APPENDIX J
AIR QUALITY TECHNICAL REPORT

AIR QUALITY ANALYSIS

TECHNICAL REPORT

I-69, Evansville to Indianapolis

Section 5 - SR 37 to SR 39

Monroe and Morgan Counties, Indiana

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1.0 INTRODUCTION

The build alternatives for Tier 2 Section 5 are located within the existing SR37 corridor, which is more densely developed in the southern portion than in the northern portion of the project area. The air quality conformity analysis in Tier 2 uses the Refined Preferred Alternative 8 and must show that it conforms to the State Implementation Plan (SIP) by not causing or contributing to any new violations of the National Ambient Air Quality Standards (NAAQS), increasing the frequency or severity of NAAQS violations, or delaying the timely attainment of the NAAQS or any interim milestones, in accordance with requirements of Section 176(c) of the Clean Air Act (CAA). Under the National Environmental Policy Act (NEPA), Carbon Monoxide (CO) and Mobile Source Air Toxics (MSAT) were also analyzed.

The regional conformity issues in Section 5 involve the Morgan County 8-hour ozone maintenance area and the Particulate Matter ($PM_{2.5}$) nonattainment area (1997 annual standard). Monroe County is in attainment for the NAAQS criteria pollutants.

As mentioned, this report also addresses MSAT and the health effects related to MSAT. For the reasons given later in the report, a qualitative analysis of MSAT emissions was performed.

Finally, this report also addresses the emerging issue of Greenhouse Gases (GHG).

2.0 CONFORMITY REQUIREMENTS

The CAA requires the United States Environmental Protection Agency (USEPA) to establish NAAQS for pollutants that are considered to be harmful to the public health and environment.

The Clean Air Act Amendments (CAAA) of 1990 linked transportation funding to air quality actions. Specific requirements aimed at transportation may include vehicle inspection and maintenance, reformulated fuels, alternative-fuel vehicles, and transportation control measures (TCMs). Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) funding is available for projects that benefit air quality.

The Federal Highway Administration (FHWA), in consultation with Indiana Department of Environmental Management (IDEM), USEPA, and Indiana Department of Transportation (INDOT), is responsible for ensuring transportation conformity as part of the NEPA process for the Section 5 corridor, which is located in Monroe and Morgan counties. Monroe County is in attainment for all NAAQS criteria pollutants. Morgan County is in nonattainment for the $PM_{2.5}$ (1997) annual standard, is a maintenance area for 8-hour ozone (redesignated to maintenance 10/19/2007) and in attainment for all other NAAQS pollutants.

Under the Clean Air Act, USEPA set forth NAAQS for six principal pollutants—PM, sulfur dioxide (SO2), CO, ozone, oxides of nitrogen (NOx), and lead. Generally, when levels of pollutants do not exceed the annual average standards and do not exceed the short-term standards more than once per year, an area is considered in attainment of the NAAQS. An area that does not meet the NAAQS for one or more pollutants will be designated by the USEPA as a "nonattainment area." An area that was formerly in nonattainment and now meets the NAAQS is known as a "maintenance area" for a period of 20 years after coming into attainment. Under the CAA, each state is required to establish a plan for achieving the NAAQS in nonattainment areas and maintaining the NAAQS in maintenance areas. This plan is known as the State Implementation Plan (SIP).

Section 176 of the CAA prohibits federal agencies from approving, funding, or supporting in any way actions in nonattainment or maintenance areas unless the federal agency determines that the action "conforms" to the applicable SIP for that area. Regional and project-level requirements must be met before a record of decision can be issued for federal transportation projects. At the regional level, a project must be included in a regional emission analysis which demonstrates that future emissions from the transportation system are below the SIP budget for any pollutants contributing to the designation of an area as nonattainment or maintenance for NAAQS. At the project level, CO and/or PM "hot spot" analyses are required if the project falls in a nonattainment or maintenance area for these pollutants and is considered a project of air quality concern. This is done to demonstrate that emission concentrations adjacent to the new roadway are below the USEPA health standard.

Because of the maintenance designation for ozone and nonattainment for $PM_{2.5}$, the I-69 project (Section 5, Morgan County) is subject to transportation conformity requirements found in 40 CFR Part 93 as amended. These requirements are met through the inclusion of the project in the Indianapolis Metropolitan Planning Organization's (MPO) long range transportation plan which must be found to conform with the SIP as a whole.

As of the publication of this document, the Indianapolis MPO has adopted a draft of the 2035 Long-Range Transportation Plan: 2012 Amendment that includes the approved Section 5 project corridor and corresponding "Air Quality Conformity Determination Report", dated July 23, 2012.

Since Morgan County has been designated a maintenance area for 8-hour ozone and nonattainment for the annual $PM_{2.5}$ standard, a regional-level conformity analysis must demonstrate that emissions with the I-69 Section 5 project are below the SIP budgets for volatile organic compounds (VOCs) and NOx. Since Morgan and Monroe counties are in attainment for CO, project-level "hot spot" analyses are not required for a transportation conformity determination for the proposed project in Section 5. Nevertheless, a worst-case CO "hot spot" was performed for information purposes to demonstrate that there are no local air quality impacts associated with CO under NEPA.

A joint FHWA/Federal Transit Administration (FTA) policy memorandum of May 20, 2003, provides guidance concerning air quality conformity requirements for projects in nonattainment or maintenance areas requiring Environmental Impact Statements (EIS). For a copy of this memorandum, see **Appendix L**, *USDOT Air Quality Guidance*. The memorandum states that, in general, any required conformity determination should be made by the time of the FEIS, but in any event, "the conformity determination must be made prior to the issuance of the Record of Decision (ROD)." Therefore, the conformity requirements for Section 5 must be completed before the Tier 2 ROD for Section 5 can be signed.

