



## Executive Summary

**C**ontrolling pollution from mobile sources is vital to improving the quality of our air and protecting public health. The Clean Air Act of 1990 empowered the U.S. Environmental Protection Agency (EPA) to take a variety of actions that has achieved significant results. For example, EPA reduced the sulfur in gasoline and diesel fuels and established successively more stringent emission standards, both of which brought about cleaner and better performing vehicles and engines.

Several programs have resulted in substantial emission reductions and health benefits. In fact, the emission reductions resulting from the clean fuel and vehicle standards finalized over the past several years will prevent more than 24,000 premature deaths, 19,000 hospi-

talizations, and 3.2 million work days lost. When fully implemented in 2030, the annual net benefits of these programs will be approximately \$175 billion, compared to \$11 billion in costs.

This report presents the most recent developments in the EPA Office of Transportation and Air Quality's (OTAQ's) key program areas, as EPA continues to progress under the Clean Air Act. These accomplishments would not have been possible without our stakeholders' involvement and support. This report is a tribute to their concerted efforts on behalf of the environment.

**Clean Cars and Fuels.** One of OTAQ's top priorities is making sure that new cars, and the fuels they use,



## Dramatic Emission Reductions

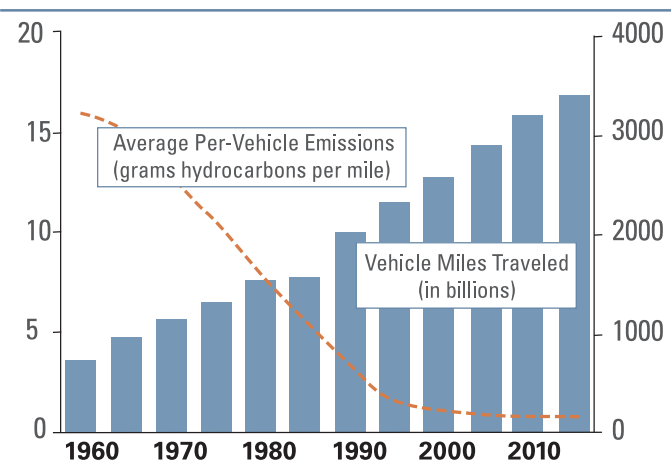
OTAQ's programs have resulted in dramatic emission reductions. Compared to 1995 baselines, these programs reduced pollutants by the following amounts in 2004:

- 1.85 million tons of volatile organic compounds
- 1.45 million tons of nitrogen oxides
- 25,000 tons of particulate matter
- 18,000 tons of fine particulate matter
- 11.3 million tons of carbon monoxide

are meeting what is known as the "Tier 2 vehicle standards." Starting in 2004, with plans to be fully implemented in 2009, EPA's Tier 2 Vehicle and Gasoline Sulfur Program represents a groundbreaking pollution control strategy for motor vehicles. This program will make new cars, sport utility vehicles (SUVs), pickup trucks, and vans 77 to 95 percent cleaner than 2003 models, while reducing sulfur levels in gasoline by 90 percent. Manufacturers are bringing to market the cleaner vehicles faster than required, with 35 percent of vehicles meeting the new standard in the first year.

models, and sulfur levels in fuel will be reduced by more than 97 percent, to 15 parts per million (ppm). OTAQ is working closely with engine manufacturers, trucking companies, and refiners to ensure the smooth implementation of these new standards.

### Cars are getting cleaner, but people are driving more.



**Clean Trucks, Buses, and Diesel Fuels.** Heavy-duty trucks and buses are significant sources of air pollution. EPA's Clean Diesel Truck and Bus Program sets stringent emission standards for diesel engines and calls for the introduction of clean, ultra low-sulfur diesel fuel. Beginning in 2007, new highway diesel engines will be as much as 95 percent cleaner than current

**Clean Nonroad Engines and Fuels.** From large agricultural machines to residential leaf blowers, non-road engines emit large quantities of harmful particulate matter and nitrogen oxides. OTAQ has developed a comprehensive set of fuel and engine requirements that will reduce sulfur in nonroad diesel by more than 99 percent by 2010. More stringent standards for locomotive, large marine diesel, and small gasoline (e.g., lawn and garden) engines are currently being developed. In addition, EPA has established standards for recreational and other nonroad engines, such as those found on motorcycles, all-terrain vehicles, and snowmobiles, that will reduce nitrogen oxides, particulate matter, hydrocarbons, and carbon monoxide by 20 to 99 percent, depending on the vehicle engine type.

