

Air Quality Conformity Analysis For the 8-Hour Ozone NAAQS

For the Cecil County Portion of the
PA-NJ-MD-DE Nonattainment Area

FY2016–2019 Transportation Improvement Program
And 2040 Regional Transportation Plan

Prepared for:

WILMAPCO



In Conjunction with
Maryland Department of Transportation
And
Maryland Department of the Environment



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Air Quality Conformity Analysis
For the 2040 Regional Transportation Plan and the Fiscal Year 2016-2019
Transportation Improvement Program for Cecil County, MD Portion of the PA-NJ-
MD-DE 8-Hour Ozone Nonattainment Area

Table of Contents

Introduction.....	1
8-hour Ozone Background.....	1
8-Hour Ozone National Ambient Air Quality Standards (NAAQS)	2
PA-NJ-MD-DE 8-Hour Ozone Nonattainment Area.....	2
Status of the 2040 RTP & 2016-2019 TIP.....	3
Interagency Consultation	4
Determine Planning Assumptions.....	4
8-Hour Ozone Regional Emissions Test.....	4
Analysis Years	5
Future Year Projects	5
Analysis Results.....	5
Travel Demand Modeling Methodology	6
Highway Networks	6
Land Use Forecast Methodology	9
Estimation Process for Mobile Source Emissions.....	9
Analysis Methodology	9
Description of Input Data.....	10
Roadway Data.....	10
Vehicle Class Data.....	11
Vehicle Age	11
Vehicle Population Data	12
Environmental and Fuel Data	12
Other Vehicle Technology and Control Strategy Data.....	13
State Vehicle Technology Program	13
2040 RTP and FY 2016-2019 TIP Conformity Determination.....	14
Financial Constraint.....	14
Public Participation.....	14
Conformity Statement.....	15
References.....	16

Appendices

- Appendix A: Conformity Question Checklist**
- Appendix B: Conformity Results, Detailed VMT, and Emissions**
- Appendix C: MOVES Input Files and Parameters**
- Appendix D: Interagency Consultation**
- Appendix E: Public Participation Materials**

List of Figures

Figure 1: Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Nonattainment Areas.....	3
Figure 2: Cecil County Network Map.....	7
Figure 3: Summary of Emission Calculation Process	10

List of Tables

Table 1: VOC Emissions Test Results – MVEB Test (tons/day)	5
Table 2: NOx Emissions Test Results – MVEB Test (tons/day)	6
Table 3: Cecil and New Castle Counties Regionally Significant Highway Projects... ..	8
Table 4: Summary of Land Use Data Used for Modeling Runs.....	9
Table A-1: Conformity Questions Matrix	A-1
Table B-1: 2020 Emissions Budget Test Results	B-1
Table B-2: 2030 Emissions Budget Test Results	B-1
Table B-3: 2040 Emissions Budget Test Results	B-1

Introduction

This report demonstrates transportation conformity of the Wilmington Area Planning Council's (WILMAPCO) Fiscal Year (FY) 2016-2019 Transportation Improvement Program (TIP) and 2040 Regional Transportation Plan (RTP) for the Cecil County, Maryland portion of the PA-NJ-MD-DE 8-hour ozone nonattainment area.

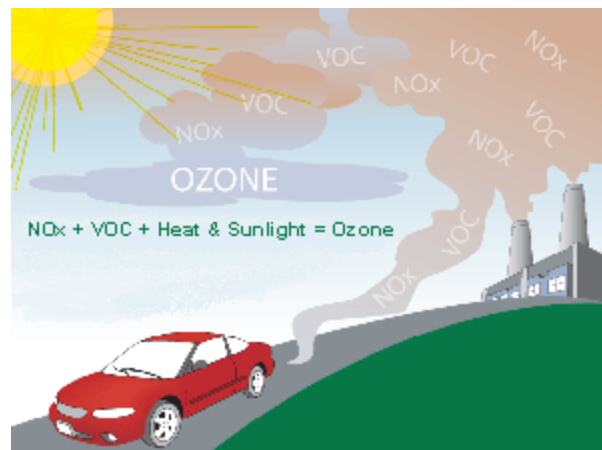
WILMAPCO is the Metropolitan Planning Organization (MPO) for New Castle County, Delaware and Cecil County, Maryland. It is designated by the governors of both states to plan for, coordinate, and program the many transportation investments in the region. Under federal law and regulation, all plans and programs that involve federal funds or are of regional significance must be reviewed and approved through WILMAPCO.

WILMAPCO is responsible for developing a Transportation Improvement Program (TIP) and a Regional Transportation Plan (RTP) in cooperation with the Maryland Department of Transportation (MDOT), the Delaware Department of Transportation (DelDOT) and affected transit operators. In accordance with federal planning requirements, a collaborative process has been developed wherein state, county, and local governments and transportation providers are partners in the planning and programming process.

As the Federally-designated MPO for New Castle County, DE and Cecil County, MD, WILMAPCO is required by law to demonstrate that the RTP and TIP conform to the transportation emission budgets set forth in the Statewide Implementation Plan (SIP) for each state. If emissions generated from the projects programmed in the TIP and RTP are equal to or less than the emission budgets in the SIPs, then conformity has been demonstrated.

8-hour Ozone Background

Ozone is an odorless, colorless, gas and is created by a reaction between Nitrogen Oxides (NOx) and Volatile Organic Compounds (VOC) in the presence of sunlight. While ozone in the stratosphere forms a protective layer, shielding the earth from the sun's harmful rays, ground level ozone is a key contributor to smog. Motor vehicle exhaust, industrial emissions, gasoline vapors, chemical solvents, and natural sources all contribute to NOx and VOC emissions. Since ozone is formed in the presence of heat and sunlight, it is considered a summertime pollutant.



The health effects of ozone vary. Ozone can irritate lung airways and cause inflammation similar to sunburn. Other symptoms include wheezing, coughing, and pain when taking a deep breath and breathing difficulties during exercise or outdoor activities. People with

respiratory problems, children, and the elderly are most vulnerable, but even healthy people that are active outdoors can be affected when ozone levels are high. Even at very low levels, ground-level ozone triggers a variety of health problems including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses such as pneumonia and bronchitis.