3.0 PROJECT DESCRIPTION

The purpose of the project for Section 5 is to advance the overall goals of the I-69 Evansville-to-Indianapolis project in a manner consistent with the commitments in the Tier 1 Record of

Decision (ROD), while also addressing local needs identified in the Tier 2 process. The local needs identified in Tier 2 for Section 5 include:

- Complete Section 5 of I-69 Between Victor Pike South of Bloomington and SR 39 in Martinsville
- Reduce Existing and Forecasted Traffic Congestion
- Improve Traffic Safety
- Support Local Economic Development Initiatives

Section 5 begins at north of the intersection of SR 37 and Victor Pike, south of Bloomington, and continues northward to south of the existing interchange of SR 37 and SR 39 in Martinsville. This section of the I-69 project is approximately 21 miles in length and extends through Monroe and Morgan Counties, Indiana, along the alignment of existing SR 37, a multi-lane divided principal arterial highway with partial access control. The majority of the corridor is in Monroe County.

4.0 ALTERNATIVES UNDER CONSIDERATION

4.1 No-Build Alternative

The No-Build Alternative is one in which the FHWA would take no action to construct Section 5 of I-69. Under the No-Build Alternative, no federally funded highway project would be implemented, and traffic from the existing and future developments would use the local roadways. The No-Build Alternative was not selected by the Tier 1 Record of Decision. While this alternative would not receive further consideration, it does provide a baseline for Tier 2 environmental analysis.

4.2 Build Alternatives

Generally, the description for build alternatives 4, 5, 6, 7, 8 and the Refined Preferred Alternative 8 are complex and extensive. Please see FEIS Chapter 3, *Alternatives* for a complete description of the build alternatives for Section 5. Table 3-12 in the FEIS provides a concise comparison of the major features of each alterntative.

5.0 METHODOLOGY

5.1 Introduction

The primary source of air pollutants associated with either construction of a new highway or the improvement of an existing highway is from motor vehicle use. One major pollutant emitted by motor vehicles is CO, which is formed primarily by the combustion of fuel associated with transportation. EPA and FHWA regulations require that Ozone, CO, $PM_{2.5}$, MSAT and GHG be analyzed for proposed projects as part of the NEPA and/or air quality conformity process.

5.2 Analysis Techniques

5.2.1 Carbon Monoxide

Currently, there are zero CO nonattainment areas in the United States. In general, CO emissions are associated with large volumes of slow-moving traffic, such as exists at highly congested intersections. Areas experiencing high levels of CO are referred to as CO "hot spots". A "hot-spot" analysis for CO is often conducted as part of the NEPA process for highway projects. A hot-spot analysis is known as a "microscale" analysis because it focuses on a relatively small geographic area.

The purpose of a CO hot-spot analysis is to determine if CO emissions generated by a proposed project would cause or contribute to an exceedance of the air quality standard for CO as promulgated by the U.S. Environmental Protection Agency (USEPA). The federal National Ambient Air Quality Standards (NAAQS) for CO are found in 40 CFR Part 50 and are as follows:

One hour: 35 ppm or 40 mg/m^3

Eight hour: 9 ppm or 10 mg/m^3

Note: ppm = parts per million; mg/m^3 = milligrams per cubic meter

These concentration values may not be exceeded more than once per year. Any computer-modeled concentration that occurs above either the 1-hour or 8-hour standard is considered a violation. Because CO is a product of combustion, is relatively inert, and is emitted near the ground surface, the highest concentrations are typically found near the source. CO concentrations were evaluated for the worst-case intersection/interchange condition with the highest volumes using the Motor Vehicle Emissions Simulator (MOVES, version 2010b) and CAL3QHC Interface computer programs.

For the Tier 2 study, a CO project-level analysis comparing existing, future build, and future no build conditions was performed for the intersection/interchange carrying the highest predicted traffic volume in the corridor and which also includes a proposed traffic signal or stop controlled intersection on a ramp junction (worst-case scenario). The selected location for the CO project-level analysis was at the SR 48/Southbound entrance ramp to I-69. This intersection was selected because it had the highest predicted design year traffic volume and the worst-case Level-of-Service (LOS). The LOS was predicted to be “D” for the 2035 design year PM peak hour. The nearby SR 48/Gates Drive intersection data was also added to the model inputs since it is in the analysis area and it was predicted to be LOS “E” for the same analysis scenario. No other analyzed intersections in the study area were predicted to exceed LOS “C”.

The emissions factors were developed using the MOVES model. The dispersion of CO was simulated using CAL3QHC, a microcomputer dispersion model developed to predict the level of CO or other inert pollutant concentrations. The model predicts concentrations based on motor vehicles traveling near roadway intersections. It is the standard model used by USEPA for these types of analyses.

The analysis used simulated meteorological conditions (described below) designed to yield "worst-case" CO concentrations. One-hour and 8-hour concentrations were calculated to permit comparison with air quality standards for CO, which are described above.

The results of the analyses conducted for the Existing Condition, the No-Build and Build Alternatives are presented in Section 4 of this report. The forecast year used in this analysis (for the Build and No-Build conditions) was 2035.

Data inputs to the computer model include: motor vehicle traffic volumes, motor vehicle emission factors, worst-case meteorological conditions, signal timing, and receptor and roadway site geometry. CO emission factors (i.e., the rates at which vehicles emit CO) were generated using the MOVES computer modeling program.

The air quality analysis was conducted under simulated meteorological conditions designed to yield "worst-case" CO concentrations. These conditions include:

Wind Speed. The wind speed was assumed to be one meter per second (1 m/sec), which provides very little, or no dispersion of the pollutants.

Stability Class. Pasquill's stability class is a measure of atmospheric turbulence, and ranges from "A" (very turbulent) to "F" (very stable). Stability class "D" (neutral) was used to model the free-flow and hotspot portions of the project corridor.

Wind Angle. The wind angle may vary from 0° to 360°, depending on the receptor site locations. The computer model has the flexibility of requiring the program to conduct an incremental worst-case wind angle search. A wind angle search in increments of 1° was used to determine the worst-case wind angle for this analysis.

Surface Roughness. Local terrain characteristics, or surface roughness, can affect the dispersion of pollutants. Surface roughness can range from 1 cm (0.4 inch) for flat, level terrain to 500 cm (16.4 feet) for urban areas (e.g., central business district). A roughness of 175 cm (office business commercial area) was used for the analysis.

Mixing Height. The mixing height was assigned a value of 1,000 meters (3,280 feet).

Background Concentrations. All CO concentrations emitted by sources other than those being modeled are considered background concentrations. They originate from either nearby parking lots or nearby adjacent intersections. For the purposes of this study, one-hour and eight-hour background concentrations of 2.0 ppm and 1.2 ppm, respectively, were used.

