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Illinois Ozone Emission Inventory for 2008

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List of Acronyms

ADVMT	Average Daily Vehicle Miles Traveled
AER	Annual Emission Report
AP-42	Compilation of Air Pollutant Emission Factors
APU	Auxiliary Power Unit
ASWVMT	Average Summer Weekday Vehicle Miles Traveled
CAA	Clean Air Act Amendments of 1990
CAERS	Computerized Annual Emission Reporting System
CATS	Chicago Area Transportation Study
CNG	Compressed Natural Gas
CO	Carbon Monoxide
ERTAC	Eastern Regional Technical Advisory Committee
FAA	Federal Aviation Administration
FC	Functional Classes
GIS	Geographic Information System
GTM	Gross Ton Miles
HPMS	Highway Performance Monitoring System
ICEMAN	Integrated Comprehensive Environmental Management System
IDOT	Illinois Department of Transportation
I/M	Inspection and Maintenance
ISSIS	Illinois EPA's Illinois' Stationary Source Inventory System
LADCO	Lake Michigan Air Directors Consortium
LPG	Liquefied Petroleum Gas
LTO	Landing and Takeoff Operation
NAA	Nonattainment Area
NOx	Oxides of Nitrogen
POTW	Publicly-owned Treatment Works
QA	Quality Assurance
QC	Quality Control
RVP	Reid Vapor Pressure
SCC	Source Classification Code
SIC	Standard Industrial Classification (code)
SIP	State Implementation Plan
TPD	Tons per Day
TPY	Tons per Year
TSDF	Hazardous Waste Treatment, Storage and Disposal Facility
USEPA	US Environmental Protection Agency
VMT	Vehicle Miles Traveled
VOL	Volatile Organic Liquid(s)
VOM	Volatile Organic Material

Executive Summary

This document provides the results of the Illinois Ozone Emission Inventory for 2008 and a general description of the methods used to calculate the emissions. This inventory uses the up-to-date emission factors and calculation methodologies that were available at the time. Every three years the Illinois EPA is required to submit a complete emission inventory to USEPA. A complete inventory includes point, area and mobile (on-road and off-road) source categories. For an ozone inventory, daily and annual emissions of CO, NOx and VOM are required. Resulting data is separated into the two nonattainment areas (Chicago and Metro-East St. Louis) and the attainment area.

The primary source of data for point sources was the source-reported 2008 annual emission reports (AERs). Area source emissions are typically estimated by multiplying an emission factor by a known indicator of activity (e.g., population) for a source category. On-road mobile source emissions were calculated using the MOBILE6.2 computer model. Off-road mobile source emissions were calculated using the NONROAD model.

To ensure this inventory is of the highest quality, Illinois EPA implemented quality assurance (QA) procedures and quality control (QC) checks throughout the inventory development process. Illinois specifically followed the procedures outlined in USEPA's guidance documents pertaining to inventory quality assurance and believes the inventory to be complete, accurate and of high quality.

1 Introduction

Every three years (e.g., 2002, 2005, 2008, etc.) the Illinois EPA is required to conduct a full state-wide emissions inventory of ozone precursor emissions for all source categories (i.e., point, area, mobile). This document reflects the items included in the inventory plus the methodology used to calculate those emissions. Special emphasis is placed on the Chicago and Metro-East St. Louis (Metro-East) since they are designated as ozone nonattainment areas.

The Chicago NAA includes the counties of Cook, DuPage, Kane, Lake, McHenry and Will, plus the Townships of Aux Sable and Goose Lake in Grundy County and Oswego Township in Kendall County. The Metro-East NAA includes the counties of Jersey, Madison, Monroe and St. Clair.

The primary source of data for point sources was the source-reported 2008 annual emission reports (AERs). Area source emissions are typically estimated by multiplying an emission factor by a known indicator of activity (e.g., population, employment, etc.) for a source category. Calculation of emissions for area sources primarily used 2008 activity levels and in a few cases projections from previous years were used. Area source calculation methodologies were updated to the most recent calculation methods identified by USEPA.

On-road mobile source emissions were estimated by multiplying appropriate emission factors generated from the MOBILE6.2 computer model by vehicle miles traveled. Illinois EPA relied on 2008 VMT data generated by the Illinois Department of Transportation Office of Planning and Programming.

Off-road mobile source emissions were calculated using the NONROAD computer model. This model outputs emissions directly. The NONROAD model does not include emission estimates for aircraft, locomotives and commercial marine vessels. Aircraft emissions were calculated using actual activity data (operations) for each airport. Emissions from locomotives were obtained from a study of the Eastern Regional Technical Advisory Committee (ERTAC). Work on that project was actually performed by Matt Harrell of the Air Quality Planning Section of the Illinois EPA. Commercial marine vessel emissions were grown from the 2005 inventory.

To ensure this inventory is of the highest quality, Illinois EPA implemented quality assurance (QA) procedures and quality control (QC) checks throughout the inventory process. Illinois EPA specifically followed the procedures outlined in USEPA's guidance

2 Emission Inventory Summaries

2.1 Background

Four basic steps were involved in the preparation of the emission inventory. The first step was planning. As required by USEPA guidance, Illinois EPA prepared an Inventory Preparation Plan (IPP). This plan outlined the methods by which the Illinois EPA would assemble the 2008 inventory and perform QA/QC checks. The QA/QC plans and procedures are presented in Section 6.0.

The second basic step was data collection. A major element in this step was to determine which source categories should be considered as point sources in the inventory and which should be considered area sources. Fundamentally different data collection procedures are used for these two source types. Actual emissions data reported in the sources' AERs are used to collect point source data, whereas county level information such as population or employment is generally used to estimate area source emissions. The data collected and maintained on point sources is more detailed than area sources.

The third basic step in the inventory compilation effort involved analysis of data collected and the development of emission estimates for each source. Emissions were determined individually for each point source, whereas emissions were generally determined for the overall area source category. Reported emission data, material balances and emission factors were all used to make these estimates. Adjustments were made to the VOM inventory to reflect only reactive VOM and to be representative of the ozone season.

The fourth step was reporting. Initially, Illinois EPA identified the kinds of data and formats that would be needed for this inventory document to fulfill USEPA inventory requirements. Later, Illinois EPA identified additional reports and features that would be useful for future inventory needs and/or modeling requirements. These have been incorporated into this document.

Demographic data characterizing the various counties in the state are crucial to many of the emission estimation calculation procedures used to develop the inventory for area source categories. As such, these data are cited in the appropriate sections of Section 4.0 – Area Sources. Also, in a number of instances, emissions are dependent to some degree on the geographic location of the county. In such instances, Illinois EPA developed factors based on whether counties were either a "Northern" or "Southern" county. Details of how the factors were developed and used are explained in detail in the appropriate area and mobile source sections of the document.

