

AIR QUALITY ANALYSIS
AND
CONFORMITY DETERMINATION
FOR
BELMONT, OHIO AND MARSHALL COUNTIES

February, 2012

Prepared by:

**Bel-O-Mar Regional Council
105 Bridge Street Plaza
Wheeling, WV 26003
www.belomar.org**

INTRODUCTION

As per the EPA's final rule published in the Federal Register Vol. 69, No. 126 on July 1, 2004, "Transportation Conformity is required under the Clean Air Act section 176(c) (42 U.S.C. 7506(c)) to ensure that federally supported highway and transit project activities are consistent with ("Conform to") the purpose of the state air quality implementation plan (SIP). Conformity currently applies under EPA's rules to areas that are designated nonattainment or maintenance." Areas are designated "nonattainment" for violating the National Ambient Air Quality Standards (NAAQS). Final Rules published in the Federal Register Vol. 69, No. 84 on April 30, 2004 state "CAA definition of the nonattainment area that is defined in Section 107(d)(1)(A)(I) as an area that is violating the standard. If an area meets this definition, EPA is obligated to designate the area as nonattainment." The nonattainment areas can be redesignated as attainment/maintenance as per section 107(d)(3) of the Clean Air Act.

Nonattainment designations are based on violating the NAAQS for any one or more criteria pollutants. Six (6) common air pollutants that are harmful for our health and for which specific standards are established by the EPA, are Nitrogen Dioxide, Ozone, Carbon Monoxide, Sulfur Dioxide, Particulate Matter and Lead. The area is designated nonattainment for particulate matter (PM 2.5) and was designated nonattainment for Ozone. Effective June, 2007 all three counties have been redesignated as attainment for Ozone.

The Ozone standard is exceeded if the three year average of the 4th highest Ozone reading is greater than 0.08 ppm. This value is also referred to as "design value." Bel-O-Mar was designated as non-attainment under this 1997 8-hour standard. In 2008, the standard was lowered to 0.075 ppm. EPA is in the process of lowering this to a value between 0.060 to 0.070 ppm. Under the new standard, the area is likely to revert back to non-attainment designation from the current maintenance status.

As part of the redesignation process, OEPA and WVDEP were required to submit a SIP revision including maintenance plan for their respective area. Both agencies were able to demonstrate that the area will continue to be in attainment of the 8-hour Ozone NAAQS for the next 12 years until 2018. In doing so, emission budgets were established in the maintenance plan and were found to be adequate by USEPA. As a maintenance area, it is Bel-O-Mar's responsibility to make a conformity determination based on established budgets for ozone precursors NOx and VOC.

West Virginia revised the Motor Vehicle Emissions budgets for Ozone precursors in 2011. The final (corrected) USEPA approved budgets were published on December 22, 2011 in the Federal Register Vol. 76, No. 246. These budgets are used for the ozone conformity for the Ohio and Marshall Counties. Belmont County ozone precursor budgets remained unchanged. The Belmont County ozone precursors VOC and Nox budgets were published in the Federal Register Vol. 72, No. 94 on May 17, 2007.

The ozone budgets are based on USEPA's emissions modeling software MOBILE 6.2. USEPA is transitioning from MOBILE 6.2 to MOVES2010 software. MOVES will replace MOBILE 6.2. EPA published Transportation Conformity Policy for MOVES2010 in the Federal Register Vol. 75, Number 40 on March 2, 2010. As per this policy, a two year grace period ending on March 2, 2012 is established for transitioning from MOBILE6.2 to MOVES2010. The MOVES implementation grace period is now extended to March 2, 2013. After this grace

period, MOVES2010 is required to be used for regional transportation conformity purposes. During the grace period, areas are to use interagency consultation process for determining which software is utilized. However, regional emissions analyses that are started during the grace period (prior to March 2, 2013) can use either MOBILE6.2 or MOVES2010. When the grace period ends, MOVES2010 will become the only approved motor vehicle emissions model for regional analyses and transportation conformity. Analyses that begin before or during the grace period may continue to rely on MOBILE6.2.

On November 29, 2011, an interagency consultation meeting was held via a conference call. The summary of this meeting and list of attendees is included as Attachment A to this document. Both EPA Region 3 and Region 5 participated in this conference call. In addition, ODOT, WVDOT and FHWA participated. During this interagency consultation process it was unanimously agreed upon that Bel-O-Mar Regional Council will utilize MOBILE6.2 emissions and budgets for ozone conformity. MOVES based budgets have not been finalized at this time. Thus ozone precursor VOC and Nox conformity of the Transportation Plan for 2035 will be based on MOBILE 6.2 emissions and MOBILE 6.2 based USEPA approved budgets.

In April, 2005 the area was designated nonattainment for the Particulate Matter (PM 2.5). PM 2.5 refers to the very fine particles (less than 2.5 microns in diameter), smaller than the human hair, that can lodge permanently in the lungs. The attainment date for PM2.5 was in 2010. For PM2.5, EPA has a 24-hour standard and annual standard. The three counties in the region are found to violate the annual standard only. The annual standard is exceeded if the three year average of annual mean concentration of PM2.5 is greater than 15 micrograms per cubic meter.

Based on the monitor readings, USEPA has issued a determination of attainment (clean data determination) for PM2.5. This finding essentially means that the area has met the PM2.5 annual standard. However, this finding does not change the area designation from non-attainment to attainment. For this designation, USEPA has to approve a maintenance plan and PM2.5 precursor budgets or issue a finding of no significant impact (FONSI) from mobile sources. No budgets have been established for PM2.5 as of this date and no FONSI is issued. Thus PM2.5 conformity is based on a baseline test with new emissions for the base year 2002. Similar to emissions for Ozone, PM2.5 emissions are also MOBILE6.2 based as per the recommendations of the interagency consultation process. Both OEPA and WVDEP are in the process of seeking USEPA's approval for a FONSI of PM2.5 precursor emission from mobile sources.

Ozone conformity for the Long Range Plan and Transportation Improvement Program is required since June 15, 2005 and PM2.5 conformity is required since April 15, 2006. The most recent conforming plan was approved on March 20, 2008. Subsequent Transportation Improvement Programs have relied on this conformity. The conforming long range plan will expire on March 20, 2012. Thus a new transportation plan is prepared and a new conformity determination is being made.

As per EPA's final rule 40 CFR Part 93 "Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant national ambient air quality standards." The metropolitan planning organization (MPO) is charged with the responsibility to demonstrate

conformity. Thus, the MPO is making a conformity determination for the Transportation Plan for 2035.

