



Delaware Valley Regional Planning Commission  
June 2008

# Conformity Findings



Demonstrations of  
Transportation Conformity of the  
DVRPC FY 2009-2012 PA and NJ  
Transportation Improvement Programs  
and the *Destination 2030* Long Range Plan

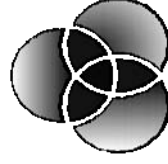


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DVRPC FY 2009 - 2012 PA and NJ Transportation Improvement Programs  
and the *Destination 2030* Long Range Plan

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Philadelphia, PA 19106-1520

[www.dvrpc.org](http://www.dvrpc.org)

June 2008

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Created in 1965, the Delaware Valley Regional Planning Commission [DVRPC] is an interstate, intercounty, and intermunicipal agency that provides continuing, comprehensive, and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.



The DVRPC logo is adapted from the official seal of the Commission, 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.

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

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## GLOSSARY OF ACRONYMS AND TERMS

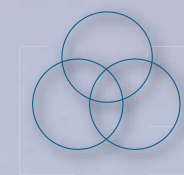
<b>AQS</b>	Air Quality Subcommittee (WILMAPCO)	<b>PennDOT</b>	Pennsylvania State Department of Transportation
<b>CAA</b>	Clean Air Act as amended	<b>Plan</b>	DVRPC <i>Destination 2030</i> Long Range Plan
<b>CFR</b>	Code of Federal Regulations	<b>PM<sub>2.5</sub></b>	Fine Particulate Matter
<b>CMAQ</b>	Congestion Management/Air Quality	<b>ppm</b>	parts per million
<b>CO</b>	Carbon Monoxide	<b>SAFETEA-LU</b>	Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users
<b>DVRPC</b>	Delaware Valley Regional Planning Commission	<b>SEPTA</b>	Southeastern Pennsylvania Transportation Authority
<b>FHWA</b>	Federal Highway Administration	<b>SIPs</b>	State Implementation Plans
<b>Final Rule</b>	Current conformity guidance under CAA	<b>State DEPs</b>	State Departments of Environmental Protection
<b>FR</b>	Federal Register	<b>State DOTs</b>	State Departments of Transportation
<b>FTA</b>	Federal Transit Administration	<b>TAZ</b>	Traffic Analysis Zone
<b>I/M</b>	Inspection and Maintenance	<b>TCICG</b>	Transportation Conformity Interagency Consultation Group (DVRPC)
<b>Maintenance Area</b>	Area that previously did not meet NAAQS	<b>TIPs</b>	DVRPC FY 2009 Transportation Improvement Programs
<b>MPO</b>	Metropolitan Planning Organization	<b>U.S.C.</b>	United States Code
<b>MVEB</b>	Motor Vehicle Emissions Budget	<b>US DOT</b>	United States Department of Transportation
<b>NAAQS</b>	National Ambient Air Quality Standards	<b>US EPA</b>	United States Environmental Protection Agency
<b>NJQAQ-ONE</b>	New Jersey Air Quality Off-Network Estimator	<b>VMT</b>	Vehicle-Miles-Traveled
<b>NJ DOT</b>	New Jersey State Department of Transportation	<b>VOCs</b>	Volatile Organic Compounds
<b>NJ Transit</b>	New Jersey Transit	<b>WILMAPCO</b>	Wilmington Area Planning Council
<b>Nonattainment Area</b>	Area currently not meeting NAAQS		
<b>NO<sub>x</sub></b>	Nitrogen Oxides		
<b>PAQ-ONE</b>	Pennsylvania Air Quality Off-Network Estimator		

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Delaware Valley Regional Planning Commission  
June 2008

# Section A



Executive Summary



# CONFORMITY FINDINGS

## EXECUTIVE SUMMARY

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*Demonstrations of Transportation Conformity of  
the DVRPC FY 2009 PA and NJ Transportation Improvement Programs and  
Destination 2030 Long Range Plan  
with the State Air Quality Implementation Plans of Pennsylvania and New Jersey  
and with Applicable National Ambient Air Quality Standards Requirements*



### **OVERVIEW**

This summary documents the demonstration of the transportation conformity of the DVRPC *Destination 2030* Long Range Plan (*Plan*) and the FY 2009-2012 Pennsylvania and New Jersey Transportation Improvement Programs (*TIPs*) with the respective State Air Quality Implementation Plans (*SIPs*) and applicable National Ambient Air Quality Standards (NAAQS) requirements under the Clean Air Act (CAA). The three interlocking circles appearing throughout this report represent the unity of these conformity components: the *Plan*, the *TIPs*, and the *SIPs*.

This conformity determination was conducted under the guidance of the Transportation Conformity Inter-Agency Consultation Group (TCICG). The TCICG is comprised of representatives of local, state, and federal transportation, environmental, and planning agencies, who review the planning assumptions, model parameters, and project analyses, and oversee the conformity process to insure that the various stakeholders and regulatory agencies are communicating throughout the conformity determination.

Transportation conformity documented in this report is specifically for the following pollutants within the stated designation areas. They are:

- ▷ Volatile Organic Compounds (VOCs) meeting the eight-hour ozone NAAQS requirements in:
  - the DVRPC portion of the Philadelphia-Wilmington-Atlantic City Ozone Nonattainment Area;
- ▷ Nitrogen Oxides (NO<sub>x</sub>) meeting the eight-hour ozone NAAQS requirements in:
  - the DVRPC portion of the Philadelphia-Wilmington-Atlantic City Ozone Nonattainment Area;
- ▷ Carbon Monoxide (CO) meeting the CO NAAQS requirements in:
  - the Philadelphia – Camden CO Maintenance Area;
  - the City of Burlington in Burlington County, New Jersey;

- the City of Trenton in Mercer County, New Jersey;
- ▷ Direct Fine Particulate Matter (PM<sub>2.5</sub>) meeting the PM<sub>2.5</sub> NAAQS requirements in:
  - the DVRPC portion of the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area; and
  - the DVRPC portion of the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area.
- ▷ Precursor NO<sub>x</sub> meeting the PM<sub>2.5</sub> NAAQS requirements in:
  - the DVRPC portion of the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area; and
  - the DVRPC portion of the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area.

This summary serves as an inclusive document that demonstrates the transportation conformity of the DVRPC *TIPs* and the *Plan* 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](http://www.dvrpc.org).

## ***ANALYSIS APPROACH***

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 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.

***NOT REGIONALLY SIGNIFICANT PROJECT***: a highway or transit project on a facility that does not serve regional needs or is not normally included in the regional emissions 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* stipulates that the emissions analysis of transportation plans and programs must model all regionally significant, nonexempt projects. Each project has an associated alphanumeric air quality code for the conformity determination and exempt eligibility identification purposes.

For the 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 metropolitan planning organization (MPO), such as DVRPC, conformity applies separately to individual state portions of its planning area under respective *SIPs*.

In the absence of an implemented *SIP*, areas must perform what is known as the “interim” emissions test. The *Final Rule* dictates that only certain interim test types and methodologies are allowed in a given nonattainment area, that they must be applied uniformly throughout the area, and that the US DOT determination on transportation conformity must be on the entire nonattainment area. The *Final Rule* further requires that all affected MPOs in the nonattainment area must work together to demonstrate conformity jointly until respective *SIPs* are implemented.

Within the DVRPC region, the NAAQS requirements for ozone, CO, and PM<sub>2.5</sub> must be met. In the nine-county DVRPC planning area, governing *SIPs* are in place for ozone and CO in the Pennsylvania and New Jersey subregions. For ozone, DVRPC utilizes the budget test to demonstrate conformity using applicable *SIP* MVEBs.

In 2006, New Jersey implemented a PM<sub>2.5</sub> *SIP* for selected portions of the state. Those areas in New Jersey with effective *SIP* PM<sub>2.5</sub> MVEBs now include Mercer County within the DVRPC planning area. Therefore, in Mercer, the budget test is also employed to demonstrate PM<sub>2.5</sub> conformity.

Otherwise, for the DVRPC portion within the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area, DVRPC coordinates its conformity efforts with WILMAPCO, and the two MPOs demonstrate conformity collectively for the entire nonattainment area. For this iteration of the conformity demonstration, DVRPC and WILMAPCO have jointly decided to use the “no-greater-than-2002-baseline” interim test. Also, the two MPOs have jointly decided to use the four-season annual inventory method. This annual inventory method is applied to all PM<sub>2.5</sub> emissions analyses in the DVRPC (except Mercer) and WILMAPCO planning areas.

The mobile source ozone emissions analysis years for VOCs and NO<sub>x</sub> are 2009 (pending *SIP* Budget Year), 2010 (eight-hour ozone standard attainment year and near term year within five years of *TIP* adoption), 2020 (the *interim* year selected to keep all analysis years no more than ten years apart) and 2030 (the *horizon* year of the *Plan*). VOCs and NO<sub>x</sub>, which are heat-sensitive ozone precursors, are estimated for a July day.

The US EPA is currently reviewing the adequacy of the 2008 Reasonable Further Progress *SIP* and 2009 Attainment *SIP* budgets for both Pennsylvania and New Jersey. It has been determined through interagency consultation that DVRPC will use the currently prevailing 2005, one-hour Ozone *SIP* budgets until the 2008 or 2009 eight-hour Ozone *SIP* budgets are found adequate for transportation conformity purposes. The most recent *SIP* budget will then be applicable for all future analysis years. All emissions estimates are tested against these budgets.

For CO, EPA has approved limited maintenance plans in place in Philadelphia, Burlington, Camden and Mercer counties. DVRPC is no longer required to perform regional emissions analysis for CO in the New Jersey or Pennsylvania subregions.

In the PM<sub>2.5</sub> demonstration, analysis years vary due to the different emissions tests being applied by area. The current analysis years in the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area are 2010, 2020, and 2030. These years are a required part of the interim test and will be used until applicable PM<sub>2.5</sub> *SIPs* are implemented in the nonattainment area. For the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area, the year 2009 is analyzed instead. 2009 is a PM<sub>2.5</sub> MVEB budget year for Mercer County. To demonstrate conformity, projected direct PM<sub>2.5</sub> emissions and precursor NO<sub>x</sub> emissions must not exceed 1) the 2002 baseline emissions results

in the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area; and, 2) the 2009 budgeted emissions in the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area.

## ***PLANNING ASSUMPTIONS***

All planning assumptions utilized in this demonstration are the latest and most current as of April 25, 2008, which is the start date of the DVRPC conformity analysis. The DVRPC Transportation Conformity Interagency Consultation Group (TCICG) has reviewed and concurred on all of the latest planning assumptions utilized.

DVRPC uses a multistep, multisource methodology to produce long-range population and employment estimates at the county level. These estimates in turn become the control totals for municipal-level and traffic analysis zone (TAZ) level estimates.

Population forecasting at the regional level involves review and analysis of five major components: births, deaths, migration, and changes in group-quarter populations (e.g., dormitories, military barracks, prisons, and nursing homes). DVRPC uses the cohort survival concept, based on the DVRPC's 2005 population estimates, to age individuals and determine the flow of people. DVRPC also relies on member counties to provide feedback on the population forecasts and information on any known, expected, and/or forecasted changes in group-quarter populations. Current and future population estimates for the DVRPC planning area were adopted by the DVRPC Board in July 2007.

In general, employment is more difficult to forecast than population, since it is impacted by numerous market factors that are difficult to predict. Various studies and past experience, however, have shown that there is a direct relationship between the number of households in a region (which is a function of population) and the number of jobs. The relative change in employment closely tracks the relative change in households, since the number of workers per household is relatively constant and also because new households require goods and services that create jobs. To forecast future employment, DVRPC calculated the ratio of employment to population for each county and the region as a whole in 1990, 2000, and 2005, and considered the historic trends in these ratios. Using planning knowledge of employment growth and decline, DVRPC developed a curve reflecting decreasing rates of growth or decline to determine the employment forecasts. All forecasts were reviewed by County planning staff before DVRPC Board adoption. Current and future employment estimates were adopted by the DVRPC Board in July 2007.

As part of the latest planning assumptions, current transit operations policies and other road toll structures are also considered. 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 2000 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 are incorporated into the future year networks as well. Future year transit networks are also augmented with any new services identified in the corresponding DVRPC *TIPs* and the *Plan*.



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.

## ***TRAVEL SIMULATION***

Regional emissions analysis begins with travel simulations. The enhanced DVRPC travel simulation, validated in 2005 using the US Census 2005 information, home interview survey, and traffic count data, is a classic four-step transportation modeling application that operates within an iterative (Evans algorithm) structure with respect to highway travel time, and is disaggregated into separate peak, midday and evening time periods. In the four-step modeling process, trip generation is based on constant trip rates imbedded in a cross-classification structure. Trip distribution uses a doubly constrained gravity model, stratified into three person (home-based work, home-based nonwork, and nonhome-based) and four vehicle trip purposes. Modal split employs a binary probit-like formulation stratified by trip purpose, transit submode, and auto ownership. The highway assignment component is based on the equilibrium method using minimum travel-time path. Free flow highway speeds are stratified by functional class and density of development.

Then the Evans algorithm reexecutes the trip distribution and the modal split highway components. This process is based on updated speeds after each iteration of the highway assignment and determines a weight value upon each performed iteration. This weight is then used to prepare a convex combination of the link volumes and trip tables for the current iteration and a running weighted average of the previous iterations. This algorithm converges rapidly to an equilibrium solution on highway travel speeds and congestion levels. When the equilibrium is attained, the model assigns the weighted average transit trip tables to the transit networks and produces link and route passenger volumes. Transit assignment is unrestrained and uses minimum paths based on the modal split model definition of impedance. The methodology and detailed TAZ level estimates are further explained in the DVRPC report: *2000 Travel Simulation for the Delaware Valley Region*. The iterative DVRPC travel demand simulation process has been reviewed and approved by the TCICG.

Due to the project scale, scope, or governing characteristics, certain nonexempt, regionally significant projects (such as park and ride facilities or bikeway improvements) cannot be represented and evaluated by the travel demand model properly. Therefore, travel impacts and emissions analyses of such projects are performed using off-network analysis tools, which are a set of travel impact and emissions analysis methodologies. The Pennsylvania Air Quality Off-Network Estimator (PAQ-ONE) and the New Jersey Air Quality Off-Network Estimator (NJAQ-ONE) are a set of such off-network methodologies developed for the Pennsylvania and New Jersey State Departments of Transportation (PennDOT and NJ DOT, respectively). Both PAQ-ONE and NJAQ-ONE contain independent MOBILE6.2 modules to determine emissions estimates. Once the characteristic changes in travel are calculated, the transportation results are fed into the emissions module to create emissions factors based on the county-level data and local assumptions. Final off-network emissions estimate outputs show the changes in VOCs, NO<sub>x</sub>, CO, and PM<sub>2.5</sub> in both kg/July-day, and tons/July-day for individual projects.

## ***EMISSIONS ESTIMATION***

The calculated travel impact changes from the travel simulation process are passed through the post-processor routine and are prepared for an emissions estimate model.

In demonstrating conformity, use of the newest version of the MOBILE emissions estimate model is required under the *Final Rule*. MOBILE6.2 is the latest version of the family of MOBILE mobile-source emissions estimate models developed by US EPA and it reflects many cumulative technological enhancements, emissions control updates, and trend shifts introduced since 1996. These changes include expanded vehicle type categories and state inspection and maintenance program specification options; more detailed vehicle activity information and fuel program definition; and revised base emissions rates.

Taking advantage of these updated changes, the input parameters to the MOBILE6.2 model specify the best available local data to accurately reflect the local conditions. Local temperature and humidity data are particularly important because MOBILE6.2 relies on these values to estimate A/C usage. Other settings accept the US EPA's default values, which represent "the worst-case conditions." Collectively, these local and default settings generate dependable regional emissions estimates suitable for demonstrating transportation conformity in the DVRPC region. As for specific parameter values, inputs for individual pollutants can and will vary.

As noted earlier, both PAQ-ONE and NJAQ-ONE also contain independent MOBILE6.2 modules to determine emissions estimates. Final off-network emissions estimate outputs from these off-network tools show the daily changes in VOCs, NO<sub>x</sub>, CO, and PM<sub>2.5</sub> for the project sets included in the *TIPs* and the *Plan*.

## ***FINDINGS***

The DVRPC *TIPs* and the *Plan* are found to be in conformity with the current Pennsylvania and New Jersey *SIPs* under the CAA. The forecasted emissions levels of VOCs, NO<sub>x</sub>, and PM<sub>2.5</sub> do not exceed the respective budgets and baseline established by 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 TCMs [40 CFR 93.113]; and
- that the *Plan* and the *TIPs* are consistent with the motor vehicle emissions budgets in the applicable implementation plans [40 CFR 93.118].

**Table E-1. VOCs Emission Analysis Results (Tons/July Day) †**

	2005	2008	2009	2009	2010	2020	2030
	<i>SIP</i> MVEB	<i>SIP</i> MVEB	<i>SIP</i> MVEB	Estimated	Estimated	Estimated	Estimated
PA	79.69	61.09	58.71	51.92	48.55	23.57	21.75
NJ	42.99	27.75	25.98	24.61	22.81	12.47	11.92

Source: DVRPC, 2008

Note: † The 2005 *SIP* MVEBs apply to all future years. The most recent (2008 or 2009) eight-hour ozone *SIP* MVEBs will apply to all future analysis years when those *SIP*s are found adequate for transportation conformity purposes. All emissions are rounded off to the nearest hundredth. Off-network adjustments have been made.