A number of agencies provided data for use in developing the Chicago and Metro-East nonattainment area inventories. The lead agency was the Illinois EPA which was directly responsible for coordinating and supervising the completion of each segment of the inventory. Several other state and local agencies contributed information to Illinois EPA that was necessary for preparing emission estimates. The majority of the highway vehicle emission calculation information was provided by IDOT. IDOT used federally approved transportation planning methods to develop VMT estimates which were based on monitored traffic count data in selected key locations throughout the state, including the Chicago area. Certain other localized traffic data were obtained from CATS for the Chicago ozone nonattainment area and the East-West Gateway Coordinating Council for the Metro-East ozone nonattainment area.

2.2 Methodology

A detailed emission inventory for a pollutant lists each source of that pollutant and the quantity of its emissions. The sources are usually categorized in two ways: (1) point, area or mobile sources or (2) industrial categories and subcategories.

Emissions from point sources are defined as those whose emissions are usually fairly well characterized and are generally discharged through stacks and which are required to possess an Illinois EPA issued permit. Fugitive emissions are not emitted from a discrete point but are emitted from numerous areas throughout a facility. Area sources are usually spread over wide areas with no distinct discharge points or are comprised of a large number of small point sources that are difficult to describe separately (e.g., the heating furnaces in individual homes in a city) and whose emissions are not so well characterized. Other examples of area sources include architectural surface coating, automobile refueling, dry cleaning and automobile refinishing. Mobile sources are divided into two major categories – on-road and off-road. On-road mobile sources include cars, trucks, buses and motorcycles used for transportation of goods and passengers on roads and streets. Off-road mobile sources include other modes of powered transportation such as aircraft, locomotives, ships and motor vehicles used off-highway. This classification protocol has been utilized throughout this document.

A typical industrial plant may have different source types associated with it. For example, a refinery with numerous industrial processes would itself be a point source, the leaks from valves, pumps and fittings throughout the miles of piping would be a fugitive source and the switch engine that moves tank cars on the railroad siding would be a non-highway mobile source. Also, a plant may have more than one industrial classification associated with it. The refinery in the previous example is in one industrial category; its tank farm is in another. Quantities of emissions may be measured directly (at the stack); they may be calculated from engineering principles (e.g., mass balance); or they may be estimated (e.g., by assuming reasonable emission rates, times, etc.). Further, emissions can be expressed in terms of annual emissions, seasonal emissions or daily emissions. In the case of the pollutant ozone, precursor emissions are

generally expressed in terms of typical daily emissions representative of the peak ozone season, or tons per day.

Emission estimates presented in this report generally followed the methodologies outlined in USEPA's emission inventory preparation guidance document, Volumes I-IV and USEPA's "Reporting Guidance for 1996 Periodic Emissions Inventories and National Emission Trends (NET) Inventories." Where different estimation methodologies were used, such methods are identified. The emission estimates were seasonally adjusted to reflect average daily emissions during the summer months, which are generally considered the peak ozone season. For point sources, emissions were taken from source submitted data for the peak ozone season, as reported in their 2008 AERs. Mobile source emissions and certain area source emissions (e.g., gasoline refueling) were adjusted using the average ambient temperature during the ten highest ozone days during 2008. Area source emissions were also modified using seasonal adjustment factors for the ozone season. Some sources have greater emissions on weekdays than on weekends. Emissions from all such sources have been adjusted to take weekday/weekend differences into consideration. In addition, adjustments were made to gasoline fuel-based categories to be representative of 2008 fuel volatility levels. Emission totals are expressed as 2008 values using data for 2008, whenever available.

The VOM emission estimates provided in this document are for those VOMs determined by USEPA to be photochemically reactive. All identified nonreactive VOMs were excluded from the VOM totals reported here for all sources and source categories. Compounds considered to be nonreactive and therefore not included in the inventory are listed below:

- Methane
- Ethane
- Methylene chloride
- Methyl chloroform
- Trichlorofluoromethane (CFC-11)
- Dichlorodifluoromethane (CFC-12)
- Chlorodifluoromethane (CFC-22)
- Trifluoromethane (HFC-23)
- Chlorofluoromethance (HCFC-31)
- Difluoromethane (HFC-32)
- Decafluoropentane (HFC-43-10mee)
- Ethylfluoride (HFC-161)
- Trichlorotrifluoroethane (CFC-113)
- Dichlorotetrafluoroethane (CFC-114)
- Chloropentafluoroethane (CFC-115)
- 2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)
- 1,1,2-Trifluoroethane (HCFC-123a)
- 2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)

- Pentafluoroethane (HFC-125)
- 1,1,2,2,-Tetrafluoroethane (HFC-134)
- 1,1,1,2-Tetrafluoroethane (HFC-134a)
- 1,1-Dichloro-1-fluoroethane (HCFC-141b)
- 1-Chloro-1,1,-difluoroethane (HCFC-142b)
- 1,1,1-Trifluoroethane (HFC-143a)
- Fluoroethane (HCFC-151a)
- 1,1-Difluoroethane (HFC-152a)
- Pentafluoropropane (HFC-225ca)
- Pentafluoropropane (HFC-225cb)
- Hexafluoropropane (HFC-236ea)
- Hexafluoropropane (HFC-236fa)
- Pentafluoropropane (HFC-245ca)
- Pentafluoropropane (HFC-245ea)
- Pentafluoropropane (HFC-245eb)
- Pentafluoropropane (HFC-245fa)
- Pentafluorobutane (HFC-365mfc)
- Parachlorobenzotrifluoride (PCBTF)
- Methoxybutane
- Nonaflourobutane
- Heptafluoropropane ($(CF_3)_2CFCF_2OCH_3$)
- Heptafluoropropane ($(CF_3)CFCF_2OC_2H_5$)
- Perchloroethylene
- Cyclic, branched or linear completely methylated siloxanes
- Methyl acetate
- Volatile methyl siloxanes
- Acetone

Plus the following four classes of perfluorocarbons (PFCs)

- Cyclic, branched or linear completely fluorinated alkanes
- Cyclic, branched or linear completely fluorinated ethers with no unsaturations
- Cyclic, branched or linear completely fluorinated tertiary amines with no unsaturations
- Sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine

2.2.1 Point Sources

Emissions and source specific data for point sources were developed for the 2008 inventory by Illinois EPA. The primary source of data for point sources was source-reported AERs and permit files. These data are reported by the sources annually as part of the inventory process conducted by Illinois EPA and include emissions, process rates, operating schedules, emission control data and other relevant information obtained from the permit files and plant inspections. The data was converted to an Access® database for processing and retrieval. Emissions were computed on a typical daily ozone season basis for each point source process using the original data. This data was then updated based on the Illinois EPA's QA/QC plan.

2.2.2 Area Sources

Area source emissions were typically estimated by multiplying an emission factor by a known indicator of activity for each source category and each county. Area source emissions for 2008 were based on data available for population, employment and commodities and were generally prepared following the procedures described in the Inventory Preparation Plans. For the 2008 inventory, USEPA made available activity data at the county level for each state. Unfortunately this was not always data representative of 2008. In other cases, data was provided from national estimates. If data more specific to Illinois was available, it was used by Illinois EPA. Emission estimates for 2008 emissions were developed using 2008 category activity levels, where available, or projections of changes in activity from 2005 levels with a preference to data specific to Illinois. Emission controls were accounted for by using either adjusted emission factors or through the use of control factors.

