Technical Support Document
for
Recommended Nonattainment Boundaries in Illinois
for the
24-Hour PM2.5 National Ambient Air Quality Standard

AQPSTR 07-04

December 18, 2007

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Introduction

On October 17, 2006, the U.S. Environmental Protection Agency (U.S. EPA) completed its review of the current National Ambient Air Quality Standards (NAAQS) for particulate matter and revised the 24-hour fine particle standard for airborne particles smaller than 2.5 microns in aerodynamic diameter (PM2.5). In this action, U.S. EPA maintained the annual standard set at a level of 15 micrograms per cubic meter (ug/m^3), and revised the 24-hour fine particle standard, strengthening it from a level of 65 ug/m^3 to a level of 35 ug/m^3. Following promulgation of a new or revised air quality standard, the Clean Air Act (CAA) requires the Governor to recommend initial designations of the attainment status for all areas in the State. Areas can be classified as ***nonattainment*** (does not meet, or contributes to a nearby area that does not meet the NAAQS), ***attainment*** (meets the NAAQS), or ***unclassifiable*** (cannot be classified based on available data). Therefore, Illinois is providing recommendations for attainment/nonattainment area boundaries for the 24-hour PM2.5 standard. The U.S. EPA will act on the State's recommendations by affirming and promulgating the recommended designation boundaries, or by promulgating new designation boundaries.

This report provides the basis for recommendations by the Illinois Environmental Protection Agency (IEPA) for attainment/nonattainment designation boundaries for all areas in the State of Illinois for the 24-hour PM2.5 standard**.** Based on the most recent three years of ambient monitoring data (2004-2006), only three counties in Illinois are currently violating the 24-hour PM2.5 NAAQS, Cook, Will and Madison counties. Based on an analysis of the factors contained in federal guidance, the IEPA is recommending that portions of the Chicago and Metro-East metropolitan areas be designated as nonattainment for the 24-hour PM2.5 standard. IEPA's recommended boundaries are consistent with the current annual PM2.5 nonattainment boundaries (see Figure 1). The recommended boundaries also reflect U.S. EPA guidance "to show that: 1) violations are not occurring in the excluded portions of the recommended area and 2) the excluded portions do not contain emission sources that contribute to the observed violations." The remaining areas of Illinois should be classified as attainment areas for the PM2.5 standard.

Federal Guidance

The IEPA has relied on a U.S. EPA's memorandum, "Area Designations for the Revised 24-hour Fine Particle National Ambient Air Quality Standard" (June 8, 2007), for developing this recommendation to designate the geographic boundaries of the nonattainment areas for the 24-hour PM2.5 standard in Illinois. In this memorandum, U.S. EPA recommends that areas with air quality data from the most recent three years that show violations of the revised 24-hour PM2.5 NAAQS, and nearby areas that cause or contribute to NAAQS violations, be designated nonattainment.

While this guidance is similar to previous guidance issued in 2003, it does not recommend applying presumptive boundaries for urban nonattainment areas. In general, the boundaries should reflect the boundaries of the current nonattainment areas that were established in 2004 for the annual PM2.5 standard. The current nonattainment area boundaries are shown in Figure 1 and are included within the boundaries of the Chicago-Naperville-Michigan City, IL-IN-WI Combined Statistical Area (Chicago CSA) and St. Louis MO-IL Metropolitan Statistical Area (St. Louis MSA), as defined by the U.S. Census Bureau. A listing of the counties in Illinois comprising the Chicago CSA and the St. Louis MSA are included in Table 1.

TABLE 1
COUNTIES INCLUDED IN THE
CHICAGO CSA AND ST. LOUIS MSA*

Chicago-Naperville-Michigan City (IL-IN-WI) CSA	**St. Louis, MO-IL MSA**
Cook County, IL	Bond County, IL
DeKalb County, IL	Calhoun County, IL
Kendall County, IL	Clinton County, IL
Lake County, IL	Jersey County, IL
McHenry County, IL	Macoupin County, IL
Will County, IL	Madison County, IL
Kankakee County, IL	Monroe County, IL
Lake County, IN	St. Clair County, IL
Porter County, IN	Crawford County (Sullivan City), MO
Kenosha County, WI	Franklin County, MO
	Jefferson County, MO
	Lincoln County, MO
	St. Charles County, MO
	St. Louis County, MO
	Warren County, MO
	Washington County, MO
	St. Louis City, MO

*Metropolitan areas defined by U.S. Office of Management and Budget, December 2006
Source: U.S. Census Bureau (Population Division) website,
http://www.census.gov/population/www/estimates/metro_general/2006/List4.txt

The U.S. EPA "anticipates the same boundaries established for implementing the annual PM2.5 standard may also be appropriate for implementing the 24-hour PM2.5 NAAQS in areas where both standards are violated." In addition, U.S. EPA recommends that States and Tribes consider the following nine factors in assessing whether to include an area in the designated nonattainment area boundary:

- Emission data
- Air quality data
- Population density and degree of urbanization
- Traffic and commuting patterns
- Growth rates and patterns

- Geography/topography
- Meteorology (weather/transport patterns)
- Jurisdictional Boundaries
- Level of control of emission sources

States may also request nonattainment area boundaries that are larger than the current annual PM2.5 nonattainment area to include adjacent counties when those counties contain emission sources, population, commuting patterns and other factors that may contribute to the nonattainment problem. In addition, states may request nonattainment area boundaries that are smaller than the existing annual PM2.5 nonattainment area boundaries where counties, or portions of counties are rural and do not contribute to nonattainment based on the 9 factors. The IEPA's analysis of each of the 9 factors are provided in the following sections of this report.

Current Air Quality

The 24-hour PM2.5 design values derived from measurements collected from IEPA's ambient air monitoring network from the most recent 3-year period of record (2004-2006) are summarized in Table 2 and Figure 2. For comparison to the 24-hour PM2.5 NAAQS, the design value for a given monitor is the 3-year average of each year's 98^{th}-percentile 24-hour PM2.5 concentration. Violations of the 24-hour PM2.5 standard have been measured in both the Chicago and Metro-East metropolitan areas as indicated in Table 2. In the Chicago area, measured design values from the 2004-2006 period exceed the NAAQS at 9 monitoring stations, located in both Cook and Will counties. In the Metro-East area, 2004-2006 design values exceeding the NAAQS have been measured at 2 monitoring stations in Madison County. These monitoring sites are highlighted in red in Table 2. Annual design values for monitors are also shown in Table 2. Air quality data collected in Illinois, therefore, indicate that it is appropriate to designate at least portions of the Chicago and Metro-East metropolitan areas as nonattainment for the 24-hour PM2.5 standard. All other areas in Illinois are attaining the 24-hour PM2.5 standard, and should be designated attainment for the 24-hour PM2.5 standard.

