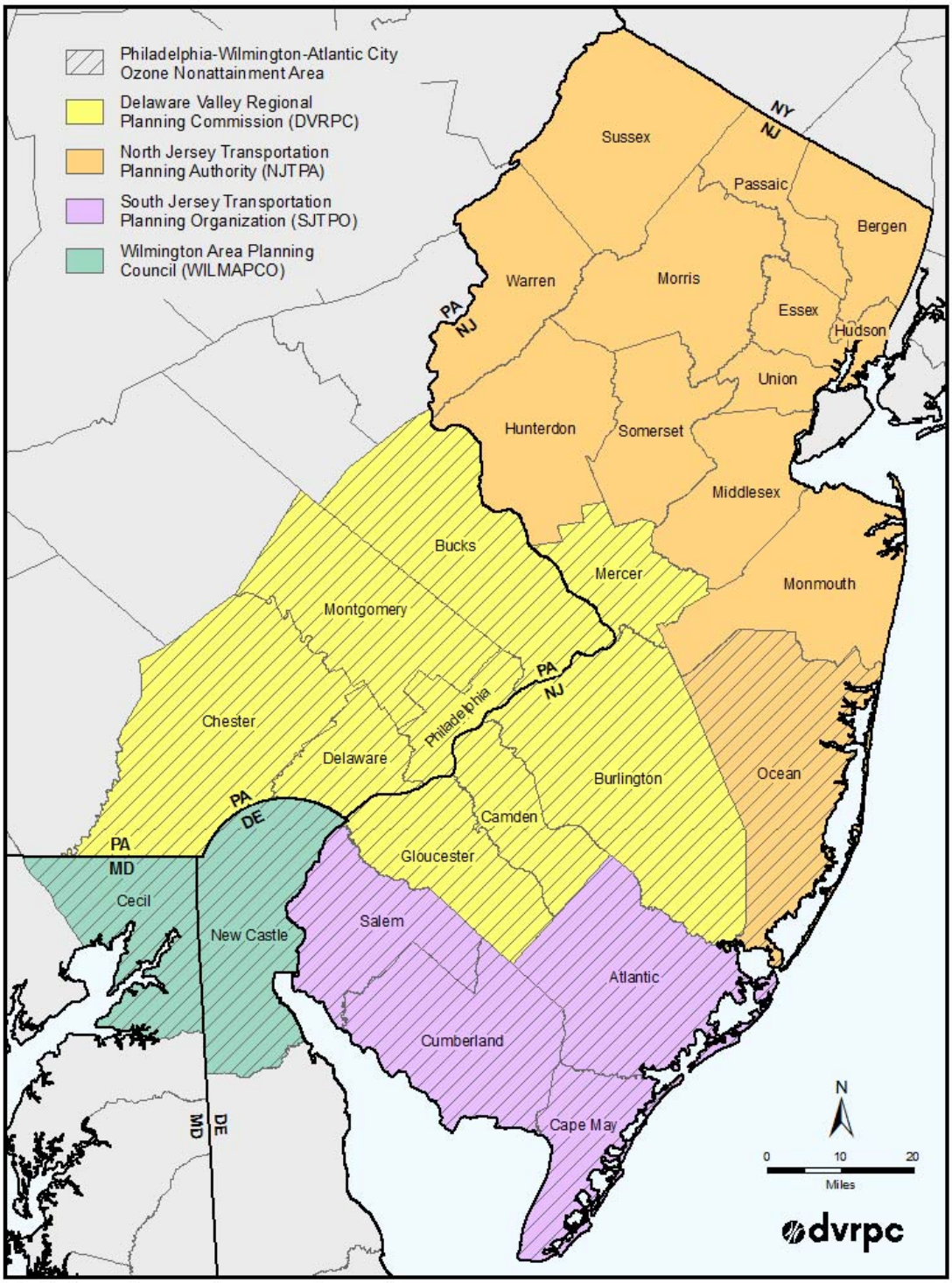
Figure 1 demonstrates the Philadelphia, Trenton, Allentown, and New York UZA boundaries within the DVRPC planning area. Figures 2 and 3 show the relevant nonattainment and maintenance areas in the region.

Figure 1: Urbanized Areas Boundaries Within the DVRPC Planning Area



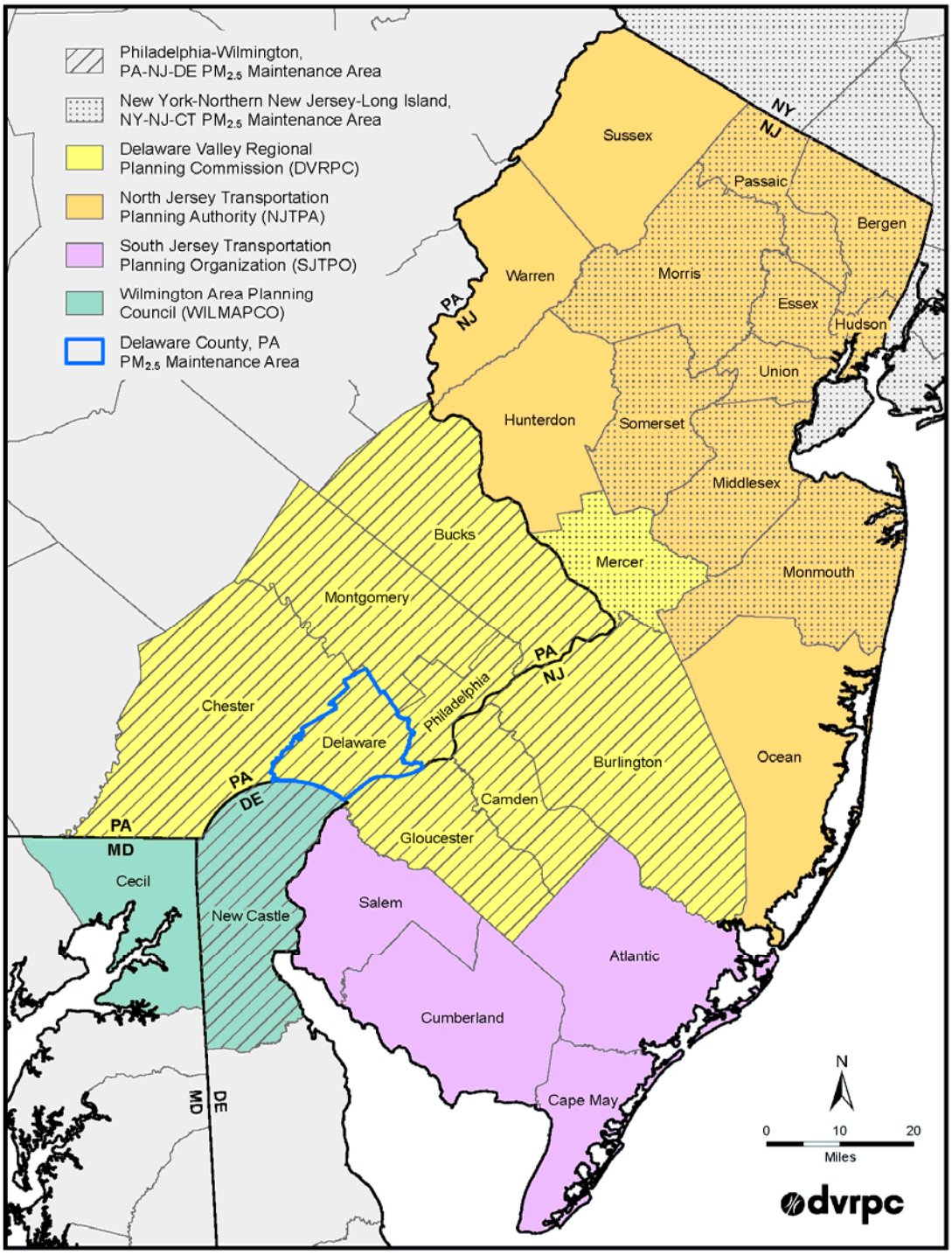
Source: U.S. Census 2010

Figure 2: Philadelphia-Wilmington-Atlantic City Eight-Hour Ozone Nonattainment Area



Source: DVRPC 2022

Figure 3: $PM_{2.5}$ Maintenance Areas in the DVRPC Region



Source: DVRPC 2022

CHAPTER 2: First Period Four-Year Performance and Targets

Congestion Measures – Philadelphia UZA

MPOs and DOTs that are part of a UZA are charged with developing common traffic congestion measures for the UZA. In the case of the Philadelphia PA-NJ-DE-MD UZA, this means that DVRPC, Lancaster County Transportation Coordinating Committee, North Jersey Transportation Planning Authority (NJTPA), South Jersey Transportation Planning Organization (SJTPO), Wilmington Area Planning Council, Pennsylvania Department of Transportation (PennDOT), New Jersey Department of Transportation (NJDOT), Delaware Department of Transportation, and Maryland Department of Transportation must adopt a common congestion measure baseline, performance measurements, and targets for the Philadelphia UZA. DVRPC took the lead in working with the partnering agencies in developing common congestion measures and targets for the UZA.

The consensus on common congestion performance measure baselines and targets in the Philadelphia UZA was accomplished for the first performance period (2018–2021) in the initial performance plan through a series of four coordination meetings where the target-setting procedures, methodologies, and data sources were determined. The consensus two- and four-year congestion measure targets for the Philadelphia UZA were agreed upon by all partnering agencies and submitted to FHWA by the respective state DOTs in May 2018.

For the interim performance plan, a meeting was held on June 11, 2020 to review the two-year performance and to potentially adjust the four-year target. Based on a lack of historical PHED data and uncertainties related to the COVID-19 pandemic, it was decided to not adjust the four-year target.

For the final performance plan of the first performance period, a meeting was held on March 30, 2022 between the MPOs and state DOTs that are part of the Philadelphia UZA in order to review the UZA's performance for the CMAQ traffic congestion measures. DVRPC presented the methodology and results for determining the congestion measure performance, and these performance values will be reported to state DOTs by October 1, 2022.

Peak-Hour Excessive Delay

The annual hours of PHED per capita baseline measure for the initial 2018 performance plan was calculated using the RITIS Probe Data Analytics (PDA) Suite on May 7, 2018, which was the "pencils down" date for the final calculation of measures and establishing targets. The PHED baseline year (2017) value was 16.8 annual hours of PHED per capita and the partnering agencies agreed on a four-year (2021) target of 17.2 annual hours of PHED per capita. An optional 2-year target of 17.0 was agreed upon as well.

For the two-year interim performance plan of the first performance period, the annual hours of PHED per capita measure two-year performance (2019) was calculated at 14.6 using the RITIS PDA Suite. This value was used to compare against the two-year optional target of 17.0, and potentially used to adjust the four-year target. The two-year performance was less than the two-year optional target, which resulted in achieving the performance goal of reducing PHED. The partnering agencies decided on June 11, 2020, which was the "pencils down" date for deciding to adjust the 4-year target, to not adjust given the uncertainties in the foreseeable future due to the COVID-19 pandemic.

For the final performance plan of the first performance period, the annual hours of PHED per capita measure four-year performance (2021) was calculated at 13.1 using the RITIS PDA Suite. This value was less than the 4-year target of 17.2 which resulted in achieving the four-year performance goal of reducing PHED.

Table 1 shows the Performance Measure baseline, two- and four-year performance, and Target Values for the Annual Hours of PHED per Capita Measure for the Philadelphia UZA.

Table 1: Baseline, Two-Year, and Four-Year Target and Performance Values for Annual Hours of PHED per Capita Measure for the Philadelphia PA-NJ-DE-MD Urbanized Area

Measure	Baseline	Optional Two-Year Target	Two-Year Performance	Four-Year Target	Four-Year Performance
PHED	16.8	17.0	14.6	17.2	13.1

Source: DVRPC 2022

Notes:

- The UZA boundary and the associated five-year ACS estimated population were obtained from the U.S. Census. The annual hours of PHED is divided by the population to derive the per capita measure.
- The 2017 baseline measure value of 16.8 was based on the best available data at the time for reporting to FHWA; since that time the baseline value was adjusted in the RITIS-PDA Suite to 16.1.
- Reporting segments and travel times (in 15-minute intervals) were derived from the National Performance Management Research Data Set (NPMRDS).
- Hourly traffic volumes by vehicle classification for buses, trucks, and cars were established from AADT reported to the HPMS and from FHWA volume profiles.
- Annual Vehicle Occupancy (AVO) for cars, buses, and trucks was provided by FHWA.
- A two-year target was not required for PHED.
- Travel models in the Philadelphia UZA indicate potential increases in VMT and delay.
- The combination of partner input, travel model forecasts, VMT, vehicle registration trends, and economic forecast was considered in establishing a 0.6 percent annual increase in delay per capita in the Philadelphia UZA.

Percent Non-Single Occupant Vehicle Travel

The Percent Non-SOV Travel measure was calculated for the initial 2018 performance plan using the U.S. Census American Community Survey (ACS) five-year estimates for the urbanized area. The 2017 baseline value (five-year ACS 2012-2016) was 27.9 percent and the partnering agencies agreed on two-year and four-year targets of 28.0 percent and 28.1 percent, respectively.

For the two-year interim performance plan, the most recent U.S. Census ACS five-year estimate (2014–2018) indicated a two-year performance of 28.2 percent, which exceeded the two-year target of 28.0 percent, and resulted in achieving the goal of increasing non-SOV travel. The two-year performance and travel trends were reviewed by the partnering agencies to potentially adjust the four-year target. A linear trend value was created based on the most recent non-overlapping five-year ACS estimates (2009–2013 and 2014–2018), that resulted in a potential target of 28.5 percent, which was higher than the previously adopted four-year target set in 2018 of 28.1 percent (a difference of 0.4 percent) and exceeded target expectations. Since the four-year target and trend value were fairly close (0.4 percent), and because of the uncertainty in travel patterns in the foreseeable future due to the COVID-19 pandemic, there was consensus among the partners to not adjust the target.

For the final performance plan of the first performance period, the most recent U.S. Census ACS five-year estimate (2016-2020) indicated a four-year performance of 30.6 percent, which exceeded the 4-year target of 28.1 percent and resulted in again achieving the goal of increasing percent Non-SOV travel.

Table 2 shows the Performance Measure baseline, two- and four-year performance, and Target Values for the Percent Non-SOV Travel measure for the Philadelphia UZA.

Table 2: Baseline, Two-Year, and Four-Year Targets and Performance Values for Percent Non-SOV Travel Measure for the Philadelphia PA-NJ-DE-MD Urbanized Area

Measure	Baseline	Two-Year Target	Two-Year Performance	Four-Year Target	Four-Year Performance
Percent Non-Single Occupant Vehicle Travel	27.9%	28.0%	28.2%	28.1%	30.6%

Source: DVRPC 2022

Notes:

- The baseline value refers to the U.S. Census five-year ACS (2012–2016); the two-year performance to the five-year ACS (2014–2018); and the four-year performance to the five-year ACS (2016–2020).
- Travel trends show slight increases in Percent Non-SOV travel from five-year ACS (2009–2013) to five-year ACS (2014–2018). A linear trend was used to help decide whether to adjust the four-year target.
- There is a two-year lag in the availability of ACS data.

Congestion Measures – New York-Newark UZA

Since there is a portion of the New York UZA in Mercer County, New Jersey, within the DVRPC region, DVRPC has coordinated with the NJTPA, the New York Metropolitan Transportation Council, NJDOT, the New York Department of Transportation, and others to adopt a common congestion measure baseline and target for that UZA. NJTPA led efforts working with the partnering agencies in facilitating meetings to develop the targets for the measures.

DVRPC participated in a series of coordination meetings to determine the congestion measure performance targets and measures for the initial baseline performance plan in the New York UZA and adopted those targets in May 2018.

A series of similar meetings were conducted for the interim performance plan for the New York UZA in 2020 to report on progress towards the established targets, and potentially adjusting the four-year target. The committee agreed to not adjust the four-year congestion measurement targets for the UZA.

The PHED and Percent Non-SOV Travel measure performance and targets for the New York UZA are presented in Tables 3 and 4.

Peak-Hour Excessive Delay

For the initial performance plan, the annual hours of PHED per capita measure baseline year (2017) value was 20.0 and the partners agreed on a four-year (2021) target of 22.0. For the interim performance plan, the annual hours of PHED per capita the two-year interim performance measurement was 22.2, and the partners agreed to not adjust the four-year target.

For the final performance plan of the first performance period, the annual hours of PHED per capita four-year performance was 20.9 which was less than the four-year target of 22.0, which resulted in achieving the four-year performance goal of reducing PHED.

Table 3: Baseline, Two-Year, and Four-Year Targets and Performance Values for Annual Hours of PHED per Capita Measure for the New York-Newark NY-NJ-CT Urbanized Area

Measure	Baseline	Optional Two-Year Target	Two-Year Performance	Four-Year Target	Four-Year PHED Performance
PHED	20.0	N/A	22.2	22.0	20.9

Source: NJDOT 2022

Notes:

- The UZA and associated five-year estimated population were from the U.S. Census.
- Reporting segments and travel times (in 15-minute intervals) were derived from the NPMRDS.
- Hourly traffic volumes and annual vehicle classifications for buses, trucks, and cars were derived from AADT reported to the HPMS.
- Annual Vehicle Occupancy (AVO) for cars, buses, and trucks was provided by FHWA.
- A two-year target was not required for PHED.

Percent Non-Single Occupant Vehicle Travel

The 2017 percent Non-SOV Travel baseline value (five-year ACS 2012–2016) was 51.6 percent and the partners agreed on two-year (2019) and four-year (2021) targets of 51.6 percent and 51.7 percent, respectively. The Percent Non-SOV travel measure two-year performance was 51.7 percent, which was one-tenth percent more the two-year target, which resulted in achieving the two-year performance goal.

The Percent Non-SOV Travel measure four-year performance was calculated at 52.4 percent using the most recent U.S. Census ACS five-year estimates (2016-2020) for the four-year performance plan. The value exceeded the four-year target of 51.7 percent which resulted in achieving the four-year performance goal of increasing Non-SOV travel.

Table 4: Baseline, Two-Year, and Four-Year Targets and Performance Values for Percent Non-SOV Travel Measures for the New York-Newark NY-NJ-CT Urbanized Area

Measure	Baseline	Two-Year Target	Two-Year Performance	Four-Year Target	Four-Year Performance
Percent Non-Single Occupant Vehicle Travel	51.6%	51.6%	51.7%	51.7%	52.4%

Source: NJDOT 2022

Notes:

- The baseline refers to the U.S. Census five-year ACS (2012–2016); the two-year performance to the five-year ACS (2014–2018); and the four-year performance to the five-year ACS (2016–2020).
- There is a two-year lag in the availability of ACS data.

On-Road Mobile Emissions Measures

Baseline

Each year DVRPC receives a local CMAQ allocation from both PennDOT and NJDOT to apply to projects that improve congestion and reduce on-road mobile source emissions in the region's ozone nonattainment and $PM_{2.5}$ maintenance areas.

Every year, each state DOT submits an annual report to FHWA that includes the emissions reductions from CMAQ-funded projects in the state. That data is entered into the FHWA PAS[2], where the public can view the emissions reductions attributable to CMAQ-funded projects. This system also serves as the official storehouse of project emissions reduction data from CMAQ-funded projects.

Federal performance measure regulations (23 CFR 490) requires that DVRPC provide a baseline report of the emissions benefits from CMAQ-funded projects during the performance period 2014–2017. DVRPC is required to report values that were entered into the FHWA PAS when calculating the baseline and performance for the emissions reduction targets.

In each state, the baseline values reported in this section were extracted from the FHWA PAS. In the development of the emissions targets, adjustments have been made to those baselines to count only the "new" projects funded during those years because it was the intent of the FHWA PAS to differentiate between continuing or on-going CMAQ projects and projects that are newly funded. Only newly funded projects' emissions benefits will be counted towards the performance targets moving forward. Both the raw baseline data that includes all of the emissions reductions reported in the FHWA PAS for the period 2014–2017, and an adjusted baseline that only includes emissions reductions from newly funded CMAQ projects are presented in this section.

Pennsylvania

Table 5 identifies the emissions reductions from CMAQ-funded projects in the Pennsylvania portion of the DVRPC region. Both baseline scenarios (all of the projects added into the PAS and the adjusted baseline with just the newly funded projects) are presented but the adjusted baseline was the value that was utilized to develop the emissions reductions targets.

[2] (https://fhwaapps.fhwa.dot.gov/cmaq_pub/)

Table 5: Baseline Emissions Reductions Values from CMAQ-Funded Projects in the Pennsylvania Portion of the DVRPC Region (2014–2017)

Pollutant	Emissions Reduction (kg/day)	
	Unedited Values from FHWA CMAQ PAS (includes continuing projects)	Adjusted Values from FHWA CMAQ PAS (includes newly funded projects only)
VOC Emissions	1,281.860	112.080
NO_x Emissions	1,498.940	72.930
$PM_{2.5}$ Emissions	31.690	2.700
CO Emissions	8,895.290	565.470

Source: PennDOT 2018

New Jersey

Table 6 identifies the emissions reductions from CMAQ-funded projects in the New Jersey portion of the DVRPC region. Both baseline scenarios (all of the projects added into the PAS and the adjusted baseline with just the newly funded projects) are presented but the adjusted baseline was the value that was utilized to develop the emissions reductions targets.

Table 6: Baseline Emissions Reductions Values from CMAQ-Funded Projects in the New Jersey Portion of the DVRPC Region (2014–2017)

Pollutant	Emissions Reduction (kg/day)	
	Unedited Values from FHWA CMAQ Database (includes continuing projects)	Adjusted Values from FHWA CMAQ Database (includes newly funded projects only)
VOC Emissions	29.300	3.090
NO_x Emissions	319.850	15.084
$PM_{2.5}$ Emissions	14.531	5.260
CO Emissions	N/A	N/A

Source: NJDOT 2018

Targets

DVRPC coordinated emissions reduction target-setting with both PennDOT and NJDOT to establish targets from CMAQ-funded projects in the relevant portions of the DVRPC planning area. Each state developed state-level emissions reductions targets that account for emissions reductions at the MPO level.

DVRPC then adopted the MPO regional targets that were used to develop each state's targets that were submitted to FHWA in May 2018. The DVRPC-supported emissions reductions targets are presented in the following sections.

In order to establish the performance targets in each state, the four-year (2014–2017) historical benefits for new (non-continuing) CMAQ projects in the DVRPC region were averaged. The historical average of the CMAQ project emissions benefits were then adjusted to reflect the anticipated emissions rates of cleaner vehicles that are expected to be operational during the next performance period. This adjustment resulted in conservative emissions reductions targets for the MPO region and each state.

DVRPC coordinated efforts to develop the On-Road Mobile Source Emissions targets in collaboration with NJDOT and PennDOT. The coordination procedures are detailed in each state's DOT's PM3 Performance Measure submission letters that were sent to FHWA in May 2018 and are included in Appendices C and D of this report.

In New Jersey, the regional targets were adjusted to account for CMAQ-funded statewide projects. Emissions targets and benefits from statewide projects are allotted to the MPOs by the MPO's share of statewide VMT. This adjustment allots the DVRPC region 20.5 percent of the emissions benefits from statewide CMAQ-funded projects.

DVRPC supported both the NJDOT and PennDOT on-road mobile emissions reductions targets for CMAQ-funded projects.

Performance

For the first performance period (2018–2021), MPOs that serve UZAs with a population of over one million people were required to submit an interim performance plan that provides the progress towards meeting the two- and four-year on-road emissions reductions from CMAQ-funded projects for the applicable pollutants. DVRPC submitted the interim two-year performance plan to the state DOTs and FHWA in September 2020 and the four-year performance measure results are included in this report.

