

Transportation Conformity Demonstration:

Connections 2040 Long-Range Plan and FY 2017
TIP for Pennsylvania



JUNE 2016



The Delaware Valley Regional Planning Commission is dedicated to uniting the region's elected officials, planning professionals, and the public with a common vision of making a great region even greater. Shaping the way we live, work, and play, DVRPC builds consensus on improving transportation, promoting smart growth, protecting the environment, and enhancing the economy.

We serve a diverse region of nine counties: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey. DVRPC is the federally designated Metropolitan Planning Organization for the Greater Philadelphia Region — leading the way to a better future.



The symbol in our logo is adapted from the official DVRPC seal and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

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Glossary of Acronyms and Terms

AQ	Air Quality (DVRPC coding)	PAQ-ONE	Pennsylvania Air Quality Off-Network Estimator
CAA	Clean Air Act (as amended)	PATCO	Port Authority Transit Corporation
CFR	Code of Federal Regulations	PennDOT	Pennsylvania Department of Transportation
CO	Carbon Monoxide	Plan	DVRPC's Long-Range Plan
DEP	Department of Environmental Protection	PM_{2.5}	Fine Particulate Matter
DOTs	Departments of Transportation	PM₁₀	Coarse Particulate Matter
DRPA	Delaware River Port Authority	ppm	Parts per Million
DVRPC	Delaware Valley Regional Planning Commission	RFP	Reasonable Further Progress
FHWA	Federal Highway Administration	SEPTA	Southeastern Pennsylvania Transportation Authority
Final Rule	Current conformity guidance under CAA	SIP	State Implementation Plan
FR	<i>Federal Register</i>	SO_x	Sulfur Oxides
FTA	Federal Transit Administration	TAZ	Traffic Analysis Zone
FY	Fiscal Year	TCICG	Transportation Conformity Interagency Consultation Group
Maintenance Area	Area that previously did not meet NAAQS	TCM	Transportation Control Measure
MOVES	Motor Vehicle Emissions Simulator: the most recent emissions estimation model approved by the US EPA	TDM	Travel Demand Model
MPO	Metropolitan Planning Organization	TIP	Transportation Improvement Program
MVEB	Motor Vehicle Emissions Budget	U.S.C.	United States Code
NAAQS	National Ambient Air Quality Standards	US DOT	United States Department of Transportation
NH₃	Ammonia	US EPA	United States Environmental Protection Agency
NJ Transit	New Jersey Transit	VMT	Vehicle Miles Traveled
Nonattainment Area	Area currently not meeting the NAAQS	VOCs	Volatile Organic Compounds
NO_x	Nitrogen Oxides		

Executive Summary

Overview

Transportation conformity is the process by which metropolitan planning organizations (MPOs) or departments of transportation (DOTs) demonstrate that transportation projects included in a region's Long-Range Plan (Plan) or Transportation Improvement Programs (TIPs) do not cause new air quality violations, worsen existing violations, or delay timely attainment of the National Ambient Air Quality Standards (NAAQS). The transportation conformity process is required in areas that have been designated by the US Environmental Protection Agency (EPA) as not having met one or more of the NAAQS. These areas are called "nonattainment areas" if they currently do not meet air quality standards, or "maintenance areas" if they have previously violated air quality standards but currently meet them and have an approved Clean Air Act (CAA) section 175(a) maintenance plan. The transportation conformity requirements are still applicable for up to 20 years after a nonattainment area is redesignated to ensure that the region continues to meet the NAAQS.

A transportation conformity demonstration is required at least once every four years or when an MPO: (1) adopts a new Plan or TIP; or (2) amends, adds, or deletes a regionally significant, nonexempt project in a Plan or TIP. This conformity demonstration is required due to the new Fiscal Year (FY) 2017 TIP for Pennsylvania and the addition of a regionally significant and nonexempt project being amended to the *Connections 2040* Long-Range Plan in the Pennsylvania portion of the region.

The Delaware Valley Regional Planning Commission (DVRPC) region includes a complex combination of nonattainment and maintenance areas for three of the NAAQS (ozone, fine particulate matter [PM_{2.5}], and carbon monoxide [CO]). The region's ozone nonattainment area encompasses the entire nine-county DVRPC region, while the PM_{2.5} and CO maintenance areas encompass various portions of the region. The region is required to demonstrate transportation conformity for each of these standards in each of the appropriate geographic areas covered by the nonattainment and maintenance areas.

This transportation conformity demonstration shows that the *Connections 2040* Long-Range Plan and FY 2017 TIP for Pennsylvania are following, or "conforming to," the Pennsylvania State Implementation Plans (SIPs) to meet the NAAQS.

This Executive Summary highlights DVRPC's conformity demonstration for:

- **Volatile organic compounds (VOCs) and nitrogen oxides (NO_x) meeting the 2008 Eight-Hour Ozone NAAQS requirements in:**
 - the Pennsylvania portion of the Philadelphia–Wilmington–Atlantic City Ozone Nonattainment Area
- **Direct PM_{2.5} and Precursor NO_x meeting the 1997 Annual and 2006 24-Hour PM_{2.5} NAAQS requirements in:**
 - the Pennsylvania portion of the Philadelphia–Wilmington, Pennsylvania–New Jersey–Delaware (PA–NJ–DE) Annual PM_{2.5} Maintenance Area
 - the Pennsylvania portion of the Philadelphia–Wilmington, PA–NJ–DE 24-Hour PM_{2.5} Maintenance Area
- **Direct PM_{2.5} and precursor NO_x meeting the 2012 Annual PM_{2.5} NAAQS requirements in:**
 - the Delaware County, Pennsylvania Annual PM_{2.5} Nonattainment Area

- **CO meeting the 1971 CO NAAQS requirements in:**
 - the Philadelphia–Camden CO Maintenance Area.

This summary serves as an inclusive document that demonstrates the transportation conformity of the DVRPC Plan and TIP with all applicable SIPs and NAAQS requirements for the above pollutants within the noted areas. The full conformity determination document is available at www.dvrpc.org.

Analysis Approach

Plan and TIP Projects

There are three categories of projects in the Plan and TIPs:

- *REGIONALLY SIGNIFICANT PROJECT*: a nonexempt highway or transit project on a facility that, regardless of its length, serves regional needs and is normally included in the regional travel simulation model;
- *EXEMPT PROJECT*: a project listed in Table 2 or 3 of the Final Conformity Guidance (Final Rule; 40 CFR 93) that primarily enhances safety or aesthetics, maintains mass transit, continues current levels of ridesharing, or builds bicycle and pedestrian facilities; and
- *NOT REGIONALLY SIGNIFICANT PROJECT/NONEXEMPT*: a highway or transit project on a facility that does not serve regional needs, or is not normally included in the regional travel simulation model and does not fit into an exempt project category in Table 2 or 3 of the Final Rule (40 CFR 93). These projects are determined to have minimal or no impact on regional air quality.

Regional Emissions Analysis

The Final Rule stipulates that the emissions analysis of transportation plans and programs must model all regionally significant, nonexempt projects. Each project in the Plan and TIPs has an associated alphanumeric air quality code for the conformity determination and exempt eligibility identification purposes.

For an area with an approved SIP, the motor vehicle emissions budget (MVEB) prescribed in the SIP sets a regional emissions amount that functions as a threshold against which conformity is tested. This process is commonly known as the “budget” test. The Final Rule stipulates that each SIP is sovereign and that for a multistate MPO such as DVRPC, conformity applies separately to individual state portions of its planning area under respective SIPs. Since there are no scheduled changes to the New Jersey TIP or Plan projects, DVRPC is only required to update conformity for the Pennsylvania portion of the region.

Beginning in October 2016, MPOs and state DOTs are required by the US EPA to use the Motor Vehicle Emissions Simulator 2014 (MOVES 2014) emissions model to demonstrate transportation conformity. MOVES 2014 replaces MOVES 2010 as the official emissions analysis model for conformity determinations. The MOVES family of models estimates on-road mobile emissions based on an operational mode that accounts for different driving patterns and emissions profiles from various vehicle types. MOVES 2014 includes a number of improvements from MOVES 2010, including the Tier III fuel standards, updates to vehicle emissions and fuel standards, new data on fleets, and vehicle activity emissions.

Conformity Test

The DVRPC region has EPA approved SIP budgets for the 1997 Eight-Hour Ozone Standard in Pennsylvania (76 FR 6559). DVRPC will utilize the 1997 Eight-Hour Ozone MVEBs to demonstrate conformity to the 2008 Eight-Hour Ozone Standard as required by the Final Rule.

The region also has approved SIP budgets for the 1997 Annual and 2006 24-Hour PM_{2.5} standards in Pennsylvania (78 FR 19991). In Pennsylvania, the Transportation Conformity Interagency Consultation Group (TCICG) has determined that since the Pennsylvania PM_{2.5} SIP budgets were developed with individual county emissions inventories, the MVEB portion of the SIP budgets for the 1997 and 2007 PM_{2.5} Standards attributed to Delaware County could serve as a SIP budget for the 2012 Annual PM_{2.5} standard conformity demonstration.

The region is a limited maintenance area for CO and no emissions analysis is required.

Analysis Years

For this conformity demonstration, the mobile source emissions analysis years are identified in Table 1.

Table 1: Mobile Source Analysis Years

Year	Ozone	PM _{2.5}	Note
2017	√	√	PM _{2.5} SIP budget year in PA
2020	√	√	2012 PM _{2.5} Std. attainment date and near-term year
2025	√	√	PA PM _{2.5} SIP budget year
2035	√	√	Year within 10 years of previous analysis
2040	√	√	DVRPC Plan horizon year

Source: Delaware Valley Regional Planning Commission, 2016.

For this conformity demonstration, the mobile source ozone emissions analysis years for VOCs and NO_x in the Philadelphia–Wilmington–Atlantic City Ozone Nonattainment Area are 2017, 2020, 2025 (an interim year selected to keep all analysis years no more than 10 years apart), 2035 (a second interim year selected to keep all analysis years no more than 10 years apart), and 2040 (the horizon year of the DVRPC Plan). VOCs and NO_x, which are heat-sensitive ozone precursors, are estimated for a July day. To demonstrate conformity, projected ozone emissions in all analysis years must not exceed the SIP MVEBs for VOCs and NO_x established for the year 2008.

In the Philadelphia–Wilmington, PA–NJ–DE PM_{2.5} Maintenance Area and the Delaware County PM_{2.5} Nonattainment Area, the analysis years are 2017 (a SIP budget year), 2020 (the attainment date for the 2012 PM_{2.5} standard for Delaware County and near-term year), 2025 (a SIP budget year), 2035 (an interim year selected to keep all analysis years no more than 10 years apart), and 2040 (the horizon year of the DVRPC Plan).

To demonstrate conformity, projected PM_{2.5} emissions in each analysis year must not exceed the 2017 MVEBs (for analysis years before 2025) and 2025 MVEBs (for analysis years 2025 and later) in the Pennsylvania portion of the Philadelphia–Wilmington, PA–NJ–DE PM_{2.5} Maintenance Area and Delaware County in the Delaware County PM_{2.5} Nonattainment Area.

Findings

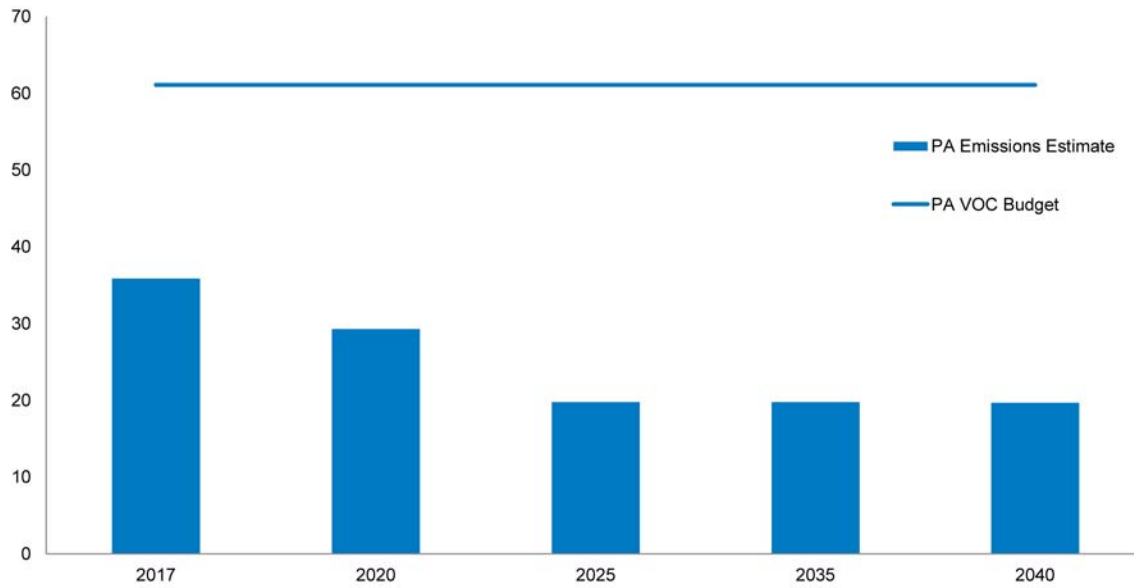
The DVRPC Plan and the TIPs are found to be in conformity with the current Pennsylvania SIP under the CAA. The forecasted emissions levels of VOCs, NO_x, and PM_{2.5} do not exceed the respective budgets established by the Pennsylvania Department of Environmental Protection (DEP) in accordance with the Final Rule under the current NAAQS governing applicable pollutants.

