Transportation Conformity Demonstration:

FY 2015 Pennsylvania TIP, FY 2016 New Jersey TIP, *Connections 2040* Long-Range Plan

JULY 2015

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

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.

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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

CAA Clean Air Act (as amended)

CFR Code of Federal Regulations

CO Carbon Monoxide

DVRPC Delaware Valley Regional Planning Commission

FHWA Federal Highway Administration

Final Rule Current conformity guidance under CAA

FR *Federal Register*

FTA Federal Transit Administration

FY Fiscal Year

ICG Transportation Conformity Interagency Consultation Group

Maintenance Area Area that previously did not meet NAAQS

MOVES Motor Vehicle Emissions Simulator: the most recent emissions estimation model approved by the US EPA

MPO Metropolitan Planning Organization

MVEB Motor Vehicle Emissions Budget

NAAQS National Ambient Air Quality Standards

NH_3 Ammonia

NJ DOT New Jersey Department of Transportation

NJ Transit New Jersey Transit

NJAQ-ONE New Jersey Air Quality Off-Network Estimator

Nonattainment Area Area currently not meeting the NAAQS

NO_x Nitrogen Oxides

PAQ-ONE Pennsylvania Air Quality Off-Network Estimator

PennDOT Pennsylvania Department of Transportation

Plan DVRPC's Long-Range Plan

PM Particulate Matter

$PM_{2.5}$ Fine Particulate Matter

ppm Parts per Million

SEPTA Southeastern Pennsylvania Transportation Authority

SIP State Implementation Plan

SO_x Sulfur Oxides

State DEPs State Departments of Environmental Protection

State DOTs State Departments of Transportation

TAZ Traffic Analysis Zone

TCM Transportation Control Measure

TDM Travel Demand Model

TIP Transportation Improvement Program

U.S.C. United States Code

US DOT United States Department of Transportation

US EPA United States Environmental Protection Agency

VMT Vehicle Miles Traveled

VOCs Volatile Organic Compounds

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 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. 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) 2016 TIP for New Jersey* and the addition of regionally significant and nonexempt projects being amended to the *FY 2015 TIP for Pennsylvania* and *Connections 2040* Long-Range Plan in the Pennsylvania portion of the region.

The DVRPC region includes a complex combination of nonattainment and maintenance areas for three of the NAAQS (ozone, fine particulate matter or $PM_{2.5}$, 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 region's TIPs and *Connections 2040* Long-Range Plan are following, or "conforming to," the respective State Implementation Plans (SIPs) to meet the NAAQS.

This Executive Summary highlights DVRPC's conformity demonstration for:

- **VOCs and NOx meeting the 2008 Eight-Hour Ozone NAAQS requirements in:**
  - The DVRPC portion of the Philadelphia–Wilmington–Atlantic City Ozone Nonattainment Area.
- **Direct $PM_{2.5}$ and Precursor nitrogen oxides (NO_x) meeting the 1997 Annual and 2006 24-Hour $PM_{2.5}$ NAAQS requirements in:**
  - 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, and
  - The DVRPC portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT 24-Hour $PM_{2.5}$ Maintenance Area.

- **Direct $PM_{2.5}$ and Precursor nitrogen oxides (NO_x) meeting the 2012 Annual $PM_{2.5}$ NAAQS requirements in:**
  - The Delaware County, PA Annual $PM_{2.5}$ Nonattainment Area
- **CO meeting the 1971 CO NAAQS requirements in:**
  - The Philadelphia–Camden CO Maintenance Area,
  - The City of Burlington in Burlington County, New Jersey CO Maintenance Area, and
  - The City of Trenton in Mercer County, New Jersey CO Maintenance Area.

This summary serves as an inclusive document that demonstrates the transportation conformity of the DVRPC Plan and TIPs 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 implemented 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.

Beginning in October 2016, MPOs and state DOTs are required to use the Motor Vehicle Emissions Simulator 2014 (MOVES 2014) emissions model to demonstrate transportation conformity by the US EPA. DVRPC is using MOVES 2014 for this analysis in order to meet that requirement. 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 emission 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, and new data on fleets, and vehicle activity emissions.

Conformity Test

The DVRPC region has implemented SIP budgets for the 1997 Eight-Hour Ozone Standard in Pennsylvania and New Jersey. The Final Rule requires that for regions with existing MVEBs for a standard of the same pollutant (i.e., 1997 Eight-Hour Ozone and 2008 Eight-Hour Ozone), the approved budget test is required to demonstrate conformity for the new standard. Therefore, DVRPC will utilize the 1997 Eight-Hour Ozone MVEBs in Pennsylvania and New Jersey to demonstrate conformity to the 2008 Eight-Hour Ozone Standard.

The region also has approved SIP budgets for the 1997 Annual and 2006 24-Hour $PM_{2.5}$ standards in both Pennsylvania and New Jersey. In Pennsylvania, the Interagency Consultation Group (ICG) 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 (PA Only)	√	√	$PM_{2.5}$ SIP budget year in PA
2020	√	√	2012 $PM_{2.5}$ Std. attainment date and near term year
2025	√	√	PA and NJ $PM_{2.5}$ SIP budget year
2035	√	√	Year within 10 years of previous analysis
2040	√	√	DVRPC Plan Horizon 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 (Pennsylvania counties only), 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.

In the New York–Northern New Jersey–Long Island, NY–NJ–CT $PM_{2.5}$, Philadelphia–Wilmington, PA–NJ–DE $PM_{2.5}$ Maintenance Areas, and the Delaware County $PM_{2.5}$ Nonattainment Area, the analysis years are 2020 (the attainment date for the 2012 $PM_{2.5}$ standard for Delaware County and near term year), 2025 (a SIP budget year in New Jersey and Pennsylvania), 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). In the

Pennsylvania counties, 2017 is also an analysis year because that is an additional SIP budget year in Pennsylvania.

To demonstrate conformity in New Jersey, projected $PM_{2.5}$ emissions in analysis years must not exceed the 2009 (for analysis years before 2025) and 2025 (for analysis years 2025 and later) budgeted emissions in the New Jersey portion of the Philadelphia–Wilmington, PA–NJ–DE $PM_{2.5}$ Maintenance Area and Mercer County in the New York–Northern New Jersey–Long Island, NY–NJ–CT $PM_{2.5}$ Maintenance Area. To demonstrate conformity in Pennsylvania, 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. Both New Jersey and Pennsylvania have approved limited maintenance plans for CO, and regional emissions analysis for CO is no longer required to demonstrate conformity.

