Chapter 3

Air Quality
TRANSPORTATION CONFORMITY
Transportation conformity is a mechanism to ensure that federal funding and approval are given to those transportation activities that are consistent with air quality goals as contained in the State Implementation Plans (SIPs). Once an area reaches attainment, the SIPs are amended to include a maintenance plan. The maintenance plans for Ohio and Kentucky cover the ten-year time frame following the U.S. Environmental Protection Agency’s (EPA) decision in 2000 to redesignate the area to attainment of the one-hour ozone standard. The maintenance area includes the Ohio counties of Butler, Clermont, Hamilton and Warren and the Kentucky counties of Boone, Campbell and Kenton.

OKI has determined that the recommended projects in this 2030 Regional Transportation Plan are consistent with the air quality goals of the one-hour ozone maintenance plans of Ohio and Kentucky. Table 3-1 shows OKI’s quantitative conformity findings for ozone-forming emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx).

<table>
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<th>Year</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
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<tbody>
<tr>
<td>Ohio VOC Budget</td>
<td>37.9</td>
<td>37.9</td>
<td>37.9</td>
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<tr>
<td>Ohio VOC Emissions</td>
<td>32.0</td>
<td>18.4</td>
<td>16.9</td>
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<td>Ohio NOx Budget</td>
<td>62.3</td>
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<tr>
<td>Ohio NOx Emissions</td>
<td>61.0</td>
<td>21.9</td>
<td>13.9</td>
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<td>Kentucky VOC Budget</td>
<td>7.33</td>
<td>7.33</td>
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<td>Kentucky VOC Emissions</td>
<td>6.84</td>
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<td>Kentucky NOx Budget</td>
<td>17.13</td>
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<tr>
<td>Kentucky NOx Emissions</td>
<td>17.08</td>
<td>7.72</td>
<td>5.94</td>
</tr>
</tbody>
</table>
• VOC and NO\textsubscript{x} emissions in the Ohio counties of the maintenance area do not exceed the budget for 2010, which is the last year of the maintenance plan.

• VOC and NO\textsubscript{x} emissions in the Ohio counties of the maintenance area do not exceed the maintenance plan’s budget for the analysis years beyond 2010 (2020 and 2030).

• OKI qualitatively finds no factors in this \textit{2030 Regional Transportation Plan} that would cause or contribute to a new violation or exacerbate an existing violation in the years before 2010 for the Ohio counties of the maintenance area.

• VOC and NO\textsubscript{x} emissions in the Kentucky counties of the maintenance area do not exceed the budget for 2010, which is the last year of the maintenance plan.

• VOC and NO\textsubscript{x} emissions in the Kentucky counties of the maintenance area do not exceed the maintenance plan’s budget for the analysis years beyond 2010 (2020 and 2030).

• OKI qualitatively finds no factors in the \textit{2030 Regional Transportation Plan} that would cause or contribute to a new violation or exacerbate an existing violation in the years before 2010 for the Kentucky counties of the maintenance area.

• OKI qualitatively finds that no goals, directives, recommendations or projects identified in the \textit{2030 Regional Transportation Plan} contradict in a negative manner any specific requirements or commitments of the applicable state implementation plans.

• The applicable state implementation plans do not contain any transportation control measures (TCM’s), therefore, nothing in the \textit{2030 Regional Transportation Plan} can interfere with their timely implementation.

The process for conducting the transportation conformity analysis is detailed in Appendix C.

**REGULATORY BACKGROUND**

In 1990, Congress adopted the Clean Air Act Amendments (CAAA) to address the country’s major air pollution problems. The CAAA regulates six major pollutants: sulfur dioxide, nitrogen dioxide, lead, carbon monoxide, particulate matter and ozone. The Greater Cincinnati region meets the national air quality standards for all of the six pollutants, with the exception of ozone.
Pursuant to provisions of the CAAA of 1990, EPA designated a seven-county area in the OKI region as a moderate nonattainment area for ozone under the one-hour ozone standard. The nonattainment area included Butler, Clermont, Hamilton and Warren counties in Southwest Ohio, and Boone, Campbell and Kenton counties in Northern Kentucky. OKI’s eighth county, Dearborn County, Indiana, was designated unclassifiable/attainment and thus is not subject to the conformity requirements under the one-hour standard.