As part of the maintenance plan for the area, budgets have been established for the ozone precursors VOC and NOx. USEPA as part of the redesignation process has issued an adequacy finding for the ozone budgets for the years 2009 and 2018. The established budgets are used for ozone conformity determination. The PM 2.5 conformity will continue to be based on the baseline emissions for 2002 til PM 2.5 budgets are found to be adequate. As per the recommendations of the interagency consultation process, MOBILE6.2 based emissions are used for the conformity.

Transportation Conformity Process

The regulatory requirements that govern this process, require that a locally relevant conformity process be developed through interagency consultation. An initial interagency meeting was held on August 31, 2004 in Marietta, Ohio to establish a process for addressing ozone conformity. Another interagency meeting was held on August 31, 2005 in Parkersburg, West Virginia to address PM 2.5 conformity issues. Since then, several meetings have been held via conference calls. The most recent interagency meeting was via a conference call on November 29, 2011.

The purpose of this meeting was to establish an appropriate conformity process for the new "Transportation Plan for 2035". For ozone, the budget years of 2009 and 2018 are the same while the new analysis year is 2015. The new interim year is 2025. Budget test is to be used for ozone conformity. Since the conformity process started well before the end of the grace period before MOVES2010 emissions are required, MOBILE6.2 based emissions are used for this conformity.

For PM2.5 USEPA has not ruled on the adequacy of the proposed budget or issued a FONSI. Thus, interim baseline budget test is used for conformity. The emissions are MOBILE6.2 based and new emissions for the baseline year of 2002 are generated. The analysis year is 2015, while the interim year is 2025.

The conformity determination is done separately for Belmont County, Ohio and Ohio and Marshall Counties in West Virginia. The ozone conformity is based on estimated plan emissions being less than the established budgets. The PM 2.5 conformity is based on the estimated emissions being less than the 2002 baseline emissions.

In developing emissions a Travel Demand Model¹ (TDM) and Mobile 6.2 software is used. The TDM inputs the roadway network and land use data for the relevant year. All roadways classified collectors and up are included in this network. The TDM outputs vehicle miles of travel (VMT). The VMT and MOBILE 6.2 emission factors for ozone, along with ODOT developed factors for PM2.5 were used to generate emissions. The latest available data or extrapolation from the most recent available data for the base year (2002) is used. As per interagency consultation process, a typical summer day was used for ozone and the single season

¹The TDM is developed, validated and maintained by ODOT with MPO input and assistance.

approach is used for PM2.5 emissions. The PM2.5 precursors used are direct PM2.5 (exhaust, brakes and tire wear) and NOx. The horizon year of the new transportation plan has not changed and is the year 2035. The ozone budget years are 2009 and 2018 while 2015 is the analysis year. For PM2.5, the year 2002 is the base year, 2015 is the analysis year and 2025 is the interim year. In forecasting demographics and land use variables for the benchmark years and LRP horizon year, the latest planning assumptions and available data are used.

Latest Planning Assumptions

For base year 2002 the block level data from the 2000 decennial census is aggregated for TAZs. Benchmarked to this data is the geocoded employment data (ES202) and vehicle registration data. The TDM base year will change before the next plan update cycle ending in 2016. The block level data from the 2010 census was released in July, 2011 and was too late to be used in this update cycle due to the current plan lapse date of March 20, 2012. The 2010 census data however, was utilized in developing new projections and land use data for the new Transportation Plan for 2035. The population in Belmont County, after decades of losses, grew in 2010. Although Ohio and Marshall Counties lost population, the rate of loss was much lower than previously projected. The population projection for 2035 reflects these changes. For employment projections, Woods and Poole Economics projections were used. Latest available school enrollment data was used for the school enrollment projections.

Land Use Data

Travel analysis zones (269 in the 3-county area) and external roadway “stations” (31) are the basic geographic units for estimating travel patterns. Socioeconomic data used to forecast future travel patterns include population, households, school enrollment, vehicle registrations, and employment by category and location. Sources for year 2000 data include the 2000 Census (primarily SF1 block data), state vehicle registration files, and ES202 employment data. All data sources were geocoded and aggregated to the zone level. Future year data for each variable were projected through various methods. More detailed explanation of base year and future year data generation follows.

Base Year Data: The base year household and population data is derived from the 2000 Census of Population and Housing. Utilizing GIS software (TransCad), base year population data at the zonal level for 2000 was derived from allocation of block level population to zones. ES202 (unemployment coverage) data for 2000 adjusted to U.S. BEA county control totals was utilized as the primary tool to calculate employment at the zonal level. Individual business records containing physical location, number of employees and SIC code were geocoded and aggregated to the TAZ level. Each zone’s employment was divided according to SIC code, area type, and degree of agglomeration into thirteen classes based upon trip generation characteristics.

Horizon Year Data: In developing horizon year projections, the 2010 census population and households were used. Belmont County population for 2035 was revised in light of the 2010 Census after interagency consultation initiated by ODOT. The consultation was via email list and relevant emails are included in Attachment A to this document. The population projections on the West Virginia side were also revisited after the 2010 Census. In spite of a trend reversal

in Belmont County, where a slight growth was recorded in the 2010 Census after decades of population loss, the projected regional populations for 2035 is only 1.5% more than the 2010 Census population of 147,950. It is assumed that Ohio and Marshall Counties will also follow the trend reversal seen in Belmont County due to increased activity in shale formation drilling to retrieve natural gas. There is a slight (less than 0.5%) increase in the number of households from the previous projections. Also using the employment projection by Woods and Poole, the regional employment in this plan shows a decline of over 3.7%. The land use and forecasted growth is shown in Table 3 in Attachment B of this document. The number of households and vehicle registrations are based on historical persons per household and vehicles per household rates.

The countywide projection totals were disaggregated for TAZ level data. A survey of local elected and appointed officials and economic development agencies in the region was conducted to determine areas of future growth and known loss of jobs and housing. The previous TAZ data was revised to include survey results. The remaining difference between 2035 county totals and revised TAZ totals was assigned to TAZs based on developmental potential of each TAZ, planned and committed developments and local knowledge. In assigning growth to TAZs, it was assumed that new sites with developed infrastructure or in close proximity to one, will have a larger share of future growth. Given the topography of the region, it is assumed generally that new economic development will mostly occur in one east-west corridor (I-70/US40) and one north-south corridor (Ohio Route 7 and US250/WV Route 2 along the Ohio River). In Belmont County, however, additional development is expected along SR331 and in areas surrounding the urban core. Due to a scarcity of developable land in Ohio County, development will occur on sites that are generally flat and can be adequately serviced. In addition, over time, generally flat land in the valley will selectively go through planned land use changes to optimize economic development.

