5.7 Air Quality Impacts

There are two objectives to the air quality analysis. First, in accordance with NEPA, the air quality analysis provides information on the mobile source emissions associated with each alternative. Second, in accordance with Section 176(c) of the Clear Air Act, the air quality analysis will be used to demonstrate that the selected alternative is in conformity with applicable air quality plans. The No-Build Alternative would result in no significant impacts to air quality.

Air quality impacts are both regional (i.e., meso-scale concerns) and local (i.e., micro-scale concerns) in scope. This chapter addresses both regional and local air quality concerns for the alternatives. Having chosen Alternative G-Es as the preferred alternative, conformity with the applicable State Implementation Plan (SIP) ozone emission budgets and national carbon monoxide standards is demonstrated in the FEIS.

5.7.1 Comparative Analysis of Alternatives

5.7.1.1 Methodology

To assess the regional air quality impacts and demonstrate US 31 Improvement Project conformity, vehicle-miles of travel (VMT) for each alternative in St. Joseph and Elkhart counties were converted to mobile source emissions and compared to the mobile source emission budgets from the SIP for the two counties.

The specific steps involved:

(1) Obtaining the VMT by Federal roadway functional classification for each alternative from the US 31 Improvement Project Travel Demand Model to determine the change in VMT from the No-Build Alternative for the year 2030;

(2) Adjusting the VMT by Federal roadway functional classification to the Highway Performance Monitoring System (HPMS) VMT for the year 2000 compared to the VMT for the US 31 Improvement Project Travel Demand Model for the year 2000.

(3) Applying the change for each alternative from the No-Build alternative to the VMT for the adopted LRP in St. Joseph and Elkhart counties for the year 2025 to reflect changes of each alternative to the adopted LRP network;

(4) Applying the unique emission rates per VMT from MOBILE 5 (with the Tier 2 Motor Vehicle Emissions Standards so as to generally approximate MOBILE 6 emissions)[1] and from MOBILE 6 for each county to the VMT for the adopted LRP network with each of the final alternatives to get total daily emissions; and

(5) Comparing the daily emissions for each alternative to the emission budgets established by the SIP for the two-county (St. Joseph and Elkhart) air quality area .

5.7.1.2 Analysis

The results of the comparative air quality analysis appear in Table 5.7.23 for the combination of St. Joseph and Elkhart counties. Excluding the carbon monoxide (CO) SIP budget that is informational only, all alternatives conform to the MACOG "maintenance area" SIP budgets using MOBILE 5 with Tier 2 estimates or MOBILE 6.

Table 5.7.23: Air Quality Emissions Year 2025								
	Alternative							
	LRP* 03/18/02	LRP No Date	LRP 10/26/04	Cs	Es	G-Cs	Preferred Alternative G-Es	SIP *Budget
VOC (Tons/Day)								
Mobile 5	20.663	-	-	-	-	-	-	20.680
Mobile 5 + Tier II	-	19.570	-	19.570	19.582	19.556	**19.571**	-
Mobile 6	-	-	5.973	5.974	5.975	5.972	5.973	-
CO (Tons/Day)**								
Mobile 5	147.360	-	-	-	-	-	-	142.240
Mobile 5 + Tier II	-	147.360		147.854	148.064	147.730	**147.968**	-
Mobile 6	-	-	84.300	84.785	84.789	84.665	**84.704**	-
NOX (Tons/Day)								
Mobile 5	25.153	-	-	-	-	-	-	27.240
Mobile 5 + Tier II	-	17.172	-	17.390	17.406	17.355	**17.381**	-
Mobile 6	-	-	5.385	5.413	5.414	5.406	**5.409**	-

Notes: * MACOG 2025 Transportation Plan Update Air Quality Conformity Analysis (analysis date)
** Informational only as the MACOG Area was always in Attainment for the CO pollutant

The following observations were made concerning the comparative air quality impact analysis for St. Joseph and Elkhart counties.

(1) When changes over the No-Build Alternative VMT are applied to the LRP roadway network for the year 2025, all alternatives result in less VMT than the No-Build Alternative and the adopted LRP (which includes the US 31 Improvement Project).