Figures 3 and 4 depict 24-hour PM2.5 design values for 2004-2006 in the Lake Michigan and St. Louis metropolitan areas, respectively. In the figures, the counties with monitoring sites in violation of the 24-hour PM2.5 NAAQS are highlighted in yellow. In the Lake Michigan region, PM2.5 design values exceeding the 24-hour PM2.5 NAAQS for 2004-2006 were observed not just in Illinois, but in both Wisconsin and Michigan as well. Furthermore, in both the Lake Michigan and metropolitan St. Louis areas, 24-hour PM2.5 design values are higher in Illinois than in neighboring states.

TABLE 2
ILLINOIS PM2.5 DESIGN VALUES FOR 2004-2006

	24-Hour 98th Percentile Values			24-Hour Design Values	Annual Mean Values			Annual Design Values
Monitoring Site	**2004**	**2005**	**2006**	**04-06**	**2004**	**2005**	**2006**	**04-06**
Quincy	25.0	40.4	26.1	31	10.7	14.7	11.2	12.2
Champaign	24.3	38.7	25.6	30	10.4	14.0	12.1	12.2
Bondville	23.6	36.0	23.0	28	10.6	14.5	11.1	12.1
Chicago-Washington	32.5	45.7	27.0	35	14.2	16.9	13.2	14.8
Chicago-SE Police	34.2	45.0	26.6	35	13.8	16.6	13.3	14.5
Chicago-Mayfair	38.8	48.3	31.6	40	15.3	17.0	14.5	15.6
Chicago-Springfield	33.1	46.5	27.7	36	13.7	16.7	13.5	14.6
Chicago-Com Ed[1]	39.7	45.1	29.0	38	14.1	16.6	13.5	14.7
McCook[1]	42.6	51.5	32.9	42	-	-	-	-
Blue Island	38.5	43.8	28.1	37	14.1	16.4	13.2	14.6
Schiller Park[1]	40.7	50.3	30.0	40	-	-	-	-
Summit	42.4	49.1	27.4	40	14.3	17.0	13.8	15.0
Des Plaines	35.0	38.5	26.8	33	12.4	13.9	11.4	12.6
Northbrook	26.1	37.7	27.0	30	11.2	14.5	11.9	12.5
Cicero	42.5	44.6	29.2	39	15.2	16.3	14.4	15.3
Naperville	31.9	42.0	25.1	33	12.7	15.6	12.7	13.7
Knight Prairie Twp[2]	-	39.1	22.3	-	-	14.3	11.2	-
Jerseyville[3]	25.0	40.9	27.5	31	11.5	14.8	11.5	12.6
Aurora[2]	-	43.6	25.4	-	-	15.9	12.7	-
Elgin	25.8	41.2	29.8	32	11.5	15.7	11.8	13.0
Zion	26.3	46.6	25.6	33	10.3	13.8	10.7	11.6
Oglesby[1]	24.5	32.8	26.0	28	-	-	-	-
Cary	27.5	37.6	27.6	31	11.3	13.9	11.8	12.3
Normal[4]	26.0	43.2	23.8	31	11.5	13.4	11.4	12.1
Decatur	26.3	41.5	26.0	31	11.9	14.5	12.2	12.9
Granite City-VFW[1]	35.3	41.2	32.9	36	-	-	-	-
Granite City-23rd	35.4	44.1	36.3	39	15.4	18.2	16.3	16.6
Alton	28.9	45.1	27.6	34	11.5	16.0	13.1	13.5
Wood River	30.0	41.2	28.3	33	13.2	16.0	13.1	14.1
Peoria	31.4	35.8	27.4	32	12.8	14.5	12.1	13.1
Houston	23.0	32.4	25.7	27	10.9	15.3	11.4	12.5
Moline/Rock Island	24.9	39.3	26.7	30	10.4	13.9	10.4	11.5
E. St. Louis	30.2	39.6	29.2	33	14.7	17.2	14.6	15.5
Swansea	26.6	37.9	28.1	31	13.2	16.0	13.4	14.2
Springfield	30.2	38.5	28.4	32	11.8	15.1	11.7	12.9
Joliet[3]	35.4	45.3	25.9	36	11.9	15.4	12.2	13.2
Braidwood	23.6	43.8	21.6	30	10.3	13.2	9.8	11.1
Rockford[5]	27.2	46.5	27.3	34	11.7	16.0	12.3	13.3

[1] - Annual $PM_{2.5}$ Standard does not apply at these monitoring sites;[2] - These sites have less than three years of data;[3] - These sites have incomplete data based on USEPA's data completeness criteria; [4] - Normal data based on two monitoring sites: (171132002-2004; 171132003-2005, 2006);
[5] - Rockford data based on two monitoring sites: (172010010-2004; 172010013-2005, 2006)

Precursor Emissions

PM2.5 may be directly emitted to the atmosphere or it can be formed when emissions of NOx, SO_2, VOC, Ammonia (NH_3) and other gases react in the atmosphere. These pollutants are referred to as precursors of PM2.5. The majority of airborne PM2.5 is formed due to precursor emissions. IEPA emissions data for PM2.5 and its precursors for 2005 are summarized in descending order by county for point, area, non-road and on-road (mobile) source categories in Figures 5 and 6.

A point source is defined as a source whose emissions are generally discharged through stacks, whereas fugitive point sources are emitted from numerous areas throughout a facility. Area sources are defined as emissions that are spread over wide areas with no distinct discharge points (e.g. forest fires), or ones that are comprised of a large number of small point sources that are difficult to describe separately (e.g. residential fuel combustion). On-road mobile sources are classified as emissions from cars, trucks, buses, and motorcycles that are used for transportation of goods and passengers on streets and roads. Mobile non-road sources are characterized by emissions from other modes of powered transportation, such as airplanes, trains, ships, and off-highway motor vehicles.