The narrative in Section 4.0 includes a discussion of the factors used to develop both the emission estimates. Category summary tables reflecting Chicago and Metro-East NAA county emissions are also included. Although the methodologies used to determine attainment county emission estimates are similar, the factors can vary by county.

2.2.3 Mobile Sources

Statewide highway vehicle emissions were estimated by multiplying USEPA emission factors generated from the MOBILE6.2 computer model by daily VMT estimates by county for the two Illinois nonattainment areas and the attainment counties. Illinois EPA relied on VMT data generated by the IDOT Office of Planning and Programming. IDOT used urban transportation planning methodologies approved by the Federal Highway Administration to generate the necessary VMT estimates. Illinois EPA ran the MOBILE6.2 model to generate vehicle emission rates and calculate emission estimates. Chicago and Metro-East nonattainment area specific data were used whenever possible to estimate inputs into the MOBILE6.2 model. For some parameters, however,

sufficient resources were not available for Illinois EPA to develop area-specific values, so national average defaults contained in the model were used. For discussion of the inputs used in running MOBILE6 is included in Section 5.0.

Emissions were also estimated for non-road equipment. Illinois EPA prepared ozone precursor emission estimates for railroad locomotives; commercial, military and civil aircraft; and commercial vessels using state- and county-specific activity factors and USEPA approved emission factors and data. Further discussion of off-road equipment emission estimation methodologies and actual estimates are contained in Section 5.2.

2.3 Results

The 2008 Emission Inventory summary of the total ozone precursor emission estimates for the State of Illinois is shown in Tables 2-1 and 2-2. It covers the entire state.

The magnitude of the total CO, NOx and VOM emissions for the state by geographic region are delineated in the bar charts of Figures 2-1 through 2-6. The percentage contributions of the individual regions to the statewide total are shown in Figures 2-7 and 2-8. The pie charts of Figures 2-9 through 2-16 present the total ozone precursor emissions by source category for each geographic region of the state.

Figures 2-17 through 2-22 show the emissions of the source categories for the previous two inventories and the current inventory. It is important to note that while a general trend can be identified, two inventory years may have had different methodologies to calculate emissions. Using different methodologies or emission factors between inventories most commonly occurs with the area source category. The MOBILE6.2 model was used for all three inventory years in the case of on-road emissions. The NONROAD model was used for the off-road inventory, however, the model was updated between the 2005 and 2008 inventories resulting in the most recent model being used for the 2008 inventory. Point sources are the most comparable from year-to-year since the emission factors do not typically change often.

Category summaries by pollutant for the 2008 statewide inventory are given in Appendices A through D. Appendix E presents a county-by-county summary of point, area, on-road and off-road emissions. Appendix H includes the surrogates used to apportion area source emissions to the nonattainment townships (portions of counties).

Table 2-1: Total Ozone Inventory Typical Summer Day Emissions (tons/day)

	Point	Area	On-Road	Off-Road	Total
Chicago NAA					
CO	85.48	41.05	1,519.84	1,737.38	3,383.75
NOx	154.25	38.56	270.28	186.56	649.65
VOM	53.11	351.51	134.60	135.91	675.14
Metro-East NAA					
CO	57.09	3.98	168.91	105.85	335.83
NOx	39.68	1.62	30.84	39.32	111.47
VOM	11.85	23.35	16.53	12.66	64.39
Attainment Area					
CO	151.00	40.88	1,178.56	967.23	2,337.67
NOx	566.89	15.39	235.07	421.01	1,238.35
VOM	107.95	271.73	117.91	154.91	652.49
Statewide					
CO	293.57	85.91	2,867.31	2,810.47	6,057.25
NOx	760.82	55.57	536.20	646.89	1,999.47
VOM	172.91	646.59	269.04	303.48	1,392.02

Table 2-2: Total Ozone Inventory Annual Emissions (tons/year)

	Point	Area	On-Road	Off-Road	Total
Chicago NAA					
CO	22,785.13	54,615.25	785,460.92	405,520.60	1,266,381.90
NOx	35,939.07	32,317.73	99,626.59	51,742.40	219,625.80
VOM	14,671.77	108,887.21	46,384.86	34,433.57	204,377.41
Metro-East NAA					
CO	17,386.87	10,429.90	80,998.22	25,148.92	133,963.91
NOx	11,680.60	1,699.99	12,100.97	9,150.92	34,632.48
VOM	3,928.46	8,275.88	5,708.08	3,234.73	21,147.16
Attainment Area					
CO	35,144.61	80,922.93	626,218.57	248,136.27	990,422.39
NOx	145,992.93	13,463.48	83,523.64	93,939.06	336,919.10
VOM	31,171.21	89,123.95	42,558.03	49,710.39	212,563.57
Statewide					
CO	75,316.62	145,968.07	1,492,677.71	676,805.79	2,390,768.20
NOx	193,612.60	47,481.20	195,251.20	154,832.38	591,177.39
VOM	49,771.44	206,287.04	94,650.98	87,378.69	438,088.14

Figure 2-1: Daily CO Emission Summary (tons/day)