Findings

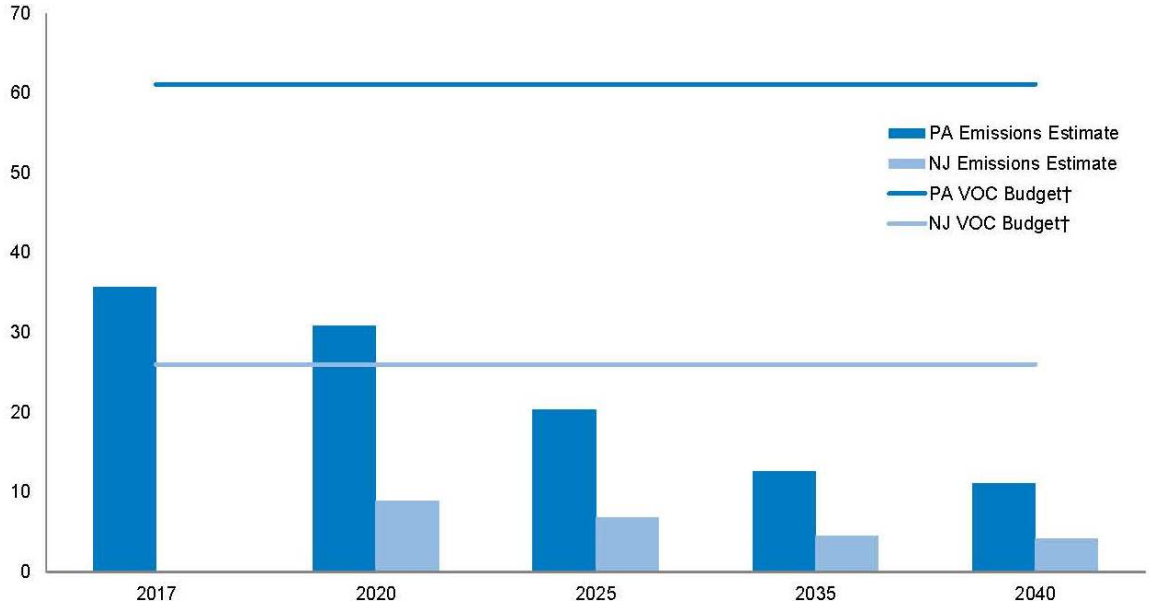
The DVRPC Plan and the TIPs are found to be in conformity with the current Pennsylvania and New Jersey SIPs under the CAA. The forecasted emissions levels of VOCs, NO_x, and $PM_{2.5}$ do not exceed the respective budgets established by the state departments of environmental protection (state DEPs) in 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 TIPs 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 TIPs do not interfere with the timely implementation of transportation control measures (TCMs) [40 CFR 93.113], and
- That the Plan and the TIPs are consistent with the MVEBs in the applicable implementation plans [40 CFR 93.118].

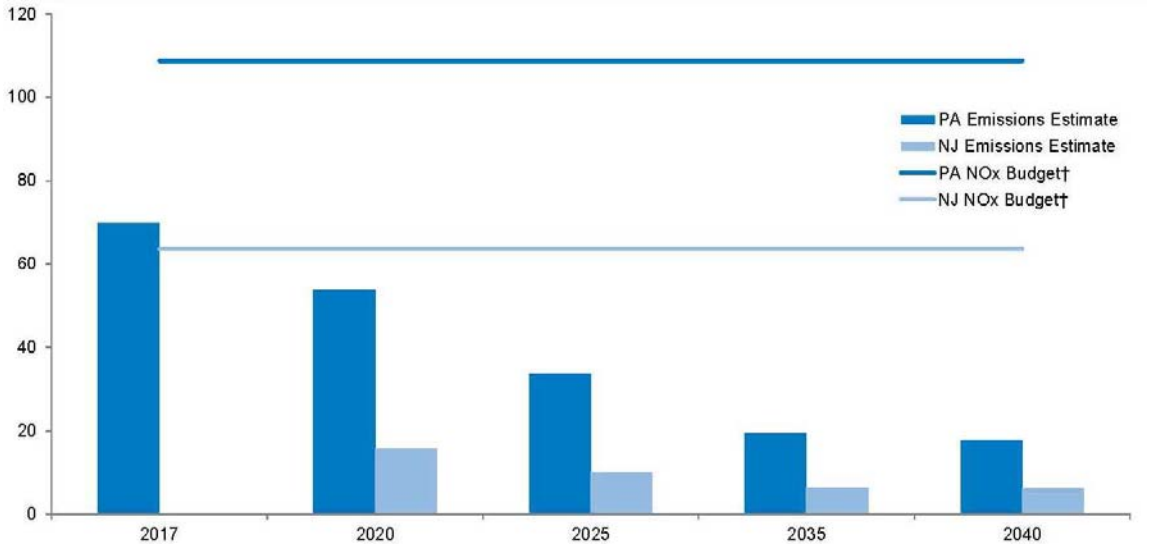
Figures 1 through 6 detail the emissions analysis results for transportation projects included in the Plan and TIPs for Pennsylvania and New Jersey. The data for these figures is detailed in Tables 12 through 18, found on pages 36 and 40. These estimates of emissions results confirm that the transportation projects in the Plan and TIPs conform to the respective SIP and Final Rule conformity requirements.

Figure 1: Volatile Organic Compounds Emissions Analysis Results (Tons/July Day)



Source: Delaware Valley Regional Planning Commission, 2015.

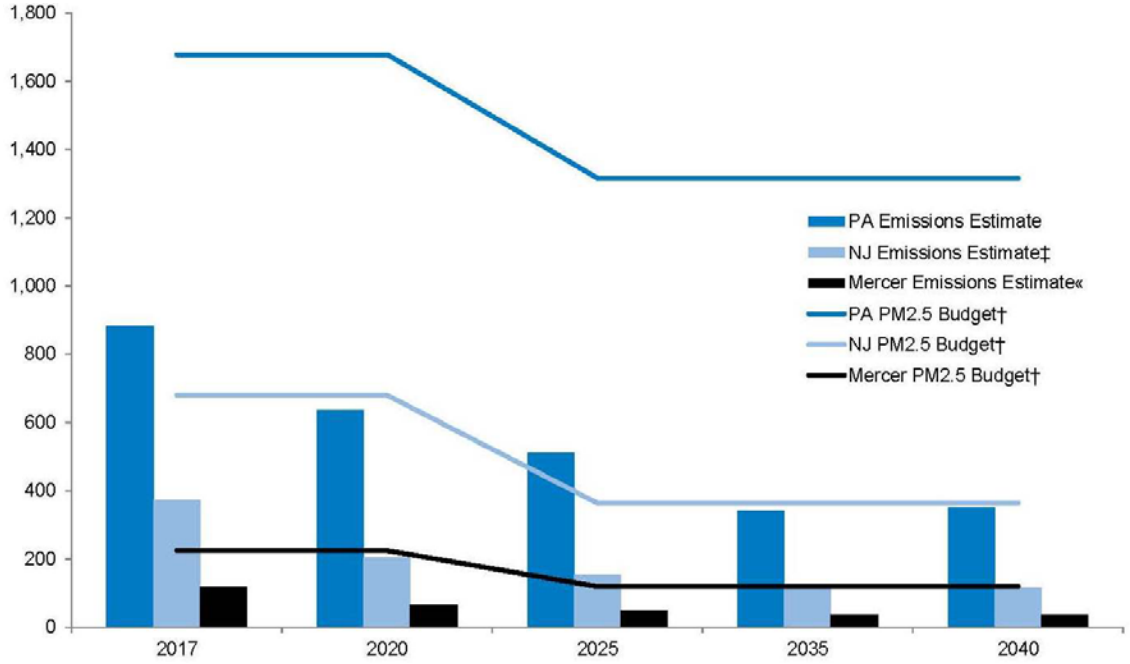
Figure 2: Nitrogen Oxides Emissions Analysis Results (Tons/July Day)



Source: Delaware Valley Regional Planning Commission, 2015.

