AIR QUALITY
CONFORMITY ANALYSIS REPORT
FOR THE LACKAWANNA/LUZERNE MPO PORTION OF THE SCRANTON-WILKES-BARRE OZONE MAINTENANCE AREA FOR THE 8-HOUR OZONE NAAQS

VOLUME I - EXECUTIVE SUMMARY

FFY 2013-2016 TIP and 2035 LRTP

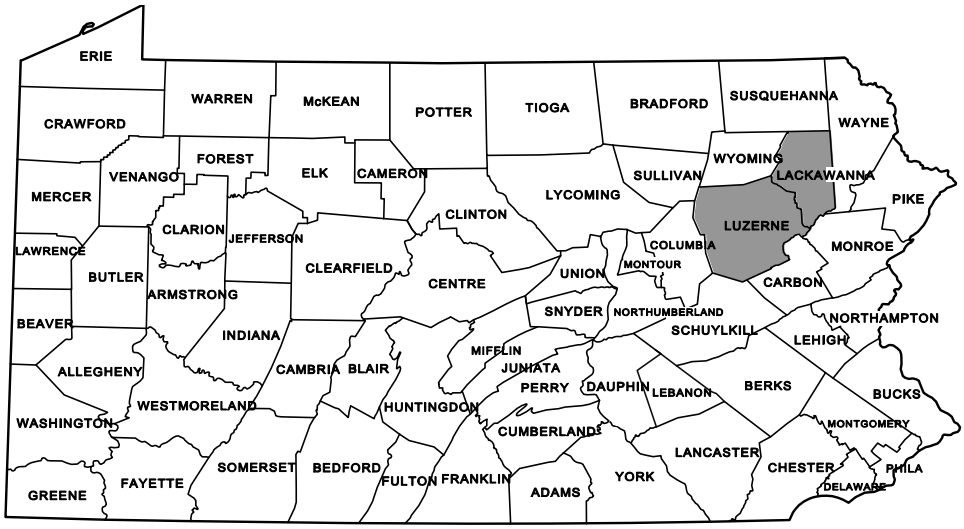

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TABLE OF CONTENTS

1. INTRODUCTION

This document provides an analysis of the air quality implications of the Lackawanna-Luzerne Metropolitan Planning Organization (MPO) FFY 2013-2016 Transportation Improvement Program (TIP) and 2035 Long-Range Transportation Plan (LRTP). The analysis demonstrates transportation conformity to the 1997 8-hour ozone National Ambient Air Quality Standards (NAAQS).

This document replaces the previous approved conformity demonstration of the TIP and LRTP and ensures that the findings meet all current ozone criteria established by the U.S. Environmental Protection Agency (EPA). As compared to previous submissions, the TIP includes several project changes and the LRTP remains unchanged.

Since vehicular emissions contribute to ozone violations, the Clean Air Act requires transportation planners in nonattainment and maintenance areas to consider the air quality impacts of their proposed plans, programs, and projects. These activities, if subject to federal involvement, must be shown to conform based on the requirements for each pollutant.

Lackawanna and Luzerne Counties are included in the Scranton-Wilkes-Barre 1997 8-hour ozone maintenance area. Both counties must make a conformity determination for ozone precursors. The maintenance area also includes Wyoming County (Northern Tier RPO) and Monroe County (NEPA RPO), both of which are included in separate conformity reports for each RPO. The results for those areas have not changed from previous submissions. A conformity determination must be completed by all counties in the maintenance area to allow the TIP/LRTPs to be approved by the U.S. Department of Transportation (US DOT).

In an attempt to reduce harmful emissions nationwide, the Clean Air Act Amendments (CAAA) of 1990 classified certain metropolitan areas as nonattainment if they did not comply with federal air quality standards under the 1-hour ozone standard. Lackawanna and Luzerne counties were originally designated as part of a marginal nonattainment area under the 1-hour ozone NAAQS. Effective June 15, 2004, EPA finalized ground-level ozone designations under the 1997 8-hour ozone NAAQS. The standard replaced the pre-existing 1-hour ozone NAAQS. The Scranton-Wilkes-Barre area was originally designated as "Basic" ozone nonattainment area under the 1997 8-hour standard.

On November 19, 2007, EPA approved a State Implementation Plan (SIP) revision requesting that the Scranton-Wilkes-Barre ozone nonattainment area be redesignated as attainment for the 1997 8-hour ozone standard. In conjunction with its redesignation request, the Pennsylvania Department of Environmental Protection (DEP) submitted a SIP revision consisting of a maintenance plan for the region that provides for continued attainment of the 1997 8-hour ozone NAAQS for at least 10 years after the redesignation. EPA approved the adequacy determination for motor vehicle emission budgets (MVEBs) that are identified in the maintenance plan for purposes of transportation conformity. On August 11, 2009, DEP submitted revised MVEBs to include separate emission budgets for each MPO and RPO within the maintenance area. As a result, separate 2009 and 2018 MVEBs are provided for the Lackawanna-Luzerne MPO area. Based on the approved maintenance plan MVEBs, transportation conformity for the 1997 8-hour ozone standard must demonstrate that future year emissions are no greater than the established 2009 and 2018 emission budgets.

Pollutants subject to conformity determination in ozone nonattainment and maintenance areas include volatile organic compounds (VOC) and nitrogen oxides (NO_x).

On March 12, 2008, EPA revised its NAAQS for ozone by strengthening the standard to 0.075 parts per million (ppm). EPA has established (77 FR 30088) air quality designations for the 2008 ozone standards. The rule also provides for the revocation of the 1997 ozone NAAQS for transportation conformity purposes to occur 1 year after the effective date of the designations for the 2008 ozone NAAQS (July 20, 2012). Lackawanna and Luzerne counties have been classified as an attainment area under the 2008 ozone NAAQS.