Since the beginning of the emissions performance measure process, DVRPC, in consultation with the state DOTs, has begun re-evaluating the emissions benefits of programmatic projects that are funded by Transportation Improvement Program (TIP) "line-item" programs. Line-item programs serve to reserve funding for a particular project type and those funds are then drawn down or applied to specific projects that meet that program's goals. These programs may retain a common project identification number but fund projects with new scopes of work and therefore provide new emissions reductions benefits to the region. Examples of these types of projects are the SEPTA Bus Purchase Program and the New Jersey Signal Retiming Program. In the past, the projects may have been labeled as "continuing" and the new benefits may not have been reported in the PAS but after further consideration, the benefits are included in the emissions reduction performance when scope changes warrant reevaluation of the emissions benefits. These projects have been noted in the CMAQ-funded project tables included in this report as "recurring projects with new benefits."

Pennsylvania

The two- and four-year progress towards meeting these targets in the Pennsylvania portion of the DVRPC planning area were extracted directly from the FHWA CMAQ PAS as required by 23 CFR 490. The two- and four-year targets and performance are presented in Table 7.

Table 7: On-Road Emissions Reductions Targets for the DVRPC Planning Area in Pennsylvania

Pollutant	Emissions Reduction (kg/day)			
	FY2018 – FY2019 Two-year Target	FY2018 – FY2019 Two-year Performance	FY2018 – FY2021 Four-year Target	FY2018 – FY2021 Four-year Performance
VOC Emissions	37.610	**142.80**	69.310	**217.099**
NO_x Emissions	23.420	**652.400**	42.500	**928.699**
$PM_{2.5}$ Emissions	1.080	**24.210**	2.060	**33.019**

Source: PennDOT 2022

The two-year emissions reductions were considerably higher than the two- and four-year targets. This was partially due to the addition of emissions reductions from the transit flex program that were included in the FHWA CMAQ PAS for the first time in 2018.

DVRPC's transportation demand management (TDM) programs underwent significant revisions during this performance period and the calculations from the new and revised TDM programs were included in the PAS reporting, which accounts for another significant portion of the actual performance outperforming the two- and four-year targets. At the time of DVRPC's baseline report, the TDM programs were considered continuing projects and the emissions benefits were not anticipated to be included in the PAS.

Projects that were not anticipated in the accounting for the two-year targets are noted in Table A-1 in Appendix A, CMAQ-funded projects in the Pennsylvania DVRPC region from the PAS.

These results were reviewed and agreed upon in coordination with PennDOT in July 2021.

New Jersey

The two and four-year progress towards meeting these targets in the New Jersey portion of the DVRPC planning area were extracted directly from the FHWA CMAQ PAS as required by 23 CFR 490. The two and four-year targets and performance are presented in Table 8.

Table 8: On-Road Emissions Reductions Targets for the DVRPC Planning Area in New Jersey

Pollutant	Emissions Reduction (Kg/day)			
	FY2018 – FY2019 Two-year Target	FY2018 – FY2019 Two-year Performance	FY2018 – FY2021 Four-year Target	FY2018 – FY2021 Four-year Performance
VOC Emissions	1.450	**70.130**	2.864	**73.692**
NO_x Emissions	7.453	**668.790**	14.861	**683.827**
$PM_{2.5}$ Emissions	2.627	**108.520**	5.253	**111.813**

Source: NJDOT 2022

DVRPC has outperformed the CMAQ two- and four-year emissions reduction targets for the applicable pollutants in the New Jersey portion of the DVRPC planning area. This performance can be credited to a

number of factors including the authorization of a particularly large transit project and the reevaluation of line-item funded programs that fund projects with new scopes of work that produce new emissions benefits periodically. In the past these programs may have been considered “continuing” projects and new benefits not included in the PAS.

These results were reviewed and agreed upon in coordination with NJDOT and the New Jersey MPOs in July 2021.

Adjusting the Four-Year Targets

The MPOs and state DOTs serving the Philadelphia and New York-Newark UZAs agreed to not adjust the congestion targets for the respective UZAs.

Pennsylvania

PennDOT, DVRPC, and the Southwestern Pennsylvania Commission (SPC) held a meeting in August 2020 to discuss the interim performance plan and the need to adjust the four-year emissions targets for the MPO areas and the state. SPC is the only other MPO in the state required to report progress on CMAQ emissions targets for this reporting period. The group agreed that DVRPC is no longer required to report CO targets and performance, and DVRPC would not include CO in this or subsequent performance reports. It was agreed that DVRPC will not adjust the MPO level targets for the remaining applicable pollutants. PennDOT and SPC agreed that there will be adjustments to the statewide level four-year targets and DVRPC supported these changes. The revised targets are detailed in PennDOT’s September 2020 CMAQ Target Revision memo attached as Appendix E to this report.

New Jersey

NJDOT and the MPOs serving New Jersey met in May 2020 to discuss adjusting the MPO and statewide four-year emissions targets. Due to uncertainties associated with forecasting the implementation of CMAQ-funded projects in the upcoming two years due to the economic downturn and COVID-19 pandemic, DVRPC, in coordination with NJDOT, agreed to not adjust the four-year emissions reduction targets in the New Jersey portion of the DVRPC region. NJ DOT also decided to not adjust the statewide CMAQ emissions targets. NJDOT’s memo agreeing to adopt the original four-year performance targets is attached as Appendix F to this report.

Achieving the Targets

According to FHWA Guidance for preparing the MPO CMAQ performance report, MPOs must present a description of projects identified for funding during the performance period (Federal Fiscal Years 2018–2019, and 2018–2021). Included with the project descriptions should be a further description of how the projects will help the MPO meet the two- and four-year targets for traffic congestion and on-road mobile source emissions.

The requirements for preparation of the interim performance plan further require that a description should be given to explain projects that contributed to the two-year targets, and explain additions, deletions, and revisions to projects included in the MPOs Baseline Performance Plan. These requirements were met in DVRPC’s PM3 Interim Period report (Publication Number TM21003) which was submitted to the state DOTs and FHWA in October 2020.

For the Four-Year Performance Period covered by this report, DVRPC is submitting two tables for each state. The first includes a project description, the emission reduction values that were extracted from the PAS and the year in which those values were included in the PAS. The second set of tables include all of the CMAQ-funded projects from the relevant TIPs for the four-year performance period, how the projects contribute to

both the congestion and emissions reduction targets, and the status of the project (continuing, completed, delayed, or canceled). The tables for each state are organized by the state project identification number (known as MPMS number in Pennsylvania and DB number in New Jersey). These tables can be found in Appendix A of this report.

The DVRPC region has met the two- and four-year Percent Non-SOV Travel and PHED UZA targets, and the two- and four-year CMAQ emissions reductions targets that were established in *the 2018 CMAQ Performance Measure Baseline Report.* DVRPC will continue to collaborate with PennDOT and NJDOT to program CMAQ-funded projects that improve congestion and reduce on-road mobile emissions in a cost-effective manner.

CHAPTER 3: Baseline and Targets for Second Performance Period (2022–2025)

Congestion Measures – Philadelphia UZA

The consensus on common PM3 traffic congestion measure baseline performance and targets for the baseline performance plan of the second performance period (2022-2025), in the Philadelphia UZA, was accomplished through a series of three coordination meetings where the target-setting procedures, methodologies, and data sources were determined. The consensus two- and four-year congestion measure targets for the Philadelphia UZA were agreed upon by all partnering agencies and will be submitted to FHWA by the respective state DOTs by October 1, 2022.

The collaboration process with the partnering agencies in setting targets for the PHED and non-SOV travel measures involved various tasks. Prior to the virtual coordination meetings, an agenda was sent out via email to the partnering agencies so they could prepare for the topics discussed and recommend any changes or additions to the agenda as appropriate. Subsequent to the meetings, a summary was prepared and sent to the partnering agencies to serve as a record of the meeting and as a reference in the future in case questions or clarifications arose. Finally, as part of setting targets at the third meeting, each agency was asked if they agreed to support the targets, which they each agreed in the affirmative. Meeting agendas, summary documents, and any other associated correspondence with the partnering agencies is available upon request.

The first meeting was held on March 30, 2022 to review the second performance period (2022–2025) measures, overall policy goals and objectives, regulations, required data and metrics, urbanized area geography, and sources of historical travel trend data.

The second meeting was held on May 4, 2022 to review nationwide PHED and non-SOV travel measures for very large urbanized areas to show how the Philadelphia UZA performed relative to similar sized UZAs. The meeting also included reviewing travel trends and forecasts in the urbanized area, and various potential two- and four-year targets for the measures based on various linear and other trends of scenarios of workers working from home, taking transit, and driving alone. The coordination group partnering agencies were asked for feedback on the potential measure targets. A “pencils down” date of June 17 was scheduled to establish targets for the two measures.

The third meeting was held on June 9, 2022 to review the alternative scenarios for establishing targets and to review feedback from the partners on establishing targets for the PHED and Non-SOV travel measures. Based on consensus at the June 9 meeting, the partnering agencies agreed on two- and four-year targets for the measures which are presented in Tables 9 and 10 along with the existing baseline performance values.

There were various considerations used in developing the two- and four-year targets. Data-driven considerations included reviewing existing trends, including UZA population, VMT, transit ridership, and percent non-SOV travel. UZA ACS five-year population estimates increased on average 0.11 percent per year (2016-2020). According to FHWA, VMT increased in the UZA before the pandemic on average 0.86 percent per year (2015-2019). According to the 5-year ACS, work from home increased in the UZA from 5.1 percent (2015-19) to 8.1 percent (2016-20). Also, the DVRPC regional travel demand model indicates increased population, employment, and VMT during the performance period. Other considerations, such as alternative scenarios of workers working from home, taking transit, and driving alone were reviewed. Projects that could

help “move the needle” on the measures were considered as well. There were various uncertainties noted that might affect driver behavior and achieving the targets, such as COVID-19 and variant impacts; inflation and associated energy and supply chain disruptions; and work from home policies.

Peak-Hour Excessive Delay

The annual hours of PHED per capita baseline measure for the baseline 2022 performance plan was calculated using the RITIS Probe Data Analytics (PDA) Suite on June 9, 2022, which was the “pencils down” date for the final calculation of measures and establishing targets. The PHED baseline year (2021) value was 13.1 annual hours of PHED per capita, and the partnering agencies agreed on two-year and four-year targets of 15.2 and 15.1, respectively (see Table 9).

The two- and four-year targets were established based on various considerations. While COVID-19 cases are declining and workers that previously took transit are returning to the office and using public transit, some will likely switch modes and drive alone for health reasons, contributing to excessive delay. The four-year target is one-tenth of an hour per capita less than the two-year target in anticipation of future projects contributing to some overall reductions in excessive delay. With economic growth, increases in the number of people traveling, and the movement of freight on the NHS would likely result in increases in delay. This would only be partially offset by population growth reflected in the “per capita” portion of the measure. Also, consideration was given to IIJA and “State of Good Repair” projects that will slow down traffic during construction, and to continued growth in e-commerce that may contribute to delays. Numerous projects in the PA TIP (FY2023−2026) were identified that could help reduce excessive delay.

The two and four-year targets are above the 2019, 2020, and 2021 existing performance, and less than the two- and four-year targets, 17.0 and 17.2 respectively, during the first performance period (2017–2021).

Table 9: Baseline, and Two- and Four-Year Targets for Annual Hours of PHED per Capita Measure for the Philadelphia, PA-NJ-DE-MD Urbanized Area

Measure	2021 Baseline	Two-Year Target	Four-Year Target
PHED	13.1	15.2	15.1

Source: DVRPC 2022

Notes:

- The UZA 2010 boundary and associated five-year ACS estimated population were obtained from the U.S. Census.
- The annual hours of PHED is divided by the population to derive the per Capita measure.
- Reporting segments and travel times (in 15-minute intervals) were derived from the NPMRDS.
- Hourly traffic volumes by annual vehicle classification for buses, trucks, and cars were derived from AADT reported to the HPMS and from FHWA volume profiles.
- Annual Vehicle Occupancy (AVO) for cars, buses, and trucks was provided by FHWA.

Percent Non-Single Occupant Vehicle Travel

The Percent Non-SOV Travel baseline measure for the baseline 2022 performance plan was derived from the U.S. Census American Community Survey (ACS) five-year estimates for the urbanized area. The 2020 baseline value (five-year ACS 2016−2020) was 30.6 percent and the partnering agencies agreed on two- and four-year targets both at 30.0 percent (see Table 10).

The two- and four-year targets were established based on various considerations. The measure shows a slight trend increase from the five-year ACS (2006–2010) to five-year ACS (2015–2019), and then a more substantial increase in five-year ACS (2016−2020) due in large part to increases in people working from home due to COVID-19. While workers are returning to the office closer to 2019 levels, some that drove alone will likely continue to work from home, increasing percent Non-SOV travel. People will likely go back taking transit and carpooling closer to 2019 levels, but some will likely shift modes and drive alone leading to reductions in in percent Non-SOV travel. The PA TIP (FY2023−2026) includes the Ardmore Transportation Center and Exton Station improvement projects and the new service extension project from Elwyn to Middletown in Delaware County, which could contribute to increasing non-SOV travel.

Table 10: Baseline, and Two- and Four-Year Targets for the Percent Non-SOV Travel Measure for the Philadelphia, PA-NJ-DE-MD Urbanized Area

Measure	2020 Baseline	Two-Year Target	Four-Year Target
Percent Non-Single Occupant Vehicle Travel	30.6%	30.0%	30.0%

Source: DVRPC 2022

Congestion Measures – Trenton UZA

The consensus on common PM3 traffic congestion measure baseline performance and targets for the baseline performance plan of the second performance period (2022–2025) in the Trenton UZA was accomplished through three coordination meetings where the target-setting procedures, methodologies, and data sources were determined. The consensus two- and four-year congestion measure targets for the Trenton UZA were agreed upon by all partnering agencies and will be submitted to FHWA by the respective state DOTs by October 1, 2022.

The collaboration process with the partnering agencies in setting targets for the percent non-SOV travel and PHED measures involved various tasks. Prior to the virtual meetings, an agenda was sent via email to the partnering agencies so they could prepare for the topics discussed and recommend any changes/additions to the agenda as appropriate. Subsequent to the meetings, a summary was prepared and sent to the partnering agencies to serve as a record of the meeting and used as a reference in the future in case questions or clarifications arose. Finally, as part of setting targets at the third meeting, each agency was asked if they agreed to support the targets, which they each agreed in the affirmative. Meeting agendas, summary documents, and any other associated correspondence with the partnering agencies is available upon request.

The first meeting was held on April 4, 2022 to review the second performance period (2022–2025) measures, overall policy goals and objectives, regulations, required data and metrics, urbanized area geography, and sources of historical travel trend data.

The second meeting was held on May 9, 2022 to review travel trends in the urbanized area, including the two traffic congestion measure trends, and various potential two-year and four-year targets for the measures based on various scenarios of workers working from home, taking transit, and driving alone. The coordination group partnering agencies were asked to provide feedback on the potential measure targets. A "pencils down" date of June 10th was scheduled as the time period to establish targets for the two measures.

The third meeting was held on June 10, 2022 to review the alternative scenarios for establishing targets along with the feedback from partners on establishing targets for the PHED and non-SOV travel measures. Based on consensus at the June 10th meeting, the partnering agencies agreed on two- and four-year targets for the measures which are presented in Table 11 and 12 along with the existing baseline performance values.

There were various considerations used in developing the two- and four-year targets. Data-driven considerations included reviewing existing UZA population, VMT, and transit ridership trends. UZA ACS five-year population estimates decreased on average 0.20 percent per year (2016-2020). According to FHWA, VMT increased in the UZA before the pandemic on average 0.12 percent per year (2015-2019). According to the National Transit Database, transit passenger miles increased in the UZA before the pandemic on average 0.12 percent per year (2015-2019). According to the ACS, work from home increased in the UZA from 3.9 percent (2015-2019) to 6.2 percent (2016-2020) Other considerations, such as alternative scenarios of workers working from home, taking transit, and driving alone were considered. Projects that could help "move the needle" on the measures were considered as well. There were various uncertainties noted that might affect driver behavior and achieving the targets, such as COVID-19 and variant impacts; inflation and associated energy and supply chain disruptions; and work from home policies.

Peak-Hour Excessive Delay

The annual hours of PHED per capita baseline measure for the baseline 2022 performance plan was calculated using the RITIS Probe Data Analytics Suite on June 10th 2022, which was the "pencils down" date for the final calculation of measures and establishing targets. The PHED baseline year (2021) value was 3.4 and the partnering agencies agreed on both two- and four-year targets at 5.7 annual hours of PHED per capita (see Table 11).

The two- and four-year targets were established based on various considerations. While COVID-19 cases are declining and workers are returning to the office using public transit, some will likely switch modes and drive alone for health reasons. This could contribute to excessive delay. While workers are still working from home, some will eventually return to the office and drive alone, contributing to excessive delay. With economic growth, increases in the number of people traveling and the movement of freight on the NHS would likely result in increases in delay. This would only be partially offset by population growth reflected in the "per capita" portion of the measure. IIJA and "State of Good Repair" projects will slow down traffic during construction, and continued growth in e-commerce may contribute to delays. Approximately nine projects in the NJ TIP (FY2022–2025) were identified that could help reduce excessive delay.

Table 11: Baseline, and Two- and Four-Year Targets for Annual Hours of PHED per Capita Measure for the Trenton, NJ Urbanized Area

Measure	2021 Baseline	Two-Year Target	Four-Year Target
PHED	3.4	5.7	5.7

Source: DVRPC 2022

Notes:

- The UZA 2010 boundary and associated five-year ACS estimated population were obtained from the U.S. Census.
- The annual hours of PHED is divided by the population to derive the per capita measure.
- Reporting segments and travel times (in 15-minute intervals) were derived from the NPMRDS.
- Hourly traffic volumes by annual vehicle classification for buses, trucks, and cars were derived from AADT reported to the HPMS and from FHWA volume profiles.
- Annual Vehicle Occupancy (AVO) for cars, buses, and trucks was provided by FHWA.

Percent Non-Single Occupant Vehicle Travel

The Percent Non-SOV Travel baseline measure for the baseline 2022 performance plan was derived from the U.S. Census American Community Survey (ACS) five-year estimates for the urbanized area. The 2020 baseline value (five-year ACS 2016-2020) was 26.4 percent and the partnering agencies agreed on two- and four-year targets of 26.5 percent and 26.8 percent, respectively (see Table 12).

The two- and four-year targets were established based on various considerations. The measure shows a slight trend increase from five-year ACS (2006–2010) to five-year ACS (2016–2020). While workers working from home are returning to the office closer to 2019 levels, some that drove alone will likely continue to work from home, increasing percent Non-SOV travel. People will likely go back taking transit and carpooling closer to 2019 levels. The NJ TIP (FY2022–2025) CMAQ E-mobility Program project and the Trenton MOVEs project could contribute to increases in non-SOV travel.

Table 12: Baseline, and Two- and Four- Year Targets for the Percent Non-SOV Travel Measure for the Trenton, NJ Urbanized Area

Measure	2020 Baseline	Two-Year Target	Four-Year Target
Percent Non-Single Occupant Vehicle Travel	26.4%	26.5%	26.8%

Source: DVRPC 2022

Notes:

- The baseline value refers to the U.S. Census five-year ACS (2016–2020).

Congestion Measures – New York-Newark UZA

Since a portion of the New York-Newark NY-NJ-CT UZA is in the DVRPC MPO in Mercer County, New Jersey, DVRPC has coordinated with the NJTPA, the New York Metropolitan Transportation Council, NJDOT, the New York State Department of Transportation, and others to adopt a common congestion measure baseline and target for that UZA. NJTPA led efforts in establishing the targets and working with the partnering agencies in facilitating meetings.

DVRPC participated in a series of coordination meetings to establish consensus on common congestion performance measure baselines and targets for the baseline performance plan of the second performance

period (2022–2025) for the New York-Newark UZA and adopted those targets in June 2022. The PHED and Percent Non-SOV Travel targets for the New York-Newark UZA are presented in Tables 13 and 14.

Peak-Hour Excessive Delay

The annual hours of PHED per capita baseline measure for the baseline 2022 performance plan was 20.9 and the partnering agencies agreed on two- and four-year targets of 22.0 and 21.0, respectively (see Table 13).

Table 13: Baseline, and Two- and Four-Year Targets for Annual Hours of PHED Per Capita Measure for the New York-Newark, NY-NJ-CT Urbanized Area

Measure	2021 Baseline	Two-Year Target	Four-Year Target
PHED	20.9	22.0	21.0

Source: NJDOT 2022

Notes

- The UZA 2010 boundary and associated five-year ACS estimated population were obtained from the U.S. Census.
- Reporting segments and travel times (in 15-minute intervals) were derived from the NPMRDS.
- Hourly traffic volumes and annual vehicle classification for buses, trucks, and cars were derived from AADT reported to the HPMS and from FHWA volume profiles.
- Annual Vehicle Occupancy (AVO) for cars, buses, and trucks was provided by FHWA.

Percent Non-Single Occupant Vehicle Travel

The Percent Non-SOV Travel baseline measure for the baseline 2022 performance plan was derived from the U.S. Census American Community Survey (ACS) five-year estimates for the urbanized area. The 2020 baseline value (five-year ACS 2016–2020) was 52.4 percent and the partnering agencies agreed on two- and four-year targets of 52.4 percent and 52.5 percent, respectively (see Table 14).

Table 14: Baseline, and Two- and Four- Year Targets for the Percent Non-SOV Travel Measure for the New York-Newark, NY-NJ-CT Urbanized Area

Measure	2021 Baseline	Two-Year Target (2023)	Four-Year Target (2025)
Percent Non-Single Occupant Vehicle Travel	52.4%	52.4%	52.5%

Source: NJDOT 2022

Congestion Measures – Allentown, Bethlehem, Easton UZA

Since a portion of the Allentown-Bethlehem-Easton, PA-NJ UZA is in the DVRPC MPO in Bucks County, Pennsylvania, DVRPC has coordinated with the Lehigh Valley Planning Commission, NJTPA, PennDOT, and NJDOT to adopt a common congestion measure baseline and targets for that UZA. PennDOT, and LVPC led efforts in establishing the targets and working with the partnering agencies in facilitating meetings.

DVRPC participated in a series of coordination meetings to establish consensus on common congestion performance measure baselines and targets for the baseline performance plan of the second performance period (2022–2025) for the Allentown-Bethlehem-Easton, PA-NJ UZA and adopted those targets in July 2022. The PHED and Percent Non-SOV Travel targets for the Allentown-Bethlehem-Easton UZA are presented in Tables 15 and 16.

Peak-Hour Excessive Delay

The annual hours of PHED per capita baseline measure for the baseline 2022 performance plan was 7.1 and the partnering agencies agreed on two- and four-year targets both at 8.4 (see Table 15).

Table 15: Baseline, and Two- and Four-Year Targets for Annual Hours of PHED Per Capita Measure for the Allentown-Bethlehem-Easton, PA-NJ Urbanized Area

Measure	2021 Baseline	Two-Year Target	Four-Year Target
PHED	7.1	8.4	8.4

Source: NJDOT 2022

Notes

- The UZA 2010 boundary and associated five-year ACS estimated population were obtained from the U.S. Census.
- Reporting segments and travel times (in 15-minute intervals) were derived from the NPMRDS.
- Hourly traffic volumes and annual vehicle classification for buses, trucks, and cars were derived from AADT reported to the HPMS and from FHWA volume profiles.
- Annual Vehicle Occupancy (AVO) for cars, buses, and trucks was provided by FHWA.

Percent Non-Single Occupant Vehicle Travel

The Percent Non-SOV Travel baseline measure for the baseline 2022 performance plan was derived from the U.S. Census American Community Survey (ACS) five-year estimates for the urbanized area. The 2020 baseline value (five-year ACS 2016−2020) was 19.7 percent and the partnering agencies agreed on two- and four-year targets both at 18.6 percent (see Table 16).