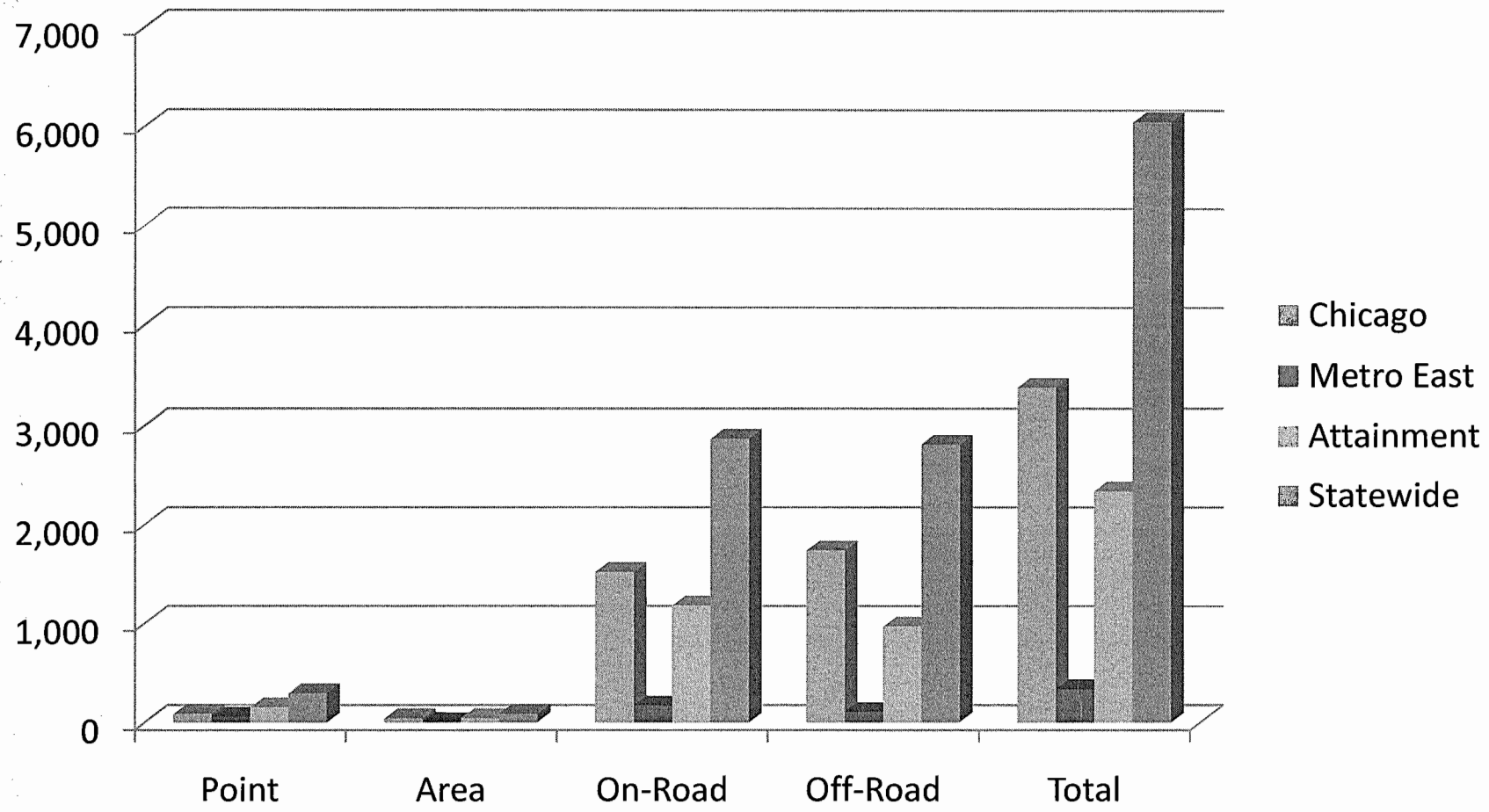


Figure 2-2: Annual CO Emission Summary (tons/year)

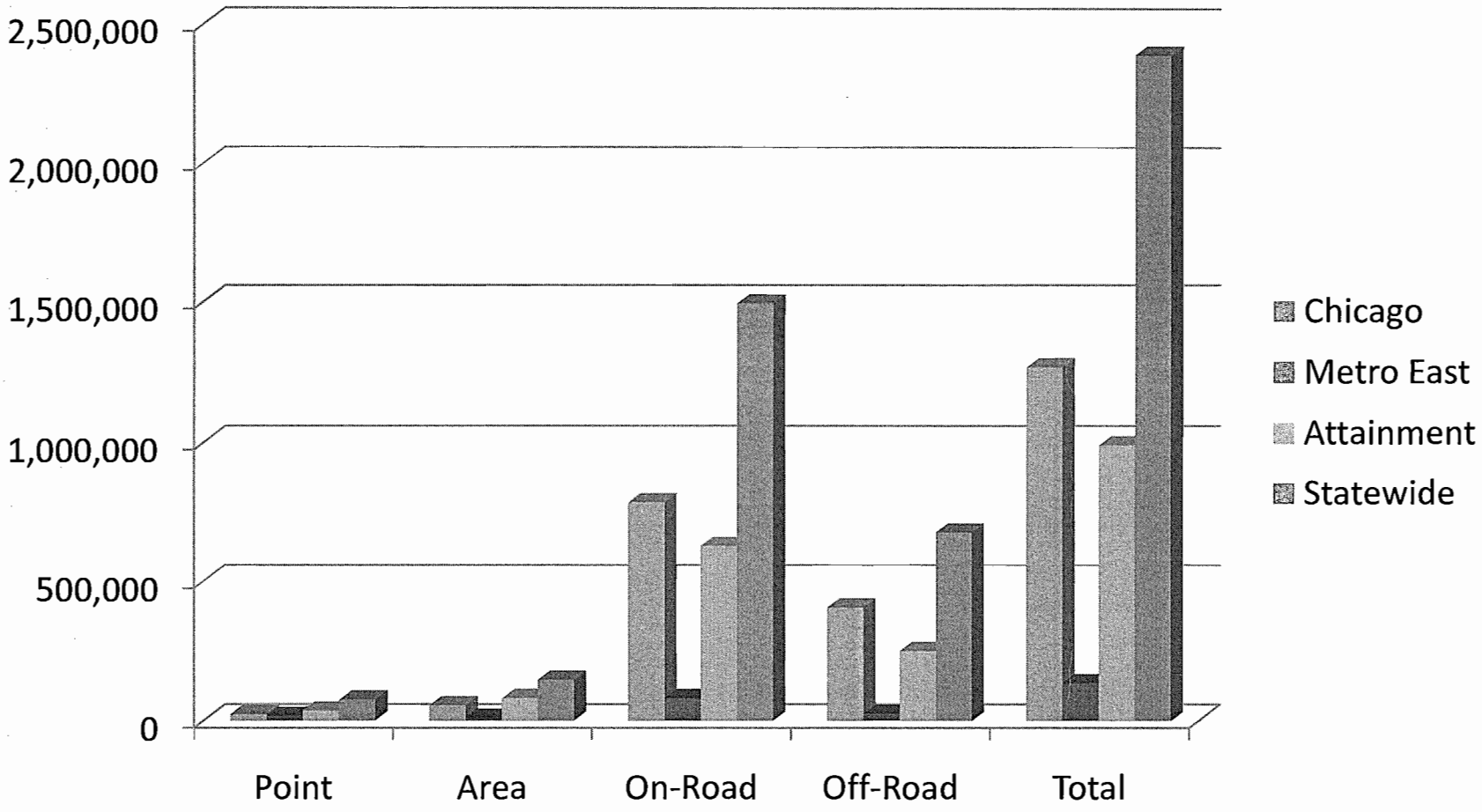


Figure 2-3: Daily NOx Emission Summary (tons/day)

