

# **Chapter 3**

## **Air Quality**



## 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 the air quality goals of the maintenance plans for both Ohio and Kentucky. The maintenance plans 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 (NO<sub>x</sub>).

**Table 3-1**

Quantitative Conformity Findings for Ozone-forming Emissions (tons per day)

<b>Year</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>
Ohio VOC Budget	37.9	37.9	37.9
Ohio VOC Emissions	36.2	29.6	32.3
Ohio NO <sub>x</sub> Budget	52.3	52.3	52.3
Ohio NO <sub>x</sub> Emissions	41.5	20.3	22.0
Kentucky VOC Budget	5.83	5.83	5.83
Kentucky VOC Emissions	5.66	4.00	4.41
Kentucky NO <sub>x</sub> Budget	15.13	15.13	15.13
Kentucky NO <sub>x</sub> Emissions	12.90	6.25	6.78

- VOC and NO<sub>x</sub> 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<sub>x</sub> 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 *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<sub>x</sub> 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<sub>x</sub> 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 *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 *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 *2030 Regional Transportation Plan* can interfere with their timely implementation.

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

## **REGULATORY BACKGROUND**

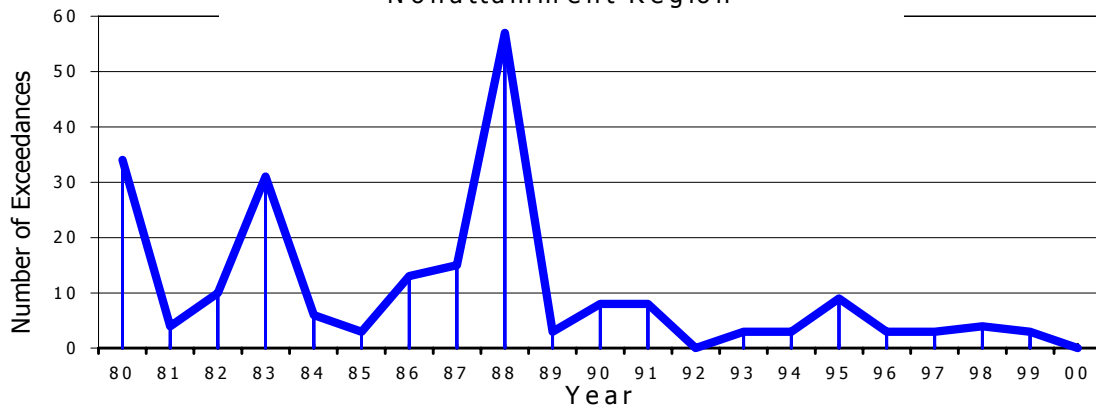
In 1990, Congress adopted the Clean Air Act Amendments (CAAA) to address the country's major air pollution problems. The CAAA regulates six major pollutants: sulfur dioxide, nitrogen dioxide, lead, carbon monoxide, particulate matter and ozone. The Greater Cincinnati region meets the national air quality standards for all of the six pollutants.

The CAAA 90 clarifies how EPA designates nonattainment areas for three pollutants (ozone, carbon monoxide and fine particulate matter) and how those areas are classified in accordance with the severity of the area's air pollution problem. Assignment of an area to one of the nonattainment classifications triggers various planning requirements with which the area must comply in order to meet the standard. The requirements vary by pollutant and they increase in number and stringency with the severity of pollution. A seven-county area encompassing the Greater Cincinnati area was designated by EPA, pursuant to

provisions of the CAAA 90, as a moderate nonattainment area for ozone based on air quality measurements from 1988-1990. The nonattainment area included Butler, Clermont, Hamilton and Warren Counties in Southwest Ohio, and Boone, Campbell and Kenton Counties in Northern Kentucky. Areas with more serious problems are required to take more numerous and stringent actions, but have more time to do so than areas with less severe problems. Any area that fails to meet the standards by its deadline could be bumped into a more stringent classification with stricter compliance requirements.