In addition to adverse health effects, ground-level ozone also interferes with the ability of plants to produce and store food, which makes them more susceptible to disease, insects, other pollutants, and harsh weather. Furthermore, ozone damages the leaves of trees and other plants, ruining the appearance of cities, national parks, and recreation areas.

8-Hour Ozone National Ambient Air Quality Standards (NAAQS)

2008 NAAQS

On May 21, 2012, the Environmental Protection Agency (EPA) issued a final rule via the Federal Register (77 FR 30088) establishing initial air quality designations for the 2008 primary and secondary NAAQS for ozone. The 2008 standard is set at an 8-hour average concentration of 0.075 ppm. The fourth highest value in a year, rounded to the nearest 0.01 and averaged over three years, may not exceed this level at any monitor in the area.

Areas that have failed to meet the standards outlined above have been designated as nonattainment areas and, as a result, are subject to transportation conformity. Transportation conformity requires nonattainment and maintenance areas to demonstrate that all future transportation projects will not hinder the area from reaching and maintaining its attainment goals. In particular, the projects will not:

- *Cause or contribute to new air quality violations,*
- *Worsen existing violations or*
- *Delay timely attainment of the relevant NAAQS.*

The effective date of the 2008 ozone standard designations was July 20, 2012. Under the final rule for implementation of the 2008 NAAQS (77 FR 30160), also effective on July 20, 2012, the 1997 ozone NAAQS were revoked for transportation conformity purposes 1 year after the effective date of designations for the 2008 ozone NAAQS, July 20, 2013. The PA-NJ-MD-DE area is classified as a marginal nonattainment area, resulting in an attainment date of December 31, 2015.

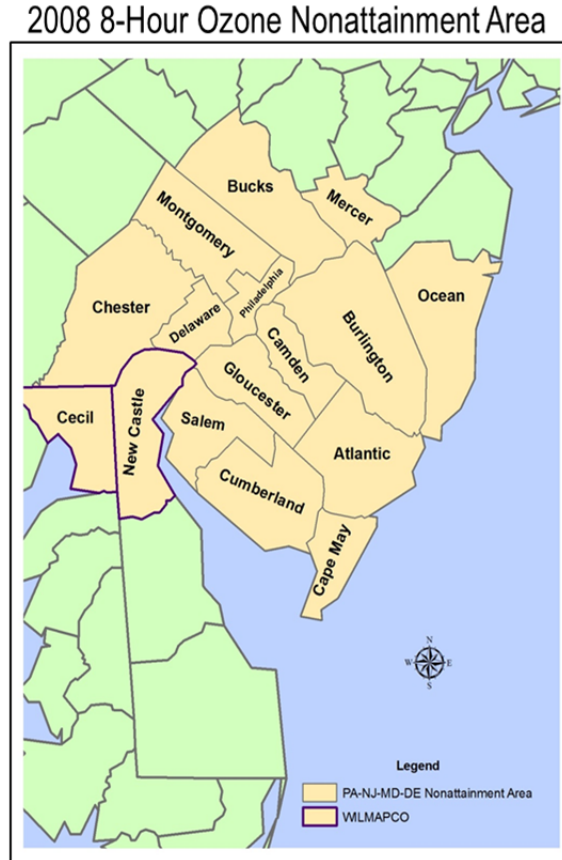
EPA published a final rule (77 FR 65488), which became effective on November 28, 2012, approving the attainment demonstration for the 1997 8-hour ozone NAAQS for the Maryland portion of the nonattainment area. The same ruling found adequate the 2009 motor vehicle emission budgets (MVEBs) associated with the attainment demonstration. Since the area was designated as marginal under the 2008 ozone standards, new MVEBs are not required and the previously approved, 2009 MVEBs must be used for conformity purposes.

PA-NJ-MD-DE 8-Hour Ozone Nonattainment Area

The 2008 8-hour ozone nonattainment area is made up of 16 counties spanning four states. Figure 1 illustrates the entire nonattainment area and the location of the areas

covered by WILMAPCO (New Castle and Cecil Counties) for both the 2008 ozone standards.

Figure 1: Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Nonattainment Areas



Status of the 2040 RTP & 2016-2019 TIP

As the regional transportation-planning agency for Cecil County, Maryland and New Castle County, Delaware, WILMAPCO is charged with authoring a long-range transportation plan with at least a 20-year planning horizon. The Plan presents recommendations for enhanced transportation efficiency and functionality, including the construction of new facilities, improved connectivity to multiple travel modes, and the enhancement of existing highway, transit, and bicycle/pedestrian facilities. Transportation projects that address challenges faced by the region are identified in this plan and placed on the four-year Transportation Improvement Program (TIP) that corresponds to that project’s development timetable.

The 2040 update of the Regional Transportation Plan and the Fiscal Year 2016 – 2019 TIP were created by the WILMAPCO staff and member agencies. The TIP and RTP will be formally adopted by the WILMAPCO Council in January 2015.

Interagency Consultation

As required by the federal transportation conformity rule (40 CFR 93.105) the conformity process includes a significant level of cooperative interaction among the federal, state, and local agencies. Interagency consultation requirements include coordination with the local county representatives, the MPO and representatives from both state and federal agencies including:

- WILMAPCO
- Maryland Department of the Environment
- Maryland Department of Transportation
- Maryland State Highway Administration (SHA), Maryland Transit Administration (MTA), and Maryland Transportation Authority (MDTA) (responsible for the State's toll facilities)
- Delaware Transit Corporation
- Delaware Department of Transportation
- Delaware Department of Natural Resources and Environmental Control
- Cecil County
- New Castle County
- FHWA
- EPA
- FTA

As part of the interagency consultation, the Technical Advisory Committee (TAC) and Air Quality Subcommittee (AQS) groups met and collaborated in order to achieve the following goals related to the transportation conformity process:

- Determine planning assumptions
- Develop a definitive list of future year projects to be analyzed
- Develop a format for presenting determination
- Develop and standardize the public participation process

The TAC met the third Thursday of each month in 2014 and the AQS met on March 13, April 10, May 8, July 17, August 14, September 11, October 16, and December 14 in 2014. Please see Appendix D for meeting minutes. (<http://www.wilmapco.org/aqs>)

Determine Planning Assumptions

8-Hour Ozone Regional Emissions Test

The emissions resulting from the implementation of regionally significant transportation projects (those which do not qualify as exempt under 40 CFR 93.126 and 127) will be compared to the 2009 Motor Vehicle Emissions Budgets (MVEB), set forth in the document: *Cecil County, Maryland 8-Hour Ozone State Implementation Plan and Base Year Inventory SIP Revision: 07-05*, for conformity purposes. The document was submitted to EPA in June 2007. EPA found the 2009 MVEBs adequate for conformity purposes, effective on November 28, 2012 (77 FR 65488).