In addition to meteorological input data, the computer model requires the roadway and receptor site geometries to be defined within a Cartesian coordinate system. Roadway segments are defined as free-flow links each having a constant width, height, traffic volume, and emission factor. Receptors are located where the maximum total projected pollutant concentration is most likely to occur, as described above.

The air quality impacts analysis associated with the existing alignment, the No-Build, and the Build Alternatives were based on average daily traffic (ADT) and peak hourly volume projections for the year 2035 developed for this project.

The modeling procedure described above was used to predict hourly "worst-case" CO concentrations. One-hour and eight-hour concentrations were calculated for comparison with NAAQS. Eight-hour concentrations were determined by subtracting the one-hour background concentration from the total one-hour concentration, then multiplying this value by the persistence factor. A persistence factor of 0.7 was used to account for the variation in traffic and meteorological conditions over an eight-hour period. The eight-hour background concentration was added to arrive at the total eight-hour concentration.

5.2.2 $PM_{2.5}$

On March 10, 2006, the U.S. Environmental Protection Agency (EPA) published a Final Rule (71 FR 12468) that establishes transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas. A quantitative PM hot-spot analysis using EPA's MOVES emission model is required only for those projects that are identified as projects of local air quality concern. The interagency consultation process is used to determine which projects require quantitative hot-spot analyses and to determine the methods and procedures for such analyses.

EPA released guidance for quantifying the local air quality impacts of certain transportation projects for the $PM_{2.5}$ and PM_{10} NAAQS on December 10, 2010 (EPA-420-B-10-040). This guidance must be used by state and local agencies to conduct quantitative hot-spot analyses for new or expanded highway or transit projects with significant increases in diesel traffic in nonattainment or maintenance areas.

The conformity rule requires that federal, state and local transportation and air quality agencies establish formal procedures for interagency coordination. This analysis included participation from the FHWA Indiana Division and Resource Center, Indiana Department of Environmental Management (IDEM), Indiana Department of Transportation (INDOT), Indianapolis Metropolitan Planning Organization (MPO), EPA Office of Transportation and Air Quality (OTAQ), and EPA Region 5. Interagency consultation provides an opportunity to reach agreements on key assumptions to be used in conformity analyses, strategies to reduce mobile source emissions, specific impacts of major projects, issues associated with travel demand and emissions modeling for hot-spot analyses. 40 CFR 93.105(c)(1)(i) requires interagency consultation to "evaluate and choose models and associated methods and assumptions." For this project, an interagency consultation meeting was conducted on April 19, 2013. A follow-up meeting was conducted on April 29, 2013 to finalize key decisions.

Section 93.109(b) of the conformity rule outlines the requirements for project-level conformity determinations. A $PM_{2.5}$ hot-spot analysis is required for projects of local air quality concern, per Section 93.123(b)(1). The need for a quantitative $PM_{2.5}$ analysis for I-69 Section 5 was discussed by the ICG. It was noted that the project is located in a PM2.5 nonattainment area (Morgan County) with an increase in the number of diesel vehicles expected in future years. The ICG agreed that a project level hot-spot analysis would be conducted for I-69 Section 5 although the group did not conclude that the project was a Project of Air Quality Concern. A technical report on the $PM_{2.5}$ analysis is included as **Appendix OO**, *Project Level Conformity Determination.*

5.2.3 Ozone

Morgan County was designated as a nonattainment area for the 1997 8-hour ozone standard (Former Subpart 1). This designation was based on monitoring data from 2004-2006. "Subpart 1" areas are 8-hour nonattainment areas that are covered under Subpart 1, Part D, Title I of the Clean Air Act. "Subpart 1" is not a classification, but is included in the table as an indication of the requirements under the CAA that apply to these areas. On June 8, 2007, the United States Court of Appeals vacated the Subpart 1 portion of the Phase 1 Rule (Court Order). The Subpart 1 areas in The Green Book Non-Attainment Areas for Criteria Pollutants are listed as "Former Subpart 1" until reclassification of the areas is finalized. Morgan County was re-designated from nonattainment to attainment "maintenance" for 8-hour ozone on October 19, 2007.

The Indianapolis MPO adopted the 2035 Long-Range Transportation Plan: 2012 Amendment that includes the approved Section 5 project corridor and corresponding "Air Quality Conformity Determination Report," dated July 23, 2012. Note: As of July 20, 2013, conformity for the 1997 ozone standard was revoked for transportation conformity purposes. However, as noted, the project is included in the most recent Plan and TIP.

5.2.4 MSAT

A qualitative analysis of MSAT was performed for Section 5 of I-69 as the forecasted daily traffic volumes do not reach the significantly higher threshold level indicative of needing a quantitative analysis. The qualitative analysis for projects with low potential MSAT effects involves a comparison of the VMT for the Build and No Build conditions because the amount of MSAT emitted is proportional to VMT.

5.2.5 GHG

No analysis of the GHG emissions or climate change effects of each of the alternatives was performed because the potential change in GHG emissions is very small in the context of the affected environment. Because of the insignificance of the GHG impacts, those impacts will not be meaningful to a decision on the environmentally preferable alternative or to a choice among alternatives. FHWA is working to develop strategies to reduce transportation's contribution to GHGs - particularly CO_2 emissions - and to assess the risks to transportation systems and services from climate change. FHWA will continue to pursue these efforts as productive steps to address this important issue. Finally, construction best practices will represent practicable project-level measures that, while not substantially reducing global GHG emissions, may help reduce GHG emissions on an incremental basis and could contribute in the long term to meaningful cumulative reduction when considered across the Federal-aid highway program.

6.0 AIR QUALITY ANALYSIS

6.1 Ozone

Morgan County is a maintenance area for 8-hour ozone. Mobile sources (cars and trucks) contribute to the generation of ozone by emitting hydrocarbons (also known as volatile organic compounds, or VOCs), and NOx. Air quality modeling is required to demonstrate that the projects in the Indiana Statewide Transportation Improvement Program (INSTIP) and Statewide Long-Range Transportation Plan conform.