1.1 Purpose

The CAAA directs the EPA to implement regulations providing for reductions in pollutant emissions. This conformity demonstration is based on the current final conformity guidance, 40 CFR Parts 51 and 93 as revised, and adheres to all requirements in the 1997 8-hour ozone NAAQS. Pollutants addressed include VOC and NO_x.

Transportation conformity for ozone includes a demonstration that emission forecasts do not exceed the emission budgets established in the maintenance

plan. Ozone analyses are for emissions during a summer day.

This report evaluates the Highway and Transit TIP and LRTP for Lackawanna and Luzerne counties. It presents the most recent estimates of highway mobile source emissions for the region, including consideration of significant projects on the TIP and LRTP. It provides the basis for determining if the conformity criteria have been satisfied.

1.2 Coverage

This report considers the impact of emissions within the Lackawanna and Luzerne county portion of the Scranton-Wilkes-Barre ozone maintenance area. Wyoming and Monroe counties are covered under separate reports for the NEPA and Northern Tier RPOs.

Ozone is a secondary pollutant; it is not directly discharged into the atmosphere. Instead, it is produced by the reaction of several precursor chemical compounds in the presence of sunlight. VOC and NO_x are primary reactants. VOCs are alternately classified as non-methane hydrocarbons (NMHC), since methane is less reactive and therefore not considered. Under the EPA conformity regulations, both VOC and NO_x must be analyzed for regional transportation conformity.

1.3 Analysis Overview

Emissions from highway vehicles within the area have been analyzed using EPA's MOBILE6.2, the agency's currently approved computer model. EPA has recently released a new emissions model (MOVES2010). States are currently reviewing the model for future application to SIP and transportation conformity analyses. A grace period extension allows for the continued use of EPA's MOBILE6.2 model through March 2, 2013 (77 FR 11394) for regional conformity purposes. The modeling procedures are described in more detail later in this report.

Certain projects were excluded if it was determined that they would not impact regional emissions (e.g., reconstructing bridges, resurfacing projects, etc.) in accordance with 40 CFR Parts 51 and 93. These projects are noted as "Exempt" (X) in Volume II, Appendices A and B. Other projects are noted as "Not Significant" (NS), and include those projects which are not exempt by definition, but for which the air quality impacts are too small to quantify through current modeling practice. All decisions on project significance were made using the guidelines in the report, "PennDOT Project Review & Classification Guidelines for Regional Air Quality Conformity", dated January 2012.

This conformity test was conducted under the requirements of 40 CFR Parts 51 and 93. For ozone, forecast emissions are demonstrated to be no greater than the 2009 and 2018 emission budgets in the Scranton-Wilkes-Barre maintenance plan. Ozone emissions are analyzed are for a summer weekday.

Analysis years are for 2015, 2018, 2025and 2035. The 2018 year is an emission budget year established in the ozone maintenance plan. The 2035 year is the last year of the LRTP. 2015 and 2025 are interim years to ensure there is not more than 10 years between any two analysis years.

1.4 Analysis Limitations

The Final Conformity Rule asserts that the conformity process must include an evaluation of proposed capital facility investments. This is required to assure that such expenditures, which are typically irreversible, are not made without consideration of air quality consequences and that CAAA requirements are being implemented.

In order to proceed with its planned projects, each MPO must adopt a conformity resolution. This study has proceeded with reasonable assumptions and the best available data to provide a valid comparison within these limitations, applying the same assumptions to each of the milestone scenarios within any given year. A reasonable effort has been extended to provide an evaluation of future year emissions.

The planning assumptions used for this conformity submission have been updated as compared to past submissions. Many of the traffic related assumptions are updated on a "triennial" basis to satisfy EPA's latest planning assumption requirements. . The last update was based on 2005 data. Future efforts will utilize 2008/2011 related data which have been compiled for use with the MOVES emission model (but not the MOBILE6.2 model) in conjunction with its implementation for conformity. The inter-agency consultation group affirmed this approach. Examples of key tools and input data are presented below:

- MOBILE6.2 is used to determine emission factors for the region.

- Roadway Traffic Data – Uses PennDOT's 2005 Roadway Management System (RMS) data.
- VMT growth rates based on PennDOT's VMT forecasting system. Growth rates based on historic HPMS VMT through 2005 and socioeconomic forecasts by county.
- HPMS Adjustments – Missing local roadway VMT is reconciled to the 2008 HPMS to ensure consistency. These adjustments are carried forward to future years.
- Vehicle Mix Patterns – Vehicle mix patterns have been developed for the county based on 2005 PennDOT RMS truck percentages.
- Vehicle Fleet Ages – Updated 2005 vehicle fleet age data was prepared from the state motor vehicle registration database.

1.5 Document Contents

The conformity analysis for the Lackawanna/Luzerne MPO is divided into two volumes. Volume I is the executive summary of the analysis. It consists of six sub-sections:

Section one provides introductory material and defines the purpose of the report. Further, it describes the scope of the study: its geographical coverage, the time frame considered, and the pollutant emissions analyzed. The limitations of the study, primarily related to constraints affecting the analysis, are also presented here.

Section two provides a summary of the analysis. This information is also presented in tabular form in Tables 1 through 3 at the end of this report.

A more detailed discussion of the analysis is presented in section three. It provides an overview of the study process and background information on the relation between vehicular emissions and ozone. The TIP and LRTP are discussed, with a focus on projects that might significantly affect emissions. Traffic and other parameters used in the modeling process are presented and discussed. This section also includes a discussion of the emission tables (Tables 2, 3) developed during the analysis, and presenting the implications of these results.

The fourth section of this report discusses the "financial constraints" of the TIP and LRTP.

Section five discusses the public participation process of the conformity analysis. This process includes the advertisements of availability of the TIP/LRTP and accompanying conformity documents, as well as any comments received and associated responses.

The sixth section concludes this report by summarizing the results of the analysis and stating a conclusion regarding the conformity of the TIP and LRTP to the applicable State Implementation Plan, and the Clean Air Act, as amended.