(2) Relative to total VMT, the alternatives from least to most total VMT are Alternative Cs, Alternative G-Cs, Alternative Es and Preferred Alternative G-Es.

(3) Relative to rural Interstate (i.e., the rural portion of US 31 Improvement Project), the alternatives from least to most total VMT are Alternative G-Cs, Alternative Cs, Preferred Alternative G-Es and Alternative Es. . This reflects the effectiveness of diverting travel from existing US 31 to the Build Alternative.

(4) Relative to urban freeway (i.e., the urban portion of US 31 Improvement Project), the alternatives from least to most total VMT are Preferred Alternative G-Es, Alternative Es, Alternative G-Cs, and Alternative Cs.

(5) Because Mobile 6 emission rates per VMT for VOCs increase as one moves from the highest to lowest roadway functional class (except for rural Interstate), changes in the composition of the total VMT by

roadway functional class affect total emissions. Alternative G-Cs had the lowest VOC emissions followed by Preferred Alternative G-Es, and Alternative Es had the highest VOC emissions.

(6) Because the Mobile 6 CO and NOX emission rates per VMT increase as one moves from the lowest to the highest roadway functional class, the alternatives with a greater concentration of VMT in the highest functional classes (interstates and freeways) have the highest emissions. Thus, Alternative G-Cs had the lowest CO and NOX emissions, and Alternative Es had the highest CO and NOX emissions. Preferred Alternative G-Es has the second lowest CO and NOX emissions.

Because all Build Alternatives fall under the SIP emissions budgets for VOCs and NOX when applied to the MACOG LRP, the selection of an Build Alternative would not jeopardize conformity with the SIP. Thus, the selection of Alternative G-Es as the preferred final alternative conforms with the SIP.

5.7.2 Conformity Findings

The US 31 Improvement Project appears in the MACOG 2025 Transportation Plan Update (March 18, 2002) as New Road Construction from the US 20 Bypass to the St. Joseph County Line. It is further described as a limited access road with interchanges at several locations that would continue to US 30 in Marshall County. As part of the LRP Update, MACOG conducted transportation air quality conformity analyses (see Table 5.7.23), and FHWA/FTA jointly determined the LRP meet transportation conformity requirements. The US 31 Improvement Project has also been included in the MACOG TIP for 2003-2005, and the associated transportation conformity analysis has also been approved by FHWA/FTA. As the US 31 Improvement Project is in an adopted LRP and TIP that have met transportation conformity requirements, the project will not jeopardize MPO air quality conformity with the applicable mobile source emission budgets established in the SIP for St. Joseph and Elkhart counties.

On October 26, 2004, MACOG performed an air quality conformity analysis of the adopted LRP with the alignment and proposed interchanges of the preferred final Alternative G-Es, and demonstrated compliance with applicable SIP emission budgets (see Table 5.7.23). Because the SIP emission budgets are based on tons of emissions per day, the demonstration of air quality conformity applies to both designation of St. Joseph and Elkhart Counties as a “maintenance” area for the one-hour standard for VOCs and NOX and as a “nonattainment” area for the eight-hour standard for VOCs and NOX.

On March 30, 2005, MACOG performed another Air Quality Transportation Conformity analysis for the new *2030 Long Range Transportation Plan* and the *FY 2005-2007 Transportation Improvement Program* that were adopted by MACOG on April 13, 2005. The 2030 Long Range Transportation Plan continues to include the preferred final Alternative G-Es for US 31 Improvement Project, and the air quality conformity analysis using MOBLE 6.2 resulted in slightly lower emissions (5.52 tons per day of VOC and 5.35 tons per day of NOX) than the analysis of October 26, 2004. On May 24, 2005, the FTA and FHWA concluded that the criteria of the conformity rule have been meet by the MACOG conformity analysis.

5.7.3 Micro-Scale Carbon Monoxide Analysis

5.7.3.1 Setting

Carbon monoxide is a site-specific pollutant, and major concentrations generally are found adjacent to high volume urban roadway intersections. Thus, the micro-scale air quality concerns focus on potential CO “hotspot” (micro-scale) areas.