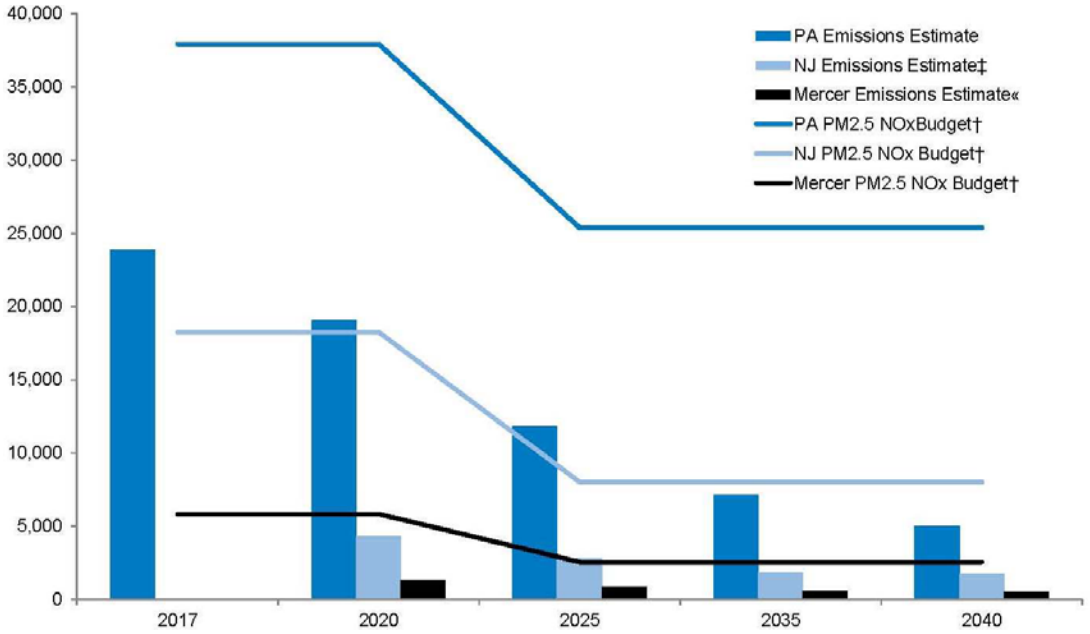
Note : † The most recent Eight-Hour Ozone SIP MVEBs (2008 in Pennsylvania or 2009 in New Jersey) will apply to all future analysis years.

Annual and 24-Hour Direct Fine Particulate Matter Emissions Analysis Results (Tons/Year)



Source: Delaware Valley Regional Planning Commission, 2015.

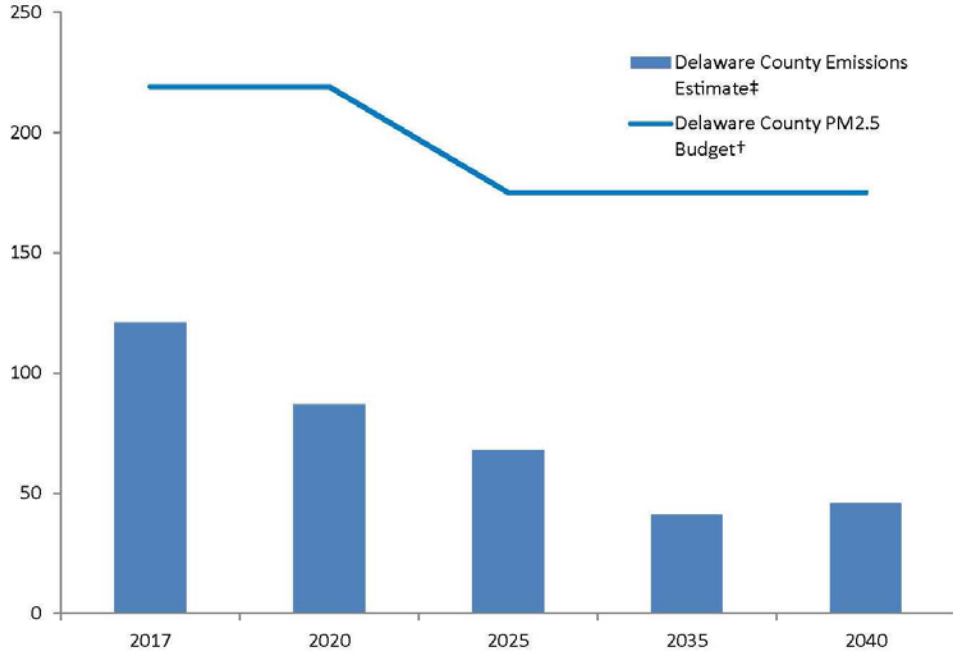
Figure 3: Annual and 24-Hour NO_x Precursor Emissions Analysis Results (Tons/Year)



Source: Delaware Valley Regional Planning Commission, 2015.

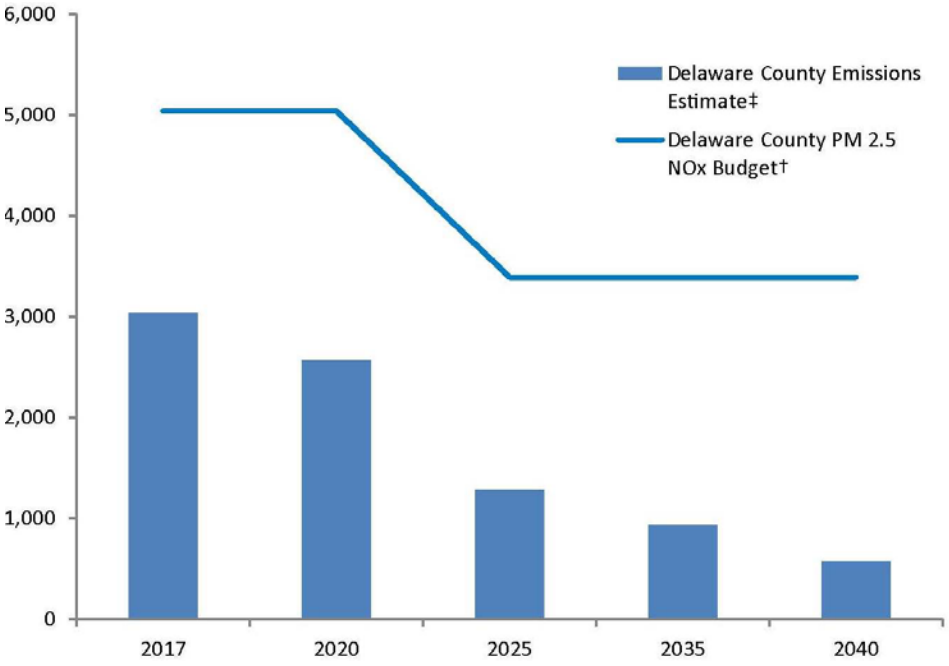
Note: ***† Associated MVEBs apply to all future analysis years.***
‡ Results are only for Burlington, Camden, and Gloucester counties, which are the New Jersey portion of the Philadelphia–Wilmington, PA–NJ–DE PM2.5 Nonattainment Area.
« Results are only for Mercer County, which is the DVRPC New Jersey portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT $PM_{2.5}$ Nonattainment Area.

Figure 4: Delaware County Annual Direct Fine Particulate Matter Emissions Analysis Results (Tons/Year)



Source: Delaware Valley Regional Planning Commission, 2015.

Figure 5: Delaware County Annual NO_x Precursor Emissions Analysis Results (Tons/Year)



Source: Delaware Valley Regional Planning Commission, 2015.

Note: † Associated MVEBs apply to all future analysis years.
‡ Results are only for Delaware County, which is the nonattainment area for the 2012 PM2.5 Annual Standard

These findings demonstrate transportation conformity of the FY2015 Pennsylvania TIP, FY2016 New Jersey TIP, and the DVRPC *Connections 2040* Long-Range Plan 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 1997 Annual and 2006 24-Hour $PM_{2.5}$ NAAQS in the DVRPC portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT $PM_{2.5}$ Maintenance Area,
- The 2012 Annual $PM_{2.5}$ Delaware County Nonattainment Area, and
- The 1971 Eight-Hour CO NAAQS in the Philadelphia–Camden CO Maintenance Area; in the City of Burlington in Burlington County, New Jersey; and in the City of Trenton in Mercer County, New Jersey.

