Fine Particulate Matter (PM$_{2.5}$) Project Level Hot-Spot Analysis
Prairie Parkway Study
Grundy, Kendall, and Kane Counties, Illinois

January 4, 2008
# Table of Contents

1.0 EXECUTIVE SUMMARY .......................................................... 1

2.0 PURPOSE OF THIS DOCUMENT ............................................. 2

3.0 PRAIRIE PARKWAY PROJECT DESCRIPTION .......................... 2

4.0 BACKGROUND OF PM$_{2.5}$ REQUIREMENTS .......................... 5
   4.1 Statutory and Regulatory Requirements .................................. 6
   4.2 PM$_{2.5}$ Regional Conformity Determination ............................ 6

5.0 PM$_{2.5}$ HOT-SPOT ANALYSIS .............................................. 7
   5.1 Construction Emissions and Re-Entrained Road Dust .................. 7
   5.2 Existing Conditions ............................................................ 8
      5.2.1 Air Quality Monitors ......................................................... 8
      5.2.2 Transportation and Traffic Conditions ............................. 11
      5.2.3 Built and Natural Environment ......................................... 12
   5.3 Emission Trends and Information .......................................... 15
      5.3.1 National Emission Trends ................................................. 15
      5.3.2 Illinois Statewide Emission Trends .................................... 16
      5.3.3 Northeastern Illinois Region Future Emission Trends .............. 16
      5.3.4 Dan Ryan Reconstruction Project Level PM$_{2.5}$ Emission Monitoring 17
   5.4 PM$_{2.5}$ Hot-spot Analysis Approach ..................................... 18
      5.4.1 Surrogate Site Selection .................................................... 18
      5.4.2 Proposed Improvement Forecast Traffic ............................... 18
      5.4.3 Surrogate Site Comparisons ............................................. 19

6.0 CONCLUSIONS ......................................................................... 23
1.0 Executive Summary

The Northeastern Illinois and Northwestern Indiana regions have been designated as nonattainment of the national ambient air quality standard (NAAQS or “standard”) for fine particulate matter (PM$_{2.5}$). Based on the Transportation Conformity regulations found in 40 CFR 93.123(b)(1) (as amended March 10, 2006) federally funded non-exempt transportation projects in the Northeastern Illinois/Northwestern Indiana region are required to address project level or “hot-spot” considerations for PM$_{2.5}$.

According to 40 CFR 93.123(b)(2) and (4), a quantitative analysis for applicable projects is not required until EPA releases modeling guidance in the Federal Register. However, a qualitative hot-spot analysis is required for projects that are found to be “projects of air quality concern” in order to assess whether the project will cause or contribute to any new localized PM$_{2.5}$ violations, increase the frequency or severity of any existing violations, or delay timely attainment of the PM$_{2.5}$ NAAQS. This document addresses those requirements for the Prairie Parkway project.

This analysis used a surrogate methodology for complying with the qualitative hot-spot requirements. A “surrogate” (or substitute) site is a site for which the current levels of Average Daily Traffic (ADT) and truck traffic are comparable to or greater than those of the future worst-case build scenario. If, additionally, the surrogate site has a monitor in the vicinity with current PM$_{2.5}$ monitor readings less than or equal to the standards, then one can logically conclude that the worst-case build scenario will not cause or add to an existing PM$_{2.5}$ violation.

Four surrogate sites with PM$_{2.5}$ monitors in proximity to existing freeways were chosen for this analysis: Elgin/I-90, Aurora/I-88, Joliet I-80 & I-55 and Braidwood/I-55. At these locations current freeway mainline daily traffic ranges from 30,000 to over 100,000; nearest arterial road interchange daily traffic ranges from 8,000 to over 33,000 and heavy commercial vehicle traffic is between 10% and 24% of total daily traffic. The Prairie Parkway Preferred Alternative forecast traffic ranges from 13,400 to 28,600 (near-term) and 25,000 to 50,000 (design year) vehicles per day with approximately 20% estimated to be diesel powered vehicles. Current traffic conditions at these four surrogate sites equal or exceed those forecast for the Prairie Parkway Preferred Alternative. The most recent (2004 to 2006) PM$_{2.5}$ monitor data at these four locations show them to be below both the 24-hour and annual PM$_{2.5}$ NAAQS.

In summary, current monitor data from four locations with (1) traffic levels equal or higher than those estimated for the Prairie Parkway Preferred Alternative; (2) current development levels comparable to those forecast for the study area; and (3) proximate enough that metrological conditions are equivalent all meet the current PM$_{2.5}$ 24-hour and annual mean NAAQS. Thus, it is determined that the Prairie Parkway Preferred Alternative meets the PM$_{2.5}$ project-level conformity requirements, and will not cause or contribute to a new violation of the PM$_{2.5}$ NAAQS, or increase the frequency or severity of a violation.
2.0 Purpose of this Document

The Clean Air Act section 176(c) requires that federally supported highway and transit project activities be consistent with state air quality goals, found in the State Implementation Plan (SIP). The process to ensure this consistency is called Transportation Conformity. Conformity to the SIP means that transportation activities will not cause new violations of the national ambient air quality standards (NAAQS or “standards”), worsen existing violations of the standard, or delay timely attainment of the relevant standard.

Transportation conformity is required for federal supported transportation projects in areas that have been designated by the U.S. Environmental Protection Agency (EPA) as not meeting a NAAQS. These areas are called nonattainment areas if they currently do not meet air quality standards or maintenance areas if they have previously violated air quality standards, but currently meet them and have an approved Clean Air Act section 175A maintenance plan.

EPA amended the Transportation Conformity rule on March 10, 2006 requiring a hot-spot analysis to determine project-level conformity in PM$_{2.5}$ and PM$_{10}$ nonattainment and maintenance areas. A hot-spot analysis is an assessment of localized emissions impacts from a proposed transportation project and is only required for “projects of air quality concern.” The March 10, 2006 rule provides examples of projects of air quality concern. The PM$_{2.5}$ and PM$_{10}$ hot-spot requirements in the final rule became effective April 5, 2006. Project level hot-spot analyses are required pursuant to 40 CFR Part 93.

The Prairie Parkway project is partially located within the Metropolitan Chicago Interstate Air Quality Control Region (AQCR #67). The portion of the project from I-88 south to the Kane/Kendall border (approximately 10 miles) and where preferred alternative connects to I-80 near Minooka in Aux Sable Township of Grundy County are within AQCR #67. This region is currently designated as a non-attainment area for the ozone and PM$_{2.5}$ NAAQS. Early interagency coordination on the project involving IDOT, FHWA, USEPA, IEPA and CMAP resulted in the determination that the Prairie Parkway project is a project of air quality concern, and thus a qualitative hot-spot analysis has been completed for the project. This hot-spot analysis of the Prairie Parkway Preferred Alternative follows the joint EPA/FHWA guidance for qualitative PM hot-spot analysis.