The transportation conformity analysis meets all applicable conformity criteria, including, but not limited to, the following:

- that the Plan and the TIP are fiscally constrained [40 CFR 93.108];
- that this determination is based on the latest planning assumptions [40 CFR 93.110];
- that this determination is based on the latest emissions estimation model available [40 CFR 93.111];
- that DVRPC has made the determination according to the applicable consultation procedures [40 CFR 93.112];
- that the Plan and the TIP do not interfere with the timely implementation of transportation control measures (TCMs) [40 CFR 93.113]; and
- that the Plan and the TIP are consistent with the MVEBs in the applicable implementation plans [40 CFR 93.118].

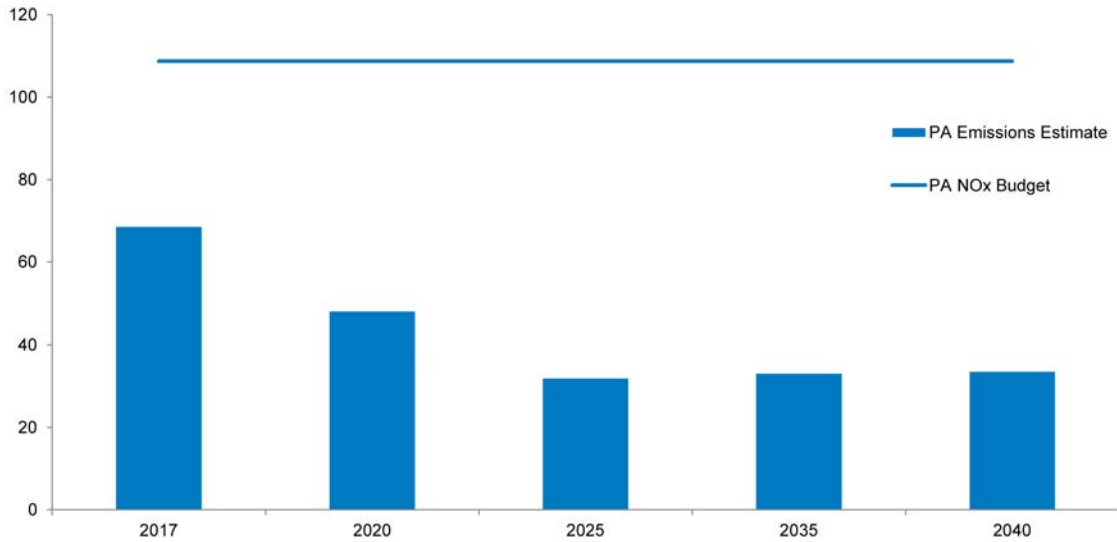
Figures 1 through 6 detail the emissions analysis results for transportation projects included in the Plan and TIP for Pennsylvania. The data for these figures is detailed in Tables 10 through 14, found on pages 30 through 32. These estimates of emissions results confirm that the transportation projects in the Plan and TIP conform to the relevant SIP and Final Rule conformity requirements.

Figure 1: VOCs Emissions Analysis Results (Tons/July Day)



Source: Delaware Valley Regional Planning Commission, 2016.

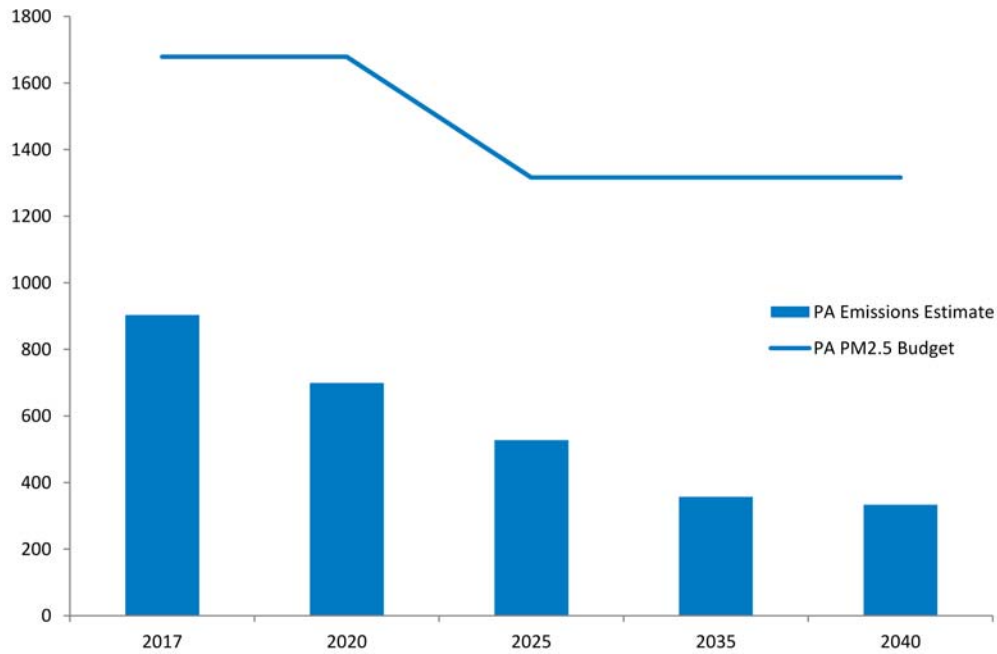
Figure 2: NO_x Emissions Analysis Results (Tons/July Day)



Source: Delaware Valley Regional Planning Commission, 2016.

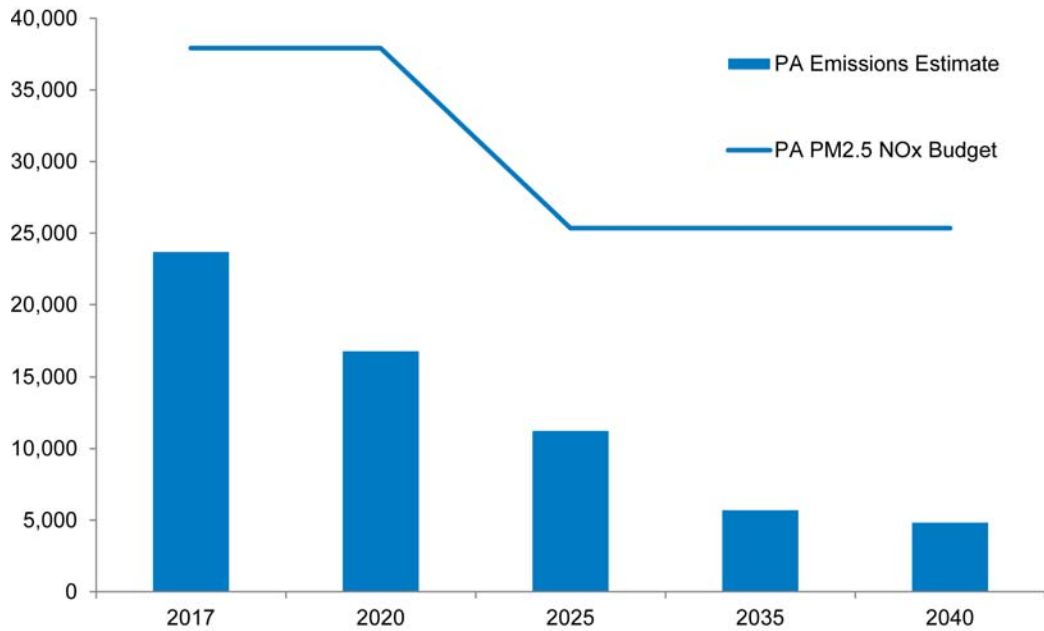
Note: The most recent Eight-Hour Ozone SIP MVEBs (2008) will apply to all future analysis years.

Figure 3: Annual and 24-Hour Direct PM_{2.5} Emissions Analysis Results (Tons/Year)



Source: Delaware Valley Regional Planning Commission, 2016.

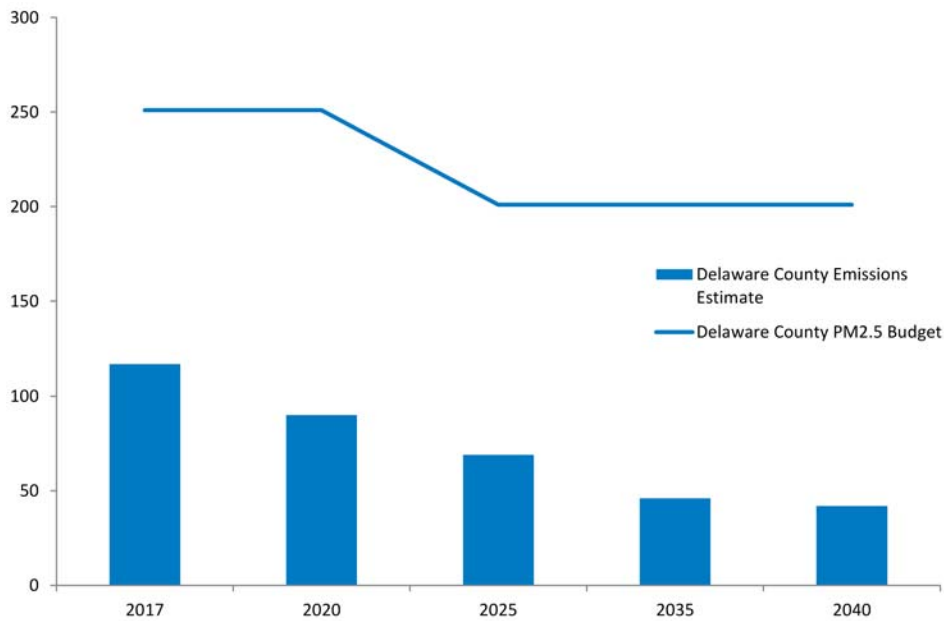
Figure 4: Annual and 24-Hour NO_x Precursor Emissions Analysis Results (Tons/Year)



Source: Delaware Valley Regional Planning Commission, 2016.

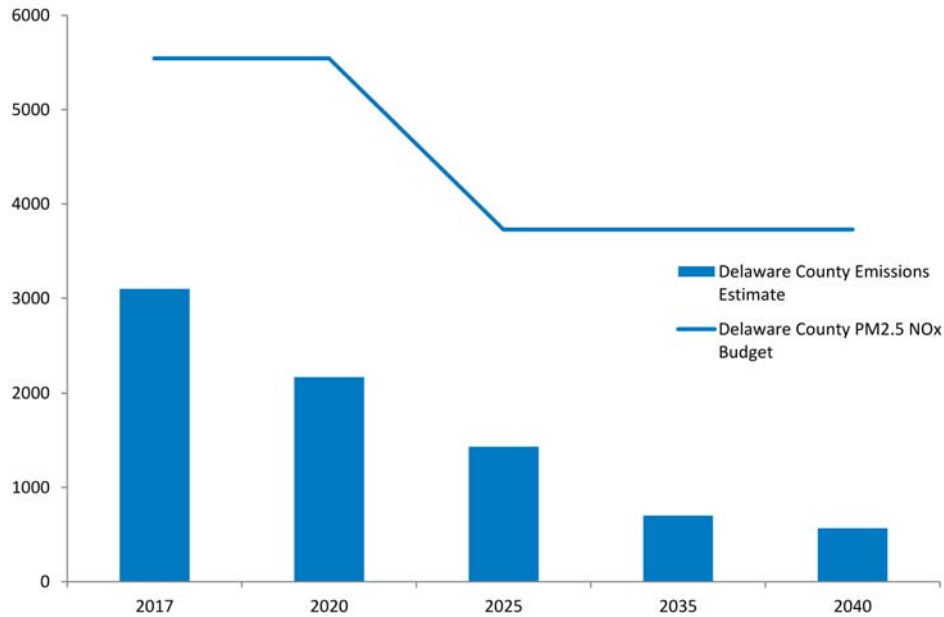
Note: † Associated MVEBs apply to all future analysis years.

Figure 5: Delaware County Annual Direct PM_{2.5} Emissions Analysis Results (Tons/Year)



Source: Delaware Valley Regional Planning Commission, 2016.

Figure 6: Delaware County Annual NO_x Precursor Emissions Analysis Results (Tons/Year)



Source: Delaware Valley Regional Planning Commission, 2016.