Analysis Years

EPA regulations, as outlined in the Final Transportation Conformity Rule, Section 93.118, Criteria and Procedures: Motor Vehicle Emissions Budget, state that the regional emissions analysis may be performed for any years in the timeframe of the conformity determination provided that they:

- Include a near-term year, one to five years in the future;
- Are not more than ten years apart;
- The analysis is performed for the attainment year (if it is in the timeframe of the transportation plan and conformity determination);
- Include the last year of the timeframe of the conformity determination.

The attainment year for the 2008 standard, is 2015, which is not within the timeframe of the transportation plan. 2020 was chosen so that the first analysis year is no more than five years beyond the year in which the conformity determination is being made. 2030 was selected as the intermediate year so that the analysis years are no more than 10 years apart. The last year of the plan is 2040, making the analysis years 2020, 2030, and 2040.

Components of the Regional Emissions Analysis

As discussed above, ozone formation is a direct result of VOC and NOx emissions reacting with each other in the presence of sunlight. The EPA has ruled that both precursor emissions, VOC and NOx, must be included in a regional analysis of 8-hour ozone for transportation conformity.

Future Year Projects

The projects listed in Table 3, in the Travel Demand Modeling section of this document, were found to be regionally significant through the interagency consultation process and are analyzed in this conformity determination.

Analysis Results

The results of the motor vehicle emissions budget tests are presented below in Tables 1 and 2. Table 1 presents the results of the budget test for VOC emissions. Table 2 outlines the results of the budget test for NOx emissions. The results show that all analysis years are below the established and approved 2009 MVEB and show a positive conformity determination. The regionally significant projects located in the Cecil County portion of the nonattainment area will not cause or contribute to any new violation of the air quality standard.

Table 1: VOC Emissions Test Results – MVEB Test (tons/day)

	2020	2030	2040
	Modeled	Modeled	Modeled
Cecil County Total	1.4	1.3	1.4
2009 Conformity Budget	2.2	2.2	2.2
Conformity Result	Pass	Pass	Pass

Table 2: NO_x Emissions Test Results – MVEB Test (tons/day)

	2020	2030	2040
	Modeled	Modeled	Modeled
Cecil County Total	4.3	3.4	3.7
2009 Conformity Budget	7.3	7.3	7.3
Conformity Result	Pass	Pass	Pass

Travel Demand Modeling Methodology

A travel demand model has been used to estimate future roadway traffic volumes and diversions related to regionally significant transportation improvement projects. The travel model was originally developed in 2006 and revalidated in 2012 for the upper eastern shore of Maryland including Cecil County.

The Upper Eastern Shore (UES) model uses the TP+ software platform and encompasses Kent, Queen Anne’s, and Cecil Counties in Maryland, as well as New Castle County, Delaware. This model is a traditional three-step model incorporating trip generation, trip distribution, and traffic assignment. The regional travel model does not contain a formal mode choice or transit assignment module. The model produces vehicle trips for 477 traffic analysis zones and assigns them to highway networks consisting of key regional roadway segments. The base year model is validated against survey data and traffic counts collected for the year 2010. A summary of the model components and validation are presented in a final report available from MDOT.

Highway Networks

For the purpose of this conformity analysis, model highway networks are created for each analysis year: 2020, 2030, and 2040. The networks are comprised of link segments representing freeways, principal arterials, minor arterials, and collectors within the nonattainment region (Figure 2). Links in the network are coded with attributes that portray the facilities’ respective capacities and travel speeds. For each horizon year, projects from the RTP and TIP are coded onto the networks by adding links for new construction projects and adjusting the link capacities for projects that add lanes to existing roadways. A list of regionally significant highway projects (as defined in section 93.101 of the Final Transportation Conformity Rule) is shown in Table 3. The primary products of the model used in the air quality analysis are estimated volumes, link distances, free-flow speeds, and link capacities. The impacts of transit on regional vehicle trips are accounted for in the validation count data. Future changes to transit service (as reflected in regionally significant transit projects) can be accounted for using off-model analysis techniques, such as MAQONE

Figure 2: Cecil County Network Map

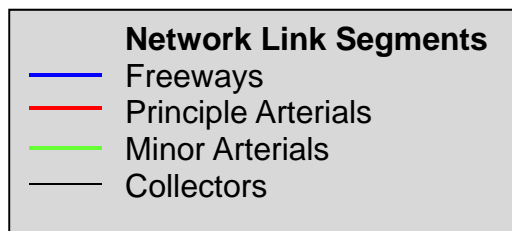
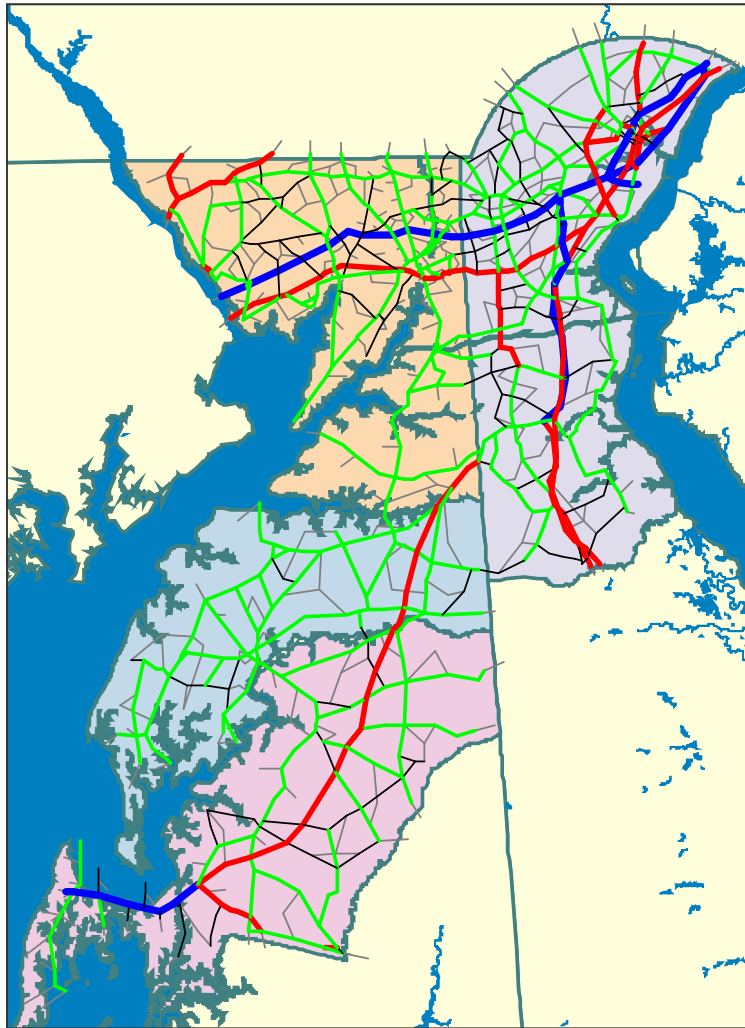