**Table E-2. NO<sub>x</sub> Emission Analysis Results (Tons/July Day) †**

	2005	2008	2009	2009	2010	2020	2030
	<i>SIP</i> MVEB	<i>SIP</i> MVEB	<i>SIP</i> MVEB	Estimated	Estimated	Estimated	Estimated
PA	144.73	108.78	101.60	86.93	78.24	24.51	15.32
NJ	63.44	69.67	63.66	60.01	53.57	14.72	9.41

Source: DVRPC, 2008

Note: † The 2005 *SIP* MVEBs apply to all future years. The most recent (2008 or 2009) eight-hour ozone *SIP* MVEBs will apply to all future analysis years when those *SIP*s are found adequate for transportation conformity purposes. All emissions are rounded off to the nearest hundredth. Off-network adjustments have been made.

**Table E-3. Direct PM<sub>2.5</sub> and NO<sub>x</sub> Emission Analysis Results (Tons/Year) †**

		2002	2009	2009	2010	2020	2030
		Baseline	<i>SIP</i> MVEB »	Estimated	Estimated	Estimated	Estimated
Direct PM <sub>2.5</sub>	PA	998.2	-	-	594.4	418.1	492.2
	NJ; except Mercer ‡	486.7	-	-	324.2	186.7	181.5
	DE (WILMAPCO) §	208.6	-	-	97.1	89.4	96.3
	Mercer only »	-	108	99	91	57	56
PM <sub>2.5</sub> Precursor (NO <sub>x</sub> )	PA	59,346.0	-	-	28,547.3	9,199.2	11,550.7
	NJ; except Mercer ‡	30,499.9	-	-	14,511.1	3,942.7	2,597.3
	DE (WILMAPCO) §	11,799.1	-	-	4,686.3	1,819.1	1,508.6
	Mercer only »	-	5,056	5,013	4,499	1,238	818

Source: DVRPC, 2008; WILMAPCO, 2008

Note: † Associated 2002 Baseline or 2009 MVEBs apply to all future analysis years. All emissions are rounded off to the nearest tenth except for those in Mercer. See note on » below.

‡ Results are for Burlington, Camden and Gloucester Counties only, which are the New Jersey portion of the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area.

§ Results are for New Castle County in Delaware only, and are provided by WILMAPCO. It is the Delaware portion of the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area.

» NJ *SIP* MVEBs and the emissions results are for Mercer County only, which is the DVRPC portion of the New York-Northern New Jersey-Long Island, NJ-NJ-CT PM<sub>2.5</sub> Nonattainment Area. Emissions results are rounded off to the nearest integer in accordance with the *SIP*.

Therefore, hereby demonstrated is transportation conformity of:

- ▷ the DVRPC *DESTINATION 2030* Long Range Plan;
- ▷ the FY 2009-2012 Pennsylvania *TIP*; and
- ▷ the FY 2009-2012 New Jersey *TIP*

with the corresponding state *SIP*s and the *Final Rule* requirements under CAA including:

- the eight-hour ozone NAAQS in the DVRPC portion of the Philadelphia-Wilmington-Atlantic City Ozone Nonattainment Area;

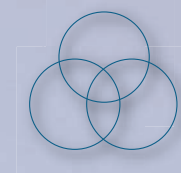
- the eight-hour CO NAAQS in the Philadelphia CO Maintenance Area, in the City of Burlington in Burlington County, New Jersey and in the City of Trenton in Mercer County, New Jersey;
- the PM<sub>2.5</sub> NAAQS in the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area; and
- the PM<sub>2.5</sub> NAAQS in the DVRPC portion of the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area.





Delaware Valley Regional Planning Commission  
June 2008

# Section B



**DVRPC Conformity  
Demonstration**



# CONFORMITY FINDINGS

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*A Demonstration of Transportation Conformity of the  
DVRPC FY 2009-2012 PA and NJ Transportation Improvement Programs  
and the Destination 2030 Long Range Plan  
with the State Air Quality Implementation Plans of Pennsylvania and New Jersey  
and with Applicable National Ambient Air Quality Standards Requirements*

## 1 INTRODUCTION

### 1.1 OVERVIEW

This report documents the demonstration of transportation conformity of the DVRPC *Destination 2030 Long Range Plan (Plan)* and the FY 2009 Pennsylvania and New Jersey Transportation Improvement Programs (*TIP*) with the respective State Air Quality Implementation Plans (*SIP*) and applicable National Ambient Air Quality Standards (NAAQS) requirements under the Clean Air Act as amended (CAA). The three interlocking circles appearing throughout this report represent the unity of the *Plan*, the *TIPs*, and the *SIPs*.

Transportation conformity documented in this report is specifically for the following pollutants within the stated designation areas. They are:

- ▷ Volatile Organic Compounds (VOCs) meeting the eight-hour ozone NAAQS requirements in:
  - the DVRPC portion of the Philadelphia-Wilmington-Atlantic City Ozone Nonattainment Area;

- ▷ Nitrogen Oxides (NO<sub>x</sub>) meeting the eight-hour ozone NAAQS requirements in:
  - the DVRPC portion of the Philadelphia-Wilmington-Atlantic City Ozone Nonattainment Area;
- ▷ Carbon Monoxide (CO) meeting the CO NAAQS requirements in:
  - the Philadelphia – Camden CO Maintenance Area;
  - the City of Burlington in Burlington County, New Jersey;
  - the City of Trenton in Mercer County, New Jersey;
- ▷ Direct Fine Particulate Matter (PM<sub>2.5</sub>) meeting the PM<sub>2.5</sub> NAAQS requirements in:
  - the DVRPC portion of the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area; and
  - the DVRPC portion of the New York-Northern New Jersey-Long-Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area.
- ▷ Precursor Nitrogen Oxides (NO<sub>x</sub>) meeting the PM<sub>2.5</sub> NAAQS requirements in:
  - the DVRPC portion of the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area; and

- the DVRPC portion of the New York-Northern New Jersey-Long-Island, NY-NJ-CT-PM<sub>2.5</sub> Nonattainment Area.

This report serves as an inclusive document that demonstrates transportation conformity of the DVRPC *TIP*s and the *Plan* with all applicable *SIP*s and NAAQS requirements for the above pollutants within the noted areas.

## 1.2 TRANSPORTATION CONFORMITY

CAA section 176(c) (42 U.S.C. 7506(c)) requires that federally supported highway and transit project activities must “conform to” state air quality goals found in *SIP*s. The process that preserves this consistency is called transportation conformity. This process ensures that transportation and air quality agencies are consulting with 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 United States Environmental Protection Agency (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.<sup>1</sup>

Transportation conformity is demonstrated when highway and transit activities that receive federal funds or approval are determined not to cause new air quality violations, worsen existing violations, or delay timely attainment of 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 the purpose of the corresponding *SIP*s. The United States Department of Transportation (US DOT) cannot fund, authorize, or approve federal actions to support programs or projects that are not found

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<sup>1</sup> US EPA also may designate an area as attainment/unclassifiable if: 1) it has monitored air quality and the data show that the area has not violated the governing standard over a certain period; or, 2) there is not enough information to determine the air quality in the area.



to conform to the CAA requirements governing the current NAAQS for transportation conformity.

This iteration of the conformity demonstration is based on the current, final conformity guidance (“*Final Rule*”) under CAA, including 40 CFR Part 93 as revised, and is for the criteria air pollutants addressed therein, among which are ozone, carbon monoxide (CO), and particulate matter (PM). 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. For those pollutants with no existing *SIP* budgets, specific interim testing procedures are followed. The demonstration process estimates emissions that will result from the region’s transportation system and determines that those emissions are within the limits outlined in respective *SIPs* and other applicable NAAQS requirements.

This demonstration also represents DVRPC’s firm commitment to adhere to the statutory requirements for planning and environmental reviews prescribed in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU) of 2005.<sup>2</sup>

### 1.3 NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

The CAA, first enacted in 1963 and last amended in 1990, currently mandates 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 it provides 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 the public health.

In compliance, US EPA has set NAAQS for several principal air pollutants, which are called “criteria” pollutants. These NAAQS criteria pollutants include ozone, CO, coarse and fine particulate matters (PM<sub>10</sub> and PM<sub>2.5</sub>, respectively), sulfur dioxide (SO<sub>2</sub>), and lead (Pb).

At the state level, the *SIP* represents the state’s air quality goals and strategies to meet those goals. 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 metropolitan planning organization (MPO), such as DVRPC, conformity applies separately to individual state portions of its planning area under respective *SIPs*.

In the absence of an implemented *SIP*, areas must perform what is known as the “interim” emissions test. The *Final Rule* dictates that only certain interim test types and methodologies in a given nonattainment area are allowed, that they must be applied

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<sup>2</sup> SAFETEA-LU compliance was first demonstrated in May 2007.

uniformly throughout the area, and that the US DOT determination on transportation conformity must be on the entire nonattainment area. The *Final Rule* further states that all affected MPOs in the nonattainment area must work together to demonstrate conformity jointly until respective SIPs are implemented. The CAA requires state departments of environmental protection (state DEPs) to develop and implement SIPs within three years of initial designation.

Within the DVRPC region, the NAAQS requirements for ozone, CO, and PM<sub>2.5</sub> must be met.

**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<sub>x</sub> in the presence of sunlight. While 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 asthmatics, but also normal, healthy adults and children as well.

Recognizing these harmful effects, US EPA has finalized ground-level ozone designations under the eight-hour ozone NAAQS. In this designation, the entire nine-county planning area of DVRPC falls within the Philadelphia-Wilmington-Atlantic City Moderate Ozone Nonattainment Area, which includes multiple jurisdictions in four states, five MPOs, and 18 counties. For DVRPC,

attainment of the eight-hour ozone NAAQS is required by June 2010.<sup>3</sup>

The state DEPs submitted Attainment SIPs reflecting the eight-hour NAAQS in the summer of 2007. The US EPA is currently reviewing these SIPs and has instructed DVRPC to include the 2008 Reasonable Further Progress SIP budgets, as well as the 2009 Attainment SIP budgets, for this conformity determination.<sup>4</sup>

In March 2008, the US EPA revised the eight-hour ozone NAAQS from 0.08 ppm to 0.075 ppm. Nonattainment area designations under these revised NAAQS are expected in between March 2010 and March 2011. New SIP MVEBs for the revised standard will be due three years after the final nonattainment area designations.

Figure 1 details the current ozone nonattainment area that affects the DVRPC region.

**Carbon Monoxide (CO)** is a colorless, odorless, yet poisonous gas produced by incomplete burning of carbon 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.<sup>5</sup> Following the attainment status,

<sup>3</sup> To be in attainment, the area must continuously carry out air quality monitoring, and the monitored ozone values measured over an 8-hr period must not exceed 0.08 parts per million (ppm) for three consecutive years.

<sup>4</sup> EPA Regions II and III have advised DVRPC to include these budgets for this conformity determination pending adequacy findings expected in May 2008.

<sup>5</sup> To attain the CO NAAQS, an 8-hr nonoverlapping average of CO level for the region must not exceed nine ppm more than once a year and the region must carry out air quality monitoring during the entire time.

portions of four counties in the region were designated as separate CO maintenance areas. The Philadelphia-Camden CO Maintenance Area is comprised of Camden and Philadelphia counties. Portions of Burlington (i.e., City of Burlington) and Mercer (i.e., City of Trenton) counties are also part of individual CO maintenance areas within the region. In 2006, US EPA approved revisions to the New Jersey *SIP* that included limited maintenance plans for CO in Burlington, Camden, and Mercer counties. In 2007, US EPA approved revisions to the Pennsylvania *SIP* which included a limited maintenance plan for Philadelphia. Due to EPA's approval of these CO limited maintenance plans, mobile emissions budgets and emissions analyses are no longer required by EPA to demonstrate conformity in those counties for CO.<sup>6</sup>

**Particulate matter (PM)** includes both solid particles and liquid droplets found in air. Many manmade 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 ( $\mu\text{m}$ ) in diameter ( $\text{PM}_{10}$ ), pose a health concern since they can be inhaled into and can accumulate in the respiratory system. The "fine" particles, less than 2.5  $\mu\text{m}$  in diameter ( $\text{PM}_{2.5}$ ), are believed to pose even greater health risks. Because of their small size, these fine particles can lodge deeply into the lungs. Individuals particularly sensitive to  $\text{PM}_{2.5}$  exposure include older adults, people with heart and lung disease, and children. Health studies have shown a significant association between exposure to  $\text{PM}_{2.5}$  and premature mortality.

<sup>6</sup> US EPA has approved the New Jersey and Pennsylvania *SIP* revisions and the limited maintenance plans for CO for Burlington, Camden, and Mercer counties in New Jersey and Philadelphia in Pennsylvania – and has published the approvals in the Federal Register on July 10, 2006 (71 FR 38770) and October 5, 2007 (72 FR 56911), respectively.

Additionally,  $\text{PM}_{2.5}$  can be emitted directly from combustion engines or chemically formed in the atmosphere when certain gases are present. Direct  $\text{PM}_{2.5}$  emissions can result from particles in exhaust fumes, from brake and tire wear, from road dust kicked up by vehicles, and from highway and transit construction. Indirect  $\text{PM}_{2.5}$  emissions can result from one or more of several exhaust components, including VOCs,  $\text{NO}_x$ , sulfur oxides ( $\text{SO}_x$ ), and ammonia ( $\text{NH}_3$ ). US EPA has instituted the  $\text{PM}_{10}$  NAAQS in July 1987 and promulgated the  $\text{PM}_{2.5}$  NAAQS in July 1997. Nonattainment areas were required to demonstrate the initial  $\text{PM}_{2.5}$  conformity by April 2006. Both state DEPs will submit  $\text{PM}_{2.5}$  *SIPs* to the US EPA in 2008. Those *SIPs* will not be approved by EPA in time to utilize the *SIP* MVEBs for  $\text{PM}_{2.5}$  in the Philadelphia-Wilmington, PA-NJ-DE Nonattainment Area in this conformity determination.

The  $\text{PM}_{2.5}$  NAAQS include an annual standard set at 15  $\mu\text{g}/\text{m}^3$ , based on a three-year average of the annual mean  $\text{PM}_{2.5}$  concentrations, and a 24-hour standard of 65  $\mu\text{g}/\text{m}^3$ , based on a three-year average of the 98<sup>th</sup> percentile of 24-hour concentrations. Areas need to meet both standards to be considered in attainment of  $\text{PM}_{2.5}$  NAAQS.<sup>7</sup>

On April 5, 2005, US EPA designations under the  $\text{PM}_{2.5}$  standards became effective, under which the area consisting of Bucks, Chester, Delaware, Montgomery and Philadelphia Counties in Pennsylvania, Burlington, Camden, and Gloucester Counties in New Jersey, and New Castle County in Delaware are collectively designated as a nonattainment area. This geographic area, termed as the Philadelphia-Wilmington, PA-NJ-DE  $\text{PM}_{2.5}$  Nonattainment Area, covers three states, two MPOs and 9 counties. Mercer

<sup>7</sup> On September 21, 2006, US EPA announced that it would tighten the 24-hour daily standards from the existing 65  $\mu\text{g}/\text{m}^3$  to 35  $\mu\text{g}/\text{m}^3$ . The nonattainment area designations for the new standards are expected to become effective in 2010.

County is part of another nonattainment area titled the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area that covers 3 states, 9 MPOs and 21 counties. Largely due to the current Metropolitan Statistical Area definitions in the US Census 2000, the DVRPC planning area is split between the two nonattainment areas for PM<sub>2.5</sub>, both of which are shown in Figure 2. These areas do satisfy the existing 24-hour standards, but portions of the area currently violate the annual standards. DVRPC must demonstrate conformity for each nonattainment area separately and must attain the PM<sub>2.5</sub> NAAQS by April 2010.