Note:

- Associated MVEBs apply to all future analysis years.
- Results are only for Delaware County, which is the nonattainment area for the 2012 PM_{2.5} Annual Standard.

These findings demonstrate transportation conformity of the DVRPC *Connections 2040* Long-Range Plan and FY 2017 TIP for Pennsylvania with the corresponding state SIP and the Final Rule requirements under the CAA, including:

- the 2008 Eight-Hour Ozone NAAQS in the Philadelphia–Wilmington–Atlantic City Ozone Nonattainment Area;
- the 1997 Annual and 2006 24-Hour PM_{2.5} NAAQS in the Philadelphia–Wilmington, PA–NJ–DE PM_{2.5} Maintenance Area;
- the 2012 Annual PM_{2.5} Delaware County Nonattainment Area; and
- the 1971 CO NAAQS in the Philadelphia–Camden CO Maintenance Area.

CHAPTER 1: Introduction

Overview

This report documents the demonstration of transportation conformity for the DVRPC *Connections 2040* Long-Range Plan and the DVRPC FY 2017 TIP for Pennsylvania with the Pennsylvania SIPs and applicable NAAQS requirements under the CAA, as amended.

This report documents transportation conformity for the following specific pollutants within the stated designation areas. Those pollutants are:

- **VOCs and NO_x meeting the 2008 Eight-Hour Ozone NAAQS requirements in:**
 - the Pennsylvania portion of the Philadelphia–Wilmington–Atlantic City Ozone Nonattainment Area
- **Direct PM_{2.5} and precursor NO_x meeting the 1997 Annual and 2006 24-Hour PM_{2.5} NAAQS requirements in:**
 - the Pennsylvania portion of the Philadelphia–Wilmington, Pennsylvania–New Jersey–Delaware (PA–NJ–DE) Annual PM_{2.5} Maintenance Area
 - the Pennsylvania portion of the Philadelphia–Wilmington, PA–NJ–DE 24-Hour PM_{2.5} Maintenance Area
- **Direct PM_{2.5} and precursor NO_x meeting the 2012 Annual PM_{2.5} NAAQS requirements in:**
 - the Delaware County, Pennsylvania Annual PM_{2.5} Nonattainment Area
- **CO meeting the 1971 CO NAAQS requirements in:**
 - the Philadelphia–Camden CO Maintenance Area.

Transportation Conformity

CAA section 176(c) (42 U.S.C. 7506(c)) requires that federally funded highway and transit project activities “conform to” state air quality goals found in SIPs. The procedure that is followed to fulfill this requirement is called “transportation conformity.” This process ensures that transportation and air quality agencies are consulting one another to look for strategies to relieve traffic congestion, improve air quality, and provide communities with a safe and efficient transportation system.

The transportation conformity process is required in areas that have been designated by the US EPA as not having met one or more of the NAAQS. These areas are called *nonattainment areas* if they currently do not meet air quality standards, or *maintenance areas* if they have previously violated air quality standards but currently meet them and have an approved CAA section 175(a) maintenance plan. A transportation conformity demonstration is required at least once every four years, or when an MPO adopts a new Plan or TIP, or amends, adds, or deletes a regionally significant, nonexempt project in a Plan or TIP. This conformity demonstration is required due to amendments of regionally significant, nonexempt projects in the *Connections 2040* Long-Range Plan and a new FY 2017 TIP for Pennsylvania.

Transportation conformity is demonstrated when federally funded highway and transit activities are determined not to cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) jointly make conformity determinations within air quality nonattainment and maintenance areas to ensure that federal actions are consistent with corresponding SIPs. The U.S. Department of Transportation (US DOT) cannot fund, authorize, or approve federal actions to support programs or

projects that are not found to conform to the CAA requirements governing the current NAAQS for transportation conformity.

This conformity demonstration is based on the current Final Rule under the CAA, including 40 CFR Part 93, as revised, and applies to ozone, CO, and PM_{2.5}. The Final Rule dictates that conformity findings within the DVRPC planning area must be based on the applicable SIP budgets in all target analysis years. The demonstration process estimates emissions that will result from the region's transportation system and determines whether those emissions are within the limits outlined in respective SIPs and other applicable NAAQS requirements.

The Final Rule requires that the latest approved emissions model be used to demonstrate that modelled emissions from the TIP and Plan are within the limits established by the respective SIP budgets. In October 2014, the US EPA released MOVES 2014. MOVES 2014 replaces MOVES 2010 as the official emissions analysis model for conformity determinations. MOVES 2014 includes a number of improvements from MOVES 2010, including the Tier III fuel standards, updates to vehicle emissions and fuel standards, new data on fleets, and vehicle activity emissions.

This demonstration also represents DVRPC's firm commitment to adhere to the statutory requirements for planning and environmental reviews prescribed in the most current transportation funding legislation.

NAAQS

The CAA, first enacted in 1963 and last amended in 1990, currently mandates the US EPA to set national air quality standards for air pollutants that are considered harmful to public health and the environment. The CAA also requires the agency to periodically review the standards to ensure that they provide adequate health and environmental protection, and to update those standards as necessary. These standards are set at the level required to provide an ample margin of safety to protect public health and welfare.

The US EPA has set NAAQS for several principal air pollutants, which are called *criteria* pollutants. The NAAQS criteria pollutants include ozone, CO, coarse and fine particulate matter (PM₁₀ and PM_{2.5}, respectively), sulfur dioxide, nitrogen oxides, and lead.

At the state level, the SIP represents the state's roadmap to meet or "attain" air quality goals. Approved SIPs contain MVEBs. Regional emissions estimates are compared against these budgets to determine progress toward meeting air quality goals. The Final Rule stipulates that each SIP is sovereign and that, for a multistate MPO such as DVRPC, conformity applies separately to individual state portions of its planning area under respective SIPs.

The DVRPC region must demonstrate transportation conformity for ozone, PM_{2.5}, and CO.

Ozone is a photochemical oxidant and a major component of smog. Ozone is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of VOCs and NO_x in the presence of sunlight. Although ozone in the upper atmosphere shields and protects the earth from harmful radiation from the sun, high concentrations of ozone at ground level are a serious health and environmental concern. Even at low levels, ozone can damage lung tissue, reduce lung function, and sensitize the respiratory system to other irritants. Additionally, scientific evidence has indicated that

ambient levels of ozone not only affect people with pulmonary conditions, such as asthma, but also normal, healthy adults and children.

In March 2008, the US EPA revised the NAAQS for the Eight-Hour Ozone Standard from 0.08 parts per million (ppm) to 0.075 ppm. Designation of the nonattainment areas for this standard was published in the *Federal Register* (77 FR 30088) on May 21, 2012, and became effective in July 2012. The DVRPC region was classified as a marginal nonattainment area for the 2008 Eight-Hour Ozone Standard, and the implementation guidance for the ozone standard revoked the 1997 Eight-Hour Ozone Standard for transportation conformity purposes in July 2013.

In October 2015, the US EPA strengthened the Eight-Hour Ozone Standard to 0.70 ppm. The nonattainment area designations for this standard revision are expected in October 2017. The DVRPC region is expected to be designated as a nonattainment area for that standard. Until that time the DVRPC region is conforming to the Final Rule Guidance for the 2008 Ozone NAAQS (EPA-420-B12-045).

The ozone standard is based on the three-year average of the annual fourth-highest daily maximum eight-hour ozone concentration monitor value. This value is called the “design value” and helps the US EPA determine which areas are meeting the NAAQS.

Figure 7 details the current ozone nonattainment area that covers the DVRPC region.

Particulate matter (PM) includes both solid particles and liquid droplets found in air. Many man-made and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. These solid and liquid particles come in a wide range of sizes. The *coarse* particles, less than 10 micrometers (μm) in diameter (PM_{10}), pose a health concern since they can be inhaled into and accumulate in the respiratory system. The *fine* particles, less than 2.5 μm in diameter ($\text{PM}_{2.5}$), are believed to pose even greater health risks. Because of their small size, these fine particles can lodge deep in the lungs. Individuals who are particularly sensitive to $\text{PM}_{2.5}$ exposure include older adults, people with heart and lung disease, and children. Health studies have shown a significant association between exposure to $\text{PM}_{2.5}$ and premature mortality.

Additionally, $\text{PM}_{2.5}$ can be emitted directly from combustion engines or chemically formed in the atmosphere when certain gases interact. Direct $\text{PM}_{2.5}$ emissions can result from particles in exhaust fumes, from brake and tire wear, from road dust kicked up by vehicles, and from highway and transit construction. Indirect $\text{PM}_{2.5}$ emissions can result from one or more of several exhaust components, including VOCs, NO_x , sulfur oxides (SO_x), and ammonia (NH_3).

The $\text{PM}_{2.5}$ NAAQS include an annual standard set at 12 $\mu\text{g}/\text{m}^3$ based on a three-year average of the annual mean $\text{PM}_{2.5}$ concentrations, and a 24-hour standard of 35 $\mu\text{g}/\text{m}^3$, based on a three-year average of the 98th percentile of 24-hour concentrations. The US EPA adopted this annual $\text{PM}_{2.5}$ standard in January 2013 and designated the nonattainment areas for this standard in December 2014.

Areas need to meet both standards (24-hour and annual) to be considered in attainment of the $\text{PM}_{2.5}$ NAAQS.

The DVRPC region is part of a complex combination of two $\text{PM}_{2.5}$ maintenance areas and a stand-alone county nonattainment area. Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in

Pennsylvania; and Burlington, Camden, and Gloucester counties in New Jersey; along with New Castle County in Delaware, are collectively designated as the Philadelphia–Wilmington, PA–NJ–DE PM_{2.5} Maintenance Area, which covers three states, two MPOs, and nine counties for the 1997 Annual and 2006 24-hour PM_{2.5} standards. Mercer County is part of another nonattainment area titled the New York–Northern New Jersey–Long Island, NY–NJ–CT PM_{2.5} Maintenance Area, which covers three states, nine MPOs, and 21 counties. Delaware County, Pennsylvania was designated as a stand-alone nonattainment area in December 2014 for not attaining the 2012 Annual PM_{2.5} NAAQS.

This conformity demonstration covers the Pennsylvania portion of the relevant nonattainment and maintenance areas.

Figure 8 shows the annual and 24-hour PM_{2.5} maintenance and nonattainment areas relevant to the DVRPC region.

CO is a colorless, odorless, but poisonous gas produced by incomplete combustion of carbon compounds in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability, and performance of complex tasks.

In 1996, the DVRPC planning area met the CO standard and attained the CO NAAQS. Following the attainment status, Center City Philadelphia was designated as a separate CO maintenance area. In 2007, the US EPA approved a limited maintenance plan SIP for Philadelphia. Due to the US EPA's approval of this CO limited maintenance plan, mobile emissions budgets and emissions analyses are no longer required to demonstrate conformity for CO in Philadelphia.