The Indianapolis MPO amended its 2035 Transportation Plan on June 6, 2012 and the July 23, 2012 Conformity Analysis/Finding found I-69 Section 5 to conform to the updated SIP budget (using MOVES and 2009 Indiana fleet mix data).

USEPA issued a Federal Register Notice on April 30, 2012 designating non-attainment areas for the new more restrictive 8-hour Ozone Standard (2008 standard of 0.075 ppm, rather than 1997 0.08 standard in which Morgan County was determined "maintenance"). The air quality in Indiana has improved to the point that the only two areas in Indiana have been determined non-attainment of the new more restrictive standard: Cincinnati (Lawrenceburg Township in Dearborn County, Indiana) and the Chicago Area (Lake & Porter County in Northwest Indiana). Morgan County is listed as attainment to the new more restrictive 8-hour ozone standard.

USEPA revoked the 1997 8-hour Ozone standard for purposes of demonstrating conformity effective July 20, 2013. FHWA will no longer need to demonstrate conformity to the ozone SIP for Central Indiana (including Morgan County) once the 1997 8-hour Ozone Standard is revoked for purposes of demonstrating conformity since the region attains the new 8-hour ozone standard (http://www.epa.gov/ozonedesignations/2008standards/final/region5f.htm).

USEPA also issued a Federal Register Notice on June 21, 2012 (see http://www.gpo.gov/fdsys/pkg/FR-2012-06-21/html/2012-14949.htm) that found the updated Central Indiana 8-hour Ozone SIP (1997 NAAQS) adequate for conformity demonstration purposes. The 8-hour Ozone SIP was updated using MOVES and the 2009 Indiana fleet mix data. This new maintenance SIP budget became effective July 23, 2012.

6.2 CO

The results of the analyses conducted for the project-level Existing Condition, future No Build Condition, Refined Preferred Alternative 8 are summarized in Table 1. There were zero (0) predicted impacts.

Existing Condition. The results of the Existing Condition analysis indicate that the highest predicted 1-hour concentration of CO is 4.8 ppm, while the highest 8-hour concentration is 3.1 ppm. The results indicate that the total concentrations are well below both the 1-hour (35 ppm) and 8-hour (9 ppm) NAAQS criteria.

Future No-Build Condition. The results of the analysis for the future No-Build Condition analysis indicate that the highest predicted 1-hour concentration is 3.5 ppm, while the highest 8-hour concentration is 2.3 ppm. The results indicate that the total concentrations are well below both the 1-hour (35 ppm) and 8-hour (9 ppm) NAAQS criteria. When compared to the Existing Condition, the predicted 1-hour and 8-hour CO concentrations for the future No-Build Condition are decreased.

Refined Preferred Alternative 8. The results of the analysis indicate that the highest 1-hour concentration is 3.6 ppm, while the highest 8-hour concentration is 2.3 ppm, both below the NAAQS criteria. When compared to the Existing Condition and the future No-Build Condition, the 1-hour and 8-hour CO concentrations for the Refined Preferred Alternative are predicted to decrease over the Existing Condition and slightly increase over the future No-Build Condition.

Free-Flow Section Analysis. The maximum 1-hour CO concentration for the Refined Preferred Alternative 8 is 2.7 ppm, while the highest 8-hour concentration is 1.7 ppm. None of the CO values pertaining to I-69, either now (SR 37) or in 2035, exceeds the NAAQS criteria.

None of the CO values pertaining to this section of I-69, either now or in 2035, exceed the ambient air quality standards mandated by the US Environmental Protection Agency. Table 1 shows the CO concentrations for both the intersection hot-spot and free-flow analyses:

Table 1: Maximum 1-Hour and 8-Hour CO Concentrations (ppm)

Modeled Segment	Modeled Location	Existing Roadway Network		Future No-Build Year 2035		Refined Preferred Build Alternative 8 Year 2035	
		1-Hr.	8-Hr.	1-Hr.	8-Hr.	1-Hr.	8-Hr.
Intersection	SR 48/Southbound entrance ramp with I-69 and nearby SR 48/Gates Drive intersection	4.8	3.1	3.5	2.3	3.6	2.3
Free-flow	Existing SR 37/Future I-69 between SR 48 and SR45	2.7	1.7	2.6	1.7	2.7	1.7

National Ambient Air Quality Standards: 1-hour: 35.0 parts per million (ppm); 8-hour: 9.0 ppm

Background CO Concentrations: 1-hour: 2.0 ppm; 8-hour: 1.2 ppm

6.3 $PM_{2.5}$

In ICG discussions regarding I-69 Section 5, the length of the project falling within the Indianapolis $PM_{2.5}$ non-attainment area was selected as a starting point in determining the geographic area impacted by the project. Results from regional traffic modeling were compiled and evaluated for locations within the Morgan County portion of the project (e.g. within the nonattainment area) and for other nearby areas that could be affected by the project. The location that was determined to potentially have the highest traffic and emissions is the interchange of I-69 with SR 39. This interchange falls just out of the Section 5 project study area but within the $PM_{2.5}$ hot-spot analysis area due to its potential to be influenced by the project. This interchange was chosen for evaluation to ensure that the location with the greatest likelihood to cause a potential exceedance would still meet the applicable NAAQS.

The results of the analyses conducted for the Refined Preferred Alternative 8 for the years 2018 and 2035 are summarized in Table 2. There were zero (0) predicted impacts. Analyses were conducted for the location with the highest expected concentration levels for the 2018 and 2035 analysis years. $PM_{2.5}$ concentrations were combined to determine design values that were compared to the NAAQS for each analysis year. The annual $PM_{2.5}$ design values are defined as the average of three consecutive years' annual averages, each estimated using equally-weighted quarterly averages. This NAAQS is met when the three-year average concentration is less than or equal to the 1997 annual $PM_{2.5}$ NAAQS. The interagency consultation process played an integral role in defining the need, methodology and assumptions for the analysis.

