INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We make Indiana a cleaner, healthier place to live.

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Mr. Bharat Mathur
Acting Regional Administrator
U.S. Environmental Protection Agency
Region V
77 West Jackson Boulevard
Chicago, IL 60604-3950

July 5, 2005

Re: Redesignation Petition and Maintenance Plan for Vigo County, Indiana Final Submittal

Dear Mr. Mathur

The Indiana Department of Environmental Management (IDEM) prepared a draft Redesignation Petition and Maintenance Plan for Vigo County, Indiana, and submitted them to the United States Environmental Protection Agency (US EPA) with a request for parallel processing on May 12, 2005. IDEM conducted a public hearing concerning the Redesignation Petition and Maintenance Plan on June 14, 2005 and the public comment period concluded on June 17, 2005.

Attached hereto is the final Redesignation Petition and Maintenance Plan for Vigo County, Indiana. This final version documents the public review process (note that no comments were received). The document has not been altered substantively since it was submitted to the U.S. EPA for parallel processing on May 12, 2005.

The attached document consists of the following:

Redesignation Petition and Maintenance Plan

- A formal request that the Terre Haute 8-hour ozone nonattainment area be redesignated to a maintenance area. It contains and meets the requirements set forth in Section 107 of the Clean Air Act and in the Redesignation guidance issued September 4, 1992.
- A maintenance year of 2015 is established and 2010 is analyzed as an interim year.
- The appendices of the document contain historic trend data, projected emission inventory data and thorough documentation of the mobile emissions analysis.
- A transcript of the public hearing and record of all comments received.

Motor Vehicle Emissions Budgets

- Contained in the Redesignation Petition is a new Motor Vehicle Emissions Budget for 2015. The Terre Haute Metropolitan Planning Organization's travel demand model and MOBILE6 were used to determine emissions for the 8-hour ozone nonattainment area.
- A conservative safety margin was applied to the 2015 projected emissions.
- The Travel Demand Model was updated with the best available assumptions.

IDEM hereby requests that the U.S. EPA proceed with final review and approval of this submittal. If you have any questions or need additional information, please contact Krista Gremos, Air Programs Branch at (317)233-5680.

Sincerely,

Thomas W. Easterly

TWE/kaw/sad
Attachments

cc: Pat Morris, US EPA (w/enclosures)
Jay Bortzer, US EPA (no Enclosures)
Ed Doty, US EPA (w/enclosures)
John Mooney, US EPA (w/enclosures)
Merv Nolot (no enclosures)
George Needham (no enclosures)

REQUEST FOR REDESIGNATION AND MAINTENANCE PLAN FOR OZONE ATTAINMENT IN THE 8-HOUR OZONE BASIC NONATTAINMENT AREA

Vigo County, Indiana

Developed By:
The Indiana Department of Environmental Management

October 2005

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REQUEST FOR REDESIGNATION AND MAINTENANCE PLAN FOR OZONE ATTAINMENT IN THE 8-HOUR OZONE BASIC NONATTAINMENT AREA

VIGO COUNTY, INDIANA

1.0 INTRODUCTION

This document is intended to support Indiana's request that Vigo County, in West Central Indiana, be redesignated from nonattainment to attainment of the 8-hour ozone standard. This county has recorded three (3) years of complete, quality assured ambient air quality monitoring data for the years 2002 – 2004 demonstrating attainment with the 8-hour ozone standard.

Section 107 of the Clean Air Act (CAA) establishes specific requirements to be met in order for an area to be considered for redesignation including:

(a) A determination that the area has attained the 8-hour ozone standard.
(b) An approved State Implementation Plan (SIP) for the area under Section 110(k).
(c) A determination that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP and other federal requirements.
(d) A fully approved maintenance plan under Section 175(A).
(e) A determination that all Section 110 and Part D requirements have been met.

This document addresses each of those requirements. It also provides additional information to support continued compliance with the 8-hour ozone standard.

1.1 Background

The Clean Air Act Amendments of 1990 (CAAA) required areas failing to meet the National Ambient Air Quality Standard (NAAQS) for ozone to develop SIPs to expeditiously attain and maintain the standard. In 1997, the United States Environmental Protection Agency (U.S. EPA) revised the air quality standards for ozone replacing the 1979 one-hour standard with an 8-hour ozone standard set at 0.08 parts per million (ppm). The standard was challenged legally and upheld by the U.S. Supreme Court in February of 2001. The U.S. EPA designated areas that attain or do not attain the 8-hour ozone standard on April 15, 2004.

Vigo County was designated as Unclassifiable/Attainment for the one-hour ozone standard pursuant to the 1990 CAAA and, therefore, has never previously been subject to nonattainment area rule-makings. As a result of the 2004 ozone designations, U.S. EPA designated Vigo County Basic nonattainment and subject to the new 8-hour ozone requirements, including development of a plan to reduce volatile organic compounds (VOCs) and oxides of nitrogen

(NO_x) emissions and a demonstration that the area will meet the federal 8-hour air quality standard for ozone by June 2009.

1.2 Geographical Description

Vigo County is located in west central Indiana and contains the city of Terre Haute. Vigo County is bordered by the Indiana counties of Vermillion and Parke to the north, Clay to the east, and Sullivan to the south. The Illinois counties of Edgar and Clark border Vigo County to the west. This area is shown in Figure 3.1.

1.3 Status of Air Quality

Ozone monitoring data for the most recent three (3) years, 2002 through 2004, demonstrates that air quality has met the NAAQS for ozone in this Basic nonattainment area. This fact, accompanied by the decreases in emission levels discussed in Section 4.0, justifies a redesignation to attainment for the subject area based on Section 107(d)(3)(E) of the CAAA.

2.0 REQUIREMENTS FOR REDESIGNATION

2.1 General

Section 110 and Part D of the CAAA lists a number of requirements that must be met by nonattainment areas prior to consideration for redesignation to attainment. In addition, U.S. EPA has published detailed guidance in a document entitled *Procedures for Processing Requests to Redesignate Areas to Attainment*, issued September 4, 1992, to Regional Air Directors. This document is hereafter referred to as "Redesignation Guidance". This Request for Redesignation and Maintenance Plan is based on the Redesignation Guidance, supplemented with additional guidance received from staff of the Regulation Development Section of U.S. EPA Region V.

The subsections below refer in greater detail to the requirements listed in Section 1.0 of this document. Each subsection describes how the requirement has been met. The pertinent sections of the CAAA are referenced where appropriate.

2.2 Ozone Monitoring 107(d)(3)(E)(i)

1) A demonstration that the NAAQS for ozone, as published in 40 CFR 50.4, have been attained. Ozone monitoring data must show that violations of the ambient standard are no longer occurring.

2) Ambient monitoring data quality assured in accordance with 40 CFR 58.10, recorded in the U.S. EPA Air Quality System (AQS) data base, and available for public view.

3) A showing that the three-year average of the fourth highest values, based on data from all monitoring sites in the area or its affected downwind environs, are below 85 parts per billion (ppb). This showing must rely on three (3) complete, consecutive calendar years of quality assured data.

4) A commitment that, once redesignated, the State will continue to operate an appropriate monitoring network to verify the maintenance of the attainment status.

2.3 <u>Emission Inventory</u> 107(d)(3)(E)(iii)

1) A comprehensive emission inventory of the precursors of ozone completed for the base year.

2) A projection of the emission inventory to a year at least 10 years following redesignation.

3) A demonstration that the projected level of emissions is sufficient to maintain the ozone standard.

4) A demonstration that improvement in air quality between the year violations occurred and attainment was achieved is based on permanent and enforceable emission reductions and not on temporary adverse economic conditions or unusually favorable meteorology.

5) Provisions for future annual updates of the inventory to enable tracking of the emission levels including an annual emission statement from major sources.

2.4 <u>Modeling Demonstration</u>

While no modeling is required for redesignating ozone nonattainment areas, the Indiana Department of Environmental Management (IDEM) has relied upon it extensively to determine necessary controls for this area.

2.5 <u>Controls and Regulations</u> 107(d)(3)(E)(ii) & 107(d)(3)(E)(v)

1) A U.S. EPA approved SIP control strategy that includes Reasonably Available Control Technology (RACT) requirements for existing stationary sources covered by Control Technology Guidelines (CTG) and non-CTG RACT for all major sources.

2) Evidence that control measures required in past ozone SIP revisions have been fully implemented.

3) Acceptable provisions to provide for new source review.

4) Assurances that existing controls will remain in effect after redesignation, unless the State demonstrates through photochemical modeling that the standard can be maintained without one (1) or more controls.

5) If appropriate, a commitment to adopt a requirement that all transportation plans conform with and are consistent with the SIP.

2.6 Corrective Actions for Potential Future Violations of the Standard

1) A commitment to submit a revised plan eight (8) years after redesignation.

2) A commitment to expeditiously enact and implement additional contingency control measures in response to exceeding specified predetermined levels (triggers) or in the event that future violations of the ambient standards occur.

3) A list of potential contingency measures that would be implemented in such an event.

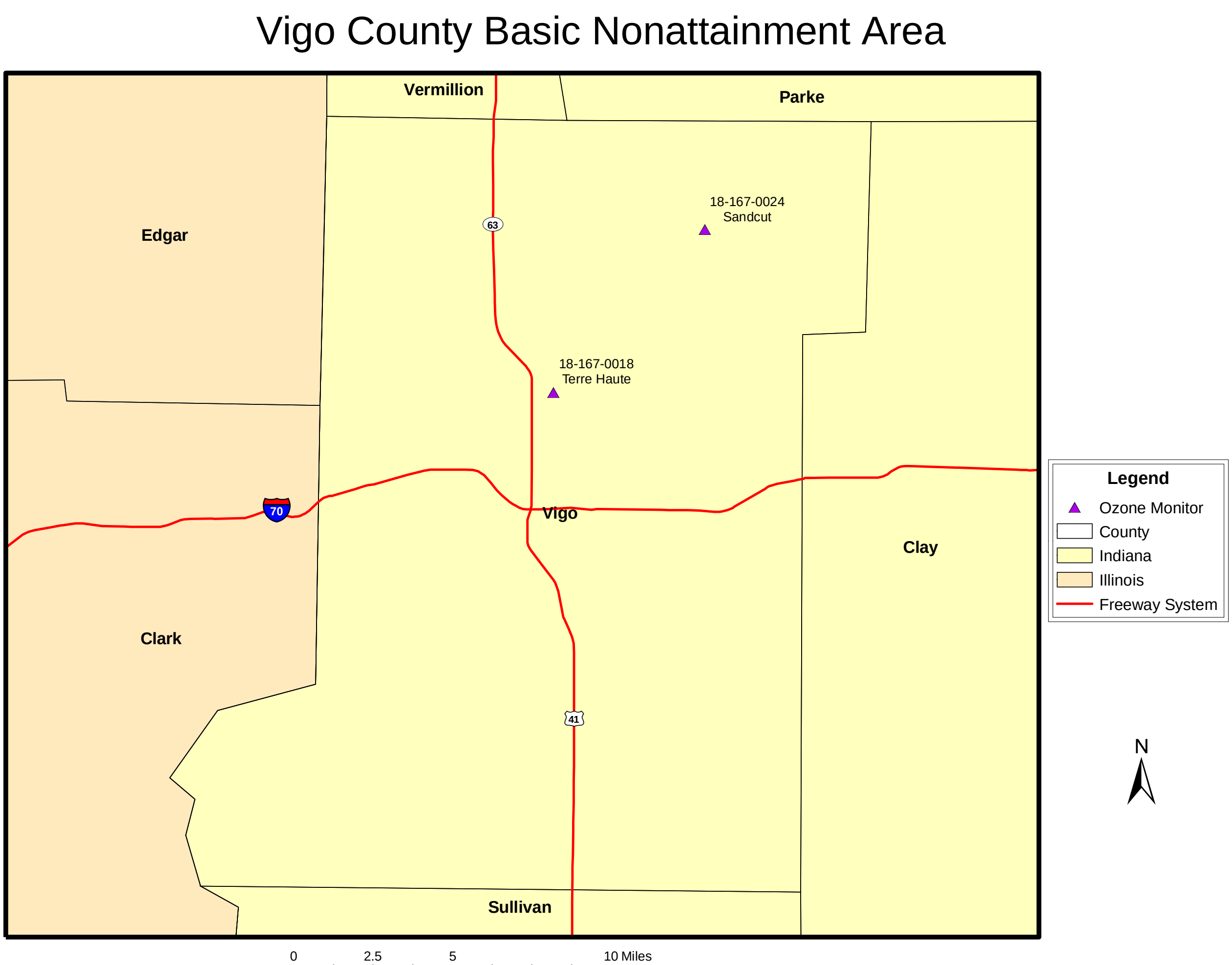
4) A list of VOC and NO_x sources potentially subject to future controls.

3.0 OZONE MONITORING

3.1 Ozone Monitoring Network

There have been two (2) monitors measuring ozone concentrations in this nonattainment area. Both of the monitors are currently operated by IDEM's Office of Air Quality (OAQ). A listing of the sites with the four (4) highest readings from 2002 through 2004 is shown in Table 3.1 and was retrieved from the U.S. EPA AQS. The locations of the monitoring sites for this nonattainment area are shown on Figure 3.1.

Figure 3.1



3.2 <u>Ambient Ozone Monitoring Data</u>

The following information is taken from U.S. EPA's "Guideline on Data Handling Conventions for the 8-Hour Ozone National Ambient Air Quality Standard (NAAQS)," EPA-454/R-98-017, December 1998.

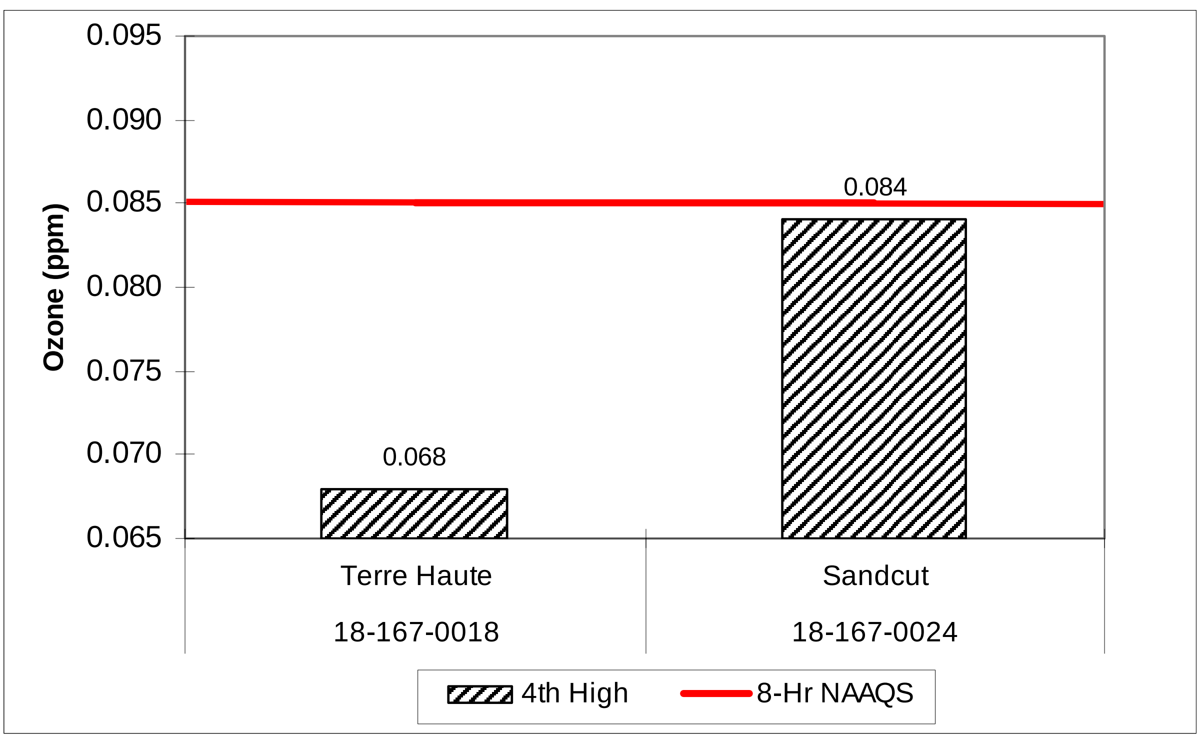
Three (3) complete years of ozone monitoring data are required to demonstrate attainment at a monitoring site. The 8-hour primary and secondary ozone ambient air quality standards are met at an ambient air quality monitoring site when the three-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to 0.08 ppm. When this occurs, the site is said to be in attainment. Three (3) significant digits must be carried in the computations. Because the third decimal digit, in ppm, is rounded, 0.084 ppm is the largest concentration that is less than or equal to 0.08 ppm. Therefore, for the purposes of this request, the 8-hour standard is considered to be 0.085 ppm. Values below 0.085 ppm meet the standard, values equal to or greater than 0.085 ppm exceed the standard. These data handling procedures are applied on an individual basis at each monitor in the area. An area is in compliance with the 8-hour ozone NAAQS if, and only if, every monitoring site in the area meets the NAAQS. An individual site's three (3) year average of the annual fourth highest daily maximum 8-hour average ozone concentration is also called the site's design value. The air quality design value for the area is the highest design value among all sites in the area. Table 3.1 shows the monitoring data for the three most recent years, 2002 - 2004, at the two nonattainment area sites.

Table 3.1: Monitoring Data for Vigo County 2002 – 2004

SITE ID	COUNTY	ADDRESS	YEAR	%OBS	1ST 8-HR	2ND 8-HR	3RD 8-HR	4TH 8-HR	2002-2004 AVERAGE
18-167-0018	VIGO	TERRE HAUTE	2002	98	**0.091**	**0.085**	0.083	0.082	
18-167-0018	VIGO	TERRE HAUTE	2003	98	0.076	0.069	0.067	0.066	0.068
18-167-0018	VIGO	TERRE HAUTE	2004	100	0.061	0.060	0.058	0.057	
18-167-0024	VIGO	SANDCUT	2002	96	**0.104**	**0.104**	0.101	0.099	
18-167-0024	VIGO	SANDCUT	2003	93	0.09	0.088	0.081	0.08	0.084
18-167-0024	VIGO	SANDCUT	2004	97	0.078	0.073	0.072	0.072	

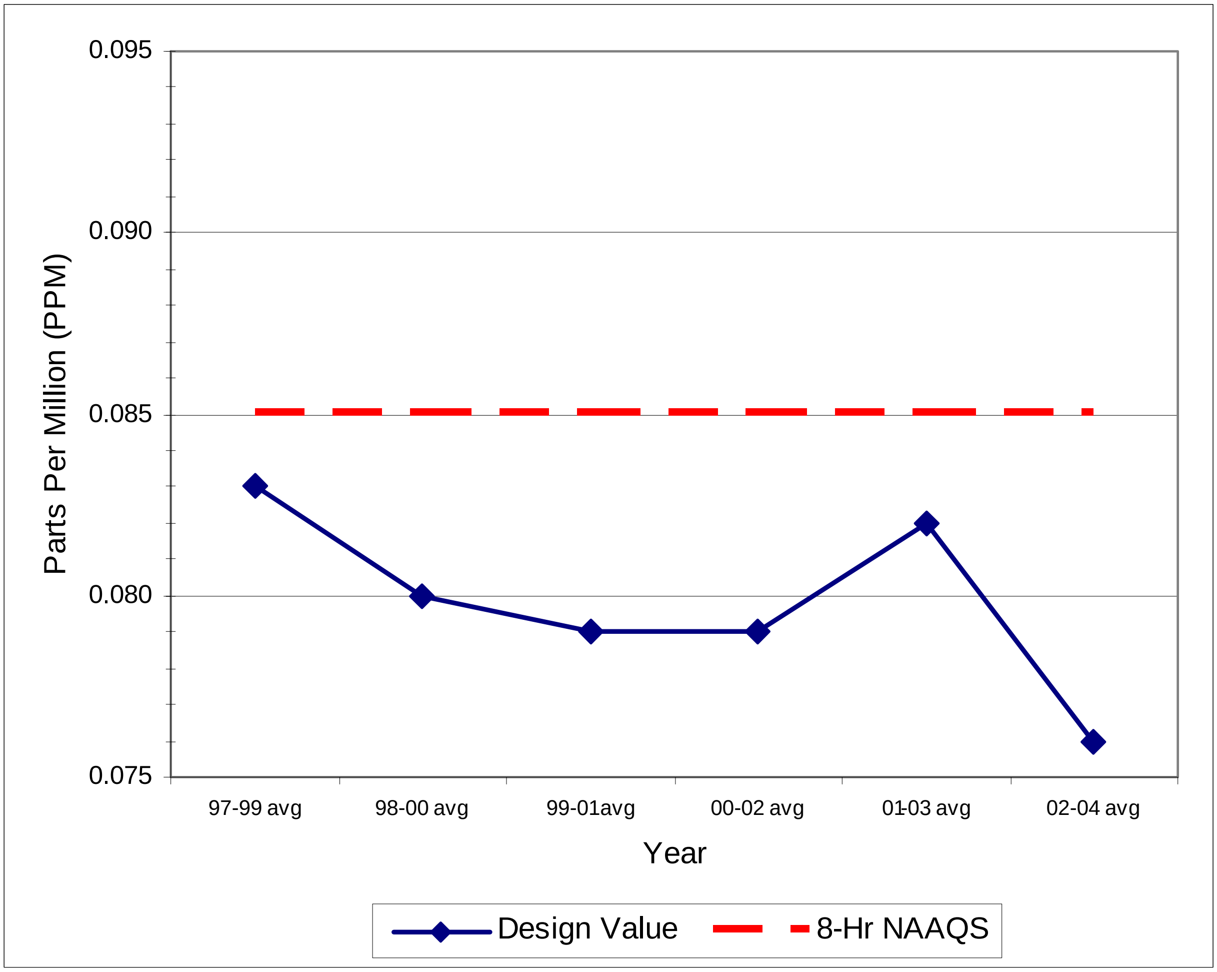
The graph below visually demonstrates the design values for this nonattainment area.