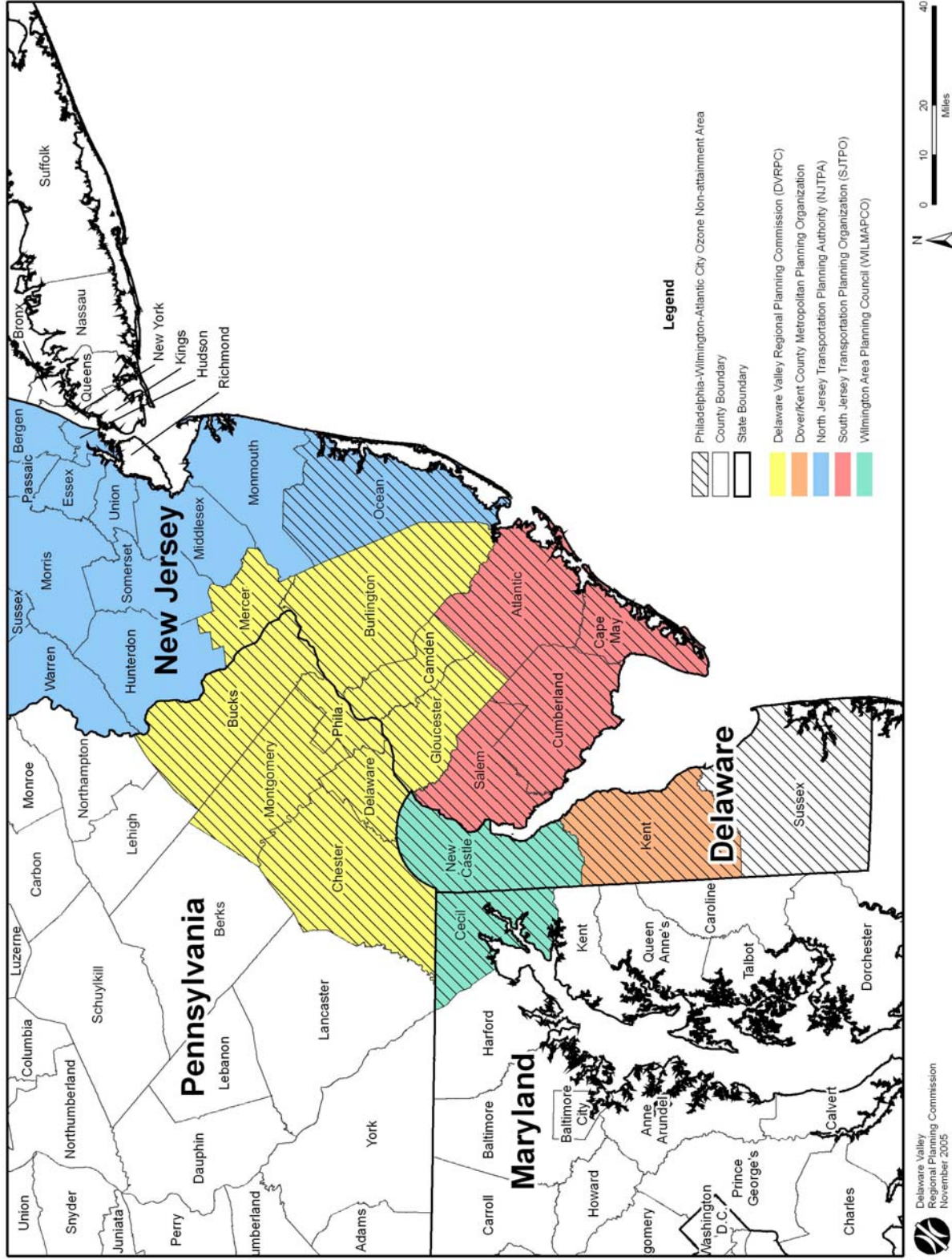


Figure 1. Philadelphia-Wilmington-Atlantic City Ozone Nonattainment Area

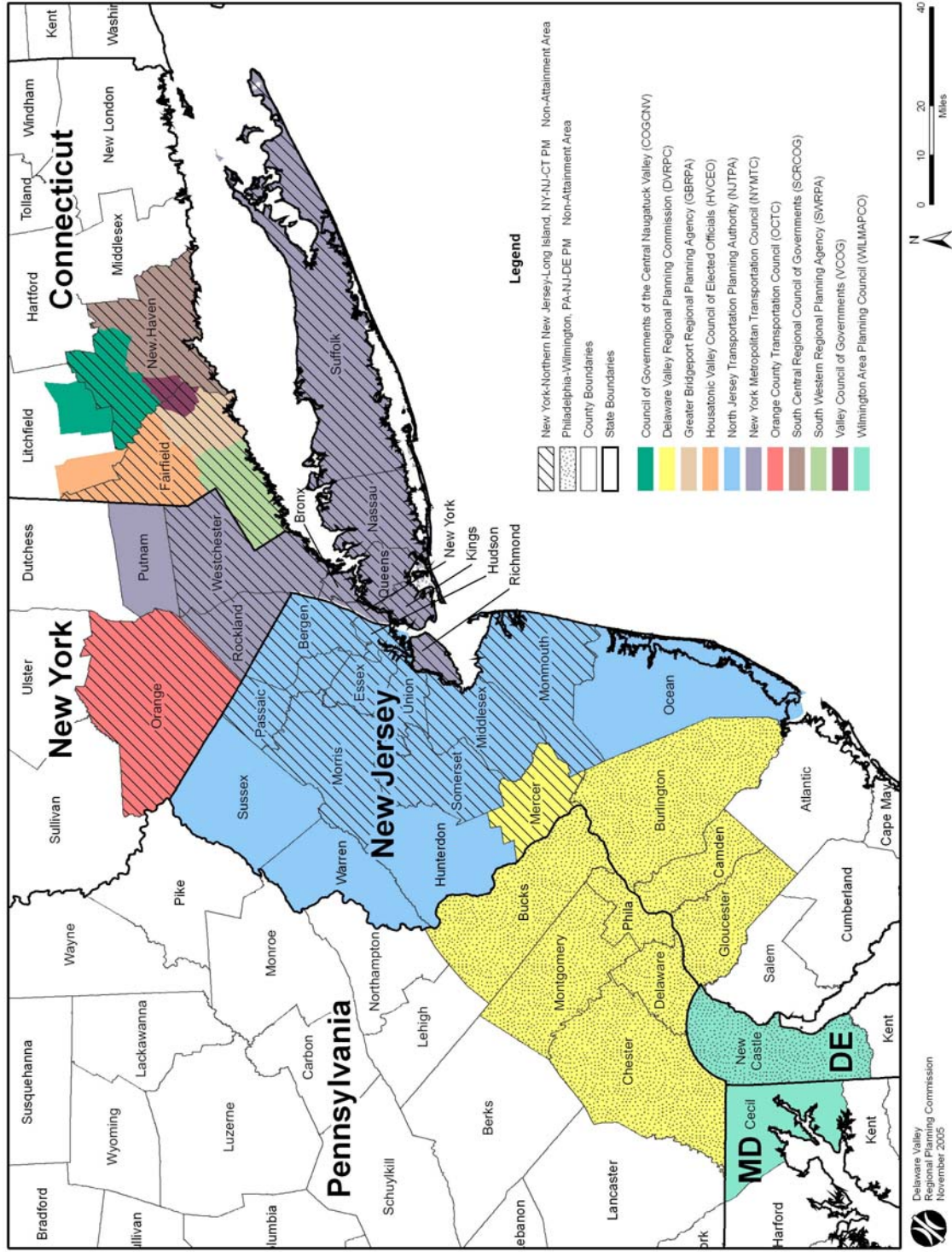


Figure 2. Pertinent PM<sub>2.5</sub> Nonattainment Areas Affecting the DVRPC Planning Area

## 1.4 DVRPC TIPS AND THE PLAN

The DVRPC FY 2009 Pennsylvania and New Jersey TIPs are staged, multiyear, intermodal programs of transportation projects covering the respective five Pennsylvania 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 the TCICG for appropriate air quality code and analysis year.

The *Destination 2030* Long Range Plan, adopted in June 2005 and revised in June 2007, 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. As adopted, the *Destination 2030 Plan* includes over \$57 billion from traditional sources for regional transportation improvements. The Plan is fiscally constrained, recommending over 110 major regional transportation improvement projects to achieve the goals and objectives therein. It also advances and supports the region's land use plans and policies and proposes strategies to carry out those policies.

In 2007, the Plan was updated to adhere to the statutory requirements for planning and environmental reviews prescribed in SAFETEA-LU legislation of 2005. The Plan's financial component has been updated to reflect actual SAFETEA-LU authorization levels. Projected costs for future Plan projects have been adjusted to account for inflation and to reflect year of expenditure as required by the FHWA/FTW *Final Rule on Statewide and Metropolitan*

*Transportation Planning and Programming*.<sup>8</sup> All Plan projects have also been reviewed and approved by the TCICG for appropriate air quality code and analysis year.

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<sup>8</sup> See 23 CFR 450.216(1), 23CFR 450.322(f) (10) (iv) and 23 CFR 450.23(b).

## 2 EMISSIONS ANALYSIS APPROACH

### 2.1 PROJECT CATEGORY

There are three categories of projects in the TIP<sub>s</sub> and the Plan:

- 1) regionally significant projects;
- 2) projects exempted from the conformity analysis;
- 3) projects that do not fit into a nonexempt category but are not regionally significant

These terms are defined as follows:

**REGIONALLY SIGNIFICANT PROJECT**<sup>9</sup> : *a nonexempt highway or transit project on a facility which, regardless of its length, serves regional needs and is normally included in the regional 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.*

**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 emissions model.*

<sup>9</sup> This applied definition of a regionally significant project is derived from the Final Rule, in which 40 CFR 93.101 states that a “regionally significant project means a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area’s transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.”

The Final Rule provides that the regional emissions analysis conducted to demonstrate conformity of the Plan and the TIP includes all “regionally significant, nonexempt” projects on principal arterials and higher classifications – that is, those which can impact regional air quality. The project set includes all those in the Plan, those in the current TIP<sub>s</sub>, and those that have been introduced in previous TIP<sub>s</sub> that are not yet completed. The Final Rule stipulates that the emissions analysis of transportation plans and programs must model all regionally significant and nonexempt projects. Each categorized project is classified by the first year it is included in the analysis, commonly referred to as the “analysis year” in this document.

Certain projects that cannot be analyzed within the travel demand model are categorized as “off-network” and are evaluated using trip estimate techniques outside the DVRPC travel demand model. The Pennsylvania Air Quality Off-Network Estimator (PAQ-ONE) and the New Jersey Air Quality Off-Network Estimator (NJAQ-ONE) are a set of travel impact and emissions analysis methodologies developed for the Pennsylvania and New Jersey State Departments of Transportation (state DOTs) used for off-network analyses in their respective states.<sup>10</sup>

<sup>10</sup> State DOTs in the region are also independently referred to as PennDOT (for Pennsylvania) and NJ DOT (for New Jersey).



## 2.2 EMISSIONS TEST

Within the DVRPC region, the NAAQS requirements for ozone, CO, and PM<sub>2.5</sub> must be met. In the nine-county DVRPC planning area, governing SIPs are in place for ozone and CO in the Pennsylvania and New Jersey subregions. For ozone, DVRPC utilizes the budget test to demonstrate conformity using applicable SIP MVEBs.

For this conformity determination, the prevailing 2005 one-hour Ozone SIP MVEBs established for VOCs and NO<sub>x</sub> were used to demonstrate conformity of the TIPs and Plan in the DVRPC Region, pending the US EPA's adequacy findings of the Eight-hour Ozone MVEBs. US EPA has recommended that the 2008 RFP SIP and 2009 Attainment SIP MVEBs, for both Pennsylvania and New Jersey, be included in this conformity determination, in the event that these SIPs are found adequate for conformity purposes, and replace the 2005 MVEBs.

Subsequently, USEPA has notified DVRPC that the 2009 MVEBs will become effective in July 2008, and that DVRPC should adopt the conformity findings, using the 2009 Attainment SIP MVEBs, contingent upon those MVEBs becoming effective. The 2009 MVEB will become the prevailing emissions budgets and will be used to compare all future analysis years. All ozone MVEBs have been established in cooperation with the state DEPs using MOBILE6.2.

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

Both New Jersey and Pennsylvania will submit PM<sub>2.5</sub> SIPs in 2008 as required by federal regulations. These SIPs will be reviewed by US EPA for adequacy. The MVEBs contained in the SIPs submissions are not yet available for use in this conformity determination. Until governing SIPs are in place, meanwhile, the *Final Rule* dictates that MPOs in nonattainment areas utilize one of the two interim emissions testing methods prescribed by US EPA. The first, the "build/no-build" interim test, requires that, for each future analysis year, emissions from the "build" scenario must be no greater than that from the "no-build" scenario. The second, the "no-greater-than-2002-baseline" interim test, requires that emissions projected for each future analysis year must be no greater than that in 2002 (i.e., the "baseline" year). US EPA states that the employed interim emissions test must be applied uniformly over the entire nonattainment area regardless of MPO boundaries.

For the regional analysis of direct PM<sub>2.5</sub> emissions, both exhaust and brake/tire wear must be included. US EPA has further ruled that regional emissions analyses for direct PM<sub>2.5</sub> should include road dust if road dust is found to be a significant contributor to PM<sub>2.5</sub> by either the US EPA Regional Administrator or state DEPs. For both nonattainment areas that DVRPC is part of, road dust has not been found to be a significant PM<sub>2.5</sub> contributor. US EPA has also required that regional direct PM<sub>2.5</sub> analyses include fugitive dust from the construction of transportation projects if a governing PM<sub>2.5</sub> SIP identifies these emissions as significant contributors to the regional PM<sub>2.5</sub> problem. In the absence of any PM<sub>2.5</sub> SIPs, no construction-related dust will be considered. Thus, the only components of direct PM<sub>2.5</sub> emissions in this DVRPC conformity iteration are tailpipe exhaust and brake/tire wear.

For the indirect PM<sub>2.5</sub> emissions (also called PM<sub>2.5</sub> precursors), US EPA has identified four potential transportation-related PM<sub>2.5</sub> precursors: VOCs, NO<sub>x</sub>, SO<sub>x</sub>, and NH<sub>3</sub>. Once a SIP is

implemented, any precursors identified in the SIP will be required in the analysis of indirect PM<sub>2.5</sub> emissions. Until a SIP is established, US EPA has ruled that indirect PM<sub>2.5</sub> emissions must be analyzed for NO<sub>x</sub>, unless US EPA and the state determine that NO<sub>x</sub> is insignificant. US EPA also stated that VOCs, SO<sub>x</sub>, and NH<sub>3</sub> must be analyzed as well if the US EPA or the state DEPs determine that one or more of these precursors are significant contributors. There have been no findings of significance for any of the precursors (also, no findings of insignificance for NO<sub>x</sub>). Thus, the only indirect PM<sub>2.5</sub> component considered in this conformity iteration is NO<sub>x</sub>.

Furthermore, PM<sub>2.5</sub> NAAQS have both annual and daily standards, while MOBILE6.2 emissions results are daily estimates. Therefore, a guidance document from US EPA presents the technique to estimate annual emissions from the MOBILE6.2 daily emissions results. This technique is termed an “annual inventory method.” There are four methods allowed for developing an annual inventory: single run; two-season runs; four-season runs; and twelve monthly runs.<sup>11</sup> For the areas using the interim test, all MPOs must use the same annual inventory method. For the areas with MVEBs, the emissions analysis must be performed using the same annual inventory method used to develop the governing SIP.

In 2006, New Jersey implemented a PM<sub>2.5</sub> SIP for selected portions of the state.<sup>12</sup> Those areas in New Jersey with effective SIP PM<sub>2.5</sub> MVEBs now include Mercer County within the DVRPC planning area. Therefore, in Mercer, the budget test is employed to

demonstrate PM<sub>2.5</sub> conformity. It should be noted that the implemented NJ PM<sub>2.5</sub> SIP was developed using the 12-month annual inventory method and that DVRPC’s emissions analysis for Mercer will be based on the same. The PM<sub>2.5</sub> SIP budget for Mercer County was revised in 2008, and that revised budget will be used for this conformity demonstration.<sup>13</sup>

Otherwise, for the DVRPC portion within the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area, DVRPC continues to coordinate its conformity efforts with WILMAPCO, and the two MPOs demonstrate conformity collectively for the entire nonattainment area.

For this iteration of the conformity demonstration, DVRPC and WILMAPCO have jointly decided to use the “no-greater-than-2002-baseline” interim test. Also, DVRPC and WILMAPCO have jointly decided to use the four-season annual inventory method. This annual inventory method is applied to all PM<sub>2.5</sub> emissions analyses in the DVRPC and WILMAPCO planning areas except Mercer County in New Jersey.

Table 1 shows governing MVEBs and other applicable NAAQS requirements to be utilized in this iteration of conformity demonstration.

<sup>11</sup> For more information, see *Guidance for Creating Annual On-road Mobile Source Emission Inventories for PM<sub>2.5</sub> Nonattainment Areas for Use in SIPs and Conformity*. US EPA; Office of Transportation and Air Quality. EPA420-B-05-008. August 2005.

<sup>12</sup> US EPA has determined the New Jersey SIP revision and the imbedded PM<sub>2.5</sub> MVEBs for Mercer County (i.e., the DVRPC portion of the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area) adequate for transportation conformity purposes and has published the adequacy finding in the Federal Register on June 8, 2006 (71 FR 33305).

<sup>13</sup> EPA notice to approve the NJ SIP revision was published in Federal Register on May 6, 2008 (73 FR 24868). The effective date of this approval is June 5, 2008.

**Table 1. Emissions Budgets (Tons/Day) and Baseline (Tons/Year) †**

Pollutant	Budget/ Baseline	Pennsylvania Subregion	New Jersey Subregion
VOCs	2005 Budget	79.69 (all counties)	42.99 (all counties)
	2008 Budget	61.09 (all counties)	27.75 (all counties)
	2009 Budget	58.71 (all counties)	25.98 (all counties)
NO <sub>x</sub>	2005 Budget	144.73 (all counties)	63.44 (all counties)
	2008 Budget	108.78 (all counties)	69.67 (all counties)
	2009 Budget	101.60 (all counties)	63.66 (all counties)
Direct PM <sub>2.5</sub>	2002 Baseline/ 2009 Budget ‡	998.2 (all counties) 59,346.0 (all counties)	486.7 (Burlington, Camden, and Gloucester) 30,499.9 (Burlington, Camden, and Gloucester)
NO <sub>x</sub>			108 (Mercer) 5,056 (Mercer)

Source: DVRPC, 2008

Note: † All MVEBs are rounded off to the nearest hundredth ton/day, except PM<sub>2.5</sub> budgets in Mercer, which are rounded off to the nearest integer in accordance with the respective SIP. Interim emissions test baseline is rounded off to the nearest tenth ton/year.