The analysis demonstrated transportation conformity for the project by determining that future design value concentrations for the 2018 and 2035 analysis year will be lower than the 1997 annual $PM_{2.5}$ NAAQS of 15.0 $\mu g/m^3$. As a result, the project does not create a violation of the 1997 annual $PM_{2.5}$ NAAQS, worsen an existing violation of the NAAQS, or delay timely attainment of the NAAQS and interim milestones, which meets 40 CFR 93.116 and 93.123 and supports the project level conformity determination. A separate technical report on this modeling analysis is included as **Appendix OO**, *Project Level Conformity Determination.*

Table 2: Maximum 2018 and 2035 $PM_{2.5}$ Concentrations ($\mu g/m^3$)

Analysis Year	Background Concentration	AERMOD Modeling Results	Design Value (rounded to one decimal per EPA Guidance)
2018	10.43	0.99	11.4
2035	10.43	0.70	11.1

Notes: Modeling results are for the receptors with the maximum concentration.
1997 annual PM2.5 NAAQS is 15 $\mu g/m^3$
$\mu g/m^3$ = micrograms per cubic meter

6.4 MSAT

On September 30, 2009, FHWA issued an interim guidance update to the February 3, 2006, interim guidance on addressing MSAT in NEPA documents. The guidance is considered interim because MSAT analysis research is still ongoing. As the science progressed, FHWA issued updated interim guidance on Mobile Source Air Toxic Analysis in NEPA on December 6, 2012.

In addition to the NAAQS, USEPA also regulates air toxics. The CAAA of 1990 identified 188 air toxics, also known as hazardous air pollutants. USEPA has assessed this expansive list of toxics and identified a group of 93 compounds as mobile source air toxics, which are set forth in the latest USEPA rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007). USEPA also extracted a subset of this list of 93 that include: acrolein, benzene, 1,3-butadiene, diesel particulate matter/diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter. A summary of these seven pollutant's health effects is presented here:

- Acrolein – the potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- Benzene – characterized as a known human carcinogen.
- 1,3-butadiene – characterized as carcinogenic to humans by inhalation.

- Diesel Exhaust (DE) – likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis.
- Formaldehyde – a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- Naphthalene – the USEPA has classified naphthalene as a possible human carcinogen. Acute exposure of humans to naphthalene by inhalation, ingestion, and dermal contact is associated with hemolytic anemia, damage to the liver, and neurological damage. Cataracts have also been reported in workers acutely exposed to naphthalene by inhalation and ingestion.
- Polycyclic Organic Matter (POM) – defines a broad class of compounds that includes the polycyclic aromatic hydrocarbon compounds (PAHs), of which benzo[a]pyrene is a member. Cancer is the major concern from exposure to POM. The USEPA has classified seven PAHs (benzo[a]pyrene, benz[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene) as probable human carcinogens.

Some of these toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics result from engine wear or from impurities in oil or gasoline. While these MSATs are considered the priority transportation toxics, USEPA stresses that the lists are subject to change and may be adjusted in future revisions to the rules.

The 2007 USEPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis, the total annual emission rate for the priority MSAT will be reduced even if vehicle-miles of travel increase.

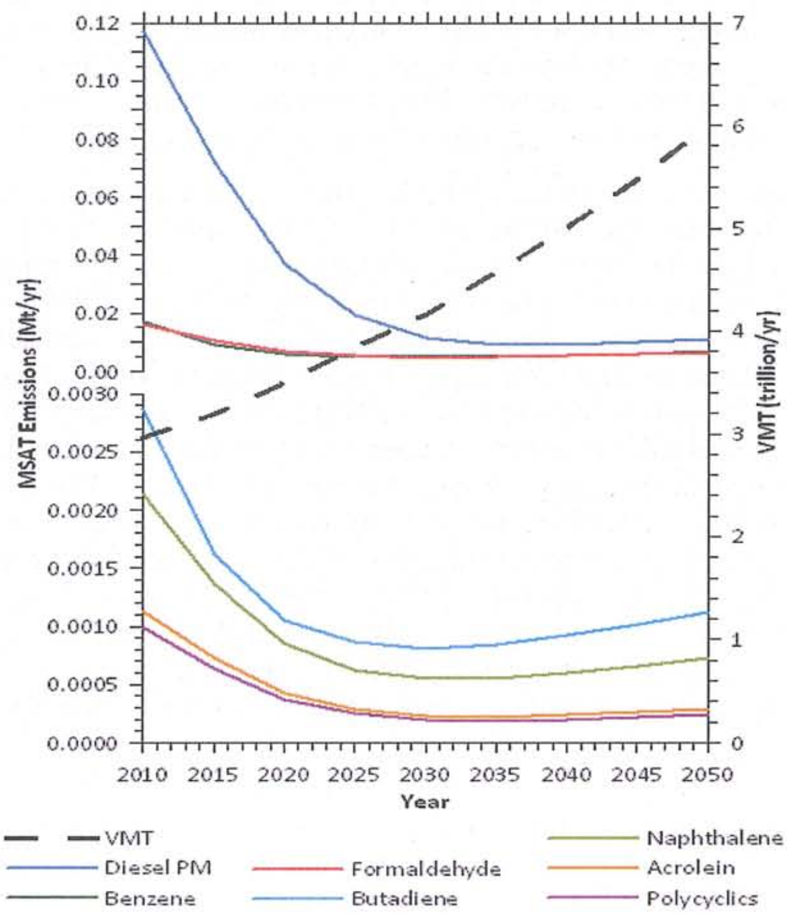
Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede FHWA's ability to evaluate how mobile source health risks should factor into project-level decision-making under NEPA. In addition, USEPA has not established regulatory concentration targets for the seven relevant MSAT pollutants appropriate for use in the project development process. Given the emerging state of the science and of project-level analysis techniques, there are no established criteria for determining when MSAT emissions should be considered a significant issue in the NEPA context.

Nonetheless, air toxics concerns continue to be raised on transportation projects during the NEPA process. As the science emerges, FHWA is increasingly expected by the public and other agencies to address MSAT impacts in its environmental documents. FHWA has issued an interim guidance on how MSATs should be addressed in NEPA documents for highway projects while research is ongoing to try to more clearly define potential risks from MSAT emissions associated with transportation projects. FHWA will continue to monitor the developing research in this emerging field.

The FHWA has developed a three tiered approach for analyzing MSAT in NEPA documents, depending on specific project circumstances. For the design year 2035, I-69, Section 5 is forecasted to have an average daily traffic (ADT) of approximately 77,300 vehicles per day (VPD) as the highest volume for Refined Preferred Alternative 8. Since traffic for the design year 2035 falls below 140,000 to 150,000 ADT, I-69 falls into the second analysis level involving a qualitative analysis for projects with low potential MSAT effects.