Graph 3.1
2002-2004 Design Values for Vigo County Nonattainment Area



The design values calculated for the Vigo County nonattainment area demonstrate that the NAAQS for ozone has been attained.

Graph 3.2 Trends in West Central Indiana 8-Hour Design Values 1997 through 2004



The above graph shows the trend in design values for the region over the past several years. A comprehensive list of the individual sites' design values over this time period is in Appendix A. The area's design value has trended downward as emissions have declined due to such factors as the Acid Rain program and cleaner automobiles and fuels both regionally and locally. U.S. EPA's rule to control nitrogen oxides from specific source categories (40 CFR Parts 51, 72, 75 and 96, published on October 17, 1998 and referred to as the "NO_x SIP Call") has significantly reduced emissions from large electric generating units (EGUs), industrial boilers, and cement kilns. Indiana's NO_x Rule was approved on June 6, 2001 (326 IAC 10-3 and 10-4). An analysis of meteorological conditions and monitoring values is in Section 7.0 and supports the conclusion that attainment of the standard as of 2004 is not the result of unusually favorable meteorological conditions. It is expected that this downward trend will continue as the above programs continue and some form of the U.S. EPA Clean Air Interstate Rule is implemented.

3.3 Quality Assurance

IDEM has quality assured all data shown in Appendix A in accordance with 40 CFR 58.10 and the Indiana Quality Assurance Manual. IDEM has recorded the data in the AQS database and, thus, the data are available to the public.

3.4 Continued Monitoring

Indiana commits to continue monitoring ozone levels at the sites indicated in Table 3.1 and Appendix A. IDEM will consult with U.S. EPA Region V staff prior to making changes to the existing monitoring network, should changes become necessary in the future. IDEM will continue to quality assure the monitoring data to meet the requirements of 40 CFR 58. Connection to a central station and updates to the IDEM website[1] will provide real time availability of the data and knowledge of any exceedances. IDEM will enter all data into AQS on a timely basis in accordance with federal guidelines.

4.0 EMISSION INVENTORY

U.S. EPA's Redesignation Guidance requires the submittal of a comprehensive inventory of ozone precursor emissions (VOC and NO_x) representative of the year when the area achieves attainment of the ozone air quality standard. Indiana must also demonstrate that the improvement in air quality between the year that violations occurred and the year that attainment was achieved is based on permanent and enforceable emission reductions. Other emissions inventory related requirements include a projection of the emission inventory to a year at least ten (10) years following redesignation; a demonstration that the projected level of emissions is sufficient to maintain the ozone standard; and a commitment to provide future updates of the inventory to enable tracking of emission levels during the ten (10) year maintenance period.

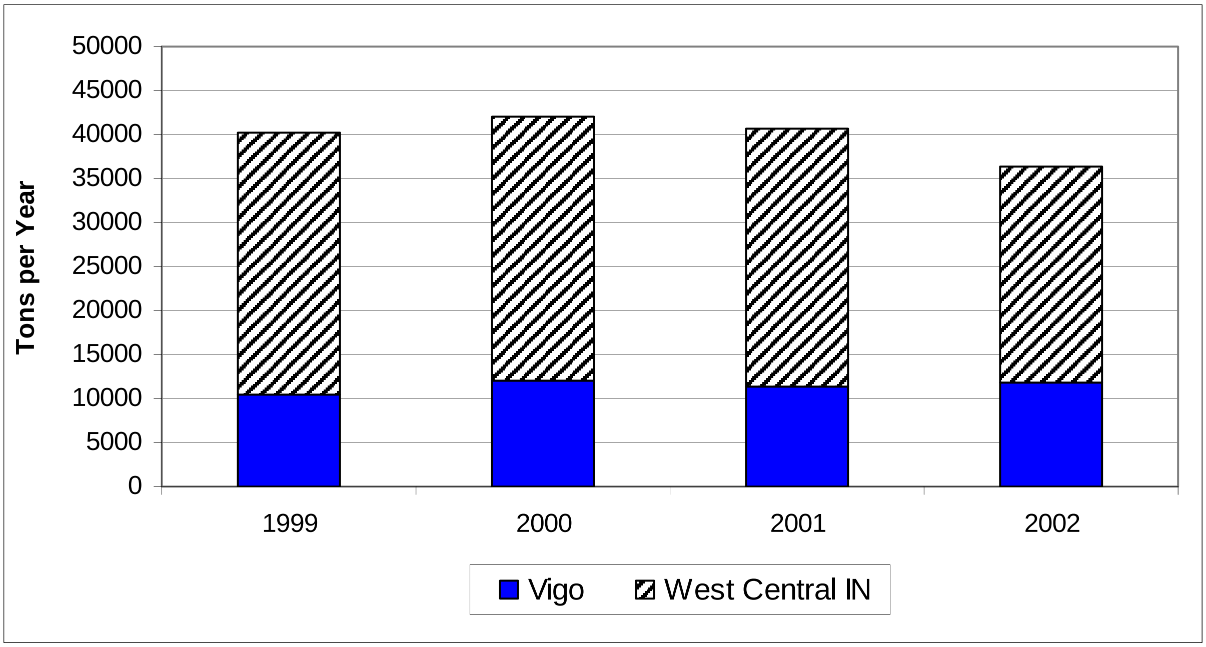
The following subsections address each of these requirements.

4.1 Emission Trends

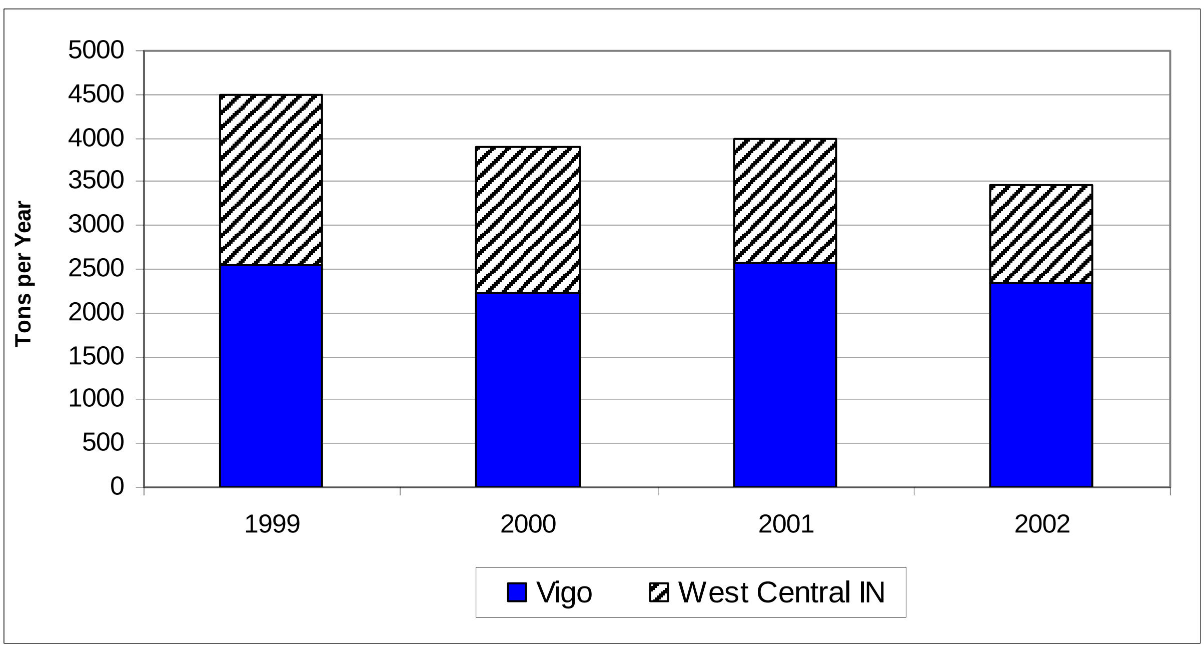
Graphs 4.1 and 4.2 show the trend in point source emissions of NO_x and VOC respectively that correspond to the years of monitored values used in this report. To better illustrate emissions that impact ozone formation at the monitoring sites, these graphs include the Vigo County nonattainment area emissions and the emissions from an additional four (4) surrounding counties (Vermillion, Clay, Parke, and Sullivan) in the west central portion of Indiana. The point source data are taken from Indiana's annual emissions reporting program. Data beyond 2002 is not available for all sources.

Graph 4.1 West Central Indiana NO_x Point Source Emissions 1999 – 2002

[1] www.in.gov/idem/air



Graph 4.2 West Central Indiana VOC Point Source Emissions 1999 – 2002



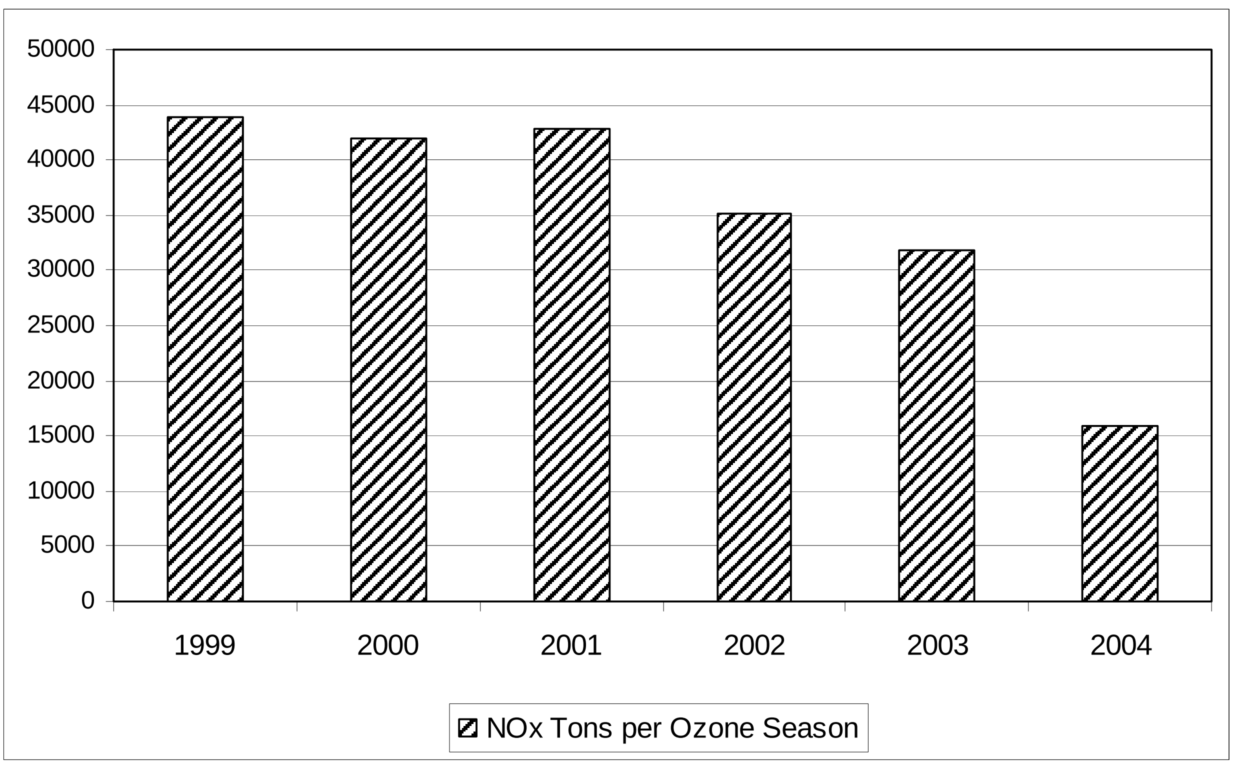
Graph 4.3 shows the trends in regional NO_x emissions from EGUs for the Vigo County area, including Sullivan, Greene, Knox, Gibson, and Pike counties. While ozone and its precursors are transported into this region from outside areas, this information does provide some indication of the impact from Indiana sources near the nonattainment area. The emissions are decreasing substantially in response to national programs affecting all EGUs such as the Acid Rain program

and the NO_x SIP Call. Other sectors of the inventory also impact ozone formation, but large regional sources such as EGUs have a substantial impact on the formation of ozone.

These data were taken from U.S. EPA's Clean Air Markets database[2]. Data are available sooner for these units than other point sources in the inventory because of the NOx SIP Call budget and trading requirements. Information from 2003 is significant because some EGUs started operation of their NO_x SIP Call controls in order to generate Early Reduction Credits for their future year NO_x budgets. The first season of the SIP Call budget period began May 31, 2004.

As part of the NO_x SIP Call, the states were required to adopt into their rules a budget for all large EGUs. Indiana's budget is adopted at 326 IAC 10-4. The budget represents a state-wide cap on NO_x emissions. Although each unit is allocated emissions based upon historic heat input, utilities can meet this budget by over-controlling certain units or purchasing credits from the market to account for overages at other units. To summarize, NO_x emissions have dramatically decreased over the years represented on these graphs. These emissions, capped by the state rule, should remain at least this low through the maintenance period covered by this request.

Graph 4.3 NO_x Emissions from West Central Indiana Electric Generating Units

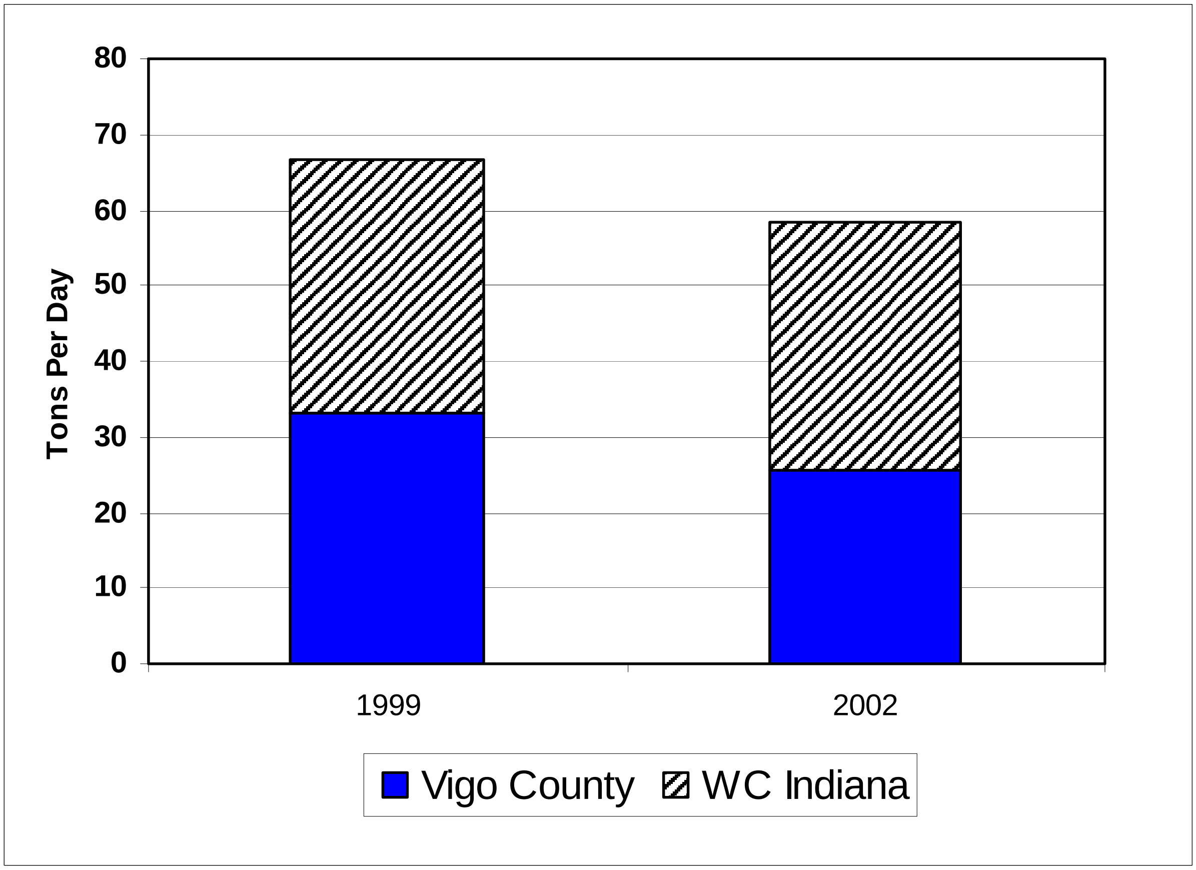


Periodic inventories, which include emissions from all sectors - mobile, area, non-road, and point sources - are prepared every three (3) years. Graphs 4.4 and 4.5 show the trends for the

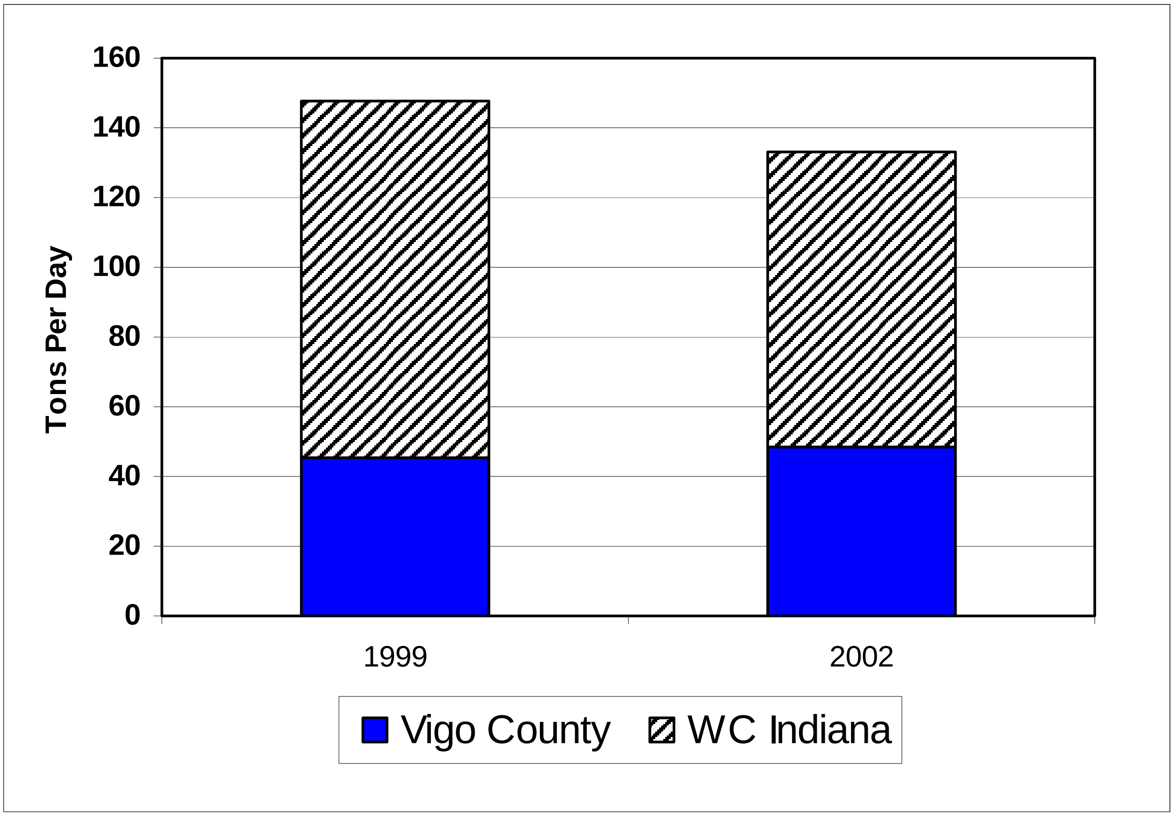
[2] http://www.epa.gov/airmarkets

total emissions for all anthropogenic source categories in these years, which also roughly follow the years of monitored trends discussed in Section 3. Graphs and data tables of emissions from each source category and from the West Central Indiana region are available in Appendix B.