3.0 Prairie Parkway Project Description

The proposed improvement is located approximately 50 miles west of the City of Chicago in southern Kane, Kendall and northern Grundy counties. This portion of the Chicago metropolitan region is undergoing major transformation, changing from a

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1 EPA posted the final rule on its website on March 1, 2006 and the final rule was published in the Federal Register on March 10, 2006.
2 EPA: Last updated on Wednesday, March 15, 2006; URL: http://www.epa.gov/oar/oaqps/greenbk/
3 EPA/FHWA, “Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas”, March 2006.
generally rural area to a more suburban environment with the coming of new residential, commercial, and industrial development. Between 1990 and 2000, there was 28 percent overall population growth for the six counties included in the Prairie Parkway study area. Will, Kendall, and Kane counties exhibited the largest increases in population at 40 percent, 38 percent, and 27 percent, respectively. These three Illinois counties were on the US Census Bureau’s list of the 100 fastest growing counties in the United States between 2000 and 2005. Based on the absolute increase in population between April 2000 and July 2005, Will County is ranked 4th, Kane is 13th, and Kendall is 48th in the nation.

Population and employment in the six county Prairie Parkway study area are projected to approximately double from 2000 to 2030. Table 1 shows the forecast growth in population and employment for three counties traversed by the proposed facility.

### Table 1 – County Population and Employment Forecasts

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Kane County</td>
<td>404,119</td>
<td>697,321 (+72.6%)</td>
<td>242,351</td>
<td>423,422 (+74.7%)</td>
</tr>
<tr>
<td>Kendall County</td>
<td>54,544</td>
<td>176,607 (+223.6%)</td>
<td>21,604</td>
<td>70,003 (+224.0%)</td>
</tr>
<tr>
<td>Grundy County</td>
<td>37,535</td>
<td>65,006 (+73.2%)</td>
<td>20,122</td>
<td>35,000 (+73.9%)</td>
</tr>
</tbody>
</table>


The Draft Environmental Impact Statement (DEIS) evaluated a No Action Alternative together with two detailed build alternatives (B2 and B5). Alternative B5 with IL-47 widening shown in Figure 1 is the Preferred Alternative. The Preferred Alternative includes provisions for the inclusion of congestion management system improvements; freeway component between Interstate 80 (I-80) and Interstate 88 (I-88); and IL-47 widening component between I-80 and Caton Farm Road.

The Preferred Alternative freeway component (Alternative B5 with IL-47 Widening) will be 37 miles long. It will begin on its south end with a freeway-to-freeway interchange with I-80 west of Minooka. It will end on the north with a freeway-to-freeway interchange with I-88 near Kaneville. It will include five additional interchanges with US-52, IL-47, IL-71, US-34, and US-30 (on a new connector road) to provide access to the study area’s road system. The freeway component of the Preferred Alternative will be four lanes (two lanes in each direction of travel) with a 63-foot-wide median that could accommodate transit or added highway lanes if needed in the future. The freeway component of the Preferred Alternative will cross 33 other roadways, 20 will be grade-
Figure 1 – Prairie Parkway Preferred Alternative

separated (with the existing road passing over the Prairie Parkway at all grade-separations except for IL-71, US-34 and US-30) and 13 roads will be closed. At two of the road closures, frontage roads will be built to maintain local access.

The Preferred Alternative freeway will pass under seven ComEd electric power lines. It will pass over three railroads. The freeway will include new drainage structures at 30 major and 14 minor stream crossings, including seven with bridges. The Preferred Alternative freeway also will include 15 major and 14 minor stream crossings on existing and new roads that cross or intersect with the freeway, including five with bridges.
The IL-47 widening component of the Preferred Alternative will be 12 miles long. It will begin on its south end at I-80 and end on its north end at Caton Farm Road where it will connect to other planned or programmed IL-47 widening projects. IL-47 will be a four-lane highway (two lanes in each direction) with a 32-foot-wide raised curb median and paved shoulders. Median openings and exclusive left-turn lanes will be provided at existing intersections.

Full control of access to adjoining properties is not planned on any section of the IL-47 improvement except for limited control of access at signalized intersections. The widening will replace existing drainage structures at nine major and one minor stream crossings, including two with bridges.

### 4.0 Background of PM$_{2.5}$ Requirements

Airborne particulate matter (PM) consists of many different substances suspended in air in the form of particles (solids or liquid droplets) that vary widely in size. The particle mix in most U.S. cities is dominated by fine particles (less than 2.5 micrometers in diameter) generated by combustion sources, with smaller amounts of coarse dust (between 2.5 and 10 micrometers in diameter). Particles less than 10 micrometers in diameter include both fine and coarse dust particles. These particles pose the greatest health concern because they can pass through the nose and throat and get into the lungs. Particles larger than 10 micrometers in diameter that suspend in the air are referred to as total suspended particulates (TSP). These larger particles can cause irritation to the eyes, nose and throat in some people, but they are not likely to cause more serious problems since they do not get down into the lungs.

Motor vehicles (i.e., cars, trucks, and buses) emit direct PM from their tailpipes, as well as from normal brake and tire wear. In addition, vehicles cause dust from paved and unpaved roads to be re-entrained, or re-suspended, in the atmosphere; and highway and transit project construction may cause dust. Finally, gases in vehicle exhaust may react in the atmosphere to form PM. Particles come in a wide variety of sizes and have been historically assessed based on size, typically measured by the diameter of the particle in micrometers. PM$_{2.5}$, or fine particulate matter, refers to particles that are 2.5 micrometers in diameter or less. (Note: A human hair is about 70 micrometers in diameter and a grain of sand is about 90 micrometers in diameter). The National Ambient Air Quality Standards (NAAQS) for fine particulate matter, as revised by EPA in 2006, include an annual standard (15.0 micrograms per cubic meter (µg/m$^3$)) and a 24-hour standard (35 µg/m$^3$). However, for conformity purposes, only the 1997 PM$_{2.5}$ NAAQS (15.0 µg/m$^3$ for the annual standard and 65 µg/m$^3$ for the 24-hour standard) applies at this time based on EPA’s April 2007 guidance\(^4\). The annual standard is based on a 3-year average of annual mean PM$_{2.5}$ concentrations; the 24-hour standard is based on a 3-year average of the 98th percentile of 24-hour concentrations.

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4.1 Statutory and Regulatory Requirements

On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: "PM$_{2.5}$ and PM$_{10}$ Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New PM$_{2.5}$ and Existing PM$_{10}$ National Ambient Air Quality Standards" (71 FR 12468). This rule amendment requires the assessment of localized air quality impacts of Federally-funded or approved transportation projects in PM$_{10}$ and PM$_{2.5}$ nonattainment and maintenance areas deemed to be projects of air quality concern$^5$. This assessment of localized impacts (i.e., "analysis") examines potential 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.