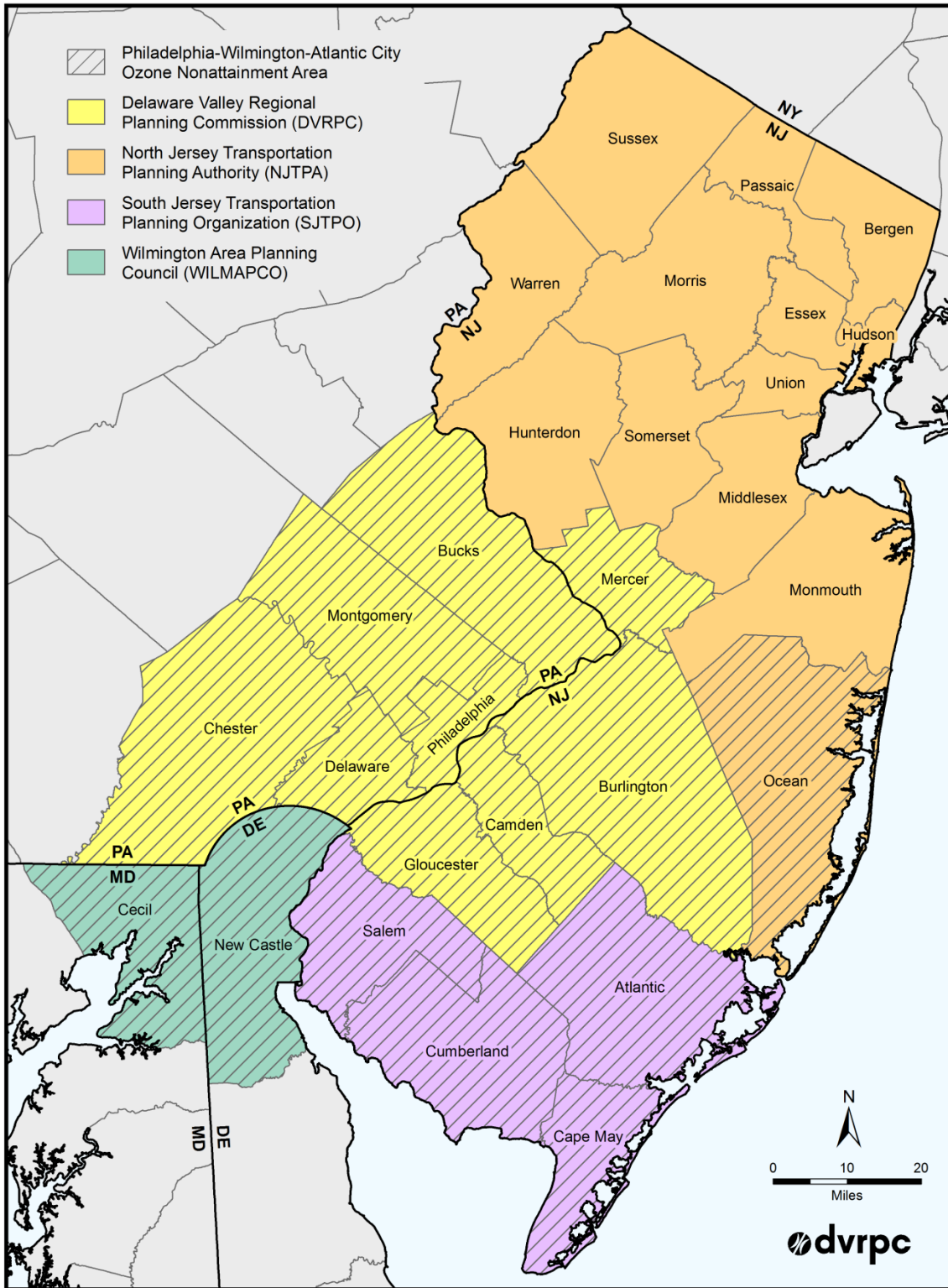
The attainment status for each of the criteria pollutants can be viewed at:

<https://www3.epa.gov/airquality/greenbook/index.html>.

Detailed information on the attainment status for each region can be viewed at:

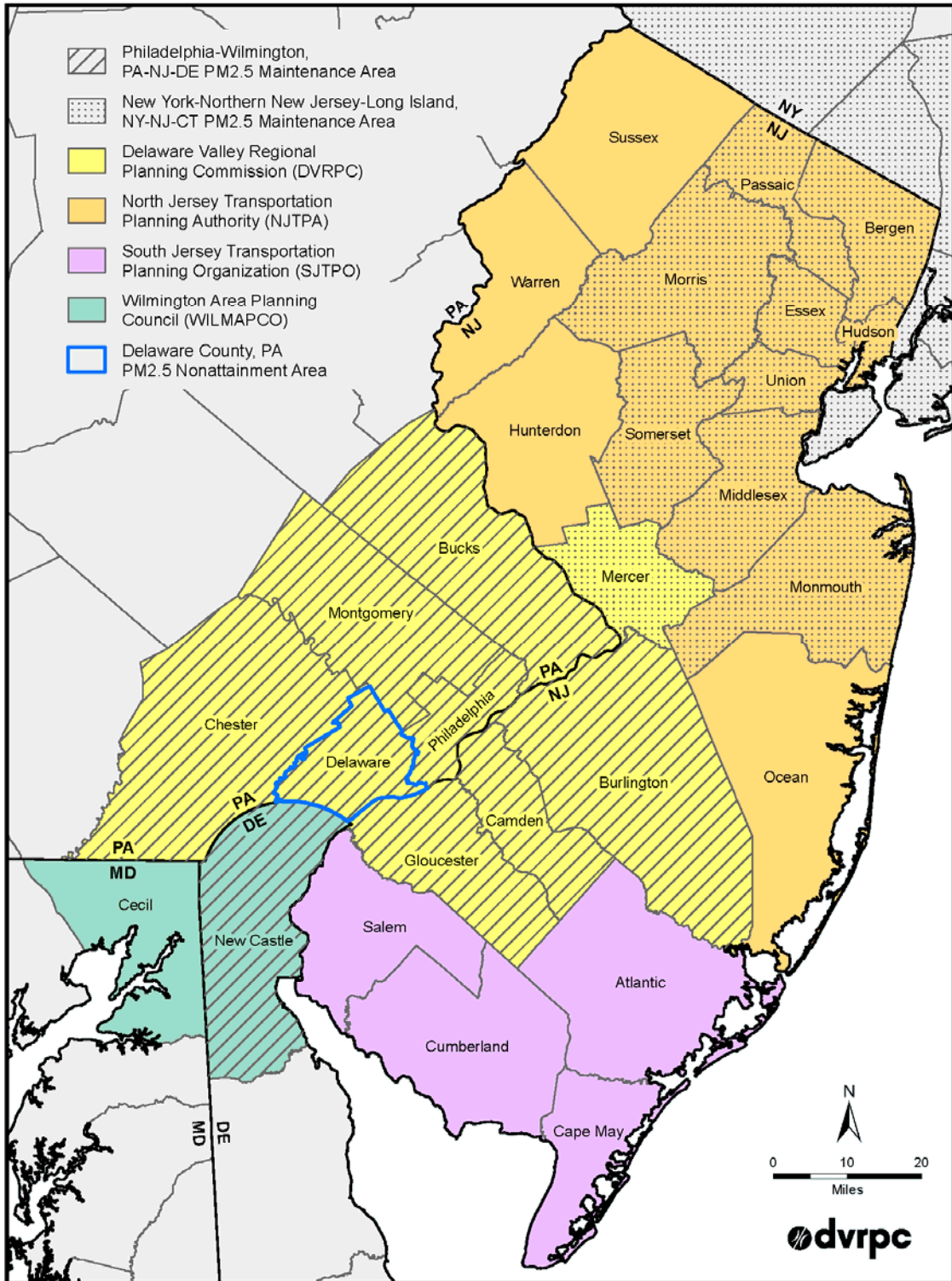
https://www3.epa.gov/airquality/urbanair/sipstatus/reports/map_s.html

Figure 7: Philadelphia–Wilmington–Atlantic City Eight-Hour Ozone Nonattainment Area



Source: Delaware Valley Regional Planning Commission, 2016.

Figure 8: DVRPC Annual and 24-Hour PM_{2.5} Maintenance and Nonattainment Areas



Source: Delaware Valley Regional Planning Commission, 2016.

CHAPTER 2: Conformity Demonstration Overview

DVRPC Plan and TIPs

The CAA requires that, in nonattainment or maintenance areas, all regionally significant and nonexempt projects included in a Plan or TIP meet the conformity requirements established in the Final Rule. Therefore, DVRPC must identify these projects in the Plan and TIPs and conduct a conformity determination on those projects in order to demonstrate that the projects included in the Plan and TIPs do not worsen air quality or inhibit the region's progress toward meeting the NAAQS.

The FY 2017 TIP for Pennsylvania is a staged, multiyear, intermodal program of transportation projects covering the five Pennsylvania counties in the DVRPC planning area. The DVRPC TIPs are consistent with the Plan and are developed, pursuant to 23 CFR Part 450, to meet the federal requirement of being financially constrained to a funding level that is available to the region, as established in the financial guidance provided by the respective states. All TIP projects have been reviewed and approved by DVRPC's TCICG for appropriate air quality code and analysis year.

The *Connections 2040* Long-Range Plan, adopted in July 2013, and amended in September 2015, provides a broad planning framework for the region. The transportation component of the Plan articulates a vision and a comprehensive long-range transportation blueprint for the DVRPC planning area. The *Connections 2040* Long-Range Plan includes over \$63 billion from traditional sources for regional transportation improvements. The Plan is fiscally constrained and focuses transportation funding on rebuilding the region's transportation infrastructure, but it also includes new major regional transportation projects to achieve its goals and objectives. The Plan also advances and supports the region's land use plans and policies and proposes strategies to carry out those policies.

The Plan's financial component reflects actual federal authorization levels. Projected costs for future Plan projects have been adjusted to account for inflation and to reflect the year of expenditure, as required by the FHWA/FTA Final Rule on Statewide and Metropolitan Transportation Planning and Programming.¹ All Plan projects have also been reviewed and approved by the TCICG for appropriate air quality code and analysis year.

¹ See 23 CFR 450.216(1), 23CFR 450.322(f) (10) (iv), and 23 CFR 450.23(h).

Project Category

There are three categories of projects in the Plan and TIPs:

- **Regionally Significant Project:** a nonexempt highway or transit project on a facility that, regardless of its length, serves regional needs and is normally included in the regional travel simulation model;
- **Exempt Project:** a project listed in Table 2 or 3 of the Final Rule (40 CFR 93) that primarily enhances safety or aesthetics, maintains mass transit, continues current levels of ridesharing, or builds bicycle and pedestrian facilities; and
- **Not Regionally Significant Project/Nonexempt:** a nonexempt highway or transit project on a facility that does not serve regional needs or is not normally included in the regional travel simulation model and does not fit into an exempt project category in Table 2 or 3 of the Final Rule (40 CFR 93).

The Final Rule requires that a regional emissions analysis be conducted to demonstrate conformity of the Plan and the TIPs and includes all “regionally significant, nonexempt” projects on principal arterials and higher classifications—that is, those that can impact regional air quality. The project set in this conformity analysis includes all those in the Plan, those in the current TIP, and those that have been introduced in previous TIPs but are not yet completed. Each project is classified by the first year that the project is included in the regional emissions analysis or analysis year. The emissions estimates for a particular analysis year include all of the projects that are expected to be open to traffic by that analysis year.

Certain projects that cannot be analyzed within the travel demand model (TDM) are categorized as “off-network” and are evaluated using trip estimate techniques outside the DVRPC TDM. The Pennsylvania Air Quality Off-Network Estimator (PAQ-ONE) provides a set of travel impact and emissions analysis methodologies developed for the Pennsylvania Department of Transportation (PennDOT) to be used for off-network analyses.

DVRPC Air Quality Code

An alphanumeric air quality (AQ) coding scheme has been developed and is applied by DVRPC for the conformity determination and exempt eligibility identification purposes for all Plan and TIP projects.

All regionally significant, nonexempt projects are assigned five-character alphanumeric AQ codes that begin with a four-digit analysis year followed by either the letter “M” (model) or “O” (off-network). For instance, a Plan or TIP project may have an AQ code of 2017O, in which case the project is identified as a regionally significant, nonexempt project, the emissions estimates of which are (1) included in the 2017 and all subsequent future analysis years and (2) performed using an off-network analysis technique.

DVRPC has also developed an internal coding scheme to identify each exempt project type based on those defined in the Final Rule. Table 2 shows the exempt project categories in the Final Rule and their corresponding DVRPC AQ codes. In cases in which multiple codes can apply to a project, the most representative code is assigned. The AQ code for each project is shown in the respective Plan and TIP documents. Projects that have been determined not to be regionally significant as defined in the Final Rule and do not fit into an exempt category are labeled as “NRS.”

A table containing the regionally significant and nonexempt projects included in this conformity determination is included in Appendix A of this report. The TCICG has reviewed all projects and concurred on all assigned AQ codes in the Plan and the TIP.

Table 2: AQ Codes for Projects in the Plan and TIPs

Exempt Project Category[†]— Safety Projects	DVRPC AQ Code	Exempt Project Category[†]—Air Quality Projects	DVRPC AQ Code
Railroad/highway crossing	S1	Continuation of ridesharing and vanpooling promotion activities at current levels	A1
Hazard elimination program	S2	Bicycle and pedestrian facilities	A2
Safer non-federal-aid system roads	S3		
Shoulder improvements	S4	Exempt Project Category[†]—Mass Transit Projects	DVRPC AQ Code
Increasing sight distance	S5	Operating assistance to transit agencies	M1
Safety improvement program	S6	Purchase of support vehicles	M2
Traffic control device and operating assistance other than signalization projects	S7	Rehabilitation of transit vehicles	M3
Railroad/highway crossing warning devices	S8	Purchase of office, shop, and operating equipment for existing facilities	M4
Guardrails, median barriers, crash cushions	S9	Purchase of operating equipment for vehicles (e.g., radios, fare boxes, lifts, etc.)	M5
Pavement resurfacing and/or rehabilitation	S10	Construction or renovation of power, signal, and communications systems	M6
Pavement marking demonstration	S11	Construction of small passenger shelters and information kiosks	M7
Emergency relief (23 U.S.C. 125)	S12	Reconstruction or renovation of transit buildings and structures	M8
Fencing	S13	Rehabilitation or reconstruction of track structures, track, and tracked-in existing rights-of-way	M9
Skid treatments	S14	Purchase of new buses and rail cars to replace existing vehicles or for minor expansions of the fleet	M10
Safety roadside rest areas	S15	Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part 771	M11
Adding medians	S16		
Truck-climbing lanes outside the urbanized area	S17	Not Regionally Significant Project Category	DVRPC AQ Code
Lighting improvements	S18	Projects determined to be “Not Regionally Significant” and do not fit into an exempt category	NRS
Widening narrow pavements or reconstructing bridges (no additional travel lanes)	S19		
Emergency truck pullovers	S20		

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Exempt Project Category [†] —Other Projects	DVRPC AQ Code
Specific activities that do not involve or lead directly to construction, such as planning and technical studies	X1
Grants for training and research programs	X2
Planning activities conducted pursuant to title 23 and 49 U.S.C.	X3
Federal aid systems revisions	X4
Engineering to assess social, economic, and environmental effects of the proposed action or alternatives to that action	X5
Noise attenuation	X6
Advance land acquisitions (23 CFR 712 or 23 CFR 771)	X7
Acquisition of scenic easements	X8
Plantings, landscaping, etc.	X9
Sign removal	X10
Directional and informational signs	X11
Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures, or facilities)	X12
Repair of damage caused by natural disasters, civil unrest, or terrorist acts, except projects involving substantial functional, locational, or capacity changes	X13

Exempt Project Category [†] —No Regional Emissions Analysis Required	DVRPC AQ Code
Intersection channelization projects	R1
Intersection signalization projects at individual intersections	R2
Interchange reconfiguration projects	R3
Changes in vertical and horizontal alignment	R4
Truck size and weight inspection stations	R5
Bus terminals and transfer points	R6

Source: Delaware Valley Regional Planning Commission, 2016.