U.S. EPA recommends that proposed nonattainment designations for the PM2.5 NAAQS reflect not only the areas of measured violations, but also the nearby areas that contribute to measured violations. Figures 5a through 5e, and the accompanying tables, summarize reported emissions from point, area, non-road and on-road/mobile sources in the Chicago annual nonattainment area and adjacent counties, for the following pollutants: sulfur dioxide (SO_2), oxides of nitrogen (NO_x), volatile organic compounds (VOC), ammonia (NH_3) and direct fine particulate matter (PM2.5). Figures 6a through 6e provide similar information for the Metro-East St. Louis area, including Madison, Monroe, St. Clair, Randolph, Jersey, Calhoun, Macoupin, Montgomery, Bond, and Clinton counties. Note that the Randolph County emissions for NH_3, PM2.5, VOC, SO_2 and NO_x reflect 2005 reported emissions from the Baldwin power plant, as it is the only major contributing source in Baldwin Township of Randolph County.

For the Chicago Annual PM2.5 NAA and Adjacent Counties (Figures 5a-5e):

- SO_2 emissions are highest in Will, Cook, and Lake counties, with the greatest emissions coming from point sources. Will and Cook counties contribute about 88% of the total SO_2 emissions in the area. The lowest SO_2 emissions are in Grundy, DeKalb, Kendall and Boone counties, accounting for < 1% of total SO_2 emissions.
- NO_x emissions are highest in Cook County with the greatest emissions from on-road sources. Cook County contributes to about 50% of total NO_x emissions in the Chicago annual PM2.5 nonattainment area (NAA) and adjacent counties. NO_x emissions in Will, DuPage, and Lake Counties are also relatively high. Kendall, Grundy, DeKalb and Boone counties have relatively low emissions, which combined amount to approximately 5% of total NO_x emissions.
- VOC emissions are highest in Cook County, with the greatest emissions coming from area sources. VOC emissions from Cook County are approximately 51% of the total PM2.5 emissions in the area. DuPage and Lake counties also have relatively high VOC emissions. VOC emissions are lowest in Kendall, Grundy and Boone counties; these counties combined contribute approximately 5% of total VOC emissions in the area.
- NH_3 emissions are highest in Cook County, where on-road and area source contributions are greatest. DeKalb, Will, DuPage, and Kane counties have moderately high emissions of NH_3. The combined emissions from Cook, DeKalb, Will, DuPage, and Kane counties combined contribute about 72% of total NH_3 emissions in the annual PM2.5 Chicago NAA including adjacent counties. Kendall, Grundy and Boone counties have the lowest NH_3 emissions. When combined together, Kendall, Grundy, and Boone counties account for approximately 10% of total NH_3 emissions.
- Direct PM2.5 emissions are highest in Cook and Will counties with area sources as the greatest contributor. PM2.5 emissions are relatively high in Kane, DuPage Lake, and McHenry counties. PM2.5 emissions in the Cook County contribute about 31% of total direct PM2.5 emissions in the Chicago NAA counties including adjacent counties. When combining emissions from Will, Kane, DuPage, Lake, and McHenry counties, the emissions account for approximately 84% of total direct PM2.5 emissions in the area.

PM2.5 emissions are lowest in Kendall Grundy, and Boone counties, contributing nearly 8% of total direct PM2.5 emissions.

For the Metro-East Annual PM2.5 NAA and Adjacent Counties (Figures 6a-6e):

- SO_2 emissions are highest in Montgomery, Madison, Randolph, and St. Clair counties. Point sources are the greatest contributors to total SO_2 emissions in Montgomery, Madison, Randolph, and St. Clair counties. Combined emissions from Montgomery, Madison, and Randolph counties contribute approximately 97% of total SO_2 emissions in the area. SO_2 emissions are lowest in Clinton, Monroe, Jersey, Calhoun, Macoupin, and Bond counties, and they account for approximately 1% of total SO_2 emissions.
- NO_x emissions are highest in Madison, Montgomery, St. Clair, and Randolph counties. Combined NO_x emissions from Madison, Montgomery, St. Clair and Randolph counties contribute about 80% of total NO_x emissions within the area. The greatest source contributors to the total NO_x emissions for Madison, Montgomery, and Randolph counties are point sources, whereas the greatest source contributions in St. Clair County comes from on-road sources. Macoupin, Bond, Jersey, and Calhoun counties have relatively low emissions; combined they contribute to nearly 10% of total NO_x emissions.
- VOC emissions are highest in Madison and St. Clair counties, and account for nearly 54% of total VOC emissions. In contrast, Clinton, Macoupin, Randolph, Montgomery, and Monroe VOC emissions contribute to 34% of total VOC emissions for the area. Area sources are the major contributor towards total VOC emissions for 2005. VOC emissions for the Metro East NAA and adjacent counties are lowest in Calhoun and Bond counties, with combined emissions contributing approximately 7% of total VOC emissions.
- NH_3 emissions are highest in Clinton, Macoupin, St. Clair, and Madison counties, with greatest emissions arising from area sources. NH_3 emissions in the combined counties of Clinton, Macoupin, St. Clair, and Madison account for 66% of total NH_3 emissions within the annual PM2.5 Metro-East NAA and adjacent counties. Randolph, Bond, Jersey, and Calhoun counties also have relatively high emissions of NH_3. Calhoun County has the lowest total NH_3 emissions, contributing only 2% of total NH_3 emissions.

- Direct PM2.5 emissions are highest in Madison, St. Clair, and Randolph counties. Macoupin, Montgomery and Clinton counties contribute moderate levels of direct PM2.5 emissions. In the combined Madison, St. Clair, and Randolph counties, direct PM2.5 emissions contribute to nearly 55% of total direct PM2.5 emissions in the area. The greatest contributor to total direct PM2.5 emissions occurs from area sources. Furthermore, direct PM2.5 emissions are lowest in Monroe, Bond, Jersey, and Calhoun counties, accounting for nearly 18% of total direct PM2.5 emissions.

Figures 7a through 7e depict both the locations and emission rates of major point sources in the current Chicago annual PM2.5 NAA Area and adjacent counties for the following pollutants: sulfur dioxide (SO_2), oxides of nitrogen (NO_x), volatile organic compounds (VOC), ammonia (NH_3), and fine particulate matter (PM2.5). Emission totals are based on IEPA reported emissions for 2005. The yellow shaded areas in the figures represent the areas being recommended as nonattainment for the 24-hour PM2.5 NAAQS and blue areas represent adjacent counties where emission sources are evaluated as contributing to nonattainment. Figures 8a through 8e provide similar information for the Metro-East/St. Louis NAA.