Volume II of this report contains the technical data used to conduct the conformity determination. Key variables, such as vehicle miles traveled (VMT), vehicle hours traveled (VHT), average speed, and daily VOC and NO_x emissions (ozone) are shown. In addition, the TIP/LRTP for the region, MOBILE6.2 set-up files, and other variables are shown. Copies of Volume II are available from PennDOT's Air Quality Section upon request.

2. SUMMARY

As required by the Clean Air Act Amendments of 1990 (CAAA), a study of vehicle emissions was performed for the Lackawanna and Luzerne MPO portion of the Scranton-Wilkes-Barre 1997 8-hour ozone maintenance area. State and federal emissions control measures are included in the analyses for the relevant analysis year.

The study compared the ozone emission forecasts for VOC and NO_x to the 2009 and 2018 MVEBs established in the maintenance plan. The future emission projections include the implementation of the TIP and LRTP. These projects are listed in section 3.3. The regional evaluation of the projects indicates an overall increase in mobility and a decrease in VOC and NO_X emissions.

For the 2015 analysis year, the VOC and NOx emissions are less than the 2009 budget (for each respective pollutant). For the 2018, 2025 and 2035 analysis years, the VOC and NOx emissions are less than the 2018 budgets

To further address VOC and NO_x reductions in the later years after the TIP (LRTP years), strategies such as reduction in VMT, speed changes, smoothness of traffic flows, use of alternative fuels, and other factors will be key to further reducing air pollution levels. Some of these have been mandated by the CAAA, and the state has committed to executing others.

3. ANALYSIS

This section of the report presents the premises for the analysis, background information supporting the modeling, and the results of the analyses.

3.1 Overview

This study used a set of computer programs and databases to estimate vehicle miles of travel and operating speeds, and to subsequently calculate emission factors and total emissions. The programs rely on a variety of input factors, which are discussed in more detail below. A travel demand model does not exist in this region.

Key traffic parameters include daily vehicle miles of travel (DVMT), average speeds, and vehicle type mix. These input factors are calculated by the PPSUITE Post Processor for Air Quality computer program from highway databases containing traffic volumes and descriptions of physical characteristics. In addition, roads are categorized into six functional classifications (Interstate, Other Principal Arterials, Minor Arterials, Major Collectors, Minor Collectors and Local Roads) in three settings: urbanized area, small urban area, and rural area.

The existing DVMT 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 summer weekday conditions.
- Adjustments of daily VMT to align with 2008 HPMS.

The 2008 VMT was then projected to the future years by applying local growth factors derived from both historic traffic volume growth trends and trip-end growth, as related to past and future projected population and employment growth. Using the latest planning assumptions, population growth, employment growth, and land use trends have been considered in the analyses to as great an extent possible.

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

Other input parameters include information regarding vehicle types using the roads and environmental factors. Since local data provides a useful distinction for this comparative analysis, county-specific data was used to describe the vehicle fleet on the highway. The environmental factors used in this analysis (e.g., ambient temperatures) were established based on historic records for peak ozone events within the region.

This conformity analysis, performed according to the Final Conformity Rules for ozone, indicates that future year emission estimates, including the impacts of planned TIP and LRTP projects, are less than emissions provided in the maintenance plan.

3.2 Background

National Ambient Air Quality Standards (NAAQS) have been established by EPA for a number of pollutants considered harmful to public health and the environment. Lackawanna and Luzerne counties are in maintenance for the 1997 8-hour ozone NAAQS.

Ozone is a strong irritant to the eyes and upper respiratory system. It hampers breathing and damages crops and rubberized materials. It is the main component of smog. A region is in nonattainment of the 1997 8- hour ozone standard if the 3- year average of the individual fourth highest air quality monitor readings, averaged over 8 hours throughout the day, exceeds the NAAQS of 0.08 parts per million (ppm). The revised 2008 ozone NAAQS is 0.075 ppm, calculated in the same manner as the 1997 ozone NAAQS.

Ozone is formed by chemical reactions occurring under specific atmospheric conditions. Two of the important classes of compounds in these reactions are hydrocarbons (including VOC) and oxides of nitrogen (NO_x). Both of these are components of vehicular exhaust. Additionally, the hydrocarbons may be produced by evaporation from vehicle fuel system components, and by displacement of vapors in the gas tank during refueling. By controlling these emissions, ozone formation can be controlled.

The actual reactions occurring in the atmosphere are complex and the subject of ongoing research. However, it is known that the formation of ground level ozone is a photochemical oxidation process

activated by sunlight. Higher ozone concentrations are associated with warm temperatures, high pressure systems involving temperature inversions and low wind speeds. Under these stagnant conditions, emissions and ozone tend to accumulate rather than disperse.

The role that each component plays in formation of ozone is also complex. Increases in NO_x could lead to an increase in ozone, depending on the time of suspension in the atmosphere and its transport to other polluted areas. Reductions in NO_x emissions may achieve regional ozone reductions. On the other hand, reductions in VOC are often most important for local ozone reduction.

Transportation accounts for significant portions of man-made emissions. On average, mobile sources contribute approximately 36% of the hydrocarbons, 45% of the oxides of nitrogen, and 78% of the carbon monoxide (CO) emissions from man-made sources. For VOCs, the rate of emissions (expressed in grams per mile for motor vehicles) generally decreases with an increase of vehicle speed. This trend is most dramatic for VOC and CO at low speeds. However, both VOC and CO exhibit a slight increase in emission rates as vehicles travel above 40 miles per hour (mph).

For NO_x, however, the emissions rate is a more gradual decline with increasing speed up to approximately 25 mph. Above that speed, vehicle NO_x emissions increase gradually. At 40 mph, the NO_x emissions begin to increase rapidly, due, in part, to the higher engine temperatures associated with higher speeds. Thus, while increasing speeds generally reduces VOC emissions, increasing speeds may cause NO_x emissions increases (see Chart 1). There is no simple way to solve both issues without producing an overall TIP and LRTP with a mix of strategies that reduce the NOx increases.