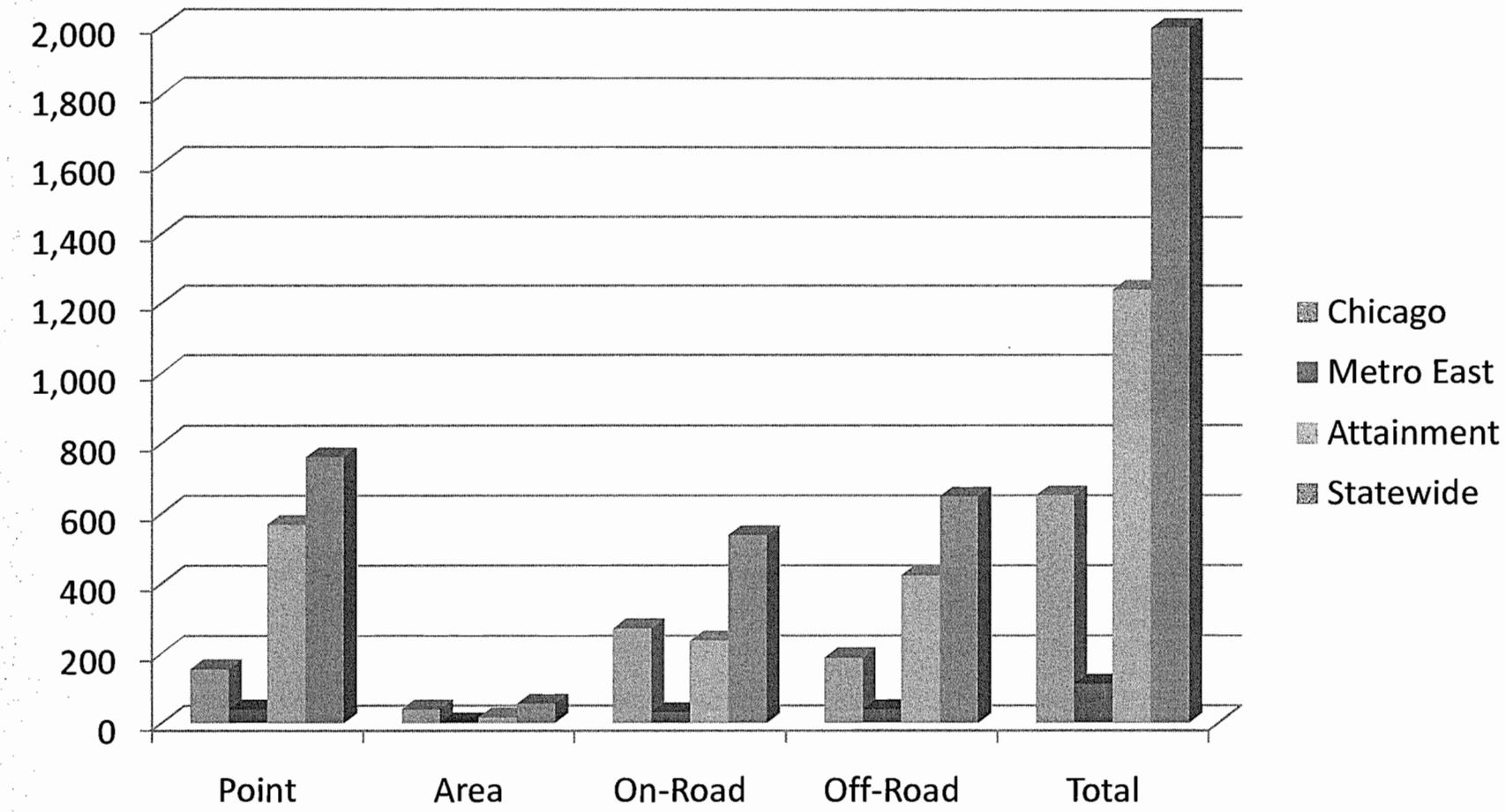


Figure 2-4: Annual NOx Emission Summary (tons/year)

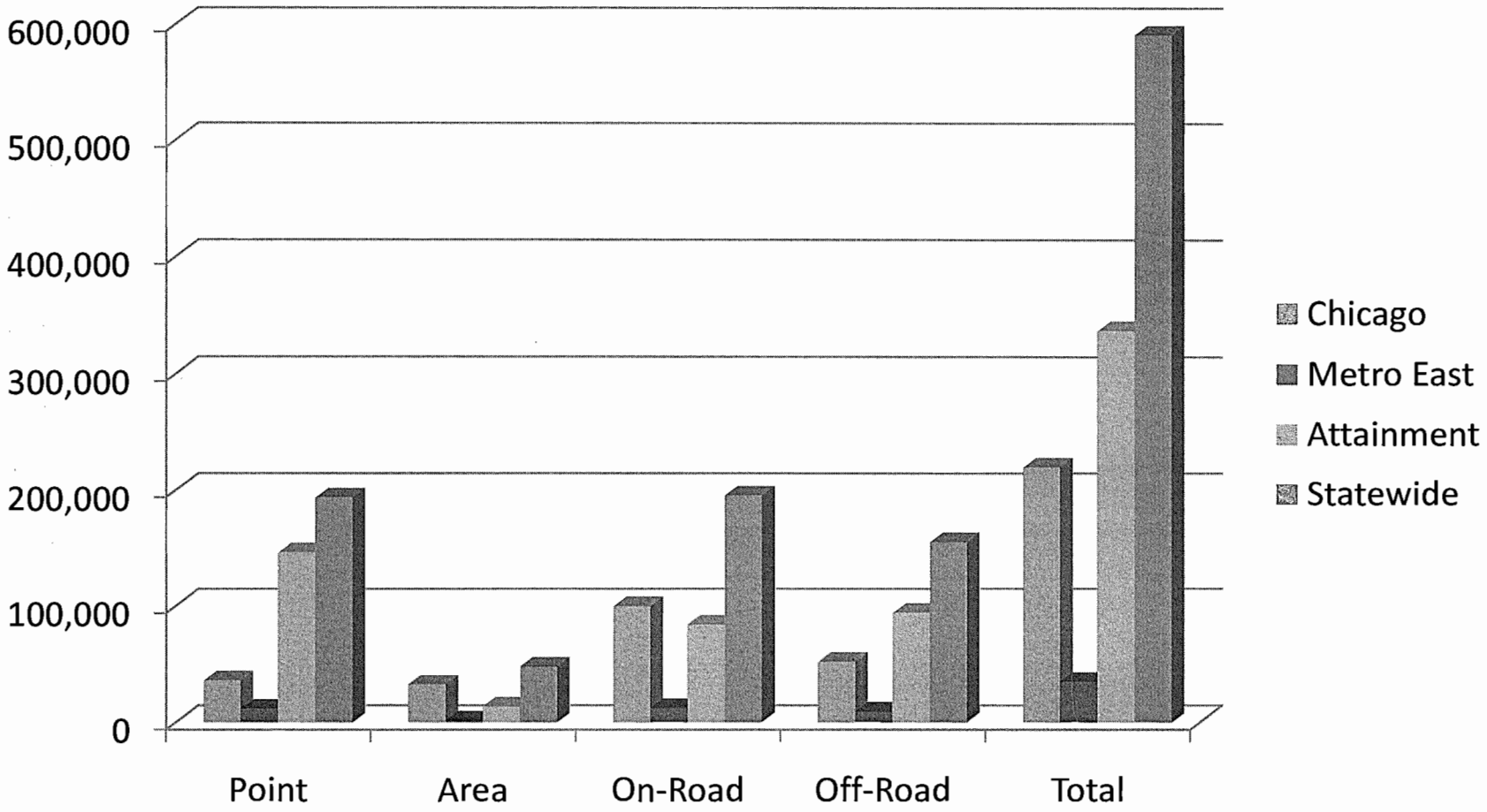


Figure 2-5: Daily VOM Emission Summary (tons/day)