CHAPTER 1: Introduction

Overview

This report documents the demonstration of transportation conformity for the DVRPC FY 2015 Pennsylvania TIP, FY 2016 New Jersey TIP, and *Connections 2040* Long-Range Plan with the respective 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 NOx meeting the 2008 Eight-Hour Ozone NAAQS requirements in:**
  - The DVRPC portion of the Philadelphia–Wilmington–Atlantic City Ozone Nonattainment Area.
- **Direct $PM_{2.5}$ and precursor nitrogen oxides (NO_x) meeting the 1997 Annual and 2006 24-Hour $PM_{2.5}$ NAAQS requirements in:**
  - 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, and
  - The DVRPC portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT 24-Hour $PM_{2.5}$ Maintenance Area.
- **Direct $PM_{2.5}$ and precursor nitrogen oxides (NO_x) meeting the 2012 Annual $PM_{2.5}$ NAAQS requirements in:**
  - The Delaware County, PA Annual $PM_{2.5}$ Nonattainment Area.
- **CO meeting the 1971 CO NAAQS requirements in:**
  - The Philadelphia–Camden CO Maintenance Area,
  - The City of Burlington in Burlington County, New Jersey CO Maintenance Area, and
  - The City of Trenton in Mercer County, New Jersey 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 FY 2015 Pennsylvania TIP, and a new FY 2016 New Jersey TIP.

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 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 TIPs and Plan are within the limits established by the respective SIP budgets. In October 2014, the US EPA released the Motor Vehicle Emissions Simulator 2014 (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, and new data on fleets, and vehicle activity emissions. The US EPA allowed MPOs and DOTs a two-year grace period before requiring them to use MOVES 2014 to demonstrate transportation conformity. DVRPC will meet this deadline by using MOVES 2014 for this conformity determination.

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.

National Ambient Air Quality Standards

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 (PM_{10} 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. Implemented SIPs contain an MVEB. 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.

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 ($PM_{2.5}$), are believed to pose even greater health risks. Because of their small size, these fine particles can lodge deep in the lungs. Individuals particularly sensitive to $PM_{2.5}$ exposure include older adults, people with heart and lung disease, and children. Health studies have shown a significant association between exposure to $PM_{2.5}$ and premature mortality.

Additionally, $PM_{2.5}$ can be emitted directly from combustion engines or chemically formed in the atmosphere when certain gases are present. Direct $PM_{2.5}$ 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 $PM_{2.5}$ emissions can result from one or more of several exhaust components, including VOCs, NO_x, sulfur oxides (SO_x), and ammonia (NH_3).

The $PM_{2.5}$ NAAQS include an annual standard set at 12 $\mu g/m^3$ based on a three-year average of the annual mean $PM_{2.5}$ concentrations, and a 24-hour standard of 35 $\mu g/m^3$, based on a three-year average of the 98th percentile of 24-hour concentrations. The US EPA adopted this annual $PM_{2.5}$ 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 $PM_{2.5}$ NAAQS.

The DVRPC region is part of a complex combination of two $PM_{2.5}$ Maintenance Areas and a standalone 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 standalone nonattainment area in December 2014 for not attaining the 2012 Annual $PM_{2.5}$ NAAQS.

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

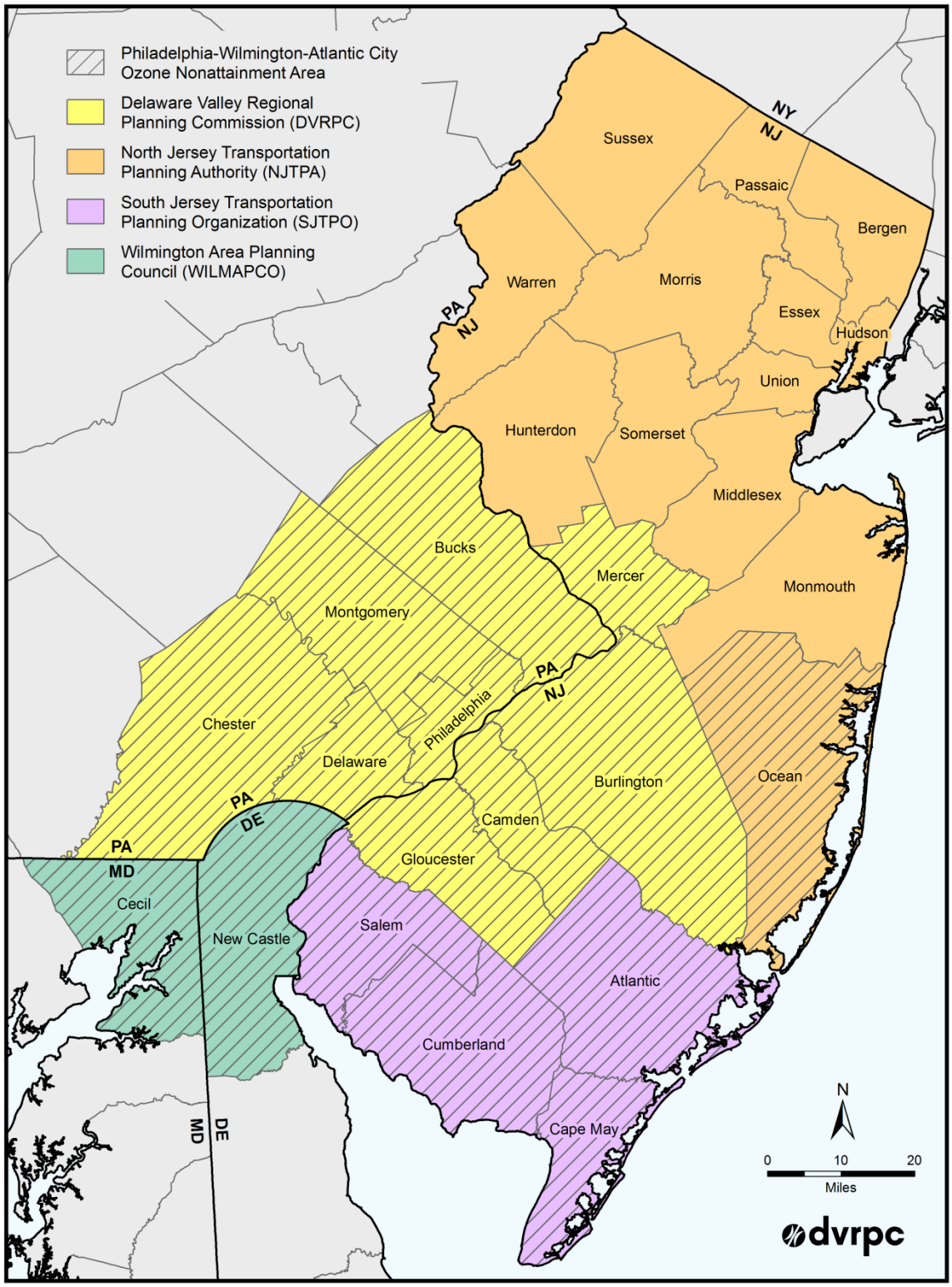
CO is a colorless, odorless, but poisonous gas produced by incomplete combustion of carbon compounds in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease. Exposure 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, portions of four counties in the region were designated as separate CO maintenance areas. The Philadelphia–Camden CO Maintenance Area comprises the cities of Camden and Philadelphia. Portions of Burlington (City of Burlington) and Mercer (City of Trenton) counties are also part of individual CO maintenance areas within the region.