Qualitative hot-spot analysis is required for these projects before EPA releases its future quantitative modeling guidance and announces that quantitative PM$_{2.5}$ hot-spot analyses are required under 40 CFR §93.123(b)(4). EPA requires hot-spot findings to be based on directly emitted PM$_{2.5}$, since secondary particles take several hours to form in the atmosphere giving emissions time to disperse beyond the immediate area of concern. The Conformity Rule requires PM$_{2.5}$ hot-spot analyses to include road dust emissions only if such emissions have been found significant by EPA or the state air agency prior to the PM$_{2.5}$ SIP or as part of an adequate PM$_{2.5}$ SIP motor vehicle emissions budget (40 CFR §93.102(b)(3)). Emissions resulting from construction of the project are not required to be considered in the hot-spot analysis if such emissions are considered temporary according to 40 CFR §93.123(d)(6).

The PM$_{2.5}$ and PM$_{10}$ hot-spot requirements in the final rule became effective April 5, 2006. A qualitative PM$_{2.5}$ hot-spot analysis that meets the final rule’s requirements must be completed for project-level determinations for projects of air quality concern completed on or after April 5, 2006.

4.2 PM$_{2.5}$ Regional Conformity Determination

Section 176(c) of the Clean Air Act and the federal conformity rule require that transportation plans and programs conform to applicable state air quality implementation plans (SIPs) and Section 174 and 176(c) and (d) of the Clean Air Act (42 U.S.C. 7504, 7506(c) and (d)). The Prairie Parkway project was included in the 2030 Regional Transportation Plan (RTP) and FY 2007 – 2012 Transportation Improvement Program (TIP), endorsed by the Policy Committee of the Chicago Area Transportation Study (CATS), the Metropolitan Planning Organization (MPO) for the region in which the project is located. On October 16, 2006, the FHWA and the FTA determined that the RTP and TIP conformed to the State Implementation Plan (SIP) and made a PM$_{2.5}$ conformity determination. These findings were in accordance with 40 CFR Part 93, “Criteria and Procedures for Determining Conformity to State or Federal

$^5$ Criteria for identifying projects of air quality concern is described in 40 CFR 93.123(b)(1), as amended.
Implementation Plans, Programs, and Projects Funded or Approved under Title 23 USC
or the Federal Transit Act.”

The Prairie Parkway Preferred Alternative design concept and scope is consistent with
the project information used for the RTP and TIP conformity analysis. The northeastern
Illinois 2030 RTP and FY 2007-2012 TIP comply with the interim PM2.5 emissions tests
required by the conformity rule and the project complies with the project-level PM2.5 hot-
spot analysis requirements of the conformity rule. This project’s TIP number is
#09-02-9033. The Prairie Parkway project was included in the regional emissions
analysis and there have been no significant changes in the project’s design concept or
scope, as used in the conformity analyses. Therefore, the project comes from a
conforming plan and program in accordance with 40 CFR §93.115.

## 5.0 PM2.5 Hot-spot Analysis

The Prairie Parkway project meets the criteria set forth in 40 CFR 93. 123(b)(1) for
projects of air quality concern primarily because it is a new highway facility with a
significant level of diesel vehicles; thereby requiring a hot-spot analysis. The Prairie
Parkway maximum 2030 ADT and total daily diesel vehicle traffic are forecasted to be
approximately 50,000 and 10,000 (20 percent), respectively. Comparing these values to
those cited in the preamble to the conformity rule by EPA as examples of projects of air
quality concern – AADT greater than 125,000 AADT and 10,000 trucks per day – indicate
this project should be so categorized.

According to 40 CFR §93.123(b)(2) and (4), a quantitative analysis for applicable projects
is not required until the EPA releases modeling guidance in the Federal Register. However,
a qualitative hot-spot analysis is still required. Therefore, a qualitative project-level hot-
spot assessment was conducted for the Prairie Parkway Preferred Alternative in order to
assess whether the project will cause or contribute to any new localized PM2.5 violations,
or increase the frequency or severity of any existing violations, or delay timely
attainment of the PM2.5 NAAQS.

### 5.1 Construction Emissions and Re-Entrained Road Dust

40 CFR 93.123(c)(5) states “CO, PM10, and PM2.5 hot-spot analyses are not required to
consider construction-related activities which cause temporary increases in emissions.
Each site which is affected by construction-related activities shall be considered
separately, using established “Guideline” methods. Temporary increases are defined as
those which occur only during the construction phase and last five years or less at any
individual site.”

At this point in time, no project construction schedule for the Prairie Parkway Freeway
and associated IL-47 widening exists. It is, however, probable that the freeway facility
will be constructed in at least two phases and that IL-47 south of Caton Farm Road will
be built at a later date. As such, localized construction emissions can be considered
separately and temporary as construction-related emissions at each individual
construction site is anticipated to be less than 5 years. Per 40 CFR 93.123(c)(5),
temporary construction-related emissions are not required to be included in the hot-spot analysis.

The Conformity Rule requires PM$_{2.5}$ hot-spot analyses to include road dust emissions only if such emissions have been found significant by EPA or the state air agency prior to the PM$_{2.5}$ SIP or as part of an adequate PM$_{2.5}$ SIP motor vehicle emissions budget (40 CFR §93.102(b)(3)). EPA has not approved a PM$_{2.5}$ SIP for the Metropolitan Chicago Interstate Air Quality Control Region PM$_{2.5}$ nonattainment area, nor has EPA or the state air agency made any significance findings related to re-entrained road dust for the PM$_{2.5}$ nonattainment area. Therefore re-entrained road dust is not considered in the analysis, per the Conformity Rule. In addition, as there is not an applicable PM$_{2.5}$ SIP for this area, there are no PM$_{2.5}$ control measures and the project is in compliance with 40 CFR 93.117.

### 5.2 Existing Conditions

The affected area for the purposes of this analysis is a new freeway corridor (37 miles) between I-88 in southern Kane County traversing Kendall County to I-80 in northern Grundy County and approximately 12 miles along existing IL-47 between Caton Farm Road in southern Kendall County and I-80 in northern Grundy County. Additional details are in the “Draft Environmental Impact Statement Prairie Parkway Study Grundy, Kendall and Kane Counties, Illinois” and associated documentation. This section includes a discussion of currently available information on existing conditions related to air quality and traffic conditions within and near the Prairie Parkway project study area.