**Certification and Compliance.** EPA's certification and compliance programs ensure that vehicles and engines are designed to meet emission standards when they first enter the market and that they continue to meet those standards throughout their useful life. OTAQ monitors the environmental performance of vehicles on the road and works with manufacturers to recall vehicles that fail to meet standards. In 2004, automotive manufacturers voluntarily recalled 2.7 million vehicles, representing 35 different emission-related problems. These recalls will prevent the release of thou-



sands of tons of pollutants into the air. OTAQ also now certifies 2,300 engine models, up from about 300 in the early 1990s.

**The National Clean Diesel Campaign.** In 2004, EPA crafted a comprehensive initiative to implement diesel regulations for future engines and address the emissions of the 11 million diesel engines in use today. With this campaign, EPA is targeting specific diesel applications. For example, under Clean School Bus USA, more than 15 million residents and 2 million children in 150 school districts now benefit from cleaner air due to cleaner buses.

**Transportation and Global Climate Change.** In addition to emissions that contribute to urban air pollution, the transportation sector accounts for 30 percent of U.S. greenhouse gas emissions. EPA is working on solutions. For example, OTAQ's automotive engineers are developing advanced technologies, such as clean diesel combustion and hydraulic hybrids, and working with commercial partners to bring these hybrids to market. In addition, OTAQ's voluntary initiatives are helping thousands of partners save billions of gallons of fuel—and thereby reduce carbon dioxide emissions—by implementing best shipping and delivery practices and by encouraging employers to offer outstanding commuter benefits.

**International Programs.** Nearly every country in the world suffers from air pollution, and each year more and more of it is generated from the transportation sector. During the 2002 World Summit for Sustainable

Development (WSSD) in Johannesburg, South Africa, EPA led the development of the Partnership for Clean Fuels and Vehicles (PCFV), which is made up of more than 70 members from around the world. As a leading and founding member of the PCFV, EPA participates in numerous international efforts to reduce air pollution from vehicles, such as helping countries remove lead from gasoline, reduce emissions from engines, and lower sulfur in fuels.