Transit Use and Modal Split

Transit trips are significantly low in relation to the auto trips for the area. On an average, there are less than 2,500 transit trips/day. Therefore, it was mutually agreed upon by the participating agencies not to use modal split in the modeling process.

Travel Modeling

The six digital roadway networks specifically developed for use in the conformity process represent the base year (2002) for PM2.5, budget years 2009 and 2018 for Ozone, and 2015 as the analysis year and 2025 as the interim year for both pollutants. The Regional Transportation Plan horizon year is 2035. All projects identified in the Plan having an impact on travel time and/or vehicle carrying capacity regardless of funding source were included in the air quality analysis. A list of Highway Project Recommendations, on the next page, shows which Plan projects are included in which time periods. Trip generation figures by zone, with some exceptions, were assumed to change linearly with time between 2000 and 2035.

Highway Project Recommendations

Belmont County

- B-1 Mall Road/Connector Road. Improve Mall Road including widening, signals, turn lanes, etc., from Banfield Road to US 40. Project to include widening on US 40 from Mall Road to Eric Drive. Also construction of a new connector roadway from US 40 South to intersection of Mall Road/Banfield Road.

Anticipated Year of Construction: 2018

Plan Funds: \$16,411,000

- B-2 IR70/US40/SR331 Interchange Modification. The project will modify the interchange of IR 70, US40 and SR 331 to improve the traffic flow in the area of the SR 331/ US 40/ IR 70 Interchange.

Anticipated Year of Construction: 2015

Plan Funds: \$20,985,000

Ohio County

O-1 Add a right turn lane on Kruger Street at the US 40 intersection.

Anticipated Year of Construction: 2012

Plan Funds: \$0

O-2 Install a new signal system at the I-70 EB off ramp intersection with US 40 just east of Kruger Street.

Anticipated Year of Construction: 2016

Plan Funds: \$213,000

O-3 Upgrade I-70 to six lanes from Elm Grove/Triadelphia interchange to Cabela Drive.

Anticipated Year of Construction: 2022

Plan Funds: \$44,400,000

Note: Projects showing \$0 in plan funds are in the current FY2012-FY2015 TIP with committed funding. Thus, as per guidance from WVDOH, no plan funds are shown for these projects.

Marshall County

- M-1 WV2 from intersection of 6th Street to intersection of US 250 widen to five lanes for two way left turn lane (TWLTL).

Anticipated Year of Construction: 2014
Plan Funds: \$0
- M-2 Upgrade WV2 to four lanes from 0.12 miles South of CR 29 (M.P. 6.46) to 0.33 miles South of CR 27 (M.P. 7.41).

Anticipated Year of Construction: 2012
Plan Funds: \$0
- M-3 Upgrade WV2 to four lanes from 0.18 miles South of CR 78 (M.P. 4.50) to 0.12 miles South of CR 29 (M.P. 6.46).

Anticipated Year of Construction: 2016
Plan Funds: \$14,945,000
- M-4 Radii improvements at the intersection of US 250 and Jefferson Avenue in Moundsville.

Anticipated Year of Construction: 2016
Plan Funds: \$562,000
- M-5 Upgrade County Line Bridge (CR 5) from one lane to two lanes.

Anticipated Year of Construction: 2013
Plan Funds: \$0
- M-6 Upgrade Rude Bridge (CR 5) from one lane to two lanes.

Anticipated Year of Construction: 2014
Plan Funds: \$0

Note: Projects showing \$0 in plan funds are in the current FY2012-FY2015 TIP with committed funding. Thus, as per guidance from WVDOH, no plan funds are shown for these projects.

Transportation system performance was estimated using the Bel-O-Mar travel demand model developed, validated and maintained by Ohio DOT staff. It uses an iterative sequential modeling approach of trip generation, distribution, and assignment. The model uses demographic/land use data and roadway performance characteristics to produce forecasted traffic volumes and travel times by road segment.

The Bel-O-Mar travel model network covers the entire 3-county metro area boundary and has been validated to observed traffic volumes for the model base year 2000, based on counts from 397 geocoded traffic count stations maintained by the Ohio and West Virginia Departments of Transportation. In a report titled “Bel-O-Mar Region Air Quality Conformity Analysis - Technical Memo” dated September, 2007 prepared by ODOT’s Modeling and Forecasting Section, further detail on Travel Demand inputs and outputs is provided. The updates to this report and specifics of this emissions analysis are included as Attachment B in this report.

The applicable digital networks were then converted to shape files for post-processing of model data, which involve overlaying or calculation of added data fields for use in the ODOT emissions model described below along with needed file format conversions.

Emissions Factor Model

ODOT staff utilizes USEPA’s emissions model MOBILE6.2 to develop emission factors for applicable years for both direct PM2.5, VOCs and NOx. ODOT developed emissions factors were used for particulate matter. The MOBILE6.2 input file contains local parameters, developed through consultation with OEPA, for temperature, humidity, vehicle inspection and maintenance programs, and fuel characteristics. These and other factors are documented in the ODOT report included as Attachment B.

Public Involvement

To be added at the end of the public comment period.

Transportation Conformity Test

The ozone conformity tests are based on the data in Table I. In this table, the 2009 and 2018 budgets are USEPA approved budgets and emissions are estimated using a Travel Demand Model, maintained and run by ODOT. The table is reproduced here from the report “Bel-O-Mar Region Air Quality Conformity Analysis - Technical Memo” prepared by ODOT in February 2012. This report is included as Attachment B. West Virginia Department of Environmental Protection submitted revised budget for Ozone. The revised (corrected) Ozone budgets for Ohio and Marshall counties were published by USEPA in the Federal Register on December 22, 2011. Revised budgets are used in Table I. Both budgets and emissions are MOBILE6.2 based.

Table I

8-Hour Ozone -Tons/Day						
OH	2009 Budget	2015 Emissions	2018 Budget	2018 Emissions	2025 Emissions	2035 Emissions
VOC	2.60	1.48	1.52	1.30	1.04	1.02
NOx	4.69	2.39	1.91	1.80	1.21	1.00
WV	2009 Budget	2015 Emissions	2018 Budget	2018 Emissions	2025 Emissions	2035 Emissions
VOC	10.4	1.43	9.1	1.25	1.04	1.07
NOx	7.7	2.15	3.1	1.63	1.15	0.99

The PM 2.5 emissions are shown in Table II. This table is produced from the ODOT report included as Attachment B. Unlike ozone conformity tests, the PM 2.5 tests will be based on the baseline emissions. No budgets for the PM 2.5 precursors are approved at present. Ohio EPA has submitted a MOBILE6.2 based emissions budget for 2009. USEPA has not issued an adequacy finding as of this date. Therefore, an interim emissions test will be used. The emissions in this table are MOBILE6.2 based.