Table 3: Cecil and New Castle Counties Regionally Significant Highway Projects

No.	Project Name	County	Description	In-service Date
1	MD 213: Frenchtown Road to US 40	CC	Two to four lane divided highway	2040
2	I-95: Susquehanna River to DE Line	CC	Add a lane in each direction, plus bridge expansion	2040
3	MD 272: US 40 to Lums Road	CC	Two to four lane divided highway	2040
4	I-95/SR 222 Interchange	CC	Two to four lanes on the SR 222 bridge	2040
5	MD 222: US 40 to MD 276	CC	Multilane reconstruction	2040
6	SR 72, McCoy Road to SR 71	NCC	Two to four lanes	2020
7	Road A / SR 7 Improvements	NCC	New lane in each direction	2020
8	US 301: MD State Line to SR 1	NCC	New four lane expressway	2020
9	Christina River Bridge	NCC	New bridge	2020
10	SR 1: Tybouts Corner to SR 273	NCC	Four to six lanes	2020
11	SR 299, SR 1 to Catherine Street	NCC	Widening	2020
12	Elkton Road, Maryland State Line to Casho Mill Road	NCC	Widening	2020
13	SR 4 (Christina Parkway): SR 2 to SR 896	NCC	Eastbound widening	2020
14	SR 141/I-95 Interchange	NCC	Expansion	2030
15	US 301: Spur	NCC	New two lane road	2030
16	Tyler McConnell Bridge, SR141: Montchanin Road to Alapocas Road	NCC	Bridge expansion	2030
17	US 40/SR 896	NCC	Grade separated intersection	2030
18	SR 1: Tybouts Corner to Roth Bridge	NCC	Widening	2030
19	SR 896/I-95 Interchange	NCC	Expansion	2030
20	SR 896/Bethel Church Road Interchange	NCC	Expansion	2030
21	US 40 Widening: Salem Church Road to Walther Road	NCC	Widening	2030
22	SR 4 (Christina Parkway): SR 2 to SR 896	NCC	Westbound widening	2030
23	I-295 Improvements Eastbound at SR 141	NCC	Add third lane	2040

Note NCC = New Castle County
CC = Cecil County

Land Use Forecast Methodology

Land use estimates for the base and future year models for Cecil County are developed from existing data sources and county comprehensive plans, as well as through coordination with state and local planning agencies. The land use data for this model is comprised of data describing the population, households, workforce, and employment for the region.

Land use data for Cecil County, Maryland and New Castle County, Delaware came directly from the land use demographics approved by WILMAPCO. WILMAPCO demographic projections for New Castle and Cecil Counties were adopted in July 2014. Table 4 summarizes the land use data used for traffic modeling for the analysis years 2020, 2030, and 2040 for Cecil County.

Table 4: Summary of Land Use Data Used for Modeling Runs

Cecil County						
Year	Population*	Households*	Labor Force*	Total* Employment	Retail* Employment	Non-Retail* Employment
2020	107,557	40,907	53,148	49,817	8,710	41,107
2030	124,360	47,659	61,149	54,785	8,541	46,243
2040	138,105	52,826	67,414	58,530	9,134	49,396

*Note: * Data Source: WILMAPCO Projections (Adopted July 2014)*

Estimation Process for Mobile Source Emissions

This conformity analysis uses MOVES2010b model, EPA’s state-of-the-art tool for estimating emissions from highway vehicles. Compared to previous tools, MOVES incorporates the latest emissions data, more sophisticated calculation algorithms, increased user flexibility, new software design, and significant new capabilities.

Analysis Methodology

The methodology used to produce the emission data conform to the recommendations provided in EPA’s technical guidance. A mix of local data and national default (internal to MOVES2010b) data has been used for the conformity analysis. Local data inputs to the analysis process reflect the latest available planning assumptions using data obtained from the Maryland Department of Environment (MDE), Motor Vehicle Administration (MVA), WILMAPCO, and other local/national sources.