Table 16: Baseline, and Two- and Four- Year Targets for the Percent Non-SOV Travel Measure for the Allentown-Bethlehem-Easton, PA-NJ Urbanized Area

Measure	2021 Baseline	Two-Year Target	Four-Year Target
Percent Non-Single Occupant Vehicle Travel	19.7%	18.6%	18.6%

Source: NJDOT 2022

On-Road Mobile Emissions Measures

DVRPC is a bi-state agency that receives CMAQ funding in Pennsylvania and New Jersey. As such, DVRPC develops performance plans for the On-road Mobile Source Emission performance measures for the DVRPC planning area in each state. DVRPC developed the baseline and targets for this measure through meetings with the state DOTs and other MPOs in each state.

DVRPC discussed the emissions measure targets through a series of calls with PennDOT in July 2022 and MPO and state targets were presented to the Pennsylvania Air Quality Working Group on July 28, 2022.

NJDOT held a meeting with the MPOs in the state on June 15, 2022 to discuss the process for developing the second performance period emissions targets. This process was agreed upon at the meeting and the final statewide and MPO targets were discussed through a series of discussions with NJ DOT in July 2022.

Baseline

For the second performance period, 23 CFR 490 requires that DVRPC provide a baseline report of the emissions benefits from CMAQ-funded projects during the performance period 2018–2021. The baseline emissions are extracted from the FHWA CMAQ PAS database. The baseline emissions value for the second performance period reflects the cumulative four-year emissions of the first performance period as presented in Tables 17 and 18 of this report.

In each state, the baseline values reported in this section were extracted from the PAS database in July 2022. The baseline values were considered in the development of the targets for the second performance period.

Pennsylvania

Table 17 identifies the emissions reductions from CMAQ-funded projects in the Pennsylvania portion of the DVRPC region. These values are identical to the four-year performance reported in Table 7 of this report.

Table 17: Baseline Emissions Reductions Values from CMAQ-Funded Projects in the Pennsylvania Portion of the DVRPC Region (2018–2021)

Pollutant	Emissions Reduction (kg/day) As Reported in FHWA CMAQ PAS Database
VOC Emissions	217.099
NO_x Emissions	928.699
$PM_{2.5}$ Emissions	33.019

Source: PennDOT 2022

New Jersey

Table 18 identifies the emissions reductions from CMAQ-funded projects in the New Jersey portion of the DVRPC region. These values are identical to the four-year performance reported in Table 8 of this report.

Table 18: Baseline Emissions Reductions Values from CMAQ-Funded Projects in the New Jersey Portion of the DVRPC Region (2018–2021)

Pollutant	Emissions Reduction (kg/day) As Reported in FHWA CMAQ PAS Database
VOC Emissions	73.692
NO_x Emissions	683.827
$PM_{2.5}$ Emissions	111.813

Source: NJDOT 2022

Targets

DVRPC has coordinated emissions reduction target-setting with both PennDOT and NJ DOT to establish emissions reduction targets from CMAQ-funded projects in the relevant portions of the DVRPC planning areas. Each state has developed state-level emissions reductions targets that account for emissions reductions at the MPO level.

DVRPC is adopting the state targets that were agreed upon through discussions with the DOTs and other partners during the summer of 2022, and the MPO level targets that were utilized to develop the state-level targets. The DVRPC emissions reductions targets are presented in the following sections.

Pennsylvania

DVRPC coordinated efforts to develop the On-road Mobile Source Emissions targets with PennDOT. The coordination procedures are detailed in PennDOT's submission of the Pennsylvania State DOT Targets for the PM3 Performance Measures that is due to FHWA by October 1, 2022. DVRPC is adopting the PennDOT on-road mobile emissions reductions targets for CMAQ-funded projects and those targets are presented in Table 19.

In order to establish the performance targets for the second performance period, PennDOT reviewed the emissions benefits of new projects identified in MPMS, the PennDOT project management database, for fiscal

years 2023-2026. The identified emissions reductions for this period were selected as the four-year targets. The two-year targets are 50 percent of the four-year targets.

The emissions reductions targets for the DVRPC region are lower than the first performance period because there are more continuing projects than new projects planned in the second performance period and only new projects count towards meeting the targets.

The planned CMAQ-funded projects in the Pennsylvania TIP that are expected to contribute to the second performance period are identified in Table B-1 in Appendix B of this report.

Table 19 identifies the two- and four-year emissions reduction targets for the second performance period.

Table 19: On-Road Mobile Source Emissions Targets for the Second Performance Period (2022–2025) in the Pennsylvania Portion of the DVRPC Planning Area

Pollutant	Emissions Reduction (kg/day)	
	2023 Two-year Target	2025 Four-year Target
VOC Emissions	9.660	19.320
NO_x Emissions	51.280	102.560
$PM_{2.5}$ Emissions	4.070	8.140

Source: PennDOT 2022

New Jersey

DVRPC coordinated efforts to develop the On-road Mobile Source Emissions targets with NJ DOT and the other MPO's in New Jersey. The coordination procedures are detailed in NJ DOT's submission of the New Jersey State DOT Targets for the PM3 Performance Measures that is due to FHWA by October 1, 2022. DVRPC is adopting the NJ DOT On-road Mobile Source Emissions reductions targets for CMAQ-funded projects in the DVRPC planning area in New Jersey. This is the same process that was used to develop the emissions targets for the first performance period. The emissions reductions targets for the second performance period are presented in Table 20.

The emissions reductions targets presented in Table 20 are based on the reported emissions reductions attributed to CMAQ-funded projects in the DVRPC planning area in New Jersey as reported in the FHWA Air Quality CMAQ PAS.

In order to establish the performance targets, the four-year (2018–2021) historical benefits for new (non-continuing) CMAQ projects in the DVRPC region were averaged. Adjustments were made to the baseline emissions reductions to discount reported emission reductions for continuing CMAQ-funded projects. The targets were developed using an adjusted baseline that accounts only for new CMAQ funded projects during the performance period 2018–2021.

The historical average of the CMAQ project emissions benefits were also adjusted to reflect the anticipated emissions rates of cleaner vehicles that are expected to be operational during the next performance period. These adjustments have resulted in conservative emissions reductions targets that both NJ DOT and DVRPC will revisit during the mid-point performance period review.

The planned CMAQ funded projects in the New Jersey TIP that are expected to contribute to the targets for the second performance period are identified in Table B-2 in Appendix B of this report.

Table 20 identifies the two and four-year emissions reduction targets for the second performance period for the DVRPC planning area in New Jersey.

Table 20: On-Road Mobile Source Emissions Targets for the Second Performance Period (2022-–2025) in the New Jersey Portion of the DVRPC Planning Area

Pollutant	Emissions Reduction (Kg/day)	
	2023	2025
	Two-year Target	Four-year Target
VOC Emissions	2.844	5.406
NO_x Emissions	9.506	17.495
$PM_{2.5}$ Emissions	24.252	45.963

Source: NJDOT 2022

Achieving the Targets

According to FHWA guidance for preparing the MPO CMAQ performance report, MPOs must present a description of projects identified for funding during the performance period (Federal Fiscal Years 2022–2023, and 2022–2025). Included with the project descriptions should be a further description of how the projects will help the MPO meet the two- and four-year targets for traffic congestion and on-road mobile source emissions.

CMAQ-funded projects from the relevant TIPs for each state are listed in a table that include the state project identification number (known as MPMS number in Pennsylvania and DB Number in New Jersey), a brief project description, and a narrative explanation on how each project will assist in meeting the on-road mobile source emissions, PHED, and percent Non-SOV goals identified in Tables 9-20, and the year the funds are programmed in the TIP. The projects are grouped by state identification number to facilitate calculation of contributions to the established targets.

The tables of planned projects identify on-going projects and new projects. According to FHWA guidance, only the emissions benefits from new projects count toward the established targets Tables B-1 and B-2 in Appendix B contain the planned CMAQ-funded projects for the Pennsylvania and New Jersey portions of the DVRPC planning area respectively. The benefits of CMAQ funds are allocated to each state based on the source of funds (PennDOT or NJDOT).

Appendices

Appendix A

Appendix A: **Pennsylvania and New Jersey CMAQ Emissions Project Performance Tables**

Table A-1: CMAQ-Funded Projects in the Pennsylvania Portion of the DVRPC Region (2018–2021) Contributing to the Emissions Reduction Targets

MPMS Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
16334	Church Road Greenwood-Rice's Mill	Church Road: Greenwood Avenue - Rice's Mill Road, Cheltenham Township Intersection Improvement.	Congestion Reduction and Traffic Flow	2020	90.88	56.57	4.74	Included in the 2020 PAS. Continuing.
17791	West Bank Pedestrian and Bikeway Improvement	This project will rebuild the existing sidewalk as a pedestrian path/bikeway; widen Spring Garden Street bridge sidewalk; construct ramp for pedestrians and bicyclists to connect the Spring Garden Street bridge to West River Drive in Philadelphia.	Bike / Pedestrian	2018	0.18	0.45	0.01	New project to the 2018 PAS report and not accounted for on the 2018 Baseline Performance Plan. Complete.
17928	Air Quality Partnership	This project funds education and outreach activities and materials to encourage the reduction of emissions from transportation sources that contribute to ozone and $PM_{2.5}$ pollution.	Education / Outreach	2018	12.52	15.99	0.65	Noted as a continuing project in the 2018 Baseline Performance Plan.
59434	Schuylkill River Trail	Construction of a 9.8-mile trail from Township Line Road in East Pikeland Township to US 422 over the Schuylkill River in North Coventry Township.	Bike / Pedestrian	2020	0.28	0.23	0.01	Included in the 2020 PAS. Completion expected in 2022.

MPMS Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
61885	Schuylkill River Trail (Mont Clare Bridge)	Construction of a multi-use path within the right-of-way of the PA 29 bridge between the Schuylkill Canal Tow Path in Mont Clare, Upper Providence Township, Montgomery County and Ashland Street in Phoenixville Borough, Chester County.	Bike / Pedestrian	2019	0.19	0.15	0.01	Included in the 2018 Baseline Performance Plan. Continuing.
65109	SEPTA Bus Purchase Program	Assist SEPTA to purchase new buses.	Transit	2018 2019 2020 2021	50.28 50.28 50.28 50.28	1.89 1.99 1.99 1.99	0.1 0.1 0.1 0.1	Transit flex included in PAS for first time in 2018 and not accounted for on the 2018 Baseline Performance Plan.
90482	East Coast Greenway: Allegheny to Lewis Streets	This project is a continuation of the East Coast Greenway. This project will connect segments of the trail at Allegheny Avenue and continue towards Lewis Street near the Betsy Ross Bridge.	Bike / Pedestrian	2018	0.04	0.09	0.01	Included in the 2018 PAS. Complete.
96218	Fayette Street. Signal Interconnect	This project will create an interconnected traffic signal system along Fayette Street from Elm Street to 11th Avenue in Conshohocken Borough.	Signal / ITS	2018	1.93	.19	0.1	Included in the 2018 PAS. Complete.
96238	Upper Merion Township ADA accessibility	Upper Merion Township ADA accessible Walkways and Crosswalks, Upper Merion Township, Montgomery County.	Bike / Pedestrian	2020	0.15	0.2	0.01	Included in the 2020 PAS. Complete.
102274	Schuylkill River Swing Bridge	This project will provide a bicycle and pedestrian connection between the Kingsessing and Grays Ferry neighborhoods of Philadelphia across the Schuylkill River.	Bike / Pedestrian	2018	0.5	0.3	0.02	Included in the 2018 Baseline Performance Plan. Continuing.

MPMS Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
105847	Newtown Branch Rail Trail	Newtown Branch Rail Trail – Bucks County.	Bike / Pedestrian	2020	0.34	0.14	0.03	Included in the 2020 PAS. Completion expected in 2023.
106265	US 30 ITS	Advanced ITS assets will be provided for the US 30 corridor including US 30 Bypass and Business as well as surrounding arterial roads (PA 113, US 322, PA 340, Reeceville Road, PA 82, Airport Rd., PA 10).	Signal / ITS	2018	82.9	5.8	4.6	Continuing project included in the 2018 Baseline Performance Plan.
107630	Paoli Pike Trail Segment D-E	Construction of 8-10' wide, 0.5-mile multi-use trail along Paoli Pike in East Goshen Township between Boot Road and North. Chester Road.	Bike / Pedestrian	2019	0.08	0.07	0.01	Included in the 2019 PAS. Continuing.
107631	Navy Yard Flow Route Shuttle	Increase shuttle service between Navy Yard and NRG Station to 11 min. headways by adding second loop shuttle for service throughout the day.	TDM	2021	1.45	1.06	0.06	Included in the 2021 PAS. Expected continuing project.
107639	Installation of Adaptive Signal Control Along PA 3	Installation of adaptive signal system along West Chester Pike for 1.5 miles in Haverford Township between Glen Gary Drive and Commercial Drive beyond Gilmore Road.	Signal / ITS	2019	2.16	1.8	0.09	Included in the 2019 PAS. Complete.
107640	PA 463 Traffic Signal System Project	Automated signal system at 11 intersections on PA 463 in Hatfield Township from Clemens Road to Cowpath Road and Broad Street to Line Street.	Signal / ITS	2019	2.5	1.04	0.12	Included in the 2019 PAS. Complete.

MPMS Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
107644	Fayette Street Signal Improvements-Phase 2	Installation of adaptive traffic signal system along 7 intersections in Conshohocken Borough from Fayette and 11th to Elm and Oak St. The system will connect with PennDOT TMS.	Signal / ITS	2018	1.93	0.19	0.1	Included in the 2018 PAS. Complete.
107646	West Main Street Traffic Signal Improvements	Upgrade 5 signaled intersections along Main Street, Norristown Borough, to allow for actuated signal timing from Forrest to Haws Avenue.	Signal / ITS	2019	1.2	1.0	0.05	Included in the 2019 PAS. Complete.
107649	Wallingford Connection	Sidewalk for 850 ft. from North Providence Road along East Possum Road to Wallingford Train Station.	Bike / Pedestrian	2020	0.02	0.02	0.01	Included in the 2020 PAS. Expected completion in 2023.
107650	Easton Road Signals	Upgrade of 9 signalized intersections (coordinated) along Easton Road in from Hamilton Avenue to Mt. Carmel Avenue in Abington Township.	Congestion Reduction and Traffic Flow	2020	1.53	0.63	0.09	Included in the 2020 PAS. Complete.
107654	CNG Philadelphia	Purchase 25 CNG waste haulers.	Alternative Fuels and Vehicles	2021	45.98	1.47	2.11	Included in the 2021 PAS. Complete.
110429	Mobility Alternatives Program (MAP)/Share a Ride Program	MAP is a TDM outreach and education program overseen by DVRPC to provide information to employers and commuters about options to the single occupant auto for commuting to work.	Education / Outreach	2018	194.5	48.3	7.9	Continuing project included in the 2018 Baseline Performance Plan.
110460	Commuter Services	This project is a work program project that allows for staff to coordinate alternative commute education and outreach programs among MAP and TMA contractors.	Education / Outreach	2018	81.4	20.2	3.3	Noted as a continuing project in the 2018 Baseline Performance Plan.

MPMS Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
110494	Regional Traffic Management Center (RTMC) General Contract	This project provides a general contract for the planning, designing, and building/commissioning of the Montgomery County ITS RTMC to optimize the performance of the surface transportation network.	Congestion Reduction and Traffic Flow	2021	1.12	2.13	0.21	Included in the 2021 PAS. Continuing. Construction expected in 2024.
111005	Conshohocken Garage (I-76 Congestion Management)	This project will provide flex funds to be transferred to SEPTA for a new "smart" parking garage at SEPTA's Conshohocken Station which will increase parking availability by approximately 500 spaces.	Transit	2019	0.01	0.01	0.01	Included in the 2021 PAS. Continuing. Construction expected in 2023.
111424	Transportation Management Associations (TMA)	TMAs help address demand for the region's transportation system. They are public-private partnerships that provide a forum to resolve transportation issues in their service areas. Services include a range of transportation improvement options, including task forces, employer and construction project shuttles, advocacy, and congestion reduction assistance to employers along corridors and in municipalities.	Education / Outreach	2018	161.4	40.1	6.6	Continuing project included in the 2018 Baseline Performance Plan.
112977	TMA Competitive Grant Program	TMA Competitive Grant Program Supplemental Work Activities for the Partnership, Delaware County and Greater Valley Forge TMAs.	TDM	2018	8.4	3.23	0.43	Included in the 2019 PAS. Continuing.
114011	Mobility Alternatives Program (MAP)	Districtwide TDM program in Southeastern Pennsylvania, administered by DVRPC through support from PennDOT.	TDM	2020	0.8	0.53	0.04	Included in the 2020 PAS. Continuing.

MPMS Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
114093	SEPTA Locomotive Replacement	The requested funding will be utilized to replace the three oldest and highest polluting locomotives with new EPA Tier 4 compliant locomotives.	Transit	2021	29.6	2.04	0.79	Included in the 2021 PAS. Complete.
114102	West Chester Pike and I-476 Interchange	This is an intersection congestion reduction project to improve traffic flow at the intersection/interchange of the I-476 on- and off-ramps at PA 3 in Delaware County.	Congestion Reduction and Traffic Flow	2021	0.12	0.2	0.06	Included in the 2021 PAS. Continuing. Construction Expected in 2023.
114114	Conshohocken and Spring Mill Road	The project involves the implementation of exclusive left-turn lanes on the eastbound Conshohocken State Road and northbound Spring Mill Road intersection approaches.	Congestion Reduction and Traffic Flow	2021	0.08	0.02	0.01	Included in the 2021 PAS. Construction expected in 2028.
114166	PA 401 and Valley Hill Road Improvement	Intersection improvements, including the addition of left turn lanes and associated traffic signal modifications, such as designated left turn phases, on PA 401 and Valley Hill Road in Charlestown Township, Chester County.	Congestion Reduction and Traffic Flow	2021	0.31	0.83	0.01	Included in the 2021 PAS. Completion expected in 2026.
114939	Regional TDM Program	TDM provides public education and outreach to commuters, employers, residents and visitors within our region about available travel options and providing a mix of incentives to encourage behavior change toward more efficient use of the regional transportation system.	TDM	2020	0.37	0.17	0.01	Included in the 2020 PAS. Continuing

MPMS Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
114967	Transportation Operations	Districtwide tasks include: 1) Incident Management Task Forces Tasks, 2) Traffic Signal Optimization Tasks, 3) Transportation Operation Task Force, and 4) TSMO Planning Efforts.	TDM	2020	2.02	3.84	0.39	Included in the 2020 PAS. Continuing.
115620	Commuter Assistance After COVID-19	Commuter Assistance After COVID-19 Regionwide. Tasks: 1. Facilitate the activities of the SE PA TMAs and Clean Air Council as they continue working with employers on telework issues. 2. Organize and implement telework training for TMAs and Clean Air Council staff 3. Implement a regional outreach campaign re: telework.	TDM	2020	0.69	0.25	0.03	Included in the 2020 PAS. Compete.
Totals				**2018-2021**	**928.70**	**217.10**	**33.02**	

Source: DVRPC 2022

Table A-2: First Four-Year Period Status of CMAQ-Funded Projects in the Pennsylvania Portion of the DVRPC Region (2018–2021)

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
16334	Church Road Greenwood-Rice's Mill	Church Road: Greenwood Avenue - Rice's Mill Road, Cheltenham Township Intersection Improvement.	Congestion Reduction and Traffic Flow	FY2020	Intersection improvements reduce emissions by improving traffic flow.	Intersection improvements reduce congestion by improving traffic flow.	N/A	Included in the 2020 PAS. Construction expected in 2025.
17791	West Bank Pedestrian and Bikeway Improvement	This project will rebuild the existing sidewalk as a pedestrian path/bikeway; widen Spring Garden Street bridge sidewalk; construct ramp for pedestrians and bicyclists to connect the Spring Garden Street bridge to West River Drive in Philadelphia.	Bike / Pedestrian	FY2018	Multi-use trail connection will help reduce emissions by providing a walking and bike link to employment and shopping centers.	This connection reduces congestion by providing alternatives to SOV travel	This connection reduces SOV travel by providing an alternative transportation option to driving.	Included in the 2018 PAS. Complete.
17928	Air Quality Partnership	This project funds education and outreach activities and materials to encourage the reduction of emissions from transportation sources that contribute to ozone and $PM_{2.5}$ pollution.	Education / Outreach	Continuing	Emissions are reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel during episodic air pollution events.	Congestion is reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel during episodic air pollution events.	SOV travel is reduced by encouraging alternative commuting patterns and increased transit use during episodic air pollution events.	Included in 2018 PAS report. Continuing Project.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
59434	Schuylkill River Trail	Construction of a 9.8-mile trail from Township Line Road in East Pikeland Township to US 422 over the Schuylkill River in North Coventry Township.	Bike / Pedestrian	FY2020	Multi-use trail will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Trail reduces congestion by providing alternatives to SOV travel.	Trail reduces SOV travel by providing an alternative transportation option to driving.	Included in the 2020 PAS. Completion expected in 2022.
61885	Schuylkill River Trail (Mont Clare Bridge)	Construction of a multi-use path within the right-of-way of the PA 29 bridge between the Schuylkill Canal Tow Path in Mont Clare, Upper Providence Township, Montgomery County and Ashland Street in Phoenixville Borough, Chester County.	Bike / Pedestrian	FY2019	Multi-use trail will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Trail reduces congestion by providing alternatives to SOV travel.	Trail reduces SOV travel by providing an alternative transportation option to driving.	Included in 2019 PAS. Complete.
63406	Retrofit for Bike Lanes and Shoulders	The purpose of this project is to maintain existing and future bicycle facilities, including installation, maintenance, and replacement of striping and damaged and missing signs.	Bike / Pedestrian	Continuing	Maintaining safe bike linkages will help reduce emissions by promoting bike travel to employment and shopping centers.	Maintaining safe bike linkages will help reduce congestion by promoting bike travel to employment and shopping centers.	Maintaining safe bike linkages will help reduce SOV travel by promoting bike travel to employment and shopping centers.	Included in the 2018 Baseline Performance Plan. Continuing.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
64791	PA 420, Kedron Avenue	Modernization of signals, road widening, and channelization.	Intersection Improvement	FY2021	This project reduces congestion and improves air quality by optimizing operations through improving intersection geometry and channelization.	This project will reduce congestion by improving traffic operations.	N/A	Construction Delayed
65109	SEPTA Bus Purchase Program	Assist SEPTA to purchase new buses.	Transit	FY2018, FY2019, FY2020, FY2021	Improved transit service will reduce emissions by providing alternatives to SOV travel.	Improved transit service will reduce congestion by providing alternatives to SOV travel.	Improved transit service will reduce SOV travel by providing transportation options.	Transit flex included in PAS for first time in 2018 and not accounted for on the 2018 Baseline Performance Plan. Recurring projects with new benefits each year.
77183	Transit and Regional Rail Station Program	This program provides for the construction, reconstruction or rehabilitation of transit and regional rail stations and terminals, bus/trolley loop facilities, transportation centers, bicycle facilities, and parking expansions and improvements.	Transit	Continuing	Improved transit service will reduce emissions by providing alternatives to SOV travel.	Improved transit service will reduce congestion by providing alternatives to SOV travel.	Improved transit service will reduce SOV travel by providing transportation options.	Continuing Project

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
84457	Signal Retiming Program	This program provides for the evaluation of existing signals along an identified corridor, with the goal of improving traffic operations.	Signal / ITS	Continuing	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Continuing Project
90482	East Coast Greenway: Allegheny to Lewis Streets	This project is a continuation of the East Coast Greenway. This project will connect segments of the trail at Allegheny Avenue and continue towards Lewis Street near the Betsy Ross Bridge.	Bike / Pedestrian	FY2018	Multi-use trail connection will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Trail reduces congestion by providing an alternative transportation option to driving	This connection reduces SOV travel by providing an alternative transportation option to driving.	Included in 2018 PAS. Complete.
96218	Fayette St. Signal Interconnect	This project will create an interconnected traffic signal system along Fayette Street from Elm Street to 11th Avenue in Conshohocken Borough	Signal / ITS	FY2018	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Included in 2018 PAS. Complete.
96223	Philadelphia Signal Retiming	This project is a congestion reduction and traffic flow improvement program.	Signal / ITS	Continuing	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Continuing Project