Emission Control Strategies:

Recognizing the contribution of transportation sources to air pollution, the federal government initiated an emission control program in 1968. These requirements are periodically revised, based on the effectiveness of existing controls in meeting pollutions challenges. In addition, cleaner burning fuels have decreased emissions rates of gasoline powered cars, and to some extent, diesel vehicles. Additional new federal vehicle and fuel control programs have been implemented between 2004 and 2010, and additional vehicle programs will be phased-in through 2016. Increasing VMT, however, tends to counteract a portion of emissions reductions resulting from cleaner vehicles and fuels.

In order to assure that emission controls are working properly, vehicle inspection and maintenance (I/M) programs have been adopted in some counties. These programs have the added benefit of improving the fuel efficiency of vehicles on the road. The Pennsylvania I/M program was upgraded and expanded throughout the state with a phase-in period starting in September 2003 and fully implemented by June 2004.

The program requirements vary by region and include on-board diagnostics (OBD) technology that uses the vehicle's computer for model years (MY) 1996 and newer to identify potential engine and exhaust system problems that could effect emissions. The program, named PAOBDII, is implemented by region, as follows:

- Philadelphia Region - Bucks, Chester, Delaware, Montgomery and Philadelphia Counties,
- Pittsburgh Region - Allegheny, Beaver, Washington and Westmoreland Counties,
- South Central and Lehigh Valley Region - Berks, Cumberland, Dauphin, Lancaster, Lebanon, Lehigh, Northampton and York Counties.

Other elements of the Pennsylvania I/M program include a gas cap test and visual inspections of subject vehicles in the North region (Blair, Cambria, Centre, Erie, Lackawanna, Luzerne, Lycoming, and Mercer Counties), and a visual inspection as part of the annual safety inspection in the other 42 counties.

The Pennsylvania Clean Vehicles (PCV) Program, adopted in 1998, incorporated the California Low Emission Vehicle Program (CA LEV II) by reference although it allowed automakers to comply with the NLEV program as an alternative to this Pennsylvania program until MY 2006. Beginning with MY 2008, "new" passenger cars and light-duty trucks with a gross vehicle weight rating (GVWR) of 8,500 pounds or less that are sold or leased and titled in Pennsylvania must be certified by the California Air Resources Board (CARB) or be certified for sale in all 50 states. For this program, a "new" vehicle is a qualified vehicle with an odometer reading less than 7,500 miles. DEP and PennDOT worked with the automobile manufacturers, dealers and other interested business partners and finalized procedures for complying with these new requirements. DEP is focusing on its outreach with the manufacturers and dealers on what they can offer

for sale and how to certify that the vehicles are compliant. PennDOT's role is to ensure paperwork procedures for title and registrations include these certifications of compliance or that the vehicle owner qualifies for an exemption to the requirements. In all cases, DEP will use information obtained during PennDOT's title and registration process to oversee and audit, as needed, certain vehicle title transactions to determine compliance to the program. The impacts of this program are modeled for all analysis years beyond 2008.

3.3 Transportation Improvement Program/ Long Range Transportation Plan

The complete TIP and LRTP for the Lackawanna/Luzerne MPO are included in Volume II, Appendix A, for highways and transit service projects.

Detailed assessments were only performed for those projects on the TIP and LRTP which may have a significant effect on emissions in accordance with 40 CFR Parts 51 and 93. Essentially, only those projects which would increase capacity or significantly impact vehicular speeds were considered. Projects such as bridge replacements and roadway restoration projects, which constitute the majority of the TIP/LRTP list, have been excluded from consideration since they are not expected to significantly alter the volume or speed of traffic.

The following TIP AQ significant highway projects are included in this analysis.

Lackawanna:

1. Dunmore Signal Network: This project involves updating and interconnecting 10 traffic signals on SR 347, SR 202 and SR 6011 in Dunmore and Throop Boroughs. Changes also include widening shoulders, adding sidewalks, ADA ramps and improvements of stop controlled intersections.
2. Tigue Street Park and Ride Lot: Construction of a park and ride lot on Tigue Street in Dunmore Borough.
3. Keyser Avenue SAMI: This 4.6 mile corridor safety improvement project involves traffic signals at 5 intersections on Keyser Avenue (SR 3011). The project extends from Continental to Keyser RR Bridge in Taylor Borough and the City of Scranton.
4. Main St. Corridor # 2: Project focuses on congestion reduction, addition of turning lanes, signal upgrades, and signal timings.
5. Main St. Corridor #3: Project includes signal and intersection improvements at five intersections on Main Avenue in Dickson City Borough.
6. Greenridge Corridor: Project focuses on congestion reduction, signal upgrades, and signal timings and pedestrian improvements.

Luzerne:

7. Airport Access Road: New 2-lane access road from SR 0315 around the airport runway over the Turnpike connecting with Commerce Boulevard.
8. Butler Twp. Park and Ride Lot: Construction of a park and ride lot on SR 309 at the I80 interchange.
9. White Haven Park and Ride Lot: Construction of a park and ride lot on SR 940 at the I80 interchange.
10. Nuangola Park and Ride Lot: Construction of a park and ride lot on SR 2042 at the Nuangola Exit (159) of I81in Rice Township.
11. Tomhicken Rd. Park and Ride Lot: Construction of a park and ride lot on SR 3020 near I81, Exit 145 in Sugarloaf Township.
12. South Valley Parkway: A new 2-lane arterial including new interchange and road widening. New roadway on new alignment in Hanover Township to alleviate congestion on Middle Road
13. Upper Demunds/Hildebrant Intersection: Signal installation at intersection of SR 309 and Center Hill Road in Dallas Township. The project includes coordination with nearby traffic signals.