Table II

PM_{2.5} (Tons/Year)					
OH	2002 Baseline	Attainment Demo Submitted 2009 Budget	2015 Emissions	2025 Emissions	2035 Emissions
Direct PM	47.7	48.42	16.3	13.1	12.5
NOx Precursor	2871.6	2879.71	806.1	407.9	337.2
WV	2002 Baseline		2015 Emissions	2025 Emissions	2035 Emissions
Direct PM	37.8		15.0	12.6	12.4
NOx Precursor	2171.5		726.8	386.4	331.5
Area Totals	2002 Baseline		2015 Emissions	2025 Emissions	2035 Emissions
Direct PM	85.5		31.3	25.7	24.9
NOx Precursor	5043.1		1532.9	794.2	668.7

Conformity Determination

A fiscally constrained 2035 Transportation Plan is prepared by the Bel-O-Mar Regional Council in accordance with the provisions of SAFETEA-LU. The financial constraint determination is made by Bel-O-Mar based on the project cost estimates and future revenue stream estimates provided by ODOT and WVDOT. All plan projects by anticipated year of completion were included in the emissions analysis.

Since the area has been redesignated as attainment/maintenance for ozone by USEPA and separate ozone budgets for the Ohio and West Virginia side have been established, the ozone conformity test is based on approved budgets. Conformity determination is made separately for Belmont County, Ohio and Ohio and Marshall Counties, West Virginia.

As per Table I for ozone in Belmont County, the VOC and NO_x emissions for the analysis year 2015 are less than budgets for 2009. Also the emissions for the year 2018, interim year 2025 and the horizon year (2035) are less than the budget for 2018. Therefore, the conformity test for ozone is met for Belmont County, Ohio. Similarly, in Ohio and Marshall Counties the emissions are less than the budget for each budget year and 2025 and 2035 emissions for 2015 are less than the 2018 budget. Therefore, the conformity test for ozone is met for Ohio and Marshall Counties in West Virginia.

The PM 2.5 emissions are shown in Table II. The interim emissions test, of future year emissions no greater than the base year (2002), still applies as budgets have not been approved. The areawide total emissions for each analysis year are less than the base year (2002) emissions. The horizon year emissions are also less than the base year emissions. Therefore, the PM 2.5 conformity test is met. The areawide emissions are also disaggregated by Ohio and West Virginia portions in Table II. Belmont County emissions for each of the three years 2015, 2025 and 2035 are less than the submitted budget for 2009. The disaggregated totals for Belmont County, Ohio and Marshall and Ohio Counties, West Virginia also demonstrate conformity.

Since the conformity for both criteria pollutants ozone and PM 2.5 is determined, the 2035 Transportation Plan is in conformity with the requirements of the CAAA, Ohio SIP and West Virginia SIP.

Transportation Improvement Program (TIP) for FY2012-FY2015 includes projects derived from the conforming plan. Only the analyzed plan projects and plan consistent exempt projects are included in this TIP. Therefore, the TIP for FY2012-FY2015 is in conformity with the requirement of the CAAA, Ohio SIP and West Virginia SIP.

The TIP is financially constrained and this determination is made by Bel-O-Mar in cooperation with the WVDOT and ODOT.

ATTACHMENT A

Interagency Consultation Documents

Bel-O-Mar Transportation Plan

Interagency Consultation-Air Quality
November 29, 2011 11:00am-12:00pm
Conference Call Summary

Participant	Agency
Dave Moore	DOT-Ohio
Nino Brunello	DOT-Ohio
Sara Walton	DOT-Ohio
Andrew Hurst	DOT-Ohio
Sam Granato	DOT-Ohio
Leigh Oesterling	FHWA-Ohio
Andy Johns	FHWA-Ohio
Bob Muransky	Bel-O-Mar
Rakesh Sharma	Bel-O-Mar
Martin Kotsch	USEPA-region 3
Richard Warner	DOH-WV
Perry Keller	DOH-WV
Fred Durham	DEP-WV
Pat Morris	USEPA-region 5

Issues resolved:

- Conformity Analysis will be performed using MOBILE
- Latest planning assumptions and tdm routines discussion - accepted
- Ozone – SIP Budget Tests
 - Budget years: 2009 & 2018
 - Analysis years: 2015, 2018, 2025, & 2035
- PM_{2.5} – Interim Budget Tests
 - Analysis years: 2015, 2025 & 2035

Confirmed schedule:

- Next Steps:
 - Finalize a list of projects by year conformity analysis timeframes – year traffic open to traffic
 - Demonstrate fiscal constraint through the plan horizon year 2035
 - Bel-O-Mar has received revenue projections from both ODOT and DOH-WV
 - Conformity analysis will be conducted by Sam Granato at ODOT during December 2011
 - Bel-O-Mar T-Plan documentation will identify when T-Plan conformity analysis process began
- Public involvement activities will occur from January 10th-26th, these activities will include the results of the air quality conformity analyses
- MPO board will vote on Transportation Plan January 26, 2012-meeting the requirement of giving Federal and State review agencies 45 days to review the Plan update before the conformity due date of March 20, 2012
 - Additionally, Bel-O-Mar plans to forward the first plan draft on January 4, 2012 for participating agency review

Date: Thu, 7 Apr 2011 09:33:00 -0500 [04/07/2011 09:33:00 AM CST]
From: Morris.Patricia@epamail.epa.gov
To: Leigh.Oesterling@dot.gov
Cc: Andy.Johns@dot.gov, Dave.Moore1@dot.state.oh.us, Kevin.Burgess@dot.gov,
Kotsch.Martin@epamail.epa.gov, Paul.Braun@epa.state.oh.us,
rsharma@belomar.org, Sam.Granato@dot.state.oh.us, Shyna.Gawell@dot.state.oh.us,
Vanessa.Adams@dot.gov, William.F.Durham@wv.gov
Subject: Re: Bel-O-Mar - Interagency Consultation - Latest Planning Assumptions
Headers: [Show All Headers](#)

Leigh,

The modest increase in population seems to be based on the 2010 census data and an expected growth in industry.

Thus, I am not opposed to the proposed County population totals.