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
96238	Upper Merion Township ADA accessibility.	Upper Merion Township ADA accessible Walkways and Crosswalks, Upper Merion Township, Montgomery County.	Bicycle and Pedestrian Facilities and Programs	FY2020	Bike and pedestrian connections will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Bike and pedestrian connections reduce congestion by providing an alternative transportation option to driving	This connection reduces SOV travel by providing an alternative transportation option to driving.	Included in 2020. PAS. Complete.
102274	Schuylkill River Swing Bridge	This project will provide a bicycle and pedestrian connection between the Kingsessing and Grays Ferry neighborhoods of Philadelphia across the Schuylkill River.	Bike / Pedestrian	FY2018	Multi-use trail connection will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Trail reduces congestion by providing an alternative transportation option to driving	This connection reduces SOV travel by providing an alternative transportation option to driving.	Included in 2018 PAS report. Construction delayed.
105847	Newtown Branch Rail Trail	Newtown Branch Rail Trail – Bucks County.	Bike / Pedestrian	FY2020	Multi-use trail will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Trail reduces congestion by providing alternatives to SOV travel.	Trail reduces SOV travel by providing an alternative transportation option to driving.	Included in the 2020 PAS. Completion expected in 2023.
106265	US 30 ITS	Advanced ITS assets will be provided for the US 30 corridor including US 30 Bypass and Business as well as surrounding arterial roads (PA 113, US 322, PA 340, Reeceville Road, PA 82, Airport Rd., PA 10).	Signal / ITS	FY2018	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Included in 2018 PAS report. Continuing.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
107630	Paoli Pike Trail Segment D-E	Construction of 8-10' wide, 0.5-mile multi-use trail along Paoli Pike in East Goshen Township between Boot Road and North. Chester Road.	Bike / Pedestrian	FY2019	Multi-use trail will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Trail reduces congestion by providing alternatives to SOV travel.	Trail reduces SOV travel by providing an alternative transportation option to driving.	Included in 2019 PAS report. Continuing.
107631	Navy Yard Flow Route Shuttle	Increase shuttle service between Navy Yard and NRG Station to 11 min. headways by adding second loop shuttle for service throughout the day.	Transit	FY2019	Improved transit service will reduce emissions by providing alternatives to SOV travel.	Improved transit service will reduce congestion by providing alternatives to SOV travel.	Improved transit service will reduce SOV travel by providing transportation options.	Included in 2021 PAS report. Continuing.
107632	Fox Chase Lorimer Trail	0.5-mile multi-use trail system connecting Fox Chase SEPTA station and 16-mile trail system in Montgomery county and Philadelphia along old rail ROW.	Bike / Pedestrian	FY2021	Multi-use trail will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Trail reduces congestion by providing alternatives to SOV travel.	Trail reduces SOV travel by providing an alternative transportation option to driving.	Removed from performance report. Construction not expected in the performance period.
107634	Pedestrian Enhancements for Media Borough	Complete gaps in sidewalk network throughout the borough.	Bike / Pedestrian	FY2020	Improved sidewalk connections will help reduce emissions by providing walking and bike links to employment and shopping centers.	Complete sidewalks reduce congestion by providing an alternative transportation option to driving.	Complete sidewalks reduce SOV travel by providing an alternative transportation option to driving.	Authorization expected after 2021 and removed from performance report.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
107636	Neshaminy Greenway Trail	10 ft., 1.5-mile multi-use trail in Doylestown Township (Central Park to Neshaminy Manor). Connects into existing Neshaminy Greenway and SEPTA Rt. 55 bus service.	Bike / Pedestrian	FY2020	Multi-use trail will help reduce emissions by providing a walking and bike link to transit and government service buildings.	Trail reduces congestion by providing alternatives to SOV travel.	Trail reduces SOV travel by providing an alternative transportation option to driving.	Authorization expected after 2021 and removed from performance report.
107637	Ramping up to Rapid Transit on Roosevelt Boulevard.	Construction of ten bus stations on Roosevelt Blvd. to support enhanced express bus service between Frankford Transportation Center and Neshaminy Mall.	Transit	FY2019	Improved transit service will reduce emissions by providing alternatives to SOV travel.	Improved transit service will reduce congestion by providing alternatives to SOV travel.	Improved transit service will reduce SOV travel by providing transportation options.	Removed from the TIP and not included in the performance report.
107639	Installation of Adaptive Signal Control Along Route 3	Installation of adaptive signal system along West Chester Pike for 1.5 miles in Haverford Township between Glen Gary Drive and Commercial Drive beyond Gilmore Road.	Signal / ITS	FY2019	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Included in 2019 PAS report. Complete.
107640	PA 463 Traffic Signal System Project	Automated signal system at 11 intersections on PA 463 in Hatfield Township from Clemens Road to Cowpath Road and Broad Street to Line Street.	Signal / ITS	FY2019	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Included in 2019 PAS report. Complete.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
107642	Smithbridge Road Corridor Improvement	Construction of 8 ft. multi-use trail along Smithbridge Rd. connecting residential neighborhoods and Garnet Valley School District campuses. Project includes intersection improvements at district campuses.	Bike / Pedestrian	FY2019	Multi-use trail will help reduce emissions by providing a walking and bike link to employment and schools.	Trail reduces congestion by providing alternatives to SOV travel.	Trail reduces SOV travel by providing an alternative transportation option to driving.	Funding moved to FY2023.
107644	Fayette Street Signal Improvements-Phase 2	Installation of adaptive traffic signal system along 7 intersections in Conshohocken Borough from Fayette and 11th to Elm and Oak St. The system will connect with PennDOT TMS.	Signal / ITS	FY2018	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Included in 2019 PAS report. Complete.
107646	West Main Street Traffic Signal Improvements	Upgrade 5 signaled intersections along Main Street, Norristown Borough, to allow for actuated signal timing from Forrest to Haws Avenue.	Signal / ITS	FY2019	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Included in 2019 PAS report. Complete.
107648	Reformatting North 5th Street as a Complete Street	Signal upgrades, fiber interconnection, and traffic calming for a 0.4-mile corridor along N. 5th Street from Luzerne to Cayuga Street. in Philadelphia.	Traffic Operations	FY2021	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Authorization expected after 2021 and removed from performance report.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
107649	Wallingford Connection	Install sidewalk for 850 ft. from North Providence Road along East Possum Road to Wallingford Train Station.	Bike / Pedestrian	FY2020	Improved sidewalk connections will help reduce emissions by providing walking and bike links to employment and shopping centers.	Complete sidewalks reduce congestion by providing an alternative transportation option to driving.	Complete sidewalks reduce SOV travel by providing an alternative transportation option to driving.	Included in 2020 PAS report. Expected completion in 2023
107650	Easton Road Signals	Upgrade of 9 signalized intersections (coordinated) along Easton Road in from Hamilton Avenue to Mt. Carmel Avenue in Abington Township	Signal / ITS	FY2019	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Included in 2020 PAS report. Complete.
107654	Advancing CNG in Philadelphia	Purchase 25 CNG waste haulers.	Diesel Replacement	FY2019	Emissions will be reduced by replacing pre-model year 2007 diesel trash trucks with CNG vehicles.	N/A	N/A	Included in 2021 PAS report. Complete.
110415	Schuylkill Banks Christian to Crescent Trail	This section of the Schuylkill River Trail will close a trail gap that exists between the Trail's current terminus at Christian Street to the beginning of the next Trail segment at 34th Street, known as the Grays Ferry Crescent.	Bike / Pedestrian	FY2021	Multi-use trail connection will help reduce emissions by providing a walking and bike link to employment and shopping centers.	This connection reduces congestion by providing alternatives to SOV travel	This connection reduces SOV travel by providing an alternative transportation option to driving.	Authorization expected after 2021 and removed from performance report.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
110429	Mobility Alternatives Program (MAP)/Share a Ride Program	MAP is an outreach and education program overseen by DVRPC to provide information to employers and commuters about options to the single occupant auto for commuting to work.	Education / Outreach	Continuing	This program improves air quality by encouraging employers to utilize alternative commute programs and reduce SOV travel by their employees.	This program reduces congestion by encouraging employers to utilize alternative commute programs and reduce SOV travel by their employees.	This program reduces SOV travel by educating employers about alternative commute programs for their employees.	Included in 2018 PAS report. Continuing project included in FY21 TIP.
110460	Commuter Services	This project is a work program project that allows for staff to coordinate alternative commute education and outreach programs among MAP and TMA contractors.	Education / Outreach	Continuing	Commuter Services helps to reduce emissions through a variety of activities including promoting alternative commute options and assisting with outreach to promote non-SOV travel.	This project reduces congestion by promoting alternative commute options and assisting with outreach to promote non-SOV travel.	This project SOV travel by promoting alternative commute options and assisting with outreach to promote non-SOV travel.	Continuing project included in the 2018 Baseline Performance Plan.
110494	Regional Traffic Management Center (RTMC) General Contract	This project provides a general contract for the planning, designing and building/commissioning of the Montgomery County ITS RTMC to optimize the performance of the surface transportation network	Signal / ITS	FY2021	This project reduces congestion and improves air quality by optimizing operations through signal timing, incident management, and advanced ITS techniques.	This project will reduce congestion by improving traffic operations.	N/A	Noted as a continuing project in the 2018 Baseline Performance Plan.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
111005	Conshohocken Garage (I-76 Congestion Management)	This project will provide flex funds to be transferred to SEPTA for a new "smart" parking garage at SEPTA's Conshohocken Station which will increase parking availability by approximately 500 spaces.	Transit	F2019	This project will improve air quality by encouraging transit use by increasing parking and parking management at a popular regional rail station.	This project will reduce congestion by encouraging transit use by increasing parking and parking management at a popular regional rail station.	This project will reduce SOV use by encouraging transit use by increasing parking and parking management at a popular regional rail station.	Included in the 2021 PAS. Continuing. Construction expected in 2023.
111424	Transportation Management Associations (TMA)	TMAs help address demand for the region's transportation system. They are public-private partnerships that provide a forum to resolve transportation issues in their service areas. Services include a range of transportation improvement options, including task forces, employer and construction project shuttles, advocacy, and congestion reduction assistance to employers along corridors and in municipalities.	Education / Outreach	Continuing	TMAs help to reduce emissions by alternative commute options, sponsoring last mile shuttles, and assisting with outreach to promote non-SOV travel.	TMAs help to reduce congestion by promoting alternative commute options, sponsoring last mile shuttles, and assisting with outreach to promote non-SOV travel.	TMAs help to reduce SOV by promoting alternative commute options, sponsoring last mile shuttles, and assisting with outreach to promote non-SOV travel.	Continuing project included in the 2018 Baseline Performance Plan.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
112977	TMA Competitive Grant Program	TMA Competitive Grant Program funds supplemental work activities for the Partnership, Delaware County and Greater Valley Forge TMAs.	TDM	FY2018	Travel Demand Management strategies reduce emissions by reducing SOV VMT.	Travel Demand Management strategies reduce congestion by reducing SOV VMT.	Travel Demand Management strategies reduce congestion by reducing SOV VMT.	Included in the 2019 PAS. Continuing.
114011	Mobility Alternatives Program (MAP)	Districtwide TDM program in Southeastern Pennsylvania - administered by DVRPC through support from PennDOT.	TDM	FY2020	Travel Demand Management strategies reduce emissions by reducing SOV VMT.	Travel Demand Management strategies reduce congestion by reducing SOV VMT.	Travel Demand Management strategies reduce congestion by reducing SOV VMT.	Included in the 2020 PAS. Continuing.
114093	SEPTA Locomotive Replacement	The requested funding will be utilized to replace the three oldest and highest polluting locomotives with new EPA Tier 4 compliant locomotives.	Transit	FY2021	Emissions will be reduced by replacing older locomotives with new, less polluting locomotives.	N/A	N/A	Included in the 2021 PAS. Complete.
114102	West Chester Pike and I-476 Interchange	This is an intersection congestion reduction project to improve traffic flow at the intersection/interchange of the I-476 on- and off-ramps at PA 3 in Delaware County.	Congestion Reduction and Traffic Flow	FY2021	Intersection improvements reduce emissions by improving traffic flow.	Intersection improvements reduce congestion by improving traffic flow.	N/A	Included in the 2021 PAS. Continuing. Construction expected in 2023.
114114	Conshohocken and Spring Mill Road	The project involves the implementation of exclusive left-turn lanes on the eastbound Conshohocken State Road and northbound	Congestion Reduction and Traffic Flow	FY2021	Intersection improvements reduce emissions by improving traffic flow.	Intersection improvements reduce congestion by improving traffic flow.	N/A	Included in the 2021 PAS. Construction expected in 2028.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
		Spring Mill Road intersection approaches.						
114166	PA 401 and Valley Hill Road. Improvement	Intersection improvements, including the addition of left turn lanes and associated traffic signal modifications, such as designated left turn phases, on PA 401 and Valley Hill Road in Charlestown Township, Chester County.	Congestion Reduction and Traffic Flow	FY2021	Intersection improvements reduce emissions by improving traffic flow.	Intersection improvements reduce congestion by improving traffic flow.	N/A	Included in the 2021 PAS. Completion expected in 2026.
114939	Regional TDM Program	TDM provides public education and outreach to commuters, employers, residents and visitors within our region about available travel options and providing a mix of incentives to encourage behavior change toward more efficient use of the regional transportation system.	Education / Outreach	FY2020	Emissions are reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel.	Congestion is reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel.	SOV travel is reduced by encouraging alternative commuting patterns and increased transit use.	Included in the 2020 PAS. Continuing
114967	Transportation Operations	Districtwide tasks include: 1) Incident Management Task Forces Tasks, 2) Traffic Signal Optimization Tasks, 3) Transportation Operation Task Force, and 4) TSMO Planning Efforts.	Education / Outreach	FY2020	This project reduces congestion and improves air quality by coordinating regional ITS efforts.	This project reduces congestion and improves air quality by coordinating regional ITS efforts.	N/A	Included in the 2020 PAS. Continuing.

MPMS Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV) Travel	Project Status
155620	Commuter Assistance After COVID-19	This project will facilitate the activities of the PA TMAs as they continue working with employers on telework issues, organize and implement telework training for TMA staff, and implement a regional telework campaign.	TDM	FY2020	Travel Demand Management strategies reduce emissions by reducing SOV VMT.	Travel Demand Management strategies reduce congestion by reducing SOV VMT.	Travel Demand Management strategies reduce congestion by reducing SOV VMT.	Included in the 2020 PAS. Compete.

Source: DVRPC 2022

Note: All projects are expected to reduce ozone and $PM_{2.5}$ pollution

Table A-3: CMAQ-Funded Projects in the New Jersey Portion of the DVRPC Region (2018–2022) Contributing to the Emissions Reduction Target

DB Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
Local Projects								
D0406	RideECO Mass Marketing Efforts	This program expands outreach to the general public about the benefits of using transit and the RideECO Program.	Education / Outreach	2018	2.74	0.77	0.14	Included in 2018 Baseline Performance Plan.
D0407	Air Quality (Ozone) Action Program in NJ	Ozone Action encourages the use of mobility alternatives that will reduce congestion and air pollution.	Education / Outreach	2018	6.49	1.78	66.3	Included in 2018 Baseline Performance Plan. Continuing project
D1601	NJ Regional Signal Retiming Initiative	This project reduces congestion and improves air quality by optimizing progression on signalized 500 and 600 routes in DVRPC's New Jersey counties.	Signal / ITS	2019	445.09	44.99	28.29	Included in the 2018 Baseline Performance Plan.
UPWP2	Regional TDM	This program supports the implementation of a new regional TDM Program, with strategic planning and coordination tasks funded separately. This program's purview includes traditional TDM activities with demonstrated SOV trip reduction benefit, as well as pilots for new TDM projects and tools to manage demand and create and cultivate new mobility opportunities for residents and workers.	TDM	2020	1.01	0.09	0.00	Regional TDM included in PAS for the first time in 2020 and not accounted for on the 2018 Baseline Performance Plan. Recurring projects with new benefits each year.

DB Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
D2005	Regional TDM Program	This program supports the implementation of a new regional TDM Program, with strategic planning and coordination tasks funded separately. This program's purview includes traditional TDM activities with demonstrated SOV trip reduction benefit, as well as pilots for new TDM projects and tools to manage demand and create and cultivate new mobility opportunities for residents and workers.	TDM	2021	1.07	0.09	0.00	Regional TDM included in PAS for the first time in 2020 and not accounted for on the 2018 Baseline Performance Plan. Recurring projects with new benefits each year.
Statewide Programs								
15343	Traffic Signal Optimization Support Services	This program will seek to improve mobility on New Jersey's arterial highways. This program will focus on dynamically managing NJ's arterials from NJDOT's Arterial Management Center. Existing traffic signals will be strategically, systematically, and programmatically upgraded from stand-alone signals to highly sophisticated, coordinated, real time traffic response traffic signals. This upgrade will consist of installing new controllers, intelligent software and algorithms, robust detection, and communication. This is a plan to upgrade most of the signals on NJDOT owned highways only.	Signal / ITS	2018 2021	212.95 2.84	21.79 0.86	13.59 2.08	NJDOT allocates 20.5 percent of the emissions benefits of this statewide CMAQ project to the MPO based on VMT share. These values represent the emissions benefits allocated to the DVRPC region. Recurring projects with new benefits each year

DB Num.	Project Title	Project Description	Project Type	FHWA Public Access System Report Year	Emissions Benefit (kg/d)			Notes
					NO_x	VOC	$PM_{2.5}$	
T112	Rail Rolling Stock Replacement	This program provides funds for the replacement of rail rolling stock, including engineering assistance and project management, to replace over-aged equipment including rail cars, revenue service locomotives, and expansion of NJ TRANSIT rolling stock fleet (cars and locomotives) to accommodate projected ridership growth and other system enhancements over the next ten years.	Transit	2018 2019 2021	0.21 1.31 2.08	0.16 0.64 1.10	0.02 0.18 0.18	Transit flex included in PAS for the first time in 2018 and not accounted for on the 2018 Baseline Performance Plan. NJDOT allocates 20.5 percent of the emissions benefits of statewide CMAQ projects to the MPO based on VMT share. These values represent the emissions benefits allocated to the DVRPC region. Recurring projects with new benefits each year.
D15343	Intelligent Transportation System	This program will focus on dynamically managing NJ's arterials from NJDOT's Arterial Management Center. Existing traffic signals will be strategically, systematically, and programmatically upgraded from stand-alone signals to highly sophisticated, coordinated, real time traffic response traffic signals.	ITS	2020	8.04	1.42	1.02	NJDOT allocates 20.5 percent of the emissions benefits of statewide CMAQ project to the MPO based on VMT share. These values represent the emissions benefits allocated to the DVRPC region. Recurring projects with new benefits each year.
Totals				**2018-2021**	**983.83**	**73.69**	**111.81**	

Source: DVRPC 2022

Table A-4: First Four-Year Period Status of CMAQ-Funded Projects in the New Jersey Portion of the DVRPC Region (2018–2021)

DB Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (% Non-SOV Travel)	Project Status
D0406	RideEco Mass Marketing	This program expands outreach to the general public about the benefits of using transit and the RideECO Program.	Education / Outreach	Continuing Project	Emissions are reduced by encouraging increased transit use resulting in a reduction in SOV travel.	This project reduces congestion by encouraging transit use through tax incentives provided by the RideEco program.	This project reduces SOV travel by encouraging transit use through tax incentives provided by the RideEco program.	Project included in 2018 PAS report. Project will not continue past FY2020.
D0407	Air Quality (Ozone) Action Program in New Jersey	Ozone Action encourages the use of mobility alternatives that will reduce congestion and air pollution.	Education / Outreach	Continuing Project	Emissions are reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel during episodic air pollution events.	Congestion is reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel during episodic air pollution events.	SOV travel is reduced by encouraging alternative commuting patterns and increased transit use during episodic air pollution events.	Continuing project included in 2018 PAS report.
D0601	Camden County Bus Purchase	Purchase of new transit vehicles for combination of fixed route, subscription, and demand responsive transit services provided in Camden County	Transit	Continuing Project	New transit vehicles will reduce emissions through better fuel economy. Transit service reduces emissions from SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Continuing project. Funds have been flexed to transit.

DB Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (% Non-SOV Travel)	Project Status
D1101	Mercer County Bus Purchase	Purchase of new transit vehicles for combination of fixed route, subscription, and demand responsive transit services provided in Mercer County.	Transit	Continuing Project	New transit vehicles will reduce emissions of $PM_{2.5}$ and ozone precursors through better fuel economy. Transit service reduces emissions from SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Continuing project. Funds have been flexed to transit.
15343 & D15343	Traffic Signal Optimization Support Services	This program will focus on dynamically managing NJ's arterials from NJDOT's Arterial Management Center.	Signal / ITS	FY2018 FY2020 FY2021	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Continuing statewide project. Recurring project with new benefits.
D1601	New Jersey Signal Timing Initiative	Optimize progression of signalized County 500 and 600 Routes in the DVRPC region.	Signal / ITS	FY2018 FY2020	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A	Continuing project included in 2018 and 2020 PAS reports.

DB Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (% Non-SOV Travel)	Project Status
D1703	Princeton Bicycle Infra-structure	Develop bike rack and bike parking infrastructure at key transit and public locations in Princeton, Mercer County.	Bike / Pedestrian	FY2018	Expanding bike share in Princeton will reduce emissions from SOV travel.	This project will reduce congestion by providing alternatives to SOV travel.	This project will provide an alternative to SOV travel for short trips.	Project Canceled and not counted in PAS.
D2005 & UPWP2	Regional TDM Program	TDM focuses on the many options available to residents to travel to and from work, as well as to get around our region, in a coordinated, cost-effective, and environmentally-positive way.	Education / Outreach	FY2020 FY2021	Emissions are reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel.	Congestion is reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel.	SOV travel is reduced by encouraging alternative commuting patterns and increased transit use.	Continuing project. Recurring project with new benefits.
D9807	Gloucester County Bus Purchase	Purchase of new transit vehicles for combination of fixed route, subscription, and demand responsive transit services provided in Gloucester County.	Transit	Continuing Project	New transit vehicles will reduce emissions of $PM_{2.5}$ and ozone precursors through better fuel economy. Transit service reduces emissions from SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Continuing project. Funds have been flexed to transit.

DB Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (% Non-SOV Travel)	Project Status
T112	Rail Rolling Stock Procurement	Funds for replacing rail rolling stock	Transit	FY2018 FY2019 FY2021	Supporting rail transit operations reduces emissions by reducing SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Continuing statewide project included in 2018, 2019, and 2021 PAS reports. Recurring project with new benefits.
T120	Small /Special Services Program	Funds efforts which initiate or promote transit solutions to reduce congestion, manage transportation demand, and improve air quality.	Transit	Continuing Project	Supporting transit operations reduces emissions by reducing SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Continuing project included in FY20 TIP. Included in 2018 PAS report.
T150	Section 5310 Program	This program provides funds for the purchase of small buses or van-type vehicles for agencies that serve the elderly and persons with disabilities.	Transit	Continuing Project	Supporting rail transit operations reduces emissions by reducing SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Continuing project.