USEPA has existing and newly promulgated mobile source control programs that include the reformulated gasoline program, national low emission vehicle standards, Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, heavy duty engine and vehicle standards, and on-highway diesel fuel sulfur control requirements. Thus, USEPA regulations for vehicles engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on an FHWA analysis using USEPA's MOVES2010b model, as shown in Figure 1, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period as shown in Figure 1.The U.S. Department of Transportation (USDOT) and FHWA are currently working with USEPA to develop and evaluate the technical tools necessary to perform air toxics analysis, including improvements to emissions models and air quality dispersion models. FHWA's ongoing work in air toxics includes a research program to determine and quantify the contribution of mobile sources to air toxic emissions, the establishment of policies for addressing air toxics in environmental reports, and the assessment of scientific literature on health impacts associated with motor vehicle toxic emissions.

Figure 1: National MSAT Emission Trends 2010-2050 for Vehicles Operating on Roadways Using EPA's MOVES2010b Model



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors
Source: USEPA MOVES2010b model runs conducted during May - June 2012 by FHWA.

6.4.1 Availability of Information for Project Specific MSAT Impact Analysis

As noted, the science and modeling of project specific MSAT impacts has not developed to the point where there is certainty or scientific community acceptance on predicting the impacts from transportation projects. Accordingly, information on MSAT impacts on any of the alternatives evaluated in this FEIS is not available, and the means to obtain this information are not currently known. When this is the case, 40 CFR 1502.22(b) requires FHWA to address four provisions: (1) a statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.

6.4.2 Project Specific MSAT Impact Analysis

This FEIS includes a qualitative analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable prediction of the project-specific health impacts of the emission changes associated with the alternatives in this FEIS. Due to these limitations, the following information[1] is included in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22), including a discussion of unavailable information for project specific MSAT Health Impacts Analysis:

> ***Information that is Unavailable or Incomplete.*** *In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more the uncertainly introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.*
>
> *The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The US EPA is in the continual process of assessing human effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.*
>
> *Other organizations are also active in the research and analyses of the human effects of MSAT, including the Health Effects Institute (HEI). Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the*

[1] The source of the text is http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm .

exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

In this document, FHWA provides a qualitative assessment that acknowledges that the project Alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain. Because of this uncertainty, the health effects from these emissions cannot be estimated.

6.4.3 MSAT Qualitative Analysis

For each alternative in this document, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT), assuming that other variables such as fleet mix are the same for each alternative. The VMT (derived by multiplying the AADT for each road link times its distance) estimated for each of the Build Alternatives is slightly higher than that for the No-Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network.

Table 3 shows the VMT for the greatest volume link for each alternative. The highest predicted road link traffic volume for the build alternatives 4, 5 and 6 is between SR46 and SR 48/3rd Street (~1.9 miles). The highest predicted road link traffic volume for the build alternatives 7, 8 and the Refined Preferred Alternative 8 is between SR 45/2nd Street and SR 48/3rd Street (~1.2 miles). In order to compare the alternatives on an equal distance footing, the entire road length between SR 45/2nd Street and SR 46 was included.

Table 3: VMT For Alternatives

Design Year No-Build	Build Alternatives					
	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8	Refined Preferred Alternative 8
196,383	231,100	245,000	236,500	244,700	244,800	236.800

Note: The VMT is based on ADT (daily) values

This increase in VMT would lead to higher MSAT emissions for the build alternatives. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases would offset VMT-related emissions increases cannot be reliably projected due to the inherent imprecision of technical models. Because the estimated VMT under each of the Build Alternatives are nearly the same, varying by approximately 7% between the highest and the lowest values, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce annual MSAT emissions by 83% between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases. Additionally, any diversion from the local road system to this facility will benefit the roads that may have lower predicted volumes as a result.

In this document, a qualitative MSAT assessment has been provided relative to the various alternatives of MSAT emissions and has acknowledged that some of the project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated. MSAT emissions are projected to decrease substantially in the future as a result of new USEPA programs to reduce MSAT emissions nationwide. As a result, the I-69 Section 5 project is expected to result in low potential MSAT effects.

6.5 GHG

Climate change is an important national and global concern. While the earth has gone through many natural changes in climate in its history, there is general agreement that the earth's climate is currently changing at an accelerated rate and will continue to do so for the foreseeable future. Anthropogenic (human-caused) greenhouse gas (GHG) emissions contribute to this rapid change. Carbon dioxide (CO_2) makes up the largest component of these GHG emissions. Other prominent transportation GHGs include methane (CH_4) and nitrous oxide (N_2O).

Many GHGs occur naturally. Water vapor is the most abundant GHG and makes up approximately two thirds of the natural greenhouse effect. However, the burning of fossil fuels and other human activities are adding to the concentration of GHGs in the atmosphere. Many GHGs remain in the atmosphere for time periods ranging from decades to centuries. GHGs trap heat in the earth's atmosphere. Because atmospheric concentration of GHGs continues to climb, our planet will continue to experience climate-related phenomena. For example, warmer global temperatures can cause changes in precipitation and sea levels.

To date, no national standards have been established regarding GHGs, nor has EPA established criteria or thresholds for ambient GHG emissions pursuant to its authority to establish motor vehicle emission standards for CO_2 under the Clean Air Act. However, there is a considerable body of scientific literature addressing the sources of GHG emissions and their adverse effects on climate, including reports from the Intergovernmental Panel on Climate Change, the US National Academy of Sciences, and EPA and other Federal agencies. GHGs are different from other air pollutants evaluated in Federal environmental reviews because their impacts are not localized or regional due to their rapid dispersion into the global atmosphere, which is characteristic of these gases. The affected environment for CO_2 and other GHG emissions is the entire planet. In addition, from a quantitative perspective, global climate change is the cumulative result of numerous and varied emissions sources (in terms of both absolute numbers and types), each of which makes a relatively small addition to global atmospheric GHG concentrations. In contrast to broad scale actions such as actions involving an entire industry sector or very large geographic areas, it is difficult to isolate and understand the GHG emissions impacts for a particular transportation project. Furthermore, presently there is no scientific methodology for attributing specific climatological changes to a particular transportation project's emissions.