In 2006 and 2007, the US EPA approved limited maintenance plan SIPs for New Jersey and Philadelphia. Due to the US EPA's approval of these CO limited maintenance plans, mobile emissions budgets and emissions analyses are no longer required to demonstrate conformity for CO in those counties.

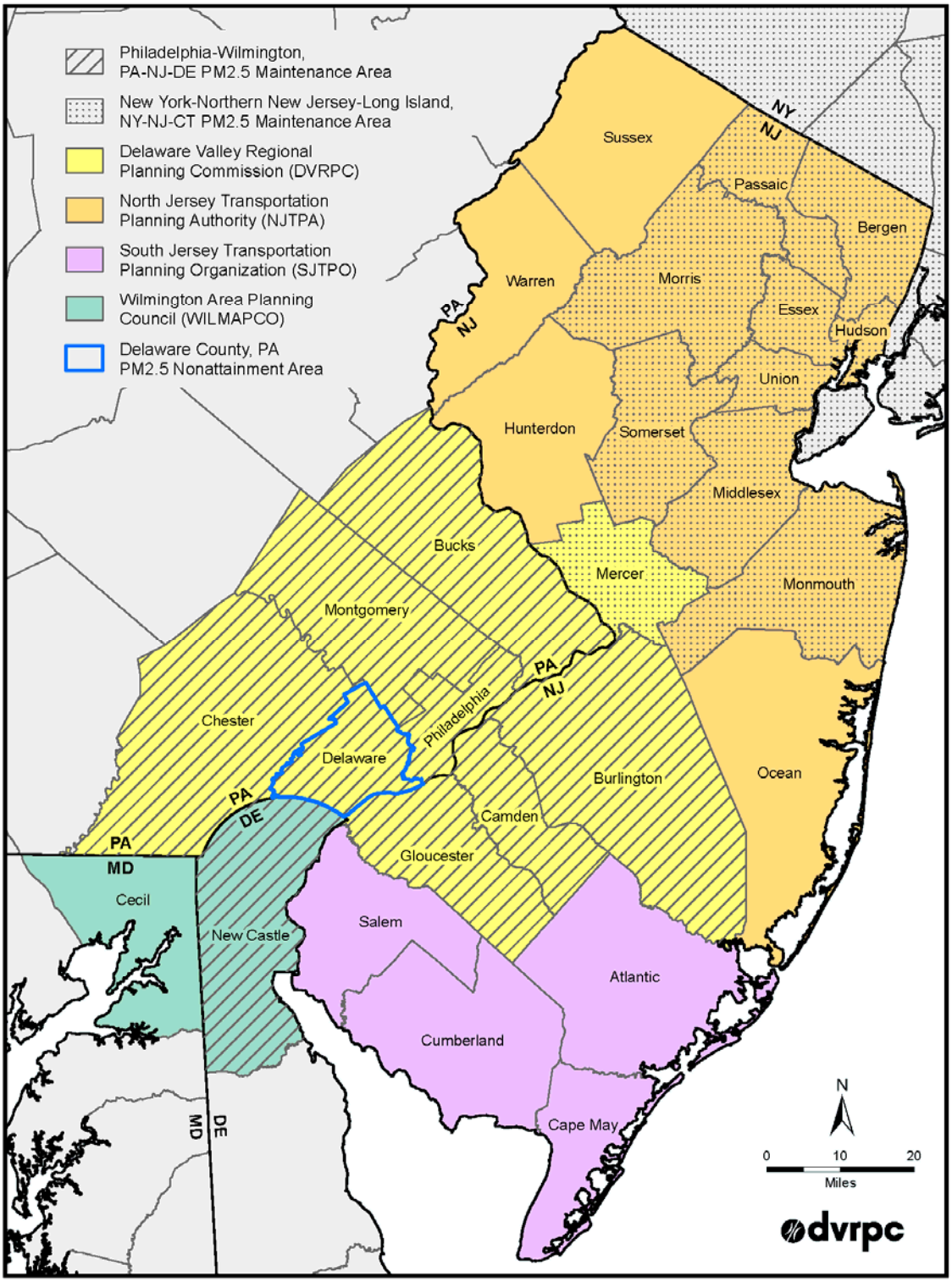
The attainment status for each of the criteria pollutants can be viewed at: **www.epa.gov/oar/oaqps/greenbk/index.html**. Detailed information on the attainment status for each region can be viewed at: :**www.epa.gov/air/urbanair/sipstatus/reports/pa_areabypoll.html**.

Figure 6: Philadelphia–Wilmington–Atlantic City Eight-Hour Ozone Nonattainment Area



Source: Delaware Valley Regional Planning Commission, 2015.

Figure 7: Delaware Valley Regional Planning Commission Annual and 24-Hour Fine Particulate Matter Maintenance and Nonattainment Areas



Source: Delaware Valley Regional Planning Commission, 2015.

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 2015 Pennsylvania and FY 2016 New Jersey TIPs are staged, multiyear, intermodal programs of transportation projects covering the five Pennsylvania counties and four New Jersey 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 ICG for appropriate air quality code and analysis year.

The *Connections 2040* Long-Range Plan, adopted in July 2013, and amended in July 2014, 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* 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 TIPs and the Plan:

- **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 includes all those in the Plan, those in the current TIPs, 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 and New Jersey Air Quality Off-Network Estimator (PAQ-ONE and NJAQ-ONE respectively) are a set of travel impact and emissions analysis methodologies developed for the state DOTs to be used for off-network analyses.

DVRPC Air Quality Code

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

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."

The ICG has reviewed all projects and concurred on all assigned AQ codes in the Plan and the TIP.

Table 2: Air Quality Codes for Projects in the Plan and Transportation Improvement Programs

Exempt Project Category† — Safety Projects	DVRPC AQ Code
Railroad/highway crossing	S1
Hazard elimination program	S2
Safer non-federal-aid system roads	S3
Shoulder improvements	S4
Increasing sight distance	S5
Safety improvement program	S6
Traffic control device and operating assistance other than signalization projects	S7
Railroad/highway crossing warning devices	S8
Guardrails, median barriers, crash cushions	S9
Pavement resurfacing and/or rehabilitation	S10
Pavement marking demonstration	S11
Emergency relief (23 U.S.C. 125)	S12
Fencing	S13
Skid treatments	S14
Safety roadside rest areas	S15
Adding medians	S16
Truck-climbing lanes outside the urbanized area	S17
Lighting improvements	S18
Widening narrow pavements or reconstructing bridges (no additional travel lanes)	S19
Emergency truck pullovers	S20

Exempt Project Category†—Air Quality Projects	DVRPC AQ Code
Continuation of ridesharing and van-pooling promotion activities at current levels	A1
Bicycle and pedestrian facilities	A2

Exempt Project Category†—Mass Transit Projects	DVRPC AQ Code
Operating assistance to transit agencies	M1
Purchase of support vehicles	M2
Rehabilitation of transit vehicles	M3
Purchase of office, shop, and operating equipment for existing facilities	M4
Purchase of operating equipment for vehicles (e.g., radios, fare boxes, lifts, etc.)	M5
Construction or renovation of power, signal, and communications systems	M6
Construction of small passenger shelters and information kiosks	M7
Reconstruction or renovation of transit buildings and structures	M8
Rehabilitation or reconstruction of track structures, track, and tracked-in existing rights-of-way	M9
Purchase of new buses and rail cars to replace existing vehicles or for minor expansions of the fleet	M10
Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part 771	M11

Not Regionally Significant Project Category	DVRPC AQ Code
Projects determined to be "Not Regionally Significant" and do not fit into an exempt category	NRS

<<continued>>

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

Exempt Project Category† —Study and Development Projects (NJ) and Projects Planned for Funding in Future Years (PA)	DVRPC AQ Code
Project in the Study and Development Program expected to result in an exempt project	SDX
Project in the Study and Development Program expected to result in a nonexempt project	SDN
Project on the Illustrative Unfunded List expected to result in a nonexempt project	FYN

Source: Delaware Valley Regional Planning Commission, 2015.