DB Num.	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (% Non-SOV Travel)	Project Status
T701	River Line Tier 4 Engine Retrofit	Repower River Line Light Rail locomotives to Tier 4 Engines.	Diesel Repower / Transit	FY2018	Emissions will be reduced by repowering Tier 1 light rail diesel locomotives with Tier 4 engines.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Obligated in 2018. Benefits accounted for in previous PAS report.
X065	Local CMAQ Initiatives – Hamilton Avenue Intersection Improve-ment	Improve the alignment and function of intersections at Hamilton Avenue (CR 606) and Kuser Road (CR 619)/Ward Avenue and Hamilton Avenue and Liberty Street.	Intersection Improve-ment	FY2020	This project reduces congestion and improves air quality by optimizing operations through improving intersection geometry and channelization.	This project will reduce congestion by improving traffic operations.	N/A	Anticipated authorization in 2021, not included in the 2021 PAS.
X065	Local CMAQ Initiatives – Gloucester Township Trail	Bicycle trail, from Oak Avenue to Evesham Road.	Bike / Pedestrian	FY2021	Multi-use trail will help reduce emissions by providing a walking and bike link to employment and shopping centers	This project will reduce congestion by providing alternatives to SOV travel.	This project will provide an alternative to SOV travel for short trips.	Expected authorization in 2022

Source: DVRPC 2022

Note: All projects are expected to reduce ozone and $PM_{2.5}$ pollution.

Appendix B

Appendix B: **Planned CMAQ Projects for the Second Performance Period**

Table B-1: Planned CMAQ Projects in the Pennsylvania Portion of the DVRPC Planning Area for the Second Performance Period (2022–2025)

MPMS NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
16334	Church Road Greenwood-Rice's Mill	Church Road: Greenwood Avenue - Rice's Mill Road, Cheltenham Township Intersection Improvement.	Congestion Reduction and Traffic Flow	Continuing	Intersection improvements reduce emissions by improving traffic flow.	Intersection improvements reduce congestion by improving traffic flow.	N/A
17697	Island Avenue Signals	Upgrade and interconnect the signal controls at six intersections	Congestion Reduction and Traffic Flow	Continuing	Intersection improvements reduce emissions by improving traffic flow.	Intersection improvements reduce congestion by improving traffic flow.	N/A
17928	Air Quality Partnership	This project funds education and outreach activities and materials to encourage the reduction of emissions from transportation sources that contribute to ozone and $PM_{2.5}$ pollution.	Education / Outreach	Continuing	Emissions are reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel during episodic air pollution events.	Congestion is reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel during episodic air pollution events.	SOV travel is reduced by encouraging alternative commuting patterns and increased transit use during episodic air pollution events.

MPMS NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
48201	DVRPC Competitive CMAQ Program	This is a TIP line-item that holds funds to support projects selected through the local CMAQ selection process. Those projects will be assigned individual project numbers when they progress towards implementation.	Various	Continuing	All selected projects are required to demonstrate emissions benefits.	Benefits vary based on projects selected for funding.	Benefits vary based on projects selected for funding.
63406	Retrofit for Bike Lanes and Shoulders	The purpose of this project is to maintain existing and future bicycle facilities, including installation, maintenance, and replacement of striping and damaged and missing signs.	Bike / Pedestrian	Continuing	Maintaining safe bike linkages will help reduce emissions by promoting bike travel to employment and shopping centers.	Maintaining safe bike linkages will help reduce congestion by promoting bike travel to employment and shopping centers.	Maintaining safe bike linkages will help reduce SOV travel by promoting bike travel to employment and shopping centers.
64791	PA 420, Kedron Avenue	Modernization of signals, road widening, and channelization.	Intersection Improve-ment	Continuing	This project reduces congestion and improves air quality by optimizing operations through improving intersection geometry and channelization.	This project will reduce congestion by improving traffic operations.	N/A
84457	Signal Retiming Program	This program provides for the evaluation of existing signals along an identified corridor, with the goal of improving traffic operations.	Signal / ITS	Continuing	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A

MPMS NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
102273	Ridge / Germantown Pike Re-alignment	This project will replace the intersection of Germantown Pike, Ridge Pike, and River Road.	Intersection Improve-ment	FY2024	This project reduces congestion and improves air quality by optimizing operations through improving intersection geometry.	This project will reduce congestion by improving traffic operations.	N/A
105291	Circuit Line-Item	This is a TIP Line-item that holds funds to support projects selected to fund Circuit Trail projects Those projects will be assigned individual project numbers when they progress towards implementation.	Bike / Pedestrian	Continuing	Multi-use trail connections will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Trails reduce congestion by providing alternatives to SOV travel.	Trails reduce SOV travel by providing an alternative transportation option to driving.
106264	I-95 Central Access Philadelphia	This project creates a cap structure, viaduct, road, and trail structures that re-establish a strong connection between central Philadelphia and its waterfront	Bike / Pedestrian	FY2023	Bicycle and pedestrian connections will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Bicycle and pedestrian connections reduce congestion by providing alternatives to SOV travel.	Bicycle and pedestrian connections reduce SOV travel by providing an alternative transportation option to driving.
107642	Smithbridge Road Corridor Improvement	Construction of 8 ft. multi-use trail along Smithbridge Rd. connecting residential neighborhoods and Garnet Valley School District campuses. Project includes intersection improvements at district campuses.	Bike / Pedestrian	FY2023	Multi-use trail will help reduce emissions by providing a walking and bike link to employment and schools.	Trail reduces congestion by providing alternatives to SOV travel.	Trail reduces SOV travel by providing an alternative transportation option to driving.

MPMS NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
110460	Commuter Services	This project is a work program project that allows for staff to coordinate alternative commute education and outreach programs among MAP and TMA contractors.	Education / Outreach	Continuing	Commuter Services helps to reduce emissions through a variety of activities including promoting alternative commute options and assisting with outreach to promote non-SOV travel.	This project helps to reduce congestion by promoting alternative commute options and assisting with outreach to promote non-SOV travel.	This project SOV travel by promoting alternative commute options and assisting with outreach to promote non-SOV travel.
111005	Conshohocken Garage (I-76 ICM)	This project will provide flex funds to be transferred to SEPTA for a new "smart" parking garage at SEPTA's Conshohocken Station which will increase parking availability by approximately 500 spaces.	Transit	Continuing	This project will improve air quality by encouraging transit use by increasing parking and parking management at a popular regional rail station.	This project will reduce congestion by encouraging transit use by increasing parking and parking management at a popular regional rail station.	This project reduces SOV use by encouraging transit use by increasing parking and parking management at a popular regional rail station.
111424	Transportation Management Associations (TMA)	TMAs help address demand for the region's transportation system. Services include a range of transportation improvement options, including task forces, employer and construction project shuttles, advocacy, and congestion reduction assistance to employers along corridors and in municipalities.	Education / Outreach	Continuing	TMAs help to reduce emissions by alternative commute options, sponsoring last mile shuttles, and assisting with outreach to promote non-SOV travel.	TMAs help to reduce congestion by promoting alternative commute options, sponsoring last mile shuttles, and assisting with outreach to promote non-SOV travel.	TMAs help to reduce SOV by promoting alternative commute options, sponsoring last mile shuttles, and assisting with outreach to promote non-SOV travel.

MPMS NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
114939	Regional TDM Program	The Regional TDM Program provides public education and outreach to commuters, employers, and residents about available travel options, and providing a mix of incentives to encourage more efficient use of the regional transportation system.	Education / Outreach	Continuing	Emissions are reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel.	Congestion is reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel.	SOV travel is reduced by encouraging alternative commuting patterns and increased transit use.
114967	Transportation Operations	Districtwide. tasks: include Incident Management Task Forces Tasks, Traffic Signal Optimization, Transportation Operation Task Force, and TSMO Planning Efforts.	Education / Outreach	Continuing	This project reduces congestion and improves air quality by coordinating regional ITS efforts.	This project reduces congestion and improves air quality by coordinating regional ITS efforts.	N/A
114172	Dreshertown Road Trail	This project will construct a portion of the regional Cross County Trail along 2.5 miles through the Fort Washington Office Park.	Bike / Pedestrian	FY2024	Bicycle and pedestrian connections will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Bicycle and pedestrian connections reduce congestion by providing alternatives to SOV travel.	Bicycle and pedestrian connections reduce SOV travel by providing an alternative transportation option to driving.
118015	CMAQ Flex for SEPTA	This project is a TIP line-item for funds to be flexed to SEPTA for various transit projects.	Transit	Continuing	Transit service reduces emissions by providing an alternative to SOV travel.	Transit service reduces congestion by providing an alternative to SOV travel.	Transit service reduces SOV travel.

Source: DVRPC 2022

Note: All projects are expected to reduce ozone and $PM_{2.5}$ pollution.

Table B-2: Planned CMAQ Projects in the New Jersey Portion of the DVRPC Planning Area for the Second Performance Period (2022–2025)

DB NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
17419	US 1, Alexander Road to Mapleton Road	This project will provide turn-lanes along Alexander Road in West Windsor Township	Intersection Improve-ment	FY2025	This project reduces congestion and improves air quality by optimizing operations through improving intersection geometry.	This project will reduce congestion by improving traffic operations.	N/A
X065	Local CMAQ Initiatives – Mercer County Maidenhead Meadows Trail	Construct a significant segment of the Lawrence Hopewell Trail	Bike / Pedestrian	FY2022	Bicycle and pedestrian connections will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Bicycle and pedestrian connections reduce congestion by providing alternatives to SOV travel.	Bicycle and pedestrian connections reduce SOV travel by providing an alternative transportation option to driving.
X065	Local CMAQ Initiatives – Gloucester Township's Bicycle Trail	Construct last mile of the Gloucester Township multi-use trail	Bike / Pedestrian	FY2022	Bicycle and pedestrian connections will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Bicycle and pedestrian connections reduce congestion by providing alternatives to SOV travel.	Bicycle and pedestrian connections reduce SOV travel by providing an alternative transportation option to driving.
X065	Local CMAQ Initiatives – Voorhees Township Access to the PATCO Station	Construct bike / pedestrian link to the Voorhees PATCO Station	Bike / Pedestrian	FY2023	Bicycle and pedestrian connections will help reduce emissions by providing a walking and bike link to transit service.	Bicycle and pedestrian connections reduce congestion by providing alternatives to SOV travel.	Bicycle and pedestrian connections reduce SOV travel by providing an alternative transportation option to driving.

DB NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
X065	Local CMAQ Initiatives – Camden County's Route 130 Camden County Link Trail Bike/Ped Bridge Project	Construct critical link in the Camden Cross County Trail	Bike / Pedestrian	FY2024	Bicycle and pedestrian connections will help reduce emissions by providing a walking and bike link to employment and shopping centers.	Bicycle and pedestrian connections reduce congestion by providing alternatives to SOV travel.	Bicycle and pedestrian connections reduce SOV travel by providing an alternative transportation option to driving.
X065	Local CMAQ Initiatives – Princeton Pike Traffic Flow Improvements	This project will provide for intersection improvements at Fackler Road and upgrades to the existing signalized intersection at Princeton Pike and Province Line Road.	Intersection Improve-ment	FY2025	This project reduces congestion and improves air quality by optimizing operations through improving intersection geometry.	This project will reduce congestion by improving traffic operations.	N/A
X065	Local CMAQ Initiatives – Hamilton Avenue Intersection Improvement	Improve the alignment and function of intersections at Hamilton Avenue (CR 606) and Kuser Road (CR 619)/Ward Avenue and Hamilton Avenue and Liberty Street.	Intersection Improve-ment	FY2022	This project reduces congestion and improves air quality by optimizing operations through improving intersection geometry and channelization.	This project will reduce congestion by improving traffic operations.	N/A
X065	Local CMAQ Initiatives – NJ DEP E-mobility project	Fund electric vehicle charging stations for ridesharing in city of Trenton	Alternative Fuel Vehicles	FY2023	This project reduces emissions by providing charging for electric vehicles.	N/A	N/A

DB NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
X065	Local CMAQ Initiatives – NJ DEP It Pays to Plug In	Fund electric vehicle charging stations	Alternative Fuel Vehicles	FY2025	This project reduces emissions by providing charging for electric vehicles.	N/A	N/A
X065	Local CMAQ Initiatives – NJ DEP Emergency Medical Vehicle anti-idling campaign	Provide Auxiliary Power Units for emergency service vehicles to reduce idling.	Idle Reduction	FY2025	This project reduces emissions by providing reducing diesel vehicle idling.	N/A	N/A
D0407	Air Quality (Ozone) Action Program in New Jersey	Ozone Action encourages the use of mobility alternatives that will reduce congestion and air pollution.	Education / Outreach	Continuing	Emissions are reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel during episodic air pollution events.	Congestion is reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel during episodic air pollution events.	SOV travel is reduced by encouraging alternative commuting patterns and increased transit use during episodic air pollution events.
D0601	Camden County Bus Purchase	Purchase of new transit vehicles for combination of fixed route, subscription, and demand responsive transit services provided in Camden County.	Transit	Continuing Project	New transit vehicles will reduce emissions through better fuel economy. Transit service reduces emissions from SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.

DB NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
D1101	Mercer County Bus Purchase	Purchase of new transit vehicles for combination of fixed route, subscription, and demand responsive transit services provided in Mercer County.	Transit	Continuing Project	New transit vehicles will reduce emissions of $PM_{2.5}$ and ozone precursors through better fuel economy. Transit service reduces emissions from SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.
D1510	Burlington County Bus Purchase	Purchase of new transit vehicles for combination of fixed route, subscription, and demand responsive transit services provided in Burlington County.	Transit	Continuing Project	New transit vehicles will reduce emissions of $PM_{2.5}$ and ozone precursors through better fuel economy. Transit service reduces emissions from SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.
D2005	Regional TDM Program	TDM focuses on the many options available to residents to travel to and from work, as well as to get around our region, in a coordinated, cost-effective, and environmentally-positive way.	Education / Outreach	Continuing Project	Emissions are reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel.	Congestion is reduced by encouraging alternative commuting patterns and increased transit use resulting in a reduction in SOV travel.	SOV travel is reduced by encouraging alternative commuting patterns and increased transit use.
D9807	Gloucester County Bus Purchase	Purchase of new transit vehicles for combination of fixed route, subscription, and demand responsive transit services provided in Gloucester County.	Transit	Continuing Project	New transit vehicles will reduce emissions of $PM_{2.5}$ and ozone precursors through better fuel economy. Transit service	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.

DB NUM	Project Title	Project Description	Project Type	TIP Program Year	Emissions Benefit	Traffic Congestion Benefit (PHED)	Traffic Congestion Benefit (Non-SOV)
					reduces emissions from SOV travel.		
T112	Rail Rolling Stock Procurement	Funds for replacing rail rolling stock.	Transit	Continuing Project	Supporting rail transit operations reduces emissions by reducing SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.
T120	Small /Special Services Program	Funds efforts which initiate or promote transit solutions to reduce congestion, manage transportation demand, and improve air quality.	Transit	Continuing Project	Supporting transit operations reduces emissions by reducing SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.
T150	Section 5310 Program	This program provides funds for the purchase of small buses or van-type vehicles for agencies that serve the elderly and persons with disabilities.	Transit	Continuing Project	Supporting rail transit operations reduces emissions by reducing SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.	Maintaining transit vehicles and supporting transit operations reduces congestion and SOV travel.
D15343	Traffic Signal Optimization Support Services	This program will focus on dynamically managing NJ's arterials from NJDOT's Arterial Management Center.	Signal / ITS	Recurring project with new benefits	This project reduces congestion and improves air quality by optimizing progression on signalized routes.	This project will reduce congestion by improving traffic operations.	N/A

Source: DVRPC 2022

Note: All projects are expected to reduce ozone and $PM_{2.5}$ pollution.

Appendix C

Appendix C: Pennsylvania State PM3 Performance Measure Memo (2018-2021)

pennsylvania
DEPARTMENT OF TRANSPORTATION

National Performance Management Measures to Assess System Performance, Freight Movement, and the CMAQ Improvement Program

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SUBJECT: Establishment of State DOT Targets for PM-3 Performance Measures [23 CFR 490.105]

DESCRIPTION:

The Federal Highway Administration (FHWA) final rule for 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* was published in the Federal Register (82 FR 5970) on January 18, 2017 and became effective on May 20, 2017.

This final rule is the third in a series of three related rulemakings that together establishes a set of performance measures for State Departments of Transportation (State DOTs) and Metropolitan Planning Organizations (MPOs) to use as required by the Moving Ahead for Progress in the 21st Century Act (MAP–21) and the Fixing America's Surface Transportation (FAST) Act. The measures in this third final rule will be used by State DOTs and MPOs to assess the performance of the Interstate and non-Interstate National Highway System (NHS) for the purpose of carrying out the National Highway Performance Program (NHPP); to assess freight movement on the Interstate System; and to assess traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. These system performance measures are collectively referred to as the PM-3 measures.

State DOTs are required to establish targets in coordination with MPOs for all the measures in this rule by May 20, 2018. MPOs will have an additional 180 days beyond that date to either set their own targets or agree to the State DOT targets. In addition, State DOTs will need to report on performance at regular intervals. The first State DOT baseline performance period report is due October 1, 2018, for all measures in this rule.

DISCUSSION:

1. PM-3 System Performance Measures include:
    - Percent of Person-miles Traveled on the Interstate System that are Reliable
    - Percent of Person-miles Traveled on the Non-Interstate NHS that are Reliable
    - Interstate System Truck Travel Time Reliability Index
    - Annual Hours of Peak-Hour Excessive Delay (PHED) per Capita
    - Percent Non-Single Occupant Vehicle (SOV) Travel
    - On-Road Mobile Source Emissions Reduction for CMAQ-funded Projects
2. State DOT 2- and 4-year targets are due May 20, 2018 and will also be reported to FHWA in the 2017 baseline report due October 2018. To satisfy coordination requirements [23 CFR

490.105(e)(2)], PennDOT has coordinated with Planning Partners in the development of the measures and selection of targets to ensure consistency, to the maximum extent practicable.

3. For the three reliability measures, PennDOT has set statewide targets (sub-state targets are optional). MPO baseline reliability measures have been provided for information purposes only. For the first performance period, the annual peak hour excessive delay and non-SOV travel measures must be developed for the Pittsburgh and Philadelphia urbanized areas only. PennDOT has worked closely with SPC and DVRPC to develop these targets and to include the necessary multi-state coordination partners in the target-setting process. The mobile source emission measure targets are produced statewide and for each MPO that is in nonattainment or maintenance of the National Ambient Air Quality Standards.

4. PennDOT has worked to identify and evaluate the data and tools used to produce the baseline performance measures. The University of Maryland CATT Lab RITIS software platform is used to generate all the travel time based measures. Data from the American Community Survey (ACS) and FHWA's CMAQ annual reporting system are used for the non-SOV travel and mobile source emissions measures, respectively. Future revisions and modifications to these tools may impact the reported performance measures and established targets.

5. Due to potential tool enhancements, limited historic information, and the need for additional research understanding the variances and factors influencing each of the performance measures, PennDOT has established conservative targets. In some respects, these may be more appropriately referred to as benchmarks. PennDOT will track the measures over the next two years. States are permitted to adjust their 4-year targets at the midterm of the performance period, representing data through 2019 in a report due to FHWA by October 1, 2020. PennDOT will coordinate any updates to the performance measures with the Planning Partners. DVRPC and SPC will also track the annual PHED and Non-SOV travel measures and revisit the estimated established 4-year targets at the mid-term period.

COORDINATION MEETINGS:

1. A workshop was conducted on January 11th with PennDOT and FHWA Pennsylvania Division staff to identify future steps and requirements related to the Transportation Performance Management (TPM) rulemaking.

2. PennDOT conducted a performance measure workshop on February 26-27th with the Pittsburgh, Philadelphia and York MPO planning staff to evaluate baseline performance measure trends and methodologies for target setting.

3. PennDOT provided status updates on the development of performance measure data, tools and methodologies to the Planning Partners. On October 18, 2017, PennDOT provided an overview of the performance measures and general approaches for target setting at the Planning Partners fall conference in State College. On a March 20, 2018 conference call, PennDOT provided a status update on the development of baseline measures and targets.

4. PennDOT conducted a May 9th webinar to review the State DOT targets with the Planning Partners.

5. There were four Transportation Performance Measure meetings held for the Philadelphia PA-NJ-DE-MD urbanized area to coordinate, discuss and establish target setting for the PHED and Non-SOV travel measures. The meetings occurred on February 16th, March 19th, April 9th and April 30th 2018. Agency representation included PennDOT, NJDOT, DelDOT, MDOT, FHWA, DVRPC, NJTPA, SJTPO, WILMAPCO, LVPC, Berks and Lancaster County MPOs.

6. PennDOT has worked to develop the *Pennsylvania Department of Transportation MAP-21 and FAST Act Performance Management Road Map* to provide Planning Partners a resource on the performance measure requirements and calculations.

ESTABLISHMENT OF STATE DOT TARGETS:

Specific targets and informational resources are attached as follows:

Attachment 1 Targets	Baseline and target values for the travel time reliability and annual peak hour excessive delay measures
Attachment 2 Targets	Baseline and target values for the non-SOV travel measures
Attachment 3 Targets	Target values for the CMAQ emissions measures
Attachment 4	MPO baseline reliability measures <u>for informational purposes only</u>

ESTABLISHMENT OF MPO TARGETS:

1. The MPOs must establish targets no later than 180 days after the respective State DOT(s) establishes (or amends in future) their targets (by November 16, 2018). The MPOs must establish targets by either:

   - Agreeing to plan and program projects so that they contribute toward the accomplishment of the relevant State DOT target for that performance measure; or
   - Committing to a quantifiable target for that performance measure for their metropolitan planning area.

2. PennDOT will be formally contacting each MPO (similar to the safety measures) regarding the above MPO target setting options. If the MPOs establish their own performance measure targets, they should coordinate with PennDOT on the selection of the targets in accordance with 23 U.S.C. 134(h)(2)(B)(i)(II) to ensure consistency, to the maximum extent practicable.

3. The MPOs must report baseline condition/performance and progress toward the achievement of their targets in the system performance report in the metropolitan transportation plan.

Attachment 1: PM-3 Baseline and Target Values for Travel Time and Annual Peak Hour Excessive Delay Measures
(Estimated using RITIS Data Extract from May 8, 2018)

Measure	2017 Baseline	*2019* 2-year Target	*2021* 4-year Target
Interstate Reliability (*Statewide*)	**89.8 %**	**89.8 %**	**89.8 %**
Non-Interstate Reliability (*Statewide*)	**87.4 %**	*N/A*	**87.4 %**
Truck Reliability Index (*Statewide*)	**1.34**	**1.34**	**1.34**
Annual Peak Hour Excessive Delay Hours Per Capita (*Urbanized Area*)	*DVRPC* **16.8**	*N/A*	**17.3**
	SPC **11.1**	*N/A*	**11.8**

Attachment 2: PM-3 Baseline and Target Values for Non-SOV Travel Measure

Measure	2017 Baseline	*2019* 2-year Target	*2021* 4-year Target
Percent Non-Single Occupant Vehicle Travel (*Urbanized Area*)	*DVRPC* **27.9 %**	**28.0 %**	**28.1 %**
	SPC **24.8 %**	**24.6%**	**24.4 %**

Target Setting Notes:

Reliability Measures:
- Targets set equivalent to 2017 baseline values
- Limited historic data to understand trends of reliability measures.
- More research and data monitoring required to identify trends and project impacts on measure.
- Reassessment at mid-term period.

Delay Measure:
- Historical Vehicle Miles Travel (VMT) and INRIX GPS data suggest increasing delay trends.
- MPO travel models in each region indicate potential increases to VMT and delay.
- Combination of MPO staff input, travel model forecasts, VMT and vehicle registration trends, and forecast economy information used to establish higher delay targets at this time.
- DVRPC estimates 0.6% annual increase in delay/capita.
- SPC estimates 1.5% annual increase in delay/capita.
- Reassessment at mid-term period.

Non-SOV Travel Measure:
- Non-SOV Travel trends based on ACS survey data are relatively constant over the last 5 years.
- DVRPC trend indicates slightly increasing Non-SOV percentage.
- SPC trend indicates slightly decreasing Non-SOV percentage.
- Reassessment at midterm.