For the Current Chicago Annual PM2.5 NAA and Adjacent Counties (Figures 7a-7e). The largest SO_2 point sources are located in Will County. Cook County has the largest number of SO_2 emitting point sources. McHenry, Kane, DeKalb, Kendall, Grundy, and Kankakee counties have relatively few point sources emitting SO_2 and most are under 100 tons/year. The largest point sources for NO_x are located in Will County. Cook and Lake counties also contain major point sources contributing NO_x emissions. In comparison, Kankakee, Kendall, DeKalb, Grundy, and Boone counties have relatively few point sources emitting NO_x with contributions only representing approximately 8% of total NO_x emissions. Both the largest size and greatest number of VOC point sources occur in Cook, Will, and Grundy counties. DeKalb, Kankakee, Kendall and Boone counties have relatively few VOC point sources. There are few point sources emitting NH_3 in the Chicago area based on IEPA's 2005 emissions inventory. Relatively large point sources are located in Grundy and Kendall counties and three smaller NH_3 sources are located in Will County. The largest emitting point sources of direct PM2.5 are located in Will

County, while the greatest number of PM2.5 point sources is located in Cook County. There are relatively few PM2.5 point sources in McHenry, Boone, Kane, DeKalb, Kendall, Grundy, and Kankakee counties.

For the Metro-East annual PM2.5 NAA and Adjacent Counties (Figures 8a-8e), the largest point sources for SO_2 are located in Madison, Montgomery, and Randolph counties. Madison and St. Clair counties have the largest number of SO_2 emitting point sources. Adjacent counties have relatively few point sources emitting SO_2. The largest point sources for NO_x are located in Madison and Montgomery counties. Madison and St. Clair counties have the largest number of NO_x emitting point sources emitting less than 100 tons per year. Adjacent counties have relatively few point sources emitting NO_x. The largest emitting and greatest number of point sources emitting VOC's are located in Madison and St. Clair counties. Adjacent counties have relatively few point sources emitting VOC's. Madison County contains the only significant point sources of NH_3 based on IEPA's 2005 inventory. The largest point sources for direct PM2.5 are located in Madison and Randolph counties. Madison and St. Clair counties have the largest number of PM2.5 emitting point sources however, individual reported point source emissions are less than 100 tons per year in these counties. Adjacent counties have relatively few point sources emitting PM2.5 and none emitting direct PM2.5 at rates greater than 50 tons per year.

Urbanization, Population and Employment Trends

Table 3 lists the population of each of the counties contained in the Chicago CSA and Metro-East/St. Louis MSA, as well as land areas, and population densities based on U.S. Census Bureau estimates for 2005.

Figures 9 and 10 graphically depict population densities in the Chicago CSA and the Metro-East MSA, respectively. For the Chicago area, this data shows that Cook, DuPage, Lake, and Will counties have the highest population and population densities, while Grundy County has the lowest. Madison and St. Clair counties contain the majority of the Metro-East population, while Monroe, Montgomery, Jersey, Bond, and Calhoun counties are considerably less populated.

TABLE 3

POPULATION ESTIMATES BY COUNTY

Chicago CSA
(Illinois Counties Only)

County	2005 Population*	Land Area (Sq. Miles)**	Population Density (Persons per sq. mile)
Cook	5,303,943	945.68	5,608.6
DuPage	931,219	333.61	2,791.3
Lake	704,086	447.56	1,573.2
Will	642,625	836.94	767.8
Kane	483,208	520.44	928.5
McHenry	304,701	603.51	504.9
Kankakee	107,824	676.75	159.3
DeKalb	97,770	634.16	154.2
Kendall	79,597	320.58	248.3
Grundy	43,736	419.9	104.2

Metro-East-St. Louis MSA
(Illinois Counties Only)

County	2005 Population*	Land Area (Sq. Miles)**	Population Density (Persons per sq. mile)
Madison	263,975	725.02	364.1
St. Clair	259,388	663.81	390.8
Macoupin	49,016	863.57	56.8
Clinton	36,138	472.23	76.5
Randolph	33,116	578.42	57.3
Monroe	31,289	388.29	80.6
Jersey	22,423	369.16	60.7
Bond	18,011	380.2	47.4
Calhoun	5,166	253.82	20.4

*Source: U.S. Census Bureau estimate as of July 1, 2005, using data from April 1, 2000 as a basis, and found at http://factfinder.census.gov/

**Source: U.S. Census Bureau's State and County Quick Facts website

Figure 11 illustrates the extent of the urbanized area within the Chicago CSA. According to the U.S. Census Bureau, MSA and CSA boundaries are dependent on a central urbanized area or contiguous area of relatively high population density. Outlying counties are included in MSAs if they exhibit strong social and economic ties to this core area, often measured by commuting and economic patterns. Boone County is included in the Rockford-IL MSA. The county's urban extent is not contiguous with the Chicago CSA and commuting patterns show a high degree of commuting with neighboring Winnebago County. Therefore, it is logical to conclude that the urbanized area in Boone County is not directly influencing emissions in the Chicago CSA. This pattern of fragmented urban development and commuting is also apparent in DeKalb, Kankakee and parts of Grundy counties. In the Metro-East area, urbanization is not as pronounced as seen in the Chicago CSA (See Figure 12). Madison and St. Clair counties are the most urbanized of the counties in the Metro-East portion of the St. Louis MO-IL MSA. Adjacent counties such as Washington and Montgomery are not included in the St. Louis MO-IL MSA and exhibit a fragmented population with the Metro-East urban core. Based on the non-contiguous pattern of urbanization, it is logical to conclude that Washington and Montgomery counties are not influencing emissions related to social, economic and population growth in the Metro-East.

Figures 13 and 14 depict current land cover for both the Chicago CSA and Metro-East St. Louis MSA areas based on data compiled by the Illinois Department of Agriculture. According to the "Land Cover of Illinois 1999-2000 On-Line Statistical Summary", the Chicago CSA has the most urbanized counties in the state. A high degree of urbanization is apparent in both Cook (79.9%) and DuPage (77.5%) counties. Lake County is also highly urban, with 48.3% of the county classified as urban or built-up land. In each of the Chicago area counties of Kane, Will and McHenry the land cover is dominated by agriculture ranging from 63 to 67% and the amount of urban and built-up land is less than 25% of the total land cover. The primarily rural counties of Kendall, DeKalb, Grundy and Kankakee have less than 6% urban land; however each county's land cover is greater than 80% agriculture. Unlike the Chicago CSA, all nonattainment counties in the Metro-East area have high percentage of agriculture land (greater than 49 %). Madison and St. Clair counties have the greatest urban land cover in the Metro-East area. (See Figure 14). The counties of Calhoun, Jersey, Macoupin, Monroe, Bond and Clinton have less

than 4% urban built-up land. The dominance of agricultural land use, coupled with the low population densities in these counties, confirm that they are primarily rural in nature.