Note: † 40 CFR 93 Sections 126 and 127.

Analysis Year

For this conformity demonstration, the mobile source ozone emissions analysis years for VOCs and NO_x in the Philadelphia–Wilmington–Atlantic City Ozone Nonattainment Area are 2017, 2020, 2025 (an interim year selected to keep all analysis years no more than 10 years apart), 2035 (a second interim year selected to keep all analysis years no more than 10 years apart), and 2040 (the horizon year of the DVRPC Plan). VOCs and NO_x, which are heat-sensitive ozone precursors, are estimated for a July day. To demonstrate conformity, projected ozone emissions in all analysis years must not exceed the established MVEBs in prior years. For this conformity demonstration, the mobile source emissions analysis years are identified in Table 3.

In the Philadelphia–Wilmington, PA–NJ–DE PM_{2.5} Maintenance Areas and the Delaware County PM_{2.5} Nonattainment Area, the analysis years are 2017 (a SIP budget year), 2020 (the attainment date for the 2012 PM_{2.5} standard for Delaware County and near-term year), 2025 (a SIP budget year), 2035 (an interim year selected to keep all analysis years no more than 10 years apart), and 2040 (the horizon year of the DVRPC Plan).

Table 3: Mobile Source Analysis Years

Year	Ozone	PM _{2.5}	Note
2017	√	√	PM _{2.5} SIP budget year in PA
2020	√	√	2012 PM _{2.5} Std. attainment date and near-term year
2025	√	√	PM _{2.5} SIP budget year
2035	√	√	Year within 10 years of previous analysis
2040	√	√	DVRPC Plan horizon year

Source: Delaware Valley Regional Planning Commission, 2016.

To demonstrate conformity, projected PM_{2.5} emissions in analysis years must not exceed the 2017 (for analysis years before 2025) and 2025 (for analysis years 2025 and later) budgeted emissions in the Pennsylvania portion of the Philadelphia–Wilmington, PA–NJ–DE PM_{2.5} Maintenance Area and Delaware County in the Delaware County PM_{2.5} Nonattainment Area.

Pennsylvania has an approved limited maintenance plan for CO, and regional emissions analysis for CO is no longer required to demonstrate conformity.

Table 4 describes the project sets that are considered in each future-year analysis. All analysis years, projects, and activities identified in Table 4 have been reviewed and approved by the TCICG for the conformity demonstration.

Table 4: Projects Included in the Regional Emissions Analysis

Analysis Year	Project Set
2008 (Eight-Hour Ozone SIP Budget)	Eight-Hour Ozone RFP SIP budget year included to compare against future emissions analysis.
2017 PA (PM _{2.5} budget)	PM _{2.5} SIP budget year included to compare against future emissions analysis.
2017	All regionally significant highway and transit facilities, services, and activities currently in place and All regionally significant highway and transit projects that are scheduled to open by 2017.
2020 (Attainment date for the 2012 PM _{2.5} Standard and near-term year)	All regionally significant highway and transit facilities, services, and activities currently in the 2017 model network and All regionally significant highway and transit projects that are scheduled to open between 2018 and 2020.
2025 (PM _{2.5} budget years and interim year)	All regionally significant highway and transit projects in the 2020 model network and Additional highway and transit projects that are scheduled to open between 2021 and 2025.
2035 (Interim year)	All regionally significant highway and transit projects in the 2025 model network and Additional highway and transit projects that are scheduled to open between 2026 and 2035.
2040 (DVRPC Plan horizon)	All regionally significant highway and transit projects in the 2035 model network and Additional highway and transit projects that are scheduled to open between 2036 and 2040.

Source: Delaware Valley Regional Planning Commission, 2016.

Note: DVRPC = Delaware Valley Regional Planning Commission; RFP = Reasonable Further Progress; PM_{2.5} = Fine Particulate Matter; SIP = State Implementation Plan.

Emissions Analysis

Once the regionally significant and nonexempt projects in the Plan and TIPs are identified, the projects are included in the DVRPC TDM. The TDM represents the regional transportation network and uses inputs such as population, employment, and land use data to develop estimates for trip length, vehicle miles traveled (VMT), and traffic volumes on the transportation network. The model includes the base transportation network of roads and transit projects that have been constructed, and new networks are built to include projects from the Plan and TIPs according to the projects' analysis years.

Outputs of the TDM are then processed and entered into the emissions estimation model, MOVES 2014. The MOVES model will then take the TDM outputs, information on meteorology, fuel information, data on vehicle types and vehicle populations, and other critical inputs to

develop a projected emissions estimate for a given analysis year and pollutant. Those emissions estimates are then reviewed against an established set of emissions budgets to determine if the Plan and TIPs conform to the state SIPs and CAA requirements.

Conformity Tests

The DVRPC region must demonstrate transportation conformity for ozone, PM_{2.5}, and CO, and governing SIPs are in place for these pollutants. DVRPC utilizes the budget test to demonstrate conformity using applicable SIP budgets.

The DVRPC region has been designated as a marginal nonattainment area for the 2008 Ozone Standard. For this conformity determination, DVRPC is using the approved Ozone Budgets in Pennsylvania for the year 2008. These budgets were approved by the US EPA for conformity purposes in February 2011. All ozone budgets have been established in cooperation with the state DEP using MOBILE 6.2. The regional emissions analysis for ozone was conducted using the MOVES model (version 2014). Analysis is conducted for ozone emissions for a typical July day.

The US EPA has an approved maintenance plan for both the 1997 Annual and 2006 24-Hour PM_{2.5} Standards in the Pennsylvania counties in the DVRPC region (approved by the US EPA in April 2015). These state SIPs contain MVEBs for direct PM_{2.5} and precursor NO_x to be used to demonstrate transportation conformity. These MVEBs are expressed in tons of emissions per year for both the annual and 24-hour standard.

The US EPA has ruled that exhaust and brake/tire wear must be included in the regional analysis of direct PM_{2.5} emissions. The US EPA has further ruled that regional emissions analyses for direct PM_{2.5} should include road dust if road dust is found to be a significant contributor to PM_{2.5} by either the US EPA Regional Administrator or the state DEP. The US EPA has also required that regional direct PM_{2.5} analyses include fugitive dust from the construction of transportation projects if a governing PM_{2.5} SIP identifies these emissions as significant contributors to the regional PM_{2.5} problem. Road dust has not been found to be a significant PM_{2.5} contributor in either of the DVRPC PM_{2.5} nonattainment areas; therefore, no construction-related dust will be considered in the direct PM_{2.5} emissions analysis. Thus, the only components of direct PM_{2.5} emissions in this DVRPC conformity iteration are tailpipe exhaust and brake/tire wear.

For the indirect PM_{2.5} emissions (also called PM_{2.5} precursors), the US EPA has identified four potential transportation-related PM_{2.5} precursors: VOCs, NO_x, SO_x, and NH₃. Once a SIP is implemented, any precursors identified in the SIP will be required in the analysis of indirect PM_{2.5} emissions. NO_x must be included in the PM_{2.5} precursor analysis unless it has been determined that NO_x emissions are not significantly contributing to regional PM_{2.5} formation. There have been no findings of significance for any of the precursors (and, also, no findings of insignificance for NO_x). Thus, the only indirect PM_{2.5} component analyzed in this conformity iteration is NO_x.

Tables 5 and 6 show governing MVEBs to be utilized in this iteration of conformity demonstration.

Table 7 provides the PM_{2.5} SIP budgets for Pennsylvania expressed in tons/day units to demonstrate the budgets in terms of a 24-hour period. The US EPA requested that these tables be provided for demonstration purposes. The values contained in the tables were derived by dividing the annual PM_{2.5} SIP budget by 365 to obtain a 24-hour value as per US EPA guidance. Conformity to the SIP is demonstrated by meeting the annual and 24-hour PM_{2.5} SIP budgets, which are both expressed as an annual tons/year value.

Table 5: Ozone Emissions Budgets (Tons/Day)

Pollutant	Budget	Pennsylvania Subregion (tons/day)
VOCs	2008 Budget (tons per July day)	61.09 (all counties)
NO _x	2008 Budget (tons per July day)	108.78 (all counties)

Source: Delaware Valley Regional Planning Commission, 2016.

Note: NO_x = Nitrogen Oxides; PM_{2.5} = Fine Particulate Matter; VOCs = Volatile Organic Compounds.

Table 6: Pennsylvania PM_{2.5} Emissions Budgets (Tons/Year) †

Pollutant	Budget	Pennsylvania Subregion (tons/year)	Delaware County (tons/year)
Annual and 24-Hour Direct PM _{2.5} †	2017 Budget (tons per year)	1,679	251
Annual and 24-Hour Precursor NO _x †		37,922	5,544
Annual and 24-Hour Direct PM _{2.5} †	2025 Budget (tons per year)	1,316	201
Annual and 24-Hour Precursor NO _x †		25,361	3,730

Source: Delaware Valley Regional Planning Commission, 2016.

Note: NO_x = Nitrogen Oxides; PM_{2.5} = Fine Particulate Matter; VOCs = Volatile Organic Compounds.

† PM_{2.5} budgets are rounded off to the nearest integer in accordance with the respective SIPs.

‡ SIP budgets for Annual and 24-Hour PM_{2.5} are the same value expressed in tons/year.

Table 7: Pennsylvania PM_{2.5} Emissions Budgets (Tons/Day) (Demonstration Purposes) [♦]

Pollutant	Budget	All Pennsylvania Counties (tons/day)
24-Hour Direct PM _{2.5} [♦]	2017 Budget (tons per day)	5
24-Hour Precursor NO _x [♦]		104
24-Hour Direct PM _{2.5} [♦]	2025 Budget (tons per day)	4
24-Hour Precursor NO _x [♦]		69

Source: Delaware Valley Regional Planning Commission, 2015.

Note: NO_x = Nitrogen Oxides; PM_{2.5} = Fine Particulate Matter; VOCs = Volatile Organic Compounds.

[♦]These tables are provided for demonstration purposes only. Both state SIP budgets for Annual and 24-Hour PM_{2.5} are the same value expressed in tons/year. Conformity must be demonstrated against those values to conform to the respective state SIPs.

CHAPTER 3: Regional Emissions Analysis Procedure

Overview

Regional emissions estimates are developed through a series of models that simulate travel demand in the region and then convert those travel characteristics into estimates of emissions of the pollutants of concern. The TDM utilizes planning assumptions to produce estimates of VMT and travel characteristics, including operating modes and vehicle characteristics, of the people in the region. The TDM results are then processed and input into the prescribed emissions estimate model—in this case, MOVES 2014.

The Final Rule establishes guidelines and minimum requirements to control the quality of the inputs to the transportation demand and emissions estimate models. These guidelines require that the latest planning assumptions and best available data inputs be used to develop the regional emissions estimates. These estimates are ultimately compared against the SIP budgets described in the previous chapter to support the conformity determination. The TCICG reviews and approves the planning assumptions and model inputs prior to the beginning of conformity analysis.

This is the third conformity determination for which DVRPC is using the TIM 2.0 TDM. The model has been successfully validated following FHWA guidelines.