Pat

Patricia Morris
Environmental Scientist
USEPA Region 5
(312) 353-8656
morris.patricia@epa.gov

Date: Wed, 6 Apr 2011 07:50:38 -0400 [04/06/2011 06:50:38 AM CST]
From: Leigh.Oesterling@dot.gov
To: morris.patricia@epamail.epa.gov, Paul.Braun@epa.state.oh.us,
Kevin.Burgess@dot.gov, Dave.Moore1@dot.state.oh.us,
Shyna.Gawell@dot.state.oh.us, Sam.Granato@dot.state.oh.us, Andy.Johns@dot.gov,
rsharma@belomar.org, Vanessa.Adams@dot.gov, Kotsch.Martin@epamail.epa.gov,
William.F.Durham@wv.gov

Subject: Bel-O-Mar - Interagency Consultation - Latest Planning Assumptions

Part(s):

 2 Case_for_2010census_based_projections.doc	[application/octet	16	 
x	-stream]	KB	
 3 Belmont County to welcome drilling boom.docx	[application/octet	16	 
	-stream]	KB	
 4 WV Counties Fracking Sites through 1-17-4 2011.pdf	[application/octet	2,01	  
	-stream]	5 KB	



[WV Counties Fracking Sites through 1-17-2011.pdf](#)

View as application/pdf

2,015 KB

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Headers: [Show All Headers](#)

1 [unnamed](#) [text/plain] 2.24 KB

Alternative parts for this section:

[unnamed](#) [text/html] 10.29 KB

Bel-O-Mar Inter-Agency Consultation Partners:

As you are aware, Ohio and its MPOs generally rely upon the Ohio Department of Development (ODOD) for providing control totals by county for population forecasts. It was agreed that if an MPO would want to deviate from the ODOD control totals, there should be inter-agency consultation so all partners would be aware of the planning assumptions and have opportunity to comment.

Please review the attached documents and provide any comments/concurrence on Bel-O-Mar's proposed population data and forecasts for their 2035 Transportation Plan update and air quality conformity analyses.

(If I have left off someone who should be included in this consultation, please forward the message.)

Leigh

Leigh A. Oesterling, Planning & Environmental Team Leader

Federal Highway Administration - Ohio Division

200 N. High Street, Room 328

Columbus, OH 43215

(614) 280-6837

leigh.oesterling@dot.gov

From: Dave.Moore1@dot.state.oh.us [mailto:Dave.Moore1@dot.state.oh.us]
Sent: Wednesday, March 16, 2011 10:17 AM
To: Oesterling, Leigh (FHWA)
Cc: Johns, Andy
Subject: Fw: case for using 2010 census based projections

Leigh,

Please review through interagency consultation Bel-O-Mar's documentation below use of 2010 Census population data as latest planning assumptions, rather than ODOD population estimates, in developing the MPOs 2035 T-Plan and air quality conformity analyses.

ODOT supports Bel-O-Mar's request to use Census data.

Thanks

DM

----- Forwarded by Dave Moore/SysPlanProgMgmt/CEN/ODOT on 03/16/2011 10:12 AM -----

rsharma@belomar.org

03/15/2011 11:24 AM

To

Dave.Moore1@dot.state.oh.us

cc

Shyna.Gawell@dot.state.oh.us, Mark.Byram@dot.state.oh.us,
Sam.Granato@dot.state.oh.us

Subject

case for using 2010 census based projections

Dave,

Attached please find our case for using 2010 census based projections for Belmont County in the 2035 Long Range Plan update. These projections vary slightly from the ODOD pre-2010 census projections. The current plan expires on March 12, 2012 and we need to finalize the 2035 TAZ statistics as soon as possible.

Thanks!

Rakesh Sharma
Senior Transportation Planner/GIS Manager
Belomar Regional Council
P.O. Box 2086
Wheeling WV 26003

ATTACHMENT B

**Bel-O-Mar Region Air Quality Conformity Analysis -
Technical Memo**

February 2012

Belomar Region Air Quality Conformity Analysis - Technical Memo Ohio DOT, Modeling & Forecasting Section February 2012

Wheeling Area Air Quality Analysis

States of Ohio and West Virginia

A. Eight-hour (summer) Ozone

Table 2.1 shows the county total daily HC and NOX emissions estimates for all three counties for years 2009, 2018, 2025, and 2035. Table 2.2 shows the regional total emissions. The comparison to regionwide budget figures is shown below in Table 1. Travel demand model area coverage matches the nonattainment area as shown in Figure 1.

Figure 1 – Nonattainment Area Analyzed

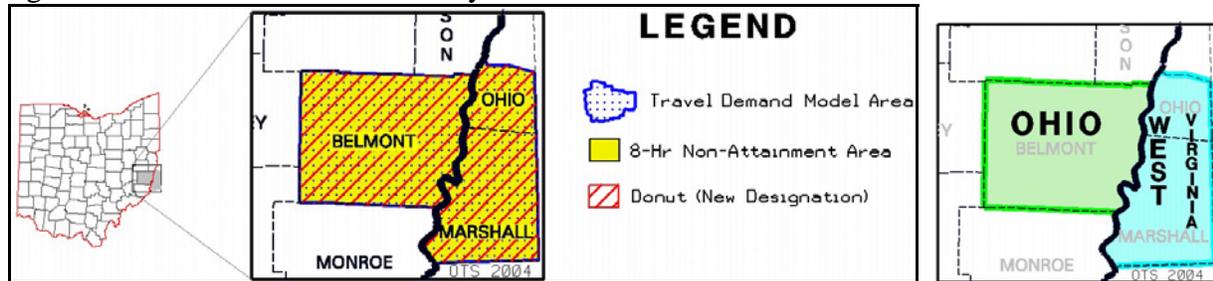


Table 1 – Ozone budget and emissions summary							
	Tons/Day						
Belmont Co. (OH)	2002 Baseline	2009 Budget	2015 Emissions	2018 Budget	2018 Emissions	2025 Emissions	2035 Emissions
VOC		2.60	1.48	1.52	1.30	1.04	1.02
NOx		4.69	2.39	1.91	1.80	1.21	1.00
MAR&OH Co. (WV)	2002 Baseline	2009 Budget	2015 Emissions	2018 Budget	2018 Emissions	2025 Emissions	2035 Emissions
VOC	3.36	10.4	1.43	9.1	1.25	1.04	1.07
NOx	5.45	7.7	2.15	3.1	1.63	1.15	0.99

Table 2.1 – HC and NOX Summer Emissions by County

	Belmont County OH		Marshall County WV		Ohio County WV		WV Total	
Year	HC	NOX	HC	NOX	HC	NOX	HC	NOX
2015	1.48	2.39	0.45	0.56	0.98	1.59	1.43	2.15
2018	1.30	1.80	0.39	0.43	0.86	1.20	1.25	1.63
2025	1.04	1.21	0.32	0.31	0.72	0.84	1.04	1.15
2035	1.02	1.00	0.32	0.26	0.75	0.73	1.07	0.99

Note: Emissions are expressed in tons per day

Table 2.2 Three-County Region Total Emissions

Year	HC	NOX
2015	2.91	4.54
2018	2.55	3.43
2025	2.08	2.35
2035	2.09	1.98

Note: Emissions are expressed in tons per day

Travel Demand Model Runs

For this analysis the latest planning assumptions available for the Wheeling metro area were used. Ohio DOT assisted the MPO by building and validating the travel demand model. The model was initially validated in 2003 and re-validated in 2010, both times meeting DOT standards. Validation information may be obtained through the Wheeling MPO upon request.