Graph 4.4 VOC Emissions Trends, 1999 - 2002, All Sources in West Central IN



Graph 4.5 NO_x Emissions Trends, 1999 - 2002, All Sources in West Central IN



4.2 Base Year Inventory

IDEM prepared a comprehensive inventory for Vigo County, including area, mobile, and point sources for precursors of ozone (volatile organic compounds and nitrogen oxides) for base year 2002.

- Area sources were taken from the Indiana 2002 periodic inventory submitted to U.S. EPA. These projections were made from the U.S. Department of Commerce Bureau of Economic Analysis (BEA) growth factors, with some updated local information.
- Mobile source emissions were calculated from MOBILE6 produced emission factors.
- Point source information was compiled from IDEM's 2002 annual emissions statement database and the 2002 U.S. EPA Air Markets acid rain database[3].
- Biogenic emissions are not included in these summaries.
- Nonroad emissions were generated by U.S. EPA and are part of the 2002 National Emissions Inventory (NEI). To address concerns about the accuracy of some of the categories in U.S. EPA's nonroad emissions model, the Lake Michigan Air Directors' Consortium (LADCO) (Midwest Regional Planning Organization), contracted with two (2) companies to review the base data and make recommendations. One of the contractors also estimated emissions for

[3] http://www.epa.gov/airmarkets/acidrain

two (2) nonroad categories not included in U.S. EPA's nonroad model. Emissions were estimated for commercial marine vessels and railroads. Recreational motorboat population and spatial surrogates (used to assign emissions to each county) were significantly updated. The populations for the construction equipment category were reviewed and updated based upon surveys completed in The Midwest and the temporal allocation for agricultural sources was also updated. A new nonroad estimation model was provided by U.S. EPA for the 2002 analysis.

Appendix B contains data tables and graphs of all these emissions.

4.3 Emission Projections

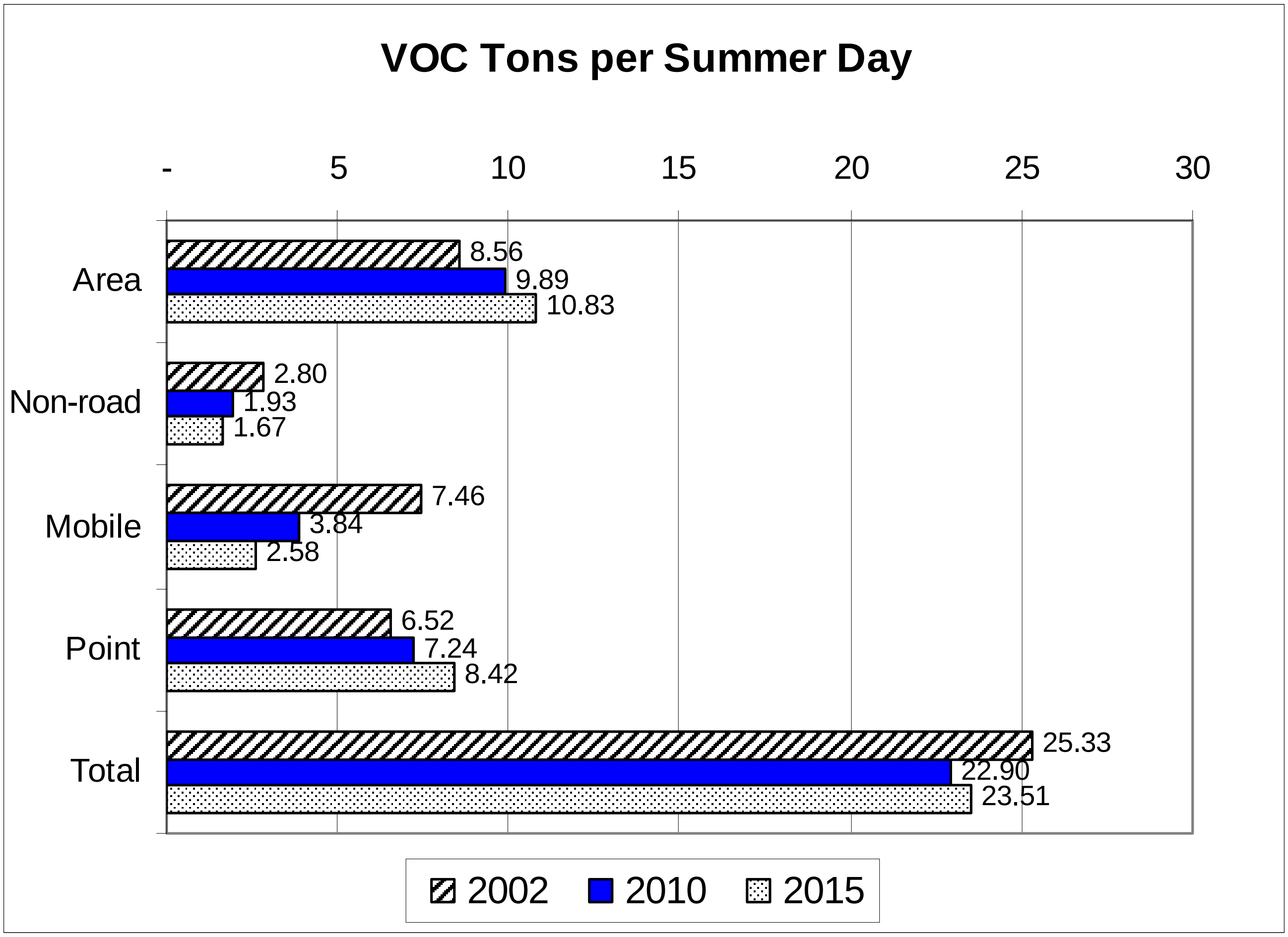
In consultation with the U.S. EPA, IDEM selected the year 2015 as the maintenance year for this redesignation request. This document contains projected emissions inventories for 2010 and 2015.

IDEM performed emission projections for Vigo County using the following approaches.

- Mobile source emission projections are based on the U.S. EPA MOBILE6 model. The analysis is described in more detail in Section 5.0. All projections were made in accordance with "Procedures for Preparing Emissions Projections", U.S. EPA-45/4-91-019.
- Emissions inventories are required to be projected to future dates to assess the influence growth and future controls will have. The Midwest Regional Planning Organization has developed growth and control files for point, area, and nonroad categories. These files were used to develop the future year emissions estimates used in this document. This was done so that the inventories used for redesignation are consistent with modeling performed in the future.

The detailed inventory information for Vigo County for 2010 and 2015 is in Appendix B. Emission trends are an important gauge for continued compliance with the ozone standard. Therefore, IDEM performed an initial comparison of the inventories for the base year and maintenance years for Vigo County. Graphs 4.6 and 4.7 visually compare the 2002 estimated emissions with the 2010 and 2015 projected emission for Vigo County. Mobile source emission inventories are described in Section 5. In addition to the Midwest RPO's estimates, point source emissions were projected based upon the state-wide EGU NO_x budgets from the Indiana NO_x rule. Appendix B also contains detailed inventory information for the west central Indiana counties that impact Vigo County.

Graph 4.6 Comparison of 2002 Estimated and 2010 and 2015 Projected VOC Emissions for Vigo County



Graph 4.7 Comparison of 2002 Estimated and 2010 and 2015 Projected NO_x Emissions for Vigo County

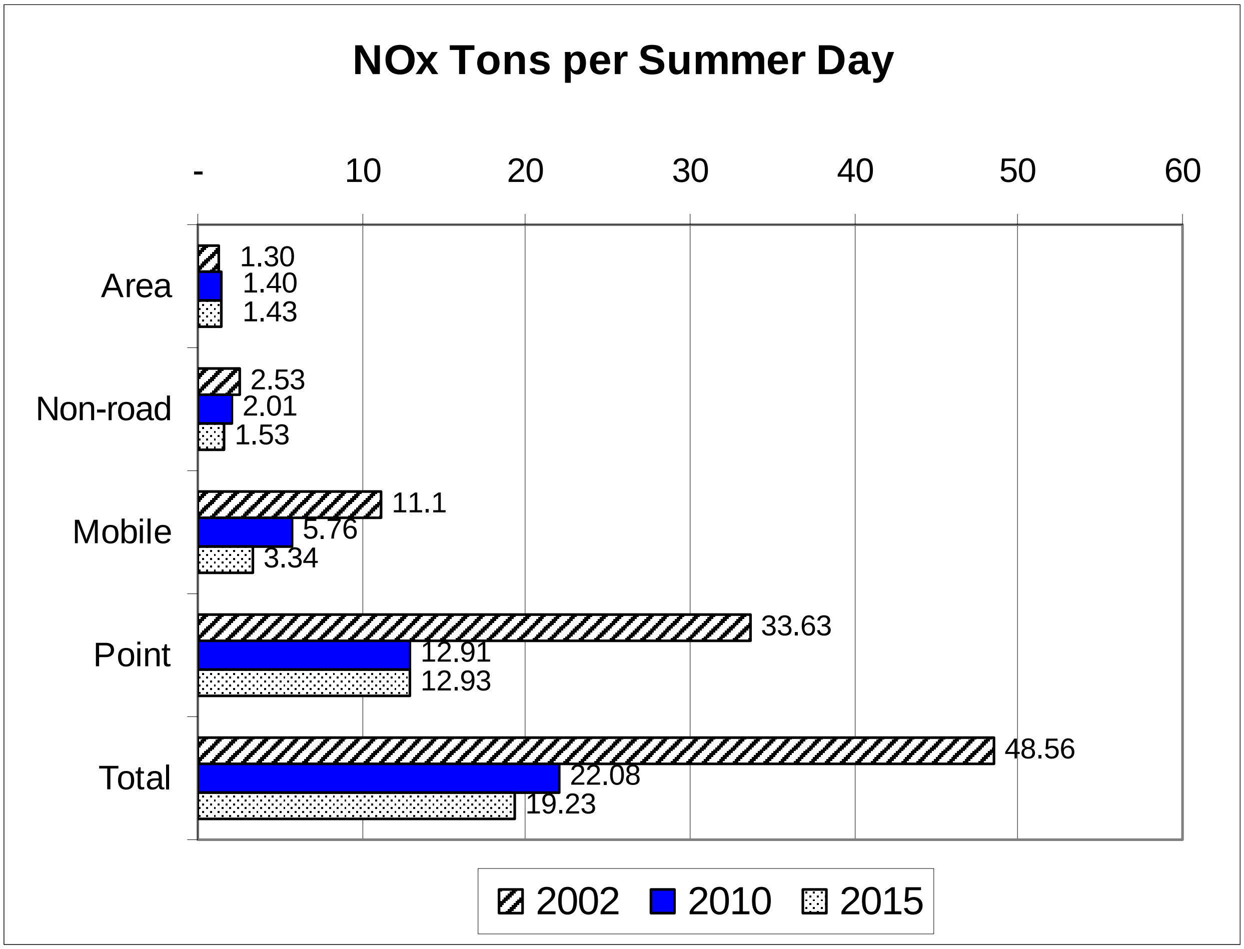


TABLE 4.1 Comparison of 2002 estimated and 2015 projected emission estimates in tons per summer day Vigo County, Indiana

	2002	2015	Change
VOC	25.69	23.88	-1.81 (-7.0%)
NO_x	48.56	19.23	-29.32 (-60.4%)

VOC emissions in the non-attainment area are projected to decrease by 7.0%. Area source emissions and, to a lesser extent, point sources, show an increase due to expectations that the population will grow in this area. However, cleaner vehicles and fuels are expected to be in place in 2010 and 2015 and result in an overall drop in VOC emissions.

NOx emissions in the nonattainment area are projected to decrease by 60.4%. In 2002, point source (primarily EGU) emissions comprised over 70% of the inventory, and so implementation of the NOx SIP Call accounts for much of this change. Decreases from U.S. EPA rules covering Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements[4], Highway Heavy-Duty Engine Rule[5] and Non-Road Diesel Engine Rule[6] are also factored into the changes. Further, due to implementation of the NOx SIP Call across the eastern United States, NOx and ozone levels entering this area will also be decreased. The Clean Air Interstate Rule (CAIR), issued in March 2005 and to be implemented in late 2006, will reduce regional EGU NOx emissions by approximately another 15% in 2015. Since CAIR is a regional cap and trade program, it cannot be predicted at this time what effect this will have on EGU units located in Vigo or the other West Central Counties. Therefore, potential reductions are not included in Graph 4.7 or Table 4.1.

4.4 Demonstration of Maintenance

Ambient air quality data from all monitoring sites indicate that air quality met the NAAQS for ozone in 2004. U.S. EPA's Redesignation Guidance (p 9) states, "A state may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory, or by modeling to show that the future mix of sources and emissions rates will not cause a violation of the NAAQS." NO_x emissions in Vigo County will be substantially reduced while VOC emissions will be slightly reduced. Section 7.0 further discusses the implications of these emissions trends and provides an analysis to support these conclusions. Therefore, air quality should meet the NAAQS ozone standard through the projected year 2015.

In Indiana, major point sources in all counties are required to submit air emissions information once every three (3) years or annually if VOC potential to emit is greater than 250 tons or NO_x potential to emit is greater than 2500 tons, in accordance with the Emission Statement Rule, 326 IAC 2-6. IDEM prepares a new periodic inventory for all ozone precursor emission sectors every three (3) years. These ozone precursor inventories will be prepared for 2005, 2008, and 2011 as necessary to comply with the inventory reporting requirements established in the CAAA. Emissions information will be compared to the 2002 base year and the 2015 projected maintenance year inventories to assess emission trends, as necessary, to assure continued compliance with the ozone standard.

4.5 Permanent and Enforceable Emissions Reductions

Permanent and enforceable reductions of volatile organic compounds and oxides of nitrogen have contributed to the attainment of the 8-hour ozone standard. Some of these reductions were due to the application of RACT rules and some were due to the application of tighter federal standards on new vehicles. Also, Title IV of the Clean Air Act and the NO_x SIP Call required

[4] http://www.epa.gov/fedrgstr/EPA-AIR/2000/February/Day-10/a19a.htm
[5] http://www.epa.gov/fedrgstr/EPA-AIR/1997/October/Day-21/a27494.htm
[6] http://www.epa.gov/fedrgstr/EPA-AIR/1998/October/Day-23/a24836.htm

the reduction of oxides of nitrogen from utility sources. Section 6.0 identifies these reductions along with an explanation of their status.

4.6 Provisions for Future Updates

As required by Section 175A(b) of the CAAA, Indiana commits to submit to the Administrator, eight (8) years after redesignation, an additional revision of this SIP. The revision will contain Indiana's plan for maintaining the national primary ozone air quality standard for ten (10) years beyond the first ten (10) year period after redesignation.

5.0 TRANSPORTATION CONFORMITY BUDGETS

The following is a summary of the detailed discussion contained in the Terre Haute/Vigo County Long Range Plan, Air Quality Conformity Documentation, located in Appendix C.

5.1 On-Road Emission Estimations

The West Central Indiana Economic Development District (WCIEDD) is the Metropolitan Planning Organization (MPO) for the Terre Haute area. This organization has a travel demand model that was developed over the last few months by the consultant Bernardin, Lochmueller & Associates, Inc. The travel demand model predicts the traffic volumes and speeds on nearly all the roads in the Vigo County area. The consultant has also developed the post-processing that uses the U.S. EPA emissions estimation model MOBILE6 to calculate total emissions from on-road mobile sources.

5.2 Overview

Broadly described, MOBILE6 is used to determine “emission factors” which are the average emissions per mile (grams/mile) for different road facility types. MOBILE6 describes road facility types as Freeway, Arterial, Local or Ramp. Vehicle speeds also affect the emission factor values. Other factors also affect the emission factors such as air temperature, humidity, age of the vehicle fleet, and the types of vehicles on the roads. These data are estimated using the best available information to create emission factors for the appropriate ozone precursors, NOx and VOCs. After emission factors are determined, the emission factor(s) must be multiplied by the vehicle miles traveled (VMT) to ultimately determine the quantity of vehicle emissions (this information comes from the travel demand model).

There are a number of ways emission factors from MOBILE6 can be used with the travel demand model information. Extensive area-specific speed and facility-type information can be input into MOBILE6 to the extent that MOBILE6 provides a single emission factor that represents the average for all vehicles and facility types in the modeled area. The post-processing simply requires multiplying this emission factor by the total VMT to get the total emissions for the area. Another method is to create “look-up” tables that describe the emission factors for each speed on each facility type. This requires much more extensive post-processing where each segment of road (or "link") has an average speed and facility type attribute that is "looked-up" in the appropriate emission factor table. This emission factor is multiplied by the link's traffic volume and length (VMT) to get the emissions from that link. The sum of each link emission will be the total for the Vigo County area. There are other methods as well, none being necessarily superior to the other. This analysis uses the former method thereby creating one emission factor. However, rather than simply multiplying the emission factor by the total VMT, the VMT is disaggregated into VMT by facility type in the documentation. This method is thoroughly described in Appendix C.

It should be noted that each year analyzed will have different emission factors, volumes, speeds and likely some additional links.

5.3 Local Road VMT

The model's 2002 VMT for each road type is adjusted relative to 2002 Highway Performance Monitoring System (HPMS) data that is gathered and maintained by the Indiana Department of Transportation (INDOT) under federal guidelines. Adjustment factors for each road type have been developed and correlate well with the model with the exception of local roads which are underrepresented in the model. Local roads are commonly not represented in the network because they are commonly less congested and have negligible effect on the modeled road network.

5.4 Emission Estimations

Table 5.1 contains the results of the emissions analysis for the appropriate years.

Table 5.1 - Emission Estimations for On-Road Mobile Sources

	2002	2010	2015	2015 Margin of Safety
VMT (miles/day)	3,506,570	3,669,020	3,764,676	
VOC (tons/day)	7.46	3.84	2.58	10.07%
NOx (tons/day)	11.10	5.76	3.34	9.88%

Note: Emission reductions associated with cleaner fuel and new engine standards outweighs increase in VMT.

5.5 Motor Vehicle Emission Budget

Table 5.2 contains the motor vehicle emissions budget for the Vigo County ozone nonattainment area for the year 2015.

Table 5.2 – Mobile Vehicle Emission Budgets

2015	tons/day
VOC	2.84
NOx	3.67

This budget includes the emission estimates calculated for 2015 and a margin of safety. The emission estimates are derived from the WCIEDD travel demand model and MOBILE6.2 as described above under the current WCIEDD 2030 Long Range Plan. The safety margins include 0.26 tons/day for VOC and 0.33 tons/day for NOx. These correspond to approximately a 10% increase (margin of safety) from the original 2015 on-road emission estimates. Margins of safety are used to accommodate the wide array of assumptions that are factored into the calculation process. Since assumptions change over time, it is necessary to have a margin of safety that will accommodate the impact of refined assumptions in the transportation planning process. The application of the budget to total area emissions, with a safety margin included, results in the 2015 total emissions for both VOC and NO_x still being below the base year emissions shown in Graphs 4.6 and 4.7.

All methodologies, latest planning assumptions, and the safety margins were determined through the interagency consultation process described in 40 CFR 93.105 and 326 IAC 19-2-1.

6.0 CONTROL MEASURES AND REGULATIONS

This section provides specific information on the control measures implemented in Vigo County, including CAAA requirements and additional state or local measures implemented beyond CAAA requirements.

6.1 Reasonably Available Control Technology (RACT)

As required by Section 172 of the CAAA, Indiana in the mid-1990s promulgated rules requiring RACT for emissions of VOCs. There were no specific rules required by the CAA such as RACT for existing sources beyond state-wide rules. State-wide RACT rules have applied to all new sources locating in Indiana since that time. The Indiana rules are found in 326 IAC 8. The following is a listing of applicable rules:

326 IAC 8-2 Surface Coating Emission Limitations
326 IAC 8-3 Solvent Degreasing Operations
326 IAC 8-4 Petroleum Sources
326 IAC 8-5 Miscellaneous Operations
326 IAC 8-6 Organic Solvent Emission Limitations

6.2 Implementation of Past SIP Revisions

This nonattainment area was not required to develop an Attainment Demonstration SIP for the one-hour NAAQS. Similarly, since the area was only recently designated nonattainment for ozone and the area has now attained the standard, no Attainment Demonstration SIP has been required to bring the area into attainment for the 8-hour NAAQS. Therefore, this requirement does not apply. Emissions of VOCs are regulated by applicable statewide provisions of 326 IAC 8.