#### 5.2.1 Air Quality Monitors

There are no PM$_{2.5}$ monitors in Kendall County. Figure 2 shows the four PM$_{2.5}$ monitors closest to the proposed improvement. Available monitoring data for 2002 through 2005 at the Aurora, Elgin, Joliet and Braidwood sites have been published in the “Illinois Annual Air Quality Report 2005”$^6$; and while not yet published, 2006 PM$_{2.5}$ monitor data have been prepared and provided by the Illinois Environmental Protection Agency for these same sites. These sites are located in Kane and Will counties: the Aurora monitor is generally south of I-88 and west of IL-31; the Elgin monitor is south of I-90 and east of IL-31; the Joliet monitor is north of I-80 and east of IL-7; the Braidwood monitor is south of the I-55/IL-129 interchange. Tables 2 and 3 show 2002 through 2006 monitor data for the PM$_{2.5}$ 24-hour and annual standards at the four monitoring sites listed.

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$^6$ Information extracted from the “Illinois Annual Air Quality Report 2005”, Illinois Environmental Protection Agency, Bureau of Air 1021 North Grand Avenue, East, P.O. Box 19276, Springfield, Illinois, 62794-9276; December 2006
Figure 2 – PM2.5 Monitors Near Proposed Improvement
It is recognized that in 2005, Illinois, as well as other Midwestern and Northeastern states experienced a most unusual air quality episode. This was the first time Illinois had any Air Pollution Action Days outside the ozone season (May through September). February 2 through 4 were so classified due to elevated levels of fine particulate matter (PM$_{2.5}$). The “Illinois Annual Air Quality Report 2005” directly addresses the unusual 2005 air quality episode stating “Scientists determined that a combination of a stagnating regional air mass and region wide winter fuel combustion was the main cause of this incident”.

The Illinois and NAAQS consist of a primary and secondary standard for each pollutant. The primary standard represents the level of air quality which is necessary to protect the public health. The secondary standard defines the level of air quality which is necessary to protect the public welfare. This includes, among other things, effects on crops, vegetation, wildlife, visibility and climate, as well as effects on materials, economic values and on personal comfort and well-being. For PM$_{2.5}$ the primary and secondary standards have the same value. Two averaging times are used for the PM$_{2.5}$ standard: 24-hour and the annual arithmetic mean. The specific standards for these two averaging times are 65 $\mu$g/m$^3$ and 15 $\mu$g/m$^3$ for 24-hour and annual arithmetic mean respectively.

Data from 2002 through 2006 for the PM$_{2.5}$ 24-hour standard at the four monitoring sites in Table 2 make apparent the uniqueness of the 2005 data. The 2005 anomaly clearly affected the three year averages, but all values still were well below the 65 $\mu$g/m$^3$ standard. It should be noted that EPA lowered the applicable standard from 65 $\mu$g/m$^3$ to 35 $\mu$g/m$^3$ on December 17, 2006; but the 2006 standards are not subject to conformity until one year after the non-attainment designations based on the 2006 standards become effective. Such a designation has not yet been made so the 1997 standard of 65 $\mu$g/m$^3$ is applicable for this hot-spot analysis (although at some future time the lower 2006 standard will be applicable).

Table 2 – PM$_{2.5}$ 24-hour Standard Assessment

<table>
<thead>
<tr>
<th>Site</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>Average</th>
<th>Average</th>
<th>Average</th>
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</thead>
<tbody>
<tr>
<td>Aurora</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43.6</td>
<td>25.4</td>
<td>34.5</td>
</tr>
<tr>
<td>Elgin</td>
<td>35.3</td>
<td>34.5</td>
<td>25.8</td>
<td>41.2</td>
<td>29.8</td>
<td>31.9</td>
<td>33.8</td>
<td>32.3</td>
</tr>
<tr>
<td>Joliet</td>
<td>33.7</td>
<td>30.8</td>
<td>29.1</td>
<td>45.3</td>
<td>25.9</td>
<td>31.2</td>
<td>35.1</td>
<td>33.4</td>
</tr>
<tr>
<td>Braidwood</td>
<td>32.0</td>
<td>27.9</td>
<td>23.6</td>
<td>43.8</td>
<td>21.6</td>
<td>27.8</td>
<td>31.8</td>
<td>29.7</td>
</tr>
</tbody>
</table>

Monitor data for 2002 through 2005 can be found in Appendix B of “Illinois Annual Air Quality Report” for those same years. Monitor data for 2006 provided by IEPA. Note - Aurora average based only on two years data.

Table 3 shows the annual arithmetic average standard values at the four selected monitor sites for the years 2002 through 2006. Again the unusual results for 2005 stand out, but it is also clear that 2006 values have returned to those for 2004; and that even when the 2005 values are included in the three year averages the results are well below the 15 $\mu$g/m$^3$ standard.
Table 3 – PM$_{2.5}$ Annual Standard Assessment

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<td>Aurora</td>
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</tr>
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<td>13.3</td>
<td>11.5</td>
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<td>11.8</td>
<td></td>
<td>13.0</td>
<td>13.5</td>
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<tr>
<td>Joliet</td>
<td>14.4</td>
<td>13.8</td>
<td>11.9</td>
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<td></td>
<td>13.3</td>
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<td>9.8</td>
<td></td>
<td>11.9</td>
<td>11.8</td>
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</table>

Monitor data for 2002 through 2005 can be found in Appendix B of “Illinois Annual Air Quality Report” for those same years. Monitor data for 2006 provided by IEPA. Note - Aurora average based only on two years data.

5.2.2 Transportation and Traffic Conditions

As noted previously, there are no PM$_{2.5}$ monitors located in Kendall County, which is where the majority of the project is proposed to be constructed. Furthermore, there is no facility like the proposed improvement in the area. The principal north-south roadway in the area is IL-47, which is primarily a two-lane rural/exurban road. Current traffic levels on IL-47 are for the most part in the 8,000 to 16,000 ADT range with volumes reaching 20,000 in Yorkville and near I-88. The four most proximate PM$_{2.5}$ monitor locations were the logical starting point to search for traffic conditions similar to that forecast for the Prairie Parkway.

Traffic data at points nearest the four monitor sites were taken from IDOT published Average Daily Total Traffic and Average Daily Heavy Commercial Vehicle (HCV) Traffic maps for 2005. Monitor locations relative to freeway sections and major road interchanges, 2005 ADT and HCV for these road sections, and the combined ADT and HCV at the monitor locations are shown in Table 4. HCV traffic is taken as the best indicator of how much of total traffic is diesel powered vehicles, with the percent share shown below the combined HCV volume. At the four monitor sites combined ADT ranges from slightly more that 40,000 to just over 140,000 and the HCV share between 9% and 20%. Traffic levels for the Prairie Parkway Preferred Alternative are estimated to be between 13,400 and 28,600 near-term, and 23,400 and 50,000 in 2030 the design year. The share of diesel powered vehicles is estimated to be 20%.

