

# Commonwealth of Pennsylvania



# pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

**PROPOSED**  
**STATE IMPLEMENTATION PLAN REVISION:**  
**REVISED MOTOR VEHICLE EMISSIONS BUDGETS**  
**PENNSYLVANIA PORTION OF THE PHILADELPHIA-**  
**WILMINGTON, PA-NJ-DE**  
**1997 FINE PARTICULATE MATTER**  
**NONATTAINMENT AREA**

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## Introduction and Overview

This State Implementation Plan (SIP) revision will update the approved Motor Vehicle Emissions Budgets (MVEBs) in the State Implementation Plan Revision: Attainment Demonstration and Base Year Inventory Pennsylvania Portion of the Philadelphia-Wilmington, PA-NJ-DE 1997 Fine Particulate Matter (PM<sub>2.5</sub>) Nonattainment Area (Attainment Plan).

On April 12, 2010, the Pennsylvania Department of Environmental Protection submitted to the U.S. Environmental Protection Agency (EPA) a revision to the SIP which contained MVEBs for the Pennsylvania portion of the PM<sub>2.5</sub> nonattainment area (Bucks, Chester, Delaware, Montgomery and Philadelphia counties). The SIP revision also contained an attainment demonstration, reasonably available control measures and technology (RACM/RACT), a reasonable further progress (RFP) plan and contingency measures. The Department amended the SIP revision on August 3, 2012, by withdrawing the RACM/RACT portion. The SIP revision demonstrated attainment for the 1997 annual PM<sub>2.5</sub> national ambient air quality standard (NAAQS) for the Philadelphia-Wilmington, Pennsylvania-New Jersey-Delaware (PA-NJ-DE) nonattainment area. The EPA promulgated a final rulemaking that approved the attainment demonstration on August 28, 2012 (77 FR 51930). The attainment demonstration is the applicable SIP for the Pennsylvania portion (5-county Philadelphia area) of the PM<sub>2.5</sub> nonattainment area.

The EPA's transportation conformity regulation codified at 40 CFR Part 93, Subpart A (relating to conformity to state or federal Implementation plans of transportation plans, programs, and projects developed, funded or approved under Title 23 U.S.C. or the federal transit laws) requires that the transportation plan, transportation improvement program (TIP), and projects not from a conforming transportation plan and TIP, be consistent with the MVEBs in the applicable air quality SIP. This criterion is satisfied if the state can demonstrate that emissions of the pollutants or pollutant precursors for which the area is in nonattainment or maintenance, and for which the applicable SIP contains MVEBs approved or deemed adequate by the EPA, are less than or equal to the MVEBs established in the applicable SIP or SIP submission. The metropolitan planning organization for the 5-county Philadelphia area, the Delaware Valley Regional Planning Commission (DVRPC), ensures that emissions resulting from its TIP are less than the MVEBs in the SIP by completing periodic conformity determinations, which are subject to public review and comment.

The MVEBs included in the approved PM<sub>2.5</sub> attainment demonstration were estimated using the EPA-approved highway emissions model in effect at the time, the Highway Mobile Source Emission Factor Model version 6.2 (Mobile6.2). The MVEBs in the attainment demonstration included emission budgets for both NO<sub>x</sub> and PM<sub>2.5</sub>. On March 2, 2010, the EPA released a new mobile source emissions model called the Motor Vehicles Emissions Simulator 2010 (MOVES2010), which was updated in December 2010 to MOVES2010a. The EPA provided a two-year grace period to transportation planning organizations, ending March 2, 2012, during which the older Mobile6.2 emissions model could be used to model emissions for transportation projects in order to meet the requirements of transportation conformity (75 FR 9,411). On October 13, 2011, the EPA proposed a one-year extension to the two-year grace period because

states and localities needed more time to transition to using MOVES2010a, and to develop the technical capacity to use MOVES2010a (76 FR 63575). The EPA finalized the extension on February 27, 2012 (77 FR 11394). The 1-year extension provides additional time that may be critical for nonattainment and maintenance areas to learn and apply MOVES2010a for regional conformity analyses. Any new transportation conformity analysis started after March 2, 2013, must use the most up-to-date version of MOVES.

The EPA issued the MOVES2010b version of the model and its associated guidance in April 2012. The EPA considers both MOVES2010a and MOVES2010b to be minor revisions to MOVES2010 that do not significantly affect the results of modeling criteria pollutant estimates for highway vehicles. Any references to “MOVES” in this document relate to all of the approved versions of the model. By the time that version 2010b was issued, a significant portion of the highway vehicle emissions modeling for this proposed SIP revision had already been developed using MOVES 2010a. Revision of the modeling which utilized this update would have been impractical.

The DVRPC will soon be required to use the MOVES model to estimate emissions for highway vehicle emissions for DVRPC’s long-range plan and TIP when they are amended or updated. Compared to Mobile6.2, the MOVES model nearly always estimates higher NO<sub>x</sub> and PM<sub>2.5</sub> emissions produced by highway vehicles. Therefore, both NO<sub>x</sub> and PM<sub>2.5</sub> emission estimates for new transportation projects produced by the MOVES model would exceed the MVEBs for NO<sub>x</sub> and PM<sub>2.5</sub> included in the attainment plan. As a result, comparing emissions from the MOVES model to the MVEBs included in the approved attainment plan would not allow DVRPC to meet the requirements of transportation conformity; the emissions budget in the attainment plan would be exceeded and transportation planning would be adversely affected. The DVRPC would effectively be prohibited from amending their long-range plan or TIP and unable to complete some transportation projects in the Pennsylvania portion of the attainment area.