6.3 Nitrogen Oxides (NO_x) Rule

The U.S. EPA NO_x SIP Call required twenty-two (22) states to pass rules that would result in significant emission reductions from large EGUs, industrial boilers, and cement kilns in the eastern United States. Indiana passed this rule in 2001. Beginning in 2004, this rule will account for a reduction of approximately thirty-one percent (31%) of all NO_x emissions state-wide compared to previous uncontrolled years.

The other 21 states have also adopted these rules. The result is that significant reductions will occur upwind and within the Vigo County nonattainment area because of the number of large electric utilities located in southern and central Indiana, Kentucky, and Illinois. U.S. EPA and IDEM performed modeling that indicated this area would attain the 8-hour ozone standard with the implementation of the NO_x SIP Call. Controls for EGUs formally commenced May 31, 2004. From Graph 4.3 it can be seen that emissions covered by this program have been generally trending downward since 1998 with larger reductions occurring in 2002 and 2003. Table 6.1, compiled from data taken from the U.S. EPA Clean Air Markets website, quantifies the gradual NO_x reductions that have occurred in Indiana as a result of Title IV of the Clean Air Act Amendments and the beginning of the NO_x SIP Call Rule. This cap will stay in place through 2008, at which time the CAIR program will supersede it.

Further, U.S. EPA has recently published Phase II of the NO_x SIP Call that establishes a budget for large (greater than 1 ton per day emissions) stationary internal combustion engines. This rule will decrease emissions state-wide from natural compressor stations by 4,263 tons during the ozone season. OAQ is on track to finalize this rule in mid-2005. Implementation of this rule will be in 2007.

TABLE 6.1 Trends in EGU Ozone Season NO_x Emissions State-Wide in Indiana

Year	NO_x Emissions, tons / ozone season	NO_x Emission rate, lbs/MMBtu
1997	152,834	0.557
1998	159,931	0.540
1999	149,827	0.502
2000	133,881	0.476
2001	136,121	0.481
2002	114,082	0.409
2003	99,967	0.342
Cap 2004-2009	43,654	0.150

6.4 Measures Beyond Clean Air Act Requirements

Reductions in ozone precursor emissions have occurred, or are anticipated to occur, as a result of local and federal control programs. These additional control measures include:

Tier II Emission Standards for Vehicles and Gasoline Sulfur Standards
In February 2000, U.S. EPA finalized a federal rule to significantly reduce emissions from cars and light trucks, including sport utility vehicles (SUVs). Under this proposal, automakers will be required to sell cleaner cars, and refineries will be required to make cleaner, lower sulfur gasoline. This rule will apply nationwide. The federal rules will phase in between 2004 and 2009. U.S. EPA has estimated that NO_x emission reductions will be approximately seventy-seven percent (77%) for passenger cars, eighty-six percent (86%) for smaller SUVs, light trucks, and minivans, and sixty-five to ninety-five percent (65-95%) reductions for larger SUVs, vans, and heavier trucks. VOC emission reductions will be approximately twelve percent (12%) for passenger cars, eighteen percent (18%) for smaller SUVs, light trucks, and minivans, and fifteen percent (15%) for larger SUVs, vans, and heavier trucks.

Heavy-Duty Diesel Engines
In July 2000, U.S. EPA issued a final rule for Highway Heavy Duty Engines, a program which includes low-sulfur diesel fuel standards, which will be phased in from 2004 through 2007. This rule applies to heavy-duty gasoline and diesel trucks and buses. This rule will result in a forty percent (40%) reduction in NO_x from diesel trucks and buses, a large sector of the mobile sources NO_x inventory.

Clean Air Nonroad Diesel Rule
In May 2004, U.S. EPA issued the Clean Air Nonroad Diesel Rule. This rule applies to diesel engines used in industries such as construction, agriculture, and mining. It also contains a cleaner fuel standard similar to the highway diesel program. The new standards will cut emissions from nonroad diesel engines by over ninety percent (90%). Nonroad diesel equipment, as described in this rule, currently accounts for forty-seven percent (47%) of diesel particulate matter (PM) and twenty-five percent (25%) of

nitrogen oxides (NO_x) from mobile sources nationwide. Sulfur levels will be reduced in nonroad diesel fuel by ninety-nine percent (99%) from current levels, from approximately three-thousand (3,000) parts per million (ppm) now to (fifteen) 15 ppm in 2010. New engine standards take effect, based on engine horsepower, starting in 2008.

Together, these rules will substantially reduce local and regional sources of ozone precursors. The modeling analyses discussed in Section 7 include these rules and show the expected ozone concentrations expected to result from the implementation of these rules.

6.5 Controls to Remain in Effect

Indiana commits to maintaining the aforementioned control measures after redesignation. Indiana hereby commits that any changes to its rules or emission limits applicable to VOC and/or NO_x sources, as required for maintenance of the ozone standard in Vigo County, will be submitted to U.S. EPA for approval as a SIP revision.

Indiana, through IDEM's Office of Air Quality and its Office of Enforcement, has the legal authority and necessary resources to actively enforce any violations of its rules or permit provisions. After redesignation, it intends to continue enforcing all rules that relate to the emission of ozone precursors in Vigo County.

6.6 New Source Review Provisions

Indiana has a long standing and fully implemented New Source Review (NSR) program. This is addressed in rule 326 IAC 2. The rule includes provisions for the Prevention of Significant Deterioration (PSD) permitting program in 326 IAC 2-2. Indiana's PSD program was conditionally approved on March 3, 2003 (68 FR 9892) and received final approval on May 20, 2004 (69 FR 29071) by U.S. EPA as part of the SIP

Any facility that is not listed in the 2002 emission inventory, or for the closing of which credit was taken in demonstrating attainment, will not be allowed to construct, reopen, modify, or reconstruct without meeting all applicable permit rule requirement. The review process will be identical to that used for new sources. Once the area is redesignated, OAQ will implement NSR through the PSD program which requires an air quality analysis to evaluate whether the new source will threaten the NAAQS.

7.0 MODELING

7.1 Summary of Modeling Results for National Emission Control Strategies in Final Rulemakings

Although U.S. EPA's redesignation guidance does not require modeling for ozone nonattainment areas seeking redesignation, extensive modeling has been performed covering the western Indiana region to determine the effect of national emission control strategies on ozone levels.

The modeling analyses determined that Vigo County is significantly impacted by ozone and ozone precursor transport and regional NO_x reductions would be necessary to attain the 8-hour standard in the area.

U.S. EPA Modeling Analysis for HDE Final Rulemaking

U.S. EPA conducted modeling for Tier II vehicles and low-sulfur fuels. This analysis was performed in 2000 to support final rulemaking for the Heavy Duty Engine (HDE) and Vehicle Standards and Highway Diesel Fuel and its expected impact on ozone levels. "Technical Support Document for the Heavy Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements: Air Quality Modeling Analyses" (EPA420-R-00-028) was referenced for support of this ozone redesignation for Vigo County. Base year emissions from 1996 were modeled for three (3) ozone episodes: June 12-24, 1995; July 5-15, 1995; and August 7-21, 1995. Results of this modeling show that ozone impacts from these fuel emission control measures, as well as the proposed NO_x SIP call, would be substantial in the Vigo County area. The relative reduction factor (RRF) calculated for the Terre Haute ozone monitor in Vigo County was 0.8695. Monitors without a complete three-year design value were not evaluated in the modeling. The Sandcut monitor was not in operation until 2001. However, for a conservative approach, the highest RRF calculated throughout the state (0.9246 at the Valparaiso monitor in Porter County) was used for the Sandcut monitor. The RRFs were applied to the most current three-year (2001-2003) design value at the Terre Haute ozone monitor of seventy-six (76) ppb and at the Sandcut ozone monitor of eighty-seven (87) ppb. The resulting future year design values were calculated at sixty-six and one tenth (66.1) ppb and eighty and four tenths (80.4) ppb, respectively, as shown below in Table 7.1. The conservative estimate of the modeled future year design value for Vigo County of eighty (80) ppb will attain the 8-hour ozone NAAQS of eighty-five (85) ppb.

Table 7.1 Modeling Results from U.S. EPA Heavy Duty Diesel

Monitor ID	Monitor Name	County	Design Value	Modeled Relative Reduction Factor (RRF)	Future Design Value
			2001-2003	**2007 Base**	**2007**
181670018	**Terre Haute**	Vigo	76	0.8695	66.1
181670024	**Sandcut**	Vigo	87	0.9246 [a]	80.4

[a] Indicates the maximum calculated RRF throughout the state (modeled at Valparaiso).

LADCO Modeling Analysis for 8-Hour Ozone Standard Assessment

Lake Michigan Air Directors Consortium (LADCO), which is the Midwest Regional Planning Organization, performed modeling to evaluate the effect of the NO_x SIP Call and Tier II / Low Sulfur rule for future year 2007 ozone in the Lake Michigan area. This modeling was originally designed to assess the one-hour ozone standard. Further analysis was conducted and documented in the LADCO's White Paper "8-Hour Ozone Assessment", dated May 2, 2001.

Base year design values used were the average of the design values for the three (3) three-year periods (1994-1996, 1995-1997, 1996-1998). Base year emissions were taken from 1996 and four (4) ozone episodes were evaluated: June 22-28, 1991; July 14-21, 1991; June 13-25, 1995; and July 7-18, 1995. Results are shown in Table 7.2 below.

While modeling results were not calculated for Vigo County, the average decrease in ozone from the base case modeling run with modeling runs that applied emission controls required by the Clean Air Act, NO_x SIP Call and Tier II / low-sulfur requirements was nine (9) ppb. This average is for nonattainment areas in northwest, north-central, central, southwest and southern Indiana. Monitors located in or near urban areas showed a slightly lower average ozone decrease of eight (8) ppb while upwind monitors or monitors located in rural areas showed an average ozone decrease of eleven (11) ppb. Southern Indiana averaged higher ozone decreases as compared to Central and Northern Indiana due to the number of power plants located near the Ohio River. Therefore, anticipated ozone decreases from LADCO's modeling analysis would be approximately six (6) to nine (9) ppb in the Vigo County area. These anticipated ozone decreases in each of the 2001 – 2003 design values for Vigo County would bring the future year 2007 design value below the 8-hour ozone NAAQS of eighty-five (85) ppb.

7.2 Summary of Modeling Results to Support Recent Rulemakings

LADCO Modeling for Clean Air Interstate Rules (CAIR) of 2005

On March 10, 2005, the U.S. EPA promulgated the Clean Air Interstate Rule (CAIR). NO_x emissions will be cut from 4.5 million tons in 2005, to a cap of 1.5 million tons by 2009, and 1.3 million tons in 2015 in 28 eastern states and the District of Columbia.

LADCO performed modeling to support the associated emission reductions for CAIR. This modeling was based on 2001 – 2003 design values for Vigo County. Future year modeling for 2010 was conducted and the future year design values were determined, as shown below in Table 7.3. Results of the CAIR modeling show Vigo County will continue to attain the 8-hour ozone NAAQS well into the future.

Table 7.2 Modeling Results from Clean Air Interstate Rules (CAIR) of 2005 for Vigo County

Monitor	County	MSA/CMSA	Design Value	Future Design Value
			2001-2003	2010 (with CAIR)
18-167-0018	Vigo	Terre Haute	76	66.4
18-167-0024		Sandcut	87	76.4

7.3 Summary of Existing Modeling Results

U.S. EPA and LADCO modeling for future year design values has consistently shown that existing national emission control measures will bring Vigo County into attainment of the 8-hour ozone NAAQS. Proposed rulemakings to be implemented in the next several years will provide even greater assurance that air quality will continue to meet the standard into the future. Modeling support for the NO_x SIP Call, Heavy Duty Engine and Highway Diesel Fuel and Tier II/Low Sulfur Fuel has shown that future year design values for Vigo County will attain the ozone standard with modeled future year design values well below eighty-five (85) ppb. U.S. EPA has modeled base case future years with existing emission controls only and shown that Vigo County will attain the 8-hour ozone NAAQS without proposed additional national emission control strategies. Future national emission control strategies will ensure that the county's attainment will be maintained with an increasing margin of safety over time.

7.4 Temperature Analysis for Vigo County

Meteorological conditions are one of the most important factors that influence ozone development and transport. A temperature analysis has been conducted to determine how the temperatures during the ozone conducive months of May, June, July, August and September for the years 1996 through 2004 compare to normal temperatures for the Central Indiana area for the years 1971 through 2000. Complete climatological data is not available for Vigo County; therefore the Indianapolis National Weather Service Office, Indianapolis Climate Data data was used. Available normal maximum temperatures by summer months from 1971-2000 for the Indianapolis, Central Indiana area are as follows:

May – 73.5^o F
June – 82.1^o F
July – 85.6^o F
August – 83.7^o F
September – 77.4^o F
May - September – 80.5^o F

Indianapolis' monthly maximum temperatures were compiled for the previous nine (9) years (1996 – 2004) to determine the average maximum monthly temperatures in Central Indiana. This analysis was made to find how the temperatures during the summer months compared to normal summer month temperatures throughout central, west central, south central, and east central Indiana. Overall, the temperatures during the 1998, 1999 and 2002 summer months of May, June, July, August, and September were one (1) to two (2) percent higher while temperatures during the 1996, 1997, 2000, 2001, 2003 and 2004 summer months were one (1) to three (3) percent lower than the normal temperatures. Table 7.4 shows the average temperatures in Central Indiana for each of the past nine (9) years and the percent difference from normal for each year.

Table 7.3 Analysis of Maximum Temperatures for Central Indiana (Percent Change from Maximum Temperature (°F) Normals (1971 – 2000))

	Normal	1996		1997		1998		1999	
	Max	Max	%	Max	%	Max	%	Max	%
May	73.5	70	-5	66.9	-9	76.4	+4	75.1	+2
June	82.1	80.9	-1	77.6	-5	80.3	-2	82.3	0
July	85.6	82.9	-3	86.2	+1	84.0	-2	89.2	+4
August	83.7	84.1	0	80.8	-3	84.5	+1	83.3	0
September	77.4	75.5	-2	77.1	+1	83.0	+7	81.2	+5
AVERAGE	80.5	78.7	-2	77.7	-3	81.6	+1	82.2	+2

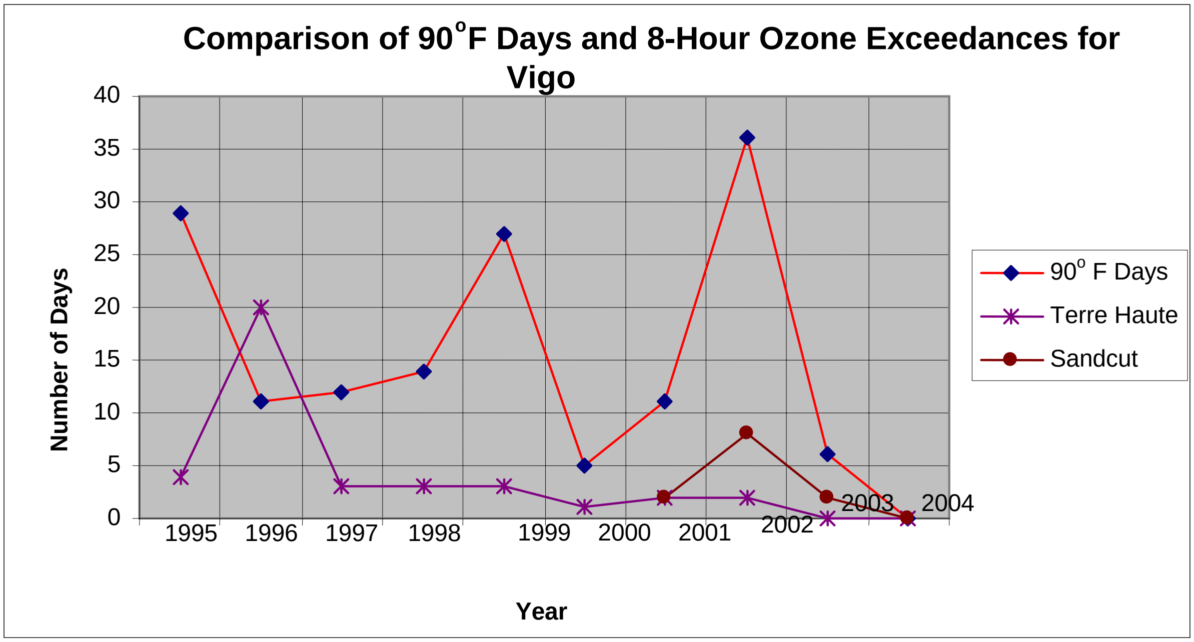
	2000		2001		2002		2003		2004	
	Max	%	Max	%	Max	%	Max	%	Max	%
May	74.9	+2	74.6	+1	70.4	-4	70.3	-4	76.2	+4
June	80.2	-2	79.5	-3	83.6	+2	78.0	-5	81.7	-2
July	82.4	-4	83.9	-2	88.2	+3	83.4	-3	81.6	-5
August	82.6	-1	85.2	+2	86.7	+4	83.9	0	78.9	-6
September	75.5	-2	75.4	-3	82.1	+6	74.2	-4	79.4	+2
AVERAGE	79.1	-2	79.7	-1	82.2	+2	80.0	-3	79.4	-2

The number of days with temperatures of 90° F and higher were calculated and compared to the normal number of days from 1971 through 2000 as well as the number of days with 8-hour ozone exceedances. Table 7.5 shows a table of the comparison of 8-hour ozone exceedances and temperatures while Graph 7.1 shows the correlation graphically.

Table 7.4 Comparison of Days with 90° F and 8-Hour Ozone Exceedance Days

Number of Days with Temperatures of 90° F and higher										
	Normal	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
# of 90° F days	14.9	29	11	12	14	27	5	11	36	6	0
Number of 8-Hour Exceedance Days at the Vigo County ozone monitors											
Monitor	**County**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Terre Haute	Vigo	4	20	3	3	3	1	2	2	0	0
Sandcut	Vigo	N/A	N/A	N/A	N/A	N/A	N/A	2	8	2	0

Graph 7.1
Comparison of Days with 90° F and 8-Hour Ozone Exceedance Days



As can be seen, a greater number of ozone exceedance days per year correlate with a higher number of 90° F days per year. However, years with a fewer number of 90° F days still yield 8-hour ozone exceedance days.

7.5 <u>Summary of Meteorological Conditions</u>

The analysis of the departure from normal of the maximum temperatures during the summer months show variation of the average maximum temperatures from –3% to 2%. The analysis shows that ten (10) or more of days with temperatures of 90° F and higher occurred in 1995, 1996, 1997, 1998, 1999, 2001, and 2002. The number of 8-hour ozone exceedance days for those years, especially those with more monitoring data, shows a greater correlation to the number of higher temperature days. However, the years with a lesser number of 90° F days still yielded 8-hour ozone exceedance days. There does not appear to be any abnormal temperature swings or recent summers with excessively warmer or cooler than normal temperatures over the past decade.

In 2002, there were thirty-six (36) 90° F and higher days and eight 8-hour ozone exceedance days. In 2003, there were six (6) 90° F and higher days and two (2) 8-hour ozone exceedance days. In 2004, there were no 90° F and higher days and no 8-hour ozone exceedances. The lower values correspond to lowered local and regional ozone precursor emissions. This is why U.S. EPA developed the 8-hour standard as a 4th high ozone value averaged over three (3) years to account for variations in temperature.

8.0 CORRECTIVE ACTIONS

8.1 Commitment to Revise Plan

As noted in Section 4.5 above, Indiana hereby commits to review its Maintenance Plan eight (8) years after redesignation, as required by Section 175(A) of the CAAA.

8.2 Commitment for Contingency Measures

Indiana hereby commits to adopt and expeditiously implement necessary corrective actions in the following circumstances:

Warning Level Response:
A Warning Level Response shall be prompted whenever an annual (1-year) fourth high monitored value of 88 ppb occurs in a single ozone season within the maintenance area. A Warning Level Response will consist of a study to determine whether the ozone value indicates a trend toward higher ozone values or whether emissions appear to be increasing. The study will evaluate whether the trend, if any, is likely to continue and, if so, the control measures necessary to reverse the trend taking into consideration ease and timing for implementation, as well as economic and social considerations. Implementation of necessary controls in response to a Warning Level Response trigger will take place as expeditiously as possible, but in no event later than twelve (12) months from the conclusion of the most recent ozone season (September 30).

Should it be determined through the Warning Level study that action is necessary to reverse the noted trend, the procedures for control selection and implementation outlined under "Action Level Response" shall be followed.

Action Level Response

An Action Level Response shall be prompted whenever a two (2) year average fourth high monitored value of 85 ppb occurs within the maintenance area. In the event that the Action Level is triggered and is not due to an exceptional event, malfunction, or noncompliance with a permit condition or rule requirement, IDEM will determine additional control measures needed to assure future attainment of NAAQS for ozone. In this case, measures that can be implemented in a short time will be selected in order to be in place within eighteen (18) months from the close of the ozone season that prompted the Action Level.