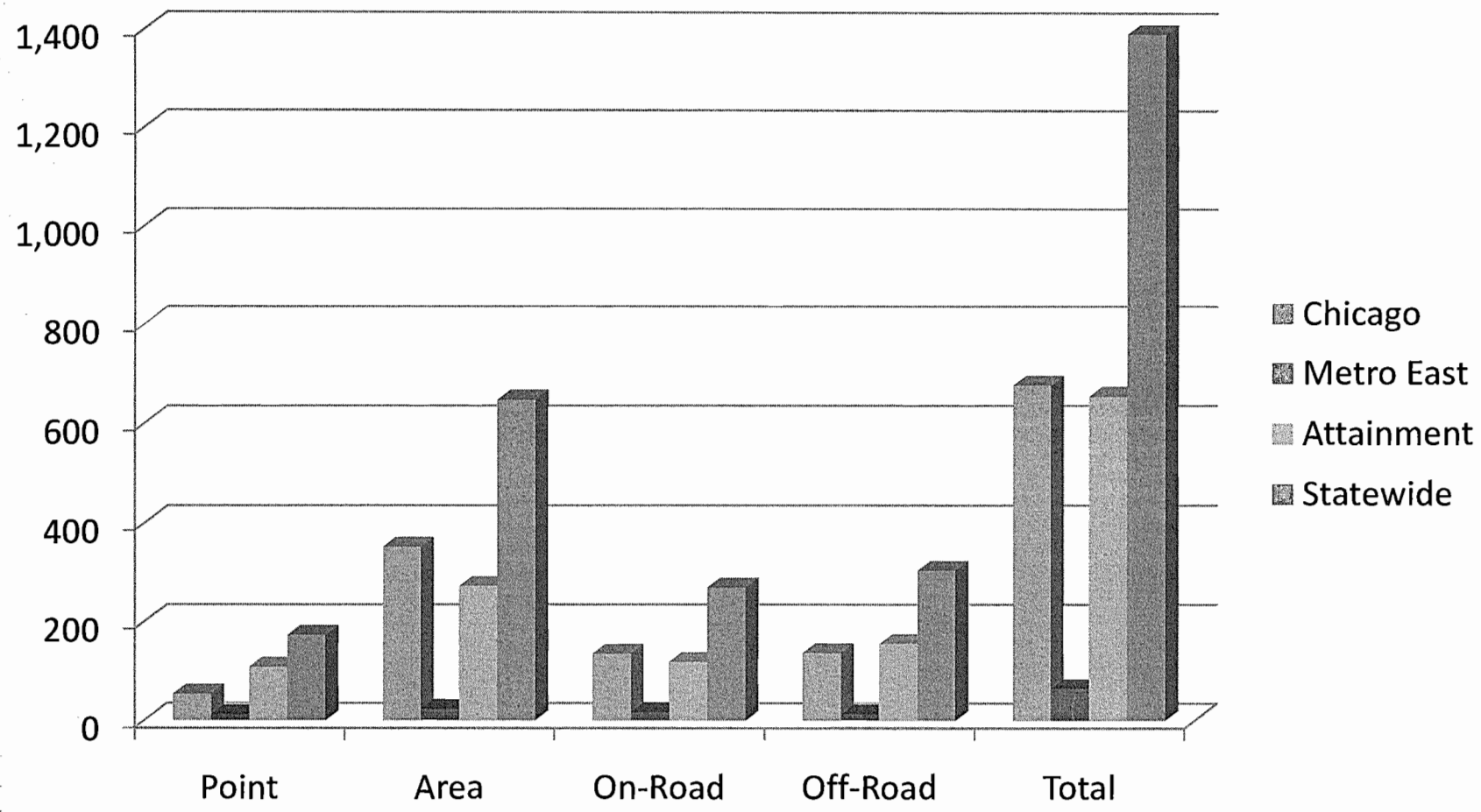


Figure 2-6: Annual VOM Emission Summary (tons/year)