Short term population growth is an important indicator of potential emission increases in an area. Table 4 and Table 5 outline percent change in population between 2000 and 2005 by county for both the Chicago CSA and St. Louis MSA. This data was provided by the U.S. Census Bureau and is based on estimates dated March 22, 2007. According the data, the Chicago CSA county of Kendall has experienced the greatest percent increase in population at 44%; however its total population is smaller compared to second ranked Will County which has experienced a 26% change between 2000 and 2005. In comparison to Kendall County, Will County population is significantly larger. Cook County has experienced an estimated negative 1.4% change in population; however its total population for 2005 represents approximately 61% of the population base in the Chicago CSA area. According the U.S Census Bureau, the Metro-East county of Monroe has experienced the greatest percent increase in population at 12.7%. Jersey County has experienced a moderate population change at 3.5% while Randolph County experienced a negative change in population (-2.4%).

Population and economic trends are developed for long range planning activities by both State and local governmental agencies. Data compiled by the Illinois Department of Commerce and Economic Opportunity (DCEO) were referenced for this analysis and are shown in Figure 15. In the Chicago CSA, the highest total population growth between 2000 and 2030 is projected to occur in Cook and Will counties. The lowest growth in terms of net population change is projected for DeKalb, Grundy, Kendall, and Kankakee counties. In the Metro-East area, long term population growth is projected to be highest in Madison, Monroe and Macoupin counties, and lowest in Randolph, Jersey, Bond, Clinton and Calhoun counties. According to this study, St. Clair County is expected have a negative change in population in future years.

Table 4
2000-2005 POPULATION CHANGE BY COUNTY
Chicago-Naperville-Michigan City, IL-IN-WI CSA (Illinois Part)

County	2000 Population	2005 Population	Change (%)
Kendall	55,197	79,597	44.2
Will	508,391	642,625	26.4
Kane	407,783	483,208	18.5
McHenry	261,746	304,701	16.4
Grundy	37,684	43,736	16.1
DeKalb	89,299	97,770	9.5
Lake	648,866	704,086	8.5
Kankakee	103,895	107,824	3.8
DuPage	907,128	931,219	2.7
Cook	5,377,890	5,303,943	-1.4

Table 5
2000-2005 POPULATION CHANGE BY COUNTY
Metro-East / St. Louis MSA (Illinois Counties Only)

County	2000 Population	2005 Population	Change (%)
Monroe	27,772	31,289	12.7
Jersey	21,672	22,423	3.5
Bond	17,648	18,011	2.1
Madison	259,122	263,975	1.9
Clinton	35,560	36,138	1.6
Calhoun	5,092	5,166	1.5
St. Clair	256,188	259,388	1.3
Macoupin	49,011	49,016	0.01
Randolph	33,916	33,116	-2.4

Occupational employment growth projections between 2004 and 2014, which were provided by DCEO and compiled from projections developed by the Illinois Department of Employment Security, are shown in Figure 16. In the Chicago area, the highest rate of occupational employment growth is expected to occur in Cook and DuPage counties, moderate increases in employment are expected to occur for Lake, Kane and Will counties, while the lowest rates of employment growth are expected in Kankakee, DeKalb, Kendall, and Grundy counties. In the Metro-East area, moderate employment growth is forecast for Madison County while relatively low employment growth is expected to occur in St. Clair, Monroe, Clinton, Jersey, Bond and Macoupin counties. Based on this study, Randolph County is expected to lose jobs in the future.

Traffic Characteristics

The Illinois Department of Transportation's (IDOT) Office of Planning and Programming publishes an annual report entitled "Illinois Travel Statistics". This report provides detailed information regarding vehicular traffic for each county in Illinois and for different users of traffic data. This includes annual average daily traffic (AADT) volumes and Vehicle Miles Traveled (VMT), which are part of the IDOT's Traffic Count Program. Table 6 summarizes IDOT's estimates of Average Daily Vehicle Miles Traveled (ADVMT) in 2006, as calculated by IDOT's Highway Information System.

Table 6

Illinois Travel Statistics 2006

Chicago Consolidated Statistical Area (CSA)	Average Daily Vehicle Miles Traveled (ADVMT)
Cook	90,620,875
DuPage	23,836,199
Lake	15,865,459
Will	14,598,626
Kane	9,846,371
McHenry	5,933,340
Kankakee	2,558,581
DeKalb	2,341,384
Kendall	2,109,661
Oswego Township	711,020
Grundy	1,839,892
Aux Sable Township	381,203
Goose Lake Township	47,918
St. Louis Metropolitan Statistical Area (MSA)	**Average Daily Vehicle Miles Traveled (ADVMT)**
Madison	7,647,820
St. Clair	7,147,490
Macoupin	1,188,607
Clinton	1,034,418
Monroe	972,936
Bond	790,266
Randolph*	728,283
Baldwin Township	38,627
Jersey	550,167
Calhoun	106,917
* Randolph County is not part of the MSA	

ADVMT is calculated by dividing Annual VMT by the number of days in a year (365, but 366 in leap years). The ADVMT on a segment of road is calculated by multiplying the Average Daily Traffic on the segment by the length of the segment in miles. In the Chicago area, Cook, DuPage, Lake, and Will counties have the highest ADVMT. In fact, the ADVMT in these four

counties account for approximately 86% of the total for the Illinois portion of the CSA. Collectively, Kankakee, DeKalb, Kendall, and Grundy counties account for about 5% of the total ADVMT in the CSA. In the Metro-East MSA, Madison, St. Clair, and Montgomery Counties have the highest ADVMT, and account for 75% of the ADVMT in the Illinois portion of the MSA. Randolph, Jersey, and Calhoun Counties have the lowest ADVMT, with about 3.4% of the total for the MSA. In addition, ADVMT has decreased in most of the State since 2004 (see Figure 17 and 18), and was nearly the same in the two nonattainment areas (NAAs) in 2006 as it was in 2002.

The U. S. Census Bureau has compiled statistics from the 2000 census that quantify commuting patterns in the Chicago and Metro-East metropolitan areas. Figures 19 and 20 illustrate where people reside and the counties where they journey to work. Each county is color-coded on the histograms. For example, Cook County is shown in Figure 19 as a yellow bar in each county's histogram. The data show that 2.07 million people reside in Cook County and commute within Cook County to reach their place of employment, but only 826 people reside in Cook County and commute to DeKalb County for employment. In some counties, a significant percentage of commuters travel to places of employment in other counties. For example, 152,433 residents of DuPage County commute to Cook County for employment. Similarly, a large percentage of commuters residing in Kendall County travel to DuPage and Kane counties for employment, although the number of commuters residing in Kendall County is small relative to the number of commuters in the Chicago CSA. From Figure 19, it is evident that more commuters in the Chicago CSA travel to places of employment in the county where they reside than travel to other counties. Commuting patterns in the Metro-East area (see Figure 20) are similar in that more commuters stay in their residence county for work than commute to surrounding counties.