Total traffic at three of the four monitor locations is higher than the maximum forecast for the Prairie Parkway, with the Braidwood location traffic level approximating that of the Prairie Parkway Preferred Alternative at its terminal point near I-88 and I-80. Two of the traffic locations have lower HCV shares than the estimated Prairie Parkway diesel share; while HCV shares at the other two traffic locations are slightly higher than the 20% diesel share estimated for the Prairie Parkway.
Table 4 – 2005 Traffic at Selected PM$_{2.5}$ Monitor Sites

<table>
<thead>
<tr>
<th>PM$_{2.5}$ monitor location</th>
<th>Roadway</th>
<th>2005 ADT</th>
<th>2005 HCV</th>
<th>Combined 2005 ADT</th>
<th>Combined 2005 HCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aurora (0890007) -0.5 mile south of I-88 and west of IL-31</td>
<td>I-88</td>
<td>57,300</td>
<td>7,300</td>
<td>80,200</td>
<td>9,000 11%</td>
</tr>
<tr>
<td></td>
<td>IL-31</td>
<td>22,900</td>
<td>1,700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elgin (0890003) -1.2 miles south of I-90 and east of IL-31</td>
<td>I-90</td>
<td>108,900</td>
<td>10,700</td>
<td>141,700</td>
<td>12,850 9%</td>
</tr>
<tr>
<td></td>
<td>IL-31</td>
<td>32,800</td>
<td>2,150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joliet (1971002) -1.1 miles north of I-80 and west of IL-7.</td>
<td>I-80</td>
<td>76,000</td>
<td>17,400</td>
<td>109,400</td>
<td>19,550 18%</td>
</tr>
<tr>
<td></td>
<td>IL-7</td>
<td>33,400</td>
<td>2,150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joliet (1971002) -3.6 miles east of I-55 and south of US-52</td>
<td>I-55</td>
<td>62,800</td>
<td>14,800</td>
<td>90,400</td>
<td>16,500 18%</td>
</tr>
<tr>
<td></td>
<td>US-52</td>
<td>27,600</td>
<td>1,700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Braidwood (1971011) -1.8 miles south of I-55 at IL129</td>
<td>I-55</td>
<td>31,200</td>
<td>7,200</td>
<td>39,700</td>
<td>7,800 20%</td>
</tr>
<tr>
<td></td>
<td>IL-129</td>
<td>8,500</td>
<td>600</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.2.3 Built and Natural Environment

The study area is southwest of the Chicago metropolitan area. Development is radiating out from Chicago. Existing land use in the vicinity of the proposed facility is shown in Figure 3. The greatest concentrations of development currently within the study area are in eastern Kane County, in northern Kendall County along US-34, and in the Morris and Minooka areas along I-80 in Grundy County. Much of this area is agricultural. This is expected to change significantly by 2030 when the area will become primarily suburban in character with residential, commercial and industrial uses dominating. The extent of this change is reflected in the land use plans of municipalities near the proposed improvement as shown in Figure 4. In comparison to agriculture as the dominant existing land use, residential, industrial and commercial uses will predominate in the future. The figures depict this land use transformation in the greatly expanded yellow areas representing residential land and reduced green areas representing agricultural uses. In Kendall County, for example, residential land use was 17% of the total county land area in 2000 and is expected to grow to 67% of total county land area by 2030. Conversely, agricultural land is expected to fall from 80% of total county land area in 2000 to 26% by 2030. It should be noted that while the character of this part of the region will change markedly, the affected counties either have already
Figure 3 – Study Area Existing Land Use

Legend
- Natural Resource Area
- 110 – Residential
- 120 – Commercial
- 130 – Institutional
- 140 – Industrial
- 200 – Agriculture
- 300 – Open Space
- Airport
- County Line
- Railroad

Note:
- Northwestern Illinois Planning Commission (NIC) land use codes were applied to
- land use categories among the plans
- listed below.

Source:
- Kane County:
  - Kane County Geospatial Digitization
  - Village of Sugar Grove Zoning Map (2006)
- Kendall County:
  - The City of Plano Zoning Map
  - City of Sugar Grove, Kendall County, Salt Area
  - Comprehensive Plan
- Grundy County:
  - City of Minooka Comprehensive Plan
  - Village of Minooka
  - 2005 Comprehensive Plan Land Use Map
- Natural Resource Areas
  - Woodams slidefile was used to incorporate
  - the location of the natural resource areas.

Aerial Photography:
- 2004 Aerial Photography

No. 12-56467 archived on November 14, 2014
Figure 4 – Study Area Planned Land Use

Legend
- Natural Resource Area
- Airport
- County Line
- Railroad
- 110 – Residential
- 120 – Commercial
- 130 – Institutional
- 140 – Industrial
- 200 – Agriculture
- 300 – Open Space

NOTE:
Northeastern Illinois Planning Commission (NIPC) land use codes were applied to
only land use categories among the plan listed below.

SOURCE:
Kane County:
- Kane County 2030 Land Resource
  Management Plan (June 2013)
- Villages of Sycamore Comprehensive
  Land Use Plan
- Villages of Yorkville Comprehensive Land
  Use Plan (September 2013)

Kendall County:
- Kendall County Land Resource
  Management Plan (February 2013)
- City of Plainfield Comprehensive
  Plan July 2005 Update
- Village of Manhattan Comprehensive
  Land Use Plan Update
- Village of Sugar Grove
- City of Joliet: Kendall County Sub Area
  Comprehensive Plan
- Village of Orland in Ilinois
  Comprehensive Plan (February 2008)

Grundy County:
- Grundy County Land Use Plan Year
  2000 Update
- City of Mazon Comprehensive Plan
  (May 2000)
- Village of Minooka

Natural Resource Areas:
- Resilience sheds

No. 12-56467 Archived on November 14, 2014
established or are actively working toward programs to protect significant tracts of agricultural lands using agricultural conservation and protection areas, the conservation reserve program and designating centennial farms.

5.3 Emission Trends and Information

This section presents information about recent trends in PM$_{2.5}$ emissions from the national to the project level; and future PM$_{2.5}$ pollutant burden estimates for the northeastern Illinois region.

5.3.1 National Emission Trends

EPA’s December 2004 “Particle Pollution Report: Current Understanding of Air Quality and Emissions through 2003” states that PM$_{2.5}$ emissions have dropped nationwide by 10% from 1999-2003. During that time, in the Industrial Midwest states, including Illinois, PM$_{2.5}$ emissions have dropped by 9%. The most current national PM$_{2.5}$ trend data from EPA, shown in Figure 5, indicates that as of 2006 levels have decreased by 15% from 1999. Note that national 2005 PM$_{2.5}$ monitor data exhibits the same anomalous spike as does Illinois 2005 PM$_{2.5}$ monitor data.