Under NEPA, detailed environmental analysis should be focused on issues that are significant and meaningful to decision-making. FHWA has concluded, based on the nature of GHG emissions and the exceedingly small potential GHG impacts of the proposed action, as discussed below and shown in Table 4, that the GHG emissions from the proposed action will not result in "reasonably foreseeable significant adverse impacts on the human environment" (40 CFR 1502.22(b)). The GHG emissions from the project build alternatives will be insignificant, and will not play a meaningful role in a determination of the environmentally preferable alternative or the selection of the preferred alternative. More detailed information on GHG emissions "is not essential to a reasoned choice among reasonable alternatives" (40 CFR 1502.22(a)) or to making a decision in the best overall public interest based on a balanced consideration of transportation, economic, social, and environmental needs and impacts (23 CFR 771.105(b)). For these reasons, no alternatives-level GHG analysis has been performed for this project.

The context in which the emissions from the proposed project will occur, together with the expected GHG emissions contribution from the project, illustrate why the project's GHG emissions will not be significant and will not be a substantial factor in the decision-making. The transportation sector is the second largest source of total GHG emissions in the U.S., behind electricity generation. The transportation sector was responsible for approximately 27 percent of all anthropogenic (human caused) GHG emissions in the U.S. in 2010 (Calculated from data in U.S. Environmental Protection Agency, Inventory of Greenhouse Gas Emissions and Sinks, 1990-2010). The majority of transportation GHG emissions are the result of fossil fuel combustion. CO_2 makes up the largest component of these GHG emissions. U.S. CO_2 emissions from the consumption of energy accounted for about 18 percent of worldwide energy consumption CO_2 emissions in 2010 (Calculated from data in U.S. Energy Information Administration International Energy Statistics, Total Carbon Dioxide Emissions from the Consumption of Energy, http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=90&pid=44&aid=8). U.S. transportation CO_2 emissions accounted for about 6 percent of worldwide CO_2 emissions (Calculated from data in EIA figure 104: http://www.eia.gov/forecasts/archive/ieo10/emissions.html and EPA table ES-3: : http://epa.gov/climatechange/emissions/downloads11/US-GHG-Inventory-2011-Executive-Summary.pdf).

While the contribution of GHGs from transportation in the U.S. as a whole is a large component of U.S. GHG emissions, as the scale of analysis is reduced the GHG contributions become quite small. Using CO_2 because of its predominant role in GHG emissions, Table 4 below presents the relationship between current and projected Indiana highway CO_2 emissions and total global CO_2 emissions, as well as information on the scale of the project relative to statewide travel activity.

Based on emissions estimates from EPA's MOVES model and global CO_2 estimates and projections from the Energy Information Administration, CO_2 emissions from motor vehicles in the entire state of Indiana contributed less than one half of one percent of global emissions in 2010 (0.141%), as shown in Table 4. These emissions are projected to contribute an even smaller fraction (0.105%) in 2035. Annual VMT in the project study area represents 2.22% of total Indiana travel activity; and the project itself would increase statewide VMT by 0.2%. (Note that the project study area includes travel on many other roadways in addition to the proposed project.) As a result, based on the Refined Preferred Alternative 8 VMT, FHWA estimates that the proposed project could result in a potential increase in global CO_2 emissions in 2035 of 0.0002% (less than one thousandth of one percent), and a corresponding increase in Indiana's share of global emissions in 2035 of 0.2%. This very small change in global emissions is well within the range of uncertainty associated with future emissions estimates.

Table 4: Statewide and Projected Emissions Potential, Related to Global Totals

	Global CO2 Emissions, MMT [2]	Indiana Motor Vehicle CO_2 Emissions, MMT [3]	Indiana Motor Vehicle Emissions, % of Global Total	Annual Project Study Area VMT (Monroe and Morgan Counties), % of Statewide Emissions	Percent Change in Statewide VMT due to the Project
Current Conditions (2010)	29,670	41.86	0.141%	1,598 (in millions) 2.04%	(Not Applicable)
Future Projection (2035)	42,862	45.19	0.105%	2,652 (in millions) 2.22%	0.2%

Table notes: MMT = million metric tons. Global emissions estimates are from International Energy Outlook 2010, data for Figure 104, prorated to 2035. Indiana emissions and statewide VMT estimates are from MOVES2010b.

Mitigation for Global GHG Emissions

To help address the global issue of climate change, USDOT is committed to reducing GHG emissions from vehicles traveling on our nation's highways. USDOT and EPA are working together to reduce these emissions by substantially improving vehicle efficiency and shifting toward lower carbon intensive fuels. The agencies have jointly established new, more stringent fuel economy and first ever GHG emissions standards for model year 2012-2025 cars and light trucks, with an ultimate fuel economy standard of 54.5 miles per gallon for cars and light trucks by model year 2025. Further, on September 15, 2011, the agencies jointly published the first ever fuel economy and GHG emissions standards for heavy-duty trucks and buses. Increasing use of technological innovations that can improve fuel economy, such as gasoline- and diesel-electric hybrid vehicles, will improve air quality and reduce CO_2 emissions future years.

Consistent with its view that broad-scale efforts hold the greatest promise for meaningfully addressing the global climate change problem, FHWA is engaged in developing strategies to reduce transportation's contribution to GHGs - particularly CO_2 emissions - and to assess the risks to transportation systems and services from climate change. In an effort to assist States and MPOs in performing GHG analyses, FHWA has developed a Handbook for Estimating Transportation GHG Emissions for Integration into the Planning Process. The Handbook presents methodologies reflecting good practices for the evaluation of GHG emissions at the transportation program level, and will demonstrate how such evaluation may be integrated into the transportation planning process. FHWA has also developed a tool for use at the statewide level to model a large number of GHG reduction scenarios and alternatives for use in transportation planning, climate action plans, scenario planning exercises, and in meeting state GHG reduction targets and goals. To assist states and MPOs in assessing climate change vulnerabilities to their transportation networks, FHWA has developed a draft vulnerability and risk assessment conceptual model and has piloted it in several locations.