‡ 2009 budget applies only to Mercer County. 2002 baseline is for the DVRPC portion of the Philadelphia-Wilmington, PA-NJ PM<sub>2.5</sub> Nonattainment Area. The WILMAPCO portion of the nonattainment area includes New Castle County in Delaware and its 2002 baselines for Direct PM<sub>2.5</sub> and NO<sub>x</sub> are 208.6 tons/day and 11,799.1 tons/day, respectively.

### 2.3 ANALYSIS YEAR

For this iteration of conformity demonstration, the mobile source ozone emissions analysis years for VOCs and NO<sub>x</sub> are 2009 (pending SIP Budget Year), 2010 (eight-hour ozone standard attainment year and near-term year within five years of TIP adoption), 2020 (the *interim* year selected to keep all analysis years no more than 10 years apart), and 2030 (the *horizon* year of the *Plan*). VOCs and NO<sub>x</sub>, which are heat-sensitive ozone precursors, are estimated for a July day. For these analysis years, ozone emissions analyses are performed. To demonstrate conformity,

projected ozone emissions in all analysis years must not exceed the established MVEBs in prior years.

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.

In the PM<sub>2.5</sub> conformity demonstration, analysis years vary by area due to the different emissions tests being applied. In the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area, PM<sub>2.5</sub> analysis years are 2010, 2020, and 2030. For the New York-

Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area, the year 2009 is analyzed instead. 2009 is a PM<sub>2.5</sub> MVEB budget year for Mercer County. To demonstrate conformity, projected PM<sub>2.5</sub> emissions in all analysis years must not exceed 1) the 2002 baseline emissions results in the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area; and 2) the 2009 budgeted emissions in the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area.

Table 2 describes the project sets that are considered in each future year analysis. All analysis years, projects, and activities identified in Table 2 have been reviewed and approved by TCICG for the conformity demonstration.

**Table 2. Projects and Activities Included in the Regional Emissions Analysis**

<i>Analysis Year</i>	<i>Project Set</i>
<b>2002</b> (PM <sub>2.5</sub> baseline)	All regionally significant highway and transit facilities, services, and activities in place by 2002; for PM <sub>2.5</sub> analysis only
<b>2005</b> (one-hour Ozone Budget)	One-hour Ozone budget year included to compare against future emissions analysis;
<b>2008</b> (eight-hour Ozone RFP Budget)	Eight-hour Ozone RFP budget year included to compare against future emissions analysis (only applicable if found adequate by US EPA before June 26, 2008 DVRPC Board adoption of conformity demonstration);
<b>2009</b> (eight-hour Ozone SIP Budget)	Eight-hour Ozone Attainment SIP budget year included to compare against future emissions analysis (expected to become effective in July, 2008); <ol style="list-style-type: none"> <li>1 All regionally significant highway and transit facilities, services, and activities currently in place +</li> <li>2 All regionally significant highway and transit projects that are scheduled to open by 2009; for ozone analysis only.</li> </ol>
<b>2009</b> (PM <sub>2.5</sub> budget)	<ol style="list-style-type: none"> <li>1 All regionally significant highway and transit facilities, services, and activities currently in place +</li> <li>2 All regionally significant highway and transit projects that are scheduled to open by 2009; for PM<sub>2.5</sub> analysis only (specifically for Mercer County, New Jersey)</li> </ol>
<b>2010</b> (Near-term horizon and eight-hour ozone attainment year)	<ol style="list-style-type: none"> <li>1 All regionally significant highway and transit facilities, services, and activities currently in place +</li> <li>2 All regionally significant highway and transit projects that are scheduled to open by 2010</li> </ol>
<b>2020</b> (Interim year)	<ol style="list-style-type: none"> <li>1 + 2 +</li> <li>3 Additional highway and transit projects that are scheduled to open between 2010 and 2020</li> </ol>
<b>2030</b> (DVRPC Plan horizon)	<ol style="list-style-type: none"> <li>1 + 2 + 3 +</li> <li>4 Additional highway and transit projects that are scheduled to open between 2020 and 2030</li> </ol>

Source: DVRPC, 2008

## 2.4 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 2010O, in which case the project is identified as a regionally significant, nonexempt project, the emissions estimates of which are 1) included in the 2010 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 3 shows the exempt project categories in the *Final Rule* and their corresponding DVRPC AQ codes. In cases where multiple codes can apply to a project, the most representative code is assigned. The air quality code for each project is shown in the respective Long Range *Plan* and *TIP* documents.

Projects under the Study and Development category are those that are still in conceptual phase and are not yet part of the current *TIP*s. However, if they are likely to be included in future *TIP*s, and DVRPC assigns AQ codes that begin with “SD.” These projects will be further scrutinized when they advance to be included in *TIP*s.

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 TCICG has reviewed all projects and concurred on all associated AQ codes in the *Plan* and the *TIP*.

**Table 3. AQ Codes for Projects in the TIPs and the Plan**

<i>Exempt Project Category</i> <sup>1</sup>	<i>DVRPC AQ Code</i>
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

Source: DVRPC, 2008

<i>Exempt Project Category</i> <sup>1</sup>	<i>DVRPC AQ Code</i>
Operating assistance to transit agencies	M1
Purchase of support vehicles	M2
Rehabilitation of transit vehicles <sup>2</sup>	M3
Purchase of office, shop, and operating equipment for existing facilities	M4
Purchase of operating equipment for vehicles (e.g., radios, fareboxes, 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 trackbed 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

Source: DVRPC, 2008

Note: <sup>1</sup> 40 CFR 93 Sections 126 and 127.

<sup>2</sup> In PM<sub>10</sub> nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.

Table 3. AQ Codes for Projects in the TIPs and the Plan (continued)

	<i>Exempt Project Category<sup>1</sup></i>	<i>DVRPC AQ Code</i>
Air Quality	Continuation of ride-sharing and van-pooling promotion activities at current levels	A1
	Bicycle and pedestrian facilities	A2
Others	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

Source: DVRPC, 2008

	<i>Exempt Project Category<sup>1</sup></i>	<i>DVRPC AQ Code</i>
No Regional Emissions Analysis Required	Intersection channelization projects	R1
	Intersection signalization projects at individual intersections	R2
	Interchange reconfiguration projects	R3
	Changes in vertical and horizontal alignment	R4
	Truck size and weight inspection stations	R5
	Bus terminals and transfer points	R6
Source: DVRPC, 2008		
Study & Dev't Projects	<i>Study &amp; Development Project Category</i>	<i>DVRPC AQ Code</i>
	Resulting project that is likely to be an exempt kind	SDX
	Resulting project that is likely to be a nonexempt kind	SDN
Source: DVRPC, 2008		
Non-Regionally Significant Projects	<i>Not Regionally Significant Project Category<sup>3</sup></i>	<i>DVRPC AQ Code</i>
	Projects determined to be "Not Regionally Significant" and do not fit into an exempt category	NRS

Source: DVRPC, 2008

Note: <sup>1</sup> 40 CFR 93 Sections 126 and 127.

<sup>2</sup> In PM<sub>10</sub> nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.

<sup>3</sup> 40 CFR 93.101 as amended by 62 FR 43780, 438303

### 3 LATEST PLANNING ASSUMPTION

#### 3.1 POPULATION & EMPLOYMENT ESTIMATES

All planning assumptions utilized in this demonstration are the latest and most current as of **April 25, 2008**, which is the start date of the DVRPC conformity analysis. The DVRPC TCICG has reviewed and concurred on all of the latest planning assumptions utilized.

Population forecasting at the regional level involves review and analysis of five major components: births, deaths, migration, and changes in group-quarter populations (e.g., dormitories, military barracks, prisons, and nursing homes). DVRPC uses the cohort survival concept, based on the DVRPC's 2005 population estimates, to age individuals and determine the flow of people. DVRPC also relies on member counties to provide feedback on the population forecasts and information on any known, expected, and/or forecasted changes in group-quarter populations. Current and future population estimates for the DVRPC planning area, adopted by the DVRPC Board in July 2007, are shown in Table 4.

Table 4. Population Estimates

County	2000	2005	2010	2015	2020	2025	2030
<b>Bucks</b>	597,636	624,351	649,187	672,674	694,893	715,819	735,579
<b>Chester</b>	433,512	473,880	505,095	531,971	557,623	582,047	605,271
<b>Delaware</b>	551,989	555,206	556,117	556,179	557,795	558,563	559,288
<b>Montgomery</b>	748,978	780,544	802,340	822,952	842,452	860,816	878,158
<b>Philadelphia</b>	1,517,5490	1,483,851	1,475,613	1,472,422	1,474,268	1,476,150	1,478,065
<b>PA Total</b>	<b>3,849,664</b>	<b>3,917,832</b>	<b>3,988,352</b>	<b>4,056,998</b>	<b>4,127,031</b>	<b>4,193,395</b>	<b>4,256,397</b>
<b>Burlington</b>	423,397	446,866	464,968	482,153	498,334	513,569	527,952
<b>Camden</b>	507,889	515,027	516,880	518,632	520,290	521,851	523,326
<b>Gloucester</b>	255,719	274,229	292,486	309,751	326,116	341,468	355,993
<b>Mercer</b>	350,752	365,097	376,738	382,692	389,002	395,692	401,710
<b>NJ Total</b>	<b>1,537,757</b>	<b>1,601,219</b>	<b>1,651,072</b>	<b>1,693,228</b>	<b>1,733,742</b>	<b>1,772,540</b>	<b>1,808,981</b>
<b>Regional</b>	5,387,421	5,519,051	5,639,424	5,750,226	5,860,773	5,965,935	6,065,378

Source: DVRPC, 2007



In general, employment is more difficult to forecast than population, since it is impacted by political and socioeconomic factors at local, national, and global levels. Various studies and past experience, however, have shown that there is a direct relationship between the number of households in a region (which is a function of population) and the number of jobs. The relative change in employment closely tracks the relative change in households, since the number of workers per household is relatively constant and also because new households require goods and services that create jobs. To forecast future employment, DVRPC calculated the ratio of employment to population for each

county and the region as a whole in 1990, 2000, and 2005, and considered the historic trends in these ratios. Using planning knowledge of employment growth and decline, DVRPC developed a curve reflecting decreasing rates of growth or decline to determine the employment forecasts. All forecasts were reviewed by County planning staff before DVRPC Board adoption. Current and future employment estimates for the DVRPC planning area are shown in Table 5. These estimates, adopted by the DVRPC Board in July 2007, have also been reviewed and approved by the TCICG for the transportation conformity process.

**Table 5. Employment Estimates**

<i>County</i>	<i>2000</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>
<b>Bucks</b>	267,124	277,886	290,233	301,910	312,957	323,361	333,185
<b>Chester</b>	238,641	253,628	270,079	285,352	299,943	313,815	326,992
<b>Delaware</b>	238,164	237,582	238,728	239,809	240,833	241,797	242,708
<b>Montgomery</b>	492,677	505,952	521,200	535,621	549,269	562,117	574,251
<b>Philadelphia</b>	741,397	728,054	722,800	724,962	727,139	731,831	734,039
<b>PA Total</b>	1,978,003	2,003,102	2,043,040	2,087,654	2,130,141	2,172,921	2,211,175
<b>Burlington</b>	202,535	214,621	223,420	231,760	239,641	247,063	254,072
<b>Camden</b>	216,931	222,721	223,481	224,200	224,880	225,520	226,124
<b>Gloucester</b>	99,467	108,229	115,456	122,291	128,757	134,847	140,597
<b>Mercer</b>	220,915	228,502	236,358	243,788	250,817	257,436	263,687
<b>NJ Total</b>	739,848	774,073	798,725	822,039	844,095	864,866	884,480
<b>Regional</b>	2,717,851	2,777,175	2,841,765	2,909,693	2,974,236	3,037,787	3,095,655

Source: DVRPC, 2007

### 3.2 TRANSIT AND ROAD TOLL POLICIES

As part of the latest planning assumptions, current transit operations policies and other road toll structures are also considered. The transit person trips produced by the modal split component of the DVRPC travel demand model 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 minimum impedance paths built through the transit network, which is not capacity constrained. The DVRPC travel demand model, including its transit segment, is further explained in section 4.1.

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 2000 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 are incorporated into the future year networks as well. Future year transit networks are also augmented with any new services identified in the corresponding DVRPC *TIPs* and the *Plan*. Table 6 details all transit operators included in the transit network and their operational assumptions, respectively.

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 6. Transit Operation Assumptions**

<i>Transit Companies</i>	<i>Fares</i>	<i>Operating Plan/Service Level</i>
SEPTA City Transit Division		
SEPTA Suburban Victory Division		
SEPTA Suburban Frontier Division		
SEPTA Regional Rail Division	Specified in the transit network by operator and by analysis year;	Specified in the transit networks by operator and by analysis year
NJ Transit Mercer Division	held constant in current dollars	
NJ Transit Southern Division	using an inflation rate	
NJ Transit Railroad Division		
PA/CO High-speed Line (DRPA)		
Pottstown Urban Transit		
Krapf's Coaches		

Source: DVRPC, 2008

### 3.3 LAND USE ASSUMPTIONS

The land use component of the travel simulation used for the transportation conformity determination employs a system of area type codes for each internal TAZ. The area type codes serve as an indicator of the intensity of travel activity occurring in a zone. This intensity of activity is measured by computing the area type factor  $\alpha$  (defined below) for each zone, whereas an employment coefficient of 2.37 is empirically derived.

$$\alpha = \frac{[(\text{Zonal Population}) + 2.37 \times (\text{Zonal Employment})]}{(\text{Zonal Land Area, in acres})}$$

Calculated area type codes are subjected to a reasonableness determination process in which the TAZs corresponding to census water tracts, urban open space, and other variations are accounted for and area codes for them are adjusted accordingly. Table 7 shows the six area types utilized in the DVRPC travel simulation process as land use inputs and the range of factor values for each area type shown.

**Table 7. Area Type and Corresponding Range of Area Type Factor Values**

<i>Area Type Code in the Model</i>	<i>Area Type Category</i>	<i>Factor Range</i>
1	Central Business District [CBD]	$200 < \alpha$
2	Fringe of CBD	$120 < \alpha \leq 200$
3	Urban	$25 < \alpha \leq 120$
4	Suburban	$4 < \alpha \leq 25$
5	Rural	$0.5 < \alpha \leq 4$
6	Open Rural	$0 \leq \alpha \leq 0.5$

Source: DVRPC, 2008

### 3.4 TIP AND PLAN AMENDMENTS

A new iteration of conformity is triggered for the new FY 2009 – 2012 Pennsylvania and New Jersey TIPs and amended Destination 2030 Long Range Plan. The Final Rule requires MPOs to demonstrate conformity when any nonexempt, regionally significant projects in the TIPs or the Plan are altered substantially to change regional travel patterns. This conformity iteration reflects all such changes proposed to the TIPs and the Plan since last demonstration.

## 4 TRAVEL SIMULATION

### 4.1 TRAVEL DEMAND MODEL

To satisfy the requirements of SAFETEA-LU, CAA, and other relevant federal conformity rules, a series of enhancements and modifications have been implemented to the travel demand model. Some of the new components recently added to the model include nested modal split and time-of-day modeling features.

The enhanced DVRPC travel simulation – validated in 2005 using the US Census 2000 information, home interview survey, and traffic count data – is a classic four-step transportation modeling application that operates within an iterative (Evans algorithm) structure with respect to highway travel time, and is disaggregated into separate peak, midday, and evening time periods. In the four-step modeling process, trip generation is based on constant trip rates imbedded in a cross-classification structure. Trip distribution uses a doubly constrained gravity model, stratified into three person (home-based work, home-based nonwork and nonhome-based) and four vehicle trip purposes. Modal split employs a binary probit-like formulation stratified by trip purpose, transit submode, and auto ownership. The highway assignment component is based on the equilibrium method using minimum travel-time path. Free flow highway speeds are stratified by functional class and density of development.

The Evans algorithm reexecutes the trip distribution and the modal split highway components. This process is based on updated speeds after each iteration of the highway assignment and determines a weight value ( $\lambda$ ) upon each performed iteration. This

weight is then used to prepare a convex combination of the link volumes and trip tables for the current iteration and a running weighted average of the previous iterations. This algorithm converges rapidly to an equilibrium solution on highway travel speeds and congestion levels. When the equilibrium is attained, the model assigns the weighted average transit trip tables to the transit networks and produces link and route passenger volumes. Transit assignment is unrestrained and uses minimum paths based on the modal split model definition of impedance.

The model relies on TAZs to estimate travel patterns. The demographic inputs to the travel simulation process are prepared for each TAZ based on the adopted forecasts, and population and employment are assigned to these geographic areas. Trips between each pair of zones are determined and assigned to either the highway or transit networks.

The iterative DVRPC travel demand simulation process, detailed in Figure 3, has been reviewed and approved by the TCICG. The methodology and detailed TAZ level estimates are further explained in the DVRPC report: *2000 Travel Simulation for the Delaware Valley Region* (in preparation).

