

**The State of Wisconsin's  
Revision to the Motor Vehicle Emissions Budgets  
Included in the Milwaukee-Racine-Waukesha County  
Fine-Particulate National Ambient Air Quality (NAAQS)  
Maintenance Areas**

Prepared by the Wisconsin Department of Natural Resources

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## **1. Introduction**

This plan establishes revised motor vehicle emission budgets (MVEBs) for the 2006 PM<sub>2.5</sub> Milwaukee-Racine-Waukesha Maintenance Area. The budgets are for VOC emissions for the years 2020 and 2025 and would be used in Wisconsin's regional transportation conformity determinations if they are approved by EPA. The proposed revisions are consistent with continued maintenance of the 2006 PM<sub>2.5</sub> NAAQS and should be approved accordingly.

## **2. Background and Purpose**

### **2.1 Fine Particulate Matter (PM<sub>2.5</sub>) and Its Formation**

Particle pollution, also called particulate matter or PM, consists of solid particles or liquid droplets suspended in the air. Fine particles (PM<sub>2.5</sub>) may be emitted directly into the atmosphere but are more commonly created by reactions of other pollutants, such as nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), organic carbon, and ammonia. Sources of these precursor pollutants include power plants, industries, and automobiles. Wind can carry these particles hundreds of miles from their sources. PM<sub>2.5</sub> levels typically peak in winter but concentrations can also be high in summer.

Exposure to these fine particles and droplets can cause serious health problems in humans, especially those with respiratory conditions such as asthma and cardiac disease. PM<sub>2.5</sub> pollution scatters light and is the major cause of reduced visibility in the United States. Many fine particles can also cause acid rain and make lakes and streams more acidic. Deposition of nitrogen-containing particles may change the nutrient balance in lakes and rivers, affecting the diversity of ecosystems or damaging forests or crops. In addition, particle pollution can damage statues, monuments, and buildings made of stone and other materials.

To reduce particle pollution, state and federal regulations target NO<sub>x</sub> and SO<sub>2</sub> emissions from power plants and industrial combustion sources. Additionally, mobile source control programs help reduce organic carbon and NO<sub>x</sub> emissions through low-emission vehicles and cleaner gasoline.

### **2.2 National Ambient Air Quality Standard for Fine Particulate Matter**

The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. There are two categories of NAAQS. The primary standards establish limits to protect public health, and the secondary standards protect against environmental and welfare

effects such as decreased visibility and damage to crops, animals, and buildings. Currently, there are six pollutants with established NAAQS: carbon monoxide, lead, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), sulfur dioxide, nitrogen dioxide, and ozone. These pollutants are referred to as “criteria” pollutants. If an area violates a standard, it is classified as a nonattainment area for that specific pollutant. The states and/or tribes responsible for the affected area must then develop and implement strategies and control measures to attain the NAAQS. The objective for designated nonattainment areas is to be reclassified to attainment by the EPA.

The NAAQS for fine particulate matter (PM<sub>2.5</sub>) was established in 1997. A primary and secondary 24-hour standard was set at 65 µg/m<sup>3</sup> (micrograms per cubic meter of air), measured as the 98th percentile concentration averaged over three years. Primary and secondary annual standards were set at 15.0 µg/m<sup>3</sup>, measured as the annual arithmetic mean averaged over three years.

The CAA requires that the EPA carry out a periodic review of the NAAQS for the criteria pollutants. The EPA reviewed the PM<sub>2.5</sub> NAAQS during the 2000s and determined based on the latest health studies that the 24-hour standard must be strengthened to ensure protection of public health. The updated standard of 35µg/m<sup>3</sup> was finalized in October, 2006. In 2012, the EPA strengthened the primary annual PM<sub>2.5</sub> standard to 12 µg/m<sup>3</sup>, but retained the secondary standard of 15.0 µg/m<sup>3</sup> and the 2006 24-hour standard of 35µg/m<sup>3</sup>.

### **2.3 Wisconsin’s 2006 PM<sub>2.5</sub> NAAQS Maintenance Area**

Milwaukee, Racine, and Waukesha counties constitute Wisconsin’s 2006 PM<sub>2.5</sub> NAAQS maintenance area (Figure 1). In 2009, EPA determined that these counties were not meeting the 2006 24-hour PM<sub>2.5</sub> standard. The nonattainment designation for the three-county area in Wisconsin was established in a [final rule](#) published on November 13, 2009.

In June 2012, the Wisconsin Department of Natural Resources (WDNR) submitted a request to EPA to redesignate the three counties from nonattainment to attainment based on monitoring data collected between 2008 and 2011. The data showed that PM<sub>2.5</sub> concentrations were no longer exceeding the levels of the standard. Measurements since 2011 continue to show attainment of the standard in the three-county area as well as the rest of the state.

In light of a court decision (*Natural Resources Defense Council v. EPA*), EPA requested that states, including Wisconsin, supplement their redesignation requests with additional information. DNR submitted this information in the following document: [Supplemental Information for a June 2012 Redesignation Request and Maintenance Plan for the 24-Hour Fine Particulate Matter National Ambient Air Quality Standard](#).