On July 5, 2000 EPA determined that the region had attained the one-hour ozone standard based on three consecutive years without a violation of the standard. The region was redesignated to a maintenance area and must continue to monitor for exceedances of the one-hour ozone standard in order to ensure

**Figure 3-1**  
One-Hour Ozone Exceedances in Cincinnati  
Nonattainment Region



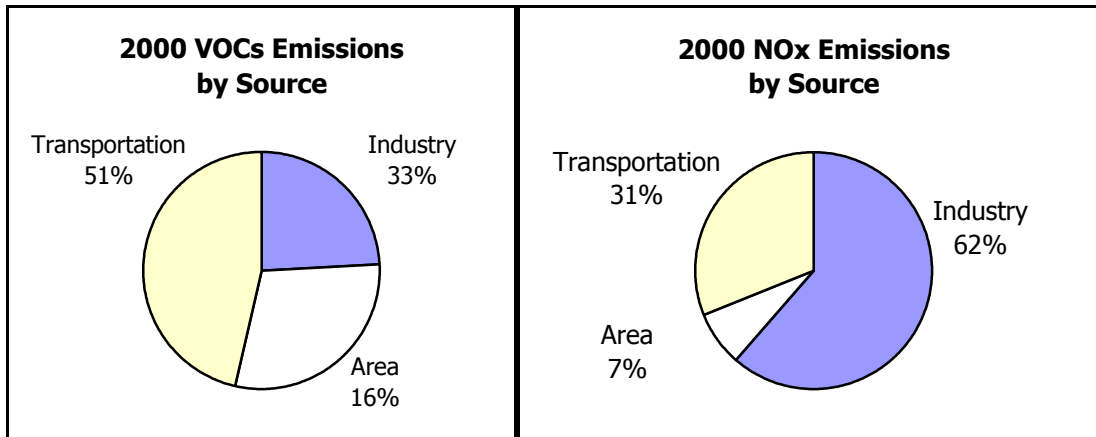
compliance. The ten-year maintenance plans submitted by both Ohio and Kentucky contain emissions budgets for VOC and NO<sub>x</sub>. These budgets establish a maximum allowable limit on future emissions from vehicles (mobile sources). Through the conformity process, OKI's transportation plans and programs must be shown not to exceed those established budgets.

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. All seven counties in the current maintenance area have been recommended for inclusion in a new ozone nonattainment area under the eight-hour standard. As of June 2001, EPA was reviewing procedures for implementing the eight-hour standard and a timetable for designating the new nonattainment areas was uncertain.

## TRANSPORTATION'S CONTRIBUTION

Ozone is formed through chemical reactions induced when sunlight reacts with VOC's (principally "hydrocarbons"), NO<sub>x</sub>. VOC's and NO<sub>x</sub> 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 percent of NO<sub>x</sub> emissions (Figure 3-2). Industry sources accounted for one-third of all VOC emissions and almost two-thirds of NO<sub>x</sub> 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.

**Figure 3-2**  
Regional Contributions of Pollutants by Source



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 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 1995 base year to 2030, emissions from vehicles in the OKI region are forecasted to decrease; VOC by 53 tons per day, carbon monoxide by 575 tons per day, and NO<sub>x</sub> by 124 tons per day.

Through its 2030 transportation plan, OKI has prioritized and 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, growth management, consideration of high-occupancy vehicle lanes as an alternative to highway expansion and parking management. TDM strategies are detailed in Chapter 7.

OKI's transportation plan also identifies improved transit as a critical component in improving air quality. Expanded bus service, development of light rail and commuter rail, 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.

### **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, a painted wall (in downtown Cincinnati) and billboards. 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. Since 1996, the Regional Ozone Coalition has sponsored a Clean Air Fare on transit buses during the summer months. Both

the Southwest Ohio Regional Transit Authority and the Transit Authority of Northern Kentucky have teamed up to offer a 50 cent fare during the summer months. The Regional Ozone Coalition, with BP Oil Company and other local, state, and national sponsors, offered the nation's first gas cap testing and replacement program in 1998. The program promoted replacement of leaking gas caps in order to reduce the amount of gasoline fumes released into the air through evaporation. The success of the program was overwhelming. Approximately 23,000 leaking gas caps were replaced, saving nearly four tons of emissions from being released into the air every day.

The Greater Cincinnati region joined the U.S. Department of Energy's Clean Cities Program in January 1997. The Tri-State Alternative Fuels Coalition promotes the acquisition and use of vehicles by local fleets that operate on alternative fuels such as compressed natural gas, biodiesel, ethanol and electricity. Alternative fuel vehicles typically produce less emissions of VOC, NO<sub>x</sub> and CO compared to conventionally fueled vehicles. The Coalition's Alternative Fuel Vehicle Rebate Program started in September 1999 and has been used to "buy down" the cost of alternative fuel vehicles and the purchase of alternative fuels. The program has helped fund the Metro and TANK biodiesel program where nearly 300 buses operated on cleaner-burning biodiesel fuel during the summer of 2000. The Alternative Fuel Vehicle Rebate Program has eliminated nearly one ton of daily smog-forming emissions.