Figure 5 – PM$_{2.5}$ Air Quality 1999 – 2006

(Based on seasonally weighted annual average)

1999 – 2006: 15% decrease in national average

According to EPA, the 2007 heavy-duty engine standards will result in the introduction of new, highly effective control technologies for heavy-duty engines, beginning in 2007. Heavy-Duty trucks and buses currently account for approximately one-quarter of mobile source PM emissions. These new standards will result in PM emission levels 95% below today’s levels. By addressing diesel fuel and engines together as a single
system, this program will provide annual emission reductions equivalent to removing the pollution from more than 90% of today’s trucks and buses, or about 13 million trucks and buses, when the current heavy-duty vehicle fleet has been completely replaced by 2030. By 2030, this program is expected to reduce annual emissions of PM by 110,000 tons.

5.3.2 Illinois Statewide Emission Trends

Recent trends in PM$_{2.5}$ levels throughout the State of Illinois including Kane, Kendall and Will, counties were available in the “Illinois Annual Air Quality Report, 2005”. For the State, in terms of the Air Quality Index (AQI) during 2005, there were 32 days (13 for PM$_{2.5}$) when air quality in some part of Illinois was considered “Unhealthy for Sensitive Groups”. This compares to seven days (all PM$_{2.5}$) in 2004 and 19 days (8 for PM$_{2.5}$) in 2003. Throughout the state monitoring was conducted at 38 stations for PM$_{2.5}$. Valid annual averages (meeting minimum statistical selection criteria) were obtained for 36 of the 38 sites. Twenty-two stations recorded averages above 15.0 μg/m$^3$, the level of the annual standard, compared with 6 stations in 2004 and 9 stations in 2003. The Statewide average of annual averages was 15.5 μg/m$^3$ in 2005 compared with 12.5 μg/m$^3$ in 2004 and 14.1 μg/m$^3$ in 2003. The trend of the statewide annual averages for PM$_{2.5}$ for the period 2000-2005 is shown in Figure 6. There were no exceedances of the 24-hour standard of 65 μg/m$^3$ in 2005. The Statewide peak in 2005 of 62.6 μg/m$^3$ was recorded at the Chicago - Mayfair station located on the north side of Chicago. The Statewide average of the 98th percentile of 24-hour averages was 421 μg/m$^3$ in 2005 compared with 30.9 μg/m$^3$ in 2004 and 34.1 μg/m$^3$ in 2003.

**Figure 6 - Illinois Statewide PM$_{2.5}$ Trends**

![Bar chart showing PM$_{2.5}$ trends]

5.3.3 Northeastern Illinois Region Future Emission Trends

The CATS October 2006, PM$_{2.5}$ conformity assessment, using EPA’s MOBILE6.2 mobile source emission factor model, estimated that direct on-road mobile source PM$_{2.5}$ annual emissions for the northeastern Illinois PM$_{2.5}$ nonattainment area would decrease by 37%
between 2010 and 2030, the period when this project could reasonably be anticipated to be open to traffic. Over this same time period, annual vehicle miles of travel are expected to increase by 15%. These data are summarized in Table 5.

Table 5 – Northeastern Illinois PM$_{2.5}$ Conformity Trend

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Direct PM$_{2.5}$ (tons/year)</th>
<th>Annual NOx (tons/year)</th>
<th>Annual Vehicle Miles of Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>3,070.78</td>
<td>167,630.81</td>
<td>58,696,684,998</td>
</tr>
<tr>
<td>2010</td>
<td>1,634.99</td>
<td>78,495.92</td>
<td>65,019,086,507</td>
</tr>
<tr>
<td>2020</td>
<td>1,042.49</td>
<td>26,035.81</td>
<td>70,374,739,843</td>
</tr>
<tr>
<td>2030</td>
<td>1,029.25</td>
<td>18,853.12</td>
<td>75,009,620,983</td>
</tr>
</tbody>
</table>

Source: Table 8, “Transportation Conformity Analysis for the PM$_{2.5}$ and 8-hour Ozone National Ambient Air Quality Standards”, CATS, October 12, 2006.

5.3.4 Dan Ryan Reconstruction Project Level PM$_{2.5}$ Emission Monitoring

The Dan Ryan is the most heavily traveled expressway in the Chicago region. In 2005, at the start of reconstruction, average daily traffic levels were between 230,000 and 300,000 and the number of daily heavy commercial vehicles ranged from 22,000 to 29,000. In conjunction with the Dan Ryan Expressway reconstruction project, IDOT monitored air quality prior to and during the entire reconstruction period. Baseline PM$_{2.5}$ monitor data were collected from September 2004 through the end of the year. Monitoring of the construction phase began in January 2005 and ended October 31, 2007. PM$_{2.5}$ monitoring locations were established in the area bounded by Cottage Grove Avenue on the east, Halsted Street on the west, 23rd Street on the north and 103rd Street on the south. In 2005 there was one elevated reading. This occurred on June 28, 2005, which was an Air Pollution Action day. On this day the entire Chicago region was experiencing poor air quality and thus the elevated PM$_{2.5}$ levels were attributed to a regional air quality issue and not a project level issue caused by the Dan Ryan. In 2006, one monitor recorded an elevated reading on October 21. No other monitors registered elevated readings on this day and no particular event or condition could be identified as the cause. These readings are not individually relatable to the PM$_{2.5}$ NAAQS. The readings are individual data points. The PM$_{2.5}$ standard is based on a 3-year average of the 98th percentile of 24-hour concentrations.
5.4 **PM$_{2.5}$ Hot-spot Analysis Approach**

The Prairie Parkway project proposes a new roadway improvement where there is currently no comparable transportation facility. There is no logical initial condition to use in comparing localized PM$_{2.5}$ concentrations for build conditions because there is neither a comparable facility nor PM$_{2.5}$ monitor data at the project location. Relying on the March 2006 joint EPA and FHWA guidance for conducting PM$_{2.5}$ hot-spot analyses, this analysis follows the “Comparison to another location with similar characteristics” or surrogate approach described in Chapter 4 of the March 2006 joint EPA and FHWA qualitative hot-spot analysis guidance. The preamble to the July 1, 2004, revision to the transportation conformity rule (69 Federal Register 40004) requires that project-level analyses consider the year (or years) of expected peak mobile source emissions from the project. For PM$_{2.5}$ this is expected to be a near term year, such as the first year of operation of the project, because emission rates from vehicles are predicted to decline significantly between the project’s opening year and its design year due to lower tailpipe emissions from fleet turnover and national vehicle emissions control programs. A particular opening year for this project has not been established; so for consistency with the analysis years used in the DEIS and FEIS, 2016 and 2030 represent near-term, expected peak emissions and design years respectively.