There are no air quality significant transit TIP projects in the region.

The following LRTP AQ significant highway projects are included in this analysis.

Lackawanna:

1. Main Avenue Corridor Improvements: This project involves capacity and safety improvements from Euclid Avenue to Bedford Street including Euclid rail overpass bridge and Route 11 ramp signals. The project also addresses high crash rates and pedestrian crashes.
2. Mulberry St. Corridor: This project involves corridor improvement from Wyoming Avenue to Harrison including construction of off-street parking lots for passenger cars, increase capacity and safety.
3. I-81 Detour/Moosic signal Interconnection: This project involves interconnecting signals along Cedar Avenue, Pittston Avenue and Birney Avenue within various municipalities, improving progression along I-81 Diversion Route and central traffic control.
4. Carbondale Industrial Park: This project includes construction of new roadway from 7th Avenue to Dundaff Street within Carbondale Industrail Park to reduce heavy traffic on SR 106 that serves downtown area.

Luzerne:

5. River Street Corridor: River Street improvements and traffic calming are proposed from North Street to South Street. This project will reduce number of lanes from four to two on River Street and create boulevard along the waterfront. Traffic will be diverted to Wilkes Barre Boulevard that operates with good level of service and provides ramp access to route 309.
6. Union Street at PA 309 Park & Ride: This project involves construction of new park & ride lot under SR 309 of Union Street with an access to existing transit service.
7. Extension of PA 424 to SR 924: Extension of SR 424 - Hazelton Beltway - to SR 924 is proposed to cut thorough the Hazleton City authority watershed to reach the south side of the industrial park. The purpose of the project is to alleviate traffic congestion and improve safety on Route 924 and the Interstate 81 interchange by extending Route 424 to create a secondary access between I-81 and Humbolt.
8. Hazleton Intermodal Center: This project is a purchase of the existing Transit Center with the potential improvements in the future. Built on the site of the former Hazleton Lehigh Valley Railroad Station, the newly dubbed Church Street Station will be a hub for buses and taxicabs, and perhaps trains. It will also hold parking facilities and commercial/retail establishments.

3.4 Traffic Parameters

Traffic parameters within the emissions modeling provide the basis for the conformity emission test comparisons. For ozone, data is compiled for an average summer day. The following summarizes the data sources, compilation and processing to produce VMT, speeds and emissions by pollutant / precursor. There is no travel demand model for this area; instead, state traffic databases are used to calculate regional VMT and speeds.

Emission factors vary with average speed and vehicle type mix. Daily emissions are calculated by multiplying the emission factor (expressed in grams per vehicle mile) and traffic volumes (expressed in daily vehicle miles of travel for ozone).

Annual Average Daily Traffic (AADT) volumes on individual roadway segments were generated from 2005 PennDOT HPMS and Roadway Management System (RMS) databases. Actual traffic counts are completed at thousands of sites around the state at least once every three years. Separate from the HPMS, there are 60 permanent counting stations, which provide data on growth trends and periodic fluctuations in traffic volumes (e.g., seasonal variations). Adjustment factors developed from these permanent station records are applied to the HPMS data.

Individual roadway segments are designated within RMS to one of the six (6) functional classifications and to one of the three settings. RMS also records the length of roadway for each segment, the number of lanes, and the traffic volume. A computerized tabulation of daily vehicle miles of travel (DVMT) for each roadway class and setting is generated by multiplying the ADT and the length for each segment, and summing the products. In addition, PennDOT has developed temporal variation data, which describe both the hourly variation of traffic volumes within a day, the daily variation within a week, and the monthly variation over the year. The AADT volumes were adjusted to reflect average summer weekday conditions in the peak ozone season, and were also disaggregated to hourly

volumes within the day to support detailed speed estimation.

VMT forecast growth rates are based on PennDOT's VMT forecasting system as documented in the report "Statistical Evaluation of Projected Traffic Growth, Traffic Growth Forecasting System: Final Report, March 14, 2005". The resulting forecasting system includes the development of VMT forecasts and growth rates for four functional classifications in each Pennsylvania county: urban interstate, urban non-interstate, rural interstate, and rural non-interstate. The forecasts use statistical relationships based on historic HPMS VMT trends and future county socioeconomic projections from Woods and Poole Economics, Inc. The statistical models incorporate historical VMT trends, socioeconomic data (households, mean household income), and a relative measure of transportation capacity (lane miles per capita). The results of the study have been shared between PennDOT, DEP, and other Interagency Consultation Group members, including the PA Conformity Work Group (which includes EPA, Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and representatives from larger MPOs within the state).

Speeds were calculated for 2005 and future years by the PPSUITE post processor computer system, and were validated against data from PennDOT's ongoing speed monitoring program. The PPSUITE software contains procedures to calculate the capacity of each highway segment, giving consideration to the physical attributes of the highway (functional class, number of lanes, geographic setting), the effects of traffic congestion are then accounted for by comparing traffic volumes to this capacity for each hour of the day, and calculating the speeds which will result.

Speeds are forecast by adjusting the link attributes to reflect future physical improvements, changing the traffic volumes to reflect growth or other actions, and recalculating capacities and speeds. This approach has proven to be appropriately sensitive to the variety of factors, which affect congestion and speed.

The traffic data was developed using the projection process described above. Conditions were evaluated for the years 2015, 2018, 2025 and 2035 for ozone precursors. The roadways affected by the TIP/LRTP projects listed were further analyzed to determine operational changes, which may result from implementation of the TIP/LRTP. In this way, emission characteristics were developed for the region.

The traffic data serves as the regional population, employment, travel, and congestion estimates required by the CAAA, and uses the area's latest planning assumptions. Travel, represented by DVMT, reflects population and employment trends. The speed estimation procedure serves as a measure of congestion, and is consistent with on-going, established monitoring programs. The estimates were coordinated with other data resources, such as the local planning departments. The RMS and HPMS data are available in published formats.