Topography

Illinois is typified by flat to gently rolling terrain, with the exception of the Driftless Area in the northwest corner of the state and the Ozark Plateau in southern portion of the state (see Figure 21). Illinois occupies a land mass of approximately 55,584 square miles. The average elevation of the state is approximately 600 feet (183 m) above sea level. Charles Mound, located in Jo

Davies County, is the highest point in the state with an elevation of 1,235 feet (376 m) above sea level. The lowest point in the state is 279 feet (85 m) above sea level along the Mississippi River in Alexander County. Total topographic relief across the state is less than 1000 feet, demonstrating the general flatness of the terrain. Topography is generally not a factor in determining pollutant transport in Illinois, and is not considered a significant issue in defining the boundaries of the 24-hour PM2.5 nonattainment areas.

Meteorology

Illinois has a temperate climate, with cold snowy winters and hot wet summers. The seasons are sharply differentiated between the northern and southern portions of the state, due to its elongated north-south orientation. Average winter temperatures are 22°F (–6°C) in the north and 37°F (3°C) in the south. Average summer temperatures are 70°F (21°C) in the north and 77°F (25°C) in the south. Illinois averages 36 inches (91 cm) of precipitation a year. Annual snowfall of 37 inches (94 cm) is normal for northern Illinois, decreasing to 24 inches (61 cm) or less in the central and southern portions of the state. The predominant wind direction across the state is from the south/southwest, with an average wind speed of approximately 11 miles per hour.

Monitors in the Chicago area that exceed the 24-hour design value (2004-2006) show evidence of regional, urban, and local influences based on wind speeds and direction. Figure 22 contains a pollution rose based on the years 2004–2006 for the Braidwood monitoring site. The length of each blue line represents the percentage of time that the wind blew from a particular direction on days when PM2.5 concentrations were > 25 ug/m^3. Based on this information, the predominant wind direction ranged from south to southwest on high concentration days. This finding is also confirmed by the pollution rose compiled from data collected at all Chicago monitoring sites on days with 24-hour concentrations > 35 ug/m^3 (see Figure 23). Braidwood's 2004-2006 design value of 30 ug/m^3 indicates that the regional background represents approximately 81% of the average 24-hour PM2.5 design value of 37 ug/m^3 measured at all other sites in Cook and Will counties. The remaining 19% comes from both urban-scale and local-scale sources located in the Chicago metropolitan area.

Local-scale influences in the Chicago area are particularly well documented at the McCook, Schiller Park, and Mayfair monitoring sites. The McCook site is influenced by two large quarry operations located to the southwest of the monitor (see Figure 24). The Schiller Park site is influenced by both mobile sources on I-294, located just east of the monitor, and by Mannheim Road and O'Hare International Airport located to the southwest of the monitor (see Figure 25). The Mayfair site is primarily affected by mobile sources on I-90, located immediately south-southwest of the monitor (see Figure 26). These three monitors all have 24-hour PM2.5 design values ranging from 40 to 42 ug/m^3. This indicates that the contribution of local-scale sources is on the order of 3-5 ug/m^3.

In the Metro-East Area, regional influences also appear to be a significant factor contributing to monitored violations of the 24-hour PM2.5 standard. The pollution rose compiled for the Houston monitor in Randolph County shows predominant wind directions ranging from south to east-southeast (see Figure 27) on days with elevated levels of PM2.5. These wind directions indicate that a substantial portion of the regional background is coming from sources in the Ohio River Valley. Meteorology for all Metro-East sites on high days > 35 ug/m^3 identifies the same general wind conditions (see Figure 28). Houston's 2004-2006 design value of 27 ug/m^3 indicates that the regional background represents approximately 79% of the average 24-hour PM2.5 design value of 34 ug/m^3 measured at all other sites in Madison and St. Clair counties. The remaining 21% comes from both urban-scale and local-scale sources located in the greater Metro-East/St. Louis metropolitan area.

Local-scale influences are also occurring in the Metro-East area. The primary local source is U.S. Steel's facility in Granite City. Based on wind patterns on high days and the proximity of the plant to nearby monitors, it is logical to conclude that emissions coming from U.S. Steel are contributing to the 24-hour PM2.5 violations at the two nearby monitors (see Figure 29). The contribution from the steel plant appears to be on the order of 2-5 ug/m^3. The pollution rose compiled for Wood River on high days > 35 ug/m^3 for 2004-2006 shows the same predominant wind pattern as the Houston and VFW sites (see Figure 30). Since Wood River is not currently violating the 24-hour PM2.5 standard and is one of the furthest downwind sites, it appears that Granite City Steel's influence is limited to a small portion of far southwestern Madison County.

Existing and Expected Emission Controls

There are numerous existing and expected emission controls in the Chicago Metropolitan and Metro-East St. Louis areas. A listing of existing and expected controls is as follows:

On-Highway Mobile Source Controls

- Tier II/Low Sulfur fuel
- Inspection/Maintenance programs (nonattainment areas)
- Reformulated gasoline (nonattainment areas)

Off-Highway Mobile Sources

- Federal control programs incorporated in NON-ROAD mobile (e.g. non-road diesel rule), plus the evaporative Large Spark Ignition and Recreational Vehicles standards
- Heavy –duty diesel engine standard/Low sulfur fuel
- Federal railroad/locomotive standards
- Federal commercial marine vessel engine standards

Electric Generating Plants

- Title IV (Phases I and II)
- NOx SIP Call
- Clean Air Interstate Rule
- Illinois Multi-Pollutant Strategy (MPS/CPS)

Other Point Sources

- VOC MACT standards
- NOx RACT

RECOMMENDATIONS

The CAA does not specify the geographic boundaries, size, or the extent to which source contributions would require that an area be designated as nonattainment for the 24-hour PM2.5 standard, nor has U.S. EPA promulgated rules prescribing such. IEPA's recommendations are consistent with a guidance memorandum provided by U.S. EPA (June 8, 2007), and are based on an evaluation of present and projected air quality, the distribution of precursor emissions, and other factors. The IEPA recognizes that each of the factors considered in this evaluation are not necessarily conclusive when evaluated individually. Rather, IEPA's recommendations are based on consideration of all of the data and projections taken together.