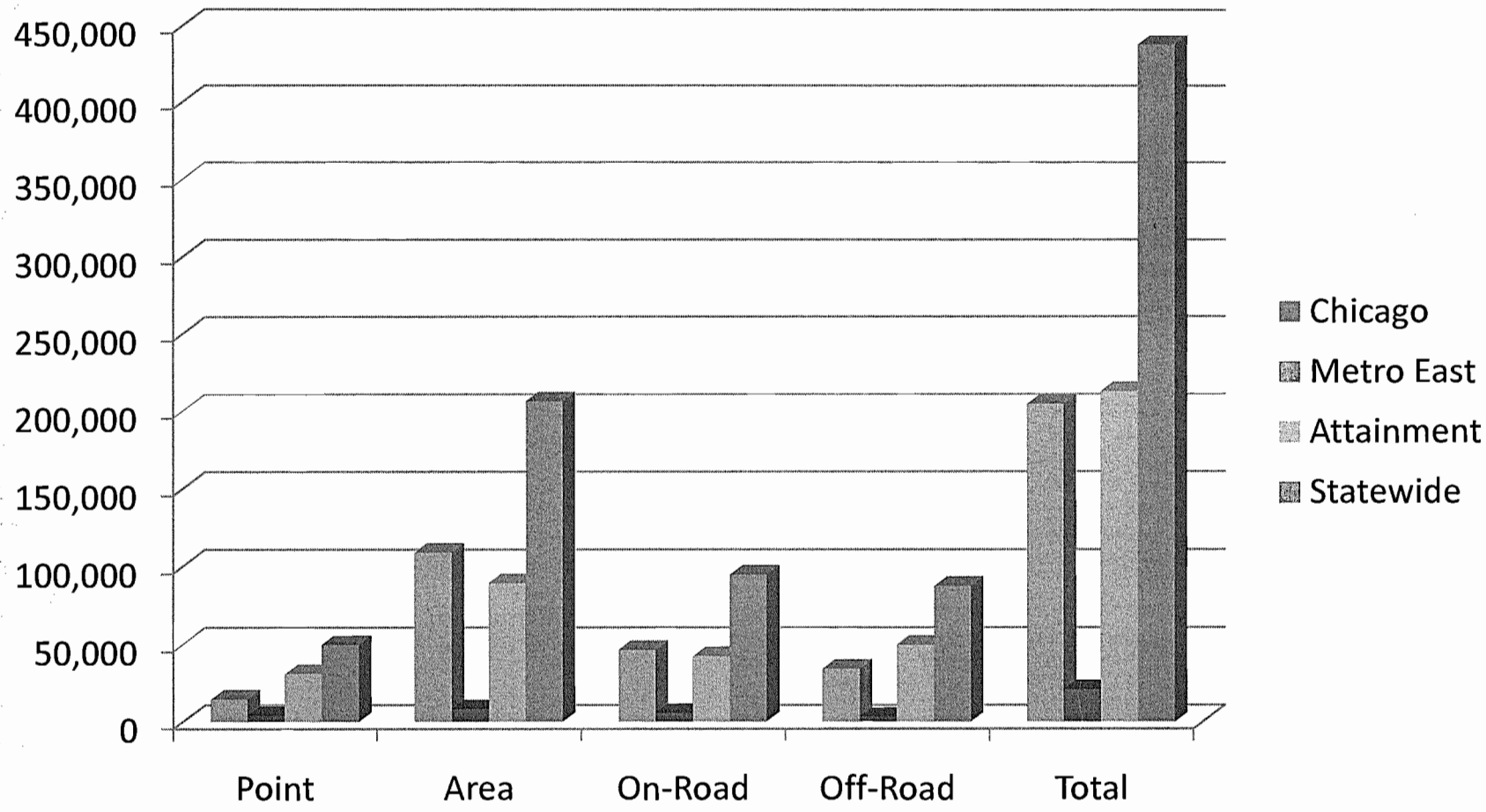
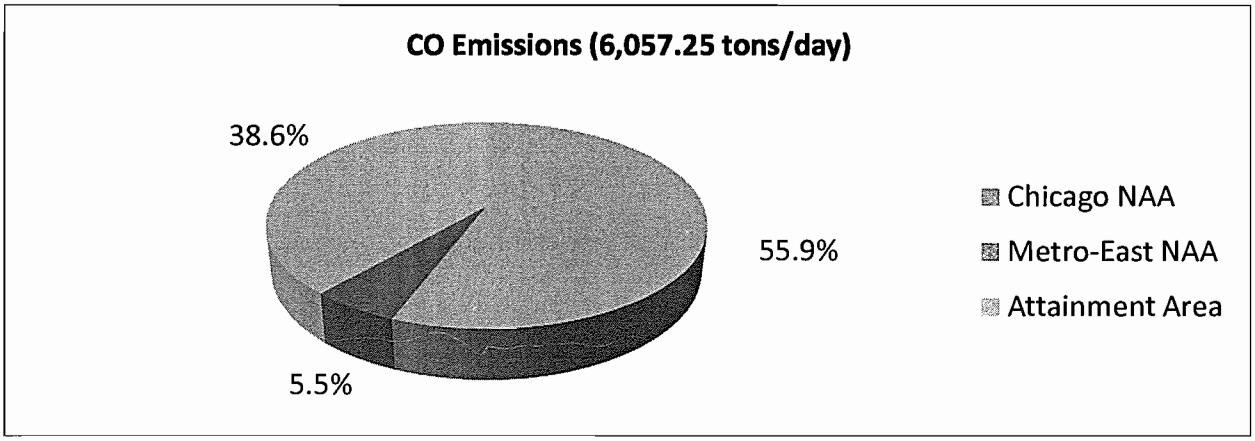
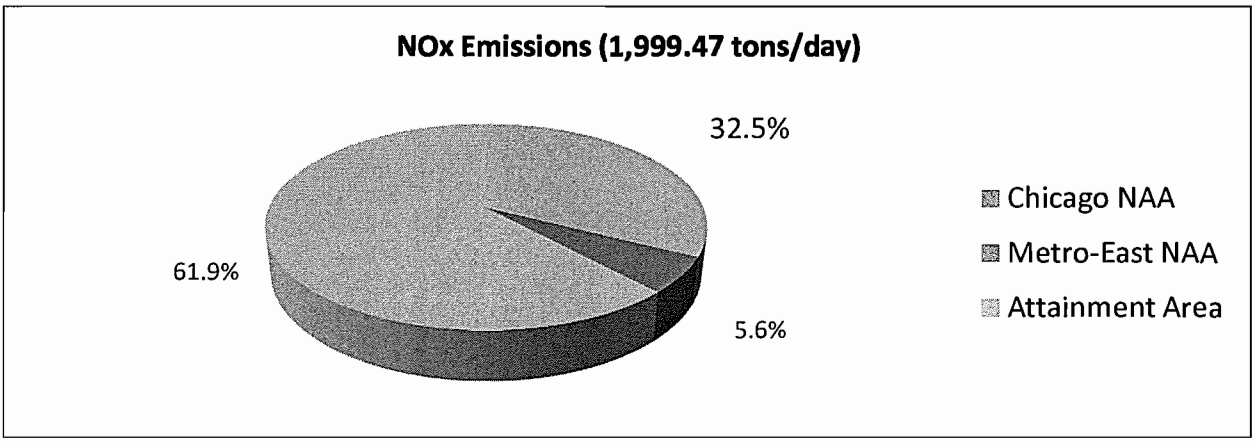


Figure 2-7: Statewide Geographic Contributions of Ozone Precursor Daily Emissions (tons/day)





