



FDM 22-10-1 Introduction

August 15, 2019

EPA has established National Ambient Air Quality Standards (NAAQS) for six principal pollutants, which are called "criteria pollutants". They are a set of air pollutants that cause smog, acid rain, and other health hazards. Criteria pollutants are typically emitted from many sources in industry, mining, transportation, electricity generation and agriculture. In most cases they are the products of the combustion of fossil fuels or industrial processes. The NAAQS are listed: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>. Only two of the six criteria pollutants—ozone (O₃) and particulate matter (P.M._{2.5})—are important to Wisconsin.

Ozone is a form of molecular oxygen that consists of three oxygen atoms linked together. Ozone in the upper atmosphere (the "ozone layer") occurs naturally and protects life on earth by filtering out ultraviolet radiation from the sun. But ozone at ground level is a noxious pollutant. It is the major component of smog and presents this country's most difficult urban air quality problem.

Particle pollution, also called particulate matter or PM, consists of solid particles or liquid droplets suspended in the air. Fine particles (PM_{2.5}) may be emitted directly into the atmosphere but are more commonly created by reactions of other pollutants, such as nitrogen oxides (NO_x), sulfur dioxide (SO₂), organic carbon and ammonia. Inhalable coarse particles (PM₁₀) usually result from some type of mechanical action such as crushing or grinding, or from wind-blown dust. Exposure to these suspended particles and droplets can cause serious health problems in humans, especially those with respiratory conditions such as asthma and cardiac disease.

FDM 22-10-2 Description

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Ozone is not emitted directly but is formed in the atmosphere through a complex set of chemical reactions involving hydrocarbons, oxides of nitrogen, and sunlight. The rate at which the reactions proceed is related to both temperature and intensity of the sunlight. Because of this, problematic ozone levels occur most frequently on hot summer afternoons. Hydrocarbons and nitrogen oxides come from a great variety of industrial and combustion processes. In typical urban areas, at least half of those pollutants come from cars, buses, trucks, and off-highway mobile sources such as construction vehicles and boats.

Ozone is a severe irritant. It is responsible for the choking, coughing, and stinging eyes associated with smog. Ozone damages lung tissue, aggravates respiratory disease, and makes people more susceptible to respiratory infections. Children are especially vulnerable to ozone's harmful effects, as are adults with existing diseases. But even otherwise healthy individuals may experience impaired health from breathing ozone-polluted air. Elevated ozone levels also inhibit plant growth and can cause widespread damage to crops and forests. Unhealthy ozone levels are a problem across the United States, with many cities exceeding the U.S. Environmental Protection Agency (EPA) National Ambient Air Quality Standard (NAAQS) for ozone. The standard is based on the highest ozone exposure sensitive persons can tolerate.

Particle pollution includes fine particles with an aerodynamic diameter of 2.5 microns or less (PM_{2.5}), inhalable coarse particles with an aerodynamic diameter of 2.5 to 10 microns or less (PM₁₀). For a sense of scale, the average human hair is 70 microns in diameter. In Wisconsin, DNR monitors inhalable coarse and fine particles.

Fine particles (PM_{2.5})

Sources of fine particle emissions include forest fires and wood stoves. Sources of the precursor pollutants that chemically react to form fine particles (NO_x, SO₂, organic carbon and ammonia) include power plants, industries and automobiles. Wind can carry these particles hundreds of miles from their sources. Fine particle levels typically peak in winter but concentrations can also be high in summer.

Coarse particles (PM₁₀)

Sources of inhalable coarse particles include roadways and dusty industries. These particles are typically not transported great distances.

FDM 22-10-3 Nonattainment Areas

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A nonattainment area is a geographic area designated by EPA that exceeds a NAAQS threshold for at least one criteria pollutant. An area may be in attainment for one or more criteria pollutants and a nonattainment area for others. Current nonattainment areas for criteria pollutants are listed by pollutant type at:

<https://www.epa.gov/green-book>

FDM 22-10-4 Conformity

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The air quality provisions of the Clean Air Act (CAA) and the metropolitan transportation planning provisions of Title 23 and Title 49 of the United States Code require a planning process that integrates air quality planning and metropolitan transportation planning such that Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) funding and approvals are given to highway and public transportation projects that are consistent with ("conform to") the air quality goals of a given state. This process is known as transportation conformity and is carried out in accordance with 40 CFR Parts 51 and 93. The state establishes and articulates its air quality goals in its State Implementation Plan (SIP). A SIP is a collection of enforceable regulations covering implementation of control measures, or equipment, or processes, or actions used by a state to reduce air pollution. Taking cost into consideration, a SIP includes a best mix of control measures identified by the state to attain a given NAAQS. A SIP also spells out how emission reduction responsibilities will be allocated among emission sources and shows not only how a state will make progress toward attaining the NAAQS by CAA deadlines, but also how a state will attain and maintain the NAAQS.

The CAA requires that metropolitan transportation plans, transportation improvement programs (TIPs), Federally funded or approved projects, and other regionally significant projects, regardless of funding source, conform to the purpose of the SIP. Conformity to a SIP means that such activities will not cause or contribute to any new violations of the NAAQS; increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone. Conformity requirements apply in areas that either do not meet or previously have not met air quality standards. These areas are known as "nonattainment areas" or "maintenance areas" respectively. Under the CAA, a state is required to develop, adopt, and submit to the EPA for approval a SIP for each criteria air pollutant for which it has a nonattainment or maintenance area. For a complete list of nonattainment and maintenance areas for these and other pollutants see:

<https://www.epa.gov/green-book>.

For a metropolitan area's transportation plan and TIP, a conformity determination demonstrates that the total emissions from on-road travel on an area's transportation system network are consistent with goals for air quality found in the SIP. Before a SIP is available, other tests of conformity are used. For project-level conformity, a project must come from a conforming metropolitan transportation plan and TIP, its design concept and scope must not have changed significantly from that in the metropolitan transportation plan and TIP, and that potential localized emissions impacts are addressed.

Isolated rural nonattainment and maintenance areas are defined in 40 CFR 93.101 as areas that do not contain or are not part of any metropolitan planning area as designated under the transportation planning regulations. These areas do not have federally required metropolitan transportation plans and TIPs and, as such, are not subject to the frequency requirements for conformity determinations of transportation plans and TIPs (40 CFR 93.104(b), (c), and (e)). Instead, in an isolated rural area, a conformity determination is required only when a non-exempt FHWA/FTA project(s) needs funding or approval, based on the conformity requirements for isolated rural areas at 40 CFR 93.109(g).

FDM 22-10-5 Determining Conformity of Transportation Plans, Programs, and Projects

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Transportation conformity ("conformity") is a way to ensure that Federal funding and approval go to those transportation activities that are consistent with air quality goals. Conformity applies to transportation plans, transportation improvement programs (TIPs), and projects funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) in areas that do not meet or previously have not met air quality standards for ozone, carbon monoxide, particulate matter, or nitrogen dioxide—all transportation related, but only ozone and particulate matter are relevant to Wisconsin. These areas are known as "nonattainment areas" or "maintenance areas," respectively. Regulations governing transportation conformity are found in Title 40 of the Code of Federal Regulations (40 CFR Parts 51 and 93).