At the state level, project planning activities are key to reducing GHG from transportation projects and mitigation of GHGs. To this end, Indiana has identified measures to mitigate emissions from transportation and to prepare infrastructure in the state for current and future impacts of climate change, including; the Indiana Safe Routes to School Partnership, Indiana State Rail Plan, the multi-state initiative (Missouri, Illinois, Indiana and Ohio DOTs) for I-70 dedicated truck lanes, the Indiana 2013-2035 Future Transportation Needs Report and the High Speed Intercity Passenger Rail program, as examples.

Project-level mitigation measures will not have a substantial impact on global GHG emissions because of the exceedingly small amount of GHG emissions involved. Nonetheless, to reduce GHG emissions during construction, best practice measures will be adopted as mitigation commitments are made. These activities are part of a program-wide effort by FHWA to adopt practical means to avoid and minimize environmental impacts in accordance with 40 CFR 1505.2(c).

Summary

This document does not incorporate a detailed analysis of the GHG emissions or climate change effects of each of the alternatives because the potential change in GHG emissions is very small in the context of the affected environment. Because of the insignificance of the GHG impacts, those impacts will not be meaningful to a decision on the environmentally preferable alternative or to a choice among alternatives. As outlined above, FHWA is working to develop strategies to reduce transportation's contribution to GHGs - particularly CO_2 emissions - and to assess the risks to transportation systems and services from climate change. FHWA will continue to pursue these efforts as productive steps to address this important issue. Finally, the construction best practices described above represent practicable project-level measures that, while not substantially reducing global GHG emissions, may help reduce GHG emissions on an incremental basis and could contribute in the long term to meaningful cumulative reduction when considered across the Federal-aid highway program.

7.0 SUMMARY AND CONCLUSIONS

Pursuant to the 1990 CAA Amendments, Monroe County has been designated as being in attainment for all the NAAQS criteria pollutants. Morgan County has been designated as a maintenance area for the 1997 8-hour ozone standard and nonattainment for $PM_{2.5}$.

The $PM_{2.5}$ hot-spot analysis had demonstrated transportation conformity for the project by determining that future design value concentrations for the 2018 and 2035 analysis year will be lower than the 1997 annual $PM_{2.5}$ NAAQS of 15.0 $\mu g/m^3$. As a result, the project does not create a violation of the 1997 annual $PM_{2.5}$ NAAQS, worsen an existing violation of the NAAQS, or delay timely attainment of the NAAQS and interim milestones, which meets 40 CFR 93.116 and 93.123 and supports the project level conformity determination.

Section 5 passes through CO attainment areas for NAAQS, and a conformity demonstration is not required at the regional-level or project-level. However, results of project level CO project-level and the free-flow section analyses (which were measured at the worst-case scenario locations) for the Build Alternative indicate no violation of the CO NAAQS. As a result, there are no local air quality impacts for CO.

Morgan County is a maintenance area for 8-hour ozone. Mobile sources (cars and trucks) contribute to the generation of ozone by emitting hydrocarbons (also known as volatile organic compounds, or VOCs), and NOx. The Indianapolis MPO amended its 2035 Transportation Plan on June 6, 2012 and the July 23, 2012 Conformity Analysis/Finding found I-69 Section 5 to conform to the updated SIP budget (using MOVES and 2009 Indiana fleet mix data). USEPA also issued a Federal Register Notice on June 21, 2012 (see http://www.gpo.gov/fdsys/pkg/FR-2012-06-21/html/2012-14949.htm) that found the updated Central Indiana 8-hour Ozone SIP (1997 NAAQS) adequate for conformity demonstration purposes. The 8-hour Ozone SIP was updated using MOVES and the 2009 Indiana fleet mix data. This new maintenance SIP budget became effective July 23, 2012.

Based on the Refined Preferred Alternative 8 VMT, FHWA estimates that the proposed project could result in a potential increase in global GHG CO_2 emissions in 2035 of 0.0002% (less than one thousandth of one percent), and a corresponding increase in Indiana's share of global emissions in 2035 of 0.2%. This very small change in global emissions is well within the range of uncertainty associated with future emissions estimates.

Finally, although regional and localized increases in MSAT emissions are expected for the Build Alternative over the No Build Condition, total MSAT emissions are projected to decrease substantially in the future compared to the present because of new USEPA programs to reduce MSAT emissions nationwide. Thus, the I-69 Section 5 project is expected to result in low potential MSAT effects.

8.0 REFERENCES

Michael Baker Jr., Inc. Air Quality Technical Report: I-69 Section 5, Evansville to Indianapolis Tier 2 Draft EIS, SR 37 to SR 39. August, 2012.

Shrouds, J. and Borinsky, S. "Memorandum: Clarification of Transportation Conformity Requirements for FHWA/FTA Projects Requiring Environmental Impact Statement". Federal Highway Administration, Federal Transit Administration, May 20, 2003.

United States Department of Transportation "CAL3Q Interface", FHWA Resource Center, U.S. Department of Transportation, September 13, 2005. Updated, October 30, 2008.

United States Department of Transportation/Federal Highway Administration, "Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA," Air Quality, Transportation & Toxic Air Pollutants, December 6, 2012, Available online at: http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidmem.cfm.

United States Environmental Protection Agency "Motor Vehicle Emission Simulator" (MOVES2010b), Office of Transportation and Air Quality (OTAG), USEPA, October 30, 2012.

United States Environmental Protection Agency. The Green Book Non-Attainment Areas for Criteria Pollutants. As of March 1, 2013. Available online at: http://www.epa.gov/oaqps001/greenbk/.

United States Environmental Protection Agency, "User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections." Document #EPA-454/R-92-006 (Revised). Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, September 1995.

United States Environmental Protection Agency "Motor Vehicle Emission Simulator" (MOVES2010b), Office of Transportation and Air Quality (OTAG), USEPA, October 30, 2012. Available online at: http://www.epa.gov/otaq/models/moves/index.htm

United States Environmental Protection Agency. Air Pollution Criteria. Available online at: http://www.epa.gov/air/criteria.html.

United States Environmental Protection Agency. 2010. Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas" (EPA-420-B-10-040). Available online at: http://www.epa.gov/otaq/stateresources/transconf/policy/420b10040.pdf