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 (Pennsylvania counties only), 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.

Table 3: Mobile Source Analysis Years

Year	Ozone	$PM_{2.5}$	Note
2017 (PA Only)	√	√	$PM_{2.5}$ SIP budget year in PA
2020	√	√	2012 $PM_{2.5}$ Std. attainment date and near term year
2025	√	√	PA and NJ $PM_{2.5}$ SIP budget year
2035	√	√	Year within 10 years of previous analysis
2040	√	√	DVRPC Plan Horizon Year

Source: Delaware Valley Regional Planning Commission, 2015.

In the New York–Northern New Jersey–Long Island, NY–NJ–CT $PM_{2.5}$, Philadelphia–Wilmington, PA–NJ–DE $PM_{2.5}$ Maintenance Areas, and the Delaware County $PM_{2.5}$ Nonattainment Area, the analysis years are 2020 (the attainment date for the 2012 $PM_{2.5}$ standard for Delaware County and near term year), 2025 (a SIP budget year in New Jersey and Pennsylvania), 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). In the Pennsylvania counties 2017 is also an analysis year because that is an additional SIP budget year in Pennsylvania.

To demonstrate conformity in New Jersey, projected $PM_{2.5}$ emissions in analysis years must not exceed the 2009 (for analysis years before 2025) and 2025 (for analysis years 2025 and later) budgeted emissions in the New Jersey portion of the Philadelphia–Wilmington, PA–NJ–DE $PM_{2.5}$ Maintenance Area and Mercer County in the New York–Northern New Jersey–Long Island, NY–NJ–CT $PM_{2.5}$ Maintenance Area.

To demonstrate conformity in Pennsylvania, 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.

Both New Jersey and Pennsylvania have approved limited maintenance plans 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 ICG for the conformity demonstration.

Table 4: Projects Included in the Regional Emissions Analysis

Analysis Year	Project Set
2008 PA only (Eight-Hour Ozone SIP Budget)	Eight-Hour Ozone RFP SIP budget year included to compare against future emissions analysis (PA portion of the region).
2009 NJ only (Eight-Hour Ozone SIP Budget)	Eight-Hour Ozone Attainment SIP budget year included to compare against future emissions analysis (NJ portion of the region).
2017 PA only ($PM_{2.5}$ budget)	$PM_{2.5}$ SIP budget year included to compare against future emissions analysis (PA portion of the region).
2017 (PA only)	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 (PA portion of the region).
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 (NJ and PA $PM_{2.5}$ 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, 2015

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 limits 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 in Pennsylvania and New Jersey. 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. On May 21, 2012, EPA published a final rule for the implementation of the 2008 Eight-Hour Ozone NAAQS (77 FR 30088). In the same rulemaking, EPA revoked the 1997 Eight-Hour Ozone NAAQS for the purposes of transportation conformity, effective July 20, 2013. For this conformity determination, DVRPC is using the 2008 Ozone SIP Budget in Pennsylvania and 2009 Ozone SIP Budget in New Jersey. These budgets were approved by the US EPA for conformity purposes in February 2011 and May 2009, respectively. All ozone budgets have been established in cooperation with the state DEPs 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 approved Maintenance Plans for both the 1997 Annual and 2006 24-Hour $PM_{2.5}$ Standards in the New Jersey and Pennsylvania Counties in the DVRPC region (approved by US EPA in September 2013 and April 2015 respectively). Both of these state SIPs contain MVEBs for direct $PM_{2.5}$ and pre-cursor 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 DEPs. 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 NH_3. 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 a 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.

In New Jersey and Pennsylvania, the US EPA has approved limited maintenance plans for CO in Burlington, Mercer, Camden, and Philadelphia counties, and no further emissions analyses are required for the conformity determination.

Tables 5-7 show governing MVEBs to be utilized in this iteration of conformity demonstration.

Tables 8 and 9 provide the $PM_{2.5}$ SIP budgets for New Jersey and Pennsylvania expressed in tons/day units to demonstrate the budgets in terms of a 24-hour period. These tables are provided for demonstration purposes and were derived by dividing the annual budget by 365. 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)	New Jersey Subregion (tons/day)
VOCs	2008 Budget (tons per July day)	61.09 (all counties)	-
	2009 Budget (tons per July day)	-	25.98 (all counties)
NO_x	2008 Budget (tons per July day)	108.78 (all counties)	-
	2009 Budget (tons per July day)	-	63.66 (all counties)

Source: Delaware Valley Regional Planning Commission, 2015.

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

Table 6: New Jersey $PM_{2.5}$ Emissions Budgets (Tons/Year) †

Pollutant	Budget	Burlington, Camden, and Gloucester counties (tons/year)	Mercer County (tons/year)
Annual and 24-Hour Direct $PM_{2.5}$ ♦	2009 Budget (tons per year)	680	224
Annual and 24-Hour Precursor NO_x ♦		18,254	5,835
Annual and 24-Hour Direct $PM_{2.5}$ ♦	2025 Budget (tons per year)	363	119
Annual and 24-Hour Precursor NO_x ♦		8,003	2,551

Source: Delaware Valley Regional Planning Commission, 2015.

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.
♦ Both state 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/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, 2015.

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

Table 8: New Jersey $PM_{2.5}$ Emissions Budgets (Tons/Day) (Demonstration Purposes) ♦

Pollutant	Budget	Burlington, Camden, and Gloucester counties (tons/year)	Mercer County (tons/year)
24-Hour Direct $PM_{2.5}$	2009 Budget (tons per day)	1.9	0.6
24-Hour Precursor NO_x ♦		50	15
24-Hour Direct $PM_{2.5}$	2025 Budge (tons per day)	1.0	0.3
24-Hour Precursor NO_x ♦		22	7

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.

Table 9: 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 ICG 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. The TIM 2.0 validation documentation is currently in development.

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 ICG before DVRPC begins the regional emissions analysis. The planning assumptions used in this demonstration are the latest and most current assumptions available as of May 27, 2015, which is the start date of 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 other 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 10 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 10: 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, 2015

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

Plan and TIP Amendments

The Final Rule requires MPOs to demonstrate conformity when any nonexempt, regionally significant projects in the Plan or the TIPs are altered substantially to change regional travel patterns. This iteration of conformity is triggered by a new FY 2016 New Jersey TIP and new regionally significant projects being amended to FY 2015 Pennsylvania TIP and *Connections*

2040 Long-Range Plan. This conformity iteration reflects all such changes proposed to the Plan and the TIPs since their last demonstration.

Each state's TIP and the *Connections 2040* Plan contain an AQ code associated with each project that identifies the project's relationship to the conformity analysis. Each code indicates whether the project is exempt or regionally significant, and the first year of analysis in the TDM network or off-network analysis.

The ICG reviewed all proposed AQ codes in the FY 2015 Pennsylvania TIP, FY 2016 New Jersey TIP, and *Connections 2040* Long-Range Plan prior to the start of this conformity analysis.

Travel Demand Simulation

DVRPC is using a TDM for this conformity determination named TIM 2.0. This TDM has been validated following FHWA guidance and features an expanded geography to improve travel simulation within, through, and across the region. The previous DVRPC TDM only included data on the nine-county DVRPC 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 TIPs. Travel patterns and modal splits are then run through a post processor in preparation for emissions analysis by MOVES.