Latest Planning Assumptions

The Final Rule requires that the most current available planning assumptions be used in determining transportation conformity. Planning assumptions such as population and employment estimates, transit and toll road policies, and land use assumptions are critical inputs to the TDM. Plan and TIP projects are also reviewed and coded according to the expected date that the projects will be opened to traffic. These codes identify which projects will be analyzed in the regional emissions model. Planning assumptions, as well as the list of Plan and TIP projects, are reviewed and approved by the TCICG before DVRPC begins the regional emissions analysis. The planning assumptions used in this demonstration are the latest and most current assumptions available as of April 15, 2016, which is the start date established for this conformity analysis.

Population and Employment Estimates

The population and employment estimates used in this conformity determination are the latest available at the traffic analysis zone (TAZ) level. Population forecasts were adopted by the DVRPC Board in January 2012, and employment forecasts were adopted in September 2012. These estimates include forecasts for the Plan horizon year of 2040 and can be reviewed in *Regional, County, and Municipal Population Forecasts, 2010–2040* (June 2012, DVRPC publication number ADR018) and *Regional, County, and Municipal Employment Forecasts, 2010–2040* (January 2013, DVRPC publication number ADR019).

Transit and Toll Road Policies

As part of the latest planning assumptions, current transit operations policies and road toll structures are considered. The transit person trips produced by the modal split component of the

DVRPC TDM are considered “linked” in the sense that they do not include any transfers that may have occurred either between transit trips or between auto approaches and transit lines. Therefore, the transit assignment procedure accomplishes two major tasks. First, the transit trips are “unlinked” to include transfers; and second, these “unlinked” transit trips are associated with specific transit facilities to produce link, line, and station volumes. These tasks are performed simultaneously within the transit assignment model, which assigns the transit trip matrix to paths built through the transit network, which is not capacity constrained.

All fares entering the transit network are “blended” by operating entity. For each operator, different existing fare types (e.g., cash; token; transfer charge; and daily, weekly, and monthly passes) are blended into a single fare policy based on the percentage of each fare type and use in the 2013 fare structure. Then the future fare for each operator is held constant in current dollars. All current operating plans, ridership, and service levels of transit systems are built into the transit network and incorporated into the future-year networks, as well. Future-year transit networks are also augmented with any new services identified in the corresponding DVRPC Plan and TIPs. Table 8 details all transit operators included in the transit network and their operational assumptions.

Other transportation-related costs, such as automobile operating costs, gasoline costs, parking costs, and road/bridge tolls, are also based on current and available data and are held constant in current dollars into the future analysis years.

Table 8: Transit Operation Assumptions

Transit Companies	Fares	Operating Plan /Service Level
SEPTA City Transit Division	Specified in the transit network by operator and by analysis year; held constant in year 2013 dollars	Specified in the transit networks by operator and by analysis year.
SEPTA Suburban Victory Division		
SEPTA Suburban Frontier Division		
SEPTA Regional Rail Division		
NJ Transit Mercer Division		
NJ Transit Southern Division		
NJ Transit Railroad Division		
PATCO High-Speed Line (DRPA)		
Pottstown Area Rapid Transit		
Krapf's Coaches		

Source: Delaware Valley Regional Planning Commission, 2016.

Note: DRPA = Delaware River Port Authority; NJ Transit = New Jersey Transit; PATCO = Port Authority Transit Corporation; SEPTA = Southeastern Pennsylvania Transportation Authority.

Travel Demand Simulation

TIM 2.0 has been validated following FHWA guidance and features an expanded geography to improve travel simulation within, through, and across the region. The current model includes detailed transportation network data on the DVRPC region, plus less detailed information on the

transportation network in the 16 counties surrounding the DVRPC region. The current DVRPC TDM meets the federal transportation authorization and planning requirements, as well as requirements included in the CAA and the Final Rule.

DVRPC's TDM is a four-step process that ultimately assigns travel patterns among and within TAZs and modes of transportation using the built transportation networks, along with the planned highway and transit networks described by the Plan and the TIP. Travel patterns and modal splits are then run through a post-processor in preparation for emissions analysis by MOVES.

The TCICG has reviewed and approved DVRPC's travel demand modeling process, including the use of off-network methodologies to analyze regionally significant, nonexempt projects, such as park-and-ride facilities, that cannot be properly evaluated by the aforementioned network TDM.

Projects Analyzed Using Off-Network Methodology

The TCICG has approved the use of the PAQ-ONE off-network travel impact and emissions analysis methodologies developed for PennDOT. The methodologies are used to analyze projects that are usually of such a scale that they cannot be properly analyzed by the network model.

The AQ-ONE models contain independent MOVES-generated look-up tables to determine emissions estimates. Final off-network emissions estimate outputs show the changes in VOCs and NO_x in kilograms or tons per July day for ozone, as well as kilograms or tons per year for PM_{2.5} and NO_x, for the project sets included in the Plan and the TIPs.

Table 9 identifies the projects in the *Connections 2040* Long-Range Plan, and DVRPC TIP for Pennsylvania that were analyzed using off-network methodologies. Emissions from these analyses were applied to the results from the network model.

Table 9: Nonexempt, Off-Network Projects in the Plan and TIPs

MPMS#/DBNUM	County/Agency	Project/Facility	First Year of Analysis
60540	SEPTA	Parking Improvements/Expansions	2017
60636	SEPTA	Wawa Station	2020
60574	SEPTA	Paoli Transportation Center	2025
60655	SEPTA	Levittown Station	2020
73214	SEPTA	Ardmore Transportation Center	2035
93588	SEPTA	Exton Station	2025
AF	PennDOT	Keystone Corridor	2020

Source: Delaware Valley Regional Planning Commission, 2016.

Note: SEPTA = Southeastern Pennsylvania Transportation Authority, PennDOT = Pennsylvania Department of Transportation.

Emissions Test

The CAA requires the US EPA to regularly update emissions models. In 2000, the National Research Council recommended that the US EPA make changes to its mobile source modeling program. After a number of years of development and testing, the US EPA released the MOVES emissions model and in 2009 required that the MOVES model become the official emissions estimation model used for SIP development and transportation conformity determinations. The MOVES family of models estimates on-road mobile emissions based on an operational mode that accounts for different driving patterns and emissions profiles from various vehicle types. DVRPC used the MOVES 2010 emissions model for previous conformity determinations in accordance with US EPA regulation.

Beginning in October 2016, MPOs and state DOTs are required to use the MOVES 2014 emissions model to demonstrate transportation conformity. DVRPC is using MOVES 2014 for this conformity determination to meet this requirement. MOVES 2014 replaces MOVES 2010 as the official emissions analysis model for conformity determinations. MOVES 2014 includes a number of improvements from MOVES 2010, including the Tier III fuel standards, updates to vehicle emissions and fuel standards, new data on fleets, and vehicle activity emissions. For a detailed description of the MOVES model, please visit:

www.epa.gov/otaq/models/moves/index.htm

CHAPTER 4: Conformity Determination

Travel Simulation Results

Quantitative analyses for this iteration of transportation conformity determination for the DVRPC region began on April 15, 2016. All planning assumptions utilized in this demonstration are the latest and most current as of that date. The TDM analysis includes all regionally significant and nonexempt projects from the *Connections 2040* Long-Range Plan and the FY 2017 TIP for Pennsylvania segregated into networks according to the anticipated date that the facilities will be open to traffic.

The TDM estimates total annual VMT. The monthly VMT fraction and daily VMT fraction are then used to proportion annual VMT to weekends and weekdays for each of the twelve months. DVRPC inputs data from the TDM into a post-processor that uses the assigned volumes from the model for the AM, midday, PM, and evening time periods; divides those into 24 hourly volumes; and calculates 24 hourly speeds for each link based on its volume, capacity, free-flow speed, functional class, area type, etc. Those distributions are then summarized and organized into a MOVES-formatted input file. Monthly distributions are used for PM_{2.5} emissions analysis. Speed distributions do not vary by weekday/weekend or by vehicle type. They do vary by county, functional class, hour of day, and analysis year. Temperatures, humidity, and fuel programs also vary by month, and these differences are accounted for in the 12 monthly analysis runs.

For ozone analysis, a second speed distribution is performed. The postprocessor applies a factor to the assigned volumes from the TDM that increases the annual average weekday volume to an average July weekday volume (these factors vary by county and functional class). This speed distribution is then organized into a MOVES-formatted input file, and the daily speed distribution is used for ozone emissions analysis to determine VOC and NO_x emissions estimates for a July day.

Results from the TDM, including speed distribution, VMT by vehicle type, road-type distribution, ramp fraction, VMT by day and month, and VMT by hour, were input into the MOVES emissions analysis model. These input files are provided to the US EPA for review and are available by request.

Emissions Estimate Results

Mobile source emissions estimates are outputs of the MOVES model. The regional emissions analysis must meet all conformity tests in the Final Rule. Specifically, emissions of VOCs, NO_x, and PM_{2.5} must be less than the MVEBs established by the states.

For ozone precursors, the conformity demonstration was performed using the Eight-Hour Ozone SIP MVEBs for the year 2008 for Pennsylvania. The US EPA published the approval of these budgets in the *Federal Register* in February 2011.

Tables 10 and 11 present the results of these calculations for the transportation conformity simulation for the critical ozone precursors of VOCs and NO_x. These results are compared with the budgets to demonstrate conformity. The emissions analysis indicates that the DVRPC region will meet all of the current SIP MVEBs. The Final Rule requires that until MVEBs are established for the 2008 Eight-Hour Ozone NAAQS, the MVEBs for the 1997 Ozone Standard are to be used to demonstrate conformity.

Table 10: VOCs Emissions Analysis Results (Tons/July Day)

		2008	2017	2020	2025	2035	2040
		SIP MVEB [†]	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*
PA	Emissions from MOVES 2014	-	35.82	29.26	19.76	11.89	10.17
	Adjustments from Off-Network Calculation [‡]	-	0.00	0.00	-0.01	-0.01	-0.01
	Estimated Total Emissions	61.09	35.82	29.26	19.75	11.88	10.16

Source: Delaware Valley Regional Planning Commission, 2016.

Table 11: NO_x Emissions Analysis Results (Tons/July Day)

		2008	2017	2020	2025	2035	2040
		SIP MVEB [†]	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*
PA	Emissions from MOVES 2014	-	68.48	48.08	31.83	15.33	13.10
	Adjustments from Off-Network Calculation [‡]	-	0.0	-0.01	-0.02	-0.02	-0.02
	Estimated Total Emissions	108.78	68.48	48.07	31.81	15.31	13.08

Source: Delaware Valley Regional Planning Commission, 2016.

Note: MVEB = Motor Vehicle Emissions Budget; SIP = State Implementation Plan.

[†] The most recent Eight-Hour Ozone SIP MVEBs will apply to all future analysis years. All emissions are rounded off to the nearest hundredth of a ton for a July day.

[‡] Emissions adjustments calculated using off-network methodology could become zero when rounded off.

Furthermore, DVRPC must make conformity determinations for PM_{2.5} in one nonattainment area and one maintenance area. Table 12 provides the PM_{2.5} emissions estimate results for the Philadelphia–Wilmington Annual and 24-Hour PM_{2.5} Maintenance Areas, and Table 13 provides the emissions estimates and MVEB for the Delaware County 2012 Annual PM_{2.5} Nonattainment Area.

In Pennsylvania, governing SIP MVEBs for the years 2017 and 2025 were approved for both the annual and 24-Hour PM_{2.5} standards in April 2015. Since the Pennsylvania regional SIP MVEBs were developed by adding county-level inventories and then applying a regional safety margin to the budgets, the TCICG determined that the county-level budget included in the SIP appendix would be appropriate to use as approved MVEBs for the 2012 Delaware County, Pennsylvania Annual PM_{2.5} Nonattainment Area. The TCICG also approved that a safety margin, composed of Delaware County's VMT-based portion of the regional safety margin included in the SIP, be added to the Delaware County MVEBs.

Conformity is demonstrated against the relevant budgets, which are established for 2017 and 2025. All applicable direct PM_{2.5} sources and precursors (NO_x) are tested for the 2017, 2020, 2025, 2035, and 2040 PM_{2.5} emissions estimates.

Since the PM_{2.5} SIPs provide MVEBs expressed in annual values (tons/year), conformity is demonstrated by comparing emissions estimates against these budgets in those terms. EPA Region III has requested that a demonstration be included that shows the PM_{2.5} MVEBs and analysis in terms of tons/day to demonstrate how the analysis might also satisfy the 24-hour PM_{2.5} standard in the relevant maintenance areas.

Table 14 provides the PM_{2.5} emissions analysis for Pennsylvania expressed in tons/day units to demonstrate the budgets in terms of a 24-hour period. The US EPA requested that this table be provided for demonstration purposes. The values contained in the table were derived by dividing the annual PM_{2.5} emissions by 365 to obtain a 24-hour value as per US EPA guidance. Conformity to the SIP is demonstrated by meeting the annual and 24-hour PM_{2.5} SIP budgets, which are both expressed as an annual tons/year value.