On July 5, 2000, the U.S. EPA determined that the Cincinnati-Hamilton area had attained the one-hour ozone National Ambient Air Quality Standard (NAAQS). The attainment determination was based on three years (1996-1998) of ambient air monitoring data that demonstrate that the area had attained the NAAQS. The area has continued to attain the standard through the most recent three-year period (2000-2003). The U.S. EPA also approved the Ohio and Kentucky ten-year maintenance plans as revisions to their respective SIPs. The maintenance plans cover the ten-year time frame following the 2000 redesignation. A subsequent U.S. Circuit Court ruling found a technical deficiency in Ohio’s redesignation request and vacated the attainment status of the Ohio portion of the region. The maintenance plans for the region remain in effect.

As required under the CAAA, motor vehicle emissions budgets were established in the maintenance plans. The emissions budget establishes a cap on emissions, which cannot be exceeded by predicted highway and transit vehicle emissions. The mobile source budgets for the Kentucky portion of the area for the purposes of transportation conformity are 7.33 tons of VOC’s and 17.13 tons of NOx per summer day for the year 2010. The mobile source budgets for the Ohio portion of the area for the purposes of transportation conformity are 37.9 tons of VOC’s and 62.3 tons per summer day for the year 2010. OKI must demonstrate that mobile sources do not exceed these levels for analysis years 2010 and later. Through interagency consultation with local, state and federal air agencies, OKI has selected 2010, 2020 and 2030 as the conformity analysis years for this update to the region’s transportation plan.

**CONFORMITY AND THE NEW OZONE STANDARD**

In 1997, EPA completed its review of the national air quality standard for ozone and replaced the one-hour 0.12 parts per million standard with a new eight-hour average 0.08 parts per million standard. A violation of the eight-hour national air quality standard for ozone occurs when the three-year average of the annual fourth highest daily maximum eight-hour concentration exceeds 0.08 parts per million. Over the past three years, monitors in the region have recorded only eight exceedances of the one-hour standard, but 243 exceedances of the eight-hour standard. In April 2004, all seven counties in the current maintenance area were included in a new ozone nonattainment area, classified as “basic” nonattainment, under the eight-hour standard. Clinton County, Ohio and a
portion of Dearborn County, Indiana were also included in the Cincinnati nonattainment area (Figure 3-1). Plans and programs will be required to meet new interim conformity requirements beginning in June 2005 until SIP’s are revised with new budgets applicable to eight-hour ozone nonattainment areas. The revised SIP’s must be final by June 2007. Also in June 2005, the one-hour ozone standard will be revoked and the one-hour budget test will no longer apply. Prior to June 2005, the plan will be amended to satisfy the eight-hour interim conformity requirements.

TRANSPORTATION’S CONTRIBUTION

Ozone is formed through chemical reactions induced when sunlight reacts with VOC’s (principally "hydrocarbons") and NOx. VOC’s and NOx occur from incomplete combustion of fossil fuels. Transportation-related sources are a major contributor of these pollutants. In 2000, transportation sources accounted for one-half of the total regional emissions of VOC’s and 31% of NOx emissions (Figure 3-2). Industry sources accounted for one-third of all VOC emissions and almost two-thirds of NOx emissions. Area sources include individually insignificant sources that when added together have a significant impact, such as lawn mowers, oil-based paints, boats and dry cleaners.

The Transportation Efficiency Act for the Twenty-First Century (TEA-21) strengthens the CAAA’s ability to meet its objectives and to ensure that improvements in air quality will not be reversed by growth in travel. TEA-21 continued many of the programs which began under its predecessor, the Intermodal Surface Transportation Efficiency Act (ISTEA), and gives state and local officials tools for adapting the transportation system to meet the CAAA requirements, including increased funding, flexibility to mix project types (e.g., transit, bicycle), and metropolitan and statewide planning requirements. The Ohio-Kentucky-Indiana Regional Council of Government’s (OKI) regional
Figure 3-1

Cincinnati Area
1-Hour Ozone and
8-Hour Ozone
Nonattainment
Counties

Legend

- State Boundary
- County Boundary
- 8 Hour Nonattainment
- 1 Hour Nonattainment
transportation plan defines local commitments to promote alternatives to automobile travel and to enhance mobility while minimizing highway construction. Air quality is a key criterion for OKI in making decisions for transportation plans, programs, and projects.