The ICG 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 ICG has approved the use of the PAQ-ONE and NJAQ-ONE off-network travel impact and emissions analysis methodologies developed for the state DOTs. 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 11 identifies the projects in the Pennsylvania TIP, New Jersey TIP, and *Connections 2040 Long-Range Plan* that were analyzed using off-network methodologies. Emissions from these analyses were applied to the results from the network model.

Table 11: Nonexempt, Off-Network Projects in the Plan and Transportation Improvement Program

MPMS#/ DBNUM	County/ Agency	Project/Facility	First Year of Analysis
60540	SEPTA	Parking Improvements/Expansions	2017
60574	SEPTA	Paoli Transportation Center	2025
60655	SEPTA	Levittown Station	2020
73214	SEPTA	Ardmore Transportation Center	2035
93588	SEPTA	Exton Station	2020
AF	PennDOT	Keystone Corridor	2025
93588	SEPTA	Exton Station	2025
T199	NJ Transit	Job Access Reverse Commute Program	2017

Source: Delaware Valley Regional Planning Commission, 2015.

Note: SEPTA = Southeastern Pennsylvania Transportation Authority, PennDOT = Pennsylvania Department of Transportation, NJ Transit = New Jersey Transit

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 emission 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, and 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 May 27, 2015. 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, FY 2015 TIP for Pennsylvania, and FY 2016 TIP for New Jersey segregated into networks according to the anticipated date that the facilities will be open to traffic.

The TDM estimates total annual VMT. The month VMT fraction and day 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, humidities, and fuel programs also vary by month and these differences are accounted for in the twelve 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 NOx 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 2008 MVEB for Pennsylvania and the Eight-Hour Ozone SIP 2009 MVEB for New Jersey. The US EPA published the approval these budgets in the *Federal Register* in February 2011 and May 2009, respectively.

Tables 12 and 13 present the results of these calculations for the transportation conformity simulation for the critical ozone precursors of VOCs and NO_x. Analysis years for ozone are 2017

(Pennsylvania only), 2020, 2025, 2035, and 2040. 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 12: Volatile Organic Compounds Emissions Analysis Results (Tons/July Day)

		SIP 2008 MVEB†	SIP 2009 MVEB†	2017	2020	2025	2035	2040
PA	Emissions from MOVES 2014	-	-	35.73	30.85	20.32	12.52	11.06
	Adjustments from Off-Network Calculation‡	-	-	0.0	0.0	0.0	0.0	0.0
	Estimated Total Emissions	61.09	-	35.73	30.85	20.32	12.52	11.06
NJ	Emissions from MOVES 2014	-	-	-	8.83	6.83	4.45	4.12
	Adjustments from Off-Network Calculation‡	-	-	-	0.0	0.0	0.0	0.0
	Estimated Total Emissions	-	25.98	-	8.83	6.83	4.45	4.12

Source: Delaware Valley Regional Planning Commission, 2015

Table 13: Nitrogen Oxides Emissions Analysis Results (Tons/July Day)

		SIP 2008 MVEB†	SIP 2009 MVEB†	2017	2020	2025	2035	2040
PA	Emissions from MOVES 2014	-	-	69.86	53.64	33.74	19.29	17.77
	Adjustments from Off-Network Calculation‡	-	-	0.0	0.0	-0.1	-0.1	-0.1
	Estimated Total Emissions	108.78	-	69.86	53.64	33.73	19.28	17.76
NJ	Emissions from MOVES 2014	-	-	-	15.65	10.01	6.36	6.03
	Adjustments from Off-Network Calculation‡	-	-	-	0.0	0.0	0.0	0.0
	Estimated Total Emissions	-	63.66	-	15.65	10.01	6.36	6.03

Source: Delaware Valley Regional Planning Commission, 2015

Note: ***MVEB = Motor Vehicle Emissions Budget; SIP = State Implementation Plan.***
† The most recent Eight-Hour Ozone SIP MVEBs (2008 in Pennsylvania or 2009 in New Jersey) 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 two different maintenance areas. Tables 14 and 15 provide the $PM_{2.5}$ emissions estimate results for the maintenance areas in each state and Table 16 provides the emissions estimates and MVEB for the Delaware County 2012 Annual $PM_{2.5}$ Nonattainment Area.

In New Jersey, governing SIP MVEBs for the years 2009 and 2025 were approved for both the Annual and 24-Hour $PM_{2.5}$ standards in September 2013. 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 ICG determined that the county level budget included in the SIP appendix would be appropriate to use as an approved MVEB for the 2012 Delaware County, PA Annual $PM_{2.5}$ Nonattainment Area. The ICG also approved that a safety margin, comprised of Delaware County's VMT based portion of the regional safety margin included in the SIP, be added to the Delaware County MVEB. In Table 16. DVRPC is demonstrating that the emissions estimates for Delaware County meet the $PM_{2.5}$ SIP MVEBs with and without the safety margin.

Conformity is demonstrated against the relevant budgets, which are established for 2009 and 2025 in New Jersey and 2017 and 2025 in Pennsylvania. All applicable direct $PM_{2.5}$ sources and precursors (NO_x) are tested for the 2017(PA only), 2020, 2025, 2035, and 2040 $PM_{2.5}$ emissions estimates.

Since the $PM_{2.5}$ SIPs in each state 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.

Tables 17 and 18 present the MVEBs and emissions analysis in terms of tons/day of emissions. These values were calculated by dividing the MVEBs and emissions analysis results by 365 days/year per ICG guidance.

Table 14: Annual and 24-Hour Direct Fine Particulate Matter and Nitrogen Oxides Emissions Analysis Results (Tons/Year) for New Jersey

		2009	2020	2025	2025	2035	2040
		SIP MVEB†	Estimated Emissions*	SIP MVEB†	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*
Direct $PM_{2.5}$	Burlington, Camden, and Gloucester Counties*‡	680	205	363	154	118	116
	Mercer County*«	224	66	119	48	36	37
$PM_{2.5}$ Precursor (NO_x)	Burlington, Camden, and Gloucester Counties*‡	18,254	4,310	8,003	2,818	1,861	1,787
	Mercer County*«	5,835	1,322	2,551	854	569	554

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 2009 and 2025 MVEBs apply to all future analysis years.
**** Off-model adjustments have been made.***
‡ Results are only for Burlington, Camden, and Gloucester counties, which are the New Jersey portion of the Philadelphia–Wilmington, PA–NJ–DE $PM_{2.5}$ Maintenance Area.
« Results are only for Mercer County, which is the DVRPC New Jersey portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT $PM_{2.5}$ Maintenance Area.

Table 15: Annual and 24-Hour Direct Fine Particulate Matter and Nitrogen Oxides Emissions Analysis Results (Tons/Year) for Pennsylvania

		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	884	636	1,316	511	342	352
$PM_{2.5}$ Precursor (NO_x)	DVRPC—PA*	37,922	23,854	19,074	25,361	11,811	7,166	5,039

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 16: 2012 Annual Direct Fine Particulate Matter and Nitrogen Oxides 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*
		W/o safety margin			W/o safety margin			
Direct $PM_{2.5}$	Delaware	251	121	87	201	68	41	46
		219			175			
$PM_{2.5}$ Precursor (NO_x)	Delaware	5,544	3,038	2,570	3,730	1,282	932	576
		5,040			3,391			

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.