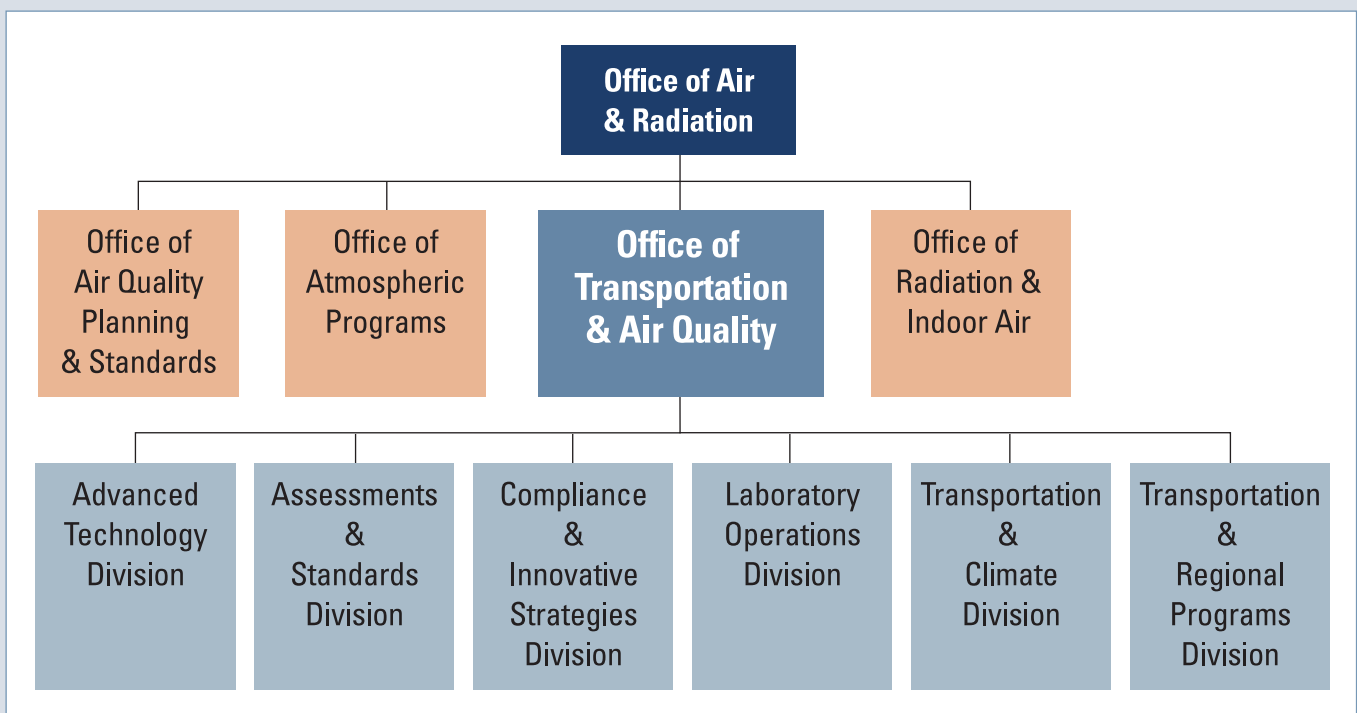


## What Is OTAQ?

The Office of Transportation and Air Quality (OTAQ) is housed within EPA's Office of Air and Radiation. OTAQ's mission is to protect public health and the environment by reducing air pollution from motor vehicles, engines, and the fuels used to operate them and by encouraging business practices and travel choices that minimize emissions. OTAQ's programs address emissions from the range of mobile sources: cars, light trucks, large trucks, buses, nonroad recreational vehicles (e.g., dirt bikes and snowmobiles), farm and construction equipment, lawn and garden equipment, marine engines, aircraft, and locomotives.

OTAQ operates with an annual budget of more than \$100 million and a staff of more than 350 technical, policy, and support personnel. Working out of EPA headquarters offices in Washington, DC, and the National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan, OTAQ's primary activities include:

- Assessing mobile source-related air quality problems and developing and using sophisticated modeling tools to develop solutions and measure results.
- Establishing national standards to reduce emissions from on-road and nonroad mobile sources of pollution.
- Implementing national mobile source standards through certification processes and in-use monitoring strategies.
- Coordinating transportation and air quality policies with state, local, and federal agencies.
- Developing fuel efficiency programs and technologies to reduce the emission of greenhouse gases from the transportation sector.
- Developing clean and efficient automotive technologies and transferring them to the marketplace.
- Operating state-of-the-art models to support national, state, and local emission inventories.
- Managing international activities that leverage U.S. clean air experience and export technology solutions to developing countries.



## The National Vehicle and Fuel Emissions Laboratory

To carry out its mission, EPA established the National Vehicle and Fuel Emissions Laboratory in 1971 in Ann Arbor, Michigan—near the birthplace of the automobile industry and home to some of the world’s most advanced vehicle manufacturing, testing, and research facilities. Since its founding, the Lab has been at the forefront of developing clean automotive technology and designing programs to reduce and prevent air pollution.

The Lab’s original mission was to test cars, light trucks, and heavy-duty engines to make sure they met established emission and fuel economy standards before entering mass production. While this work remains a core function, the Lab is now recognized as a leader in advanced testing and automotive technology.

The Lab is also responsible for:

- Determining whether vehicles and engines comply with emission standards and fuel economy requirements.
- Testing fuels as well as highway and nonroad vehicles and engines to verify compliance with regulations designed to reduce emissions.
- Researching, evaluating, and developing advanced technologies for controlling emissions, as well as developing new strategies for improving fuel efficiency.

The Lab has recently undergone extensive modernization and is now home to some of the most sophisticated instrumentation systems for emissions measurement in the world. EPA can now test more types of vehicles and engines under a broader range of operating conditions than ever before. For example, the Lab has instruments capable of accurately measuring emissions from the newest, ultra low-emitting Tier 2 vehicles, along with post-2007 heavy-duty engines and hydrogen-fueled (fuel cell) vehicles. This facility also houses the first four-

### What is a Dynamometer?



A dynamometer functions as a treadmill for vehicles. Vehicles on a dynamometer run on rollers to simulate driving conditions so that technicians can measure tailpipe emissions.

wheel drive dynamometer site in the nation, specifically designed for certification testing of a wide range of vehicles, including four-wheel drive vehicles, chassis-certified heavy-duty vehicles, and hybrids.

As new needs arise, the Lab will continue to maintain its position as a global leader in emissions testing and a resource to other nations as they develop stronger emission standards and associated testing requirements.