With supplemental analysis performed by PPSUITE, both speed and vehicle type mix data were used in application of the MOBILE6.2 computer model. The emission factors (expressed in grams per vehicle mile) derived by the model were then multiplied by the appropriate VMT for each functional class / setting / time period to calculate the total emissions (in kilograms per day). Off-system adjustments were made using the Congestion Mitigation and Air Quality (CMAQ) methodologies and the PAQONE emissions model developed by the consulting firm of Michael Baker Jr., Inc. for PennDOT.

3.5 Other Parameters

MOBILE6.2 includes a variety of input parameters which characterize the environmental setting, the vehicle fleet, the condition of emission controls, and the volatility of gasoline. A set of sample input files has been provided in Volume II, Appendix C, of this document. Separate runs of the program were performed for each year and improvement scenario, as described in section 3.7, to produce summer weekday VOC and NO_x.

The sample input file shows a number of the parameters indicate use of MOBILE6.2 default or uncorrected values. A combination of default assumptions and site-specific data were determined through the interagency consultation process. For all data, assumptions were applied uniformly to each analysis scenario, providing an unbiased comparison.

MOBILE6.2 allows a calculation for refueling losses. This analysis is used for estimating the effectiveness of vapor recovery systems at fueling stations, where such equipment exists. DEP includes refueling emissions as an area emissions source, not as part of the mobile source category. Therefore the

emissions from refueling have not been calculated for this conformity analysis.

Emissions from fuel evaporation from vehicles depend on the age of the vehicle, fuel used, length of time the vehicle was operating, and whether the engine was cold or hot when it was started. The effect of the start condition also varies with the emissions control system on the particular vehicle. This study used national average percentages for fuel evaporation from highway motor vehicles.

Minimum and maximum temperature and humidity data in the local area parameter and scenario records have been developed from historic temperature records in 14 regions across the state (see Volume II, Appendix C3). These temperatures represent conditions consistent with the development of the region's maintenance plan.

An in-use Reid vapor pressure (RVP) of 8.7 pounds per square inch (see Volume II, Appendix C4) has been used for all analysis summer weekday analysis scenarios.

3.6 Transportation Control Measures

No Transportation Control Measures (TCMs) have been adopted for the Lackawanna/Luzerne MPO area because existing and planned emissions controls are sufficient for attainment and maintenance purposes.

3.7 Emissions

The results of the computer modeling are used to demonstrate conformity for ozone. For ozone, emission forecasts are compared against 2009 and 2018 emission budgets established in the Scranton-Wilkes-Barre maintenance plan (for the Lackawanna-Luzerne MPO). Emissions are produced for the following analysis scenarios:

1- Interim Year – A 2015 analysis year has been included as an interim year even though it is not required for the ozone conformity determination. It represents summer traffic volumes on the base highway network, plus those AQ significant projects that are scheduled for completion by 2015. This year is compared against the 2009 emission budget year for Lackawanna and Luzerne counties.

2- Budget Year - 2018 summer traffic volumes and the base highway network, plus those AQ significant projects that are scheduled for completion by 2018. This year is an emission budget year established in the maintenance plan.

3- Interim Year - 2025 summer traffic volumes and the base highway network, plus those AQ significant projects that are scheduled for completion by 2025. This year is included to ensure that no analysis year is more than 10 years apart.

4- End Year of LRTP –2035 summer traffic volumes and the base highway network, plus those AQ significant projects that are scheduled for completion by end of Plan. This year satisfies the conformity requirement for at least a 20-year horizon.

Based on this analysis and the summary emission tables provided at the end of this report, the conformity results for the 1997 8-hour ozone standard are described below.

Ozone Conformity Test Results:

Results for the Lackawanna-Luzerne MPO portion of the Scranton-Wilkes-Barre nonattainment area indicate that forecast 2015 VOC and NO_x emission estimates (including TIP & LRTP) are lower than the 2009 emission budgets established in the maintenance plan for the MPO area. Forecast 2018, 2025 and 2035 emissions are lower than the 2018 VOC and NO_x emission budgets.

The TIP and LRTP are expected to provide a favorable increase in travel speeds, which reduces the VOC emission rates. The favorable mix of projects contributes to a reduction in NO_x emissions.

3.8 Discussion

This analysis demonstrates that the forecast summer day VOC and NO_x satisfy the applicable conformity tests for the ozone standards. Therefore, implementation of the TIP and LRTP as defined in the study will not adversely affect air quality goals.

Further measures directed at reducing vehicle trips may become increasingly important in future transportation plans and programs. Transit and intermodal alternatives may serve as a means for achieving these reductions. The current plan and program present several appropriate means of achieving this. Additionally, transit and intermodal alternatives can be incorporated into preliminary engineering for highway projects.

4. FINANCIAL CONSTRAINT

The Planning Regulations, Sections 450.322 (b) (11) and 450.324 (e) require the TIP and the LRTP 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. The Lackawanna/Luzerne MPO, in conjunction with PennDOT, has developed an estimate of the cost to maintain and operate the existing roads and bridges in Lackawanna and Luzerne counties and have compared that with the estimated revenues and maintenance needs of the new roads.

5. PUBLIC PARTICIPATION

This TIP and LRTP have undergone the public participation requirements and the comment and response requirements set forth in the Final Conformity Rule, the Final Statewide/Metropolitan Planning Rule, and Pennsylvania's Conformity SIP. A public meeting was held, pursuant to public notice, on ___(date)_____. The documentation of the public notice for the hearings, comments, and the responses to comments can be found in Volume II, Appendix C.