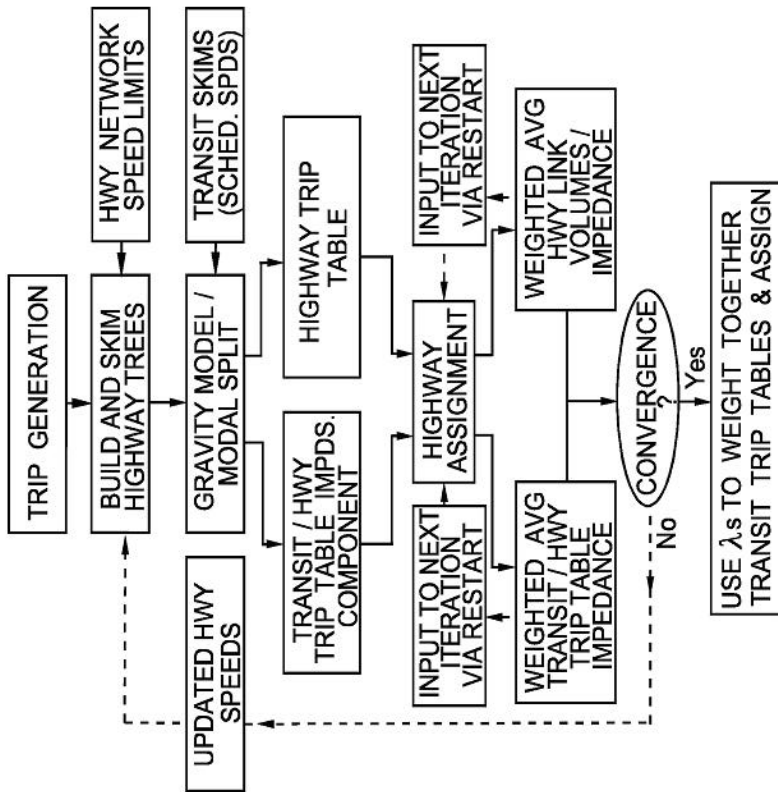
## 4.2 OFF-NETWORK METHODOLOGY

Due to the project scale, scope, or governing characteristics, some nonexempt, regionally significant projects, such as park and ride facilities or bikeway improvements, cannot be represented and evaluated by the travel demand model properly. As previously noted, therefore, travel impacts and emissions analyses of such projects are performed using PAQ-ONE and NJAQ-ONE. These off-network analysis tools are a set of travel impact and emissions analysis methodologies and are configured for summer conditions only. These methodologies were initially developed for state DOTs to assist in the analysis and ranking of congestion mitigation/air quality (CMAQ) funded projects.<sup>14</sup>

Currently, there are 37 PAQ-ONE and NJAQ-ONE travel impact methodologies available, all of which have three steps in common: 1) data collection; 2) calculation of changes in travel characteristics; and 3) computation of the emissions impacts associated with the changes in travel characteristics. In steps 1) and 2), each of the off-network methodologies calculates the estimated travel impacts of individual projects based on a combination of project-level, county-level, and national data, and then, it assesses the resulting changes on the transportation system. Outputs are typically measured in the change in vehicle-miles-traveled (VMT), in vehicle trips, in total vehicle time spent in idling, and in speed. In step 3), the travel changes are fed into an emission estimate module to produce the air quality impacts.

Both PAQ-ONE and NJAQ-ONE contain independent MOBILE6.2 modules to determine emissions estimates. Once the characteristic changes in travel are calculated, the transportation results are fed into the emissions module to create emissions

<sup>14</sup> CMAQ is a federal funding category for projects specifically designed to contribute to the attainment of the NAAQS in ozone nonattainment areas.



SOURCE: DVRPC, 2007

Figure 3. Travel Demand Simulation Process

factors based on the county-level data and local assumptions. The input parameters for the MOBILE6.2 component, prepared by the travel impact module of the off-network methodologies, vary by each off-network project's own scope, scale, and characteristics, but include the average speed and VMT mixes broken down for each county by area type, facility type, time of day, and/or inspection and maintenance programs implemented. Final off-network emissions estimate outputs show the changes in VOCs, NO<sub>x</sub>, CO, and PM<sub>2.5</sub> in both kg/July-day and tons/July-day for individual projects. The emissions estimation process using MOBILE6.2 is further described in section 5.1.

In this iteration of conformity demonstration, there are 15 projects whose emissions estimates are generated using the off-network methodology. These off-network projects are identified in Table 8.

**Table 8. Nonexempt, Off-Network Projects in the TIPs and the Plan**

MPMS #	County/ Agency	Project/Facility	First Year of Analysis
702	SEPTA	Exton Station Parking Expansion	2020
703	SEPTA	Gwynedd Valley Station Parking Expansion	2020
704	SEPTA	Jenkintown Parking Garage	2020
705	SEPTA	Malvern Station and Pedestrian Improvements	2020
706	SEPTA	Penllyn Station Parking Expansion	2020
707	SEPTA	Philmont Station Parking Expansion	2020
60286	SEPTA	SEPTA Bus Purchase Program	2020
60574	SEPTA	Paoli Transportation Center	2020
60629	SEPTA	Job Access and Reverse Commute	2010
60655	SEPTA	Intermodal Facility Improvement (B)	2020
73214	SEPTA	Ardmore Transit Center	2020
74799	Delaware	Upper Darby Parking Facility	2020
74823	Philadelphia	Philadelphia Zoo Intermodal Center	2020
T1199	NJ Transit	Job Access and Reverse Commute	2010
G (Plan)	SEPTA	Rt 23/Rt 56 Light Rail Vehicle Purchase	2020

Source: DVRPC, 2008

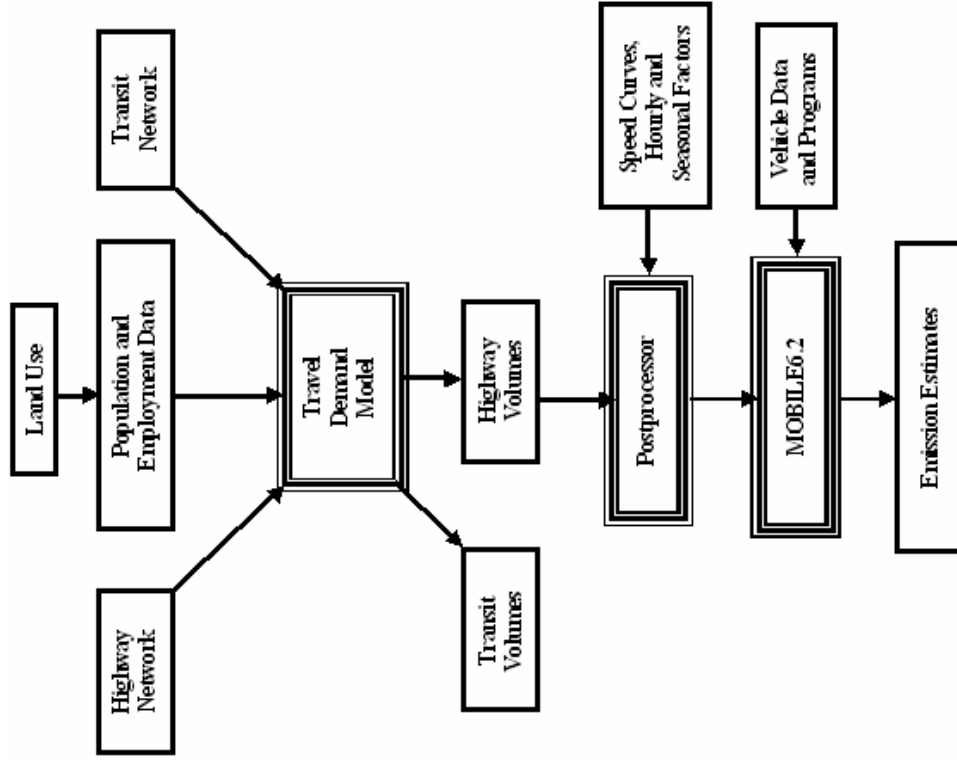
# 5 EMISSIONS ESTIMATION

## 5.1 MOBILE6.2

The calculated travel impact changes from the travel simulation process are passed through the post-processor routine and are prepared for an emissions estimate model.

In demonstrating conformity, use of the newest version of the MOBILE emissions estimate model is required under the *Final Rule*. MOBILE6.2 is the latest version of the family of MOBILE mobile-source emissions estimate models developed by US EPA and reflects many cumulative technological enhancements, emissions control updates, and trend shifts introduced since 1996. These changes include expanded vehicle type categories and state inspection and maintenance (I/M) program specification options, more detailed vehicle activity information and fuel program definitions, and revised base emissions rates.

Taking advantage of these updated changes, the input parameters to the MOBILE6.2 model specify available fuel types, composition mix of vehicle fleets, and meteorological conditions, among other choices. Also, recent vehicle registration data is used to specify vehicle fleet parameters. A general flow of the emissions calculation process is shown in Figure 4.



SOURCE: DVRPC, 2007

Figure 4. Emissions Calculation Process with MOBILE6.2

## 5.2 MOBILE6.2 INPUTS

DVRPC utilizes the best available local data for applicable input settings in MOBILE6.2 to accurately reflect the local conditions. These settings include, among other parameters, MIN/MAX TEMP, ABSOLUTE HUMIDITY, REG DISTRIBUTION, DIESEL FRACTIONS, VMT FRACTIONS, VMT BY FACILITY, VMT BY HOUR, SPEED VMT, FUEL RVP, ALTITUDE, and individual I/M program information. Local temperature and humidity data are particularly important because MOBILE6.2 relies on these values to estimate air conditioner usage. As for specific parameter values, inputs for individual pollutants can differ.

Using ozone settings as an example, MOBILE6.2 takes prevailing daily temperatures and humidity values during a three-year period. These settings facilitate the model output to cater to real-life driving patterns, including air conditioner usage, various state and local emissions control provisions, and changing meteorological conditions. Applicable I/M program settings are also part of the MOBILE6.2 inputs. All gasoline-fueled cars and trucks in both Pennsylvania and New Jersey are subject to emissions tests. Depending on the vehicle type and age, each vehicle is subject to an on-board diagnostics test, a dynamometer test, or an idle test under the respective state emissions requirements and I/M programs. These services are fundamentally similar in nature and are performed in a largely decentralized fashion where private garages both conduct the emissions test and make necessary vehicle repairs. However, New Jersey has some centralized test-only locations in addition to the private garages. The emissions tests include a check of the vehicle's evaporative control system and the integrity of the vehicle's emissions control equipment. They are performed annually in Pennsylvania and biennially in New Jersey. MOBILE6.2 also utilizes vehicle registration data to generate

emissions estimates. The base year for the vehicle registration information is 2005 for Pennsylvania and 2007 for New Jersey.

As for the low emission vehicle technology, in January 2004 the New Jersey Legislature enacted N.J.S.A. 26:2C-8.5 et seq., requiring the NJ DEP to promulgate rules adopting the California Low Emission Vehicle Program (CA LEV II) beginning in 2009. Subsequently, the New Jersey Low Emission Vehicle (NJ LEV) program and the DVRPC emissions estimate reflected this change.

Additionally, the Pennsylvania Clean Vehicles Program, adopted in 1998, incorporated the CA LEV II by reference. However, it also allowed automakers to comply with the National Low Emission Vehicle (NLEV) program as an alternative to the Pennsylvania program until a later model year (MY). The Pennsylvania Clean Vehicles Program had initially targeted MY 2006 for implementation, but PA DEP has recently passed a regulation that postpones compliance with the Pennsylvania program until MY 2008.<sup>15</sup> Also, the Pennsylvania program was analyzed using US EPA's recommended analysis approach, and the methodology and data files therein were revised to phase in CA LEV II after MY 2008 as well.<sup>16</sup> In this conformity iteration, DVRPC has incorporated the Pennsylvania Clean Vehicles program into its emissions estimates.

Other settings including CLOUD COVER, PEAK SUN, SUNRISE/SUNSET, STARTS PER DAY, START DIST, SOAK DISTRIBUTION, HOT SOAK ACTIVITY, and DIURN SOAK ACTIVITY parameters currently accept the US EPA's default

<sup>15</sup> The final rule can be viewed at <http://www.pabulletin.com/secure/data/vol36/36-49/2406.html>. The regulation was published in the Pennsylvania Bulletin on December 9, 2006. Webpage last accessed on April 16, 2008.

<sup>16</sup> The US EPA recommended analysis approach is documented in the June 2002 guidance, *Modeling Alternative NLEV Implementation and Adoption of California Standards in MOBILE6*.



values, which represent “the worst-case conditions.”<sup>17</sup> Collectively, these local and default settings generate dependable regional emissions estimates suitable for demonstrating transportation conformity in the DVRPC region.

Table 9 shows selected MOBILE6.2 settings used for the ozone conformity determination processes.

As for the PM<sub>2.5</sub> analysis, MOBILE6.2 input settings may vary slightly from those in the ozone analyses. Such variances are inevitable due to the annual inventory process detailed in section 2.2.

For the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area, the conformity determination is based on the four-season annual inventory methodology, requiring four sets of seasonal input conditions, one for each of the four seasons. Since MOBILE6.2 has only two input options for evaluation month (i.e., January for winter and July for summer), July input parameters are entered for a spring inventory and January of the following year is used for a fall inventory. Fuel parameters and VMT inputs are seasonally apportioned as well. The total annual PM<sub>2.5</sub> inventory for the DVRPC portion of the nonattainment area is the sum of these four seasonal inventories.

For the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area, MOBILE6.2 must be configured to produce a monthly run because the governing PM<sub>2.5</sub> SIP is developed using a 12-month inventory methodology. Therefore, the input settings such as temperature and humidity data are

adjusted for each month accordingly. The sum of these monthly inventories is then tested against the SIP budget in Mercer County to determine conformity.

All PM<sub>2.5</sub> adjustments detailed herein fully comply with the current US EPA guidance on developing annual inventories for the transportation conformity purposes.

### 5.3 OFF-NETWORK METHODOLOGY

Both PAQ-ONE and NJAQ-ONE contain independent MOBILE6.2 modules to determine emissions estimates. Final off-network emissions estimate outputs show the changes in VOCs, NO<sub>x</sub>, and PM<sub>2.5</sub> in both kg/July-day and tons/July-day for the project sets included in the TIP<sub>s</sub> and the *Plan*.

<sup>17</sup> Dolce, Gary. 2001. “MOBILE6 Input and Modeling Guidance: SIP and Conformity Policy.” Presentation at the North American Vehicle Emission Control Conference. US EPA, Office of Transportation and Air Quality. Available online at <http://www.epa.gov/otaq/models/mobile6/m6SIPool.pdf>. Last accessed on December 28, 2005.

Table 9. Selected Ozone MOBILE6.2 Parameter Settings

<i>MOBILE6.2 Parameter</i>	<i>Pennsylvania Summer †</i>	<i>New Jersey Summer †</i>
Minimum/Maximum Temperatures	70.2 F/87.5 F	73.2 F/96.1 F
Absolute Humidity	83.4 grains/lb.	76.2 grains/lb.
Cloud Cover	0.0 (default)	0.0 (default)
Peak Sun	10 am to 4 pm (default)	10 am to 4 pm (default)
Sun Rise / Sun Set	6 am and 9 pm (default)	6 am and 9 pm (default)
Fuel Reid Vapour Pressure (RVP)	6.80 psi	6.80 psi
Engine Starts per day		
<i>Cars (wkdy/ wkend)</i>	7.28/5.41 (default)	7.28/5.41 (default)
<i>Trucks (wkdy/ wkend)</i>	8.06/5.68 (default)	8.06/5.68 (default)
Daily Distribution of Starts	Default Values	Default Values
Trip Length Distribution	Default Values	Default Values
Diesel Fractions	2005 Data	2003 Data
Altitude	Low	Low
Stage II Refuelling	N/A §	Applied
Fuel Program (RFG)	RFG, Northern Region	RFG, Northern Region
Low Emission Vehicle Technology	PA LEV Program *	NJ LEV Program *
Vehicle Registration Data Base Year	2005	2007
I/M Program		
<i>Program Length</i>	Annual	Biennial
<i>Centralized/ Decentralized</i>	100% Decentralized	70% Centralized/30% Decentralized
<i>Credit for Decentralized Program</i>	100%	80%
<i>On-Board Diagnosis (OBD)</i>	1996 Model Year or Later	1996 Model Year or Later
<i>ASM5015</i>	1981 to 1995 Model Years	1981 to 1995 Model Years
<i>Anti-Tampering Program</i>	Light-duty Vehicles Only	Light- and Heavy-duty Vehicles
<i>Gas Cap Evaporative Check</i>	1975 Model Year or Later	1970 Model Year or Later
<i>OBD Evaporative Check</i>	1996 Model Year or Later	1996 Model Year or Later
<i>Pre-1981 Models Stringency</i>	20%	30%
<i>Waiver Rate</i>	3%	3%
<i>Compliance Rate</i>	96%	98%

Source: DVRPC, 2008

Note:

† Summer settings are for a July day and are for both VOCs and NO<sub>x</sub> estimates.

§ In Pennsylvania, although the Stage II refuelling program is not part of the mobile source section of the SIP, the control is under the area source section and is in place.

« Includes Tier I for vehicles of 1996-1999 MYs, NLEV (OTC) for 2000-2003 MY vehicles, Tier II for 2004-2007 MYs, and CA LEV II for 2008 MY and beyond.

\* In January 2004, the New Jersey Legislature enacted NJSA 26:2C-8.5 et seq., requiring NJ DEP to promulgate rules adopting the CA LEV II program.

# 6 CONFORMITY DETERMINATION

## 6.1 TRAVEL SIMULATION RESULTS

Travel simulation work began on April 25, 2008, and other relevant quantitative analyses for this iteration of transportation conformity determination subsequently ensued. All planning assumptions utilized in this demonstration are

the latest and most current as of that date. Tables 10 and 11 present selected VMT results from these simulations. Table 10 shows the estimates based on the four-season approach utilized in PM<sub>2.5</sub> analysis. Table 11 includes the VMT estimates that used in ozone analysis.

