

**Commonwealth of Pennsylvania  
Department of Environmental Protection**



**State Implementation Plan (SIP) Revision  
For the Philadelphia Ozone Nonattainment Area**

**Revised Highway Vehicle Emission Budgets**

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## **What Is Ozone?**

Ozone levels above the health-based standard (national ambient air quality standards) are a serious human health threat, and also can cause damage to important food crops, forests, and wildlife. Ozone in the troposphere, also called ground-level ozone, should not be confused with stratospheric ozone – located in the upper atmosphere – which protects the earth by blocking out damaging solar radiation.

Ozone is not emitted directly to the atmosphere, but is formed by photochemical reactions between volatile organic compounds (VOCs) and oxides of nitrogen (NO<sub>x</sub>) in the presence of sunlight. The long, hot, humid days of summer are particularly conducive to ozone formation, so ozone levels are of general concern during the months of May through September.

The primary sources of man-made VOCs and NO<sub>x</sub>, the ozone precursors, are the evaporation of fuels and solvents (gasoline and consumer products), combustion of fuels (motor vehicles, power plants, and other industries), and chemical and industrial processes. The Philadelphia Metropolitan area still exceeds the one-hour health-based standard for ozone during the summer.

## **Why This State Implementation Plan (SIP) Revision?**

Pennsylvania is responsible for developing state implementation plans (SIPs) for air quality for the five Pennsylvania counties of the Philadelphia interstate ozone nonattainment area -- Bucks, Chester, Delaware, Montgomery and Philadelphia counties. Pennsylvania submitted its required post-1996 rate-of-progress and attainment plans in several documents during 1998 and 1999.

The Clean Air Act Amendments (Section 176c) provides a mechanism by which federal funded or approved highway and transit plans, programs and projects are determined not to produce new air quality violations, worsen existing violations or delay timely attainment of national air quality standards. EPA regulations issued to implement this “transportation conformity” provide that motor vehicle emission “budgets” establish caps of these emissions which cannot be exceeded by the predicted transportation system in the future. Transportation agencies in Pennsylvania are responsible for making timely transportation conformity determinations. The Delaware Valley Regional Planning Commission holds that responsibility for the Philadelphia area. The Federal Highway Administration approves these determinations after EPA concurrence.

The Clean Air Act Amendments also require Pennsylvania to demonstrate that the area will attain the one-hour National Ambient Air Quality Standard for ozone by 2005. On December 16, 1999, EPA published a proposed rule which conditioned approval of Pennsylvania’s attainment plan upon submittal of an adequate motor vehicle emissions budget for its portion of the Philadelphia area consistent with attainment. EPA policy requires that the budgets must include the effects of all motor vehicle controls that will be in place by the attainment year, including federal measures. These control measures must be specifically identified and their emission reductions must be quantified.

Because EPA’s calculations in the December 16, 1999 proposed rule of the emission reductions necessary for attainment in the Philadelphia interstate nonattainment area included implementation

of the federal Tier 2 tailpipe/low sulfur in fuel rule (citation here) subsequently finalized on February 10, 2000, EPA is also requiring Pennsylvania to revise its 2005 highway vehicle emissions budget to include emission reductions attributable to Tier 2/low sulfur regulations. The Tier 2/low sulfur regulations establish more protective tailpipe emissions standards for all passenger vehicles, including sport utility vehicles (SUVs), minivans, vans and pick-up trucks and lower standards for sulfur in gasoline, which will ensure the effectiveness of low emission-control technologies in vehicles. The rules begin to take effect in 2004.

This SIP revision therefore identifies and quantifies the additional emission reductions expected from Tier 2/low sulfur and revises the transportation conformity budgets accordingly. These budgets will be used in any transportation conformity determinations made subsequent to a finding of adequacy by EPA.

**Motor Vehicle Emission Budgets for Transportation Conformity**

All inputs to the MOBILE model remain unchanged from the transportation conformity budget for 2005 found adequate by EPA on January 20, 2000. Emissions are reduced because of the additional control strategy estimated using the EPA Office of Air Quality and Transportation’s April 2000 Info Sheet #8, Tier 2 Benefits Using MOBILE5, EPA420-F-00-001.

<b>POLLUTANT</b>	<b>Existing 2005 budget</b>	<b>Proposed 2005 Budget</b>
VOC		
Kilograms/summer day	56,027	54,595
Tons/summer day	61.76	60.18
NOx		
Kilograms/summer day	78,400	70,272
Tons/summer day	86.42	77.46

The following information is available in the Appendix to document establishment of the highway vehicle emissions inventories and the transportation conformity budgets:

- Summary VMT, VOC and NOx inventories and forecasts by county
- Modeling parameters
- Control strategy emissions component breakdown
- VMT, VOC, CO and NOx inventory and forecast emissions by county by functional class
- VMT, VOC, CO and NOx inventory and forecast emissions by county by vehicle type
- MOBILE input files for milestone year control strategy scenarios

**Public Comment:** This SIP revision was available for public comment for the period May 26 through June 29, 2001. One public hearing was held on June 28, 2001 in DEP’s Southeast Regional Office, Conshohocken. Notice was provided in the major newspaper in the five-county area and as a notice in the *Pennsylvania Bulletin*.