Attachment 3: PM-3 Baseline and Target Values for CMAQ Emission Measures

Applicable MPOs and Pollutants Determined from:
https://www.fhwa.dot.gov/environment/air_quality/cmaq/measures/cmaq_applicability/page03.cfm#toc494364458

Measure	MPO	Emissions (kg/day)	
		2019 2-year Target*	2021 4-year Target
VOC Emissions	Statewide	**109.460**	**201.730**
	DVRPC (PA only)	**37.610**	**69.310**
	SPC	**58.060**	**107.000**
	Lehigh Valley	11.690	**21.540**
	Lancaster	1.950	**3.600**
	Reading	0.150	**0.270**
	NEPA	0.000	**0.000**
NOx Emissions	Statewide	**337.700**	**612.820**
	DVRPC (PA only)	**23.420**	**42.500**
	SPC	**256.110**	**464.770**
	Lehigh Valley	57.550	**104.440**
	Lancaster	0.570	**1.030**
	Reading	0.040	**0.080**
	NEPA	0.000	**0.000**
$PM_{2.5}$ Emissions	Statewide	**10.760**	**20.490**
	DVRPC (PA only)	**1.080**	**2.060**
	SPC	**7.010**	**13.350**
	Lehigh Valley	2.320	**4.410**
	York	0.060	**0.110**
	Harrisburg	0.050	**0.100**
	Lancaster	0.020	**0.040**
	Lebanon	0.050	**0.090**
	Johnstown	0.170	**0.320**
PM_{10} Emissions	Statewide	**9.540**	**17.470**
	SPC	**9.540**	**17.470**
CO Emissions	Statewide	**567.700**	**1135.400**
	DVRPC (PA only)	**282.740**	**565.470**
	SPC	**284.970**	**569.930**

** 2-year emission targets are only applicable for SPC, DVRPC and Statewide targets (bold above). MPOs with populations <1 million are not required to report 2-year emission targets. The values were used to establish statewide 2-year targets.*

Target Setting Notes:

Emission Measures:

- Targets based on reported emissions in FHWA's CMAQ annual database.
- Targets are very difficult to anticipate as CMAQ-funded projects can produce a wide range of benefits.
- 4-year (2014-2017) historical benefits for new CMAQ projects averaged to support target setting.
- Many projects are expected to provide less emissions benefit in the future due to fleet turnover.
- Historical average CMAQ benefits by MPO adjusted to reflect cleaner fleet in future years.

Attachment 4: Supplemental Information for MPO Distribution
PM-3 Baseline Reliability Measure Values by MPO
(Extracted from RITIS on May 8, 2018)

MPO*	*2017 Baseline Travel Time Values*		
	Interstate Reliability	**Non-Interstate Reliability**	**Truck Reliability**
Statewide	**89.8%**	**87.4%**	**1.34**
Adams	*N/A*	87.9%	*N/A*
Altoona	100.0%	83.5%	1.20
Johnstown	*N/A*	95.1%	*N/A*
Centre	100.0%	92.6%	1.14
DVRPC**	74.4%	84.1%	1.83
Erie	100.0%	83.9%	1.25
Franklin	100.0%	94.0%	1.09
Harrisburg	90.9%	91.9%	1.37
Scranton-Wilkes-Barre	98.1%	87.5%	1.40
Lancaster	100.0%	94.1%	1.08
Lebanon	100.0%	93.0%	1.11
Lehigh Valley	100.0%	87.1%	1.34
NEPA	100.0%	92.1%	1.22
Reading	100.0%	93.4%	1.12
Shenango Valley	99.4%	94.9%	1.18
SPC	92.3%	87.0%	1.44
SEDA-COG	100.0%	95.5%	1.10
Williamsport	100.0%	98.3%	1.16
York	100.0%	89.5%	1.22

** The RITIS analysis platform currently does not directly produce MAP-21 measures for RPO areas*
*** DVRPC MPO values currently include areas outside of Pennsylvania that are within MPO boundaries*

Appendix D

Appendix D: **New Jersey State PM3 Performance Measure Memo (2018-2021)**

State of New Jersey

DEPARTMENT OF TRANSPORTATION
P.O. Box 600
Trenton, New Jersey 08625-0600

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DIANE GUTIERREZ-SCACCETTI
Acting Commissioner

May 16, 2018

Robert Clark, Division Administrator
Federal Highway Administration, New Jersey Division
840 Bear Tavern Road, Suite 202
West Trenton, NJ 08628

Dear Mr. Clark:

As you know, the New Jersey Department of Transportation (NJDOT) is required to provide Safety (PM1), Infrastructure (PM2) and System Performance (PM3) targets to FHWA. In my April 27, 2018 letter to you, I provided the Safety targets. In a companion letter to this one, I will provide the Infrastructure targets. With this letter, I am pleased to provide New Jersey's 2018 System Performance Targets. The NJDOT intends to include these targets in New Jersey's Initial Performance Report due by October 1, 2018.

MAP-21, followed by the FAST Act, requires State DOTs and MPOs to implement a performance management process. For each performance area noted below (Subparts E, F, G and H), FHWA sets forth one or more performance measures. Each state must develop targets for each performance measure, and each MPO must either adopt the state target or their own regional target. All performance areas require single statewide targets, except for the two in Subpart G, where the requirements currently apply to urbanized areas with a population over 1 million. For those, there is a single target for each urbanized area, and all State DOTs and MPOs in that area must collaborate to develop and agree on a single target.

For performance areas in Subparts E, F, and G, the performance period is from January 1, 2018 to December 31, 2021. For this 4-year performance period, 2-year targets reflect the anticipated condition or performance level at the midpoint of the performance period (12/31/2019), and 4-year targets reflecting the anticipated condition or performance level at the end of the performance period (12/31/2021). For the On-Road Mobile Source Emissions Measure (Subpart H), the performance period is October 1, 2017 to September 30, 2021, based on the federal fiscal year. We will have the opportunity to adjust all 4-year targets at the mid-point of the performance period.

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The following narrative describes the basic requirements and proposed targets for each performance area.

Travel Time Reliability (Subpart E)
Travel time reliability does not mean eliminating traffic congestion, but reducing its extremes to keep it within reasonable limits. The Department is using the National Performance Management Research Data Set (NPMRDS) data from 2016 and 2017 as a basis to determine travel time reliability targets. With support from the CATT Lab of the University of Maryland, travel time data has been analyzed to determine which roadway segments are reliable, and which are unreliable. Then segment length, traffic volume and vehicle occupancy data are used to calculate total person-miles of travel for the reliable and unreliable categories. The statewide reliability targets below describe the percentage of overall travel on the NHS that we expect to be reliable. At this stage, we have no definitive basis to change the baseline values for the 2- and 4-year targets, but will use the mid-year performance report as an opportunity to adjust the 4-year target as needed.

Performance Measure	Units	Baseline	2-year Target	4-year Target
Travel Time Reliability, Interstate NHS	Percentage of person-miles traveled that are reliable	82.0%	82.0%	82.0%
Travel Time Reliability, Non-Interstate NHS	Percentage of person-miles traveled that are reliable	84.1%	Not required	84.1%

Freight Reliability (Subpart F)
The Freight Reliability target is based on the same NPMRDS data source. Truck travel reliability is calculated through the Truck Travel Time Reliability (TTTR) index, which compares congested truck travel time (95th percentile) to average truck travel time (50th percentile). The highest TTTR values for segments are combined and weighted by segment length, and the sum of all length-weighted segments are divided by the total length of Interstate roadways in the state. There is no threshold, and the target is required only for interstate highways on the NHS.

The Baseline value is the average of the most recent calendar year of data (2017), which is 1.81. Data trends show a very modest increase in TTR over the calendar years of 2016 and 2017. Therefore, the Department and the MPOs agreed on a 2-year target of 1.9. However, it is anticipated that over 4 years, the target would be slightly higher, so it is set to 1.95.

Performance Measure	Units	Baseline	2-year Target	4-year Target
Truck Travel Time Reliability (TTTR)	TTTR Index, Interstate NHS	1.81	1.9	1.95

Peak Hour Excessive Delay (PHED) (Subpart G) – Urbanized Area Target
The Peak Hour Excessive Delay (PHED) measure indicates the extra time spent traveling due to extreme congestion, expressed as the number of hours per year on a per capita basis. This target is required for urbanized areas of greater than 1 million population. For NJ, the applicable

urbanized areas are New York City and Philadelphia, and a single target is required for each multi-state urbanized area.

For the New York urbanized area, partner agencies agreed that the effects of expected economic growth, especially in New York City, would exceed the impacts of investments to reduce traffic congestion. The 2 percent per year increase was the result.

For the Philadelphia urbanized area, the PHED value was 16.8 for 2017. The Vehicle Miles of Travel (VMT) forecasts for the DVRPC region for 2015–2020, based on the travel demand model, indicated a growth of 0.7% per year. On that basis, the 0.6% per year value was deemed appropriate.

Performance Measure	Units	Urbanized Area	Baseline	2-year Target	4-year Target
Peak Hour Excessive Delay (PHED)	Annual Hours of PHED per capita on the NHS	New York City (NY-NJ-CT)	20.0	Not Required	22.0 (+2%/yr.)
Peak Hour Excessive Delay (PHED)	Annual Hours of PHED per capita on the NHS	Philadelphia (PA-NJ-DE-MD)	16.8	Not Required	17.2 (+0.6%/ yr.)

Non-SOV Travel (Subpart G) – Urbanized Area Target
The Non-SOV Travel measure indicates the amount of travel not by single occupant vehicle (SOV), including modes such as walk, bus, carpool, train, bicycle, taxi, rideshare, and work at home. As with the PHED measure, the Non-SOV measure applies to the New York and Philadelphia urbanized areas. Both areas used U.S. Census American Community Survey (ACS) data as a basis for the targets. Specifically, ACS 5-year (2012-2016) estimates for journey to work trips for residents within the urbanized area.

The New York-Newark, NY-NJ-CT urbanized area's 5-year average percentage was 51.6%. This reflects a 61.8% non-SOV value for residents within the New York portion of urbanized area, and a 31.7% value for residents of the New Jersey portion of urbanized area. Given the large volume of existing transit ridership in the region where transit facilities are at capacity, the lack of any major transit projects being completed in the 4-year period, and the overall difficulty of "moving the needle" for this measure, the group decided to propose no increase for the 2-year target, and a conservative 0.1% increase for the 4-year target.

The Philadelphia area partner agencies faced similar considerations, but saw slightly more opportunities for growth in alternative modes of travel. Therefore, 0.1% increases were proposed for each 2-year increment.

Performance Measure	Units	Urbanized Area	Baseline	2-year Target	4-year Target
Non-SOV Travel	Percent of Non-SOV Travel in urbanized area	New York City (NY-NJ-CT)	51.6%	51.6%	51.7%
Non-SOV Travel	Percent of Non-SOV Travel in urbanized area	Philadelphia (PA-NJ-DE-MD)	27.9%	28.0%	28.1%

On Road Mobile Source Emissions (Subpart H)
The On Road Mobile Source Emissions measure covers expected emission benefits by pollutant from all investments made through the federal Congestion Mitigation and Air Quality (CMAQ) program. Target values are based on emissions benefits recorded in the FHWA CMAQ Public Access Database for fiscal years 2014-2017. Targets are only required for areas that are in nonattainment or maintenance status for the pollutant.

In developing the targets in consultation with the MPOs and NJDEP, consideration was given to the fact that the vehicle fleet, on average, is becoming cleaner over time. For example, the emissions benefit obtained from driving 20 fewer miles in an average model year 2014 vehicle will be greater than that obtained from driving 20 fewer miles in an average model year 2021 vehicle.

It is important to note that these 2- and 4-year targets are cumulative. The 2-year target reflects expected emissions benefits based on projects authorized in federal fiscal years 2018 and 2019, and the 4-year target reflects federal fiscal years 2018 through 2021.

As noted above, by rule this target is required to include all investments made through the federal Congestion Mitigation and Air Quality (CMAQ) program, regardless of the implementer. The target values below reflect benefits from NJDOT projects, those resulting from MPO local CMAQ programs, and NJ TRANSIT projects.

Statewide CMAQ Emissions Targets (Sum of MPO Targets)				
	Total Emissions Benefits Projections (kg/day)			
Year	Volatile Organic Compounds (VOC)	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Fine Particulate Matter ($PM_{2.5}$)
2018	10.058	16.085	59.919	2.154
2019	7.624	15.842	54.482	2.137
2020	9.442	15.631	58.946	2.122
2021	9.200	15.452	58.504	2.108
Cumulative 2-yr Target ('18-19)	**17.682**	**31.927**	**114.401**	**4.290**
Cumulative 4-yr Target ('18-21)	**36.324**	**63.010**	**231.850**	**8.520**

Coordination
For each of the System Performance targets described above, the Department has engaged in a robust coordination process through the nationally recognized interagency Complete Team. Representatives from each of the three MPOs, along with NJ TRANSIT, the Port Authority of New York and New Jersey, CATT Lab of the University of Maryland, and TRANSCOM have worked closely with the Department to ensure that the target development process met technical requirements and adequately considered policy issues. In addition, for the two urbanized area measures, Department staff have participated in regular meetings & conference calls for the NY-NJ-CT and greater Philadelphia regions, led by NJTPA and the New York Metropolitan Transportation Council (NYMTC) for the former, and DVRPC for the latter. For the New York-New Jersey Urbanized area, NJDOT has worked closely with the New York State Department of Transportation, NJTPA, the (NYMTC), and other entities to coordinate identical targets for the two urbanized area measures. Similarly, NJDOT has worked closely with DVRPC, PennDOT, DelDOT, Maryland DOT, and other entities to coordinate identical targets in the greater Philadelphia urbanized area. In so doing, both regions have ensured that all key agencies have participated in and agreed upon the required targets.

If you have any questions, please contact my office.

Sincerely,

Diane Gutierrez-Scaccetti

Diane Gutierrez-Scaccetti
Acting Commissioner

bc M. Ameen, Acting Executive Director, NJTPA
B. Seymour, Executive Director, DVRPC
J. Marandino, Executive Director, SJTPO

Appendix E

Appendix E: Pennsylvania State Four-Year Target Adjustment Memo

pennsylvania
DEPARTMENT OF TRANSPORTATION

National Performance Management Measures to Assess System Performance, Freight Movement, and the CMAQ Improvement Program

SUBJECT: Mid Performance Period Progress Report and Adjusted 4-Year Targets (PM-3 Measures) [23 CFR 490.107]

BACKGROUND:

The Federal Highway Administration (FHWA) final rule for 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* was published in the Federal Register (82 FR 5970) on January 18, 2017 and became effective on May 20, 2017. This final rule is the third in a series of three related rulemakings that together establishes a set of performance measures for State Departments of Transportation (State DOTs) and Metropolitan Planning Organizations (MPOs) to use as required by the Moving Ahead for Progress in the 21st Century Act (MAP–21) and the Fixing America's Surface Transportation (FAST) Act. The measures in this third final rule are used by State DOTs and MPOs to assess the performance of the Interstate and non-Interstate National Highway System (NHS) for the purpose of carrying out the National Highway Performance Program (NHPP); to assess freight movement on the Interstate System; and to assess traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. These system performance measures are collectively referred to as the PM-3 measures.

In May 2018, PennDOT established 2-year and 4-year targets in coordination with Pennsylvania's Planning Partners. All MPO/RPOs agreed to support the PennDOT statewide and regional PM-3 targets established at that time. PennDOT is required to submit a Mid Performance Period Progress Report to FHWA by October 1, 2020. The Mid Performance Progress Report includes:

- The actual performance derived from the latest data collected through the midpoint of the performance period;
- A discussion of PennDOT's progress toward achieving each established 2-year target;
- A discussion on progress of PennDOT's efforts in addressing congestion at truck freight bottlenecks within the state;
- Adjustments to the 4-year targets for select performance measures with a discussion of the basis for the adjustment and how the revised targets support expectations in the long-range statewide transportation plan;
- MPO CMAQ performance plans for the SPC, DVRPC and Lancaster MPOs.

The FHWA makes a formal determination of significant progress in the achievement of 2- and 4-year targets. If significant progress is not made, states will be required to document actions to achieve targets in future performance periods.

PERFORMANCE MEASURES:

The PM-3 system performance measures include:

- Percent of Person-miles Traveled on the Interstate System that are Reliable
- Percent of Person-miles Traveled on the Non-Interstate NHS that are Reliable
- Interstate System Truck Travel Time Reliability Index (TTTR)
- Annual Hours of Peak-Hour Excessive Delay (PHED) per Capita
- Percent Non-Single Occupant Vehicle (SOV) Travel
- On-Road Mobile Source Emissions Reduction for CMAQ-funded Projects

ACTUAL 2-YEAR PERFORMANCE DATA & PROGRESS TOWARD ACHIEVING TARGETS:

The 2-year performance data related to the PM-3 measures is obtained from the University of Maryland CATT Lab RITIS software platform (for travel time measures), American Community Survey (for non-SOV travel modes) and FHWA's CMAQ annual reporting system (for mobile source emission reductions). The following tables and notes summarize progress towards achieving the targets.

Travel Time Reliability Measures:

Area (MPO/RPO)	Interstate Reliability			Non-Interstate Reliability			Truck Travel Time Reliability Index		
	2017 Baseline	2018	2019	*2017 Baseline*	2018	2019	*2017 Baseline*	2018	2019
Statewide Total	**89.8%**	**89.6%**	**89.9%**	**87.4%**	**88.2%**	**88.4%**	**1.34**	**1.39**	**1.36**
Statewide Target	**89.8%** *2 & 4-Year Target*			**87.4%** *4-Year Target*			**1.34** *2 & 4-Year Target*		
Targets only Apply to Statewide Total - MPO Numbers Provided for Information Purposes Only									
Adams	*Not Applicable*			86.2%	89.8%	93.4%	*Not Applicable*		
Altoona	100.0%	100.0%	100.0%	82.7%	83.9%	84.4%	1.21	1.25	1.18
Centre	100.0%	100.0%	100.0%	91.3%	93.2%	94.9%	1.13	1.33	1.15
DVRPC	65.5%	66.0%	66.6%	81.2%	82.6%	83.2%	2.01	2.04	1.99
Erie	100.0%	100.0%	100.0%	83.8%	86.7%	88.2%	1.25	1.23	1.29
Franklin	100.0%	100.0%	100.0%	93.8%	96.5%	94.6%	1.08	1.11	1.09
Harrisburg	91.3%	92.7%	92.4%	91.0%	92.4%	90.3%	1.32	1.33	1.31
Johnstown	*Not Applicable*			93.0%	94.5%	95.6%	*Not Applicable*		
Lancaster	100.0%	100.0%	100.0%	95.2%	95.3%	92.1%	1.09	1.12	1.17
Lebanon	100.0%	100.0%	100.0%	97.5%	97.7%	95.4%	1.12	1.14	1.15
Lehigh Valley	100.0%	100.0%	99.5%	86.4%	84.6%	85.4%	1.32	1.34	1.35
NEPA	100.0%	100.0%	99.9%	91.9%	90.9%	93.1%	1.26	1.25	1.28
North Central	100.0%	100.0%	100.0%	93.0%	95.7%	95.6%	1.10	1.11	1.50
Northern Tier	100.0%	100.0%	100.0%	98.8%	99.1%	94.7%	1.24	1.17	1.18
Northwest	100.0%	100.0%	100.0%	87.5%	91.5%	91.8%	1.18	1.32	1.17
Reading	100.0%	100.0%	100.0%	93.2%	94.2%	95.0%	1.12	1.38	1.19
S. Alleghenies	100.0%	100.0%	100.0%	95.9%	96.7%	94.2%	1.11	1.13	1.16
Scranton	98.3%	98.3%	98.2%	87.4%	90.3%	90.1%	1.39	1.28	1.35
SEDA-COG	100.0%	100.0%	100.0%	95.7%	96.4%	96.2%	1.11	1.11	1.12
SPC	92.9%	91.6%	92.1%	87.0%	87.7%	88.9%	1.42	1.49	1.46
SVTS	99.3%	99.2%	100.0%	95.1%	96.7%	95.9%	1.18	1.59	1.14
Wayne	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	1.11	1.12	1.17
Williamsport	100.0%	100.0%	100.0%	98.4%	98.3%	97.4%	1.16	1.18	1.19
York	100.0%	97.5%	94.9%	90.0%	89.6%	90.7%	1.22	1.32	1.28

Notes on Progress Towards Achieving Targets

- The 2- and 4-year reliability targets only apply statewide. MPO/RPO values are provided for informational purposes only.
- At the mid-performance period (2019), Pennsylvania met the established 2-year target for interstate reliability. The state did not meet the 2-year truck travel time reliability index target. Although a 2-year target is not applicable to the non-interstate reliability measure, the mid-performance period data exceeds the 4-year target.

- PennDOT reliability targets were originally developed based on 2017 baseline values. The goal was to maintain baseline reliability throughout the four-year performance period. MPO/RPO values indicate areas that maintained their regional baseline value (green) or worsened over the baseline (red).

Transportation Project Impacts on Reliability Measures

- The two-year interstate reliability target has been met. Over the two year period, projects which reached completion brought roadway segments into the reliable category. For example, the widening of I-81 on both sides of the Capital Beltway near Harrisburg significantly improved reliability. The completion of I-279 reconstruction near Pittsburgh didn't add capacity, but the removal of work zone traffic restrictions improved reliability.
- The TTTR trends show a reduction in freight reliability, which does not meet the 2-year target. PennDOT has observed the impact of construction work zones on freight reliability. For example, a bridge rehabilitation project along I-80 near DuBois significantly reduced freight reliability from 1.12 to 2.55. The completion of I-81 widening in Harrisburg near PA 114 improved reliability near this segment, but created a new bottleneck closer to the US 11 interchange.
- Comparing the 2017 baseline data to 2019 data shows significant improvement where construction activities were underway in 2017 and completed prior to 2019. However, these improvements are offset by other locations which were under construction in 2019 but not 2017. PennDOT must continue to improve pavement and bridge conditions along interstate highways, so the construction impacts cannot be eliminated. Implementation of alternative construction work zone strategies to mitigate freight reliability impacts will take several years and will not significantly affect reliability within this performance period.

Efforts to Better Understand Progress in Addressing Reliability

- PennDOT is working to better understand how reliability has changed on roads throughout the state. Ongoing work efforts include the mapping of reliability changes, completed transportation projects and construction activities for each year in the performance period. These mapping products will be shared with the Planning Partners when finalized to assist in regional reliability assessments.

CMAQ PHED and Non-SOV Measures:

Urbanized Area (MPO)	CMAQ Non-SOV Percentage		CMAQ PHED	
	2017 Baseline	2019	*2017 Baseline*	2019
Philadelphia (DVRPC)	**27.9%**	**28.2%**	**16.8**	**14.6**
2-year Target	**28.0%**		*17.0 <Optional>*	
4-year Target	**28.1%**		**17.2**	
Pittsburgh (SPC)	**24.8%**	**25.5%**	**11.1**	**10.1**
2-year Target	**24.6%**		*N/A*	
4-year Target	**24.4%**		**11.8**	

Notes on Progress Towards Achieving Targets

- The CMAQ Non-SOV and PHED measures currently only apply to the Pittsburgh and Philadelphia urbanized areas. Targets were developed jointly by PennDOT, SPC and DVRPC (and other relevant stakeholders) for each respective region.
- The 2017 baseline PHED values are consistent with the original PennDOT baseline report submission (some values have changed in RITIS due to methodology and data corrections).

- Both the Pittsburgh and Philadelphia regions have had increases in the non-SOV regional travel percentage and meet the 2-year target. At this time both regions would also meet the 4-year target if trends continue over the next 2 years.
- Both the Pittsburgh and Philadelphia regions have seen reductions in the PHED measure and would meet the 4-year target if trends continue over the next 2 years.