**Table 10. Simulated Daily Travel Impacts (For PM<sub>2.5</sub> Analysis)**

Analysis Year	DVRPC Area	Avg Winter Daily VMT <sup>†</sup>		Avg Spring Daily VMT <sup>†</sup>		Avg Summer Daily VMT <sup>†</sup>		Avg Fall Daily VMT <sup>†</sup>	
		Dec \$	Jan \$	Mar \$	Apr \$	Jun \$	Jul \$	Sep \$	Oct \$
2002	PA Subregion	62,773,700		67,036,500		69,734,700		67,638,600	
	NJ Subregion ‡	28,879,000		30,817,100		32,129,500		31,146,200	
2009	Mercer Only §	9,539,800	8,811,800	9,531,500	9,836,600	10,205,500	10,274,800	10,113,400	9,880,900
	PA Subregion	69,490,500		74,206,600		77,200,300		74,874,000	
2010	NJ Subregion ‡	30,390,000		32,432,300		33,816,200		32,784,800	
	Mercer Only §	9,728,600	8,986,400	9,720,100	10,031,200	10,407,400	10,478,100	10,313,500	10,076,500
2020	PA Subregion	75,155,700		80,252,400		83,492,200		80,971,800	
	NJ Subregion ‡	32,152,700		34,313,300		35,778,900		34,687,900	
2030	Mercer Only §	10,133,100	9,358,100	10,126,100	10,447,400	10,839,500	10,913,200	10,742,300	10,495,900
	PA Subregion	80,562,700		86,027,700		89,504,700		86,801,900	
2030	NJ Subregion ‡	33,958,300		36,241,500		37,790,800		36,641,000	
	Mercer Only §	10,847,900	10,017,000	10,841,600	11,183,900	11,603,700	11,682,700	11,500,000	11,236,500

Source: DVRPC, 2008

Note:

† Except for the monthly estimates for Mercer, VMT shown are seasonal averages and may not represent a single month. For more information, contact DVRPC.

‡ Burlington, Camden, and Gloucester counties only.

§ Monthly VMT estimates apply to Mercer County only.

**Table 11. Simulated Daily Travel Impacts (For Ozone Analyses)**

<i>Analysis Year</i>	<i>DVRPC Area</i>	<i>Summer Condition (July Day)</i>	
		<i>Avg VMT</i>	<i>Avg Travel Speed (mph)</i>
<b>2009</b>	Entire PA Subregion	79,997,600	30.2
	Entire NJ Subregion	45,985,300	33.4
<b>2010</b>	Entire PA Subregion	81,374,300	30.1
	Entire NJ Subregion	46,610,300	33.3
<b>2020</b>	Entire PA Subregion	88,018,700	30.3
	Entire NJ Subregion	49,133,300	33.3
<b>2030</b>	Entire PA Subregion	94,351,700	29.9
	Entire NJ Subregion	52,055,700	32.9

Source: DVRPC, 2008

## 6.2 EMISSIONS ESTIMATE RESULTS

Mobile source emissions estimates are obtained by using MOBILE6.2 emission factors to convert link-level VMT and speed from the simulation assignments. The regional emissions analysis must meet all conformity tests in the *Final Rule*. Specifically, emissions of VOCs, and NO<sub>x</sub> and PM<sub>2.5</sub> in Mercer County, must be less than the MVEBs established by the states. Having no budgets, PM<sub>2.5</sub> emissions levels in the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area must meet the “no-greater-than-the-2002-baseline” interim test.

For ozone precursors, the conformity demonstration was performed using the prevailing one-hour Ozone SIP MVEB. Eight-hour Ozone SIPs are currently being reviewed for adequacy by the US EPA and were included in this analysis in anticipation of an adequacy finding by US EPA. Adequacy findings for these budgets are expected to be published in the Federal Register and become effective in July 2008. At the request of US EPA, DVRPC is adopting this conformity determination contingent upon the 2009 Eight-hour Ozone Attainment SIP MVEB becoming effective in July 2008. The 2009 eight-hour Ozone SIPs MVEBs will then become the prevailing MVEBs for ozone conformity.

Tables 12 and 13 present the results of these calculations for the transportation conformity simulation for the critical ozone precursors of VOCs and NO<sub>x</sub>. Analysis years for ozone are 2009, 2010, 2020, and 2030. These results are compared with the budgets to demonstrate conformity. Emissions analysis indicate that the DVRPC region will meet all of the current and proposed SIP MVEBs

In addition, the region must maintain the CO standard. EPA has approved limited maintenance plans for both the Pennsylvania and

New Jersey portions of the region and has ruled that no emissions analysis are required to demonstrate conformity in the region for CO.

Furthermore, DVRPC must make conformity determinations for PM<sub>2.5</sub> in two different nonattainment areas with two different emissions tests. Table 14 provides the PM<sub>2.5</sub> emissions estimate results.

In the DVRPC portion of the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area, a governing SIP MVEB exists and PM<sub>2.5</sub> conformity therein is demonstrated against this budget, which is established for 2009. All applicable direct PM<sub>2.5</sub> sources and precursors (NO<sub>x</sub>) are tested for the 2009, 2010, 2020, and 2030 PM<sub>2.5</sub> emissions estimates.

In the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area, there are no PM<sub>2.5</sub> SIPs, and DVRPC and WILMAPCO have opted to utilize the “no-greater-than-2002-baseline” interim emissions test. All analysis results are considered against the 2002 baseline for the interim test.

Collectively, these tables show that the estimated emissions of VOCs, NO<sub>x</sub>, and PM<sub>2.5</sub> do not exceed the respective MVEBs included in the SIPs established by the corresponding states or the appropriate baseline established for the interim emissions test.

**Table 12. VOCs Emission Analysis Results (Tons/July Day) †**

	2005 SIP MVEB	2008 SIP MVEB	2009 SIP MVEB	2010	2020	2030
PA	Emissions from MOBILE6.2	-	-	51.92	48.56	21.76
	Adjustments from Off-Network Calculation ‡	-	-	0.00	-0.01	-0.01
	<b>Estimated Total Emissions</b>	<b>79.69</b>	<b>61.09</b>	<b>51.92</b>	<b>48.55</b>	<b>21.75</b>
NJ	Emissions from MOBILE6.2	-	-	24.61	22.81	11.92
	Adjustments from Off-Network Calculation ‡	-	-	0.00	0.00	0.00
	<b>Estimated Total Emissions</b>	<b>42.99</b>	<b>27.75</b>	<b>24.61</b>	<b>22.81</b>	<b>11.92</b>

Source: DVRPC, 2008

Note: † The 2005 SIP MVEB applies to all future years. The most recent (2008 or 2009) eight-hour ozone SIP MVEBs will apply to all future analysis years when those SIPs are found adequate for transportation conformity purposes. All emissions are rounded off to the nearest hundredth.  
‡ Emissions adjustments calculated using off-network methodology could become zero when rounded off.

**Table 13. NOx Emission Analysis Results (Tons/July Day) †**

	2005 SIP MVEB	2008 SIP MVEB	2009 SIP MVEB	2010	2020	2030
PA	Emissions from MOBILE6.2	-	-	87.27	78.87	15.79
	Adjustments from Off-Network Calculation ‡	-	-	-0.30	-0.63	-0.47
	<b>Estimated Total Emissions</b>	<b>144.73</b>	<b>108.78</b>	<b>86.93</b>	<b>78.24</b>	<b>15.32</b>
NJ	Emissions from MOBILE6.2	-	-	60.01	53.57	9.41
	Adjustments from Off-Network Calculation ‡	-	-	0.00	0.00	0.00
	<b>Estimated Total Emissions</b>	<b>63.44</b>	<b>69.67</b>	<b>60.01</b>	<b>53.57</b>	<b>9.41</b>

Source: DVRPC, 2008

Note: † The 2005 SIP MVEB applies to all future years. The most recent (2008 or 2009) eight-hour ozone SIP MVEBs will apply to all future analysis years when those SIPs are found adequate for transportation conformity purposes. All emissions are rounded off to the nearest hundredth.  
‡ Emissions adjustments calculated using off-network methodology could become zero when rounded off.

**Table 14. Direct PM<sub>2.5</sub> and NO<sub>x</sub> Emission Analysis Results (Tons/Year) †**

	2002		2009		2010	2020	2030
	Baseline	SIP MVEB »	Estimated Emissions	Estimated Emissions	Estimated Emissions	Estimated Emissions	Estimated Emissions
Direct PM <sub>2.5</sub>	DVRPC - PA	998.2	-	-	594.4	418.1	492.2
	DVRPC - NJ; except Mercer †	486.7	-	-	324.2	186.7	181.5
	WILMAPCO - DE §	208.6	-	-	97.1	89.4	96.3
	Mercer County, NJ »	-	108	99	91	57	56
PM <sub>2.5</sub> Precursor (NO <sub>x</sub> )	DVRPC - PA	59,346.0	-	-	28,547.3	9,199.2	11,550.7
	DVRPC - NJ; except Mercer †	30,499.9	-	-	14,511.1	3,942.7	2,597.3
	WILMAPCO - DE §	11,799.1	-	-	4,686.3	1,819.1	1,508.6
	Mercer County, NJ »	-	5,056	5,013	4,499	1,238	818

Source: DVRPC, 2008; WILMAPCO, 2008

Note: † Associated 2002 Baseline or 2009 MVEBs apply to all future analysis years. All emissions are rounded off to the nearest tenth except for those in Mercer. See note on » below.

‡ Results are for Burlington, Camden, and Gloucester counties only, which comprise the New Jersey portion of the Philadelphia-Wilmington, PA-NJ-DE-PM<sub>2.5</sub> Nonattainment Area.

§ Results are for New Castle County in Delaware only and are provided by WILMAPCO. It is the Delaware portion of the Philadelphia-Wilmington, PA-NJ-DE-PM<sub>2.5</sub> Nonattainment Area.

» NJ SIP MVEBs and the emissions results are for Mercer County, which is the DVRPC portion of the New York-Northern New Jersey-Long Island, NJ-NJ-CT PM<sub>2.5</sub> Nonattainment Area.

Emissions results are rounded off to the nearest integer in accordance with the SIP.

### 6.3 MEETING THE CONFORMITY CRITERIA

Tables 12 through 14 in section 6.2 cumulatively demonstrate that the *Plan* and the *TIP<sub>s</sub>* conform to the existing and proposed *SIP<sub>s</sub>* with respect to the motor vehicle emissions budgets in the corresponding implementation year. The *Plan* and the *TIP<sub>s</sub>* meet all requirements under the governing ozone and PM<sub>2.5</sub> for all analysis years tested. The *Plan* and the *TIP<sub>s</sub>* also conform to the CAA provisions, whereas there are no *SIP<sub>s</sub>* as specified in the *Final Rule*. The *Plan* and the *TIP<sub>s</sub>* are shown to meet the prescribed interim emissions test for all years analyzed.

In addition, 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 be shown, among other items, to:

- be on fiscally constrained *TIP<sub>s</sub>* and the *Plan* [40 CFR 93.108];
- be based on the latest planning assumptions [40 CFR 93.110];
- be based on the latest emissions estimation model available [40 CFR 93.111];
- include consultation procedures consistent with those described in the *Final Rule* [40 CFR 93.112];
- not interfere with the timely implementation of TCMs [40 CFR 93.113]; and
- be consistent with the motor vehicle emissions budgets in the applicable implementation plans [40 CFR 93.118].

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

**Table 15. Evaluation of the Conformity Determination Criteria**

<i>Corresponding 40 CFR Part 93 Section(s)</i>	<i>Evaluation Criteria</i>	<i>DVRPC's Response</i>
§93.106(a) (1)	Are the transportation plan horizon years correct?	Yes. The analysis years of 2009 (ozone only), 2010, 2020, and 2030 correspond to the eight-hour ozone budget year, attainment and near-term year, an interim year within a 10-year frame, and the current <i>Plan</i> horizon years of WILMAPCO and DVRPC. In Mercer County, PM <sub>2.5</sub> is analyzed for 2009, which is its budget year.
§93.106(a) (2)(i)	Does the plan quantify and document the demographic and employment factors influencing transportation demand?	Yes. The <i>Destination 2030</i> Long Range Plan does quantify and document demographic and employment factors influencing transportation demand.
§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 <i>Plan</i> and <i>TIP</i> documents.
§93.108	Are the transportation improvement program and the transportation plan fiscally constrained?	Yes. The <i>Plan</i> and the <i>TIP</i> are constrained to reasonably anticipated financial resources.
§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.

<<continued>>



**Table 15. Evaluation of the Conformity Determination Criteria (*continued*)**

<i>Corresponding 40 CFR Part 93 Section(s)</i>	<i>Evaluation Criteria</i>	<i>DVRPC's Response</i>
<p>§93.109(e) §93.109(f)</p>	<p>Are all budget tests for VOCs, NO<sub>x</sub>, and CO satisfied as required by §93.118 and §93.119 for conformity determination?</p>	<p>Yes. MOBILE6.2 VOCs and NO<sub>x</sub> MVEBs for both Pennsylvania and New Jersey have been approved by US EPA. DVRPC performs budget tests to demonstrate the ozone conformity of the <i>Plan</i> and the <i>TIP</i>. US EPA has approved limited maintenance plans for the CO Maintenance Areas within the region and no emissions analyses are required. PM<sub>2.5</sub> is tested using area-appropriate budget and interim tests.</p>
<p>§93.110</p>	<p>Are the conformity determinations based upon the latest planning assumptions?</p> <p>(a) 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 the conformity determination began?</p> <p>(b) 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?</p> <p>(c) Are any changes in the transit operating policies (including fares and service levels) and assumed transit ridership discussed in the determination?</p> <p>(d) The conformity determination must include reasonable assumptions about transit service and increases in transit fares and road and bridge tolls over time.</p> <p>(e) The conformity determination must use the latest existing information regarding the effectiveness of the transportation control measures [TCMs] and other implementation plan measures that have already been implemented.</p> <p>(f) Key assumptions shall be specified and included in the draft documents and supporting materials used for the interagency and public consultation required by §93.105.</p>	<p>Yes.</p> <p>(a) Yes. This conformity determination utilizes the most recent planning assumptions as of the start date of this conformity determination process, April 25, 2008.</p> <p>(b) Yes. This conformity determination utilizes the most recent demographic and employment data adopted by the DVRPC Board in July 2007 and shown in this conformity determination document. Also, planning assumptions and other travel data from as recent as 2007 are utilized. These assumptions are derived from the most current information available to DVRPC.</p> <p>(c) Yes. Applicable transit operating policies and transit ridership are discussed in section 3.2 of this document.</p> <p>(d) Key transit and toll assumptions are outlined in section 3.2 of this document.</p> <p>(e) Currently, there are no adopted TCMs in the corresponding <i>SIP</i>.</p> <p>(f) Key assumptions are specified and other supporting documents are included in this conformity determination document, which is available to the public and TICCG.</p> <p style="text-align: right;">&lt;&lt;<i>continued</i>&gt;&gt;</p>

**Table 15. Evaluation of the Conformity Determination Criteria (continued)**

<i>Corresponding 40 CFR Part 93 Section(s)</i>	<i>Evaluation Criteria</i>	<i>DVRPC's Response</i>
§93.111	Is the conformity determination based upon the latest emissions model?	Yes. The transportation conformity determination for the <i>Plan</i> and the <i>TIP</i> is based on MOBILE6.2.
§93.112	Did the MPO make the conformity determination according to the consultation procedures of the <i>Final Rule</i> or the state's conformity <i>SIP</i> ?	Yes. Three 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 the transportation conformity. In compliance with 23 CFR 450, two public meetings were held to receive comments regarding transportation conformity of the <i>Plan</i> and the <i>TIP</i> ; under all governing NAAQS.
§93.113(b) §93.113(c)	Are TCMs being implemented in a timely manner?	There are currently no adopted transportation control measures in the <i>SIP</i> .
§93.114	Are there a currently conforming transportation plan and a currently conforming <i>TIP</i> at the time of project approval?	Yes. The <i>TIP</i> s supplant the FY 2007 Pennsylvania and FY 2008 New Jersey <i>TIP</i> s, which are currently conforming <i>TIP</i> s. This conformity demonstration reflects new FY 2009 New Jersey and Pennsylvania <i>TIP</i> s. The <i>Destination 2030</i> Plan is currently a conforming plan and was updated to comply with SAFETEA-LU provisions in 2007.
§93.115	Are the projects from a conforming <i>Plan</i> and <i>TIP</i> ?	Yes. The projects are from the currently conforming <i>TIP</i> s and the <i>Plan</i> . The <i>TIP</i> s are consistent with the <i>Plan</i> .
§93.118	For areas with <i>SIP</i> Budgets: is the Transportation Plan, <i>TIP</i> , or Project consistent with the established motor vehicle emissions budget(s) in the applicable <i>SIP</i> ?	Yes. <i>TIP</i> s and the <i>Plan</i> result in fewer emissions than the established budgets for all applicable pollutants in each analysis year.