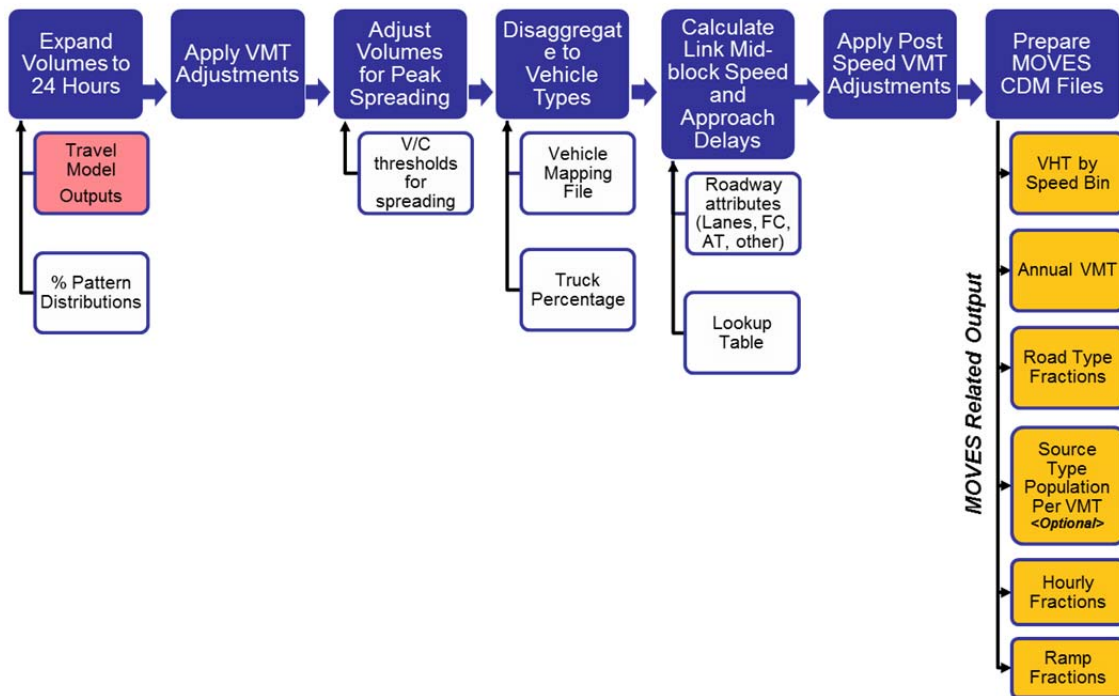
The analysis methodology includes the use of regional travel model outputs (as described above) for 2020, 2030, and 2040 to estimate the regional Vehicle Miles Traveled (VMT) along with custom post-processing software (PPSUITE) to prepare key input files to the MOVES2010b emission model. PPSUITE consists of a set of programs that perform the following functions:

- Analyzes highway operating conditions.
- Calculates highway speeds.

- Compiles VMT and vehicle type mix data.
- Prepares MOVES runs and processes MOVES outputs.

The PPSUITE system has been used for previous inventory and conformity submissions in Maryland and in other states including Pennsylvania, Virginia, New Jersey, and New York. The software has gone through a significant revision to ensure consistency with the MOVES emissions model. The PPSUITE process is also integral to producing other key input files to the MOVES emission model. Figure 3 summarizes the key functions of PPSUITE and the traffic-related input files prepared for MOVES.

Figure 3: Summary of Emission Calculation Process



Description of Input Data

A large number of inputs to MOVES are needed to fully account for the numerous vehicle and environmental parameters that affect emissions. These include traffic flow characteristics, vehicle descriptions, fuel parameters, inspection/maintenance (I/M) program parameters, and environmental variables. MOVES includes a default national database of meteorology, vehicle fleet, vehicle activity, fuel, and emissions control program data for every county; but EPA cannot certify that the default data is the most current or best available information for any specific area. As a result, local data is recommended for use when completing a regional conformity analysis. Local data sources are used for all inputs that have a significant impact on calculated emission rates. These data items are discussed in the following sections.

Roadway Data

The emission calculation process uses key traffic data from the regional travel demand model to estimate regional VMT and speeds. This data includes individual roadway traffic volumes and physical roadway descriptive characteristics including area type, facility type, lanes, distances, capacity, and free-flow speeds. Travel demand model runs

are produced for future analysis years and include the impact of regionally significant transportation projects. The model provides a key resource for estimating the impact of population and employment growth on roadway volumes and calculating the diversions due to transportation projects.

VMT was determined for each roadway class/setting by multiplying the length of road by the number of vehicles using the road per day. Additional adjustments to VMT included: seasonal adjustments to reflect an average weekday for the summer season and Highway Performance Monitoring System (HPMS) adjustments used to align annual VMT estimates with HPMS reported totals for the base year.

Speed data was calculated for each highway segment and hour of the day, based on roadway capacity, traffic volume, and other physical roadway features (e.g. traffic signals) using the post processing software. Thus, average speeds reflect physical highway conditions and congestion caused by traffic volume. For future conditions, congestion (and thereby speed) is affected by traffic growth and changes in physical conditions due to transportation improvement projects.

Vehicle Class Data

Emission rates within MOVES vary significantly by vehicle type. The MOVES model produces emissions and rates by thirteen MOVES vehicle source types. However, VMT is imputed into MOVES by six HPMS vehicle groups.

For this emissions analysis, vehicle type pattern data was developed for the county by functional class based on State Highway Administration (SHA) classification counts and internal MOBILE6.2 and MOVES defaults. As the first step, SHA count data was used to develop percentage splits to the four vehicle groups: Autos, Heavy trucks, Motorcycles and Buses. Following procedures used for previous conformity analyses, the vehicle groups were expanded to the 28 MOBILE6.2 weight-based vehicle types. Using procedures provided in EPA technical guidance, the MOBILE6.2 vehicle classes were mapped to the MOVES source type and HPMS class groups.

The vehicle type percentages are also provided to the capacity analysis section of PPSUITE to adjust the speeds in response to trucks. That is, a given number of larger trucks take up more roadway space than a given number of cars, and this is accounted for in the speed estimation process by adjusting capacity using information from the Highway Capacity Manual.

Vehicle Age

Vehicle age distributions are input to MOVES for the county by the thirteen source types. The distributions reflect the percentage of vehicles in the fleet up to 31 years old. The vehicle age distributions were prepared by MDE based on information obtained from MVA registration data.

The age distributions are based on 2011 MVA registration data that included cleaning of duplicate, expired, and non-eligible vehicles (from the emission standpoint such as trailers, farm tractors). The data was transformed into two sets of MOBILE6.2 vehicle

types; one conforming to MOBILE6.2-28 vehicle type and the other to MOBILE6.2-16 composite vehicle type system using a SAS-based computer program.

The MOVES model input age distributions were produced utilizing the available EPA MS-Excel-based vehicle registration converter tool. This tool assisted in converting the MOBILE6.2-based data into the MOVES source type categories.

Vehicle Population Data

Vehicle fleet information such as the number and age of vehicles has an impact on the forecasted start and evaporative emissions within MOVES. The MOVES model requires the population of vehicles to be separated by the thirteen source type categories. This data was prepared and provided by MDE utilizing another SAS-based computer program similar to the one discussed in the previous vehicle age section. Maryland county vehicle registration data was used to estimate vehicle population for light-duty and heavy-duty vehicles for Cecil County.