For the reason stated in section 5.1 above, this analysis does not consider PM$_{2.5}$ precursors, re-entrained road dust or construction emissions. The project’s major design features are consistent with those used in the last regional PM$_{2.5}$ conformity determination. No PM$_{2.5}$ mitigation or control measures are anticipated as part of this project’s implementation.

### 5.4.1 Surrogate Site Selection

Existing PM$_{2.5}$ monitor locations in Illinois were reviewed to identify sites that could serve as surrogates for this analysis. Acceptable surrogate sites should have similar, or greater, ADT and diesel vehicle traffic levels compared to the values forecast for the Prairie Parkway Preferred Alternative; development levels like those forecast for the project study area; and comparable average meteorological conditions. Information about the four PM$_{2.5}$ monitor sites chosen as surrogates was presented previously in Table 4. These sites all have comparable or higher total traffic levels; HCV shares near the regional average or above the project’s estimated diesel share; are all east of the project area in more developed parts of the region; but are physically close enough that meteorological conditions such as temperature, humidity, etc. are similar.

### 5.4.2 Proposed Improvement Forecast Traffic

Table 6 shows the maximum mainline traffic level estimate for the Preferred Alternative and arterial cross road for the near-term, worst case year (2016) and design year (2030). The maximum freeway mainline traffic level is on the section between the US-34 and IL-71 interchanges, with US-34 having higher traffic levels at its interchange with the Prairie Parkway than IL-71. Forecast 2030 traffic is from regional travel simulations that were done as part of the project’s Phase 1 Engineering Study, while those for the near-
term, worst case year 2016 were interpolated using 2000 base and 2030 design year forecasts.

Table 6 – Preferred Alternative – Mainline Traffic

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Year</th>
<th>ADT (2-Way)</th>
<th>HCV (2-Way)</th>
<th>Combined ADT</th>
<th>Combined HCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prairie Parkway</td>
<td>2016</td>
<td>28,600</td>
<td>5,700</td>
<td>50,500</td>
<td>7,100 14%</td>
</tr>
<tr>
<td>US-34</td>
<td>2016</td>
<td>21,900</td>
<td>1,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prairie Parkway</td>
<td>2030</td>
<td>50,000</td>
<td>8,900</td>
<td>80,300</td>
<td>12,100 15%</td>
</tr>
<tr>
<td>US-34</td>
<td>2030</td>
<td>30,300</td>
<td>2,100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In addition to maximum freeway traffic level, another worst case PM$_{2.5}$ condition can occur at freeway/freeway junctions. The Prairie Parkway Preferred Alternative maximum combined freeway/freeway terminal volume will be at its southern terminus with I-80. Table 7 shows the near-term (2016) and design year (2030) traffic estimates for the Preferred Alternative at this point.

Table 7 – Preferred Alternative – Terminal Point Traffic

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Year</th>
<th>ADT (2-Way)</th>
<th>HCV (2-Way)</th>
<th>Combined ADT</th>
<th>Combined HCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prairie Parkway</td>
<td>2016</td>
<td>13,400</td>
<td>2,700</td>
<td>53,800</td>
<td>16,200 30%</td>
</tr>
<tr>
<td>I-80</td>
<td>2016</td>
<td>40,400</td>
<td>13,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prairie Parkway</td>
<td>2030</td>
<td>23,400</td>
<td>4,700</td>
<td>70,000</td>
<td>20,100 29%</td>
</tr>
<tr>
<td>I-80</td>
<td>2030</td>
<td>46,600</td>
<td>15,400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.4.3 Surrogate Site Comparisons

This PM$_{2.5}$ hot-spot analysis is for a project extending more than 30 miles. Conditions will obviously vary over the project length in terms of volume of traffic, flow along the mainline or near interchanges, at connections to other expressways, level of development, type of area etc. The use of multiple surrogates is the best means of matching such a range of conditions and so ensuring a robust analysis. Consistent with the PM$_{2.5}$ hot-spot guidance, traffic comparisons are made using the expected peak mobile source emission year 2016 and design year 2030 project traffic estimates. Table 8 summarizes the comparison data for 2016 and Table 9 summarizes the data for 2030. Overall conditions at each of the four surrogate PM$_{2.5}$ monitor sites are discussed below.
### Table 8 – Surrogate to Preferred Alternative to 2016 Comparison

<table>
<thead>
<tr>
<th>Comparison Monitor</th>
<th>Comparison roadways</th>
<th>Comparison traffic</th>
<th>Project traffic</th>
<th>Monitor data</th>
<th>Project traffic condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aurora</td>
<td>I-88 &amp; IL-31</td>
<td>80,200</td>
<td>9,000</td>
<td>50,500</td>
<td>7,100</td>
</tr>
<tr>
<td>Elgin</td>
<td>I-90 &amp; IL-31</td>
<td>141,700</td>
<td>12,850</td>
<td>50,500</td>
<td>7,100</td>
</tr>
<tr>
<td>Joliet</td>
<td>I-80 &amp; IL-7</td>
<td>109,400</td>
<td>19,550</td>
<td>50,500</td>
<td>7,100</td>
</tr>
<tr>
<td>Joliet</td>
<td>I-55 &amp; US-52</td>
<td>90,400</td>
<td>16,500</td>
<td>50,500</td>
<td>7,100</td>
</tr>
<tr>
<td>Braidwood</td>
<td>I-55 &amp; IL-129</td>
<td>39,700</td>
<td>7,800</td>
<td>50,500</td>
<td>7,100</td>
</tr>
<tr>
<td>Joliet</td>
<td>I-80 &amp; I-55</td>
<td>152,000</td>
<td>19,800</td>
<td>53,800</td>
<td>16,200</td>
</tr>
</tbody>
</table>

### Table 9 – Surrogate to Preferred Alternative to 2030 Comparison

<table>
<thead>
<tr>
<th>Comparison Monitor</th>
<th>Comparison roadways</th>
<th>Comparison traffic</th>
<th>Project traffic</th>
<th>Monitor data</th>
<th>Project traffic condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aurora</td>
<td>I-88 &amp; IL-31</td>
<td>80,200</td>
<td>9,000</td>
<td>80,300</td>
<td>12,100</td>
</tr>
<tr>
<td>Elgin</td>
<td>I-90 &amp; IL-31</td>
<td>141,700</td>
<td>12,850</td>
<td>80,300</td>
<td>12,100</td>
</tr>
<tr>
<td>Joliet</td>
<td>I-80 &amp; IL-7</td>
<td>109,400</td>
<td>19,550</td>
<td>80,300</td>
<td>12,100</td>
</tr>
<tr>
<td>Joliet</td>
<td>I-55 &amp; US-52</td>
<td>90,400</td>
<td>16,500</td>
<td>80,300</td>
<td>12,100</td>
</tr>
<tr>
<td>Braidwood</td>
<td>I-55 &amp; IL-129</td>
<td>39,700</td>
<td>7,800</td>
<td>80,300</td>
<td>12,100</td>
</tr>
<tr>
<td>Joliet</td>
<td>I-80 &amp; I-55</td>
<td>152,000</td>
<td>19,800</td>
<td>70,000</td>
<td>20,100</td>
</tr>
</tbody>
</table>
5.4.3.1  *Aurora*