6. CONFORMITY STATEMENT

The Clean Air Act Amendments of 1990 (CAAA) require that a Metropolitan Planning Organization (MPO) determine that a Transportation Improvement Program (TIP) and Long Range Transportation Plan (LRTP) conform with the applicable State Implementation Plan (SIP), or other tests as defined in the EPA's Conformity Rule, before the programs are adopted. No Federal agency may approve, accept, or fund a TIP/LRTP or its component projects unless each has been found to conform to the SIP. Under the Act, conformity is determined by applying three criteria; that "the transportation plans and programs--

(i) Are consistent with the most recent estimates of mobile source emissions;

(ii) Provide for the expeditious implementation of transportation control measures in the applicable implementation plan; and

(iii) With respect to ozone and carbon monoxide non-attainment areas, contribute to annual emissions reductions consistent with sections 182(b)(1) and 187(a)(7)"

Each new TIP/LRTP must be found to conform before they are approved by the MPO/RPO or accepted by US DOT.

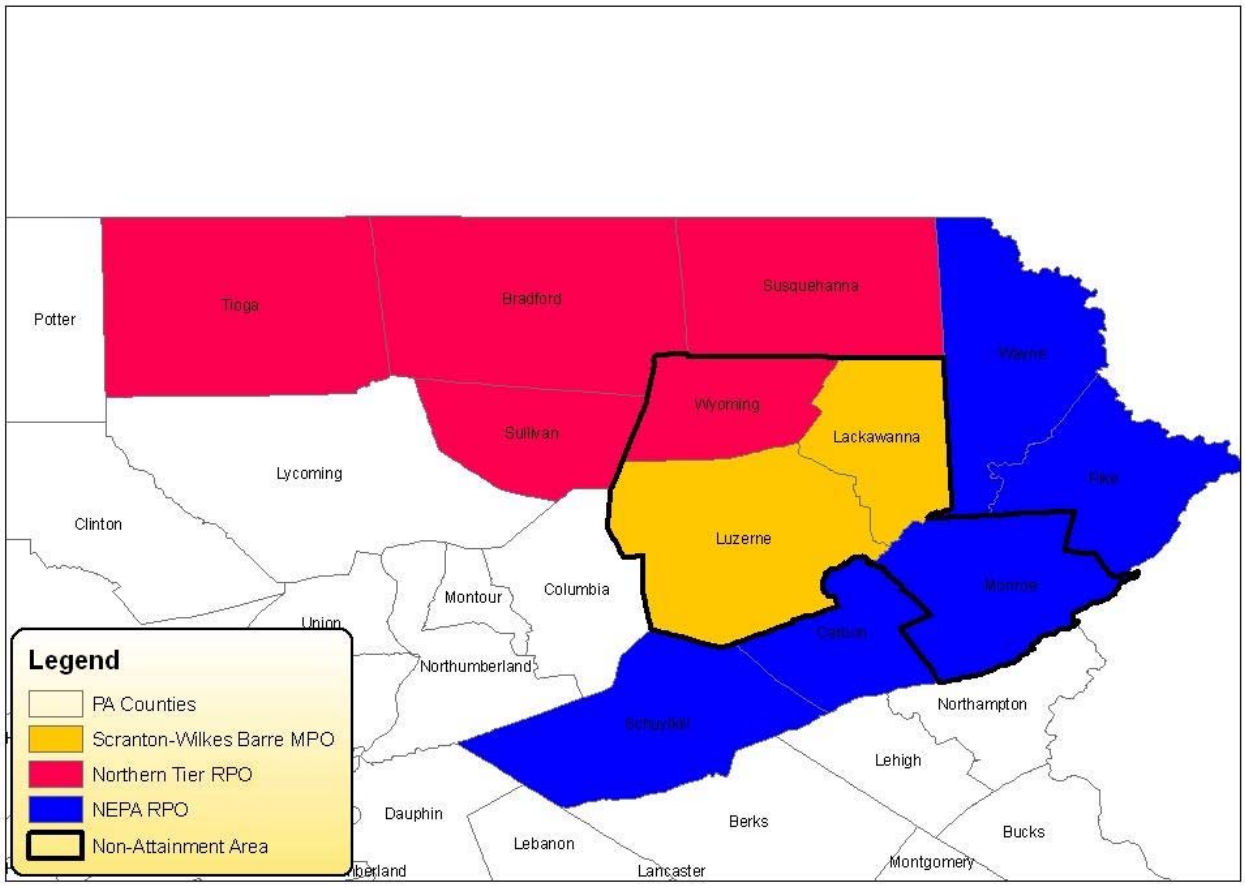
As specified under the first item, the most recent estimates of highway emissions for Lackawanna and Luzerne counties have been developed as a part of this study. The results for the Lackawanna-Luzerne MPO indicate that the forecast ozone precursors, VOC and NO_X, are lower than the 2009 and 2018 regional emission budgets established in the Scranton-Wilkes-Barre area maintenance plan for the 1997 8-hour ozone standard. Affirmative conformity determinations are provided for the Northern Tier and NEPA RPO portions of the maintenance area in separate conformity reports for each area.

Lackawanna and Luzerne counties were not considered to be nonattainment for ozone (prior to the CAAA of 1990) and have not submitted a SIP including TCMs under the 1990 CAA Amendments. No transportation control measures for this area exist in a state implementation plan. Consequently, the second criterion (above) is not applicable.

Therefore, the TIP and LRTP for the Lackawanna-Luzerne MPO area are found to satisfy the regional transportation conformity requirements for the 8 hour ozone standard for the Scranton-Wilkes-Barre 1997 8-hour ozone maintenance area under the Clean Air Act.

