



## 4.7 Air Quality

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 Clean Air Act, the air quality analysis will be used to demonstrate that the selected alternative is in conformity with applicable air quality plans. Air quality impacts are both regional (i.e., meso-scale concerns) and local (i.e., micro-scale concerns) in scope.

### 4.7.1 Regulatory Setting

#### 4.7.1.1 Overview

The Clean Air Act and the 1990 Clean Air Act Amendments (CAA) required the United States Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants that are considered to be harmful to the public health and environment. The USEPA set forth standards for six principal pollutants – particulate matter (PM), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (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 is known 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. Under the CAA, each state is required to establish a plan for achieving and/or maintaining the NAAQS in nonattainment and maintenance areas. This plan is known as the State Implementation Plan (SIP). In nonattainment or maintenance areas, the Metropolitan Planning Organization (MPO), as the designated agency for transportation planning in the metropolitan area, is required to demonstrate continuing conformity of their Long Range Plan (LRP) and short-range Transportation Improvement Program (TIP) with the mobile emission budgets established in the SIP for air quality. Further, in accordance with the federal transportation metropolitan planning requirements (23 SC 135 and 23 CFR 450), “regionally significant” transportation projects must be included in a LRP and a TIP that have undergone an emissions analysis to demonstrate conformity with the SIP.

#### 4.7.1.2 Applicability

Within the US 31 Improvement Project study area, Marshall County is currently in attainment of the NAAQS, and St. Joseph County is nonattainment for the eight-hour ozone standard. St. Joseph and Elkhart counties were at one time designated marginal nonattainment areas for the one-hour ozone standard (specifically including volatile organic compounds and nitrous oxides, and excluding carbon monoxide) under the Clean Air Act Amendments of 1977, but have carried an air quality “maintenance area” designation since November 30, 1994 for the one-hour ozone standard. On April 15, 2004, St. Joseph and Elkhart counties were identified by the USEPA as nonattainment for the new eight-hour ozone standard. The nonattainment designation for the eight-hour ozone standard became effective on June 15, 2004, and the grace period for demonstrating conformity ended June 15, 2005. Thus, the air quality conformity requirements are applicable to these counties for volatile organic compounds (VOC) and nitrous oxide (NOX) for the eight-hour ozone standard. For all US 31 Build Alternatives, regional air quality analyses were conducted for St. Joseph and Elkhart counties to identify air quality impacts and to evaluate conformity with the SIP using MOBILE 5 emission factors with Tier 2 Motor Vehicle Emissions Standards.<sup>1</sup> Because maintenance of the NAAQS for mobile sources (cars and trucks) in these two counties for ozone is the issue, the regional air quality analyses focus on the three major precursors to ozone – hydrocarbons (also known as volatile organic compounds or

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<sup>1</sup> 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.



VOCs), CO and NOX. However, CO is not considered a major contributor to ozone in St. Joseph and Elkhart counties, and the counties have always been considered attainment areas for NAAQS CO standards.

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).

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 MSATs.

The US 31 Improvement Project appears in the MACOG 2025 Transportation Plan Update (March 18, 2002) for which MACOG conducted transportation air quality conformity analyses. On June 3, 2002, the FHWA and FTA jointly determined that the LRP Update met transportation conformity requirements. The US 31 Improvement Project has also been included in the MACOG TIP for 2004-2006, and the associated transportation conformity analysis has also been approved by FHWA and FTA (November 23, 2003). In January of 2004, MACOG reran the air conformity analyses for the LRP (with the US 31 Improvement Project) using MOBILE 6 as required by FHWA prior to January 29, 2004, and demonstrated that the calculated emissions for years 2006, 2015 and 2025 were well below the 2006 budgets for VOC and NOX emissions. On October 26, 2004, MACOG reran MOBILE 6 for the LRP with the proposed freeway interchange locations of Preferred Alternative G-Es for the US 31 Improvement Project, and demonstrated that the calculated emissions for years 2006, 2015 and 2025 were not only below the 2006 budgets for VOC and NOX emissions, but also equal or less than the calculated emissions of the approved 2002 conformity analysis.