Control Measure Selection and Implementation

Adoption of any additional control measures is subject to the necessary administrative and legal process. This process will include publication of notices, an opportunity for public hearing, and other measures required by Indiana law for rulemaking by state environmental boards.

If a new measure/control is already promulgated and scheduled to be implemented at the federal or state level, and that measure/control is determined to be sufficient to address the upward trend in air quality, additional local measures may be unnecessary. Furthermore, Indiana will submit to U.S. EPA an analysis to demonstrate the proposed measures are adequate to return the area to attainment.

8.3 Contingency Measures

Contingency measures to be considered will be selected from a comprehensive list of measures deemed appropriate and effective at the time the selection is made. Listed below are example measures that may be considered. The selection of measures will be based upon cost-effectiveness, emission reduction potential, economic and social considerations or other factors that IDEM deems appropriate. IDEM will solicit input from all interested and affected persons in the maintenance area prior to selecting appropriate contingency measures. All of the listed contingency measures are potentially effective or proven methods of obtaining significant reductions of ozone precursor emissions. Because it is not possible at this time to determine what control measure will be appropriate at an unspecified time in the future, the list of contingency measures outlined below is not comprehensive. Indiana anticipates that only a few of these measures will be required.

1) Lower Reid vapor pressure gasoline program.

2) Broader geographic applicability of existing measures.

3) Tighten RACT on existing sources covered by U.S. EPA Control Technique Guidelines issued in response to the 1990 CAAA.

4) Apply RACT to smaller existing sources.

5) A modern vehicle inspection/maintenance program.

6) One or more transportation control measures sufficient to achieve at least half a percent (0.5%) reduction in actual area wide VOC emissions. Transportation measures will be selected from the following, based upon the factors listed above after consultation with affected local governments:

    a) Trip reduction programs, including, but not limited to, employer-based transportation management plans, area wide rideshare programs, work schedule changes, and telecommuting.

    b) Transit improvements.

    c) Traffic flow improvements.

   d) Other new or innovative transportation measures not yet in widespread use that affect state and local governments deemed appropriate.

7) Alternative fuel and diesel retrofit programs for fleet vehicle operations.

8) Controls on consumer products consistent with those adopted elsewhere in the United States.

9) Require VOC or NO_x emission offsets for new and modified major sources.

10) Require VOC or NO_x emission offsets for new and modified minor sources.

11) Increase the ratio of emission offsets required for new sources.

12) Require VOC or NO_x controls on new minor sources (less than 100 tons).

No contingency measure shall be implemented without providing the opportunity for full public participation during which the relative costs and benefits of individual measures, at the time they are under consideration, can be fully evaluated.

9.0 PUBLIC PARTICIPATION

Indiana published notification for a public hearing and solicitation for public comment concerning the draft Redesignation Petition and Maintenance Plan in several widely distributed publications on May 13, 2005.

The Public hearing to receive comments on the redesignation request was held on June 14, 2005, at the Vigo County Annex Building, located at 120 Oak Street, in Terre Haute, Indiana. The public comment period closed on June 17, 2005. No comments were received during the public comment period. Appendix D includes a copy of the public notice, certifications of publication, and the transcript from the public hearing.

10.0 CONCLUSIONS

The Vigo County basic nonattainment area has attained the NAAQS standard and complied with the applicable provisions of the 1990 Amendments to the Clean Air Act regarding redesignations of basic ozone nonattainment areas. Documentation to that effect is contained herein. IDEM has prepared a State Implementation and Maintenance Plan that meets the requirement of Section 110 (a)(1) of the 1990 Clean Air Act.

Indiana has performed an analysis that shows the air quality improvements are due to permanent and enforceable measures. In addition, significant regional NO_x reductions will ensure continued compliance (maintenance) with the standard and that all CAAA requirements necessary for redesignation have been met.

Based on this presentation, the Vigo County ozone basic nonattainment area meets the requirements for redesignation under the CAA and U.S. EPA guidance. Furthermore, because this area is subject to significant transport of pollutants, significant regional NO_x reductions will ensure continued compliance (maintenance) with the standards with an increasing margin of safety.

The State of Indiana hereby requests that the Vigo County ozone basic nonattainment area be redesignated to attainment simultaneously with U.S. EPA approval of the Indiana State Implementation and Maintenance Plan provisions contained herein.

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APPENDIX A

AEROMETRIC INFORMATION RETRIEVAL SYSTEM (AIRS) DATA

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

AIR QUALITY SYSTEM

QUICK LOOK REPORT (AMP450)

Nov. 10, 2004

EXCEPTIONAL DATA TYPES

EDT	DESCRIPTION
0	NO EVENTS
1	EVENTS EXCLUDED
2	EVENTS INCLUDED
3	EXCEPTIONAL EVENTSEXCLUDED
4	NATURAL EVENTS EXCLUDED
5	EVENTS WITH CONCURRENCE EXCLUDED
6	EXCEPTIONAL EVENTSWITH CONCURRENCE EXCLUDED
7	NATURAL EVENTS WITH CONCURRENCE EXCLUDED

Note: The * indicates that the mean does not satisfy summary criteria.

Ozone (44201) 8-HOUR INDIANA PPM -7

SITE ID	POC	REP ORG	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX>/= 0.085	CERT	EDT
18-167-0018	1	520	TERRE HAUTE	VIGO	961 N. LAFAYETTE AV	2002	47	98	179	183	0.091	0.085	0.083	0.082	2	Y	0
18-167-0018	1	520	TERRE HAUTE	VIGO	961 N. LAFAYETTE AV	2003	47	98	179	183	0.076	0.069	0.067	0.066	0		0
18-167-0018	1	520	TERRE HAUTE	VIGO	961 N. LAFAYETTE AV	2004	47	100	183	183	0.061	0.06	0.058	0.057	0		0
18-167-0024	1	520	NOT IN A CITY	VIGO	SANDCUT	2002	47	96	176	183	0.104	0.104	0.101	0.099	8	Y	0
18-167-0024	1	520	NOT IN A CITY	VIGO	SANDCUT	2003	47	93	171	183	0.09	0.088	0.081	0.08	2		0
18-167-0024	1	520	NOT IN A CITY	VIGO	SANDCUT	2004	47	97	178	183	0.078	0.073	0.072	0.072	0		0

METHODS USED IN THIS REPORT

METHOD PARAMETER	CODE	COLLECTION METHOD	ANALYSIS METHOD
44201	47	INSTRUMENTAL	ULTRA VIOLET

REPORTING ORGANIZATIONS USED IN THIS REPORT

REPORTING ORGANIZATION CODE	AGENCY DESCRIPTION
520	Indiana Depart Of Environ Management/Office Of Air Management
523	Indianapolis Division Of Air Pollution Control

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APPENDIX B

HISTORIC AND PROJECTED EMISSION INVENTORIES

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NOx Point Source Emissions for West Central Indiana, 1999 – 2002

NOx	1999	2000	2001	2002
Vigo	**10560**	**12068**	**11454**	**11715**
Clay	0	0	1	0
Parke	2246	2246	1878	1500
Sullivan	16187	16235	16075	14136
Vermillion	11223	11437	11350	9001
Total	**29656**	**29918**	**29304**	**24637**

VOC Point Source Emissions for West Central Indiana, 1999 – 2002

VOC	1999	2000	2001	2002
Vigo	**2535**	**2227**	**2574**	**2349**
Clay	235	177	57	68
Parke	59	51	40	27
Sullivan	147	96	93	95
Vermillion	1513	1355	1228	935
Total	**1954**	**1679**	**1418**	**1125**

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NOx Emissions from Electric Generating Units, 1997 - 2004

County	Plant	1997	1998	1999	2000	2001	2002	2003	2004
Gibson	Cinergy-Gibson	20920	21721	21395	19086	18138	13903	11324	7552
Greene	Worthington Generation	Not Reported	Not Reported	Not Reported	Not Reported	22	34	19	18
Knox	Cinergy-Edwardsport	1079	1168	1946	1258	1084	1013	1085	250
	Wheatland Generating	Not Reported	Not Reported	Not Reported	Not Reported	70	58	1	1
Pike	Hoosier Energy-Ratts Station	1223	1752	1542	1961	1890	1549	1669	1270
	IPL-Petersburg	8257	10156	7817	8608	9809	8144	7683	2762
Sullivan	Hoosier Energy-Merom	6866	6982	7110	6283	6739	5714	5401	1070
Vigo	Cinergy-Wabash River	3888	4902	4037	4840	5057	4661	4470	2937
	Mirant Sugar Creek	Not Reported	Not Reported	Not Reported	Not Reported	Not Reported	9	253	24
	Total	**42233**	**46681**	**43845**	**42036**	**42808**	**35085**	**31905**	**15884**

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Total NOx Emissions from Electric Generating Units
West Central Indiana, 1999 - 2004

Year	NOx Tons per Ozone Season
1999	43845
2000	42036
2001	42808
2002	35085
2003	31905
2004	15884

1999-2002 NOx and VOC Emissions Trends for All Sources in Vigo County

NOx	1999	2002
Area	1.45	1.30
Nonroad	5.28	2.53
Onroad	11.67	11.1
Point	26.65	33.63
Total	45.04	48.56

VOC	1999	2002
Area	14.18	8.92
Nonroad	2.32	2.80
Onroad	9.29	7.46
Point	7.36	6.52
Total	33.15	25.69

2002 Base Year Emissions Inventory and Projected Emissions Inventory for NOx

2002 NOx

County	Area	Non-Road	Mobile	Point	Total
Clay	0.25	1.13	2.48	0	3.87
Parke	0.14	1.16	1.34	2.73	5.37
Sullivan	0.15	1.12	1.66	42.75	45.68
Vermillion	0.18	0.76	1.50	27.19	29.63
Vigo	1.30	2.53	11.1	33.63	48.56

2010 NOx

County	Area	Non-Road	Mobile	Point	Total
Clay	0.27	0.97	1.66	0	2.90
Parke	0.15	0.99	0.81	2.74	4.69
Sullivan	0.16	1.00	1.03	17.14	19.34
Vermillion	0.20	0.64	0.81	16.92	18.56
Vigo	1.40	2.01	5.76	12.91	22.08

2015 NOx

County	Area	Non-Road	Mobile	Point	Total
Clay	0.28	0.79	1.23	0	2.30
Parke	0.16	0.83	0.57	2.89	4.44
Sullivan	0.16	0.85	0.74	17.15	18.90
Vermillion	0.20	0.52	0.55	16.94	18.20
Vigo	1.43	1.53	3.34	12.93	19.23

2002 Base Year Emissions Inventory and Projected Emissions Inventory for VOC

2002 VOC

County	Area	Non-Road	Mobile	Point	Total
Clay	3.51	1.10	5.56	0.27	10.45
Parke	2.91	0.92	1.78	0.04	5.65
Sullivan	3.58	1.16	2.73	0.28	7.76
Vermillion	2.25	0.75	3.18	2.57	8.76
Vigo	8.92	2.80	7.46	6.52	25.69

2010 VOC

County	Area	Non-Road	Mobile	Point	Total
Clay	4.09	0.71	3.39	0.41	8.60
Parke	3.44	0.79	1.00	0.05	5.29
Sullivan	4.22	0.80	1.50	0.32	6.84
Vermillion	2.60	0.67	1.51	2.73	7.51
Vigo	10.25	1.93	3.84	7.24	23.26

2015 VOC

County	Area	Non-Road	Mobile	Point	Total
Clay	4.47	0.63	2.07	0.50	7.67
Parke	3.78	0.62	0.63	0.05	5.09
Sullivan	4.62	0.69	0.93	0.34	6.58
Vermillion	2.85	0.52	0.85	3.09	7.30
Vigo	11.21	1.67	2.58	8.42	23.88

2002 and Projected NOx and VOC Emissions Trends for All Sources in Vigo County

Sector	2002 NOx	2010 NOx	2015 NOx
Area	1.30	1.40	1.43
Non-road	2.53	2.01	1.53
Mobile	11.1	5.76	3.34
Point	33.63	12.91	12.93
Total	48.56	22.08	19.23

Sector	2002 VOC	2010 VOC	2015 VOC
Area	8.56	9.89	10.83
Non-road	2.80	1.93	1.67
Mobile	7.46	3.84	2.58
Point	6.52	7.24	8.42
Total	25.33	22.90	23.51

APPENDIX C

DETAILED DESCRIPTION OF THE EMISSIONS ANALYSIS METHOD

Terre Haute / Vigo County Long Range Plan
Transportation Plan for Year 2030

Air Quality Conformity Documentation

Prepared for the
West Central Indiana Economic Development District, Inc.

April 2005

Prepared by:
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INTRODUCTION

Vigo County, Indiana was designated as a basic non attainment area for ozone under the 8-hour ozone standard in June of 2004. With this designation, the West Central Indiana Economic Development District, serving as the Metropolitan Planning Organization for the Terre Haute - Vigo County area, is the agency responsible for conducting the air quality analyses. All plans, programs and projects must be reviewed for conformity with the standards to assure that they do not exceed the established budgets as established in the State Implementation Plan (SIP).

In general, examinations for conformity have two major components: (1) an air quality analysis to determine that air pollutant emissions do not exceed the budgets for VOCs and NOx set in the State Implementation Plan (SIP) and (2) a monitoring of the progress in implementation of the Transportation Control Measures (TCMs) contained in the SIP. Vigo County, as a newly designated non-attainment area, does not yet have an established emissions budget based upon a SIP. SIP development is not required to be completed until 3 years after an area is designated, in this case 3 years after June 2004, though it is possible that the SIP may be prepared sometime in 2005. After consultation with the state air agency (IDEM), US EPA, FHWA, and INDOT, it was agreed that an interim “no greater than” year 2002 baseline test would be used for the current Vigo County conformity analysis. Also, since no SIP has been established for Vigo County, there are no approved TCMs to be evaluated at this time. Therefore, it was possible to show conformity of the 2030 Transportation Plan simply by determining that the air pollutant emissions do not exceed the 2002 emissions.

The air quality analysis involved four procedures. First, a travel model using the TransCAD software was used to determine the vehicle-miles-traveled (VMT) for each of the analysis years (2002, 2010, 2015, 2020, and 2030). The VMT was then adjusted using factors which were derived for the base year (2002). These factors allow the model output to be reconciled with estimates of VMT from the Highway Performance Monitoring System (HPMS). Second, a post processing procedure was used to compute speeds, for each hour of the day, for each facility type, and from that data, Mobile 6.2 input files were created. Third, the Mobile 6.2 emission factor model was used to determine the emission factors for VOCs and NOx. Fourth, the VMT by functional classification was then multiplied by the emission factors to determine the emissions. Further explanation of the components of the analysis is documented in this report.

FEDERAL CONFORMITY REQUIREMENTS

Federal Regulations for Metropolitan Planning in 23 CFR (Code of Federal Regulations) Part 450 require that federally funded highway and transit projects be included in a conforming plan and Transportation Improvement Program (TIP). 40 CFR Part 93, amended August 15, 1997, outlines the requirements for making conformity determinations under Subpart A. Applicable requirements are listed below.

1. The Transportation Plan must specifically describe the transportation system envisioned for certain future years, which are called horizon years.

- *The horizon years may be no more than 10 years apart.*
- *The first horizon year may not be more than 10 years from the base year used to validate the travel demand model.*
- *If the attainment year is in the time span of the Transportation Plan, the attainment year must be a horizon year.*
- *The last horizon year must be the last year of the Transportation Plan's forecast year.*

The 2030 Transportation Plan lists specific projects by time periods that meet this requirement. Traffic modeling for the conformity analysis was done for the years 2002, 2010, 2015, 2020, and 2030. The attainment year for SIP development will be 2015, thus this additional year was included.

2. The Transportation Plan will quantify and document the demographic and employment factors influencing the expected transportation demand; and the highway and transit system shall be described in terms of the regionally significant additions or modifications to the existing transportation network, which the transportation plan envisions to be operational in the horizon years.

The documentation of how travel demand is estimated using existing and forecasted demographic and employment data is described in the March, 2005 Travel Demand Model Technical Documentation included as an appendix of the 2030 Transportation Plan. Regionally significant additions or modifications to the transportation system included in the financially constrained transportation plan are listed by time period in the next section of this report. Non-capacity increasing projects, which were not used in the conformity analysis, are listed in the main Transportation Plan document.

3. The Transportation Plan must be financially reasonable and the TIP must be fiscally constrained consistent with the U.S. DOT's metropolitan planning regulations at 23 CFR part 450 in order to be found in conformity.

All projects included in the conformity analysis are fiscally constrained within the plan horizon. A list of illustrative (fiscally unconstrained) projects is also included in the main Transportation Plan document.

4. The conformity determination must be based on the latest emission estimation model available.

This analysis uses the US EPA approved Mobile 6.2 software, which is the latest emission model available for use in Indiana.

> *5. The MPO must make the conformity determination according to the interagency consultation procedures required in 40 CFR Parts 51 and 93 (sections 51.390 and 93.105), and according to the public involvement procedures established by the MPO in compliance with 23 CFR Part 450.*

All major decisions relating to methodology, assumptions, and data used in the conformity analysis have been made via the interagency consultation process. Parties to the interagency consultation process include WCIEDD, INDOT, IDEM, FHWA, US EPA, and FTA, each has had the opportunity to participate in the consultation meetings. The plan updated process has also included a public involvement component that is consistent with the MPO's currently adopted public involvement procedures.

> *6. The Transportation Plan must provide for the timely implementation of Traffic Control Measures (TCM) from the applicable State Implementation Plan (SIP). Nothing in the plan may interfere with the implementation of any TCM in the applicable implementation plan.*

An implementation plan has not yet been developed. No TCMs are currently applicable in the Terre Haute/Vigo County MPO area.

> *7. The Transportation Plan must be consistent with the motor vehicle emissions budget in the applicable State Implementation Plan (SIP).*

Vigo County was newly designated as a Basic Non-Attainment Area for Ozone in June 2004. A SIP has not yet been developed for this county, and thus a motor vehicle budget has not been created. During the interagency consultation process, an agreement was reached that the conformity determination for this Transportation Plan update would be done using an interim test whereby no future horizon year can exceed 2002 emissions.

> *8. The regional emissions analysis shall estimate emissions from the entire transportation system, including all regionally significant projects contained in the Transportation Plan and all other regionally significant highway and transit projects expected in the non-attainment area in the time frame of the Transportation Plan.*

All regionally significant projects within Vigo County have been included in the 2030 Transportation Plan list of projects. Those projects that involve an increase in a regionally significant increase in capacity have been included in the conformity analysis.

> *9. The emissions analysis methodology shall meet the requirement of section 93.122: (a) Regional emissions analysis for the Transportation Plan shall include all regionally significant projects expected in the maintenance area. Projects that are not regionally significant are not required to be explicitly modeled, but VMT from such projects must be estimated in accordance with reasonable professional practices. The effects of TCM's and similar projects that are not regionally significant may also be estimated in accordance with reasonable*

professional practices. (b) For TCM's demonstrating a quantifiable emission reduction benefit, the emissions analysis may include that emissions reduction credit. (c) For areas with a Transportation Plan that meets the content requirements of section 93.106, the emissions analysis shall be performed for each horizon year.

The emissions analysis methodology includes all regionally significant projects. VMT from all facilities is included in the analysis, including off-model facilities. There are no required TCMs for the Vigo County non-attainment area. There are also no additional credits being sought from the Congestion Mitigation and Air Quality (CMAQ) program funded projects that will be implemented in Vigo County.

2030 LONG RANGE PLAN

Capacity expansion projects that were explicitly modeled in the conformity analysis are listed below. The fiscally constrained listing specifies, by conformity horizons, when projects are expected to be completed. For a complete listing of projects, capacity, non-capacity, financially constrained, and non-financially constrained, please refer to the main 2030 Transportation Plan document.