For the analysis years 2020, 2030, and 2040, the vehicle population was forecasted based on projected household and population growth obtained from state and MPO sources. The growth rate methodology included:

- Choosing the highest growth rate between population, households, and VMT growth.
- Default VMT/Population ratio for trucks, i.e., truck population growth based on Truck VMT.

Environmental and Fuel Data

Information on environmental, fuel, vehicle technology, and other control strategy assumptions were determined based on a review of MOVES2010b default information by MDE.

Fuel Data: MDE obtains monthly fuel data reports regularly from the Maryland Fuel Laboratory, which is under the jurisdiction of Maryland Fuel Tax Division of the Office of the Comptroller of Maryland. These fuel reports are generated by testing samples collected in the field (gas stations) for the purpose of fuel regulation enforcement. Two sets of fuel data inputs (Fuel Formulation and Fuel Supply tables) required by the MOVES model were developed for Cecil County. The fuel parameters that changed from the MOVES defaults include:

fuelFormulationID	Unique ID used for easy recognition
fuelSubtypeID	Selected per guidance based on ethanol content of gasoline
sulfurLevel	Computed from the local fuel data
rvp	Computed from the local fuel data
ETOHVolume	Computed from the local fuel data
aromaticContent	Computed from the local fuel data
olefinContent	Computed from the local fuel data
benzineContent	Computed from the local fuel data
E200	Computed from the local fuel data

Meteorological Data: Evaporative emissions are influenced significantly by the temperatures of the surrounding air. Ozone analysis temperature and humidity values were determined by MDE using the procedures documented in EPA's technical guidance. On a triennial basis, meteorological data including hourly temperature and relative humidity is compiled to be used for periodic emission inventories. The data used for this analysis were updated in 2011. The month-by-month, raw hourly-data sets were obtained from the National Climate Data Center of NOAA. Hourly average temperature and humidity computations were developed from the 24 hourly values for every hour in a given month for the county.

Other Vehicle Technology and Control Strategy Data

The MOVES2010b default I/M data was reviewed and updated by MDE for Cecil County. The current I/M program known as the Vehicle Emission Inspection Program (VEIP) was utilized for these analysis runs and is described below.

MD Vehicle Emission Inspection Program: This program tests model year 1977 and newer gasoline powered vehicles weighing up to 26,000 pounds. The test is done biennially, and on change of ownership. There is a two-year grace period for new vehicles. Light duty vehicles model year 1996 and newer, and model year 2008 and newer vehicles weighing up to 14,000 pounds receive the OBD test. All other vehicles receive an idle test with a gas cap pressure test and a visual check for the presence of a catalytic converter. The compliance factors reflect the fail and waiver rates observed in the program, combined with an assumed 96% compliance rate for vehicles showing up for testing. Heavy duty vehicles have an additional factor, reflecting the fraction of vehicles in the weight range covered by the program. This was derived from documentation comparing the MOVES and MOBILE vehicle classes. The significantly higher compliance rate for the gas cap check reflects the much higher retest pass rate for this check.

Federal Programs: Current federal vehicle emissions control and fuel programs are incorporated into the MOVES2010b software. These include the National Program standards covering model year vehicles through 2016. Modifications of default emission rates are required to reflect the early implementation of the National Low Emission Vehicle Program (NLEV) program in Maryland. To reflect these impacts, EPA has released instructions and input files that can be used to model these impacts. This inventory utilized the August 2010 version of the files:

(<http://www.epa.gov/oms/models/moves/tools.htm>).

State Vehicle Technology Program:

MD Clean Car Program: Under the Maryland Clean Cars Act of 2007, Maryland adopted the California Low Emission Vehicle (LEV II) program. The program was implemented in 2011 and requires all 2011 model year and newer vehicles (GVWR up to 14,000 lbs.) registered in Maryland to meet California emission standards for both criteria and greenhouse gas pollutants. This program also contains a zero emission vehicles component that requires the manufactures to produce a certain percentage of zero

emission vehicles (electric, fuel cell, etc.) for purchase in the state. California has just adopted new amendments to the Low-Emission Vehicle regulation entitled LEV III (third generation low emission vehicle standards). These amendments create more stringent emission standards for new motor vehicles. These new standards will be phased-in over the 2015-2025 model years.

The impacts of this program were modeled for all analysis years using EPA's guidance document, *Instructions for Using LEV and NLEV Inputs for MOVES, EPA-420-B-10-003, January 2010*. EPA provided input files to reflect the CAL LEVII program with the standard phase-in schedules for new emission standards. Modifications to those schedules were done per EPA's instructions, to reflect a later start for the State of Maryland beginning with vehicle model year 2011.

2040 RTP and FY 2016-2019 TIP Conformity Determination

Financial Constraint

The planning regulations, Sections 450.322(b) (11) and 450.324(e) require the transportation plan to be financially constrained while the existing transportation system is being adequately operated and maintained. Only projects for which construction and operating funds are reasonably expected to be available are included. As shown in the Regional Transportation Plan, WILMAPCO has developed an estimate of the cost to maintain and operate existing roads and bridges in the MPO area and has compared that with the estimated revenues and maintenance needs of the new roads. WILMAPCO has found that the projected revenues are sufficient to cover the costs, therefore satisfying the financial constraint requirement.

Public Participation

This conformity document has undergone the public participation requirements set forth in the Final Conformity Rule, and Final Statewide / Metropolitan Planning Rule. The draft document was made available for formal public review and comment beginning on November 17, 2014. The public review and comment period was announced using the following outlets:

- Notices in the Delaware News Journal and Cecil Whig Newspapers
- Radio advertisements
- WILMAPCO website (www.wilmapco.org)
- WILMAPCO E-NEWS (monthly electronic newsletter)
- Presentations to various civic and local government groups
- The public forum "Our Town" (<http://www.wilmapco.org/ourtown>) where the emissions analyses were displayed on September 3, 2014, at the Embassy Suite Hotel in Newark, Delaware.

The documentation of the observed 30-day public comment period, comments, and the responses to comments can be found in Appendix E.