IEPA's recommendations for attainment/nonattainment designations in Illinois for the 24-hour PM2.5 ambient air quality standards are contained in Table 7. Current air quality data collected by the IEPA indicate that the only areas of Illinois where the 24-hour PM2.5 air quality standard is not being met are in portions of the Chicago and Metro-East metropolitan areas. Nonattainment designations for at least portions of these metropolitan areas are, therefore, warranted. The IEPA's recommendation for inclusion of counties within the boundaries of the nonattainment areas are discussed in the following section and geographically depicted in Figure 31.

Chicago PM2.5 Nonattainment Area and Adjacent Counties

Cook County. Current air quality data (2004-2006) at 9 monitoring locations in Cook County do not meet the 24-hour PM2.5 annual standard. Cook County is currently designated nonattainment for the annual PM2.5 standard. Cook County has high levels of precursor emissions, and generally has the highest emissions of any of the ten counties in the CSA. Demographically, Cook County has the highest population, the highest population density, the largest extent of urban land cover, and the highest level of vehicular traffic of all the counties in the Chicago CSA. Therefore, Cook County should be included in the Chicago nonattainment area for the 24-hour PM2.5 standard.

Lake County. Lake County is currently designated nonattainment for the annual PM2.5 standard by the IEPA. Lake County has high levels of precursor emissions, relatively high total population and population density, a high percentage of urban land cover, and high levels of vehicular traffic. The IEPA, therefore, recommends that Lake County be included in the Chicago nonattainment area for the 24-hour PM2.5 standard.

DuPage and Will Counties. Both DuPage and Will counties are currently designated as nonattainment for the annual PM2.5 standard. Air quality at one monitoring station in Will county exceeds the 24-hour PM2.5 air quality standard. DuPage and Will counties have high levels of precursor emissions. DuPage County is second only to Cook County in total population, population density, vehicular traffic, and total urban land cover. Similarly, Will County has a relatively high population, population density, population growth, traffic level, and urban land coverage. The IEPA therefore recommends that DuPage and Will counties be included in the Chicago nonattainment area for the 24-hour PM2.5 standard.

McHenry and Kane Counties. McHenry and Kane counties are on the western fringe of the metropolitan area with the eastern portions of these counties having an urban/suburban character, while the western portions are basically rural. These counties have moderate levels of precursor emissions relative to Cook, Lake, DuPage, and Will counties, and the total population, population density, and total urban land cover in these counties are also relatively moderate. McHenry and Kane counties are experiencing moderate population and employment growth. Both McHenry and Kane counties are currently designated nonattainment for the annual PM2.5 standard. The IEPA, therefore, recommends that McHenry and Kane counties be included in the Chicago nonattainment area for the 24-hour PM2.5 standard.

Grundy and Kendall Counties. Due to their primarily rural character, most of Grundy and Kendall counties were not included in the annual PM2.5 nonattainment area. Precursor emission levels in these counties are low, as is the total population, population density, traffic volumes, and total urban land cover. However, the IEPA recommends that Oswego Township in Kendall County and Goose Lake and Aux Sable Townships in Grundy County be included in the Chicago

nonattainment area for the NAAQS for 24-hour PM2.5. The remainder of these two counties should retain their current designation as attainment.

DeKalb and Kankakee Counties. The U.S. Census Bureau added DeKalb and Kankakee counties to the Chicago CSA in 1998. They were not included in the annual PM2.5 nonattainment area. These counties are primarily rural, as shown by their low 2005 population totals and population densities, and the small amount of urban land cover in each county is not contiguous with the Chicago urbanized area. Current precursor emission levels in these counties are also low, compared to the other counties in the CSA. For these reasons, the IEPA recommends that DeKalb and Kankakee counties not be included in the nonattainment area and that they be designated as attainment for the NAAQS for 24-hour PM2.5.

Boone County. Boone County is not included in the annual PM2.5 nonattainment area, nor is it part of the Chicago CSA. The county is not contiguous with the Chicago urbanized area and was therefore, not evaluated based on population and economic influence. Current precursor emission levels in this county are low, compared to the other counties evaluated included in this analysis (adjacent counties). For these reasons, the IEPA recommends that Boone County not be included in the nonattainment area and that it be designated as attainment for the NAAQS for 24-hour PM2.5.

Metro-East PM2.5 Nonattainment Area and Adjacent Counties

Madison County. Madison County is currently designated as a nonattainment area for the annual PM2.5 standard. Current air quality data (2004-2006) at 2 monitoring locations in Madison do not meet the 24-hour PM2.5 annual standard. In terms of precursor emissions, Madison County has high levels of all precursor emissions, including direct PM2.5. Demographically, Madison County has the highest population, the second highest population density, and the largest percentage of urban land cover of all the counties in the Metro-East. Madison County should be included in the Metro-East nonattainment area for the 24-hour PM2.5 standard.

St. Clair County. St. Clair County is currently designated as nonattainment for the annual PM2.5 standard. St. Clair County has relatively high levels of VOC, NO_x, NH_3 and PM2.5 emissions, relatively high total population and population density, and a large percentage of urban land cover. St. Clair County is expected to experience negative population growth and moderate employment growth in future years. The IEPA recommends that St. Clair County be included in the Metro-East nonattainment area for the 24-hour PM2.5 standard.

Monroe County. Monroe County is on the southern fringe of the Metro-East area with the northern portions of the county having an urban/suburban character, while the southern and eastern portions of the county are basically rural. It is currently designated as nonattainment for annual PM2.5. This county has relatively low levels of precursor emissions relative to Madison and St. Clair counties, and the total population, population density, and total urban land cover is also relatively low. Because of its current designation as an annual PM2.5 nonattainment area, the IEPA recommends that Monroe County be included in the Metro-East nonattainment area for the 24-hour PM2.5 standard.

Jersey County. Jersey County is a rural county located to the north of St. Louis, and is not currently designated as nonattainment for the annual PM2.5 standard. Jersey County has low levels of precursor emissions, low population and population density, low urban land cover, and low population and employment growth rates. For these reasons, the IEPA recommends that Jersey County be designated as attainment for the NAAQS.

Clinton County. As mentioned previously, the current MSA boundaries established by the U.S. Census Bureau (2003) for St. Louis include Clinton County. This county is primarily rural, with low 2000 population totals and population densities, and small amounts of urban land cover, compared to other counties in the MSA. Current precursor emission levels in Clinton County are low, as are expected rates of population and employment growth. For these reasons, the IEPA recommends that Clinton County be designated as attainment for the NAAQS for 24-hour PM2.5.