TABLE 1: LONG RANGE PROJECT LIST

Year 2000-2002

- T-1a: 13th Street Extension – widening to four lanes from Poplar St. to Hulman St. (2002)
- T-3: Locust Street at Blakely Avenue – new traffic signal (2001)
- T-8: 13th Street at Washington Avenue – intersection realignment (2001)
- V-1: Lafayette Avenue at Haythorne Road – new traffic signal (2000)
- S-1: US 41 at Eaton Drive – new traffic signal (2000)
- S-4: US 40 at Thorpe Road – new traffic signal (2001)
- TF-2a: 13th Street – add continuous center left-turn lane from Wabash Avenue to Poplar St. (2002)

Year 2003-2010

- T-1b: 13th Street Extension – widening to four lanes from Hulman St. to I-70
- T-2: Margaret Avenue at 19th Street – new traffic signal (September 2005)
- T-4: Locust Street at 25th Street new traffic signal (December 2004)
- T-5: 1st Street Extension – two-lane extension and reconstruction from SR 63 to Locust Street (left-turn lanes at major intersections) (to be open August 2005)
- T-6: Lafayette Avenue – add continuous center left-turn lane from Ft. Harrison Road to Haythorne Road
- T-10: Fruitridge Avenue – two-lane reconstruction with partial access control from Ft. Harrison Road to Haythorne Avenue with new traffic signal at Haythorne Avenue
- T-11: Lafayette Avenue – add continuous center left-turn lane from Lost Creek Bridge to Ft. Harrison Road
- TF-8: SR 63 at Margaret Avenue – new traffic signal (2003)
- V-2: Fruitridge Avenue at Park Avenue -- intersection improvements and new traffic signal
- V-3: Canal Road/McDaniel Road – reconstruction and widening to four lanes from I-70 to SR 641
- V-4: Lafayette Avenue at Park Avenue – intersection improvements and new traffic signal
- S-2a: SR 63 at Johnson Drive – new traffic signal (part of Project SF-9a)
- S-2b: SR 63 at Springhill Drive – new traffic signal (November 2005)
- S-3: SR 641 – new four-lane freeway from US 41 to Canal Road
- S-5a: SR 641 – new four-lane freeway from Canal Road to Riley Road
- TF-3: Margaret Avenue – widening to five lanes from 13th Street to 25th Street
- TF-7a: Margaret Avenue – CSX RR underpass near 19th St (related to TF-3)

- TF-13a: Brown Avenue Extension – new two-lane (16' lanes with median) from Locust Street to Maple Avenue with new traffic signal at Locust Street and 2-lane reconstruction from Ohio Street to Locust Street
- TF-14a: Margaret Avenue – two-lane reconstruction (12-foot lanes) and realignment (west of SR 46) from 25th Street to SR 46
- TF-15 (new): Locust Street – new two-lane roadway from 25th Street to Brown Avenue (December 2004)
- VF-2a: Harlan Road – widening to five lanes from US 41 to Industrial Park Access Road
- SF-9a: SR 63 – add continuous center left-turn lane from Honey Creek Drive to US 41

Year 2011-2015

- S-5b/5c: SR 641 – new four-lane freeway from Riley Road to I-70
- TF-10: Margaret Avenue -- add continuous center left-turn lane from SR 63 to 13th Street (four lanes from US 41 to 13th Street)
- TF-18 (new): 8th Avenue Extension – new two-lane roadway from Kester Avenue to Fruitridge Avenue
- VF-3a Lafayette Avenue – add continuous center left-turn lane from Haythorne Ave. to Hasselburger Ave.
- SF-10 (new): US 41 – widening to six lanes from Margaret Avenue to Hulman Street (SR 63)

Year 2016-2020

- TF-2b: 13th Street – add continuous center left-turn lane from Maple Avenue to Wabash Avenue
- TF-11a: 1st Street – reconstruction with left-turn lanes at major intersections from Locust St. to Hulman St.
- TF-19 (new): College Avenue Extension – new two-lane roadway from Fruitridge Avenue to SR 46

Year 2021-2030

- TF-20 (new): 19th Street – two-lane reconstruction and realignment from Wabash Avenue to Locust Street (possibly moved up to before 2010)
- VF-9: Third Place Extension – new two-lane roadway from Johnson Road to Springhill Drive
- S-6b: I-70 at US 41 – interchange modification (possible single point urban diamond interchange with dual-lefts and separate right-turn lanes)
- SF-11 (new): I-70 – widen to six lanes from 0.4 mile west of US 41 to 0.5 mile east of SR 46
- SF-12 (new): I-70 – widen to six lanes from 0.5 mile east of SR 46 to SR 59

TRAVEL DEMAND MODEL

The Terre Haute/Vigo County regional travel demand model is a mathematical computer model, using state of the art TransCAD software, which relates current and future travel demand to basic socioeconomic information. The model area covers all of Vigo County. This area is divided into 341 smaller units called traffic analysis zones. All major roadways are represented in the travel model.

The Terre Haute/Vigo County regional travel demand model underwent a recalibration and conversion to TransCAD software which was completed in December 2004. This recalibration established 2002 as the new base year for the model. The model update and recalibration in 2004 utilized the latest data from the 2000 Census, ES202 employment dataset, 2000 Census Transportation Planning Package, 2004 update of the Indiana Statewide Travel Demand Model, and several additional sources which are reported in detail in the Travel Demand Model Technical Documentation. During the model calibration process, model parameters were adjusted such that the model output matched—within accepted standards--several calibration criteria based on measured data. These criteria included items such as comparisons against traffic counts, modeled vs. observed vehicle miles of travel, trip lengths by trip purpose, etc. The result of the recalibration was a travel model which replicated travel in the Terre Haute area for 2002, and is capable of producing accurate traffic forecasts out to year 2030.

The recalibrated travel model was subsequently used in the regional air quality analysis. The Terre Haute/Vigo County travel demand model uses the standard four steps of modeling: trip generation, trip distribution, mode choice, and traffic assignment. In addition, it considers travel by vehicles (trucks and autos) entering, leaving, and crossing the study area. These types of trips are known as external-internal, internal-external, and external-external, respectively.

Trip generation is the process of determining the number of unlinked trip ends—called productions and attractions--and their spatial distribution based on socioeconomic variables such as households and employment. Trip rates used to define these relationships were derived from the travel data collection efforts described above. The internal trip purposes are home-based work, non home-based work, home-based other, home based shopping, non home-based other, home-based school.

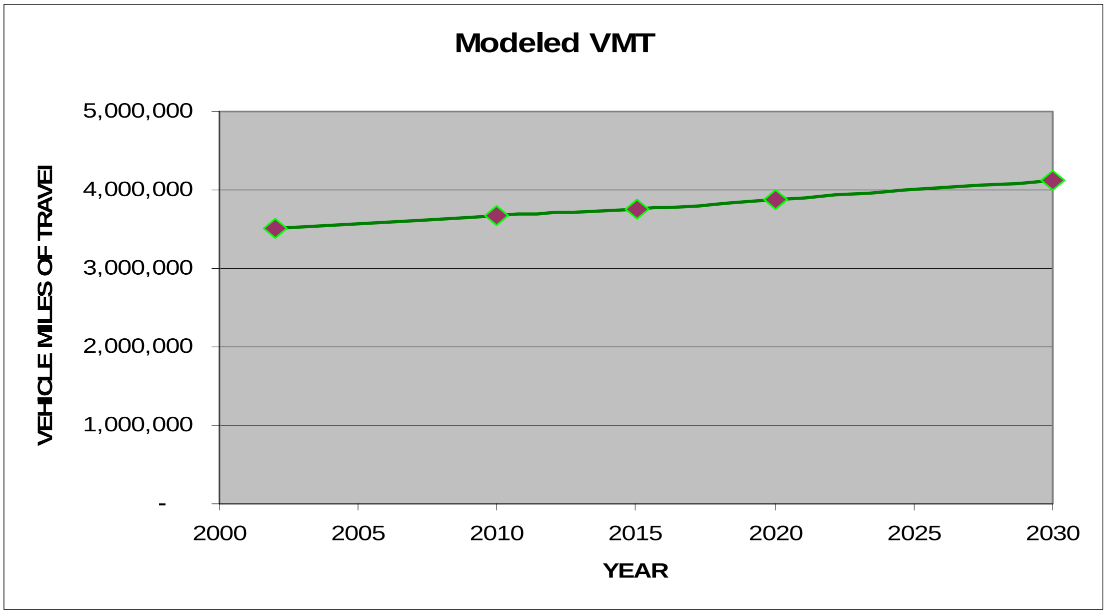
Trip distribution is the process of linking the trip ends thereby creating trips which traverse the area. The travel model uses a gravity model to link all trips except the external-external ones. The gravity model is based on the principle that productions are linked to attractions as a direct function of the number of attractions of a zone and as an inverse function of the travel time between
zones. This inverse function of travel time is used to generate parameters called friction factors which, in turn, direct the gravity model. The friction factors used in the gravity model were developed as part of the calibration effort performed during the model update of 2000.

Mode choice is the process used to separate the trips which use transit from those which use automobiles. It is also used to separate the auto drive-alone trips from auto shared-ride trips. In the Terre Haute/Vigo County travel demand model, mode choice is modeled based on stratifications by trip purpose and travel times using recent household travel survey data from small to medium sized urban areas in Ohio. This procedure accounts for person trips that use transit or shared-ride (carpool), and the result is a origin to destination auto trip table.

Traffic assignment is the process used to determine which links of the network an auto or truck trip will use. A capacity restraint provision is used to adjust travel times between assignment iterations, to account for the effects of congestion. This sequence is called an equilibrium assignment. The results of this process produces a forecast of traffic volumes on each link in the network and an estimate of congested travel speeds, which allows for the calculation of vehicle-miles-traveled (VMT) and vehicle-hours-traveled (VHT).

Each of the horizon years contained in the Transportation Plan were coded into the model as a specific socioeconomic forecast with appropriate network capacity projects for that time period. These scenarios yielded the traffic forecasts used in the conformity analysis. Vehicle miles of travel forecasts from these model runs are summarized in Figure 1.

FIGURE 1: MODELED VEHICLE MILES OF TRAVEL



MODEL POST-PROCESSING AND MOBILE 6.2 INPUT FILES

Model outputs are expressed in terms daily volumes for each roadway segment. The raw model results from each scenario have traffic estimates only for those facilities coded in the model. These modeled traffic estimates generally include facilities that are classified as major collector or higher. Travel on the lower classed roadways (collector and local), while not entirely absent, is under-represented in the model. For estimating total emissions, raw model VMT is summarized by functional classification. These values are adjusted on a functional classification basis using a Model-to-HPMS VMT adjustment factor. The Model-to-HPMS VMT adjustment factor is calculated using the base year 2002 Model VMT compared to the base year HPMS reported VMT. HPMS is considered to be a more complete estimate of vehicle miles of travel in a county, and accounts for travel on all classifications of roadways. The HPMS adjustment factors are used in each of the Transportation Plan scenarios.

TABLE 2: HPMS ADJUSTMENT FACTORS

Functional Class	Functional Class Code	HPMS Adjustment Factor
Rural Interstate	1	0.84
Rural Principal Arterial	2	0.92
Rural Minor Arterial	6	0.87
Rural Major Collector	7	1.41
Rural Minor Collector	8	1.48
Rural Local	9	1.36
Urban Interstate	11	1.03
Urban Expressway	12	1.00
Urban Principal Arterial	14	1.14
Urban Minor Arterial	16	1.45
Urban Collector	17	0.93
Urban Local	19	5.19

Additionally, it is necessary to post-process the model estimates of travel speed by each road link to better match observed speeds. In the post-processing, an average speed and VMT are computed for each hour for each link and stored in a separate data file. The data file also contains an attribute for Mobile 6.2 facility class. In the post-processing, daily volumes are split into hourly volumes using an average hourly traffic distribution derived from the 1995 Indiana Household Travel Survey, see table 3 below.

TABLE 3: HOURLY DISTRIBUTION OF TRAFFIC

DISTRIBUTION OF TOTAL TRAFFIC BY HOUR			
HOUR OF DAY	**PERCENT OF DAILY TRAFFIC**	**HOUR OF DAY**	**PERCENT OF DAILY TRAFFIC**
1:00 AM	0.47%	1:00 PM	4.77%
2:00 AM	0.36%	2:00 PM	5.13%
2:00 AM	0.26%	3:00 PM	8.62%
4:00 AM	0.36%	4:00 PM	9.60%
5:00 AM	1.61%	5:00 PM	9.22%
6:00 AM	6.55%	6:00 PM	5.13%
7:00 AM	8.01%	7:00 PM	3.99%
8:00 AM	6.24%	8:00 PM	2.90%
9:00 AM	4.61%	9:00 PM	2.95%
10:00 AM	4.41%	10:00 PM	3.06%
11:00 AM	4.61%	11:00 PM	1.71%
12:00 AM	4.61%	12:00 PM	0.83%

Source: 1995 Indiana Household Travel Survey

Hourly volumes are then compared to an hourly capacity to determine a volume to capacity ratio. Hourly capacities use HCM 2000 methodology (described elsewhere in the model documentation).

Volume to capacity (v/c) ratios for each link for each hour are then used to estimate an hourly speed. A BPR volume delay function was used to estimate the link speeds for each hour formulated as follows.

$$Speed_{congested} = \frac{Speed_{freeflow}}{1+\alpha\left(v/c\right)^{\beta}}$$

Alpha and Beta parameters are US EPA recommended values, where:

TABLE 4: BPR CURVE PARAMETERS

Volume-Delay Curve Parameters		
	Under 60 mph	**Over 60 mph**
Alpha	0.20	0.15
Beta	8.00	10.00

To avoid unrealistically low average hourly speeds, the V/C ratio is capped at 1.6. Any links that have an hourly V/C ratio that exceeds 1.6 is assumed to remain at 1.6 for speed estimation purposes.

Distribution of VMT by hour of the day is input to Mobile 6.2 via the HVMT.def file. The hourly distribution percentages use the Indiana Household Survey data shown in Table 3. The HVMT.def file does not change from scenario to scenario. It is listed in the Appendix.

Adjusted vehicle miles of travel are summed by Mobile 6.2 speed bin (speeds generated as discussed above), by facility classes 1 & 2, and by each hour of the day to create the SVMT.def Mobile 6.2 input files. A separate SVMT.def file is created for each scenario. These are listed in the Appendix.

Vehicle miles of travel for each of the 4 facility classes are summarized (Freeway, Arterial/Collector, Local, Ramp), by each hour of the day for the entire model to create the FVMT.def Mobile 6.2 input file. The distribution of auto trips across the facility types is derived from the post-processing of the model results discussed previously. The distribution of truck trips across facility types is derived from statewide HPMS data for 2002 provided by INDOT to IDEM, this distribution is shown in Table 5. When creating each of these files, only VMT from Vigo County links is used. The FVMT.def varies with each scenario. All FVMT files used in the analysis are listed in the Appendix.

TABLE 5: TRUCK VMT MIX BY FACILITY

Facility	Distribution Using Indiana HPMS data
Freeway	0.2214
Arterial/Collector	0.6526
Local	0.1207
Ramp	0.0054

Vehicle fleet age distribution was provided for light duty vehicles for Vigo County by IDEM, these values are used in the Regvigo.d file. For other vehicle classes, the standard Mobile 6.2 defaults are used. The Regvigo.d remains constant in each scenario, the file is listed in the Appendix

Other assumptions, such as the minimum and maximum July temperatures (65 and 87.3) for Terre Haute; absolute humidity (93.7), cloud cover (0.34), and sunrise/sunset (6am & 8pm respectively) were provided by IDEM. Each of these variables are specified in the Mobile 6.2 input files for each scenario.

The Mobile 6.2 model is run using the above-mentioned user inputs to get emission rates for each of the model scenarios. Emissions are then calculated from the adjusted

VMT, by functional classification, using the Mobile 6.2 output emission rates.

ANALYSIS RESULTS

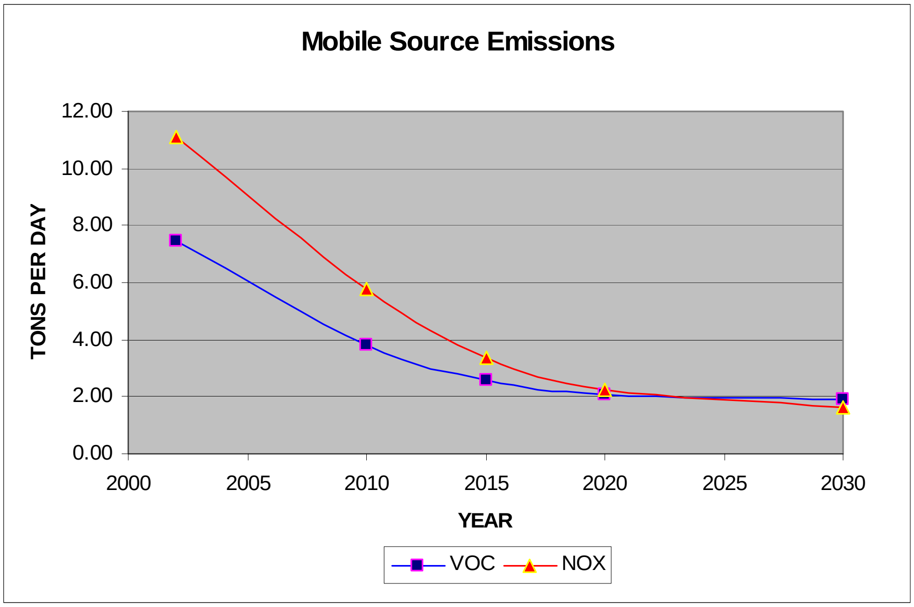
The regional emissions analysis was conducted to provide estimates of the levels of emissions of volatile organic compounds (VOC) and oxides of Nitrogen (NOx) for the various scenarios. VOC and NOx contribute directly to the production of ozone. Because no emission budgets are yet established for VOC and NOx, emissions are not permitted to exceed the 2002 levels.

The results of the regional emissions analysis are summarized in Tables 6 through 12, and in Figure 2. Table 6 shows that for each of the analysis years, the VOC and NOx emissions are less than those in 2002. Figure 2 illustrates that emissions for both ozone precursors is estimated to decline steadily over the next 25 years.

TABLE 6: EMISSION ANALYSIS RESULTS

Year	Daily VMT	VOC *Tons/day*	NOX *Tons/day*
2002	3,506,370	7.46	11.10
2010	3,669,020	3.84	5.76
2015	3,764,676	2.58	3.34
2020	3,884,845	2.05	2.24
2030	4,120,421	1.89	1.61

Figure 2: EMISSION ANALYSIS RESULTS



TABLES 7-11: DETAILED EMISSION ANALYSIS RESULTS

Modeled Vehicle Miles of Travel and Mobile Source Emissions for 2002 Scenario

	Model VMT	HPMS Adjusted VMT	VOC *Tons/day*	NOX *Tons/day*
Rural Interstates	160,473	135,464	0.29	0.43
Other Rural Principal Arterials	291,819	267,585	0.57	0.85
Rural Minor Arterials	59,618	51,669	0.11	0.16
Rural Major Collectors	173,047	243,658	0.52	0.77
Rural Minor Collectors	42,163	62,241	0.13	0.20
Rural Local Roads	68,709	93,604	0.20	0.30
Urban Interstates	397,209	408,860	0.87	1.29
Other Urban Freeways & Expwys	-	-	0.00	0.00
Other Urban Principal Arterials	878,961	1,004,952	2.14	3.18
Urban Minor Arterials	442,141	640,308	1.36	2.03
Urban Collectors	259,431	241,190	0.51	0.76
Urban Local Roads	68,812	356,839	0.76	1.13
Total Vigo County	2,842,383	3,506,370	**7.46**	**11.10**

Modeled Vehicle Miles of Travel and Mobile Source Emissions for 2010 Scenario

	Model VMT	HPMS Adjusted VMT	VOC *Tons/day*	NOX *Tons/day*
Rural Interstates	186,399	157,350	0.16	0.25
Other Rural Principal Arterials	314,847	288,701	0.30	0.45
Rural Minor Arterials	62,476	54,146	0.06	0.08
Rural Major Collectors	178,220	250,942	0.26	0.39
Rural Minor Collectors	44,357	65,479	0.07	0.10
Rural Local Roads	69,546	94,744	0.10	0.15
Urban Interstates	418,470	430,745	0.45	0.68
Other Urban Freeways & Expwys	45,616	45,616	0.05	0.07
Other Urban Principal Arterials	869,805	994,484	1.04	1.56
Urban Minor Arterials	427,386	618,940	0.65	0.97
Urban Collectors	302,631	281,352	0.29	0.44
Urban Local Roads	74,536	386,522	0.40	0.61
Total Vigo County	2,994,289	3,669,020	**3.84**	**5.76**

Modeled Vehicle Miles of Travel and Mobile Source Emissions for 2015 Scenario

	Model VMT	HPMS Adjusted VMT	VOC *Tons/day*	NOX *Tons/day*
Rural Interstates	202,632	171,053	0.12	0.15
Other Rural Principal Arterials	329,437	302,079	0.21	0.27
Rural Minor Arterials	64,400	55,813	0.04	0.05
Rural Major Collectors	185,530	261,235	0.18	0.23
Rural Minor Collectors	44,383	65,518	0.04	0.06
Rural Local Roads	71,657	97,620	0.07	0.09
Urban Interstates	429,010	441,594	0.30	0.39
Other Urban Freeways & Expwys	64,204	64,204	0.04	0.06
Other Urban Principal Arterials	883,086	1,009,668	0.69	0.90
Urban Minor Arterials	436,788	632,556	0.43	0.56
Urban Collectors	301,420	280,226	0.19	0.25
Urban Local Roads	73,878	383,110	0.26	0.34
Total Vigo County	3,086,425	3,764,676	**2.58**	**3.34**

Modeled Vehicle Miles of Travel and Mobile Source Emissions for 2020 Scenario

	Model VMT	HPMS Adjusted VMT	VOC *Tons/day*	NOX *Tons/day*
Rural Interstates	218,855	184,748	0.10	0.11
Other Rural Principal Arterials	341,709	313,332	0.17	0.18
Rural Minor Arterials	66,152	57,332	0.03	0.03
Rural Major Collectors	191,716	269,945	0.14	0.16
Rural Minor Collectors	45,635	67,366	0.04	0.04
Rural Local Roads	73,800	100,539	0.05	0.06
Urban Interstates	457,317	470,732	0.25	0.27
Other Urban Freeways & Expwys	68,044	68,044	0.04	0.04
Other Urban Principal Arterials	895,997	1,024,430	0.54	0.59
Urban Minor Arterials	447,590	648,199	0.34	0.37
Urban Collectors	306,819	285,246	0.15	0.16
Urban Local Roads	76,158	394,934	0.21	0.23
Total Vigo County	3,189,792	3,884,845	**2.05**	**2.24**

Modeled Vehicle Miles of Travel and Mobile Source Emissions for 2030 Scenario

	Model VMT	HPMS Adjusted VMT	VOC *Tons/day*	NOX *Tons/day*
Rural Interstates	251,326	212,158	0.10	0.08
Other Rural Principal Arterials	365,963	335,572	0.15	0.13
Rural Minor Arterials	70,049	60,709	0.03	0.02
Rural Major Collectors	204,461	287,890	0.13	0.11
Rural Minor Collectors	48,717	71,916	0.03	0.03
Rural Local Roads	78,167	106,488	0.05	0.04
Urban Interstates	510,072	525,034	0.24	0.20
Other Urban Freeways & Expwys	75,008	75,008	0.03	0.03
Other Urban Principal Arterials	927,746	1,060,730	0.49	0.41
Urban Minor Arterials	459,859	665,967	0.31	0.26
Urban Collectors	322,047	299,403	0.14	0.12
Urban Local Roads	80,904	419,545	0.19	0.16
Total Vigo County	3,394,319	4,120,421	**1.89**	**1.61**

The regional emissions analysis of the projects in the 2030 Transportation Plan indicates that the plan contributes to the improvement of air quality. In summary, it can be concluded that the Transportation Plan conforms to the national air quality standards.