In the case of the US 31 Improvement Project, the No-Build Alternative results in traffic volume increases of almost

40% by the year 2030 at four signalized intersection (US 6, SR 4, Kern Road and Johnson Road) that have urban uses in all quadrants of the intersections. Most intersection quadrants have highway-oriented commercial uses, but the existing intersections of SR 4 and Johnson Road have one or more quadrants with a residential use.

In the case of the alternatives, the potential interchanges of the freeway are abutted by agricultural uses except for the possible interchange with Kern Road. In the case of Alternatives Cs and G-Cs, the possible Kern Road interchange is surrounded by a mixture of residential and vacant land uses. For the Alternative Cs Kern Road interchange, the approaches to the ramp-crossroad intersections are not less than 100 feet from residential structures that may remain in the northwest and southeast quadrant. For the Alternative G-Cs Kern Road interchange, the approaches to the ramp-crossroad intersections are not less than 100 feet residential structures that may remain in all quadrants.

For Alternative Es and Preferred Alternative G-Es, the Kern Road interchange is abutted on the east by commercial uses and on the west by a mixture of residential and vacant land uses. For the Alternative Es or Preferred Alternative G-Es Kern Road interchange, the approaches to the ramp-crossroad intersections are not less than 100 feet from a residential structure that may remain in the northwest quadrant, a fast-food restaurant in the southeast quadrant, and motel rooms on the northeast quadrant.

5.7.3.2 Methodology

Hot spot air quality analysis was completed along all of the proposed Build Alternatives and the No-Build Alternative using the CAL3QHC mobile source air dispersion model for the one-hour standard of 35 ppm. The areas analyzed along each of the alternatives were five segments between the proposed interchanges: 1) US 30 to East 7th Road, 2) East 7th Road to US 6, 3) US 6 to SR 4, 4) SR 4 to Kern Road, and 5) Kern Road to the US 20 Bypass. This analysis was completed using 2025 CO emissions factors based on Mobile 5 data for St. Joseph and Elkhart counties for the year 2005 (from the MACOG Transportation Air Quality Analysis for the 2025 Transportation Plan Update (March 18, 2002)), and from 2025 traffic data. The CO emissions factors used for this analysis were 12.5 grams per mile for all of the freeway Build Alternatives and 6.9 per mile for the rural arterial No-Build Alternative. Five receptors were set up along all of the alternatives in the areas described above. They were placed 1) 15 feet away from the edge of the pavement, 2) 30 feet away from the edge of pavement, 3) 45 feet from the edge of pavement, the 4) 60 feet from the edge of pavement, and 5) 75 feet away from the edge of the pavement.

5.7.3.4 Results

As shown in Table 5.7.24, the results of this analysis show that no alternative will exceed the 35.0 ppm hour emissions standard for the nearest receptor within 15 feet of the edge of pavement. Thus, the less stringent 8-hour emissions standard of 9.0 ppm will not be exceeded either. The maximum CO emission calculated along the No-Build Alternative was 2.4 ppm between Kern and the US 20 Bypass. The maximum CO emission calculated for Alternative Cs was 2.7 ppm in all locations, except between US 30 and East 7th Road where the CO emissions were 2.5 ppm. The maximum CO emission calculated for Alternatives Es and G-Es were 2.9 ppm between Kern Road and the US 20 Bypass. The maximum CO emission calculated for Alternative G-Cs was 2.7 ppm between SR 4 and Kern Road. A comparison of this analysis shows that the No-Build Alternative will have the lowest CO emissions and that Alternative Es will have the highest CO emissions calculated for the year 2025.