Table 12: Annual and 24-Hour Direct PM_{2.5} and NO_x Emissions Analysis Results (Tons/Year) for Philadelphia–Wilmington PM_{2.5} Maintenance Areas

		2017	2017	2020	2025	2025	2035	2040
		SIP MVEB [†]	Estimated Emissions*	Estimated Emissions*	SIP MVEB [†]	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*
Direct PM _{2.5}	DVRPC—PA*	1,679	903	699	1,316	527	357	323
PM _{2.5} Precursor (NO _x)	DVRPC—PA*	37,922	23,675	16,787	25,361	11,209	5,963	4,823

Source: Delaware Valley Regional Planning Commission, 2015.

Note: DVRPC = Delaware Valley Regional Planning Commission; MVEB = Motor Vehicle Emissions Budget; NO_x = Nitrogen Oxides; PM_{2.5} = Fine Particulate Matter; SIP = State Implementation Plan.
[†] Associated 2017 and 2025 MVEBs apply to all future analysis years.
 * Off-model adjustments have been made.

Table 13: 2012 Annual Direct PM_{2.5} and NO_x Emissions Analysis Results (Tons/Year) for Delaware County

		2017	2017	2020	2025	2025	2035	2040
		SIP MVEB [†]	Estimated Emissions	Estimated Emissions	SIP MVEB [†]	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*
Direct PM _{2.5}	Delaware County	251	117	90	201	69	46	42
PM _{2.5} Precursor (NO _x)	Delaware County	5,544	3,098	2,169	3,730	1,432	701	567

Source: Delaware Valley Regional Planning Commission, 2016.

Note: DVRPC = Delaware Valley Regional Planning Commission; MVEB = Motor Vehicle Emissions Budget; NO_x = Nitrogen Oxides; PM_{2.5} = Fine Particulate Matter; SIP = State Implementation Plan.
[†] Associated 2017 and 2025 MVEBs apply to all future analysis years.

Table 14: Annual and 24-Hour Direct PM_{2.5} and NO_x Emissions Analysis Results (Tons/Day) for Philadelphia–Wilmington PM_{2.5} Maintenance Areas (Demonstration Purposes)

		2017	2017	2020	2025	2025	2035	2040
		Derived MVEB	Estimated Emissions	Estimated Emissions	Derived MVEB	Estimated Emissions	Estimated Emissions	Estimated Emissions
Direct PM _{2.5}	DVRPC—PA	4.6	2.5	1.9	3.6	1.4	1.0	0.9
PM _{2.5} Precursor (NO _x)	DVRPC—PA	103.9	64.9	46.0	69.5	30.7	16.3	13.2

Source: Delaware Valley Regional Planning Commission, 2016.

Note: DVRPC = Delaware Valley Regional Planning Commission; MVEB = Motor Vehicle Emissions Budget; NO_x = Nitrogen Oxides; PM_{2.5} = Fine Particulate Matter; SIP = State Implementation Plan.

Meeting the Conformity Criteria

Collectively, these tables show that the estimated emissions of VOCs, NO_x, and PM_{2.5} do not exceed the respective MVEBs included in approved SIPs discussed in the previous sections of this conformity demonstration. Tables 10 through 13 cumulatively demonstrate that the Plan and the TIPs conform to the SIPs with respect to the MVEBs in the corresponding analysis year. The Plan and the TIPs meet all requirements under the governing ozone and PM_{2.5} regulations for all analysis years tested.

In addition to PM_{2.5} and ozone, the region must maintain the CO standard. The US EPA has approved limited maintenance plans for both the Pennsylvania portions of the region and has ruled that no emissions analyses are required to demonstrate conformity in the region for CO.

The transportation conformity process must also meet all the applicable criteria that are consistent with the requirements for nonattainment areas and maintenance areas under the CAA. Specifically, the finding must show, among other items, that:

- the Plan and the TIP are fiscally constrained [40 CFR 93.108];
- this determination is based on the latest planning assumptions [40 CFR 93.110];
- this determination is based on the latest emissions estimation model available [40 CFR 93.111];
- DVRPC has made the determination according to the applicable consultation procedures [40 CFR 93.112];
- the Plan and the TIP do not interfere with the timely implementation of TCMs [40 CFR 93.113]; and
- the Plan and the TIP are consistent with the MVEBs in the applicable SIPs [40 CFR 93.118].

All identified conformity evaluation criteria in the Final Rule and subsequent responses from DVRPC are detailed in Table 15.

Table 15: Evaluation of the Conformity Determination Criteria

Corresponding 40 CFR Part 93 Section(s)	Evaluation Criteria	DVRPC Response
§93.106(a)(1)	Are the transportation plan horizon years correct?	Yes. The analysis years of 2017, 2020, 2025, 2035, and 2040 correspond to the 2012 Annual PM _{2.5} attainment date (Delaware County), SIP budget years, interim years within a 10-year time frame, and the current DVRPC Plan horizon year.
§93.106(a)(2)(i)	Does the plan quantify and document the demographic and employment factors influencing transportation demand?	Yes. The <i>Connections 2040</i> Long-Range Plan does quantify and document demographic and employment factors influencing transportation demand. Future population and employment forecasts were developed with member counties and adopted by the DVRPC Board.
§93.106(a)(2)(ii)	Is the highway and transit system adequately described in terms of regionally significant additions or modifications to the existing transportation network that the transportation plan envisions to be operational in horizon years?	Yes. The regionally significant additions and modifications to the network utilized in this conformity analysis are listed and described. Detailed information regarding each project can be found in the respective Plan and TIP documents. The projects are included in a table in an appendix to this report.
§93.108	Are the transportation Plan and TIPs fiscally constrained?	Yes. The Plan and the TIP are constrained to reasonably anticipated financial resources as required by federal regulations and are based on year-of-expenditure costs.
§93.109(a)	Has the MPO demonstrated that all applicable criteria and procedures for conformity are complied with and satisfied?	Yes. As part of the response, this table itemizing criteria and responses is presented.
§93.109(e) §93.109(f)	Are all budget tests for VOCs, NO _x , and CO satisfied as required by §93.118 and §93.119 for conformity determination?	Yes. PM _{2.5} , VOCs, and NO _x MVEBs have been approved by the US EPA. DVRPC performs budget tests to demonstrate the PM _{2.5} and ozone conformity of the Plan and the TIPs. The US EPA has approved limited maintenance plans for the CO maintenance areas within the region, and no emissions analyses are required.

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Corresponding 40 CFR Part 93 Section(s)	Evaluation Criteria	DVRPC's Response
§93.110	<p>Are the conformity determinations based upon the latest planning assumptions?</p> <p>Is the conformity determination, with respect to all other applicable criteria in §93.111-93.119, based upon the most recent planning assumptions in force at the time that the conformity determination began?</p> <p>Are the assumptions derived from the estimates of current and future population, employment, travel, and congestion the most recently developed by the MPO or other designated agency? Is the conformity determination based upon the latest assumptions about current and future background concentrations?</p> <p>Are any changes in the transit operating policies (including fares and service levels) and assumed transit ridership discussed in the determination?</p> <p>The conformity determination must include reasonable assumptions about transit service and increases in transit fares and road and bridge tolls over time.</p> <p>The conformity determination must use the latest existing information regarding the effectiveness of the TCMs and other implementation plan measures that have already been implemented.</p> <p>Key assumptions must be specified and included in the draft documents and supporting materials used for the interagency and public consultation, as required by §93.105.</p>	<p>Yes.</p> <p>Yes. This conformity determination utilizes the most recent planning assumptions as of April 15, 2016, the start date of this conformity determination process for the Pennsylvania Plan and TIPS.</p> <p>Yes. This conformity determination utilizes the most recent demographic and employment data, which were adopted by the DVRPC Board in January and September 2012, respectively. Also, other planning assumptions and travel data are derived from the most current information available to DVRPC.</p> <p>Yes. Applicable transit operating policies and transit ridership are discussed in this document and were verified through the consultation process (Chapter 3, p. 26 & 27).</p> <p>Key transit and toll assumptions outlined in this document were verified through the consultation process (Chapter 3, p. 26&27).</p> <p>Currently, there are no adopted TCMs in the corresponding SIPs.</p> <p>Key assumptions are specified, and other supporting documents are included in this conformity determination document, which is available to the TCICG and the public.</p>

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Corresponding 40 CFR Part 93 Section(s)	Evaluation Criteria	DVRPC's Response
§93.111	Is the conformity determination based upon the latest emissions model?	Yes. The transportation conformity determination for the Plan and the TIP is based on MOVES 2014.
§93.112	Did the MPO make the conformity determination according to the consultation procedures of the Final Rule or the state's conformity SIP?	Yes. Two formal interagency consultation meetings have been held according to the consultation procedures consistent with the requirements of all applicable regulations, including §93.105(a) and (e), to consider input assumptions and to review findings regarding transportation conformity. In compliance with 23 CFR 450, a 30-day public comment period and a public meeting were held to receive comments regarding the transportation conformity of the Plan and the TIP under all governing NAAQS.
§93.113(b) §93.113(c)	Are TCMs being implemented in a timely manner?	There are currently no adopted TCMs in the SIPs.
§93.114	Are there a currently conforming transportation plan and a currently conforming TIP at the time of project approval?	Yes. The <i>Connections 2040</i> Long-Range Plan is a conforming Plan. The FY 2017 PA TIP supplants the FY 2015 PA TIP.
§93.115	Are the projects from a conforming plan and TIP?	Yes. The projects are from a conforming Plan and TIP. The TIP is consistent with the Plan.
§93.118	For areas with SIP Budgets: Is the transportation plan, TIP, or project consistent with the established MVEB(s) in the applicable SIP?	Yes. Projects contained in the TIP and the Plan result in fewer emissions than the established budgets for all applicable pollutants in each analysis year.
§93.122(a)(1)	Does the conformity analysis include all regionally significant projects?	Yes. The project sets for the Plan and the TIP include all regionally significant projects.
§93.122(a)(6) §93.122(a)(7)	Are reasonable methods and factors used for the regional emissions analysis consistent with those used to establish the emissions budget in the applicable SIP?	Yes. The ambient temperatures and other factors used in the analysis, including the methods for off-network VMT and speed, have been reviewed by the TCICG and deemed reasonable.
§93.122(b)	Is there a network-based travel model of reasonable methods to estimate traffic speed and delays for the purpose of transportation-related emissions estimates?	Yes. DVRPC uses a network-based model that runs iteratively using the Evans algorithm to obtain convergence on input/output highway and transit travel speed. It is sensitive to travel time, costs, and other factors affecting travel choices.

Source: Delaware Valley Regional Planning Commission, 2016.

CHAPTER 5: Stakeholder Participation

Interagency Consultation Group Meetings

DVRPC participated a series of TCICG meetings and correspondence for this iteration of the transportation conformity demonstration of the Plan and the TIP. Two TCICG meetings were held. The first meeting was held on March 16, 2016, as part of the Pennsylvania State Air Quality Working Group meeting. Staff from Michael Baker International (a consultant to PennDOT) reviewed the transportation conformity process and MOVES model inputs and identified the latest planning assumptions utilized. At a second meeting, held via conference call on April 8, 2016, the TCICG reviewed draft TIP project sets, the update to the *Connections 2040* Long-Range Plan, and associated AQ codes. The draft conformity document was emailed to the TCICG before it was released for public comment.

Additional consultation occurred regularly through email and phone correspondence between TCICG members throughout the conformity determination process. Final decisions on items of discussion were summarized and shared with the TCICG.

Represented federal, state, and local partners on the TCICG included US EPA Region III offices, FHWA PA Division Office, the Pennsylvania DEP, PennDOT, and SEPTA. The consultant firm of Michael Baker International, also participated in the TCICG process because of its extensive involvement and expertise in the transportation conformity processes in Pennsylvania.

Public Participation

DVRPC opened a mandated 30-day public comment period on June 3, 2016, to receive comments on the draft conformity findings. The announcement for the public comment period for the conformity determination of the Plan and the TIPs appeared in five major newspapers throughout the region during the week of May 30, 2016. Additionally, a media release was sent to local television, radio, and print media.

This draft conformity document was distributed to various libraries throughout the region and made available online at www.dvrpc.org. A public meeting/information session was held on June 21, 2016, at the DVRPC offices at 190 N. Independence Mall West, in Philadelphia. The comment period closed on July 5, 2016, at 5:00 PM.

DVRPC accepted public comments on the draft conformity document online at www.dvrpc.org; by fax at (215) 592-9125; by mail at the address at the end of this document, and by submission of a written copy of oral comments made at the public meetings.

No public comments were submitted regarding the Draft Conformity findings.

The DVRPC Board adopted the conformity findings on July 28, 2016.