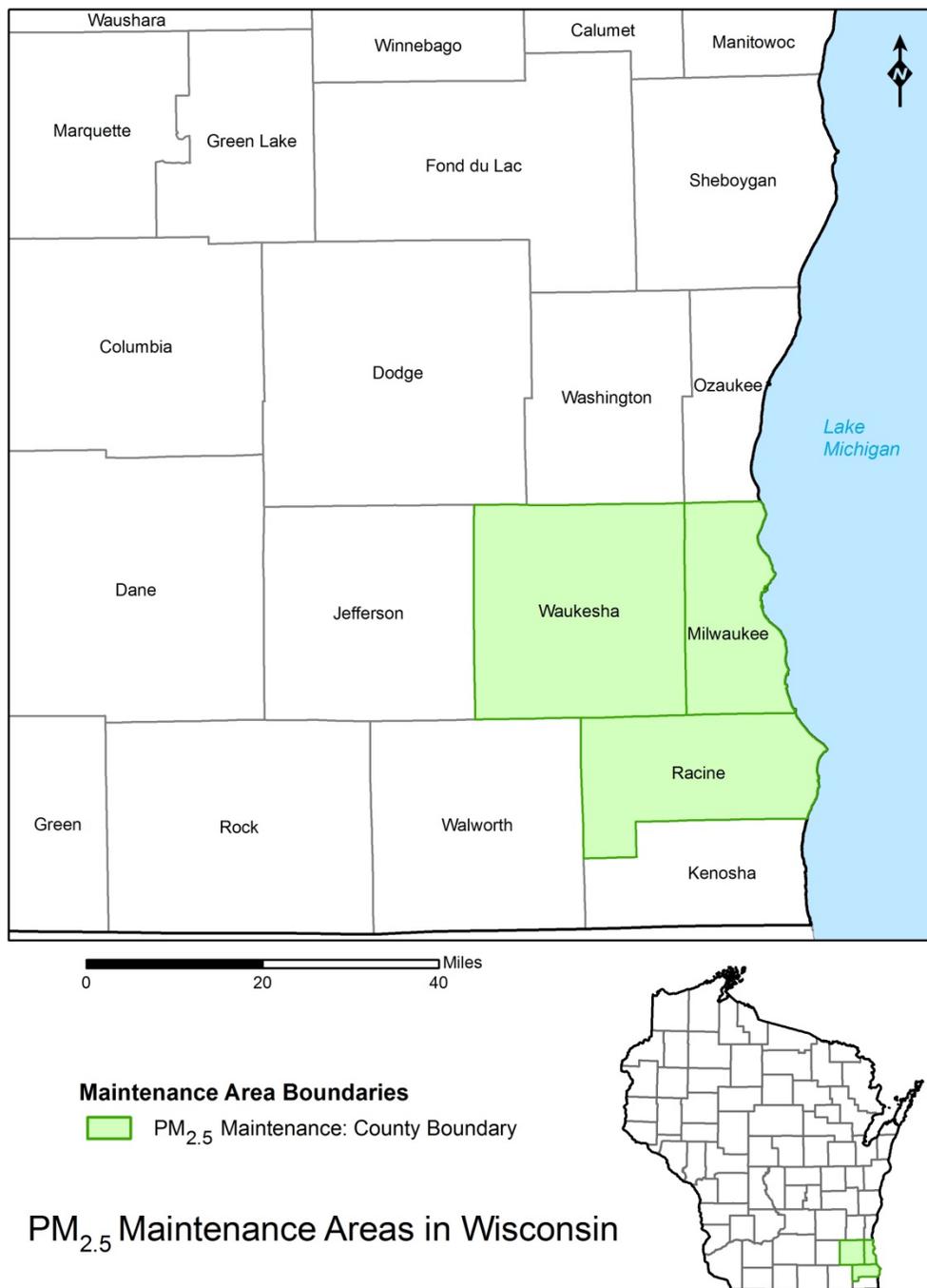


Figure 1. Wisconsin Maintenance Area under the 2006 PM<sub>2.5</sub> NAAQS

On February 18, 2014, EPA published a [proposed rule](#) to redesignate the three counties to attainment and approve all parts of Wisconsin's maintenance plan, the plan demonstrating how the state will ensure continued attainment of the PM<sub>2.5</sub> standard. On April 22, 2014, EPA published its [final approval of the redesignation](#).

## 2.4 Transportation Conformity

Transportation conformity is required under CAA section 176 (c) (42 U.S.C 7506(c)) to ensure that federally funded or approved highway and transit activities are consistent with – or “conform to” – the purpose of the state air quality implementation plan (SIP). “Conform to” the purpose of the SIP means that transportation activities will not cause or contribute to new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS or any interim milestones. Transportation conformity applies to designated nonattainment and maintenance areas for transportation-related criteria pollutants: ozone, PM<sub>2.5</sub>, PM<sub>10</sub>, carbon monoxide, and nitrogen dioxide. EPA’s transportation conformity rule (40 CFR Parts 51 and 93) establishes the criteria and procedures for determining whether metropolitan transportation plans, metropolitan transportation improvement programs, federally supported highways projects, and federally supported transit projects conform to the SIP.