With the adoption of the *MACOG 2030 Long Range Transportation Plan* and the *FY 2005-2007 Transportation Improvement Program* on April 13, 2005, MACOG performed a new Air Quality Conformity Determination on March 30, 2005 that included Preferred Alternative G-Es for the US 31 Improvement Project. This recent analysis demonstrated again that the calculated emissions for the years 2006, 2009, 2015, 2020, 2025 and 2030 were significantly below the 2006 SIP budgets for VOC and NOX emissions. On May 25, 2005, the FTA and FHWA concluded that the criteria of the conformity rule has been met by the MACOG conformity analysis.



### 4.7.1.3 Air Quality Modeling

**MOBILE 5 versus MOBILE 6.** The MOBILE model for estimating pollution from highway vehicles was first developed by USEPA in 1978. MOBILE 5 was released in 1993, and was used by the MACOG in 2002 and 2003 for the air quality conformity determinations that included the US 31 Improvement Project in their LRP and TIP. The USEPA released MOBILE 6 on January 29, 2002 as the first major revision to MOBILE since MOBILE 5. MOBILE 6 is based on new emissions data and reflects regulations that have been issued since MOBILE 5.

There are a number of reasons why emissions estimates are different in MOBILE 5 and MOBILE 6. These reasons include new knowledge (such as pollution control technologies in the late 1980s proving to be more durable than had been expected when MOBILE 5 was developed<sup>2</sup>) or new rules (such as the final rule on Tier 2 Motor Vehicle Emissions Standards of February 10, 2000, resulting in more stringent emission requirements for SUVs and pickup trucks).

When the USEPA released MOBILE 6, a two-year grace period ending January 29, 2004, was established to permit the transition from MOBILE 5 to MOBILE 6 for transportation conformity analyses. While the USEPA rule encourages the use of MOBILE 6 or MOBILE 5 with Tier 2 estimates for conformity analyses during the two-year grace period, MOBILE 5 can continue to be used for conformity analyses through January 29, 2004. Only if a state updated the emissions budgets in the SIP to MOBILE 6 would transportation conformity analyses using MOBILE 6 be compelled prior to January 29, 2004. For Indiana, the MOBILE 5 emission budgets established in the SIP by IDEM are expected to continue until the SIP is updated for the 8-hour ozone standard area designations. As previously noted, MACOG calculated ozone emissions using MOBILE 6 in January of 2004 demonstrating continuing conformity of the LRP with the 2006 emissions budgets, and again on October 26, 2004, demonstrating continuing conformity of the LRP with the US 31 Improvement Project based on the proposed freeway interchange locations of Preferred Alternative G-Es.

## 4.7.2 Existing Ambient Air Quality

As previously noted, St. Joseph and Elkhart counties were previously “maintenance areas” for one-hour ozone standard, but became “nonattainment areas” for the eight-hour ozone standard effective June 15, 2004. The SIP has established year 2006 emission budgets of 20.68 tons per day for VOC and 27.24 tons per day of NOX that are not to be exceeded by mobile emissions. (For informational purposes only, the SIP includes an emission budget of 142.24 tons per day for CO.) These budgets remain the measure of transportation air quality conformity until new budgets are established. Accordingly, any major roadway capacity expansion (such as the US 31 Improvement Project) must be in the MPO’s LRP and conform to the SIP emission budgets. The current MACOG LRP and TIP include the US 31 Improvement Project, and FHWA and FTA have jointly made a determination on June 2, 2002, that these documents conform to the SIP. FHWA and FTA reaffirmed this conclusion on May 25, 2005, for the *MACOG 2030 Long Range Transportation Plan* and the *FY 2005-2007 Transportation Improvement Program*.

The US 31 Improvement Project must also conform to NAAQS for CO involving 35 ppm for one-hour and 9.0 ppm for eight hours. CO is a site-specific pollutant, and major concentrations are generally found adjacent to roadways at high-volume intersections where human activities may be affected. The site-specific CO analysis is found in section 5.7.

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<sup>2</sup> Frequently Asked Questions on MOBILE 6; USEPA; January 16, 2002.