

Prairie Parkway Project Level Hot-Spot Conformity Analysis for Fine Particulate Matter PM_{2.5} Synopsis

June 26, 2007

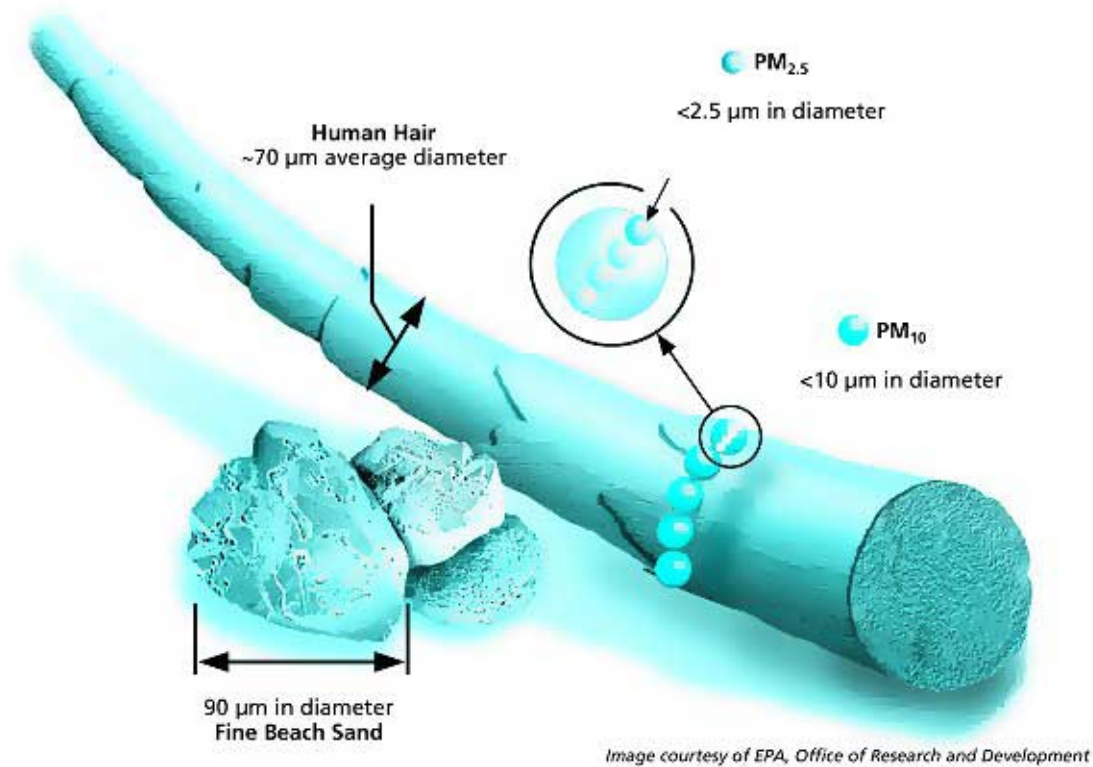
The Clean Air Act, as amended in 1990, requires the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for widespread pollutants from numerous and diverse sources considered harmful to public health and the environment. EPA has set these standards (NAAQS) for six principal pollutants, which are called "criteria" pollutants: ozone, particulate matter (PM), carbon monoxide, sulfur dioxide, nitrogen oxides and lead. In order to ensure that federally supported highway and transit activities do not cause new air quality violations, worsen existing violations or delay timely attainment of the relevant standards, such activities must be found to conform to the purpose of state air quality implementation plan (SIP). The Chicago metropolitan area's current 2030 Regional Transportation Plan (RTP) and FY2007 – 2012 Transportation Improvement Program (TIP) were determined to meet the requirements of the conformity regulations for ozone and PM_{2.5} by EPA and US Department of Transportation in October 2006. This is a regional conformity determination for all transportation improvement projects in the Illinois portion of the air quality nonattainment area. The proposed Prairie Parkway is an element in the 2030 RTP, partially within the nonattainment area, and so is part of a conforming transportation plan.

In addition to regional conformity, "projects of air quality concern" are subject to PM_{2.5} hot-spot analysis. A hot-spot analysis assesses the air quality impacts on a scale smaller than an entire nonattainment or maintenance area. Such an analysis is a means of demonstrating that a transportation project meets Clean Air Act conformity requirements to support state and local air quality goals with respect to potential localized air quality impacts. The Prairie Parkway was found to be of air quality concern because of expected levels of diesel traffic. A qualitative PM_{2.5} hot-spot analysis of the proposed Prairie Parkway was prepared using the joint EPA and Federal Highway Administration March 2006 guidance.

PM_{2.5} Background

Particulate matter, or PM, is the term for particles found in the air, including dust, dirt, soot, smoke, and liquid droplets. Particles can be suspended in the air for long periods. Some particles are large or dark enough to be seen as soot or smoke. Others are so small that individually they can only be detected with an electron microscope. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. These solid and liquid particles come in a wide range of sizes. Particles less than 10 micrometers in diameter (PM₁₀) pose a health concern because they

can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter (PM_{2.5}) are referred to as "fine" particles and are believed to pose the greatest health risks. Because of their small size (approximately 1/30th the average width of a human hair), fine particles can lodge deeply into the lungs.