Transportation system performance was estimated using an iterative sequential modeling approach of trip generation, distribution, and assignment to the digital network (more fully described at <http://my.execpc.com/~ajh/>). The model uses demographic/land use data and roadway performance characteristics to produce forecasted traffic volumes and travel times by road segment. The applicable digital networks are then converted to shape files for post-processing of model data, which involve overlaying or calculation of added data fields for use in the Ohio DOT's emissions model program described below along with needed file format conversions.

Networks

The travel model network covers the entire three-county metro area boundary and has been validated to observed traffic volumes for the modeling base year of 2000. The Long Range Plan project listings were used to create digital networks for the Years 2015, 2018, 2025 and 2035. This includes all projects identified in the plan having an impact on travel time and/or vehicle carrying capacity regardless of funding source, and is included in Attachment A.

Independent Variables

Socioeconomic data used to forecast future travel patterns include household population, school enrollment, vehicle registrations, labor force participation, and employment by category and location. Sources for year 2000 data include the 2000 Census (primarily SF1 block data), state vehicle registration files, and ES202 employment data. Table 3 below provides a summary of forecasted growth in metro area population and employment. The land use forecasts for the three-county area (including sources and rate of change over time) were previously documented in the Air Quality PM2.5 Conformity report prepared by Bel-O-Mar staff (see http://www.belomar.org/air_quality_analysis_conform_deter_bomts_revision.pdf) and updated as shown in Table 3.

Table 3 – Summary of Key Metro Area Land Use and Forecasted Growth Assumptions

	2000	2035 Projected
Population	152,200	150,200
Households	61,800	64,300
Vehicle Registrations	112,700	126,200
Employment	81,900	103,000
K-8 School Enrollment	17,598	16,100
High School Enrollment	8,587	7,700
Post Secondary/College	7,605	9,900

Table 4 – Forecasted daily vehicle-miles of travel (VMT)

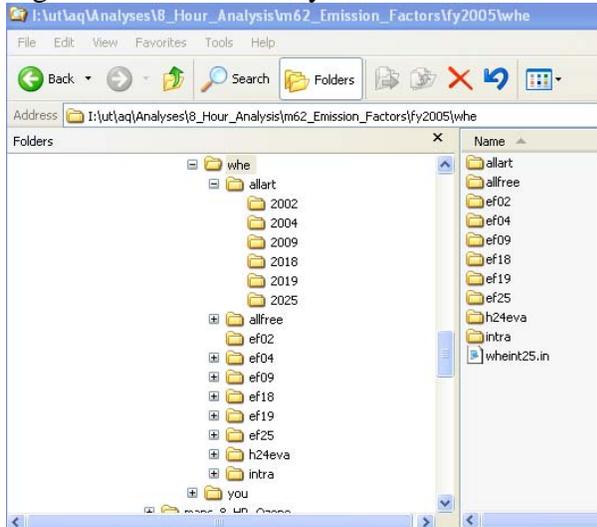
Est. Travel Model VMT by County				
County	Yr 2015	Yr 2018	Yr 2025	Yr 2035
Ohio	1,495,000	1,514,000	1,611,000	1,736,000
Marshall	782,000	792,000	816,000	839,000
Belmont	2,394,000	2,430,000	2,474,000	2,548,000
Total	4,671,000	4,737,000	4,902,000	5,123,000

Emission Factors

ODOT staff utilizes U.S. EPA’s emissions model MOBILE6.2 to develop emission factors for applicable years for both VOCs and NOX. The MOBILE6.2 input file contains local parameters, developed through consultation with OEPA, for temperature, humidity, vehicle inspection and maintenance programs, and fuel characteristics.

Total emissions were computed as described in the CMAQ report prepared by ODOT staff and available on the World Wide Web at <http://www.dot.state.oh.us/urban/Download/cmaqr1.doc> . (The network format used, as described in the report, is that of the Ohio statewide model.) Unless cited otherwise in this report, U.S. EPA default values are utilized. For the three-county Wheeling metro area, this includes the distribution of vehicles by age and type by functional class. Emission factor files were generated for each year of analysis. Each emission factor file involves multiple runs of MOBILE6.2, one for arterials, one for freeways, one for evaporative factors, and one for intra-zonal trips. Figure 2 below shows the file directory structure.

Figure 2 – File Directory Structure



Emission factor results from the MOBILE6.2 runs are extracted and reformatted using a DOS batch file to run a set of FORTRAN PROGRAMS, M6FOR8A, M6FOR8B, M6FOR8C, M6FOR8D, M6EF24A, M6EF24B, M6EF24C, M6FOR8I, and M6FOR8J.

Table 5 below shows the MOBILE 6.2 inputs agreed upon by interagency consultation. Table 6 shows a partial listing of the MOBILE6.2 input file for arterials that is used to generate emission factors by hour of day temperatures and by speed in 1 mph increments. A similar file is used for freeways. Tables 7 and 8 show the MOBILE6.2 input files for evaporative and intrazonal trip emissions, respectively, and show concisely the summer day temperatures by hour of day used in all emission calculations. A partial listing of the 2002 final emission factor file is shown in Table 9.

Table 5 – Wheeling Area Non-default MOBILE 6.2 Inputs

Evaluation Month	Max/Min Temp	Gasoline RVP
July	58/88	9

Table 6 – Partial Listing of MOBILE 6.2 input file for 2002 Arterial Emission Factors

MOBILE6 INPUT FILE :	
RUN DATA	
EXPRESS HC AS VOC :	
EXPAND EVAPORATIVE :	
EXPAND EXHAUST :	
HOURLY TEMPERATURES:	65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3
	65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3 65.3
FUEL RVP :	9.0
SCENARIO REC :	WHEELING 2002 MODEL RUN - VOC - ARTERIAL h0 - SPEED 5.0

```

CALENDAR YEAR      : 2002
EVALUATION MONTH  : 7
AVERAGE SPEED     : 5 ARTERIAL 92.0 0.0 0.0 8.0

SCENARIO REC      : WHEELING 2002 MODEL RUN - VOC - ARTERIAL h0 - SPEED 6.0
CALENDAR YEAR     : 2002
EVALUATION MONTH  : 7
AVERAGE SPEED     : 6 ARTERIAL 92.0 0.0 0.0 8.0

SCENARIO REC      : WHEELING 2002 MODEL RUN - VOC - ARTERIAL h0 - SPEED 7.0
CALENDAR YEAR     : 2002
EVALUATION MONTH  : 7
AVERAGE SPEED     : 7 ARTERIAL 92.0 0.0 0.0 8.0