Therefore, the Department is updating the MVEBs in the PM<sub>2.5</sub> attainment plan for the 5-county Philadelphia area using the newer EPA-approved emissions model, MOVES2010a. The updated SIP revision will ensure that results for comparison use the same highway estimation model and allow more efficient transportation planning in the 5-county Philadelphia area. When the EPA approves the MVEBs in this SIP revision, DVRPC will be able to compare future transportation project emissions with attainment plan emissions estimates produced by the same model. The revised SIP revision will lead to an equitable and more relevant result when evaluating transportation impacts on an area’s air quality.

## **Motor Vehicle Emission Budgets for Transportation Conformity**

The Department proposes to establish budgets for highway emissions in order to ensure that transportation emissions do not impede clean air goals for the next decade. The information in the table below, once approved by EPA for the purposes of transportation conformity, will establish the MVEBs for the 5-county Philadelphia area.

Amendments to the 40 CFR Part 93, Subpart A transportation conformity regulations to address the 1997 PM<sub>2.5</sub> standard were published in the *Federal Register* on May 6, 2005, to account for

PM<sub>2.5</sub> and its precursors (70 FR 24280). Section 93.102 requires conformity determinations to be applicable to direct emissions of PM<sub>2.5</sub> and NO<sub>x</sub> (unless, with regard to NO<sub>x</sub>, a determination is made that transportation-related emissions are not significant contributors to PM<sub>2.5</sub>). Section 93.102 only requires conformity determinations to be applicable to emissions of sulfur dioxide (SO<sub>2</sub>), volatile organic compounds (VOC), and ammonia (NH<sub>3</sub>) if a finding is made that transportation-related emissions of these pollutants are significant contributors to PM<sub>2.5</sub>, or if the applicable implementation plan (or implementation plan submission) establishes an approved (or adequate) budget for the emissions as part of the reasonable further progress, attainment or maintenance strategy. Neither of those conditions exists for SO<sub>2</sub>, VOC or NH<sub>3</sub> emissions.

Motor vehicle emissions of SO<sub>2</sub> were analyzed using the MOVES model to determine if MVEBs should be established for these pollutants. Table 1 illustrates below the on-road mobile source fraction of the total 2009 inventory for SO<sub>2</sub>. Motor vehicle emissions of SO<sub>2</sub> account for 1% of the total projected 2009 inventory for SO<sub>2</sub>.

**Table 1: Comparison of 2009 MOVES Model Precursor Emissions to the Total Projected 2009 Inventory**

<b>2009</b>	<b>SO<sub>2</sub></b>
<b>On-Road Mobile Source Projected Inventory (Tons)</b>	316
<b>Total Projected 2009 Inventory (Tons)</b>	28,189
<b>Percent of Total Projected 2009 Inventory (%)</b>	1.12

MVEBs for SO<sub>2</sub>, VOC, and NH<sub>3</sub> are needed only if the state air agency director or the EPA Regional Administrator submit a finding that MVEBs must be established in order to attain the NAAQS for PM<sub>2.5</sub>. The reactions that form particulate matter from emissions of VOC and NH<sub>3</sub> are complex and highly variable, and there is considerable uncertainty regarding the contribution of VOC and NH<sub>3</sub> to particulate formation. Because of this uncertainty, the Commonwealth is not considering VOC or NH<sub>3</sub> as PM<sub>2.5</sub> precursors for the purpose of the attainment plan. As shown in Table 1, motor vehicle emissions of SO<sub>2</sub> are a small percentage of the total inventory. Based on the uncertainty surrounding VOC and NH<sub>3</sub> and the fact that no applicable finding has been made for them or for SO<sub>2</sub>, the Department is only establishing MVEBs for direct PM<sub>2.5</sub> and NO<sub>x</sub>, as shown in Table 2.

Pennsylvania proposes to revise the MVEBs for highway emissions for direct PM<sub>2.5</sub> and NO<sub>x</sub>, as shown in Table 2. Once the EPA approves these MVEBs as a SIP revision for purposes of conformity, the MVEBs will be used in transportation conformity for the 5-county Philadelphia area.

It is important to mention that higher emission estimates calculated by MOVES2010a do not mean that emissions from vehicles actually increased. The MOVES model better estimates emissions that are already being produced by vehicles. Consequently, the ability of the area to attain the fine particulate matter standard will not be affected by using estimates produced by the new model.

The MVEBs in the currently-approved SIP will be superseded by this SIP revision. A detailed methodology of how highway emissions were estimated can be found in Appendix A of the SIP revision.

**Table 2: Motor Vehicle Emission Budgets**

<b>Calendar Year</b>	<b>Pollutant</b>	
	<b>NO<sub>x</sub></b>	<b>PM<sub>2.5</sub></b>
<b>2009 Budget</b>	<b>51,908,101 kilograms/year (57,218.3 tons/year)</b>	<b>1,730,472 kilograms/year (1907.5 tons/year)</b>

## **Conclusion**

This proposed SIP revision will update the approved MVEBs for NO<sub>x</sub> and PM<sub>2.5</sub> emissions in the Commonwealth's approved PM<sub>2.5</sub> SIP for the 5-county Philadelphia area. This update, which is due to a change in methodology, will not negatively affect the 5-county Philadelphia area's ability to attain the 1997 PM<sub>2.5</sub> NAAQS.