

**Commonwealth of Pennsylvania
Department of Environmental Protection**



**Revision to the State Implementation
Plan
for the
Reading Area (Berks County)**

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INTRODUCTION

This document is a proposed revision to the maintenance plan contained in the State Implementation Plan (SIP) for the Reading area (Berks County). In January 1997, Pennsylvania submitted a request to redesignate the Reading Area Moderate Ozone Nonattainment area to maintenance/attainment. The request contained a plan that demonstrated that the area would maintain the one-hour ozone standard for 10 years (2007). The request also contained emission inventories for years of significance to the redesignation process. On May 7, 1997 (62 Fed. Reg. 24826), the U.S. Environmental Protection Agency (EPA) approved the plan and redesignated the area to maintenance.

Subsequently, all analyses conducted for purposes of demonstrating that the area's transportation plan conformed to the SIP used the highway emissions inventories contained in the 1997 plan as the transportation "budget." Specifically, volatile organic and nitrogen oxides emissions generated by planned changes in the transportation system could not exceed these budgets.

On January 29, 2002, EPA revised the methodology by which highway emissions are to be calculated, officially releasing MOBILE6 (67 Fed. Reg. 4254). Pennsylvania was not required by this release to update the approved maintenance plan for Berks County. However, the transportation conformity rule (40 CFR Part 93) requires that conformity analyses be based on the latest motor vehicle emissions model approved by EPA. The formal release of MOBILE6 established a grace period of at most two years before MOBILE6 is required for new conformity analyses in most cases. Therefore, the grace period expires January 29, 2004.

DEP is proposing to amend the Berks County maintenance plan to provide updated transportation conformity budgets in order to provide consistent methodology between the SIP and future conformity analyses. This SIP revision also contains documentation demonstrating that the updated conformity budgets are consistent with maintenance of the one-hour standard.

AMBIENT AIR QUALITY

What is ozone?

Maintaining concentrations of ground-level ozone below the health-based standard is important because ozone is 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.

Repeated exposure to ozone pollution may cause permanent damage to the lungs. Even when ozone is present in low levels, inhaling it triggers a variety of health problems including chest pains, coughing, nausea, throat irritation, and congestion. It can also worsen bronchitis, heart disease, emphysema, and asthma, and reduce lung capacity. Asthma is a significant and growing threat to children and adults. Ozone can aggravate asthma, causing more asthma attacks, increased use of medication, more medical treatment and more frequent visits to hospital emergency clinics. Healthy people also experience difficulty in breathing when exposed to ozone pollution. Because ozone pollution usually forms in hot weather, anyone who spends time outdoors in the summer may be affected, particularly children, the elderly, outdoor workers and people exercising. Children are most at risk from exposure to ozone because they are active outside, playing and exercising, during the summertime when ozone levels are highest. Ozone interferes with the ability of plants to produce and store food, making them more susceptible to disease, insects, other pollutants, and harsh weather. It damages the foliage of trees and other plants, ruining the landscape of cities, parks and forests, and recreation areas. One of the key components of ozone, nitrogen oxides, contributes to fish kills and algae blooms in sensitive waterways, such as the Chesapeake Bay.

Ozone is not emitted directly to the atmosphere, but is formed by photochemical reactions between volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) in the presence of sunlight. The long, hot, humid days of summer are particularly conducive to ozone formation, so ozone levels are of concern primarily during the months of May through September. The primary sources of man-made VOCs and NO_x, the ozone precursors, are the evaporation of fuels and solvents (gasoline and consumer products), combustion of fuels (motor vehicles, power plants and non-road engines), and industrial processes.

Ozone Concentrations in Berks County

This document does not supersede the ambient air quality analysis provided in the 1997 maintenance plan, which showed that the ozone design value is predicted to remain below the standard through 2007. However, additional updated information is provided to demonstrate that the 1997 predictions have been accurate to date.

There continue to be no violations of the one-hour ozone standard in Berks County.