```

Table 7 – MOBILE 6.2 input file for 2002 Evaporative Emission Factors

```

MOBILE6 INPUT FILE :
RUN DATA
EXPRESS HC AS VOC  :
EXPAND EVAPORATIVE :
EXPAND EXHAUST     :
HOURLY TEMPERATURES: 57.8 61.8 66.9 72.3 77.0 80.4 83.1 84.8 87.3 87.7 87.8
87.4 85.5 82.4 76.7 71.9 69.9 67.6 65.3 63.5 62.0 60.3 58.9 58.8

FUEL RVP           : 9.0

SCENARIO REC      : Wheeling 2002 MODEL RUN - VOC - FREEWAY H24 - SPEED 30.0
CALENDAR YEAR     : 2002
EVALUATION MONTH  : 7
AVERAGE SPEED     : 30 FREEWAY 92.0 0.0 0.0 8.0

SCENARIO REC      : Wheeling 2002 MODEL RUN - VOC - ARTERIAL H24 - SPEED
30.0
CALENDAR YEAR     : 2002
EVALUATION MONTH  : 7
AVERAGE SPEED     : 30 ARTERIAL
end of run

```

Table 8 – MOBILE 6.2 input file for 2002 Intrazonal Emission Factors

```

MOBILE6 INPUT FILE :
RUN DATA
EXPRESS HC AS VOC  :
EXPAND EVAPORATIVE :
EXPAND EXHAUST     :
HOURLY TEMPERATURES: 57.8 61.8 66.9 72.3 77.0 80.4 83.1 84.8 87.3 87.7 87.8
87.4 85.5 82.4 76.7 71.9 69.9 67.6 65.3 63.5 62.0 60.3 58.9 58.8

FUEL RVP           : 9.0

```

```

SCENARIO REC      : Wheeling 2002 INTRA - CENTROID H24 - SPEED 20.0
CALENDAR YEAR    : 2002
EVALUATION MONTH : 7
AVERAGE SPEED   : 20 ARTERIAL
end of run

```

Table 9 – Partial Listing of 2002 Final Emission Factor File

11 0	5.0	62.6	EXHAUST	HC:	2.434
11 0	5.0	62.6	RUNING L	HC:	2.147
11 0	5.0	62.6	RSTING L	HC:	0.111
11 0	5.0	62.6	EXHAUST	CO:	35.174
11 0	5.0	62.6	EXHAUST	NOX:	3.851
11 0	6.0	62.6	EXHAUST	HC:	2.167
11 0	6.0	62.6	RUNING L	HC:	1.557
11 0	6.0	62.6	RSTING L	HC:	0.111
11 0	6.0	62.6	EXHAUST	CO:	31.350
11 0	6.0	62.6	EXHAUST	NOX:	3.674
11 0	7.0	62.6	EXHAUST	HC:	1.951
11 0	7.0	62.6	RUNING L	HC:	1.275
11 0	7.0	62.6	RSTING L	HC:	0.111
11 0	7.0	62.6	EXHAUST	CO:	28.523
11 0	7.0	62.6	EXHAUST	NOX:	3.493
11 0	8.0	62.6	EXHAUST	HC:	1.789
11 0	8.0	62.6	RUNING L	HC:	1.063
11 0	8.0	62.6	RSTING L	HC:	0.111
11 0	8.0	62.6	EXHAUST	CO:	26.404
11 0	8.0	62.6	EXHAUST	NOX:	3.358
11 0	9.0	62.6	EXHAUST	HC:	1.664
11 0	9.0	62.6	RUNING L	HC:	0.899
11 0	9.0	62.6	RSTING L	HC:	0.111
11 0	9.0	62.6	EXHAUST	CO:	24.755
11 0	9.0	62.6	EXHAUST	NOX:	3.252
11 0	10.0	62.6	EXHAUST	HC:	1.563
11 0	10.0	62.6	RUNING L	HC:	0.767
11 0	10.0	62.6	RSTING L	HC:	0.111
11 0	10.0	62.6	EXHAUST	CO:	23.436
11 0	10.0	62.6	EXHAUST	NOX:	3.168

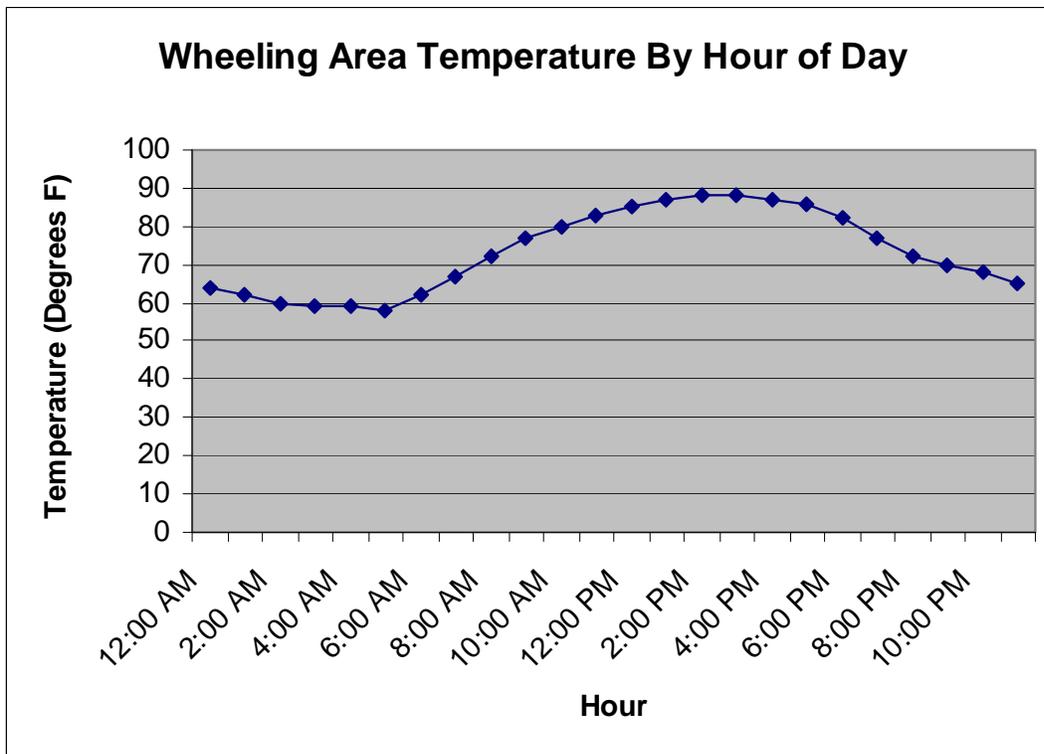
Temperatures

The base year for current state implementation work for both PM2.5 and ozone is 2002. This was also a significant ozone year with several 1-hour and 8-hour episodes of elevated ozone within the state of Ohio. For the ozone day maximum and minimum temperatures, three episodes with statewide elevated ozone concentrations were chosen to determine the average maximum and minimum temperatures for these episode days.