<<continued>>

**Table 15. Evaluation of the Conformity Determination Criteria (*continued*)**

<i>Corresponding 40 CFR Part 93 Section(s)</i>	<i>Evaluation Criteria</i>	<i>DVRPC's Response</i>
§93.119	For areas without <i>SIP</i> Budgets: does the Transportation Plan, <i>TIP</i> , or Project satisfy the prescribed interim emissions test?	Yes. For the Philadelphia-Wilmington, PA-NJ-DE, PM <sub>2.5</sub> Nonattainment Area, the <i>TIP</i> and the <i>Plan</i> result in less emissions than the 2002 baseline result for PM <sub>2.5</sub> in each analysis year.
§93.122(a) (1)	Does the conformity analysis include all regionally significant projects?	Yes. The project sets for <i>TIP</i> and the <i>Plan</i> 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 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: DVRPC, 2008

# 7 STAKEHOLDER PARTICIPATION

## 7.1 INTERAGENCY CONSULTATION

DVRPC hosted a series of TCICG correspondence for this iteration of the transportation conformity demonstration of the *Plan* and the *TIP*s amendments. Three TCICG meetings were held. The first meeting was held on April 8, 2008 to assess the transportation conformity process, to advise on the timeline, and to determine the latest planning assumptions utilized. The second conference call meeting was held on April 21, 2008 to review draft *TIP* and *Plan* project sets and associated AQ codes. The third conference call meeting was held on May 12, 2008, to review the draft conformity document before it was released for public comment.

Represented federal, state, and local partners on the TCICG included US EPA Region II and III Offices, FHWA Pennsylvania and New Jersey Division Offices, FTA Region II and III Offices, NJ DEP, NJ DOT, NJ Transit, PA DEP, PennDOT, SEPTA, and the Air Management Services of the City of Philadelphia. The consultant firm of Michael Baker Jr., Inc. also participated in the TCICG process for its extensive involvement and expertise in the transportation conformity processes in both Pennsylvania and New Jersey. For the PM<sub>2.5</sub> demonstration, DVRPC also consulted with the WILMAPCO.

## 7.2 PUBLIC INVOLVEMENT

DVRPC opened a mandated public comment period on May 16, 2008, to receive comment on the draft conformity findings. The announcement for the public comment period for the conformity determination of the *Plan* and the *TIP*s appeared in five major newspapers throughout the region on April 30, 2008. Additionally, a media release was sent to local television, radio, and print media.

The draft conformity document was distributed to various libraries throughout the region and made available online at [www.dvrpc.org](http://www.dvrpc.org). Written comments were to be received by fax at (215) 592-9125 and online at [TIP-plan-comments@dvrpc.org](mailto:TIP-plan-comments@dvrpc.org). Two public meetings/information sessions were held. One on May 14, 2008 at the DVRPC offices and one on May 28, 2008, in Cherry Hill, New Jersey. The comment period closed on June 20, 2008, at 5 pm.

DVRPC received four comments that related to the conformity determination during the public comment period. These comments and the DVRPC responses are addressed in Section D of this report.

## 8 CONCLUSION

The DVRPC *TIP*s and the *Plan* are found to be in conformity with the current Pennsylvania and New Jersey *SIP*s under the CAA. The forecasted emissions levels of VOCs, NO<sub>x</sub>, and PM<sub>2.5</sub> do not exceed the respective budgets and baseline 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 *TIP* are fiscally constrained [40 CFR 93.108];
- that this determination is based on the latest planning assumptions [40 CFR 93.110];
- that this determination is based on the latest emissions estimation model available [40 CFR 93.111];
- that DVRPC has made the determination according to the applicable consultation procedures [40 CFR 93.112];
- that the *Plan* and the *TIP* do not interfere with the timely implementation of TCMs [40 CFR 93.113]; and
- that the *Plan* and the *TIP* are consistent with the motor vehicle emissions budgets and interim tests in the applicable implementation plans [40 CFR 93.118].

Hereby demonstrated is transportation conformity of:

- ▷ the DVRPC *Destination 2030 Long Range Plan*;
- ▷ the FY 2009 Pennsylvania *TIP*; and
- ▷ the FY 2009 New Jersey *TIP*

with the corresponding state *SIP*s and the *Final Rule* requirements under CAA including:

- the eight-hour ozone NAAQS in the Philadelphia-Wilmington-Atlantic City Ozone Nonattainment Area;
- the eight-hour CO NAAQS in the Philadelphia CO Maintenance Area, in the City of Burlington in Burlington County, New Jersey and in the City of Trenton in Mercer County, New Jersey;
- the PM<sub>2.5</sub> NAAQS in the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area; and
- the PM<sub>2.5</sub> NAAQS in the New York-Northern New Jersey-Long Island, NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area.

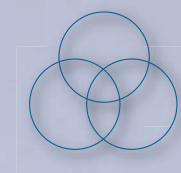


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Delaware Valley Regional Planning Commission  
June 2008

# Section C



**PM<sub>2.5</sub>**  
**Non-Attainment**  
**Area Conformity**  
**Demonstration**





By submitting below, DVRPC and WILMAPCO jointly demonstrate their collective PM<sub>2.5</sub> conformity in the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area. This common document is for both DVRPC and WILMAPCO and is a required part of the nonattainment area-wide conformity demonstration. For DVRPC, this document is formatted as a self-contained, supplementary section of its conformity finding.

**A DEMONSTRATION  
OF  
TRANSPORTATION CONFORMITY  
FOR PM<sub>2.5</sub>  
IN THE PHILADELPHIA-WILMINGTON,  
PA-NJ-DE PM<sub>2.5</sub> NONATTAINMENT AREA**

JUNE 2008

## Overview

Transportation conformity is a process to ensure that federal funding and approval goes to those transportation activities that are consistent with air quality goals. Transportation conformity applies to long-range transportation plans (*Plans*), transportation improvement programs (*TIPs*), and other projects funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) in areas that do not meet or previously have not met air quality standards for identified pollutants, such as ozone, carbon monoxide, particulate matter, and sulfur dioxides. These areas are known as "nonattainment areas" or "maintenance areas," respectively. FHWA and FTA jointly make conformity determinations within air quality nonattainment and maintenance areas to ensure that federal actions conform to the purpose of the corresponding state implementation plans. The United States Department of Transportation (US DOT) cannot fund, authorize, or approve federal actions to support programs or projects that are not found to conform to the Clean Air Act requirements governing the current National Ambient Air Quality Standards (NAAQS).

In January 2005, the United States Environmental Protection Agency (US EPA) finalized fine particulate matter (PM<sub>2.5</sub>) designations under the NAAQS. Under this designation, the area consisting of Burlington, Camden, and Gloucester counties in New Jersey, Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in Pennsylvania, and New Castle County in Delaware were designated as nonattainment for PM<sub>2.5</sub>. This geographic area is termed as the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area.

The two Metropolitan Planning Organizations (MPOs) within the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area –

Delaware Valley Regional Planning Commission (DVRPC) and Wilmington Area Planning Council (WILMAPCO) – have determined that their respective Plans and *TIPs* conform to the transportation conformity rules for PM<sub>2.5</sub>. The MPOs have passed the required interim emissions test for PM<sub>2.5</sub>, both individually and collectively.

This PM<sub>2.5</sub> conformity determination has been required due to a change in the *TIPs* for DVRPC (update of FY 2009-2012 *TIPs*) and amendments to the *Destination 2030 Long Range Plan*. The *Final Rule* mandates that, during the interim emissions testing period, all MPOs within a nonattainment area must redemonstrate conformity any time any of the MPOs make changes to their *Plans* and/or *TIPs*. The emissions results for DVRPC and WILMAPCO are included in this document. WILMAPCO demonstrated conformity of its FY 2009 *TIP* in April 2008. US EPA Region III and the TCICG determined that a reaffirmation of this determination was not necessary due to temporal proximity of both MPO's conformity determinations.

## Background on PM<sub>2.5</sub>

Fine particulate matter (PM<sub>2.5</sub>) is a mixture of microscopic solids and liquid droplets suspended in air, where the size of the particles is less than 2.5 μm. Fine particles can be emitted directly (such as smoke from a fire or as a component of automobile exhaust) or be formed indirectly in the air from power plant, industrial, and mobile source emissions of gases, such as sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>).

US EPA reports that the health effects associated with exposure to PM<sub>2.5</sub> are significant. Scientific studies have shown significant associations between elevated PM<sub>2.5</sub> levels and premature death. Effects associated with PM<sub>2.5</sub> exposure include aggravation of

respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days), lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems, such as heart attacks and cardiac arrhythmia. While PM<sub>2.5</sub> is unhealthy for anyone to breathe, people with heart or lung disease, asthmatics, older adults, and children are especially at risk.

### **PM<sub>2.5</sub> National Ambient Air Quality Standards and Nonattainment**

In July 1997, US EPA issued NAAQS for PM<sub>2.5</sub>, designed to protect the public from exposure to PM<sub>2.5</sub> at levels that may cause health problems. The standards include an annual level set at 15 µg/m<sup>3</sup>, based on a three-year average of the annual mean PM<sub>2.5</sub> concentrations and a 24-hr standard of 65 µg/m<sup>3</sup>, based on a 3-year average of the 98<sup>th</sup> percentile of 24-hr concentrations.<sup>18</sup> Areas need to meet both standards to be considered in attainment of PM<sub>2.5</sub> NAAQS.

Meeting the PM<sub>2.5</sub> standards nationwide would prevent an estimated 15,000 premature deaths; 75,000 cases of chronic bronchitis; 10,000 hospital admissions for respiratory/cardiovascular disease; hundreds of thousands of occurrences of aggravated asthma; and 3.1 million days when people miss work because they are suffering from symptoms related to particle pollution exposure.

On April 5, 2005, US EPA designations under the PM<sub>2.5</sub> NAAQS became effective. Designated areas have had or have contributed to PM<sub>2.5</sub> levels higher than allowed under the two PM<sub>2.5</sub> standards.

<sup>18</sup> On September 21, 2006, US EPA revised - and made it more stringent - the 24-hour daily standard from 65 µg/m<sup>3</sup> to 35 µg/m<sup>3</sup>. Nonattainment designations based on the new daily standard are expected by 2010.

Those areas not meeting either standard are called PM<sub>2.5</sub> nonattainment areas (NAAs). All PM<sub>2.5</sub> NAAs must demonstrate transportation conformity of the PM<sub>2.5</sub> requirements under the final transportation conformity rule (*Final Rule*). Upon meeting the transportation conformity requirements, the NAAs are mandated to meet the PM<sub>2.5</sub> NAAQS ("reach attainment") as soon as possible, but no later than 2010. US EPA may grant attainment date extensions of up to five years in areas with more severe PM<sub>2.5</sub> problems and where emissions control measures are not available or feasible.

States with designated nonattainment areas must submit plans that outline how they will meet the PM<sub>2.5</sub> standards. Those plans are known as State Implementation Plans (*S/Is*). Both Pennsylvania and New Jersey are required to submit PM<sub>2.5</sub> *S/Is* to US EPA in 2008.

### **The Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> Nonattainment Area**

The Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> NAA is designated by US EPA as in nonattainment because the region fails to meet the annual PM<sub>2.5</sub> NAAQS (no portions of the NAA were found to violate the daily PM<sub>2.5</sub> NAAQS). This NAA includes the following counties:

- Delaware: New Castle
- New Jersey: Burlington, Camden, and Gloucester
- Pennsylvania: Bucks, Chester, Delaware, Montgomery, and Philadelphia

Transportation conformity must be demonstrated for the entire NAA as a whole. Figure U-1 below shows the NAAs affecting the planning areas of the two MPOs in the NAA and the boundaries of other involved MPOs.

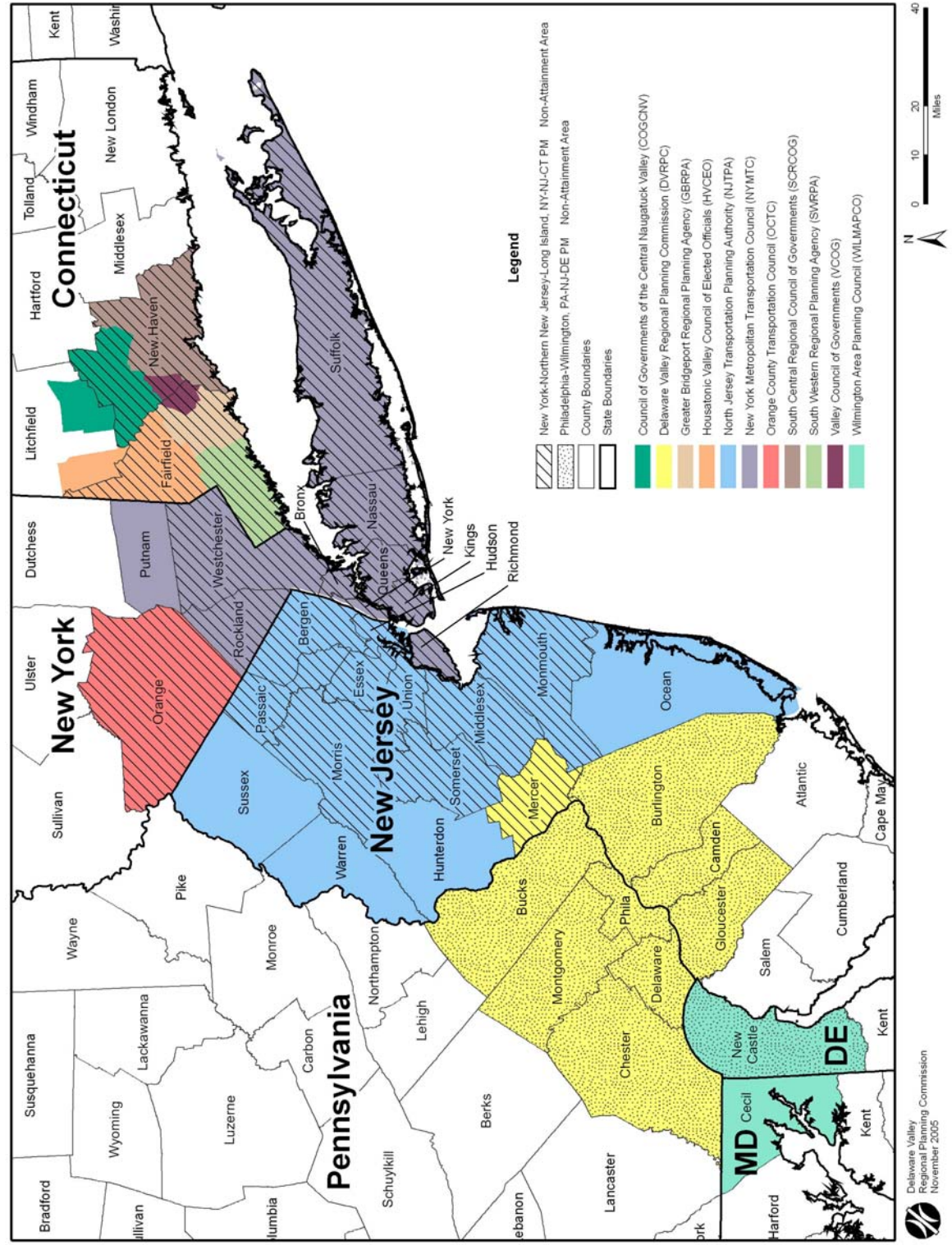


Figure U-1. Fine Particulate Matter (PM<sub>2.5</sub>) NAAs and Affected MPOs

## **Multistate Interagency Consultation**

As required by the federal transportation conformity rule, the conformity process includes a significant level of cooperative interaction among the many regional, state, and federal agencies. For PM<sub>2.5</sub> conformity determinations, this interagency consultation process occurs at both the entire NAA level and at individual state and MPO levels. This process is called the Multistate Interagency Consultation Process, which is referred to as TCICG/AOS herein.<sup>19</sup>

TCICG/AOS for the conformity demonstration purpose consists of – but is not limited to – representatives from the following agencies:

- US DOT, FHWA - PA, NJ, and DE Division Offices
- US DOT, FTA - Region II and Region III Offices
- US EPA - Region II and Region III Offices
- Delaware Department of Transportation (Del DOT)
- Delaware Department of Natural Resources & Environmental Control (DE DNREC)
- Delaware Transit Corporation (DART)
- Delaware River Port Authority (DRPA)
- New Jersey Department of Transportation (NJ DOT)
- New Jersey Department of Environmental Protection (NJ DEP)
- New Jersey Turnpike Authority
- New Jersey Transit (NJ Transit)
- Pennsylvania Department of Transportation (Penn DOT)
- Pennsylvania Department of Environmental Protection (PA DEP)

<sup>19</sup> DVRPC has an existing conformity interagency group named the Transportation Conformity Interagency Consultation Group, or TCICG. WILMAPCO has its own, named The Air Quality Subcommittee (AOS). The two groups form the multistate interagency group.

- Pennsylvania Turnpike Commission
- Southeastern Pennsylvania Transportation Authority (SEPTA)
- City of Philadelphia, Air Management Services (AMS)
- Delaware Valley Regional Planning Commission (DVRPC)
- Wilmington Area Planning Council (WILMAPCO)

TCICG/AOS is consulted several times throughout the conformity determination process to review, discuss, and approve planning assumptions, and to provide guidance on other related conformity issues.

## **Annual Inventories for PM<sub>2.5</sub>**

A four-season approach was chosen to develop the annual emissions estimates for the NAA.