CHAPTER 6: Conclusion

The DVRPC Plan and TIP are found to be in conformity with the current Pennsylvania SIPs under the CAA. The forecasted emissions levels of VOCs, NO_x, and PM_{2.5} do not exceed the respective budgets established by the Pennsylvania SIPs in accordance with the Final Rule under the current NAAQS governing applicable pollutants. The transportation conformity analysis meets all applicable conformity criteria, including, but not limited to, the following:

- that the Plan and the TIP are fiscally constrained [40 CFR 93.108];
- that this determination is based on the latest planning assumptions [40 CFR 93.110];
- that this determination is based on the latest emissions estimation model available [40 CFR 93.111];
- that DVRPC has made the determination according to the applicable consultation procedures [40 CFR 93.112];
- that the Plan and the TIP do not interfere with the timely implementation of TCMs [40 CFR 93.113]; and
- that the Plan and the TIP are consistent with the MVEBs in the applicable SIPs [40 CFR 93.118].

These findings demonstrate transportation conformity of the DVRPC *Connections 2040* Long-Range Plan and FY 2017 TIP for Pennsylvania with the corresponding state SIPs and the Final Rule requirements under CAA, including:

- the 2008 Eight-Hour Ozone NAAQS in the Philadelphia–Wilmington–Atlantic City Ozone Nonattainment Area;
- the 1997 Annual and 2006 24-Hour PM_{2.5} NAAQS in the Philadelphia–Wilmington, PA–NJ–DE PM_{2.5} Maintenance Area;
- the 2012 Annual PM_{2.5} NAAQS in the Delaware County, Pennsylvania, PM_{2.5} Nonattainment Area; and
- the 1971 CO NAAQS in the Philadelphia–Camden CO Maintenance Area.



Appendix A

Appendix A: Regionally Significant and Nonexempt Projects in the FY 2017 TIP for Pennsylvania and Connections 2040 Long-Range Plan

TIP Projects

MPMS Number	Project Title	AQ Analysis Code
Bucks County		
12923	Bristol Road Extension	2025M
13347	I-95, PA Turnpike Interchange Stages 1 and 2	2020M
13549	US 1 (Bridges) Design (Section 03S) SR:0001	2025M
13727	Bristol Road Intersection Improvements	2025M
57619	Route 313 Corridor Improvements	2025M
57624	Woodbourne Road (SR 2033) and Langhorne-Yardley Road (SR 2049) Improvements	2025M
57635	Quakertown Joint Closed Loop Signal System	2020M
64779	County Line Road Widening	2020M
93444	Route 1 Improvement-South (Section RC1)	2025M
93445	Route 1 Improvement-North (Section RC2)	2035M
95439	I-95, PA Turnpike Interchange (TPK)-Section D10	2020M
95444	I-95, PA Turnpike Interchange (TPK)-Section D20	2020M
102831	Solebury Route 202 Gateway Trail (TAP)	2020M
Chester County		
14541	US 1, Baltimore Pike Widening	2025M
57659	French Creek Parkway--Phase 1	2025M
84884	US 30, Coatesville Downingtown Bypass (CWR-Western Section)	2035M
87781	US 30, Coatesville Downingtown Bypass (CER-Eastern Section)	2040M
102708	PA 41 at PA 841 Improvements	2025M
102709	PA 41 & SR 926 Improvements	2025M
Delaware County		
64790	MacDade Boulevard Closed Loop Signal System	2020M
69816	US 322, US 1 to Featherbed Lane (Section 101)	2025M
69817	US 322, Featherbed Lane to I-95 (Section 102)	2035M
79329	Bridgewater Road Extension	2035M
95429	US 202 and US 1 Loop Road	2025M
104465	Langford Run Road (PA3/I-476/Lawrence Rd)	2020M
Montgomery County		
16334	PA 73, Church Road Intersection and Signal Improvements	2025M
16577	Ridge Pike, Butler Pike to Crescent Avenue Reconstruction and Signal Upgrade	2025M
48172	PA 23 Moore to Allendale and Trout Creek Road Bridge	2035M
48174	PA 63, Welsh Road Improvements	2035M
48175	Ridge Pike, PA Turnpike to Butler Pike	2025M
48187	Henderson/Gulph Road Widen near I-76 Ramps	2035M

MPMS Number	Project Title	AQ Analysis Code
Montgomery County Con't		
57851	Plank Road/Otts Road/Meyers Road/Seitz Road Intersection Improvements	2020M
63486	US 202, Johnson Highway to Township Line Road (61S)	2035M
63490	US 202, Township Line Road to Morris Road (61N)	2025M
63491	US 202, Morris Road to Swedesford Road (65S)	2035M
63493	PA 309, 5-Points Intersection Improvements (71A) (Old US 202, 5-Points Intersection Improvements (71A))	2025M
64795	Belmont Rd/Rock Hill Rd Widening: I-76 Ramps to Rock Hill Road	2035M
70197	US 422, (New) Expressway Bridge Over Schuylkill River (SRB)	2025M
74816	Whitemarsh Street Imprv (TE)	2020M
77211	PA 309 Connector: Allentown Road to Souderton Pike (HT2)	2035M
79864	Lafayette Street, Barbados Street to Ford Street Widening (MGN)	2025M
102273	Second Collegeville Bridge Crossing	2035M
104280	First Avenue Road Diet (TAP)	2020M
104282	Virginia Drive Road Diet and Trail (TAP)	2020M
105803	PA 309 Connector: Souderton Pike to PA 309 (HT3)	2035M
Philadelphia County		
17782	I-95 & Aramingo Avenue, Adams Avenue Connector	2020M
17821	I-95, Shackamaxon Street to Ann Street (GIR)	2025M
46956	North Delaware Avenue Extension	2020M
79686	I-95, Columbia Avenue to Ann Street (GR1)	2025M
79911	I-95: Allegheny Ave Interchange Advance Contract (AFI)	2025M
102102	North Delaware Avenue Phase 1B	2025M
103563	I-95: Bridge Street Ramps (Section BS5)	2035M
104367	Robbins Avenue ISIP	2020M
104368	Cottman Avenue ISIP	2020M
104381	Levick Street ISIP	2025M
104385	Ridge Avenue ISIP	2020M
106632	Westmoreland Street over Conrail (TIGER)	2020M
106991	5th Street Signal Improvements	2020M
106992	2nd Street Signal Improvements	2020M
106993	Frankford Avenue Signal Improvements	2020M
106994	Rising Sun Avenue Signal Improvements	2020M
106995	Castor Avenue Signal Improvements	2020M
107198	Safe Spaces for Cyclists: Building a Protected Bicycle Network	2020M
Interstate Management Program		
Delaware County		
15477	I-95/322/Conchester Highway Interchange/Impvts.	2035M
Montgomery County		
106672	I-76 Integrated Corridor Management	2035M

MPMS Number	Project Title	AQ Analysis Code
Philadelphia County		
47811	Bridge Street Design (Section BSR) (IMP)	2035M
47812	I-95: Betsy Ross Interchange (BRI)–Design (IMP)	2035M
47813	I-95: Ann Street to Wheatshaeaf Lane (AFC)	2035M
79685	I-95: Cottman-Princeton Main Line and Ramps (CP2)	2020M
79826	I-95 Northbound: Columbia-Ann Street N (GR3)	2025M
79827	I-95 Southbound: Columbia-Ann Street N (GR4)	2035M
79828	I-95: Race-Shackamaxon (GR5)	2035M
79903	I-95: Betsy Ross Bridge Ramps Construction (BR0)	2025M
79904	I-95: Betsy Ross Section Overhead Bridges, Ramps, Adams Ave (BR2)	2035M
79905	I-95: Betsy Ross Mainline (BR3)	2035M
79908	I-95: Kennedy to Levick (Section BS1)	2025M
79910	I-95: Margaret to Kennedy (Section BS2)	2025M
79912	I-95: Allegheny Avenue Inter (AF2)	2035M
83640	I-95: Shackamaxon Street to Columbia Avenue (GR2)	2025M
103555	I-95 Corridor ITS	2035M
103557	I-95N Ann Street-Wheatshaeaf Lane (AF3)	2035M
103559	I-95 Betsy Ross Mainline SB (BR4)	2035M
103562	I-95 Betsy Ross Ramps/Adams Avenue Con. (BS4)	2025M
Transit		
93586	Downingtown Train Station Rehabilitation	2025O
60540	Parking Improvements	2017O
60574	Paoli Transportation Center	2025O
60636	Elwyn to Wawa Rail Restoration	2025M
60655	Levittown Station in Bucks County	2020O
73214	Ardmore Transportation Center	2035O
93588	Exton Station	2025O
105572	Lansdale Area Improvements	2020M

Long-Range Plan Projects

MRP ID	Project Name	Air Quality Code
20	I-95 and I-476 Ramps	2040M
32	I-476 (PA Turnpike Northeast Extension) Widening	2040M
35	I-95 at PA Turnpike Interconnection	2035M
36	I-95 at Scudders Falls Bridge Widening	2020M
37	US 1 Widening	2025M
40	I-76 (PA Turnpike) Widening	2025M
41	French Creek Parkway New Road	2040M
44	US 1 Widening	2025M
48	US 30/Co Widening Coatesville-Downingtown Bypass	2040M
50	US 322	2025M
52	I-476 (PA Turnpike Northeast Extension) Widening	2020M
54	Henderson Road and South Gulph Road Widening	2035M
55	Lafayette Street Extension	2025M
56	US 202 (Section 600) Widening	2025M
57	PA 309 Connector Road	2035M
64	Ridge Pike Reconstruction	2035M

MRP ID	Project Name	Air Quality Code
65	I-95 Philadelphia North Reconstruction	2025M
66	North Delaware Avenue Extension	2025M
68	Adams Avenue Connector	2020M
96	US 422 Bridge and PA 23 Interchange (River Crossing)	2025M
98	US 422 Mainline Widening (River Crossing)	2040M
101	Bryn Mawr Avenue Extension	2040M
106	I-476 and I-76 Ramp Modifications	2040M
107	I-76 at PA 23 Matsonford Rd Ramp Modifications	2040M
108	US 422 at Sanatoga Interchange Ramp Modifications	2040M
110	I-276/PA 611 Willow Grove Ramp Modifications	2040M
113	I-276 and Lafayette Street/Ridge Avenue Ramp Modifications	2040M
115	I-95/US 322/Highland Avenue Interchange Ramp Modifications	2040M
116	PA 113 Widening	2040M
117	Bridgewater Road Extension	2035M
119	Bristol Road Extension	2040M
120	Belmont Ave at I-76 Interchange	2035M
123	US 202 and US 1 Loop Roads	2025M
126	G.O. Carlson Boulevard Extension	2040M
130	I-476 Hard Shoulder Running	2040M
158	PA Turnpike All Electronic Tolling	2025M
160	Second Collegeville Bridge Crossing	2025M
161	PA 23 & Trout Creek Road Bridge	2035M
163	Butler Pike Reconstruction	2025M
Transit		
E	Paoli Station	2025O
T3	Ardmore Station	2035O
T3	Fern Rock Station	2035O
T3	Regional Rail Parking Expansion	2035O
T4	Roosevelt Boulevard Better Bus	2040M
P	Media-Elwyn Line Rail Extension	2025M
Q	Norristown High Speed Line	2035M
AF	Keystone Corridor	2020O
AE	Exton Station	2025O
CF	Franklin Square Station	2025M

AQ Codes for Long-Range Plan projects indicate when the project is expected to be complete. Phases of these projects are often programmed in the TIP as breakout projects. These phases are analyzed for conformity when the breakout project is expected to open to traffic.

Title of Report: Transportation Conformity Demonstration: *Connections 2040* Long-Range Plan and FY 2017 TIP for Pennsylvania

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Geographic Area Covered:

The five-county Pennsylvania portion of the DVRPC planning area, which covers the counties of Bucks, Chester, Delaware, Montgomery, and Philadelphia.

Key Words:

Transportation Conformity, Air Quality, National Ambient Air Quality Standards, Ozone, Volatile Organic Compounds (VOCs), Nitrogen Oxides (NOx), Carbon Monoxide (CO), Fine Particulate Matter (PM_{2.5}), Nonattainment Area, Maintenance Area, Multijurisdictional Nonattainment Area, *Connections 2040* Long-Range Plan, Transportation Improvement Program (TIP), State Implementation Plan (SIP).

Abstract:

The Delaware Valley Regional Planning Commission (DVRPC) demonstrates transportation conformity of its *Connections 2040* Long-Range Plan, Fiscal Year (FY) 2017 Pennsylvania Transportation Improvement Program (TIP). A transportation conformity demonstration is required at least once every four years or when an metropolitan planning organization: (1) adopts a new Plan or TIP; or (2) amends, adds, or deletes a regionally significant, nonexempt project in a Plan or TIP. This conformity finding of the DVRPC Plan and TIPs shows that they meet the National Ambient Air Quality Standards requirements governing ozone, carbon monoxide, and fine particulate matter. This conformity finding reflects all amendments to the Plan and TIPs through June 2016.

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