Efforts to Better Understand Progress in Addressing CMAQ Congestion Measures

- PennDOT will continue to work with SPC and DVRPC to better understand how the transportation investments and land use changes have impacted the PHED and non-SOV measures. Future efforts will aim to better identify key roadway segments that contribute to the PHED measure.
- PennDOT will continue to support CMAQ congestion measure assessments and mapping. For future performance periods, these measures will apply to additional MPOs where urbanized area populations are greater than 200,000.

CMAQ Emission Measures:

Measure	MPO	Emissions (kg/day)		
		2019 2-year Target	2021 4-year Target	2019 2-year Actual Performance
VOC Emissions	*Statewide*	109.46	201.73	231.03
	DVRPC (PA only)	37.61	69.31	142.79
	SPC	58.06	107.00	66.76
	Lehigh Valley	N/A	21.54	*20.19*
	Lancaster	N/A	3.60	*0.25*
	Reading	N/A	0.27	*0.32*
	NEPA	N/A	0.00	*0.72*
NOx Emissions	*Statewide*	337.70	612.82	936.29
	DVRPC (PA only)	23.42	42.50	652.4
	SPC	256.11	464.77	152.55
	Lehigh Valley	N/A	104.44	*126.64*
	Lancaster	N/A	1.03	*1.16*
	Reading	N/A	0.08	*3.08*
	NEPA	N/A	0.00	*0.46*
$PM_{2.5}$ Emissions	*Statewide*	10.76	20.49	37.87
	DVRPC (PA only)	1.08	2.06	24.21
	SPC	7.01	13.35	6.21
	Lehigh Valley	N/A	4.41	*5.48*
	York	N/A	0.11	*1.41*
	Harrisburg	N/A	0.10	*0.41*
	Lancaster	N/A	0.04	*0.06*
	Lebanon	N/A	0.09	*0.06*
	Johnstown	N/A	0.32	*0.03*
PM_{10} Emissions	*Statewide*	9.54	17.47	0.00
	SPC	9.54	17.47	0.00
CO Emissions	*Statewide*	567.70	1135.40	133.37
	DVRPC (PA only)	282.74	565.47	N/A
	SPC	284.97	569.93	133.37

Notes on Progress Towards Achieving Targets

- Pollutant Definitions include VOC = Volatile Organic Compounds; NOx = Nitrogen Oxides; PM = Particulate Matter for specified size particles; and CO = Carbon Monoxide
- The 2-year targets for the CMAQ emissions measure only apply to the statewide totals and the nonattainment/maintenance areas in the SPC and DVRPC MPO regions. The 2-year actual performance does not meet the 2-year targets for the highlighted (red) cells in the table, which includes the SPC NOx, CO, PM_{10} and $PM_{2.5}$ pollutant categories. The statewide CO has also not met the target.
- DVRPC is now in attainment for CO and a CO target is no longer required for that region.

Efforts to Better Understand Progress in Addressing CMAQ Emission Measures

- PennDOT continues to work with relevant MPOs to better understand progress and to inform future target setting. In many areas, CMAQ fund investments are directed to projects that were initiated before the performance period. Additional efforts are underway to better track and identify CMAQ funding used for these "continuing" projects that do not count towards the performance target in that year.
- A CMAQ project selection process has been integrated to enhance coordination between MPO/RPOs and PennDOT District Offices in the identification and selection of CMAQ projects that provide the most benefit to air quality.
- Several targets including those for SPC need to be adjusted to reflect corrections to the methodology for accounting for emission credits (see section on 4-year Target Adjustments).

PROGRESS IN ADDRESSING CONGESTION AT FREIGHT BOTTLENECKS:

As per 23 CFR 490.107(b)(2)(ii)(D) and 23 CFR 490.107(b)(3)(ii)(D), States must provide in their mid and full performance period progress reports, a discussion on progress of the State DOT's efforts in addressing congestion at truck freight bottlenecks.

PennDOT's statewide long range transportation and freight plans are currently being updated and will include an enhanced evaluation of freight bottlenecks using NPMRDS truck travel times and other available data. Efforts are underway to develop bottleneck mapping and rankings for the interstate system based on road segments with high TTTR values and truck volumes. These efforts will continue as part of the statewide plan development process. In addition, work efforts will aim to identify the causes of bottlenecks, the impacts of construction activities and the benefits of completed transportation projects on those measures. PennDOT will work to verify those insights with MPO/RPOs throughout the state.

ADJUSTMENTS TO 4-YEAR PERFORMANCE TARGETS AND COORDINATION:

The mid period progress report offers an opportunity for PennDOT and its Planning Partners to review and revise the four-year targets for each of the PM-3 performance measures. The CMAQ congestion measure targets were developed with consensus of all relevant state DOT and MPO partners for each urbanized area (e.g. Philadelphia and Pittsburgh areas). All other reliability, freight and CMAQ emission targets were developed in coordination between PennDOT and Pennsylvania's MPO/RPOs.

The following table summarizes the target evaluation considerations and adjusted target values that are provided in PennDOT's mid performance period progress report to FHWA. All target adjustments were submitted to FHWA using the online Performance Management Form (PMF) by October 1, 2020.

Adjustments to 4-Year Targets:

Measure	Area	Original Target	Adjusted Target	Basis for Adjustment
Statewide Reliability Targets				
Interstate Reliability	Statewide	89.8%	**89.5%**	PennDOT's target was developed to maintain status quo for operations. Based on a review of the first three years of data, there are minor fluctuations within the statewide measure each year. PennDOT anticipates construction projects will cause performance drops before longer-term benefits of those projects are realized. The target adjustment reflects anticipated construction impacts which cannot be mitigated within the timeframe of the four-year target.
Non-Interstate Reliability		87.4%	**No Adjustment To Target**	
Truck Travel Time Reliability Index (TTTR)		1.34	**1.40**	The impacts of construction work zones on the freight reliability measure cannot be mitigated prior to the 2021 construction season. PennDOT will continue to monitor data to develop appropriate mitigation strategies to improve freight reliability in future performance periods. The 4-year target is intended to account for anticipated construction projects which will impact 2021 performance and unknown freight impacts due to the COVID-19 pandemic.
Philadelphia Urbanized Area Targets				
Peak Hour Excessive Delay (PEHD)	Philadelphia Urbanized Area	17.2	**No Adjustment To Target**	The existing 4-year targets remain reasonable, given existing trends, uncertainties in some of the PHED data, coverage and calculations, and unknown changes due to COVID.
Percent Non-SOV Travel		28.10%		
Pittsburgh Urbanized Area Targets				
Peak Hour Excessive Delay (PEHD)	Pittsburgh Urbanized Area	11.8	**No Adjustment To Target**	The existing 4-year targets remain reasonable, given existing trends, uncertainties in some of the PHED data, coverage and calculations, and unknown changes due to COVID.
Percent Non-SOV Travel		24.40%		
Statewide and MPO CMAQ Emission Targets in Kg/Day (only areas with adjusted values shown)				
VOC Emissions	Lancaster	3.60	**0.40**	Targets adjusted based on a review of "continuing" projects (that do not get counted in emission benefits) and anticipated new projects in the remaining 2-year TIP period. Methodology and emission factor changes to the emission calculation procedures are accounted for in the target adjustments.
NOX Emissions	SPC	464.77	**250.00**	
PM2.5 Emissions	SPC	13.35	**10.00**	
	Lebanon	0.09	**0.06**	
	Johnstown	0.32	**0.03**	
PM10 Emissions	Statewide	17.47	**0.00**	The original target was set assuming PM10 benefits of CMAQ projects across the entire SPC region. The target should only be for the actual nonattainment/maintenance area which just includes Liberty Clairton. No CMAQ projects are anticipated in this area over the 4-year performance period. The SPC and statewide targets will be adjusted to zero.
	SPC	17.47		
CO Emissions	Statewide	1135.40	**250.00**	The DVRPC region is now in attainment for CO and no longer requires a target. As such the MPO target can be removed and the statewide number is adjusted only to reflect the SPC area.
	DVRPC	565.47	**Remove Target**	
	SPC	569.93	**250.00**	The original target was set assuming CO benefits of CMAQ projects across the entire SPC region. The target should only be for the actual nonattainment/maintenance area which just includes the Pittsburgh central business district. MPO and statewide targets have been updated to reflect historic and future projects anticipated in that area.

MPO CMAQ PERFORMANCE PLANS:

As required in the federal rule, PennDOT includes the MPO CMAQ Performance Plans as part of the statewide mid performance progress report online submittal to FHWA. This includes performance plans for the following agencies: DVRPC, SPC and the Lancaster County MPO.

COORDINATION CONDUCTED FOR MID-PERFORMANCE REPORT:

- PennDOT provided a presentation on the PM-3 target adjustments at the September 16th Planning Partners call. The call included a discussion on the target setting process and requested comments on the proposed changes to target values. No MPO/RPOs indicated concerns regarding adjustments to the reliability, freight or CMAQ emission targets.

- PennDOT coordinated with both SPC and DVRPC in the review of their CMAQ PHED and Non-SOV percentage targets. The DVRPC coordination included all stakeholders for the Philadelphia PA-NJ-DE-MD urbanized area including PennDOT, NJDOT, DelDOT, MDOT, FHWA, DVRPC, NJTPA, SJTPO, WILMAPCO, LVPC, Berks and Lancaster County MPOs.

ESTABLISHMENT OF MPO TARGETS:

- The MPO/RPOs must establish targets no later than 180 days after PennDOT adjusts their targets (due October 1st, 2020). The MPO/RPOs must establish targets by either:
  - ⇨ Agreeing to plan and program projects so that they contribute toward the accomplishment of the relevant PennDOT target for that performance measure; or
  - ⇨ Committing to a quantifiable target for that performance measure for their metropolitan planning area.

- PennDOT will be formally contacting each MPO/RPO (similar to process conducted after May 2018 target establishment) regarding the above target setting options for the adjusted interstate freight reliability target. If the MPO/RPOs establish their own performance measure targets, they should coordinate with PennDOT on the selection of the targets in accordance with 23 U.S.C. 134(h)(2)(B)(i)(II) to ensure consistency, to the maximum extent practicable.

- The MPO/RPOs must report baseline condition/performance and progress toward the achievement of their targets in the system performance report in the metropolitan transportation plan.

Appendix F

Appendix F: New Jersey State Four-Year Target Adjustment Memo

Michael Baker
INTERNATIONAL

From: Robert d'Abadie, MBI

To: NJDOT Department of Statewide Planning
New Jersey Metropolitan Planning Organizations

Date: September 10, 2020

Subject: PM-3 Performance Measures for On-Road Mobile Source Emissions Reduction for CMAQ – Midterm Reporting

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Introduction

The Federal Highway Administration (FHWA) final rule for 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* was published in the Federal Register (82 FR 5970) on January 18, 2017 and became effective on May 20, 2017.

This final rule is the third in a series of three related rulemakings that together establishes a set of performance measures for State Departments of Transportation (State DOTs) and Metropolitan Planning Organizations (MPOs) to use as required by the Moving Ahead for Progress in the 21st Century Act (MAP–21) and the Fixing America's Surface Transportation (FAST) Act. The measures in this third final rule will be used by State DOTs and MPOs to assess the performance of the Interstate and non-Interstate National Highway System (NHS) for the purpose of carrying out the National Highway Performance Program (NHPP); to assess freight movement on the Interstate System; and to assess traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. These system performance measures are collectively referred to as the PM-3 measures.

By October 1, 2020, and every 4 years thereafter, State DOTs report their 2-year (midpoint performance period) progress to FHWA in their Mid Performance Period Progress Report. At that time, the 4-year targets may be updated based on insights from the midterm data.

This memorandum focuses solely on the last performance measure, the On-Road Mobile Source Emissions Reduction for CMAQ-funded Projects. The discussion begins with a summary of the process undertaken in New Jersey to develop the original targets, both for the Municipal Planning Organization (MPO) and Statewide. Next, the 2018 and 2019 emission benefits reported in FHWA's CMAQ Public Access System (CMAQ PAS) are adjusted using the same process employed when developing the original targets. Lastly, the progress to date is presented along with recommendation for the 4-year targets.

Review of Previous Target Setting Process

- To satisfy coordination requirements [23 CFR 490.105(e)(2)], NJDOT engaged with their Planning Partners in the development and selection of targets, including all three of the NJ MPOs and the

New Jersey Department of Environmental Protection (NJDEP.) This is covered in detail in the June 18th, 2020 memorandum to NJDOT found in **Attachment A**.

- In addition to informal consultation efforts, webinars where held with all planning partners on March 22nd and May 10th, 2018 to discuss the initial approach and final process/methodology, including all data assumptions.
- MPO technical staff were given the opportunity to review the base data, data modifications, the final calculations and final targets. Concurrence with the general target setting approach was requested and received via email with the understanding that each MPO would obtain the approval from their respective executive committees prior to the targets being official.
- A number of considerations went into the development of the 2-year and 4-year targets, including:
    - Development of the CMAQ emissions targets began by reviewing the reported emission benefits in FHWA's CMAQ PAS for fiscal years 2014-2017.
    - It was noted that going forward NJDOT will be updating the conventions used in entering data into the CMAQ PAS for greater uniformity, and these changes were reflected in the development of the targets. In particular, benefits of continuing projects were only considered in the first year the project received CMAQ funding as per FHWA recommendation.
    - Stakeholder staff reviewed the CMAQ PAS database, highlighting any analysis/data entry issues.
    - Benefits of NJ Transit projects receiving CMAQ funding are not recorded in the CMAQ PAS in New Jersey prior to 2018. NJ Transit provided the estimated emissions impacts for their 2014-2017 CMAQ projects, with the benefits of many of the NJ Transit project assigned to MPOs in which they were physically located.
    - Emission benefits of projects classified as *No MPO identified/State sponsored projects* (i.e. NJDOT and NJ Transit efforts not located within a specific MPO) were distributed using the ratio of the MPO Vehicle Miles of Travel (VMT) to the total VMT as reported in the 2016 Highway Performance Monitoring System (HPMS): DVRPC - 43,143,107 miles or 20.5%, NJTPA – 151,417,069 miles or 71.9%, SJTPO -16,075,432 miles or 7.6%.
    - Projects with entry errors/erroneously high values recorded in the CMAQ PAS were assumed to be qualitative for the purposes of targeting setting.
    - One-time "heavy hitter" projects were not considered when setting targets to avoid skewing them to unachievable levels. One example was the River Line diesel fleet re-engine/retrofit project. No project with a similar benefit were anticipated by DVRPC, so this project was not considered when setting the 2 and 4-year targets.
    - In developing the targets, a number of additional factors were considered in projecting the baseline 2014-2017 data into the future:
        - Adjustments we made to reflect the downward trend in average vehicle emission rates going forward. This was done by developing average emission rates for light duty vehicles for each analysis year using the EPA MOVES emission rates model and using these to factor the reported emission benefits into the future.
        - Projects involving the reduction of diesel vehicle emissions were not adjusted over time. Generally, these projects involve the one-for-one replacement or retrofit of specific older, more polluting vehicles/equipment built to specific standards, and as such their typical impact is unlikely to trend downwards in the next 4 years unlike the projects that reduce VMT.

- MPO targets were only developed for the pollutants for which area is classified as nonattainment or maintenance:
    1. NJTPA – Ozone (VOC + NOX), $PM_{2.5}$ and CO
    2. DVRPC – Ozone (VOC + NOX) and $PM_{2.5}$
    3. SJTPO – Ozone (VOC + NOX) only
- Additional assumptions were needed in developing the targets for the NJTPA region:
    - The entire $PM_{2.5}$ emissions benefit was included when setting targets. It was assumed that the majority of $PM_{2.5}$ benefits would occur within the boundaries of the $PM_{2.5}$ non-attainment area.
    - For the CO targets, the emission reductions were factored using the ratio of the 2016 HPMS VMT within Passaic, Essex, Bergen, Hudson and Union counties (the majority of the CO non-attainment area) to total VMT in the MPO - 39.26%
- For the SJTPO region it was noted that due to a backlog of projects, no new CMAQ funded projects were anticipated in FY2019. This was reflected when setting targets.

- The final MPO and Statewide targets are summarized in **Exhibit A.**

Exhibit A: PM-3 Target Values for CMAQ Emission Measures

Measure	MPO	Emissions (kg/day)	
		2019 2-year Target	2021 4-year Target
VOC Emissions	Statewide	17.682	36.324
	DVRPC (NJ only)	1.450	2.864
	NJTPA	14.026	27.318
	SJTPO	2.207	6.142
NO_X Emissions	Statewide	114.401	231.927
	DVRPC (NJ only)	7.453	14.861
	NJTPA	101.722	202.745
	SJTPO	5.226	14.245
$PM_{2.5}$ Emissions	Statewide	4.290	8.520
	DVRPC (NJ only)	2.627	5.253
	NJTPA	1.663	3.267
CO Emissions	Statewide	31.927	63.010
	NJTPA	31.927	63.010

Midterm Performance

- The data found in the CMAQ PAS was downloaded for fiscal years 2018 and 2019. A summary of the project data can be found in **Attachment B.**
- A spreadsheet was created to replicate the calculations used in developing the targets, specifically:
    - The emission benefit for projects classified as *No MPO identified/State sponsored projects* (NJDOT and NJ Transit) were distributed to the MPOs based on the fraction of statewide

HPMS VMT recorded within each MPO, the same values used during the target setting: DVRPC - 20.5%, NJTPA - 71.9%, SJTPO - 7.6%.

- The 2018 and 2019 NJ Transit projects were not location specific. These benefits were therefore distributed based on the HPMS VMT ratios above.
- To gauge performance, similar to what was used when developing targets:
  - Only the pollutants for which area is classified as nonattainment or maintenance were considered:
    - NJTPA – Ozone (VOC + NO_X), $PM_{2.5}$ and CO
    - FattainDVRPC – Ozone (VOC + NO_X) and $PM_{2.5}$
    - SJTPO – Ozone (VOC + NO_X) only
  - In the NJTPA, all of the $PM_{2.5}$ benefits and 39.26% of the CO benefits (based on the amount of VMT estimated within the CO maintenance area) were reported.

- **Exhibit B** lists the total reported 2018 and 2019 emissions reductions and compares them to the existing 2 and 4-year targets.
- The spreadsheet calculating these values is available on request. It has already been shared and reviewed by stakeholders and incorporates their comments.

Results and Recommendations

- Using the data in the CMAQ PAS and the process discussed above, all of the 2 and 4-year CMAQ emissions targets have already been achieved both for the individual MPOs and Statewide:
  - DVRPC was able to achieve its target goals both for the 2 and 4-year based solely on the benefits of projects initiated by the MPO directly.
  - NJTPA only had one project recorded during the first 2 years of reporting period, a 2018 project recorded as qualitative. While there are no quantified emission benefits attributed directly to the MPO so far, the MPO's assigned share of the benefits from the *No MPO identified/State sponsored projects* achieves both the 2 and 4-year target goals.
  - SJTPO has only continuing projects in the first two years of the reporting period. While there are no quantified emission benefits attributed directly to the MPO so far, the MPO's assigned share of the benefits from the *No MPO identified/State sponsored projects* achieves both the 2 and 4-year target goals.
  - Note that Statewide values shown are less than the totals in the CMAQ PAS as individual MPOs only take credit for individual pollutants of concern in their regions. Since the MPO and statewide targets must align, the Statewide reported values are the sum of the MPO values.
- The occurrence of the COVID-19 pandemic has resulted in immense uncertainty, both on the types of CMAQ projects that will be championed and the ability of the state and MPOs to fund them.
- Given the ongoing uncertainty, and the fact the 4-year targets have already been achieved, it was recommended by NJDOT to the MPOs that the 4-year targets not be changed. Concurrence with this recommendation was received via email from all three MPOs via emails. Copies of these emails are provided in **Attachment C**.

Appendix G

Appendix G: **Pennsylvania State Performance Plan (2018-2021) and Four-Year Target Memos (2022-2025)**

File to be added when received by PennDOT

Appendix H

Appendix H: New Jersey State Performance Plan (2018-2021) and Four-Year Target Memos (2022-2025)

TECHNICAL MEMORANDUM

Michael Baker INTERNATIONAL

DATE: September 21, 2022

TO: Jamie Derose, NJDOT

CC: Chuck Grill, NJDOT
Sean Green, DVRPC
Keith Miller, NJTPA
Liz DeRuchie, NJTPA
Richard Cippoletti, NJTPA
Jason Simmons, SJTPO
David Heller, SJTPO

FROM: Robert d'Abadie - Michael Baker International

SUBJECT: Progress Report 2018-2021 CMAQ Emissions Performance Measure

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INTRODUCTION

Transportation Performance Management (TPM) provisions of MAP-21 and FAST Act require that state DOTs and Municipal Planning Organizations (MPOs) incorporate performance measures and target setting into the planning and programming process, providing accountability and transparency in how federal funding is spent on Congestion Mitigation and Air Quality (CMAQ) funded transportation projects. As part of this effort NJDOT, NJDEP, NJ Transit (NJT), and the three (3) New Jersey Municipal Planning Organizations (MPOs) engaged in a process to establish targets for the CMAQ emissions performance metric for the first reporting period: 2018-2021.

The purpose of the CMAQ program is to fund transportation projects or programs that will contribute to attaining or maintaining national ambient air quality standards (NAAQS). This measure helps assess progress toward that purpose. For projects funded with CMAQ funds, states enter estimated emissions reductions of applicable criteria pollutants (ozone, carbon monoxide, and particulate matter) and precursors that aid in the formation of those pollutants into FHWA's CMAQ PAS database. States estimate emissions reductions in kilograms per day for all projects funded with CMAQ program funds.

CMAQ annual reporting requires the project's estimated emissions reductions for the first year of full operation. The emission estimate is entered in the CMAQ Project Tracking System for the first year of funding. Per FHWA guidance, emissions on not reported for projects that carry over to future funding years to avoid double counting.

Calculation of the Original CMAQ Emission Targets

The methodology used to develop the original targets was created in coordination by NJDEP, NJT, NJDOT, and the NJ MPOs. The targets were developed using some basic concepts and considerations:

1. The process recognized that on average fleet emissions are going down over time. This is due to stricter fuel and emissions standards and the turnover in the fleet with older more polluting vehicles being retired and newer cleaner-running vehicles entering the fleet. This results in projects, particularly those that reduce Vehicle Miles of Travel (VMT), will show declining emission impacts over time.
2. Outliers, either large one-time projects or projects that appeared to be calculated/recorded incorrectly, were not considered when formulating the targets. The identification of outliers was done in conjunction with MPO and NJDOT staff.
3. Projects identified as "No MPO Identified/State Sponsored" in the FHWA CMS PAS could not be assigned to a single MPO. These projects, those sponsored by NJDOT and NJ Transit, were defined generically without identifying the specific location(s) each was likely to impact. To be equitable, it was decided to distribute the benefits of the "No MPO Identified/State Sponsored" among the MPOs based on the percent of 2016 HPMS Statewide VMT Travel within each of the three MPOs. This resulted in a distribution of 20.5%, 71.9%, and 7.6% to DVRPC, NJTPA, and SJTPO regions, respectively.
4. **Table 1** identifies the pollutants analyzed in each of the MPOs. The statewide target is the sum of the MPO targets.
5. CO represents a unique case as the only MPO with CO maintenance areas was the NJTPA, and the CO area represented only a small portion of the MPO overall. Similar to how the "No MPO Identified/State Sponsored" project benefits were distributed, The CO benefits within the NJTPA region were factored by the approximate share of MPO VMT within the CO maintenance counties divided by the total MPO VMT, a value of 39.26%

Table 1 – Applicable NAAQS by NJ MPO

MPO	NAAQS			
	VOC	NO_X	CO	$PM_{2.5}$
DVRPC	✓	✓		✓
NJTPA	✓	✓	✓	✓
SJTPO	✓	✓		

Comparison of Forecasted Targets to Reported Data

The reported total emission reductions achieved from MPO were started by adding all the 2018-2021 reported project benefits values as recorded in the FHWA CMAQ PAS directly. Distribution of the "No MPO Identified/State Sponsored" project benefits was done using the same method and ratios used when developing the original targets. **Table 2** has a summary of the achieved CMAQ emission reduction benefits along with original targets for comparison. In all cases, the 2-year midterm and 4-year full reporting period targets were readily achieved. A summary of the calculations is provided in **Attachment A** and a spreadsheet with the data reported in the CMAQ PAS and full calculations is available on request.