Table 17: Annual and 24-Hour Direct Fine Particulate Matter and Nitrogen Oxides Emissions Analysis Results (Tons/Day) for New Jersey (Demonstration Purposes)

		2009	2020	2025	2025	2035	2040
		Derived MVEB	Estimated Emissions*	Derived MVEB	Estimated Emissions*	Estimated Emissions*	Estimated Emissions*
Direct $PM_{2.5}$	Burlington, Camden, and Gloucester Counties‡	1.9	0.6	1.0	0.4	0.3	0.3
	Mercer County«	0.61	0.18	0.32	0.13	0.1	0.1
$PM_{2.5}$ Precursor (NO_x)	Burlington, Camden, and Gloucester Counties‡	50.0	11.8	21.9	7.7	5.1	4.9
	Mercer County«	15.0	3.6	7.0	2.3	1.6	1.5

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.***
‡ Results are only for Burlington, Camden, and Gloucester counties, which are the New Jersey portion of the Philadelphia–Wilmington, PA–NJ–DE $PM_{2.5}$ Maintenance Area.
« Results are only for Mercer County, which is the DVRPC New Jersey portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT $PM_{2.5}$ Maintenance Area.

Table 18: Annual and 24-Hour Direct Fine Particulate Matter and Nitrogen Oxides Emissions Analysis Results (Tons/Day) for Pennsylvania (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	2.4	1.7	3.6	1.4	0.9	1.0
$PM_{2.5}$ Precursor (NO_x)	DVRPC—PA	103.9	65.4	52.3	69.5	32.4	19.9	13.8

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.

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 11 through 16 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 and New Jersey 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:

- That the Plan and the TIPs 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 TIPs do not interfere with the timely implementation of transportation control measures (TCMs) [40 CFR 93.113]; and
- That the Plan and the TIPs are consistent with the MVEBs in the applicable state implementation plans [40 CFR 93.118];

All identified conformity evaluation criteria in the Final Rule and subsequent responses from DVRPC are detailed in Table 19.

Table 19: 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 (PA only), 2020, 2025, 2035, and 2040 correspond to the 2012 Annual $PM_{2.5}$ attainment date (Delaware County), SIP budget years in both states, interim years within a 10-year time frame, and the current DVRPC Plan horizon years.
§93.106(a)(2)(i)	Does the plan quantify and document the demographic and employment factors influencing transportation demand?	Yes. The *Connections 2040* 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.
§93.108	Are the TIP and the transportation plan 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	Are the conformity determinations based upon the latest planning assumptions?	Yes.
	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?	Yes. This conformity determination utilizes the most recent planning assumptions as of May 27, 2015, the start date of this conformity determination process for the New Jersey and Pennsylvania TIPs and Plan.
	Are the assumptions derived from the estimates of current and future population, employment, travel, and congestion 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?	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.
	Are any changes in the transit operating policies (including fares and service levels) and assumed transit ridership discussed in the determination?	Yes. Applicable transit operating policies and transit ridership are discussed in this document and were verified through the consultation process. (Chapter 3, p. 31).
	The conformity determination must include reasonable assumptions about transit service and increases in transit fares and road and bridge tolls over time.	Key transit and toll assumptions are outlined in this document were verified through the consultation process. (Chapter 3, p. 31&32).
	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.	Currently, there are no adopted TCMs in the corresponding SIPs.
	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.	Key assumptions are specified and other supporting documents are included in this conformity determination document, which is available to the ICG and the public.

<<continued>>

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 TIPs 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 are scheduled to receive comments regarding the transportation conformity of the Plan and the TIPs 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 FY 2016 NJ TIP supplants the FY 2014 NJ TIP. The FY 2015 PA TIP is a conforming TIP and the *Connections 2040* Long-Range Plan is a conforming Plan.
§93.115	Are the projects from a conforming plan and TIP?	Yes. The projects are from conforming TIPs and the Plan. The TIPs are consistent with the Plan.
§93.118	For areas with SIP Budgets: is the transportation plan, TIP, or project consistent with the established motor vehicle emissions budget(s) in the applicable SIP?	Yes. Projects contained in the TIPs 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 Plan and the TIPs 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 state implementation plan?	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, 2015

CHAPTER 5: Stakeholder Participation

Interagency Consultation Group Meetings

DVRPC hosted a series of ICG meetings and correspondence for this iteration of the transportation conformity demonstration of the Plan and the TIPs. Two ICG meetings were held. The first meeting was held on May 27, 2015, to assess the transportation conformity process, to advise on the timeline, and to determine the latest planning assumptions utilized. At that meeting the ICG reviewed draft TIP project sets, updates to the *Connections 2040* Long-Range Plan, and associated AQ codes. The second meeting was held on July 7, 2015, to review the draft conformity document before it was released for public comment.

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

Represented federal, state, and local partners on the ICG included US EPA Region II and III offices, FHWA–NJ Division Office, FHWA–PA Division Office, NJDOT, NJ Transit, NJ DEP, PA DEP, PennDOT, and SEPTA. The consultant firm of Michael Baker Jr., Inc., also participated in the ICG process because of its extensive involvement and expertise in the transportation conformity processes in both Pennsylvania and New Jersey.

Public Participation

DVRPC is scheduled to open a mandated 30-day public comment period on July 9, 2015, 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 June 29, 2015. 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 (in both states) and made available online at **www.dvrpc.org**. Two public meeting/information sessions are scheduled to be held on July 23, 2015, at the DVRPC offices at 190 N. Independence Mall West, in Philadelphia and July 30, 2015 at the Cherry Hill Library, 1100 Kings Highway North Cherry Hill, New Jersey. The comment period will close on August 10, 2015, at 5:00 PM.

DVRPC encourages the public to submit comments on the Draft Conformity document by email to **tip-plan-comments@dvrpc.org**; by faxing to (215) 592-9125; by mailing to the address at the end of this document, Attention: TIP/Plan/Conformity Comments; or by submitting a written copy of oral comments made at the public meetings. After consideration of the public comments, the DVRPC Board may adopt the Draft TIP with any recommended changes at the September, 2015, Board meeting.

CHAPTER 6: Conclusion

The DVRPC Plan and TIPs are found to be in conformity with the current Pennsylvania and New Jersey 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 states 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 TIPs 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 TIPs do not interfere with the timely implementation of transportation control measures (TCMs) [40 CFR 93.113], and
- That the Plan and the TIPs are consistent with the MVEBs in the applicable state implementation plans [40 CFR 93.118].

These findings demonstrate transportation conformity of the FY 2015 TIP for Pennsylvania, FY 2016 TIP for New Jersey, and the DVRPC *Connections 2040* Long-Range Plan 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 1997 Annual and 2006 24-Hour $PM_{2.5}$ NAAQS in the DVRPC portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT $PM_{2.5}$ Maintenance Area,
- The 2012 Annual $PM_{2.5}$ NAAQS in the Delaware County, PA, $PM_{2.5}$ Nonattainment Area, and
- The 1971 Eight-Hour CO NAAQS in the Philadelphia–Camden CO Maintenance Area; in the City of Burlington in Burlington County, New Jersey; and in the City of Trenton in Mercer County, New Jersey.

Title of Report: Draft Transportation Conformity Demonstration: FY 2015 Pennsylvania TIP, FY 2016 New Jersey TIP and *Connections 2040* Long-Range Plan

Publication Number: 15050

Date Published: July 2015

Geographic Area Covered:

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 in New Jersey.

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, Multi-jurisdictional 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 Fiscal Year (FY) 2015 Pennsylvania Transportation Improvement Program (TIP), FY 2016 New Jersey TIP, and *Connections 2040* Long-Range Plan. A transportation conformity demonstration is required at least once every four years or when an MPO: 1) adopts a new Plan or TIPs, or 2) amends, adds, or deletes a regionally significant, non-exempt 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 (NAAQS) requirements governing ozone, carbon monoxide, and fine particulate matter. This conformity finding reflects all amendments to the Plan and TIPs through June 2015.

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