The Aurora monitor (0890007) is located approximately one-half mile south of I-88 just west of the IL-31 interchange. This is a relatively new monitoring site and so data are available only for 2005 and 2006. The level of development in the area surrounding the monitor is as high as or higher than anticipated for any location along the Prairie Parkway corridor – the City of Aurora 2000 population was 142,990 while 2030 estimated population for all of Kendall County is 176,607. The combined 2005 ADT at this monitor site is almost 60% higher than the project’s 2016 traffic estimate and equal to the project’s 2030 traffic forecast. The combined 2005 HCV traffic at this monitor site is approximately 25% higher than the project’s 2016 truck traffic estimate, but almost 35% below the project’s 2030 truck traffic forecast. Both the 24-hour and annual monitor values are below their respective standards at this location. Note that because this is a new monitor site, data are averaged for only two years not three.

5.4.3.2  *Elgin*

The Elgin monitor (0890003) is located approximately 1.2 miles south of I-90 just east of the IL-31 interchange. This monitor is located in a mature, built out section of the City of Elgin that is developed to a higher level than anticipated for the Prairie Parkway corridor – the City of Elgin 2000 population was 94,487 while 2030 estimated population for all of Kendall County is 176,607. The combined 2005 ADT at this monitor site is more than double the project’s 2016 traffic estimate and approximately 75% higher than the project’s 2030 traffic forecast. The combined 2005 HCV traffic at this monitor site is 80% higher than the project’s 2016 truck traffic estimate and still 6% above the project’s 2030 truck traffic forecast. Both the 24-hour and annual monitor values are below their respective standards at this location.

5.4.3.3  *Joliet*

The Joliet monitor (1971002) is located in the vicinity of the junction of I-80 and I-55 on the near west side of the City of Joliet. It is approximately one mile north of I-80 east of the IL-7 interchange, and approximately 3.6 miles east of I-55 just north of the US52 interchange. This monitor is located in a mature, built out section of the City of Joliet that is developed to a higher level than anticipated for the Prairie Parkway corridor – the City of Joliet 2000 population was 106,221 while 2030 estimated population for all of Kendall County is 176,607. Because this monitor is near the junction of two existing freeways, it is reasonable for comparisons to be made to both maximum project section traffic level and maximum traffic level at the project’s junction with existing freeways.

The 2005 combined traffic at I-80 and IL-7 is slightly more than twice the project’s 2016 traffic estimate and still 36% higher that the project’s forecast 2030 traffic. The combined 2005 HCV at I-80 & IL-7 is 175% of the project’s estimated 2016 HCV traffic and 60% higher than the project’s forecast 2030 traffic.

The 2005 combined traffic at I-55 and US-52 is 80% higher than the project’s 2016 estimated traffic and 12% higher than the project’s forecast 2030 traffic. The combined 2005 HCV traffic at I-55 and US-52 is 130% higher than the project’s 2016 estimated HCV traffic and 36% higher than the project’s forecast 2030 HCV traffic.
The 2005 combined traffic at the junction of I-80 and I-55 is approximately three times that of the Preferred Alternative’s 2016 traffic level at its terminus with I-80 and somewhat more than double the project’s 2030 traffic at this same point. The combined HCV traffic at the junction of I-80 and I-55 is 22% higher than the project’s 2016 HCV estimate and just slightly less than the project’s forecast 2030 HCV traffic level. Both the 24-hour and annual monitor values are below their respective standards at this location.

5.4.3.4  Braidwood
The Braidwood monitor (1971001) is located approximately 1.8 miles south of I-55 just west of the IL-129 interchange. This monitor is located in an exurban town that is currently developed to a level comparable to the lower to moderate levels anticipated for the Prairie Parkway corridor. The 2005 combined ADT at this monitor site is 27% lower than the project’s 2016 traffic estimate and only about half of the project’s estimated 2030 traffic level. The combined HCV traffic at this monitor site is 10% higher than the project’s 2016 estimate HCV traffic, but 55% lower than the project’s 2030 forecast HCV traffic. Both the 24-hour and annual monitor values are significantly below their respective standards at this location.
6.0 Conclusions

In summary, based on the analysis and surrogate site monitoring data, it is determined that Prairie Parkway Preferred Alternative meets all the project level PM$_{2.5}$ conformity requirements, and that the Prairie Parkway project will not cause or contribute to a new violation of the PM$_{2.5}$ NAAQS, or increase the frequency or severity of a violation for the reasons listed below. Therefore, the Prairie Parkway Preferred Alternative meets the conformity hot-spot requirements in 40 CFR 93.116 and 93.123 for PM$_{2.5}$.

- PM$_{2.5}$ monitor sites with current traffic characteristics comparable to those estimated for the Preferred Alternative have current values below the 24-hour and annual PM$_{2.5}$ NAAQS. This is true for the project’s overall maximum traffic level and freeway junction maximum traffic level at both the near-term worst case year 2016 and design year 2030.

- The development level at three of the four comparison PM$_{2.5}$ monitor locations are equal to or greater than those anticipated for the Prairie Parkway corridor by 2030. Monitor data for these locations therefore most likely reflects higher non-mobile source particulate matter emissions than would the development level anticipated in the Prairie Parkway corridor.

- The comparison PM$_{2.5}$ monitor locations are proximate enough to the corridor that there should be no difference in meteorological conditions in comparison to the Prairie Parkway corridor.

- National and state data show a consistent downward trend in PM$_{2.5}$ emissions that is anticipated to decline even more due to technological improvements on new diesel vehicles from the 2007 heavy-duty engine standards and new clean fuels program. Regional PM$_{2.5}$ conformity analyses show reductions in PM$_{2.5}$ of 36% from 2010 to 2020 and a continued, slight, further decline between 2020 and 2030.

- Detailed, project level PM$_{2.5}$ monitoring data from the Dan Ryan Expressway reconstruction area has consistently been below the 24-hour PM$_{2.5}$ NAAQS. Current Dan Ryan traffic levels are many times higher than both the near-term and design year volumes estimated for the Prairie Parkway Preferred Alternative, and the Dan Ryan Expressway is located in an area far more densely developed than envisioned for any portion of the Prairie Parkway study area.