Conformity Statement

The conformity rule, as it applies to the Cecil County, MD portion of the PA-NJ-MD-DE 8-hour ozone nonattainment area, requires the RTP and TIP to conform to the motor vehicle emissions budgets established in the SIP. Appendix A contains a matrix, which provides responses to all of EPA's criteria as applicable to this conformity determination.

The results of the conformity analysis for the Cecil County portion of the PA-NJ-MD-DE 8-hour ozone nonattainment area indicate that the projected mobile source emissions are below the EPA-approved motor vehicle emission budgets for the established analysis years of 2020, 2030, and 2040. Based on the conformity analysis, WILMAPCO, in its capacity as the MPO, has concluded that the implementation of the 2040 RTP and 2016-2019 TIP will not worsen the region's air quality or delay the timely attainment of the National Ambient Air Quality Standards.

References

Transportation Conformity Regulations as of April, 2012, EPA-420-B-12-013;
<http://www.epa.gov/otaq/stateresources/transconf/conf-regs.htm>

FHWA, 23 CFR PART 450 – Planning Assistance and Standards, Subpart C -- Metropolitan Transportation Planning and Programming; <http://www.ecfr.gov/>

FY 2016-2019 Transportation Improvement Program; Wilmington Area Planning Council; <http://www.wilmapco.org/tip/>

Regional Transportation Plan, 2040 Update; Wilmington Area Planning Council;
<http://www.wilmapco.org/rtp/>

Modeling Page within EPA’s Office of Mobile Sources Website
(<http://www.epa.gov/omswww/models.htm>) contains a downloadable model, MOVES users guide and other information.

Policy Guidance on the Use of MOVES2010 and Subsequent Minor Revisions for SIP Development, Transportation Conformity, and Other Purposes, US EPA Office of Air and Radiation, EPA-420-B-12-010, April 2012.

Using MOVES to prepare Emission Inventories in State Implementation Plans and Transportation Conformity: Technical Guidance for MOVES2010, 2010a and 2010b. US EPA Office of Air and Radiation, and Office of Transportation and Air Quality, EPA-420-B-12-028, April 2012.

Motor Vehicle Emission Simulator, User Guide for MOVES2010b, EPA-420-B-12-001b, June 2012.

Highway Capacity Manual 2010, Transportation Research Board, January, 2010.

Traffic Trends System Report Module, 2011 Data, State Highway Administration 2005.

Appendix A

Conformity Question Checklist



Table A-1: Conformity Questions Matrix

Section	Requirement	Y/N	Response
40 CFR 93.110	Is the conformity determination based on the latest planning assumptions?	Y	See below.
	(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 of the conformity determination?	Y	The conformity analysis uses the UES travel demand model that is validated (checks the accuracy of the model) to 2010 conditions. Assumptions regarding vehicle mix, hourly patterns, monthly/seasonal factors, and vehicle fleet registration data are based on the latest available (2011) information from the Maryland Department of the environment (MDE) & State Highway Administration (SHA).
	(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?	Y	Land use for Cecil County, Maryland and New Castle County, Delaware came directly from the land use approved by WILMAPCO. WILMAPCO demographic projections for Cecil and New Castle Counties were adopted in July 2014.
	(c) Are any changes in the transit operating policies (including fares and service levels) and assumed transit ridership discussed in the determination?	Y	The impact of transit on regional vehicle trips is accounted for in the validation count data. Any future changes to transit service can be accounted for using off-model or sketch analysis tools, such as MAQONE. However, there are not any regionally significant transit projects in this analysis.
	(d) The conformity determination must include reasonable assumptions about transit service and increases in transit fares and road and bridge tolls over time.	Y	See above regarding transit. Tolls are included in the validated UES travel demand model.
	(e) The conformity determination must use the latest existing information regarding the effectiveness of the TCMs and other implementation plan measures, which have already been implemented.	N/A	There are no TCMs identified in the SIP.

Section	Requirement	Y/N	Response
	(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.	Y	Summary provided in Interagency Consultation Section with supporting documents in Appendix D & E.
40 CFR 93.111	Is the conformity determination based on the latest emissions model?	Y	EPA's latest emissions model, Motor Vehicle Emissions Simulator (MOVES) was used for this conformity determination.
40 CFR 93.112	Did the MPO make the conformity determination according to the consultation procedures of the conformity rule or the state conformity SIP?	Y	Consultation procedures were followed in accordance with the Federal Transportation Conformity Rule. WILMAPCO consulted appropriate agencies and provided a scope of work to the following agencies: MDOT, MDE, DelDOT, DNREC, FHWA, FTA, and EPA.
40 CFR 93.106 (a) (1)	Are the horizon years correct?	Y	The years chosen: 2020, 2030, and 2040, represent the appropriate horizon years needed for the 8-hour ozone NAAQS conformity determinations.
93.106(a) (2)(i)	Does the plan quantify and document the demographic and employment factors influencing transportation demand?	Y	A summary is provided in the Land Use Forecast Methodology section and the relevant data is summarized in Table 4 of this document.
93.106(a) (2)(ii)	Is the highway and transit system adequately described in terms of the regionally significant additions or modifications to the existing transportation network that the transportation plan envisions to be operational in the horizon years?	Y	A summary of regionally significant projects can be found in the land use section and Table 3 of this document.
93.108	Is the Transportation Plan Fiscally Constrained?	Y	See Financial Constraint Section.
93.113(b)	Are TCMs being implemented in a timely manner?	N/A	There are no TCMs in the SIP.
40 CFR 93.118	Is the Transportation Plan consistent with the motor vehicle emissions budget in the applicable SIP?	Y	The conformity determination was performed using the 2009 motor vehicle emissions budgets contained in the SIP and found adequate by EPA.