At the time of the midterm review, specifically for the 2018-2019 CMAQ Emissions benefits to date, the MPO's and State's two and four-year targets had been achieved. Agencies are allowed to revisit their targets at the time of the mid-term progress report, however NJDOT and the MPOs decided not to make changes at that time. The uncertainty stemming from the COVID-19 pandemic and the resulting economic fallout meant changes to the targets could not be made with confidence.

Conclusions

All jurisdictions in New Jersey fully achieved the 2 and 4-year CMAQ emissions targets for the 2018-2021 performance planning reporting period. NJ Transit projects and continuing projects are now being coded into the CMAQ PAS fully as specified by the FHWA. This will provide more consistent data for the development of the second reporting period targets for 2022 – 2025.

Table 2 –2018-2021 CMAQ Emissions First Period Targets and Results

DVRPC Results

Pollutant		VOC	CO*	NO_X	$PM_{2.5}$
Midterm ('18-19)	Target	1.450		7.453	2.627
	Achieved	70.133		668.791	108.524
Full Period ('18-21)	Target	2.864		14.861	5.253
	Achieved	73.692		683.827	111.813
All Targets Achieved?	Yes	Yes	N/A	Yes	Yes

* No CO Target as DVRPC meets the NAAQS for this pollutant

NJTPA Results

Pollutant		VOC	CO*	NO_X	$PM_{2.5}$**
Midterm ('18-19)	Target	14.026	31.927	101.722	1.663
	Achieved	79.241	145.495	752.218	48.382
Full Period ('18-21)	Target	27.318	63.010	202.745	3.267
	Achieved	95.804	250.276	803.959	60.636
All Targets Achieved?	Yes	Yes	Yes	Yes	Yes

* Approximately 39.26%VMT in CO area, target and reported benefits factored accordingly

** 100% of PM2.5 benefit taken, assumed to occur in MPO's non-attainment area

SJTPO Results

Pollutant		VOC	CO*	NO_X	$PM_{2.5}$*
Midterm ('18-19)	Target	2.207		5.226	
	Achieved	8.376		79.511	
Full Period ('18-21)	Target	6.143		14.245	
	Achieved	9.680		84.534	
All Targets Achieved?	Yes	Yes	N/A	Yes	N/A

* No CO or PM2.5 as SJTPO meets the NAAQS for these pollutants

Statewide Results (Sum of MPO results)

Pollutant		VOC	CO	NO_X	$PM_{2.5}$
Midterm ('18-19)	Target	17.683	31.927	114.401	4.290
	Achieved	157.750	145.495	1500.520	156.906
Full Period ('18-21)	Target	36.325	63.010	231.851	8.520
	Achieved	179.176	250.276	1572.321	172.449
All Targets Achieved?	Yes	Yes	Yes	Yes	Yes

Attachment A – Summary of Calculations

Data from FHWV CMAQ Public Access System - Download 9/15/2022

DVRPC Reported Benefits

FY Year	Non-Diesel Emissions Benefits Projections (kg/day)			
	VOC	CO	NOX	PM2.5
2018	2.550	32.460	9.230	66.440
2019	44.990	159.820	445.090	28.290
2020	0.090	0.080	1.010	0.003
2021	0.086	1.287	1.070	0.003

NJTPA Reported Benefits

Year	Non-Diesel Emissions Benefits Projections (kg/day)			
	VOC	CO	NOX	PM2.5
2018	0.000	0.000	0.000	0.000
2019	0.000	0.000	0.000	0.000
2020	4.700	0.000	6.300	0.740
2021	0.000	0.000	0.000	0.000

SJTPO Reported Benefits

Year	Non-Diesel Emissions Benefits Projections (kg/day)			
	VOC	CO	NOX	PM2.5
2018	0.000	0.000	0.000	0.000
2019	0.000	0.000	0.000	0.000
2020	0.050	0.410	0.220	0.020
2021	0.000	0.000	0.000	0.000

Statewide Project Reported Benefits

Year	Non-Diesel Emissions Benefits Projections (kg/day)			
	VOC	CO	NOX	PM2.5
2018	107.080	399.440	1039.820	66.420
2019	3.130	115.990	6.380	0.870
2020	6.940	199.340	39.210	4.990
2021	9.560	171.854	23.991	11.024

MPO Share of Statewide Project Benefits
Percentage of MPO VMT/Statewide VMT (2016)

DVRPC Share of Statewide Projects : 20.5%

FY Year	Non-Diesel Emissions Benefits Projections (kg/day)			
	VOC	CO	NOX	PM2.5
2018	21.95	81.89	213.16	13.62
2019	0.64	23.78	1.31	0.18
2020	1.42	40.86	8.04	1.02
2021	1.96	35.23	4.92	2.26

NJTPA Share of Statewide Projects: 71.9%

FY Year	Non-Diesel Emissions Benefits Projections (kg/day)			
	VOC	CO	NOX	PM2.5
2018	76.99	287.20	747.63	47.76
2019	2.25	83.40	4.59	0.63
2020	4.99	143.33	28.19	3.59
2021	6.87	123.56	17.25	7.93

SJTPO Share of Statewide Projects: 7.6%

FY Year	Non-Diesel Emissions Benefits Projections (kg/day)			
	VOC	CO	NOX	PM2.5
2018	8.14	30.36	79.03	5.05
2019	0.24	8.82	0.48	0.07
2020	0.53	15.15	2.98	0.38
2021	0.73	13.06	1.82	0.84

First Reporting Period Achievements

DVRPC Total Benefits Reported

FY Year	Total Emissions Benefits Projections (kg/day)			
	VOC	CO*	NOX	PM2.5
2018	24.50		222.39	80.06
2019	45.63		446.40	28.47
2020	1.51		9.05	1.03
2021	2.05		5.99	2.26
Sum '18-'19	**70.13**	**0.00**	**668.79**	**108.52**
Sum '18-'21	**73.69**	**0.00**	**683.83**	**111.81**

* No CO Target as DVRPC meets the NAAQS for this pollutant

DVRPC Total Benefits Reported

FY Year	Total Emissions Benefits Projections (kg/day)			
	VOC	CO*	NOX	PM2.5
2018	76.99	112.75	747.63	47.76
2019	2.25	32.74	4.59	0.63
2020	9.69	56.27	34.49	4.33
2021	6.87	48.51	17.25	7.93
Sum '18-'19	**79.24**	**145.50**	**752.22**	**48.38**
Sum '18-'21	**96.80**	**250.28**	**803.96**	**60.64**

* Approximately 39.26%VMT in CO area, target factored accordingly

* 100% of PM2.5 benefit taken, assumed to occur in non-attainment area

DVRPC Total Benefits Reported

FY Year	Total Emissions Benefits Projections (kg/day)			
	VOC	CO*	NOX	PM2.5*
2018	8.14		79.03	
2019	0.24		0.48	
2020	0.58		3.20	
2021	0.73		1.82	
Sum '18-'19	**8.38**	**0.00**	**79.51**	**0.00**
Sum '18-'21	**9.68**	**0.00**	**84.53**	**0.00**

* No CO or PM2.5 as SJTPO meets the NAAQS for these pollutants

Resulting Statewide Totals and Reported

Year	Total Emissions Benefits Projections (kg/day)			
	VOC	CO	NOX	PM2.5
2018	109.63	112.75	1049.05	127.81
2019	48.12	32.74	451.47	29.09
2020	11.78	56.27	46.74	5.35
2021	9.65	48.51	25.06	10.19
Sum '18-'19	**157.75**	**145.50**	**1500.52**	**156.91**
Sum '18-'21	**179.18**	**250.28**	**1572.32**	**172.45**

First Period Targets

DVRPC Goals (includes 20.5% of Benefits From Statewide Projects)

FY Year	Total Emissions Benefits Projections (kg/day)			
	VOC	CO*	NOX	PM2.5
2018	0.730		3.733	1.314
2019	0.720		3.720	1.313
2020	0.711		3.709	1.313
2021	0.703		3.698	1.313
Sum '18-'19	**1.450**	**0.000**	**7.453**	**2.627**
Sum '18-'21	**2.864**	**0.000**	**14.861**	**5.253**

* No CO Target as DVRPC meets the NAAQS for this pollutant

NJTPA Goals (includes 71.9% of Benefits From Statewide Projects)

FY Year	Total Emissions Benefits Projections (kg/day)			
	VOC	CO*	NOX	PM2.5**
2018	7.121	16.085	50.960	0.840
2019	6.905	15.842	50.762	0.823
2020	6.725	15.631	50.595	0.809
2021	6.568	15.452	50.428	0.796
Sum '18-'19	**14.026**	**31.927**	**101.722**	**1.663**
Sum '18-'21	**27.318**	**63.010**	**202.745**	**3.267**

* Approximately 39.26%VMT in CO area, target factored accordingly

** 100% of PM2.5 benefit taken, assumed to occur in non-attainment area

SJTPO Goals (includes 7.6% of Benefits From Statewide Projects))

FY Year	Total Emissions Benefits Projections (kg/day)			
	VOC	CO*	NOX	PM2.5*
2018	2.207		5.226	
2019				
2020	2.007		4.642	
2021	1.929		4.377	
Sum '18-'19	**2.21**	**0.00**	**5.23**	**0.00**
Sum '18-'21	**6.14**	**0.00**	**14.25**	**0.00**

* No CO or PM2.5 as SJTPO meets the NAAQS for these pollutants

Statewide Totals

Year	Total Emissions Benefits Projections (kg/day)			
	VOC	CO	NOX	PM2.5
2018	10.058	16.085	59.919	2.154
2019	7.624	15.842	54.482	2.137
2020	9.442	15.631	58.946	2.122
2021	9.200	15.452	58.503	2.108
Sum '18-'19	**17.683**	**31.927**	**114.401**	**4.290**
Sum '18-'21	**36.325**	**63.010**	**231.851**	**8.520**

TECHNICAL MEMORANDUM

Michael Baker INTERNATIONAL

DATE: September 21, 2022

TO: Jamie Derose, NJDOT

CC: Chuck Grill, NJDOT
Sean Green, DVRPC
Keith Miller, NJTPA
Liz DeRuchie, NJTPA
Richard Cippoletti, NJTPA
Jason Simmons, SJTPO
David Heller, SJTPO

FROM: Robert d'Abadie - Michael Baker International

SUBJECT: Methodology and Resulting Targets for the Congestion Mitigation and Air Quality Emissions Performance Planning Measure for 2022 - 2025 Planning Period

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Introduction

Transportation Performance Management (TPM) provisions of MAP-21 and FAST Act require that state DOTs and Municipal Planning Organizations (MPOs) incorporate performance measures and target setting into the planning and programming process, providing accountability and transparency in how federal funding is spent on transportation projects. As part of this effort, NJDOT, NJDEP, NJ Transit (NJT) and the three (3) New Jersey MPO's engaged in a process to establish targets for the Congestion Mitigation and Air Quality (CMAQ) emissions measure, one of three performance measures specific to the CMAQ program. Specifically, emissions reductions reported in the CMAQ Public Access System (PAS) from the last four years were used to inform the setting of two-year (2023) and four-year (2025) targets. For this second performance reporting period, the CMAQ emissions targets were developed using a slightly updated process as compared to the first performance period, using reported data from 2018-2021 as the basis for forecasting. This update was developed for NJDOT with direct input from the MPOs, NJT and NJDEP. The following is a brief overview of the methodology used for forecasting targets and summarizes the underpinnings of the spreadsheet process. The spreadsheet itself can be made available on request.

Considerations in the Development of CMAQ Emissions Performance Targets.

The purpose of the CMAQ program is to fund transportation projects or programs that will contribute to attaining or maintaining national ambient air quality standards (NAAQS). This measure helps assess progress toward that purpose.

For projects funded with CMAQ funds, states enter estimated emissions reductions of applicable criteria pollutants (ozone, carbon monoxide, and particulate matter) and precursors that aid in the formation of those pollutants into a national database. States estimate emissions reductions in kilograms per day for all projects funded with CMAQ program funds.

To keep this measure simple and consistent with current CMAQ annual reporting requirements, a project's estimated emissions reductions are only estimated for the first year of full operation. The emission estimate is entered in the CMAQ Project Tracking System for the first year of funding. For projects that carry-over to future funding years, emissions are only entered for the first year to avoid double counting. The FHWA understands this approach may result in taking credit for a project in a performance period before it becomes operational but believes the simplicity of this process is appropriate. The total emissions reduction measure was then calculated by adding together the total emissions projections, across all funded projects, for the 2- and 4-year reporting periods.

Assumptions and Calculations

The development of a methodology to forecast targets for the reporting periods was conceived and agreed to by NJDEP, NJT, NJDOT and the NJ MPOs. The targets were forecasted using a few basic concepts and considerations:

1. The process recognizes that on average fleet emissions are going down over time. This is due to stricter fuel and emissions standards and the turnover in the fleet with older more polluting vehicles being retired and newer cleaner-running vehicles entering the fleet.
2. Reported benefits from the last four-years in the FHWA CMAQ PAS were added and projected forward to develop targets, taking into account the cleaner fleet over time.
3. Outliers, particularly one-time high-impact projects that are unlikely to be repeated, were not used to develop targets as they disproportionally skew the forecasts/targets.
4. Projects containing oversights or miscalculations entered into the CMAQ PAS were reviewed and possibly eliminated when identified.

It should be noted that in addition to the above adjustments, for the last few reporting periods, NJDOT has been entering project data into the CMAQ PAS differently than in the past to better reflect FHWA guidance. In addition to properly coding multi-year projects, NJ Transit projects are now consistently coded in the FHWA CMS PAS database as statewide projects.

Decreasing Average Fleet Emissions

Many of the projects seeking CMAQ funding either improve traffic flow or aim to decrease Light Duty Vehicle (LDV) travel usually associated with commuting. As newer, cleaner vehicles enter the fleet, and as older vehicles are retired, the fleet as a whole becomes cleaner. This means that many project types have declining benefits over time. As an example, a Travel Demand Management (TDM) project encourages telecommuting has an estimated reduction in Vehicle Miles of Travel (VMT) of 1,000 vehicle miles per day. If the project was in Fiscal Year (FY) 2018 the benefits would be higher as the average emission rates per vehicle were also higher. The same project in 2025, eliminating the same 1,000 vehicles per day, would have emissions benefits decrease by approximately 35% to 50% depending on the pollutant and the location simply due to fleet turnover.

To account for this reduction in average fleet emissions rates, 2018-2025 fleet average emission rates for each of the criteria pollutants were developed for each of the three NJ MPOs as summarized in **Table 1** below. These rates are for a representative county in each of the MPOs and were developed using the EPA Motor Vehicle Emissions Simulator (MOVES) and data assembled for the latest air quality conformity demonstration

for each MPO. The rates were used to factor and project the annual average project benefits reported in the CMS PAS as follows:

- Existing projects found in the CMS PAS are factored to a 2021 baseline. Emissions benefits are multiplied by a factor of the average emissions rate/pollutant in the year of the project is reported and divided by the average emissions rate in 2021.
- Benefits for projects in 2021 occur in the baseline year and were not factored according.
- The adjusted benefits for all years were added together (by pollutant) and an average of the adjusted emissions calculated.
- Benefits reported are then averaged over the 4-year reporting period to yield the emission benefits in a typical year in 2021 equivalent values.
- The 2021 average is then projected forward year-by-year (2022-2025) by factoring the average emissions rate for the future year (by pollutant) dividing by the emissions rate for the year of the project by the 2021 fleet average emission rates.
- The above is done for all future years (to 2025) and the 2022-2025 and 2022-2025 values were summed together to create the targets.
- In the past, diesel projects such as vehicle emissions retrofits were not factored over time. For these projects the year and model of the vehicles were generally known so the benefit calculated is more precise and factoring was not appropriate. However, in the years 2018-2021 there were no diesel retrofit projects seeking CMAQ funds, so this approach was not needed. The lack of diesel projects can be attributed to a number of factors, the most significant being delays and denials of waivers to the federal "Buy America" requirements.

Table 1: Representative County Average Fleet Emissions Rates By MPO, Pollutant and Year

DVRPC Representative County

Year	General Fleet Running Emission Rates (grams/mile)			
	VOC	CO	NO_X	$PM_{2.5}$
2018	0.348	4.877	0.836	0.02481
2019	0.323	4.549	0.751	0.02277
2020	0.298	4.220	0.667	0.02073
2021	0.272	3.891	0.582	0.01869
2022	0.260	3.699	0.537	0.01755
2023	0.247	3.508	0.491	0.01640
2024	0.235	3.331	0.452	0.01560
2025	0.222	3.154	0.412	0.01479

Table 1 Continued: Representative County Average Fleet Emissions Rates By MPO, Pollutant and Year

NJTPA Representative County

Year	General Fleet Running Emission Rates (grams/mile)			
	VOC	CO	NOX	$PM_{2.5}$
2018	0.351	4.883	0.809	0.02376
2019	0.326	4.554	0.727	0.02183
2020	0.300	4.224	0.644	0.01990
2021	0.275	3.895	0.562	0.01797
2022	0.263	3.703	0.517	0.01690
2023	0.250	3.511	0.473	0.01582
2024	0.237	3.334	0.435	0.01506
2025	0.225	3.157	0.396	0.01430

SJTPO Representative County

Year	General Fleet Running Emission Rates (grams/mile)			
	VOC	CO	NO_X	$PM_{2.5}$
2018	0.339	4.829	0.845	0.02552
2019	0.314	4.504	0.760	0.02340
2020	0.289	4.178	0.675	0.02127
2021	0.264	3.852	0.591	0.01915
2022	0.251	3.662	0.544	0.01795
2023	0.239	3.472	0.498	0.01674
2024	0.227	3.296	0.459	0.01591
2025	0.214	3.120	0.419	0.01507

Distribution of Benefits from Statewide projects

Projects identified as "No MPO Identified/State Sponsored" (generally NJDOT and NJT efforts) were not assigned to a single MPO. Project examples falling into this category include NJ Transit rail car purchases that may travel through multiple MPO's, and NJDOT sponsored signal improvement programs which could be undertaken at any congested or failing intersection anywhere in the state. With no clear documentation where these projects would have an impact, the benefits of these projects were distributed to each of the MPOs based of the fraction of total statewide Vehicle Miles of Travel (VMT) occurring within the boundaries of each of the three MPOs as reported in the 2020 Highway Performance Monitoring System (HPMS). This was deemed appropriate as the NJ MPOs completely cover the entire state. **Table 2** below shows the share of "No MPO Identified/State Sponsored" projects assigned to each of the MPOs.

Table 2: Share of Statewide VMT by MPO

MPO	2020 HPMS AADT	Percent of Statewide Total
DVRPC	37,334,262	20.6%
NJTPA	129,483,903	71.4%
SJTPO	14,441,813	8.0%
Statewide	181,259,978	

Outlier Projects and Target Development

In some cases, a single project may have such a high reported benefit, unreasonably skewing the target calculations. These outliers can occur for a number of reasons.

- Particular beneficial projects that are unliked to replicated in the future, sometimes referred to as "one-time Heavy-hitters."
- Recorded benefit that seemed unusually high given the project description and is likely an error.
- A recurring project with its benefit recoded in years other than the first year of the project.
- A particularly large continuing project where the benefit is only calculated in the first year then will be a continuing project for years to come. This is an indication the project should be broken up over multiple years to spread out the benefit.

In cases like those described above, the interagency group was consulted before a project was eliminated from consideration to avoid unachievable 2 and 4-year targets. In the current target setting effort, only two projects were eliminated:

- A 2018 statewide project NJ20180003. This project reduces congestion and improves air quality by optimizing progression for 217 intersections in various counties. It is likely this project should be broken apart and the project should not be considered a continuing project in future years. The project benefits were eliminated from consideration in the target setting process.
- A similar project in the DVRPC Region NJ20190008 also seeks to improve air quality through improvements in traffic signal equipment and coordination. This project also likely needs to be broken out into multiple smaller projects over time. This project was also eliminated from the target setting process.

Special consideration of CO Emissions in the NJTPA region.

At the time of this effort, NJTPA includes CO in its air quality conformity analysis while all other MPOs are in full attainment for this NAAQS. There is no reasonable way to estimate impact of the projects just within the CO maintenance area, so as a substitute the percentage of total MPO VMT within the CO Maintenance area was used: 39.26%. In all likelihood the NJTPA region will reclassified as full attainment of the CO standard during this reporting period and this pollutant will no longer need to be reported.

Results

Table 3 below shows the 2023 and 2025 targets for the MPOs and statewide. The calculation spreadsheet was updated, and the two projects listed above were not used in the final calculation of targets. It should be noted that there are numerous continuing projects which are, by necessity, coded as qualitative and do not contribute to the estimation of targets, resulting in lower overall targets. For each MPO, only the pollutants that the regions are classified as non-attainment or maintenance of the NAAQS are shown.

The target setting does not attempt to reflect the COVID-19 pandemic's immediate and ongoing impacts. At this time there is little clarity on the longer-term impacts of the pandemic on overall travel including changes to mode choice, changes to time of day travel patterns, the frequency with which individuals' travel, the impact on project funding as well as other factors. It is suggested that when revisiting the targets at the midterm reporting period there may be an opportunity to revisit the pandemic impacts and adjust the targets accordingly.

Table 3: Summary of Agreed to CMAQ Performance Planning Emission Targets for the 2023 Midterm and 2025 Four-Year Full Reporting Period

Summary of 2023 Two-Year Midterm Targets

Location	Total Emissions Benefits Projections (kg/day)			
	VOC	CO	NO_X	$PM_{2.5}$
DVRPC	2.844		9.506	24.252
NJTPA	8.384	60.422	22.528	4.659
SJTPO	0.730		2.334	
Statewide Total	11.958	60.422	34.367	28.911

Summary of 2025 Four-Year Targets

Location	Total Emissions Benefits Projections (kg/day)			
	VOC	CO	NO_X	$PM_{2.5}$
DVRPC	5.406		17.495	45.963
NJTPA	15.948	114.796	41.425	8.841
SJTPO	1.386		4.298	
Statewide Total	22.740	114.796	63.218	54.805

Congestion Mitigation and Air Quality

Final Performance Plan (2018–2021) and Baseline Report (2022–2025)

Publication Number: TM230023

Date Published: September 2022

Geographic Area Covered:

Portions of the Philadelphia, Trenton, Allentown, and New York–Newark Urbanized Area that comprise the nine-county DVRPC planning area, which covers the counties of Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania and Burlington, Camden, Gloucester, and Mercer counties in New Jersey.

Key Words:

Congestion Mitigation and Air Quality, CMAQ, Performance Measures, Transportation Performance Management, Congestion, On-road Mobile Emissions, PM3, State Performance Measure Targets, Nonattainment Area, Maintenance Area, Peak Hour Excessive Delay (PHED), Non-Single Occupancy Vehicle (Non-SOV), Volatile Organic Compounds (VOCs), Nitrogen Oxides (NO_x), Fine Particulate Matter ($PM_{2.5}$)

Abstract:

Metropolitan Planning Organizations are required to adopt CMAQ Emissions targets and develop a baseline performance plan as part of the federally mandated Transportation Performance Management process. This technical memo serves as the final performance report to FHWA for the first performance period (2018–2021) for the congestion and on-road mobile emissions performance measures for the Philadelphia Urbanized Area and New York-Newark Urbanized Area and on-road mobile emissions performance measures in the DVRPC Planning Area. This report also serves as the baseline report for the second performance period (2022-2025) for these measures and includes additional reporting for the Allentown Urbanized Area and the Trenton Urbanized Area as required by federal regulations.

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