June 21, July 8 and August 10, 2002 were the three episodes chosen. Local Climatic Data summaries from the National Climatic Data Center for National Weather Service sites in and

around Ohio were reviewed to obtain the individual temperature values. The three day average maximum and minimum temperatures were developed for each of these sites. Each county in the state was then assigned one of these surface stations in a manner consistent with the assignment of meteorological data sets for use in air quality modeling in the Division of Air Pollution Control Engineering Guide 69 (EG69) which provides guidance on the application of air quality models within Ohio. In cases where the surface station data were not available, the upper air station identified in EG69 was assigned for those counties. For the Wheeling metro area, temperature data from the Pittsburgh, PA weather station was used, with a three-day average high temperature of 88 degrees and a three-day average low of 58 degrees as shown in the graph in Figure 3.

Figure 3 – Summer Temperature by Hour of Day



CMAQ Process

Total emissions were computed with ODOT’s new CMAQ process. This process produces the same outputs as the old CMAQT, but uses newer data on daily and directional traffic distributions as well as more up to date volume/delay functions from the 2000 Highway Capacity Manual (HCM). This process also uses rewritten code able to handle the newer model network formats.

The process uses a combination of the MOBILE6.2 emission factors and the daily link volumes that come out of the travel demand model. Emissions are calculated for each link for each hour of the day.

The hourly volumes are multiplied by the MOBILE6.2 emission factor for the corresponding hour of day and speed to calculate emissions for every link for each hour. The final total emissions for the area are the sum of all individual link-hour emissions.

B. PM 2.5 Analysis

In December 2004, the US EPA issued air quality designations regarding the fine particulate (or PM 2.5) standard. All three counties in the metro area were designated non attainment for PM 2.5 and federal rules require a new conformity determination within a year of the effective date of a new standard. The effective date for the PM 2.5 standard is April 5, 2006. Belomar, in cooperation with state and federal Departments of Transportation and Environmental Protection, has updated the regional air quality emissions analysis for Plans and Transportation Improvement Programs (TIPs) to include PM 2.5 related emissions.

PM 2.5 Standard

The U.S. EPA has established two standards for PM 2.5, annual and 24-hour. The annual standard is exceeded if the 3-year average of annual mean PM2.5 concentrations is greater than 15 micrograms per cubic meter, the 24-hour standard is exceeded if the 3-year average of the annual 98th percentile concentrations is greater than 65 micrograms per cubic meter. Currently, the metro area only violates the annual standard and to be consistent with the standard, regional emission estimates used to determine transportation conformity must also have annual units.

In urban areas regional emissions analyses typically rely on the results of travel demand models, which replicate average daily travel conditions. Therefore there is a need to develop annual emission estimates from daily travel demand model outputs, primarily vehicle miles of travel. In August 2005, US EPA issued a Guidance Document for Creating Annual On-Road Mobile Source Inventories for PM 2.5 Non-Attainment Area for Use in SIPs and Conformity, outlining several acceptable approaches.

Regional Emissions Test and Analysis Years

In the absence of budgets the **No-greater-than-2002 Baseline year test** is being used to demonstrate conformity. Emissions were generated for two interim years (2015 and 2025) as well as the plan horizon year (2035).

Analysis Components

The regional emissions analysis includes emissions for **Direct PM 2.5** (exhaust, brake, and tire wear) and **Nitrogen Oxides** (NO_x). Thru the interagency consultative process, Volatile Organic Compounds, Sulfur Oxides, and Ammonia were presumed insignificant. Calculated emissions are shown in Tables 10.1 and 10.2.

Table 10.1 – PM 2.5 and NOX Annual Emissions by County

Year	Belmont County OH		Marshall County WV		Ohio County WV		WV Total	
	PM	NOX	PM	NOX	PM	NOX	PM	NOX
2002	47.7	2871.6	14.2	742.0	23.6	1429.6	37.8	2171.5
2015	16.3	806.1	4.3	189.7	10.8	537.1	15.0	726.8
2025	13.1	407.9	3.6	103.1	9.0	283.3	12.6	386.4
2035	12.5	337.2	3.4	86.3	9.0	245.2	12.4	331.5

Table 10.2 Three-County Region Total Emissions

Year	PM	NOX
2002	85.5	5043.1
2015	31.3	1532.9
2025	25.7	794.2
2035	24.9	668.7

Note: Emissions are expressed in tons per year

ATTACHMENT A – PROJECTS IN THE 2035 MPO LONG-RANGE PLAN

Ohio County Projects

Year	Project
09-15	Add a right turn lane on Kruger Street at the US40 intersection.
16-18	Install a new signal system at the I-70 EB off ramp intersection with US40 just east of Kruger Street.
18-25	Upgrade I-70 to six lanes from Elm grove/Tridelphia interchange to Cabela Drive Interchange.

Marshall County Projects

09-15	WV2 from intersection of 6 th Street to intersection of US250 widen to five lanes for TWLTL.
09-15	Upgrade WV2 to four lanes from 0.12 miles south of CR29 (M.P. 6.46) to 0.33 miles south of CR27 (M.P. 7.41).
16-18	Upgrade WV2 to four lanes from 0.18 mile south of CR78 (M.P. 4.50) to 0.12 miles south CR29 (M.P. 6.46).
16-18	Radii improvements at the intersection of US250 and Jefferson Avenue in Moundsville.
09-15	Upgrade County Line Bridge (CR5) form one lane to two lanes.
09-15	Upgrade Rude Bridge (CR5) from one lane to two lanes.

Belmont County Projects

18-25	PID: 89314, BEL Mall Rd/Connector Rd, Improve Mall Rd including widening, signals, turn lanes, etc., from Banfield Rd to US 40. Project to include widening on US 40 from Mall Rd to Eric Dr. Also construction of new connector roadway from US 40 South to intersection of Mall Rd/Banfield Rd. (Phase 1 of this project (PID 92593) will construct approximately 1600 ft of roadway beginning at US40 in FY2013.)
16-18	PID 80599, BEL IR70 14.45, modify the interchange at IR 70, US 40 and SR 331