MAPS

Scranton - Wilkes Barre Ozone
Maintenance Area and MPO/RPO Boundaries



TABLES

TABLE 1
OZONE Conformity
Summary of Total Highway Vehicle Miles Traveled (VMT)
Average Summer Weekday
Lackawanna-Luzerne MPO Portion of Scranton-Wilkes-Barre Ozone Maintenance Area

County	2015	2018	2025	2035
Lackawanna	6,536,675	6,752,948	7,205,190	7,862,807
Luzerne	8,903,351	9,061,618	9,470,467	10,129,210
MPO Region	15,440,026	15,814,566	16,675,657	17,992,017

TABLE 2
OZONE Conformity
Summary of Total Highway VOC Emissions
Average Summer Weekday (tons/day)
Lackawanna-Luzerne MPO Portion of Scranton-Wilkes-Barre Ozone Maintenance Area

County	2015	2018	2025	2035
Lackawanna	3.39	2.92	2.56	2.78
Luzerne	4.69	3.93	3.26	3.47
MPO Region	**8.09** (7,337 kg/day)	**6.85** (6,212 kg/day)	**5.82** (5,282 kg/day)	**6.24** (5,663 kg/day)
Emission Budget*	**17.99 (2009 Budget)**	**11.80 (2018 Budget)**	***Same as 2018***	***Same as 2018***

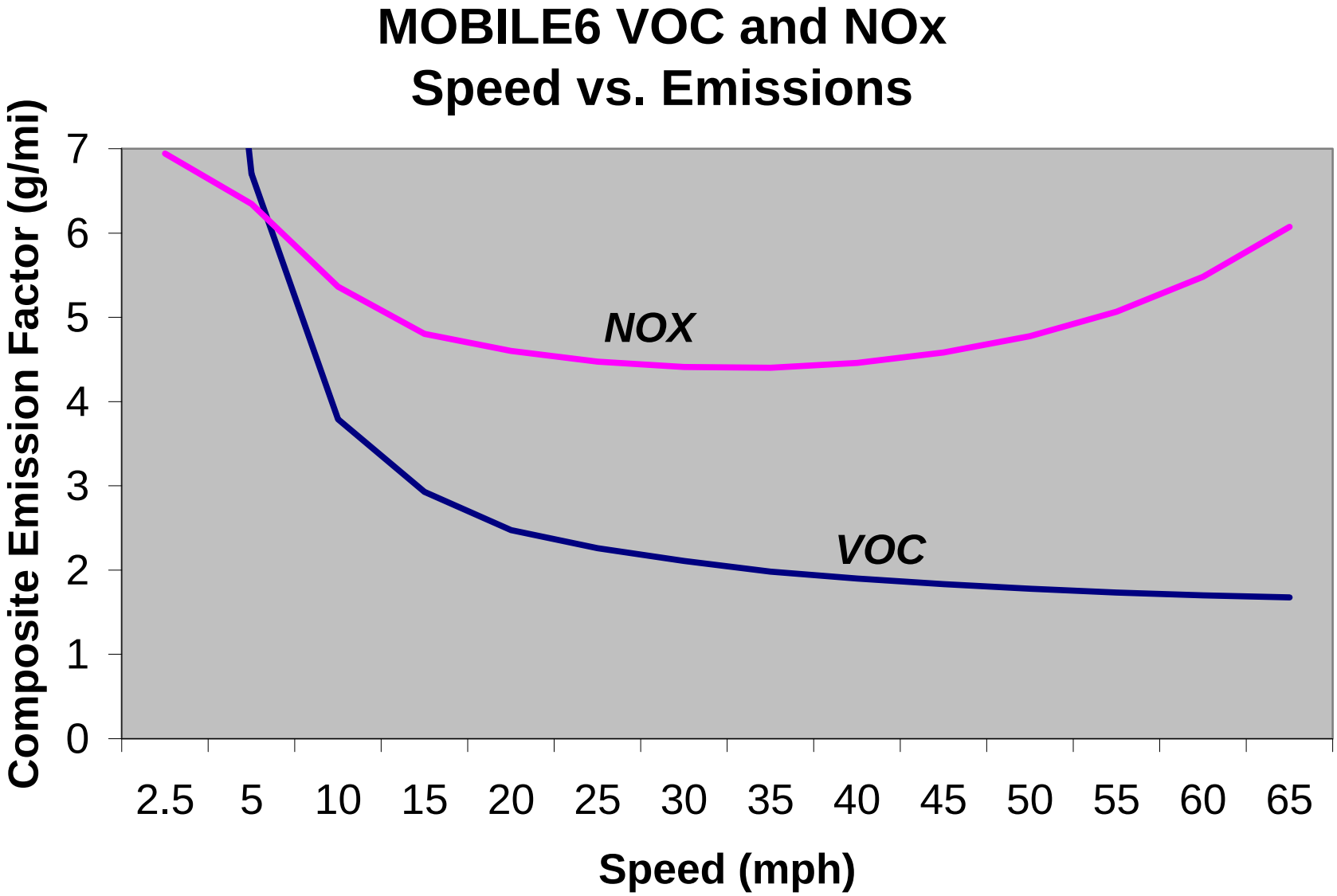
TABLE 3
OZONE Conformity
Summary of Total Highway NO_X Emissions
Average Summer Weekday (tons/day)
Lackawanna-Luzerne MPO Portion of Scranton-Wilkes-Barre Ozone Maintenance Area

County	2015	2018	2025	2035
Lackawanna	6.32	4.83	3.33	3.01
Luzerne	9.22	6.92	4.56	3.96
MPO Region	**15.54** (14,099 kg/day)	**11.75** (10,662 kg/day)	**7.89** (7,159 kg/day)	**6.97** (6,321 kg/day)
Emission Budget*	**34.58 (2009 Budget)**	**16.70 (2018 Budget)**	***Same as 2018***	***Same as 2018***

* Emission budgets from August 11, 2009 revision to the November 19, 2007 Scranton-Wilkes Barre 1997 8-hour ozone maintenance plan; Budget for Lackawanna-Luzerne MPO portion of maintenance area.

** All analysis years are lower than applicable budget years.

CHARTS


MOBILE6 VOC and NOx
Speed vs. Emissions
Composite Emission Factor (g/mi)
0
1
2
3
4
5
6
7
NOX
VOC
2.5
5
10
15
20
25
30
35
40
45
50
55
60
65
Speed (mph)