APPENDIX – MOBILE 6.2 FILES

VIGO COUNTY VEHICLE REGISTRATION – INPUT FILE

```
REG DIST
*
* THIS FILE CONTAINS THE DEFAULT MOBILE6 VALUES FOR THE DISTRIBUTION OF
* VEHICLES BY AGE FOR JULY OF ANY CALENDAR YEAR.  THERE ARE SIXTEEEN (16)
* SETS OF VALUES REPRESENTING 16 COMBINED GASOLINE/DIESEL VEHICLE CLASS
* DISTRIBUTIONS.  THESE DISTRIBUTIONS ARE SPLIT FOR GASOLINE AND DIESEL
* USING THE SEPARATE INPUT (OR DEFAULT) VALUES FOR DIESEL SALES FRACTIONS.
* EACH DISTRIBUTION CONTAINS 25 VALUES WHICH REPRESENT THE FRACTION OF
* ALL VEHICLES IN THAT CLASS (GASOLINE AND DIESEL) OF THAT AGE IN JULY.
* THE FIRST NUMBER IS FOR AGE 1 (CALENDAR YEAR MINUS MODEL YEAR PLUS ONE)
* AND THE LAST NUMBER IS FOR AGE 25.  THE LAST AGE INCLUDES ALL VEHICLES
* OF AGE 25 OR OLDER.  THE FIRST NUMBER IN EACH DISTRIBUTION IS AN INTEGER
* WHICH INDICATES WHICH OF THE 16 VEHICLE CLASSES ARE REPRESENTED BY THE
* DISTRIBUTION.  THE SIXTEEN VEHICLE CLASSES ARE:
*
*  1  LDV    LIGHT-DUTY VEHICLES (PASSENGER CARS)
*  2  LDT1   LIGHT-DUTY TRUCKS 1 (0-6,000 LBS. GVWR, 0-3750 LBS. LVW)
*  3  LDT2   LIGHT DUTY TRUCKS 2 (0-6,001 LBS. GVWR, 3751-5750 LBS. LVW)
*  4  LDT3   LIGHT DUTY TRUCKS 3 (6,001-8500 LBS. GVWR, 0-3750 LBS. LVW)
*  5  LDT4   LIGHT DUTY TRUCKS 4 (6,001-8500 LBS. GVWR, 3751-5750 LBS. LVW)
*  6  HDV2B  CLASS 2B HEAVY DUTY VEHICLES (8501-10,000 LBS. GVWR)
*  7  HDV3   CLASS 3 HEAVY DUTY VEHICLES (10,001-14,000 LBS. GVWR)
*  8  HDV4   CLASS 4 HEAVY DUTY VEHICLES (14,001-16,000 LBS. GVWR)
*  9  HDV5   CLASS 5 HEAVY DUTY VEHICLES (16,001-19,500 LBS. GVWR)
* 10  HDV6   CLASS 6 HEAVY DUTY VEHICLES (19,501-26,000 LBS. GVWR)
* 11  HDV7   CLASS 7 HEAVY DUTY VEHICLES (26,001-33,000 LBS. GVWR)
* 12  HDV8A  CLASS 8A HEAVY DUTY VEHICLES (33,001-60,000 LBS. GVWR)
* 13  HDV8B  CLASS 8B HEAVY DUTY VEHICLES (>60,000 LBS. GVWR)
* 14  HDBS   SCHOOL BUSSES
* 15  HDBT   TRANSIT AND URBAN BUSSES
* 16  MC     MOTORCYCLES (ALL)
*
* THE 25 AGE VALUES ARE ARRANGED IN TWO ROWS OF 10 VALUES FOLLOWED BY A ROW
* WITH THE LAST 5 VALUES.  COMMENTS (SUCH AS THIS ONE) ARE INDICATED BY
* AN ASTERISK IN THE FIRST COLUMN. EMPTY ROWS ARE IGNORED.  VALUES ARE
* READ "FREE FORMAT," MEANING ANY NUMBER MAY APPEAR IN ANY ROW WITH AS
* MANY CHARACTERS AS NEEDED (INCLUDING A DECIMAL) AS LONG AS 25 VALUES
* FOLLOW THE INITIAL INTEGER VALUE SEPARATED BY A SPACE.
*
* IF ALL 28 VEHICLE CLASSES DO NOT NEED TO BE ALTERED FROM THE DEFAULT
* VALUES, THEN ONLY THE VEHICLE CLASSES THAT NEED TO BE CHANGED NEED TO
* BE INCLUDED IN THIS FILE.  THE ORDER IN WHICH THE VEHICLE CLASSES ARE
* READ DOES NOT MATTER, HOWEVER EACH VEHICLE CLASS SET MUST CONTAIN 25
* VALUES AND BE IN THE PROPER AGE ORDER.
*
* COUNTY 84, VIGO
* LDV
 1 0.0384 0.0513 0.0511 0.0558 0.0691 0.0702 0.0587 0.0640 0.0553 0.0677
   0.0547 0.0551 0.0488 0.0481 0.0419 0.0375 0.0276 0.0235 0.0204 0.0140
   0.0107 0.0057 0.0038 0.0034 0.0232
* LDT1
 2 0.0277 0.0369 0.0368 0.0274 0.0247 0.0264 0.0381 0.0296 0.0479 0.0513
   0.0674 0.0517 0.0427 0.0614 0.0497 0.0616 0.0509 0.0599 0.0529 0.0443
   0.0276 0.0182 0.0169 0.0141 0.0338
* LDT2
 3 0.0550 0.0733 0.0730 0.0715 0.0849 0.0841 0.0885 0.0872 0.0525 0.0538
   0.0470 0.0445 0.0339 0.0270 0.0242 0.0198 0.0253 0.0106 0.0085 0.0067
   0.0080 0.0043 0.0031 0.0024 0.0111
* LDT3
 4 0.0450 0.0600 0.0598 0.0657 0.0629 0.0799 0.0584 0.0593 0.0649 0.0666
   0.0585 0.0396 0.0352 0.0246 0.0229 0.0269 0.0199 0.0172 0.0191 0.0168
   0.0125 0.0099 0.0049 0.0037 0.0657
* LDT4
 5 0.0658 0.0877 0.0877 0.0905 0.0801 0.0946 0.0739 0.0525 0.0421 0.0580
   0.0615 0.0207 0.0110 0.0097 0.0145 0.0048 0.0076 0.0062 0.0124 0.0138
   0.0055 0.0055 0.0021 0.0007 0.0911
```

HOURLY VMT DISTRIBUTION INPUT FILE

```
VMT BY HOUR
*
*  FRACTION OF ALL VEHICLE MILES TRAVELED BY HOUR OF THE DAY.
*  FIRST HOUR IS 6 A.M.
*
      0.0655  0.0801  0.0624  0.0461  0.0441  0.0461
      0.0461  0.0477  0.0513  0.0862  0.0960  0.0922
      0.0513  0.0399  0.0290  0.0295  0.0306  0.0171
      0.0083  0.0047  0.0036  0.0026  0.0036  0.0161
```

2002 SCENARIO FILES – FVMT (VMT BY FACILITY BY VEHICLE CLASS BY HOUR)

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VMT BY FACILITY
    1  0.1703 0.6754 0.1490 0.0053
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2002 SCENARIO FILES – SVMT (SPEED DISTRIBUTION BY TIME OF DAY BY FACILITY)

```
SPEED VMT
1 1  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 1  0.0021 0.0007 0.0000 0.0114 0.0164 0.0305 0.1412 0.0750 0.2282 0.1458 0.1382 0.0657 0.1443 0.0000
1 2  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 2  0.0036 0.0333 0.0325 0.0395 0.0245 0.0646 0.1429 0.0952 0.1308 0.1170 0.1121 0.0700 0.1336 0.0000
1 3  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 3  0.0015 0.0006 0.0007 0.0007 0.0180 0.0261 0.1403 0.0633 0.2155 0.1836 0.1369 0.0678 0.1443 0.0000
1 4  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 4  0.0000 0.0000 0.0000 0.0011 0.0010 0.0039 0.1253 0.0705 0.1779 0.2418 0.1457 0.0882 0.1443 0.0000
1 5  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 5  0.0000 0.0000 0.0000 0.0000 0.0015 0.0038 0.1224 0.0643 0.1876 0.2418 0.1457 0.0882 0.1443 0.0000
1 6  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 6  0.0000 0.0000 0.0000 0.0011 0.0010 0.0039 0.1253 0.0705 0.1779 0.2418 0.1457 0.0882 0.1443 0.0000
1 7  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 7  0.0000 0.0000 0.0000 0.0011 0.0010 0.0039 0.1253 0.0705 0.1779 0.2418 0.1457 0.0882 0.1443 0.0000
1 8  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 8  0.0000 0.0000 0.0000 0.0015 0.0006 0.0039 0.1253 0.0705 0.1814 0.2382 0.1497 0.0842 0.1443 0.0000
1 9  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 9  0.0000 0.0000 0.0015 0.0006 0.0007 0.0031 0.1351 0.0668 0.1861 0.2343 0.1530 0.0739 0.1443 0.0000
1 10 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 10 0.0202 0.0492 0.0459 0.0237 0.0710 0.0837 0.1007 0.0731 0.1079 0.1095 0.1119 0.1006 0.1021 0.0000
1 11 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 11 0.0620 0.0634 0.0768 0.0658 0.0398 0.0456 0.0883 0.0654 0.0890 0.1071 0.1160 0.1401 0.0401 0.0000
1 12 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 12 0.0361 0.0780 0.0364 0.0711 0.0611 0.0510 0.0892 0.0644 0.1073 0.1006 0.1241 0.1199 0.0603 0.0000
1 13 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 13 0.0000 0.0000 0.0015 0.0006 0.0007 0.0031 0.1351 0.0668 0.1861 0.2343 0.1530 0.0739 0.1443 0.0000
1 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0053 0.1224 0.0562 0.1957 0.2344 0.1375 0.1038 0.1443 0.0000
1 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
1 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
1 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
1 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
1 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
1 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
1 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
1 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
1 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
1 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000
2 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1246 0.0487 0.2032 0.1819 0.1805 0.1133 0.1443 0.0000
```

2002 SCENARIO FILES – MOBILE 6.2 INPUT FILE

```
MOBILE6 INPUT FILE :
*updated 4/6/2005, DLM
> Vigo County 2002

POLLUTANTS          : HC CO NOx
REPORT FILE         : VIGO2002.txt
SPREADSHEET         : M6REPORT
EMISSIONS TABLE     : vigo2002.tb1

RUN DATA
> Vigo County 2002

MIN/MAX TEMP        : 65. 87.3
FUEL RVP            : 9.0
EXPRESS HC AS VOC   :
NO REFUELING        :
REG DIST            : Regvigo.d
VMT BY FACILITY     : 2002fvmt.def
VMT BY HOUR         : Hvmtvigo.def
SPEED VMT           : 2002Svmt.def


SCENARIO RECORD     : Scenario Title : Vigo County 2002
> Vigo County 2002

CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7

ABSOLUTE HUMIDITY   : 93.7
CLOUD COVER         : 0.34

SUNRISE/SUNSET      : 6 8


END OF RUN
```

2002 SCENARIO FILES – MOBILE 6.2 OUTPUT FILE

```
***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                              *
* Input file: VIGO2002.IN (file 1, run 1).                                *
***************************************************************************
* Vigo County 2002
  M603 Comment:
              User has disabled the calculation of REFUELING emissions.


* Reading Registration Distributions from the following external
* data file: REGVIGO.D
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)

* Reading Hourly Roadway VMT distribution from the following external
* data file: 2002FVMT.DEF

  Reading User Supplied ROADWAY VMT Factors

* Reading Hourly VMT distribution from the following external
* data file: HVMTVIGO.DEF

* Reading Hourly, Roadway, and Speed VMT dist. from the following external
* data file: 2002SVMT.DEF

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Scenario Title : Vigo County 2002
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Vigo County 2002
  M617 Comment:
              User supplied alternate AC input: Cloud Cover Fraction set to 0.34.
  M618 Comment:
              User supplied alternate AC input: Sunrise at  6 AM, Sunset at  8 PM.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                    Calendar Year:  2002
                            Month:  July
                         Altitude:  Low
             Minimum Temperature:  65.0 (F)
             Maximum Temperature:  87.3 (F)
               Absolute Humidity:   94. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.7 psi
             Fuel Sulfur Content:  279. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.4453    0.3065    0.1159              0.0372    0.0009    0.0019    0.0861    0.0062    1.0000
 --------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      2.077     1.907     2.295     2.013     2.137     0.823     0.887     0.663      2.52     1.930
     Composite CO  :     20.27     22.89     28.48     24.43     27.61      1.913     1.594     3.663     17.90    20.802
     Composite NOX :      1.302     1.407     1.644     1.472     5.186     1.941     1.803    17.013      1.18     2.871
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2010 SCENARIO FILES – FVMT (VMT BY FACILITY BY VEHICLE CLASS BY HOUR)

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VMT BY FACILITY
     1  0.1729 0.6856 0.1362 0.0054
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     4  0.1729 0.6856 0.1362 0.0054
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   6  0.2214 0.6526 0.1207 0.0054
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   7  0.2214 0.6526 0.1207 0.0054
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```

2010 SCENARIO FILES – SVMT (SPEED DISTRIBUTION BY TIME OF DAY BY FACILITY)

```
SPEED VMT
1 1  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 1  0.0045 0.0000 0.0007 0.0099 0.0175 0.0251 0.1086 0.0673 0.2007 0.1892 0.1454 0.0788 0.1518 0.0000
1 2  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 2  0.0052 0.0239 0.0225 0.0116 0.0249 0.0377 0.1355 0.1070 0.1597 0.1192 0.1398 0.1110 0.1015 0.0000
1 3  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 3  0.0045 0.0000 0.0000 0.0007 0.0111 0.0246 0.1195 0.0553 0.1975 0.1990 0.1546 0.0810 0.1518 0.0000
1 4  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 4  0.0000 0.0000 0.0000 0.0017 0.0028 0.0031 0.1065 0.0673 0.1910 0.2364 0.1347 0.1043 0.1518 0.0000
1 5  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 5  0.0000 0.0000 0.0000 0.0017 0.0028 0.0031 0.1065 0.0673 0.1910 0.2364 0.1347 0.1043 0.1518 0.0000
1 6  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 6  0.0000 0.0000 0.0000 0.0017 0.0028 0.0031 0.1065 0.0673 0.1910 0.2364 0.1347 0.1043 0.1518 0.0000
1 7  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 7  0.0000 0.0000 0.0000 0.0017 0.0028 0.0031 0.1065 0.0673 0.1910 0.2364 0.1347 0.1043 0.1518 0.0000
1 8  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 8  0.0000 0.0000 0.0017 0.0028 0.0000 0.0031 0.1065 0.0680 0.1933 0.2334 0.1401 0.0989 0.1518 0.0000
1 9  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 9  0.0000 0.0006 0.0039 0.0000 0.0000 0.0038 0.1125 0.0662 0.1929 0.2316 0.1406 0.0957 0.1518 0.0000
1 10 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 10 0.0160 0.0357 0.0133 0.0245 0.0499 0.0615 0.1125 0.0992 0.1339 0.1165 0.1244 0.1489 0.0632 0.0000
1 11 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 11 0.0439 0.0373 0.0525 0.0577 0.0396 0.0495 0.1016 0.0919 0.0919 0.1314 0.1633 0.0970 0.0420 0.0000
1 12 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 12 0.0340 0.0291 0.0320 0.0641 0.0421 0.0524 0.1107 0.0864 0.1107 0.1114 0.1556 0.1289 0.0420 0.0000
1 13 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 13 0.0000 0.0006 0.0039 0.0000 0.0000 0.0038 0.1125 0.0662 0.1929 0.2316 0.1406 0.0957 0.1518 0.0000
1 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0076 0.1065 0.0600 0.1983 0.2323 0.1388 0.1043 0.1518 0.0000
1 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
1 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
1 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
1 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
1 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
1 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
1 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
1 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
1 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
1 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0722 0.0000 0.0000 0.0000 0.0000 0.9277
2 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0031 0.1083 0.0547 0.2064 0.1825 0.1885 0.1043 0.1518 0.0000
```

2010 Scenario Files – Mobile 6.2 Input File

```
MOBILE6 INPUT FILE :
*updated 4/6/2005, DLM
> Vigo County 2010
* Vigo County 2010
POLLUTANTS         : HC CO NOx
REPORT FILE        : VIGO2010.txt

EMISSIONS TABLE    : vigo2010.tb1

RUN DATA
> Vigo County 2010
MIN/MAX TEMP       : 65. 87.3
FUEL RVP           : 9.0
EXPRESS HC AS VOC  :
NO REFUELING       :
REG DIST           : Regvigo.d
VMT BY FACILITY    : 2010fvmt.def
VMT BY HOUR        : Hvmtvigo.def
SPEED VMT          : 2010Svmt.def

SCENARIO RECORD    : Scenario Title : Vigo County 2010
> Vigo County 2010
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR      : 2010
EVALUATION MONTH   : 7

ABSOLUTE HUMIDITY  : 93.7
CLOUD COVER        : 0.34

SUNRISE/SUNSET     : 6 8


END OF RUN
```

2010 Scenario Files – Mobile 6.2 Output File

```
****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                               *
* Input file: VIGO2010.IN (file 1, run 1).                                 *
****************************************************************************
* Vigo County 2010
  M603 Comment:
               User has disabled the calculation of REFUELING emissions.