The pollutant impact of transportation sources has been significantly reduced through federal legislation requiring vehicles to meet stricter emissions standards and rules implemented in the OKI region by both the State of Ohio and the Commonwealth of Kentucky for inspection and maintenance programs, vapor recovery systems at the fuel pumps and cleaner fuels. These actions have resulted in lower emission rates per motor vehicle. These technology-based air quality benefits of lower vehicle emission rates will be the primary contributor to lower total emissions from vehicles. From a 2000 base year to 2030, emissions from vehicles in the OKI region are forecasted to decrease; VOC by 71 tons per day, carbon monoxide by 651 tons per day, and NOx by 153 tons per day.

Through its 2030 transportation plan, OKI has recommended behavior-based strategies to reduce vehicle miles traveled. These travel demand management (TDM) strategies encourage using alternatives to single-occupant vehicle travel and shifting trips out of peak travel period, or even eliminating some trips all together. The TDM strategies identified in OKI’s transportation plan include increased telecommuting and flexible work schedules through employers, expanded rideshare programs, additional opportunities for safe bicycle and pedestrian travel, parking management and land-use planning as an alternative to highway expansion. TDM strategies are detailed in Chapter 8.

OKI’s transportation plan also identifies improved transit as a critical component in improving air quality. Expanded bus service, development of rail transit, and improved access to the transit system through park-and-ride lots and transit centers would attract additional transit ridership, thereby reducing vehicle miles traveled. The plan also identifies measures aimed at easing congestion through improved traffic flow. These measures, such as traffic signal coordination, traveler information systems and incident management programs, generally have a positive impact on emissions because of a decrease in stop-and-go travel and reduced delay due to accidents or construction.

CONGESTION MITIGATION AND AIR QUALITY PROGRAM
The Congestion Mitigation and Air Quality Program (CMAQ), under TEA-21, provides funding for projects demonstrating measurable reductions in vehicle emissions. Examples of projects eligible for CMAQ funds include new transit service, traffic signal interconnection, park-and-ride lots and new bicycle/pedestrian facilities. OKI’s 2004-2007 Transportation Improvement Program includes 21 projects utilizing $30.5 million in CMAQ. Those projects are
expected to result in the elimination of 0.93 tons per day of VOC and 0.91 tons per day of NOx.

LOCAL COMMITMENT TO CLEAN AIR
The Regional Ozone Coalition is a voluntary association of local governments, organizations and businesses committed to reducing smog in the Greater Cincinnati region. The Coalition’s “Smog Alert” program, which began in 1994, encourages voluntary efforts by individuals and businesses to reduce ozone-forming activities on forecasted high ozone days. This program is supported by a “Do Your Share for Cleaner Air” multimedia marketing campaign. These media include outdoor advertising in the form of pole banners and a painted wall (in downtown Cincinnati). A variety of other advertising outlets are used such as television and radio advertising, painted buses, print advertising, and distribution of informational materials through employers, special events and targeted mailings. The “Smog Alert” fax and electronic mail system notifies approximately 1,000 businesses, governments, members of the media and other interested individuals when an alert is issued, typically the afternoon before a forecasted high ozone day.

Community outreach is an important aspect of the Coalition’s campaign. For the past several years, the Coalition has sponsored a kick-off event to signify the start of smog season. Since 2001, the event has been the Clean Air A-Thon 5k walk/run and family funfest. Interest in this event has been great. The Coalition educates and provides teachers with activities and curriculum through sponsoring teacher workshops for grades K-12. The Coalition also sponsors an annual calendar contest open to students in grades K-12 throughout the seven-county region.

The Coalition is a participating member and funding partner of the Cincinnati Clean Cities program: the Tri-State Clean Fuels Network (TSCFN). The Greater Cincinnati region has been designated a Clean City by the Department of Energy since 1997. The TSCFN strives to reduce emissions through the use of cleaner-burning fuels in cars, trucks, buses, airplanes and other modes of transportation. A pilot project, funded in part by the Regional Ozone Coalition, will introduce urban school districts to alternative diesel products for use in their school bus fleets.