Appendix B

Conformity Results Detailed VMT and Emissions By County By Road Type By Analysis Year

Table B-1: 2020 Emissions Budget Test Results

2020 Analysis				
Road Type	VMT	Speed (mph)	VOC (tons/day)	NOX (tons/day)
Off-Network	-	-	0.97	0.98
Rural Restricted Access	2,184,210	59.5	0.19	1.77
Rural Unrestricted Access	2,047,049	36.2	0.20	1.17
Urban Restricted Access	121,191	59.7	0.01	0.10
Urban Unrestricted Access	360,370	18.8	0.06	0.26
Nonattainment Area Total	4,712,821	41.1	1.44	4.27
	2009 Budgets (Submitted)		2.2	7.3
			PASS	PASS

Table B-2: 2030 Emissions Budget Test Results

2030 Analysis				
Road Type	VMT	Speed (mph)	VOC (tons/day)	NOX (tons/day)
Off-Network	-	-	0.91	1.08
Rural Restricted Access	2,621,392	51.3	0.17	1.28
Rural Unrestricted Access	2,395,458	35.2	0.16	0.83
Urban Restricted Access	151,495	58.8	0.01	0.07
Urban Unrestricted Access	404,816	17.9	0.05	0.17
Nonattainment Area Total	5,573,160	38.6	1.30	3.43
	2009 Budgets (Submitted)		2.2	7.3
			PASS	PASS

Table B-3: 2040 Emissions Budget Test Results

2040 Analysis				
Road Type	VMT	Speed (mph)	VOC (tons/day)	NOX (tons/day)
Off-Network	-	-	0.95	1.14
Rural Restricted Access	3,105,096	56.9	0.18	1.40
Rural Unrestricted Access	2,709,947	34.3	0.18	0.88
Urban Restricted Access	181,665	59.4	0.01	0.08
Urban Unrestricted Access	437,472	18.0	0.05	0.18
Nonattainment Area Total	6,434,181	40.0	1.38	3.67
	2009 Budgets (Submitted)		2.2	7.3
			PASS	PASS

Appendix C

MOVES Input Files and Parameters For Cecil County, MD



SUMMER DAY OZONE MOVES SAMPLE INPUT FILES
Cecil County

Sample Cecil County MOVES Run Specification File Settings for Analysis Year 2020

Sample xml file format – Run 1

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    <day id="2"/>
    <day id="5"/>
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    <endhour id="24"/>
    <aggregateBy key="Hour"/>
  </timespan>
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```

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Sample xml file format – Run 2

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    </filters>
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Sample mrs file format – Run 1

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sourcetypename="Combination Short-haul Truck"/>
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sourcetypename="Light Commercial Truck"/>
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sourcetypename="Motor Home"/>
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sourcetypename="Motorcycle"/>
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sourcetypename="Passenger Car"/>
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sourcetypename="Refuse Truck"/>
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sourcetypename="School Bus"/>
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sourcetypename="Single Unit Short-haul Truck"/>
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<pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="17"
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<pollutantprocessassociation pollutantkey="87" pollutantname="Volatile Organic Compounds" processkey="12"
processname="Evap Fuel Vapor Venting"/>
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processname="Evap Fuel Leaks"/>
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processname="Crankcase Start Exhaust"/>
<pollutantprocessassociation pollutantkey="87" pollutantname="Volatile Organic Compounds" processkey="17"
processname="Crankcase Extended Idle Exhaust"/>
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<fueltype selected="false"/>
<emissionprocess selected="true"/>
  <onroadoffroad selected="true"/>
<roadtype selected="true"/>
<sourceusetype selected="true"/>
  <movesvehicletype selected="false"/>
<onroadsc selected="false"/>
  <offroadsc selected="false"/>
  <estimateuncertainty selected="false" numberOfIterations="2" keepSampledData="false" keepIterations="false"/>
  <sector selected="false"/>
  <engtechid selected="false"/>
  <hpclass selected="false"/>
</outputemissionsbreakdownselection>
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<outputvmtdata value="true"/>
<outputsho value="true"/>
<outputsh value="true"/>
<outputshp value="true"/>
<outputshidling value="true"/>
<outputstarts value="true"/>
<outputpopulation value="true"/>
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```

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Sample mrs file format – Run 2

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Inventory with user's data]]></description>
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        <beginhour id="1"/>
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    </timespan>
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sourcetype="Combination Long-haul Truck"/>
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sourcetype="Combination Short-haul Truck"/>
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sourcetype="Intercity Bus"/>
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```

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sourcetyname="Passenger Car"/>
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sourcetyname="Passenger Truck"/>
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sourcetyname="Refuse Truck"/>
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sourcetyname="School Bus"/>
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sourcetyname="Single Unit Long-haul Truck"/>
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sourcetyname="Single Unit Short-haul Truck"/>
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<sourceusetype selected="true"/>
    <movesvehicletype selected="false"/>
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    <estimateuncertainty selected="false" numberOfIterations="2" keepSampledData="false" keepIterations="false"/>
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    <engtechid selected="false"/>
    <hpclass selected="false"/>
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<outputstarts value="true"/>
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]]></internalcontrolstrategy>
  </internalcontrolstrategies>
</runspec>
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Appendix D

Interagency Consultation

Please Visit:

<http://www.wilmapco.org/aqs>

The WILMAPCO Air Quality Subcommittee has 13 members representing federal, state and local agencies in Delaware and Maryland. The AQS assesses the air quality impacts of transportation projects in WILMAPCO's Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP). Their recommendations help our region attain its air quality goals.

Appendix E

Public Participation Materials

Please Visit:

<http://www.wilmapco.org/rtp>

Every four years, MPOs must update their long-range transportation plan with at least a 20 year planning horizon. This long-range plan must be financially reasonable and conform to air-quality standards. Significantly, no transportation projects in the region may be funded with federal money unless the projects are found in an approved long-range transportation plan. Our long-range plan is called the Regional Transportation Plan, or RTP.

<http://www.wilmapco.org/aq>

Air Quality Conformity is a process which ensures federal funding and approval goes to transportation activities that are consistent with our air quality goals. This process applies to both the long range Regional Transportation Plan (RTP) and the Transportation Improvement Program (TIP). Known as “non-attainment areas” or “maintenance areas,” respectively, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) jointly determine conformity within these regions which do not meet air quality standards to ensure that federal actions conform to the purpose of the State Implementation Plan (SIP). The US Department of Transportation cannot fund, authorize, or approve federal actions to support projects that do not conform to Clean Air Act requirements governing the current National Ambient Air Quality Standards (NAAQS).

While ozone and fine particulate emissions have and continue to drop dramatically, the WILMAPCO region still does not meet the rigorous federal air quality standards. Both New Castle and Cecil Counties are designated in moderate non-attainment for ozone. New Castle County is considered in maintenance for fine particulate matter (PM2.5). WILMAPCO is responsible for ensuring a plan in place to meet the attainment levels in these counties