* Reading Registration Distributions from the following external
* data file: REGVIGO.D
  M 49 Warning:
                 1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00     MYR sum not = 1. (will normalize)

* Reading Hourly Roadway VMT distribution from the following external
* data file: 2010FVMT.DEF

  Reading User Supplied ROADWAY VMT Factors

* Reading Hourly VMT distribution from the following external
* data file: HVMTVIGO.DEF

* Reading Hourly, Roadway, and Speed VMT dist. from the following external
* data file: 2010SVMT.DEF

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Scenario Title : Vigo County 2010
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Vigo County 2010
  M617 Comment:
               User supplied alternate AC input: Cloud Cover Fraction set to 0.34.
  M618 Comment:
               User supplied alternate AC input: Sunrise at  6 AM, Sunset at  8 PM.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                     Calendar Year:  2010
                             Month:  July
                          Altitude:  Low
              Minimum Temperature:  65.0 (F)
              Maximum Temperature:  87.3 (F)
                 Absolute Humidity:   94. grains/lb
                  Nominal Fuel RVP:   9.0 psi
                     Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3376    0.3840    0.1449              0.0370    0.0003    0.0021    0.0884    0.0056    1.0000
   ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      1.050     0.927     1.086     0.971     0.907     0.225     0.390     0.366      2.43     0.949
     Composite CO  :     10.33     10.87     12.59     11.34      9.83     1.011     0.692     1.727     16.85    10.098
     Composite NOX :      0.654     0.757     0.987     0.820     2.340     0.577     0.764     7.621      1.19     1.423
   ------------------------------------------------------------------------------------------------------------------------   ----------
------------------------------------------------------------------------------------------------------------
```

2015 Scenario Files – FVMT (VMT by Facility by Vehicle Class by Hour)

```
VMT BY FACILITY
     1  0.1726 0.6846 0.1374 0.0054
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        0.1726 0.6846 0.1374 0.0054
        0.1726 0.6846 0.1374 0.0054
     2  0.1726 0.6846 0.1374 0.0054
        0.1726 0.6846 0.1374 0.0054
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     4  0.1726 0.6846 0.1374 0.0054
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     0.1726 0.6846 0.1374 0.0054
     0.1726 0.6846 0.1374 0.0054
     0.1726 0.6846 0.1374 0.0054
  6  0.2214 0.6526 0.1207 0.0054
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     0.2214 0.6526 0.1207 0.0054
     0.2214 0.6526 0.1207 0.0054
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        0.1726 0.6846 0.1374 0.0054
```

2015 SCENARIO FILES – SVMT (SPEED DISTRIBUTION BY TIME OF DAY BY FACILITY)

```
SPEED VMT
1 1  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 1  0.0043 0.0000 0.0000 0.0028 0.0086 0.0170 0.1107 0.0734 0.2336 0.1663 0.1558 0.0716 0.1555 0.0000
1 2  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 2  0.0056 0.0068 0.0202 0.0091 0.0198 0.0678 0.1386 0.1042 0.1503 0.1270 0.1337 0.1240 0.0923 0.0000
1 3  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 3  0.0017 0.0025 0.0000 0.0007 0.0044 0.0152 0.1143 0.0658 0.1970 0.2061 0.1571 0.0793 0.1555 0.0000
1 4  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 4  0.0000 0.0000 0.0000 0.0017 0.0025 0.0030 0.1013 0.0603 0.1929 0.2369 0.1412 0.1043 0.1555 0.0000
1 5  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 5  0.0000 0.0000 0.0000 0.0006 0.0010 0.0056 0.1013 0.0603 0.1929 0.2369 0.1405 0.1050 0.1555 0.0000
1 6  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 6  0.0000 0.0000 0.0000 0.0017 0.0025 0.0030 0.1013 0.0603 0.1929 0.2369 0.1412 0.1043 0.1555 0.0000
1 7  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 7  0.0000 0.0000 0.0000 0.0017 0.0025 0.0030 0.1013 0.0603 0.1929 0.2369 0.1412 0.1043 0.1555 0.0000
1 8  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 8  0.0000 0.0000 0.0006 0.0010 0.0025 0.0030 0.1013 0.0610 0.1922 0.2397 0.1431 0.0996 0.1555 0.0000
1 9  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 9  0.0000 0.0006 0.0010 0.0025 0.0000 0.0037 0.1047 0.0597 0.1935 0.2356 0.1463 0.0964 0.1555 0.0000
1 10 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 10 0.0084 0.0240 0.0106 0.0318 0.0675 0.0503 0.1169 0.1051 0.1235 0.1229 0.1492 0.1467 0.0428 0.0000
1 11 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 11 0.0324 0.0230 0.0773 0.0459 0.0459 0.0486 0.1052 0.0883 0.1034 0.1594 0.1566 0.0802 0.0334 0.0000
1 12 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 12 0.0193 0.0222 0.0493 0.0541 0.0603 0.0371 0.1133 0.0906 0.1076 0.1170 0.1872 0.0986 0.0428 0.0000
1 13 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 13 0.0000 0.0006 0.0010 0.0025 0.0000 0.0037 0.1047 0.0597 0.1935 0.2356 0.1463 0.0964 0.1555 0.0000
1 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0047 0.1038 0.0559 0.1973 0.2353 0.1421 0.1050 0.1555 0.0000
1 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
1 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
1 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
1 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
1 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
1 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
1 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
1 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
1 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
1 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0775 0.0171 0.0000 0.0000 0.0000 0.9053
2 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0030 0.1030 0.0585 0.1973 0.1828 0.1946 0.1050 0.1555 0.0000
```

2015 Scenario Files – Mobile 6.2 Input File

```
MOBILE6 INPUT FILE :
*updated 4/6/2005, DLM
> Vigo County 2015
* Vigo County 2015
POLLUTANTS         : HC CO NOx
REPORT FILE        : VIGO2015.txt

EMISSIONS TABLE    : vigo2015.tb1

RUN DATA
> Vigo County 2015
MIN/MAX TEMP       : 65. 87.3
FUEL RVP           : 9.0
EXPRESS HC AS VOC  :
NO REFUELING       :
REG DIST           : Regvigo.d
VMT BY FACILITY    : 2015fvmt.def
VMT BY HOUR        : Hvmtvigo.def
SPEED VMT          : 2015Svmt.def

SCENARIO RECORD    : Scenario Title : Vigo County 2015
> Vigo County 2015
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR      : 2015
EVALUATION MONTH   : 7

ABSOLUTE HUMIDITY  : 93.7
CLOUD COVER        : 0.34

SUNRISE/SUNSET     : 6 8


END OF RUN
```

2015 SCENARIO FILES – MOBILE 6.2 OUTPUT FILE

```
****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                               *
* Input file: VIGO2015.IN (file 1, run 1).                                 *
****************************************************************************
* Vigo County 2015
  M603 Comment:
             User has disabled the calculation of REFUELING emissions.


* Reading Registration Distributions from the following external
* data file: REGVIGO.D
  M 49 Warning:
               1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               1.00     MYR sum not = 1. (will normalize)

* Reading Hourly Roadway VMT distribution from the following external
* data file: 2015FVMT.DEF

  Reading User Supplied ROADWAY VMT Factors

* Reading Hourly VMT distribution from the following external
* data file: HVMTVIGO.DEF

* Reading Hourly, Roadway, and Speed VMT dist. from the following external
* data file: 2015SVMT.DEF

* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Scenario Title : Vigo County 2015
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Vigo County 2015
  M617 Comment:
             User supplied alternate AC input: Cloud Cover Fraction set to 0.34.
  M618 Comment:
             User supplied alternate AC input: Sunrise at  6 AM, Sunset at  8 PM.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                   Calendar Year:  2015
                           Month:  July
                        Altitude:  Low
            Minimum Temperature:  65.0 (F)
            Maximum Temperature:  87.3 (F)
              Absolute Humidity:   94. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2937    0.4156    0.1569              0.0370    0.0003    0.0023    0.0889    0.0054    1.0000
  ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.638     0.607     0.782     0.655     0.579     0.126     0.233     0.277      2.41     0.622
     Composite CO  :      8.20      8.58      9.54      8.84      8.21      0.807     0.488     0.772     16.41     7.934
     Composite NOX :      0.433     0.496     0.645     0.537     1.141     0.249     0.362     3.614      1.19     0.805
  ----------------------------------------------------------------------------------------------------------------------
```

2020 SCENARIO FILES – FVMT (VMT BY FACILITY BY VEHICLE CLASS BY HOUR)

```
VMT BY FACILITY
     1  0.1719 0.6818 0.1409 0.0053
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     2  0.1719 0.6818 0.1409 0.0053
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     3  0.1719 0.6818 0.1409 0.0053
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     4  0.1719 0.6818 0.1409 0.0053
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     5  0.1719 0.6818 0.1409 0.0053
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        0.1719 0.6818 0.1409 0.0053
     6  0.2214 0.6526 0.1207 0.0054
        0.2214 0.6526 0.1207 0.0054
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        0.1719 0.6818 0.1409 0.0053
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2020 SCENARIO FILES – SVMT (SPEED DISTRIBUTION BY TIME OF DAY BY FACILITY)

```
SPEED VMT
1 1  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 1  0.0041 0.0000 0.0000 0.0006 0.0102 0.0193 0.0996 0.0874 0.2241 0.1677 0.1570 0.0841 0.1454 0.0000
1 2  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 2  0.0041 0.0045 0.0218 0.0080 0.0219 0.0646 0.1312 0.1215 0.1411 0.1271 0.1354 0.1478 0.0705 0.0000
1 3  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 3  0.0016 0.0025 0.0000 0.0006 0.0000 0.0149 0.1045 0.0790 0.2047 0.2033 0.1590 0.0719 0.1576 0.0000
1 4  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 4  0.0000 0.0000 0.0000 0.0016 0.0025 0.0029 0.0864 0.0730 0.1931 0.2383 0.1444 0.0998 0.1576 0.0000
1 5  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 5  0.0000 0.0000 0.0000 0.0000 0.0016 0.0054 0.0864 0.0730 0.1931 0.2356 0.1417 0.1052 0.1576 0.0000
1 6  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 6  0.0000 0.0000 0.0000 0.0016 0.0025 0.0029 0.0864 0.0730 0.1931 0.2383 0.1444 0.0998 0.1576 0.0000
1 7  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 7  0.0000 0.0000 0.0000 0.0016 0.0025 0.0029 0.0864 0.0730 0.1931 0.2383 0.1444 0.0998 0.1576 0.0000
1 8  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 8  0.0000 0.0000 0.0000 0.0016 0.0025 0.0029 0.0864 0.0730 0.1931 0.2383 0.1456 0.0986 0.1576 0.0000
1 9  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 9  0.0000 0.0000 0.0016 0.0025 0.0000 0.0036 0.0857 0.0765 0.1937 0.2342 0.1595 0.0848 0.1576 0.0000
1 10 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 10 0.0054 0.0250 0.0092 0.0447 0.0493 0.0612 0.1030 0.1177 0.1225 0.1197 0.1633 0.1351 0.0435 0.0000
1 11 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 11 0.0305 0.0340 0.0627 0.0616 0.0377 0.0554 0.0956 0.0914 0.1165 0.1533 0.1619 0.0650 0.0339 0.0000
1 12 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 12 0.0268 0.0110 0.0517 0.0512 0.0639 0.0450 0.1024 0.0917 0.1219 0.1380 0.1725 0.0895 0.0339 0.0000
1 13 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 13 0.0000 0.0000 0.0016 0.0025 0.0000 0.0036 0.0857 0.0765 0.1937 0.2342 0.1595 0.0848 0.1576 0.0000
1 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0045 0.0889 0.0686 0.1975 0.2339 0.1433 0.1052 0.1576 0.0000
1 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
1 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
1 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
1 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
1 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
1 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
1 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
1 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
1 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
1 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0766 0.0171 0.0000 0.0000 0.0000 0.9062
2 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0029 0.0881 0.0711 0.1975 0.1829 0.1944 0.1052 0.1576 0.0000
```

2020 SCENARIO FILES – MOBILE 6.2 INPUT FILE

```
MOBILE6 INPUT FILE :
*updated 4/6/2005, DLM
> Vigo County 2020
* Vigo County 2020
POLLUTANTS         : HC CO NOx
REPORT FILE        : VIGO2020.txt

EMISSIONS TABLE    : vigo2020.tb1

RUN DATA
> Vigo County 2020
MIN/MAX TEMP       : 65. 87.3
FUEL RVP           : 9.0
EXPRESS HC AS VOC  :
NO REFUELING       :
REG DIST           : Regvigo.d
VMT BY FACILITY    : 2020fvmt.def
VMT BY HOUR        : Hvmtvigo.def
SPEED VMT          : 2020Svmt.def

SCENARIO RECORD    : Scenario Title : Vigo County 2020
> Vigo County 2020
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR      : 2020
EVALUATION MONTH   : 7

ABSOLUTE HUMIDITY  : 93.7
CLOUD COVER        : 0.34

SUNRISE/SUNSET     : 6 8


END OF RUN
```

2020 SCENARIO FILES – MOBILE 6.2 OUTPUT FILE

```
****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                               *
* Input file: VIGO2020.IN (file 1, run 1).                                 *
****************************************************************************
* Vigo County 2020
  M603 Comment:
             User has disabled the calculation of REFUELING emissions.


* Reading Registration Distributions from the following external
* data file: REGVIGO.D
  M 49 Warning:
               1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               1.00     MYR sum not = 1. (will normalize)

* Reading Hourly Roadway VMT distribution from the following external
* data file: 2020FVMT.DEF

  Reading User Supplied ROADWAY VMT Factors

* Reading Hourly VMT distribution from the following external
* data file: HVMTVIGO.DEF

* Reading Hourly, Roadway, and Speed VMT dist. from the following external
* data file: 2020SVMT.DEF

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Scenario Title : Vigo County 2020
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* Vigo County 2020
  M617 Comment:
             User supplied alternate AC input: Cloud Cover Fraction set to 0.34.
  M618 Comment:
             User supplied alternate AC input: Sunrise at  6 AM, Sunset at  8 PM.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2020
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  65.0 (F)
            Maximum Temperature:  87.3 (F)
              Absolute Humidity:   94. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2698    0.4320    0.1630              0.0374    0.0002    0.0024    0.0898    0.0053    1.0000
  ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.471     0.468     0.611     0.507     0.388     0.075     0.166     0.245      2.41     0.479
     Composite CO  :     7.18      7.62      8.56      7.88      7.88      0.685     0.413     0.448     16.43     7.051
     Composite NOX :     0.308     0.377     0.511     0.414     0.613     0.092     0.232     1.839      1.19     0.524
  ----------------------------------------------------------------------------------------------------------------------
```

2030 SCENARIO FILES – FVMT (VMT BY FACILITY BY VEHICLE CLASS BY HOUR)

```
VMT BY FACILITY
     1  0.1708 0.6772 0.1467 0.0053
        0.1708 0.6772 0.1467 0.0053
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     2  0.1708 0.6772 0.1467 0.0053
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   5  0.1708 0.6772 0.1467 0.0053
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      0.1708 0.6772 0.1467 0.0053
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      0.1708 0.6772 0.1467 0.0053
      0.1708 0.6772 0.1467 0.0053
      0.1708 0.6772 0.1467 0.0053
   6  0.2214 0.6526 0.1207 0.0054
      0.2214 0.6526 0.1207 0.0054
      0.2214 0.6526 0.1207 0.0054
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2030 SCENARIO FILES – SVMT (SPEED DISTRIBUTION BY TIME OF DAY BY FACILITY)

```
SPEED VMT
1 1  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 1  0.0038 0.0000 0.0000 0.0019 0.0063 0.0178 0.1033 0.0929 0.2131 0.1788 0.1521 0.0882 0.1414 0.0000
1 2  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 2  0.0038 0.0090 0.0161 0.0149 0.0349 0.0478 0.1295 0.1297 0.1313 0.1333 0.1532 0.1512 0.0448 0.0000
1 3  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 3  0.0005 0.0032 0.0000 0.0000 0.0032 0.0114 0.1016 0.0807 0.2122 0.1924 0.1608 0.0921 0.1414 0.0000
1 4  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 4  0.0000 0.0000 0.0000 0.0000 0.0014 0.0050 0.0845 0.0709 0.1928 0.2363 0.1485 0.0989 0.1613 0.0000
1 5  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 5  0.0000 0.0000 0.0000 0.0000 0.0005 0.0059 0.0845 0.0677 0.1960 0.2336 0.1512 0.0989 0.1613 0.0000
1 6  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 6  0.0000 0.0000 0.0000 0.0000 0.0014 0.0050 0.0845 0.0709 0.1928 0.2363 0.1485 0.0989 0.1613 0.0000
1 7  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 7  0.0000 0.0000 0.0000 0.0000 0.0014 0.0050 0.0845 0.0709 0.1928 0.2363 0.1485 0.0989 0.1613 0.0000
1 8  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 8  0.0000 0.0000 0.0000 0.0005 0.0032 0.0027 0.0845 0.0726 0.1968 0.2306 0.1505 0.0969 0.1613 0.0000
1 9  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 9  0.0000 0.0000 0.0005 0.0032 0.0000 0.0027 0.0874 0.0736 0.1929 0.2306 0.1623 0.0850 0.1613 0.0000
1 10 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 10 0.0075 0.0225 0.0208 0.0340 0.0415 0.0678 0.1369 0.0933 0.1240 0.1416 0.1837 0.0910 0.0349 0.0000
1 11 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 11 0.0301 0.0432 0.0549 0.0605 0.0444 0.0679 0.1141 0.1097 0.1142 0.1526 0.1182 0.0549 0.0349 0.0000
1 12 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 12 0.0197 0.0306 0.0345 0.0603 0.0576 0.0614 0.1053 0.1166 0.1196 0.1516 0.1526 0.0549 0.0349 0.0000
1 13 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 13 0.0000 0.0000 0.0005 0.0032 0.0000 0.0027 0.0874 0.0736 0.1929 0.2306 0.1623 0.0850 0.1613 0.0000
1 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 14 0.0000 0.0000 0.0000 0.0000 0.0000 0.0033 0.0877 0.0671 0.1967 0.2286 0.1495 0.1055 0.1613 0.0000
1 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 15 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
1 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 16 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
1 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 17 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
1 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 18 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
1 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 19 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
1 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 20 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
1 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 21 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
1 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 22 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
1 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 23 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
1 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0747 0.0171 0.0000 0.0000 0.0000 0.9081
2 24 0.0000 0.0000 0.0000 0.0000 0.0000 0.0027 0.0859 0.0694 0.1967 0.1840 0.1941 0.1055 0.1613 0.0000
```

2030 SCENARIO FILES – MOBILE 6.2 INPUT FILE

```
MOBILE6 INPUT FILE :
*updated 4/6/2005, DLM
> Vigo County 2030
* Vigo County 2030
POLLUTANTS         : HC CO NOx
REPORT FILE        : VIGO2030.txt

EMISSIONS TABLE    : vigo2030.tb1

RUN DATA
> Vigo County 2030
MIN/MAX TEMP       : 65. 87.3
FUEL RVP           : 9.0
EXPRESS HC AS VOC  :
NO REFUELING       :
REG DIST           : Regvigo.d
VMT BY FACILITY    : 2030fvmt.def
VMT BY HOUR        : Hvmtvigo.def
SPEED VMT          : 2030Svmt.def

SCENARIO RECORD    : Scenario Title : Vigo County 2030
> Vigo County 2030
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7

ABSOLUTE HUMIDITY  : 93.7
CLOUD COVER        : 0.34

SUNRISE/SUNSET     : 6 8


END OF RUN
```

2030 SCENARIO FILES – MOBILE 6.2 OUTPUT FILE

```
***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                              *
* Input file: VIGO2030.IN (file 1, run 1).                                *
***************************************************************************
* Vigo County 2030
  M603 Comment:
               User has disabled the calculation of REFUELING emissions.


* Reading Registration Distributions from the following external
* data file: REGVIGO.D
  M 49 Warning:
                 1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00     MYR sum not = 1. (will normalize)

* Reading Hourly Roadway VMT distribution from the following external
* data file: 2030FVMT.DEF

  Reading User Supplied ROADWAY VMT Factors

* Reading Hourly VMT distribution from the following external
* data file: HVMTVIGO.DEF

* Reading Hourly, Roadway, and Speed VMT dist. from the following external
* data file: 2030SVMT.DEF

* # # # # # # # # # # # # # # # # # # # # # # # # #
* Scenario Title : Vigo County 2030
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
* Vigo County 2030
  M617 Comment:
               User supplied alternate AC input: Cloud Cover Fraction set to 0.34.
  M618 Comment:
               User supplied alternate AC input: Sunrise at  6 AM, Sunset at  8 PM.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  65.0 (F)
              Maximum Temperature:  87.3 (F)
                Absolute Humidity:   94. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2698    0.4320    0.1630              0.0374    0.0002    0.0024    0.0898    0.0053    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.407     0.425     0.489     0.442     0.279     0.051     0.106     0.223      2.42     0.416
     Composite CO  :      6.77      7.29      7.82      7.43      7.68     0.630     0.341     0.249     16.57     6.645
     Composite NOX :     0.251     0.330     0.416     0.354     0.194     0.032     0.139     0.692      1.18     0.354
  ---------------------------------------------------------------------------------------------------------------------
```

APPENDIX D

PUBLIC PARTICIPATION DOCUMENTATION

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