An exceedance of the standard occurs when the concentration, averaged over a rolling one-hour period, is more than 124 parts per billion. A violation of the one-hour standard occurs if four exceedances occur at the same monitor during a rolling three-year period. The one-hour ozone design value of a monitor is the fourth highest daily one-hour maximum over three years. If there is more than one monitor, the highest design value determines the design value for the entire area.

There are two ozone monitors in Berks County, at Kutztown and Reading. The current design value at both of these monitors (2001-3) is below 124. Kutztown's design value is 111 and Reading's, which determines the maintenance area's design value, is 116. Ambient air quality information is reported to EPA as required. Ozone air quality information is available from DEP at www.dep.state.pa.us, keyword: ozone.

MAINTENANCE PLAN REVISIONS

Revision to permanent and enforceable control measures and contingency measures. In the approved maintenance plan, a low enhanced vehicle emission inspection/maintenance (I/M) program was identified as a contingency measure for the Reading area. With this revision, Pennsylvania proposes to move the I/M program to the maintenance plan itself. Parameters of the program have been included in the MOBILE6 modeling assumptions.

The Commonwealth will begin implementing the I/M program in the Reading/Berks area in January 2004. The program will be applicable to gasoline-powered vehicles 9,000 pounds and under. It will include an on-board diagnostics and gas cap check for vehicles model year 1996 and newer, and visual inspections/gas cap checks for vehicles 1995 and older. Vehicles 25 years old and older will not be covered. A separate State Implementation Plan revision will be submitted to EPA for approval by November 30, 2003. More information on the program is available at www.drivecleanpa.state.pa.us.

Establishment of New Transportation Conformity Budget

The highway emission inventory contained in the maintenance plan approved in 1997 was prepared with MOBILE5, the approved EPA model at the time.

There are a number of reasons why MOBILE5 and MOBILE6 emission estimates differ. Depending on the year modeled, some changes drive the estimates down; others drive the estimates up. There is a tendency for MOBILE6 emission estimates to be higher than MOBILE5 in early years and lower in later years. Each new version of MOBILE reflects the collection and analysis of new test data. It also incorporates changes in vehicle, engine, and emission control system technologies; and improved understanding of in-use emissions levels and the factors that influence them. MOBILE6 incorporates updated information on basic emission rates, more realistic driving patterns, separation of starting and running emissions, improved correction factors, and changing fleet composition. It also includes impacts of new regulations promulgated since the release of the previous version of MOBILE (MOBILE5b).

In addition to the availability of MOBILE6, more recent vehicle fleet information has become available since the submission of Pennsylvania’s original motor vehicle emissions budgets. EPA guidance requires MOBILE model emissions estimates to be based on the latest planning assumptions. For this reason, Pennsylvania is using the following updated data inputs:

- Vehicle mixes based on 2002 PA Department of Transportation (PENNDOT) truck percentages and MOBILE6 defaults for 2007;
- Vehicle age distributions recalculated using MOBILE6 vehicle type definitions;
- Daily minimum/maximum temperatures and humidity;
- Growth rates;
- 2002 traffic data and information, including hourly patterns, seasonal adjustments and VMT (Vehicle Miles Traveled); and
- Implementation of an enhanced vehicle emission inspection program beginning in January 2004.

Section 176(c) of the Clean Air Act (CAA), 42 U.S.C. § 7506(c), provides a mechanism by which federally 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 under section 176(c) of the CAA to implement “transportation conformity” provide that motor vehicle emission “budgets” cannot be exceeded by emissions produced by the planned transportation system. The motor vehicle budget represents the highway-generated portion of Pennsylvania’s total emissions for an area from on-road mobile sources. Transportation agencies in Pennsylvania are responsible for making timely transportation conformity determinations. The Berks County Planning Commission holds that responsibility for the Reading area. The Federal Highway Administration approves these determinations after EPA concurs.

The Commonwealth is proposing the following transportation conformity budgets. Once EPA finds this budget “adequate” under the adequacy process described by EPA guidance (EPA420-F-99-025, May 1999), these budgets would supersede previous budgets and would be the applicable budgets to use for subsequent conformity determinations.