Sources of fine particles include all types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes. Particles with diameters between 2.5 and 10 micrometers are referred to as "coarse." Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads. Other particles may be formed in the air from the chemical change of gases. They are indirectly formed when gases from burning fuels react with sunlight and water vapor. These can result from fuel combustion in motor vehicles, at power plants, and in other industrial processes.

Health studies have shown a significant association between exposure to fine particles and premature death. Other important effects include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, and absences from school or work, and restricted activity days), lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and irregular heart beat. Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children.

PM_{2.5} Controls and Regulations

Diesel engine emissions are the primary mobile, transportation related, source of PM_{2.5}. In 2006, EPA established standards for ultra-low sulfur diesel fuel, which in conjunction with advanced pollution control technology for heavy-duty trucks and buses, will mean new trucks and buses would be 90% cleaner than current models. This program will provide annual emission reductions equivalent to removing about 13 million trucks and buses when the current heavy-duty vehicle fleet has been completely replaced by 2030.

PM_{2.5} Hot-Spot Analysis Finding

A surrogate type qualitative analysis was performed for the proposed Prairie Parkway project. This approach identified existing PM_{2.5} monitor sites in proximity to existing expressway facilities in the metropolitan Chicago area with current traffic levels similar to future traffic levels for the Prairie Parkway; i.e., total average daily traffic (ADT) and amount of diesel traffic equal to or above that forecast for the Prairie Parkway. The four selected sites and their general characteristic are:

- Aurora [one-half mile south of I-88] existing 2005 total daily traffic is almost 10% higher than the maximum 2030 forecast Prairie Parkway total daily traffic, and the current heavy-duty commercial vehicle traffic level is 70% of the maximum 2030 diesel vehicles forecast for the Prairie Parkway.
Monitor data for 2004-2006: 24-hour = 34.5 µg/m³ and annual = 13.0 µg/m³
- Elgin [1.2 miles south of I-90] existing 2005 total daily traffic is twice the maximum 2030 forecast Prairie Parkway total daily traffic, with a higher number of heavy-duty commercial vehicles currently than the maximum diesel vehicles forecast for the Prairie Parkway in 2030.
Monitor data for 2004-2006: 24-hour = 32.3 µg/m³ and annual = 14.3 µg/m³
- Joliet [1.1 miles north of I-80] existing 2005 total daily traffic is 50% higher than the maximum 2030 forecast Prairie Parkway total daily traffic, and there are 70% more heavy-duty commercial vehicles currently than the maximum diesel vehicles forecast for the Prairie Parkway in 2030.
Monitor data for 2004-2006: 24-hour = 33.4 µg/m³ and annual = 13.2 µg/m³
- Braidwood [1.8 miles southwest of I-55] existing 2005 total daily traffic is approximately equal to the 2030 total traffic levels forecast for the Prairie Parkway junctions with I-80 and I-88, and 10% more current heavy-duty commercial vehicle traffic than the estimated 2030 diesel vehicles at these junctions.
Monitor data for 2004-2006: 24-hour = 29.7 µg/m³ and annual = 11.1 µg/m³

The National Ambient Air Quality Standards for PM_{2.5} are:

- 24-hour = 35µg/m³ based on a 3-year average of 98th percentile 24-hour concentrations
- Annual = 15 µg/m³ based on a 3-year average of annual concentrations

The four PM_{2.5} monitors selected all have existing traffic levels similar to those forecast for the Prairie Parkway in 2030 and meet both of the PM_{2.5} standards for the current period (2004 – 2006) as required. The PM_{2.5} project level hot-spot analysis therefore concludes that proposed Prairie Parkway project will not cause new air quality violations, worsen existing violations or delay timely attainment of the relevant standards (NAAQS).

Where to find information:

Information regarding the Conformity Analysis for Fine Particulate Matter is available for inspection in advance of the Public Hearings beginning on June 26th, 2007, as well as after the hearings, at the following locations: at the IDOT District 3 Office, 700 East Norris Drive, Ottawa, IL; at the IDOT District 1 Office, 201 West Center Court, Schaumburg, IL; and at the office of Smith Engineering, 759 John Street, Yorkville, IL. This and other information about the Prairie Parkway Study also can be viewed on-line by visiting www.prairie-parkway.com.

Public hearings scheduled:

Date:	Wednesday, July 11, 2007	Thursday, July 12, 2007
Time:	5:30 p.m. – 8 p.m.*	5:30 p.m. – 8 p.m.*
Location:	Yorkville High School 797 Game Farm Rd. Yorkville, Illinois	Kaneland John Shields Elementary School 85 South Main Street Sugar Grove, Illinois

* Presentation and question and answer session at 6:30 p.m.