Because this NAA does not meet the annual PM<sub>2.5</sub> standard, the emissions analysis for PM<sub>2.5</sub> must consider annual emissions. However, the emissions model that US EPA requires for conformity analysis, MOBILE6.2, is only designed to produce daily emissions. The technique used to estimate annual emissions from the daily MOBILE6.2 emissions is termed an “annual inventory method.” Guidance from US EPA presents four possible options for developing an annual inventory before a SIP is developed: using a single MOBILE6.2 output to represent daily emissions for the entire year; running MOBILE6.2 to represent two seasons; running MOBILE6.2 to represent four seasons; or running MOBILE6.2 to represent 12 individual months.<sup>20</sup> However, various sensitivity analyses show that there are not enough differences among the two-season, four-season, and 12-month

<sup>20</sup> Guidance for Creating Annual On-road Mobile Source Emission Inventories for PM<sub>2.5</sub> Nonattainment Areas for Use in SIPs and Conformity. US EPA. Office of Transportation and Air Quality. EPA420-B-05-008. August 2005.

approaches, so TCI/CG/AOS decided to use the four-season annual inventory method. The same annual inventory method is used for all emissions analyses conducted within the NAA.

### ***PM<sub>2.5</sub> Regional Emissions Tests***

The “no-greater-than-2002” baseline test was chosen for the NAA.

As stated above, states are required to submit *SIPs*; by April 2008. These *SIPs* have not yet been ruled adequate for transportation conformity purposes and *SIP* budgets are not available for this determination. Once *SIPs* have been established, each MPO will have a budget for PM<sub>2.5</sub> emissions with which to compare projected future emissions resulting from implementation of *Plans* and *TIPs*. However, until that time, EPA requires that one of two interim emission tests be used to demonstrate PM<sub>2.5</sub> conformity: either the baseline year test or the build/no-build test. The baseline year test requires that emissions projected for each future analysis year be no greater than emissions in 2002 (the baseline year). The build/no-build test requires that, for each future analysis year, emissions from the “build” scenario be no greater than emissions from the “no-build” scenario. The selected interim emission test must be used for the entire nonattainment area. Within the Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> NAA, the baseline year test has been selected as the interim emissions test. This has been selected through the interagency consultation process.

### ***Analysis Years***

The following four analysis years were chosen for the NAA:

- 2002 (baseline year for the interim test);
- 2010 (near-term year within five years of analysis);

- 2020 (interim year to keep analysis years less than 10 years apart); and,
- 2030 (DVRPC and WILMAPCO *Plan* horizon year).

US EPA regulations require that emissions analysis be conducted for specific analysis years. Section 93.119(g) of the *Final Rule* states that these analysis years must include a near-term year no more than five years beyond the year in which conformity was demonstrated, the last year of the long-range plan, and an intermediate year or years such that analysis years are no more than 10 years apart.

For this NAA, the attainment date for the annual PM<sub>2.5</sub> NAAQS is 2010. This is also the near-term year of analysis. Furthermore, because there are multiple MPOs, the last year of all of the MPOs’ *Plans* must be included as analysis years (2030). An intermediate year of 2020 has also been selected so that no two analysis years are more than 10 years apart.

### ***Components of PM<sub>2.5</sub> Regional Emissions Analyses***

The following PM<sub>2.5</sub> pollutants and precursors were tested:

- Direct PM<sub>2.5</sub> source: tailpipe exhaust, brake, and tire wear;
- PM<sub>2.5</sub> Precursor: NO<sub>x</sub>.

PM<sub>2.5</sub> can result from both direct and indirect sources. Gasoline and diesel on-road vehicles emit both direct PM<sub>2.5</sub> and other gases that react in the air to form PM<sub>2.5</sub>. Transportation-related direct PM<sub>2.5</sub> 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. Transportation-related indirect PM<sub>2.5</sub> emissions can result from one or more of

several exhaust components, including NO<sub>x</sub>, VOCs, sulfur oxides (SO<sub>x</sub>), and ammonia (NH<sub>3</sub>).

For the regional analysis of direct PM<sub>2.5</sub> emissions, US EPA has ruled that both exhaust and brake/tire wear must be included. However, US EPA has ruled that regional emissions analyses for direct PM<sub>2.5</sub> should include road dust only if road dust is found to be a significant contributor to PM<sub>2.5</sub> by either the US EPA Regional Administrator or a state air agency. For this NAA, neither the US EPA Regional Administrators nor any of the three state air agencies have found that road dust is a significant PM<sub>2.5</sub> contributor. US EPA has also ruled that regional direct PM<sub>2.5</sub> analyses only need to include fugitive dust from construction of transportation projects if the *SIP* identifies these emissions as significant contributors to the regional PM<sub>2.5</sub> problem. Because no PM<sub>2.5</sub> *SIP* has been established, construction-related dust does not need to be considered. Thus, the only components of direct PM<sub>2.5</sub> emissions to be considered in the NAA are tailpipe exhaust and brake/tire wear.

For the regional analysis of indirect PM<sub>2.5</sub> emissions (also called PM<sub>2.5</sub> precursors), US EPA has identified four potential transportation-related PM<sub>2.5</sub> precursors: NO<sub>x</sub>, VOCs, SO<sub>x</sub>, and NH<sub>3</sub>. Once a *SIP* is established, any precursors identified in the *SIP* will be required in the analysis of indirect PM<sub>2.5</sub> emissions. Until a *SIP* is established, US EPA has ruled that indirect PM<sub>2.5</sub> emissions must be analyzed for NO<sub>x</sub> unless US EPA and the state determine that NO<sub>x</sub> is insignificant, and they must be analyzed for VOCs, SO<sub>x</sub> and NH<sub>3</sub> only if the US EPA or the state determine that one or more of these precursors are significant. There have been no findings of significance (or insignificance in the case of NO<sub>x</sub>). Thus, the only indirect PM<sub>2.5</sub> component that needs to be considered in the NAA is NO<sub>x</sub>.

## Analysis Results

Emissions analyses for the DVRPC portion of the NAA began on April 25, 2008. (The results are presented in Tables U-1 and U-2). Presented in the tables are individual emissions analysis results from the MPOs. Both MPOs met applicable requirements individually and the NAA passed the interim emissions test collectively.

Table U-1. Direct PM<sub>2.5</sub> Interim Emissions Test Results (Tons/Year)

	2002	2010	2020	2030
DVRPC-PA	998.2	594.4	418.1	492.2
DVRPC-NJ	486.7	324.2	186.7	181.5
WILMAPCO-NCCT†	208.6	97.1	89.4	96.3
<b>NAA Total:</b>	<b>1,693.5</b>	<b>1015.7</b>	<b>694.2</b>	<b>770</b>
<b>Conclusion</b>	<b>Baseline</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

Source: DVRPC, 2008; WILMAPCO 2008

Note: † NCC denotes New Castle County.

Table U-2. PM<sub>2.5</sub> Precursor (NO<sub>x</sub>) Interim Emissions Test Results (Tons/Year)

	2002	2010	2020	2030
DVRPC-PA	59,346.0	28,547.3	9,199.2	11,550.7
DVRPC-NJ	30,499.9	14,511.1	3,942.7	2,597.3
WILMAPCO-NCCT†	11,799.1	4,686.3	1,819.1	1,508.6
<b>NAA Total:</b>	<b>101,645.0</b>	<b>47,744.7</b>	<b>14,961.0</b>	<b>15,656.6</b>
<b>Conclusion</b>	<b>Baseline</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

Source: DVRPC, 2008; WILMAPCO 2008

Note: †NCC denotes New Castle County.

### **Public Involvement Process**

After consulting with US EPA Region III and the TCICG, it was determined that since WILMAPCO had adopted a conformity determination in April 2008, WILMAPCO could rely on those results (as per 40 CFR 93.122 (g) ) and would not be required to reaffirm those results for this conformity determination. DVRPC opened a minimum 30-day public comment period to receive comments on the draft conformity findings for the entire NAA. The comment period opened on May 16, 2008 and ended on June 20, 2008. Two public meetings were held in the NAA. The public meetings were held on:

- **Wednesday, May 14, 2008 (hosted by DVRPC)**
  - o at DVRPC Offices;  
from 4:00 pm to 6:00 pm
- **Wednesday, May 28, 2008 (hosted by DVRPC)**
  - o at Cherry Hill Library;  
from 4:00 pm to 6:00 pm

DVRPC received four comments that related to the conformity determination during the public comment period. These comments and the DVRPC responses are addressed in Section D of this report.

### **Conclusion**

The respective *TIPs* and the *Plans* of DVRPC and WILMAPCO are found to be in conformity with all current regulations and requirements under the Clean Air Act as amended. The forecasted emissions levels of PM<sub>2.5</sub> in the NAA do not exceed the corresponding baselines established in accordance with the *Final Rule*.

The Philadelphia-Wilmington, PA-NJ-DE PM<sub>2.5</sub> NAA has hereby demonstrated transportation conformity with the PM<sub>2.5</sub> standards in the *Final Rule*. Because there are no current *S/Ps* for PM<sub>2.5</sub> in this NAA, this demonstration has utilized the baseline (i.e., “no-greater-than-2002”) interim emissions test under the *Final Rule*.

The region is steadily working toward improving air quality and fully attaining all applicable NAAQS. This conformity finding reflects positively carrying forward the vision of the various partners in the NAA and their broad regional goals for improved natural and built environments, a growing economy, and an effective, interconnected, safe, and reliable transportation system coordinated with land use.

### **For Additional Information:**

For more detailed information on this demonstration, contact the MPO responsible for your region.

DVRPC: Delaware Valley Regional Planning Commission  
190 North Independence Mall West, 8th Floor  
Philadelphia, PA 19106  
(215) 592-1800 (voice)  
(215) 592-9125 (fax)  
www.dvrpc.org

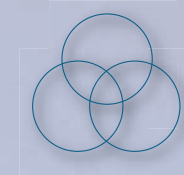
WILMAPCO: Wilmington Area Planning Council  
850 Library Avenue, Suite 100  
Newark, DE 19711  
(302) 737-6205 (voice)  
(302) 737-9584 (fax)  
www.wilmapco.org





Delaware Valley Regional Planning Commission  
June 2008

# Section D



**Comments & Responses**



**From:** Zubrzycki, Kathleen [mailto:KZubrzycki@septa.org]  
**Sent:** Thursday, May 15, 2008 4:28 PM  
**To:** Schoonmaker, Elizabeth; Anderson, Gastonia  
**Cc:** Popp-Mcdonough, Cath  
**Subject:** Ardmore Transit Center

Ladies,

Ardmore Transit Center currently has earmarked funds programmed in year FY2008 of the current TIP. There are no additional funds, so the project is not listed in the new TIP (FY 2009-2012). However, it appears as though the funds programmed for obligation in FY 2008 will not likely be obligated by the end of FY 2008 now. What would your suggestion be in regards to this project? Does it get put on a transition list? Should it be added to FY 2009-2012 now? Please advise. Your assistance in this matter is greatly appreciated.

Thanks,  
Kathleen

*Kathleen Zubrzycki*  
Management Analyst  
SEPTA  
1234 Market Street, 9th Floor  
Philadelphia, PA 19107  
(215) 580-3721 - Phone  
(215) 580-7231 - Fax

## DVRPC RESPONSE

**Comment #1-1 was for DVRPC to add Ardmore Transportation Center to the FY 2009 TIP. This project previously was coded as Regionally Significant / Non-exempt for air quality and analyzed using off-network methodology.**

*[Note: This addition of this project back into the FY 2009 TIP results in a revised analysis year of a regionally significant air quality project, however the revision of the analysis of this project is below the level of accuracy of the regional emissions analysis and the change results in no measurable change to the final regional emissions estimates ]*

DVRPC will revise the analysis year of MPMS 73214 Ardmore Transportation Center from 20100 to 20200 to reflect a change in the construction date of the project. This change is construction schedule will change the first year of off-network analysis from 2010 to 2020. The removal of this project from the 2010 analysis results in an increase in the forecasted NO<sub>x</sub> and VOCs estimates that are less than 0.01 tons per day. When this project is removed from the 2010 analysis, the results do not impact the reported final emissions estimate nor preclude the region from meeting the proscribed 8-hour ozone budgets.

The Transportation Conformity Interagency Consultation Group was consulted and has approved this change.

**COMMENTS OF THE DVRPC  
REGIONAL CITIZENS COMMITTEE  
DVRPC FY 2009 - 2012 DRAFT TIP FOR NEW JERSEY  
DVRPC FY 2009-2012 DRAFT TIP FOR PENNSYLVANIA**  
(Relating to Air Quality or Transportation Conformity)  
**Received: June 1, 2008**

- The RCC reads that the production of the TIP is the culmination of the transportation planning process and represents a **consensus** among state and regional officials as to what near term improvements to pursue. **Consensus** is crucial because the federal and state governments want assurances that all interested parties have participated in developing the priorities before committing significant sums of money for a project's inclusion in the TIP. The TIP signifies regional agreement on the priority of the project and establishes eligibility for federal funding. *Does it matter that the TIP process does not seem to use a deliberate selection process following selected safety and air quality criteria from the 2030 plan?*
- Where are air quality improvement projects with meaningful air quality improvement goals that lead the region to compliance to meet 2030 goals?  
The American Lung Association's 2008 "State of the Air Report" lists our area as one of the most polluted regions in the Country and we lose too many lives to crashes on our highways.
- Why must Air Quality conformity be so complicated? Can't we keep it simple and relate our progress toward conformity by improving Air Quality for our children and grandchildren.  
**IS THIS PLAN OUR LEGACY FOR OUR CHILDREN?**

## D V R P C R E S P O N S E

**Comment #2-1 Does it matter that the TIP process does not seem to use a deliberate selection process following selected safety and air quality criteria from the 2030 plan?**

Projects included in the TIP are required to be consistent with the goals and vision of the 2030 Long Range Plan. The air quality criteria are just one of seven criteria that projects must meet to be consistent with the plan. While air quality and safety impacts are considered in the evaluation of each project, relying solely on air quality and safety as criteria for a project's inclusion on the TIP would limit the region's ability to improve the transportation network and enhance the movement of goods and people.

**Comment #2-2 Where are air quality improvement projects with meaningful air quality improvement goals that lead the region to compliance to meet 2030 goals?**

Many projects included in the TIP contribute towards improving air quality, including transit, pedestrian and bicycle improvements. Projects receiving Congestion Mitigation Air Quality (CMAQ) funds are required by regulation to demonstrate air quality benefits.

**Comment #2-3 Why must Air Quality conformity be so complicated? Can't we keep it simple and relate our progress toward conformity by improving Air Quality for our children and grandchildren.**

Transportation Conformity is a federal requirement of the Clean Air Act. The Clean Air Act and Final Conformity Rule dictate the process and procedures for determining Transportation Conformity of TIPs and Plans. The very specific requirements of this procedure insure consistency, across the nation, in demonstrating that TIPs and Plans, in air quality non-attainment areas, are not worsening air quality. The complex nature of demonstrating transportation conformity is necessitated by the nature of air pollution and transportation's contribution to air pollution.

## Publication Abstract

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**Title of Report:**

Conformity Findings: Transportation Conformity of the DVRPC FY 2009 PA and NJ Transportation Improvement Programs and the *Destination 2030* Long Range Plan

**Date Published:** June 2008  
**Publication Number:** 08033

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**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. Per PM<sub>2.5</sub>, it also addresses New Castle County in Delaware.

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**Key Words:**

Transportation Conformity, Air Quality, National Ambient Air Quality Standards, Ozone, Volatile Organic Compounds (VOCs), Nitrogen Oxides (NO<sub>x</sub>), Carbon Monoxide (CO), Fine Particulate Matter (PM<sub>2.5</sub>), Nonattainment Area, Maintenance Area, Multi-jurisdictional Nonattainment Area, *Destination 2030* Long Range Transportation Plan, Transportation Improvement Program (*TIP*), State Implementation Plan (*SIP*), Wilmington Area Planning Council (WILMAPCO).

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**Abstract:**

DVRPC demonstrates transportation conformity of its FY 2009 PA *TIP*, FY 2009 NJ *TIP*, and the 2030 Long Range Plan. This conformity finding of the DVRPC Transportation Improvement Programs and the long-range plan 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 *TIPs* and the long-range plan adopted through April 2008.

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**Title VI Statement:**

DVRPC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. DVRPC public meetings are always held in ADA-accessible facilities and in transit-accessible locations when possible. Auxiliary services can be provided to individuals who submit a request at least seven days prior to a meeting. For more information, please call 215.238.2871.

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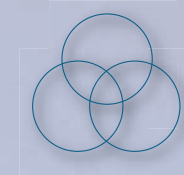
**Email** [sgreene@dvrpc.org](mailto:sgreene@dvrpc.org)





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# Section D

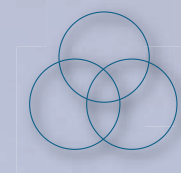


**Comments & Responses**



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# Section C

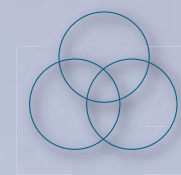


**PM<sub>2.5</sub>**  
**Non-Attainment**  
**Area Conformity**  
**Demonstration**



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# Section B

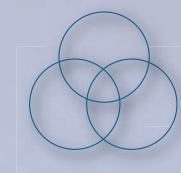


**DVRPC Conformity  
Demonstration**



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# Section A



Executive Summary



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# Conformity Findings



Demonstrations of  
Transportation Conformity of the  
DVRPC FY 2009-2012 PA and NJ  
Transportation Improvement Programs  
and the *Destination 2030* Long Range Plan