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Table 5.7.24: Predicted Micro-Scale Carbon Monoxide One-Hour Concentrations for Year 2025 (in parts per million)

Segments	Alternative in the Year 2025				
	No-Build	Cs	Es	G-Cs	Preferred Alternative G-Es**
US 30 to East 7th Road*	2.1	2.5	2.5	2.5	2.5
East 7th Road to US 6*	2.3	2.7	2.7	2.6	2.6
US 6 to SR 4	2.3	2.7	2.7	2.5	2.5
SR 4 to Kern Road	2.4	2.7	2.4	2.7	2.7
Kern Road to US 20 Bypass	2.4	2.7	2.9	2.6	2.9

Notes:

* Because the receptor conditions and forecasted daily traffic volumes are similar for the mainline for the DEIS for the interchange at West 5A Road and FEIS for the interchange at East 7th Road, the DEIS analysis of the segments of the alternatives north and south of the West 5A Road interchange is considered applicable to the final alternatives north and south of the East 7th Road interchange. Further, because no CO emissions exceeded the one-hour and eight-hour CO NAAQS for the DEIS segments of all alternatives between US 30 and US 6, no additional hot-spot analysis was performed for the final alternatives with the shift of the proposed interchange from West 5A Road to East 7th Road.

** Based on the results of the DEIS analysis of Alternatives Es and G-Cs, it has been concluded that no CO emissions will exceed the one-hour and eight-hour NAAQS. Thus, no additional hot-spot analysis was performed for the preferred Alternative G-Es whose alignment coincides with portions of Alternatives G-Cs and Es.

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some 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 also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent. As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six

[1] MOBILE 5 Information sheet #8: Tier 2 Benefits Using MOBILE 5; U.S. Environmental Protection Agency; April 2000. "Tier 2" in this context, refers to "Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements" that have been enacted subsequent to the release of the MOBILE 5 emissions factors.

MSATs.

This FEIS includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this FEIS. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

   These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. Dispersion. The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to

determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.

- 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.

- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.

- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.

- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- **Diesel exhaust (DE)** is 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. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems[2]. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions—if any—from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives, found at:

www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm

For each alternative in this FEIS, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. Because the VMT estimated for the No Build Alternative is higher than for any of the Build Alternatives, higher levels of regional MSATs are not expected from any of the Build Alternatives compared to the No-Build. (See Table 3.4.32) In addition, because the estimated VMT under each of the Build Alternatives are nearly the same, varying by less than 2 percent, 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 EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. 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 EPA-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 virtually all locations.

[2] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

Because of the specific characteristics of the project alternatives [i.e. new connector roadways], under each alternative there may be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore it is possible that localized increases and decreases in MSAT emissions may occur. The localized increases in MSAT emissions would likely be most pronounced along the new roadway sections that would be built at all interchange locations, including 7tth Road, US 6, SR 4/Pierce Road, Kern Road, and US 20, under all build alternatives. However, even if these increases do occur, they too will be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations. The localized decreases in MSAT emissions would likely be most pronounced along the existing roadway sections in the populated areas of LaPaz and Lakeville.

In summary, under all Build Alternatives in the design year, it is expected there would be reduced MSAT emissions in the immediate area of the project, relative to the No Build Alternative, due to the reduced VMT associated with more direct routing, and due to EPA's MSAT reduction programs. In comparing various project alternatives, MSAT levels could be higher in some locations than others, but current tools and science are not adequate to quantify them. However on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Summary of Preferred Alternative G-Es

Air quality impacts are both regional (i.e., meso-scale concerns) and local (i.e., micro-scale concerns) in scope. Conformity with the applicable State Implementation Plan (SIP) ozone emission budgets and national carbon monoxide standards was demonstrated for Preferred Alternative G-Es. To assess the regional air quality impacts and demonstrate conformity, vehicle-miles of travel (VMT) in St. Joseph and Elkhart counties were converted to mobile source emissions and compared to the mobile source emission budgets from the SIP for the two counties. Excluding the carbon monoxide (CO) SIP budget that is informational only, Preferred Alternative G-Es conforms to the MACOG "maintenance area" SIP budgets using MOBILE 5 with Tier 2 estimates or MOBILE 6.

Hot spot air quality analysis was completed along the proposed Preferred Alternative G-Es using the CAL3QHC mobile source air dispersion model for the one-hour standard of 35 ppm. The results of this analysis show that Preferred Alternative will not exceed the 35.0 ppm hour emissions standard for the nearest receptor within 15 feet of the edge of pavement. Thus, the less stringent 8-hour emissions standard of 9.0 ppm will not be exceeded either. The maximum CO emission calculated for Preferred Alternative G-Es was 2.9 ppm between Kern Road and the US 20 Bypass.