Table 1: Revised Transportation Conformity Budgets

	2004	2007
Vehicle Miles Traveled/summer day	10,074,383	10,671,317
VOC kg/summer day	15,440	12,530
VOC tons/summer day	17.02	13.81
NOx kg/summer day	26,300	20,920
NOx tons/summer day	28.99	23.06

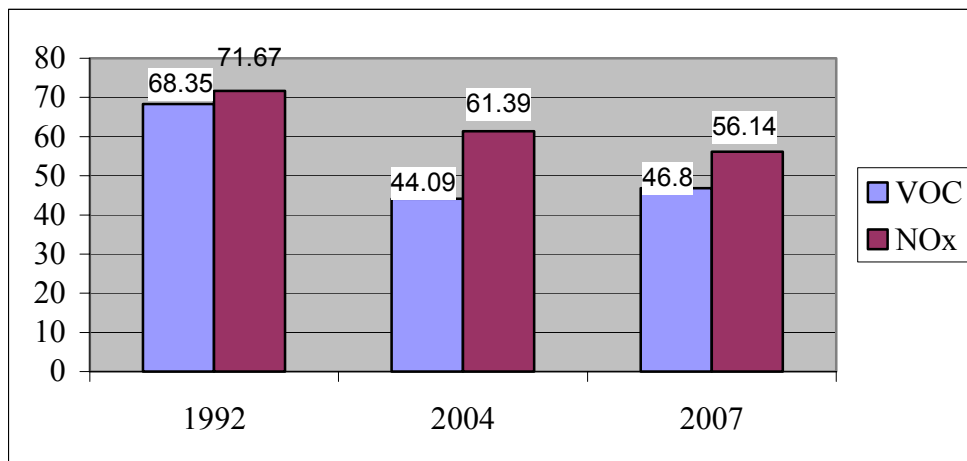
Appendix 1 contains technical information on the preparation of these budgets, including an explanation of methodology, summary tables and input parameters.

Revised Highway Budgets Are Consistent With Maintenance of the One-Hour Standard

The plan submitted in 1997 demonstrated that emissions projected to 2007 would remain below the emissions in the “attainment year.” The attainment year, 1992, was the mid-point of the 1991 to 1993 monitoring period used to demonstrate that the Reading area is attaining the ozone standard. The plan also demonstrated that emissions in an interim year, 2004, would remain below 1992 emissions.

Because MOBILE6 estimates much higher highway emissions in earlier years, the highway emission estimates for the attainment year, 1992 were recalculated to show the most current estimate of emissions in that year. Figure 1 shows total emissions for 1992, 2004 and 2007.

Figure 1. Emissions in tons per summer day



Tables 2 and 3 show emission inventories by sector. The year 1990 is included in these tables because in the 1997 maintenance plan, 1992 emissions for point and (stationary) area were projected from 1990 levels.

Table 2: VOC Emissions in tons per summer day

	1990	1992	2004	2007
Point	12.41	12.01	11.73	12.03
Area	25.96	29.09	15.34	20.96
Highway	30.45	27.25	17.02	13.81
TOTAL	68.82	68.35	44.09	46.8

Table 3: NOx Emissions in tons per summer day

	1990	1992	2004	2007
Point	25.6	25.2	21.65	22.4
Area	11.42	10.9	10.75	10.68
Highway	36.59	35.57	28.99	23.06
TOTAL	73.61	71.67	61.39	56.14

Total projected emissions for 2004 and 2007 are estimated to be below emissions for 1992, thus demonstrating that the revised inventories are consistent with maintenance. These projections use the estimates from previous submissions for point and area sources. However, examination of emission trends for these sources indicate that they will not increase. See Appendix 2.

Public Participation

Notice of this proposed SIP revision was published in the *Pennsylvania Bulletin* on October 11, 2003 and in local newspapers on October 10, 11 and 13, 2003. A public hearing was held in Reading on November 12, 2003. The comment period closed on November 14, 2003. A comment/response document is provided in the SIP submission.