Randolph County. Randolph County is not part of the Metro-East/St. Louis MSA as defined by the U.S. Census Bureau. A portion of it is however included in the current annual PM2.5 nonattainment area. This rural county has low population and population density, low urban land cover, and low population and employment growth rates. Randolph County has high levels of 24-hour PM2.5 emissions and high precursor emissions, especially SO_2 and NO_x, virtually all of which are emitted from an existing, stationary emission source, the Baldwin Power Station. Figure 32 shows the location of the Baldwin plant in northern Randolph County. Because of the high levels of precursor emissions, and because of the close proximity of the Baldwin facility to the southern edge of St. Clair County, the IEPA recommends that just a portion of Randolph County be designated as nonattainment for PM2.5. Specifically, IEPA recommends that Baldwin Township (Precinct), east of the Kaskaskia River, be designated as nonattainment for the 24-hour PM2.5 standards, and the remainder of Randolph County should be designated as attainment.

Macoupin, Bond and Calhoun Counties. Bond, Calhoun and Macoupin counties were added to the St. Louis MO-IL MSA as defined by the U.S. Census Bureau, in 2003. All three counties are not included in the current annual PM2.5 nonattainment area. Calhoun County is the only county of the three that is not adjacent to the current annual PM2.5 NAA. These counties are primarily rural, with low 2005 population totals and population densities, and have small amounts of urban land cover, compared to other counties in the MSA. Current precursor emission levels in Macoupin, Bond and Calhoun counties are low, as are expected rates of population and employment growth. For these reasons, the IEPA recommends that Macoupin, Bond and Calhoun counties be designated as attainment for the NAAQS for 24-hour PM2.5.

Montgomery County. Montgomery County is not included in the annual PM2.5 nonattainment area, nor is it part of the St. Louis MO-IL MSA. The county is not contiguous with the Metro-East urbanized area and was therefore, not evaluated based on population and economic influence. Based on 2005 emissions data high precursor emission totals are the results of a large electric utility source which is farther than 46.4 miles away from violating 24-hour PM2.5 monitor and is downwind from the Metro-East area. For these reasons, the IEPA recommends

that Montgomery County not be included in the nonattainment area and that it be designated as attainment for the NAAQS for 24-hour PM2.5.

Washington County. Washington County is not included in the annual PM2.5 nonattainment area, nor is it part of the St. Louis MO-IL MSA. Washington County is considered adjacent to St. Clair County, however the county is not contiguous with the Metro-East urbanized area and was therefore, not evaluated based on population, transportation and economic influence. Current precursor emission levels in these counties are very low, compared to the other counties evaluated for this analysis (adjacent counties). For these reasons, the IEPA recommends that Washington County not be included in the nonattainment area and that it be designated as attainment for the NAAQS for 24-hour PM2.5.

Remainder of Illinois

Areas of the state that are not part of these two metropolitan areas are in attainment with the 24-hour PM2.5 NAAQS, and it is recommended that all remaining counties be designated as attainment.

Table 5
Recommended Attainment/Nonattainment Designations in Illinois
For the PM2.5 Ambient Air Quality Standard

County	Designation	Name of Area
Cook	Nonattainment	Chicago
DuPage	Nonattainment	Chicago
Kane	Nonattainment	Chicago
Lake	Nonattainment	Chicago
Will	Nonattainment	Chicago
McHenry	Nonattainment	Chicago
Kendall:		
Oswego Township	Nonattainment	Chicago
All Other Townships	Attainment	
Grundy:		
Aux Sable Township	Nonattainment	Chicago
Goose Lake Township	Nonattainment	Chicago
All Other Townships	Attainment	
Madison	Nonattainment	Metro-East
Monroe	Nonattainment	Metro-East
St. Clair	Nonattainment	Metro-East
Randolph:		
Baldwin Township/Precinct (east of the Kaskaskia River)	Nonattainment	Metro-East
All Other Townships	Attainment	
All Other Counties	Attainment	

24-Hour PM2.5 NAA Boundary Recommendation
Nine Factor Documentation

Factor	Data Analysis	Data Source	Date of Study
1. Air Quality - Monitoring	24-Hour and Annual PM2.5 2004-2006 Design Values at individual monitors (statewide)	IEPA BOA Database, Air Monitoring Section	2004-2006
2. Emissions	Emission inventory information for pollutants: PM2.5, NH_3, NO_x, SO_2 and VOC within the current Annual PM2.5 NAA and adjacent counties. Emission totals (tons/year) are summarized by county for point, area, on-road/mobile, and off-road sectors	IEPA 2005 Reported Inventory	2005
	Source locations in non-attainment areas and adjacent counties	IEPA BOA database	2005
3. Population Density and Urbanization	Annual Estimates of the Population in Illinois. Total population and population density estimates* Urbanized area boundaries	Table1:Annual Estimates of the Population for Counties of Illinois:April1, 2000 to July, 2006 (CO-EST2006-01-17) Population Division, U.S. Census Bureau; ESRI Maps and Data	Release date: March 22, 2007 2006
4. Traffic and Commuting Patterns	Average Daily Traffic tables for 2006 County to County Commuting Workflow files table	Illinois Department of Transportation, Travel Statistics 2006; U.S. Census Bureau	2006
5. Expected Growth extent/pattern/rate	Total population change based on Long-Term population projection ** Total occupational employment change based on Long Term study**	Illinois Department of Commerce and Economic Opportunity: Illinois Population Trends 2000-2030 Illinois Department of Employment Security	2000-2030 Population Projection Table - 2005 edition 2004-2014 Occupational Employment Projections by County – 2005 edition

6. Meteorology	Weather patterns – Pollution/Wind Rose, PM2.5 Frequency Distribution, Regionally Influenced High days	Bob Swinford (Air Monitoring Section); Illinois State Water Survey	2004-2006
7. Topography	relatively flat	Google Earth; U.S. Geological Survey	2007 (data is about one to three years old and updated on a regular basis– no set year is given)
8. Political and Jurisdictional Boundaries	MSA/CBSA/CSA boundary information; Current Annual PM2.5 NAA	Office of Management and Budget; IEPA, BOA	2003; April 2005
9. Current Emission Controls	Existing and expected controls	IEPA – BOA Programs	2007

* http://www.census.gov/popest/housing/tables/HU-EST2006-04-17.xls

** http://www.commerce.state.il.us/dceo/Bureaus/Facts_Figures