The maintenance plan established motor vehicle emissions budgets (MVEBs) for volatile organic compounds (VOCs), sulfur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), and fine particulate matter (PM<sub>2.5</sub>) for the years 2020 and 2025 for use in conducting transportation conformity determinations. These budgets were developed based on key motor vehicle parameters that reflect the most recent planning assumptions, such as vehicle age distribution, vehicle fuel inspection requirements, and maintenance plan requirements.

The transportation conformity rules require that planning assumptions are “current,” which means no older than five years in the case of vehicle age distribution. During the update of the dataset to the year 2014, the WDNR, Wisconsin Department of Transportation (WisDOT), and Southeastern Wisconsin Regional Planning Commission (SEWRPC) noted a significant reduction in the purchase of new motor vehicles beginning in 2008, reflecting the national economic recession. This decrease in new car sales resulted in an increase in the average age of the vehicle fleet as motorists continued to drive their vehicles longer. Incorporating the 2014 vehicle age distribution in the MOVES2014 model resulted in an increase in projected emissions. During the most recent conformity determination for the SEWRPC region, WDNR determined that the difference between the forecasted VOC emissions for the transportation plan and the VOC MVEB was only 2 percent.

Another factor potentially affecting motor vehicle emissions estimates is the travel activity outputs from SEWRPC’s travel demand model. These model outputs include miles and hours of vehicle travel, categorized by time of day, speed, vehicle type, and facility type. A number of

factors unrelated to changes in the region’s transportation plan and program can affect the model output. Thus, changes can occur in emission estimates that do not reflect an actual change in the region’s emissions. Such model changes include:

- Updated version of the model software;
- Changes to the network coding outside the region, reflecting choice of which roads to include in the model rather than changes to the actual road network;
- Changes in input file generation methods; and
- Changes in modeling methods, such as changes to traffic analysis zones (e.g., splitting or combining zones).

Due to the emissions impact of the recent changes in vehicle age distribution, as well as potential variability in travel demand model outputs, the WDNR proposes to revise the MVEBs for VOCs by allocating safety margin emissions to the budgets, as described in the following section. The MVEB revisions will facilitate transportation conformity determinations for the Milwaukee-Racine-Waukesha area while remaining consistent with maintenance of the 2006 PM<sub>2.5</sub> standard.

## 2.5 Revised Motor Vehicle Emission Budgets for VOCs

One of the critical components of a maintenance plan is the comparison of the area’s emissions in the attainment year to those projected for the final year of the maintenance plan. Table 1 compares the 2006 PM<sub>2.5</sub> Milwaukee-Racine-Waukesha Maintenance Plan’s attainment year total VOC emissions from point, area, and mobile sources to the emissions projected for the year 2025. The difference between the two values is referred to as a “safety margin.”

Table 1

*VOC Emissions Safety Margin under the 2006 PM<sub>2.5</sub> Maintenance Plan*

<b>2010 Attainment Year Emissions</b> (tons per winter day)	<b>2025 Final Year Emissions Projection</b> (tons per winter day)	<b>Total Safety Margin</b> (tons per winter day)
127.4	106.7	20.7

The EPA transportation conformity regulations (40 CFR 93.124) allow for the use of some or the entire safety margin in the development of MVEBs for maintenance plans (58 FR 62188). As indicated in Table 1, VOC emissions are projected to be 20.7 tons per day lower in 2025 than 2010. The WDNR proposes to allocate a portion of the safety margin to the year 2020 and 2025 MVEBs established in the maintenance plan, as shown in Table 2 below.

Table 2

*Proposed Revised Motor Vehicle Emissions Budgets for VOCs*

<b>Emission Budget Year</b>	<b>Approved Emission Budget</b> (tons per winter day)	<b>Proposed Allocation of Safety Margin</b> (tons per winter day)	<b>Proposed Revised Emission Budget</b> (tons per winter day)
2020	15.890	2.384	18.274
2025	11.980	1.798	13.778

### 3. Public Participation

In accordance with section 110(a) (2) of the CAA, the WDNR is required to hold a public hearing prior to the adoption of this plan and subsequent submittal to the EPA. The Department will notify the public and other interested parties of an upcoming public hearing and public comment period 14 days prior to holding the hearing as follows:

Notice of availability of the Revision to the Motor Vehicle Emissions Budgets Included in the Milwaukee-Racine-Waukesha County Fine-Particulate National Ambient Air Quality (NAAQS) Maintenance Areas was posted on the WDNR Air Management website on September 29, 2015: <http://dnr.wi.gov/topic/AirQuality/Input.html>

- The public hearing was scheduled for October 9, 2015 beginning at 1:30p.m. at the Wisconsin Department of Natural Resources Building, Conference Room 713, 101 South Webster Street, Madison, WI 53707.
- The public comment period for the plan opened when it was posted on the Wisconsin Department of Natural Resources Air Management website on September 29, 2014, and closes on October 28, 2015, 19 days after the public hearing.