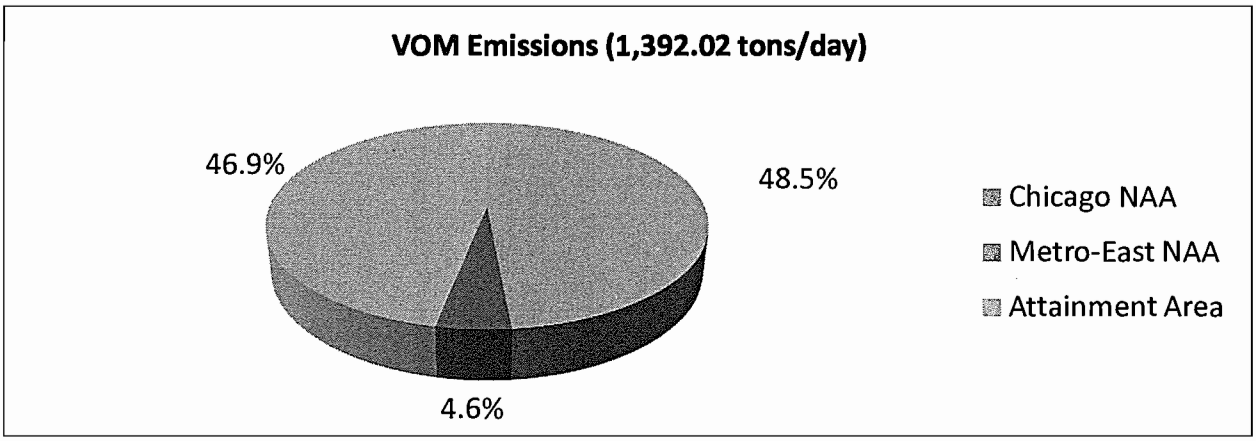
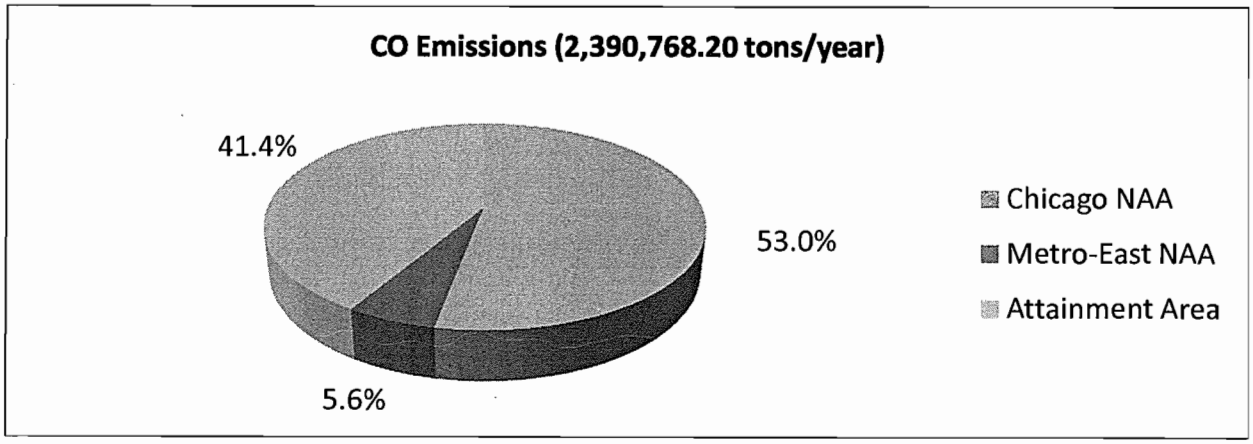
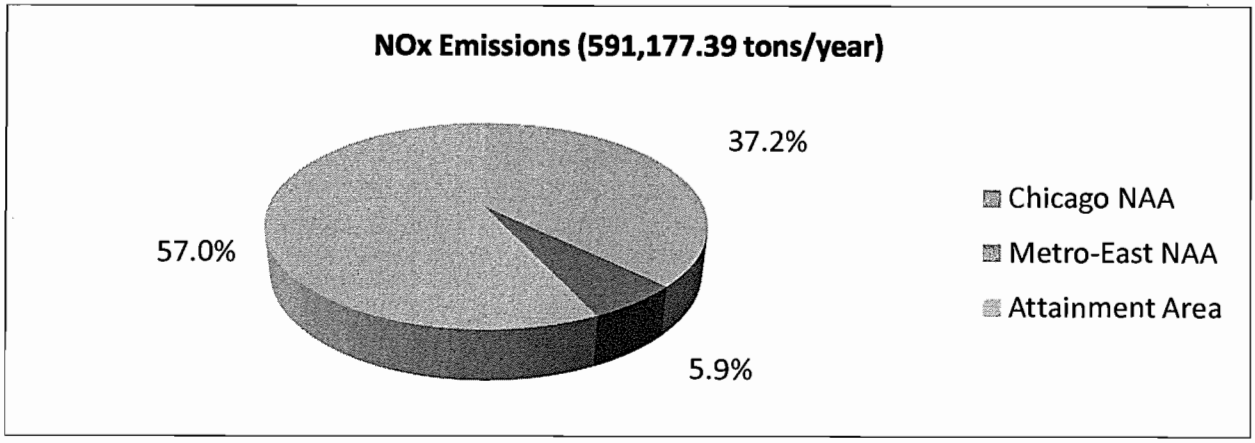


Figure 2-8: Statewide Geographic Contributions of Ozone Precursor Annual Emissions (tons/year)





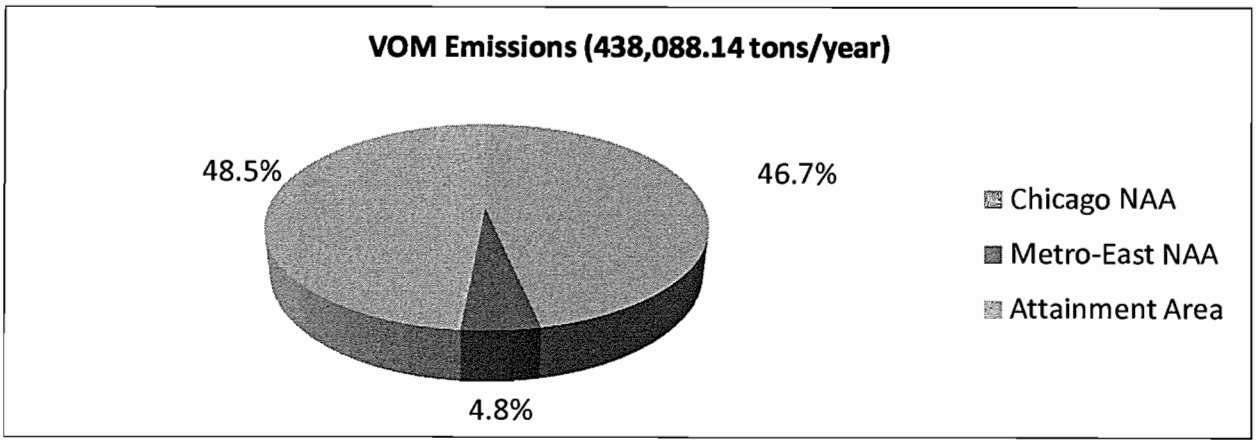
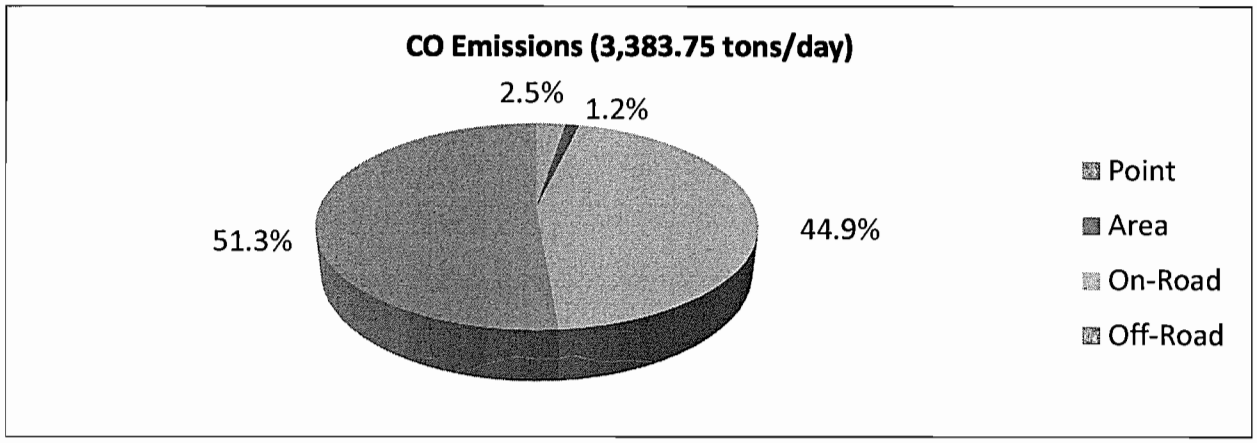
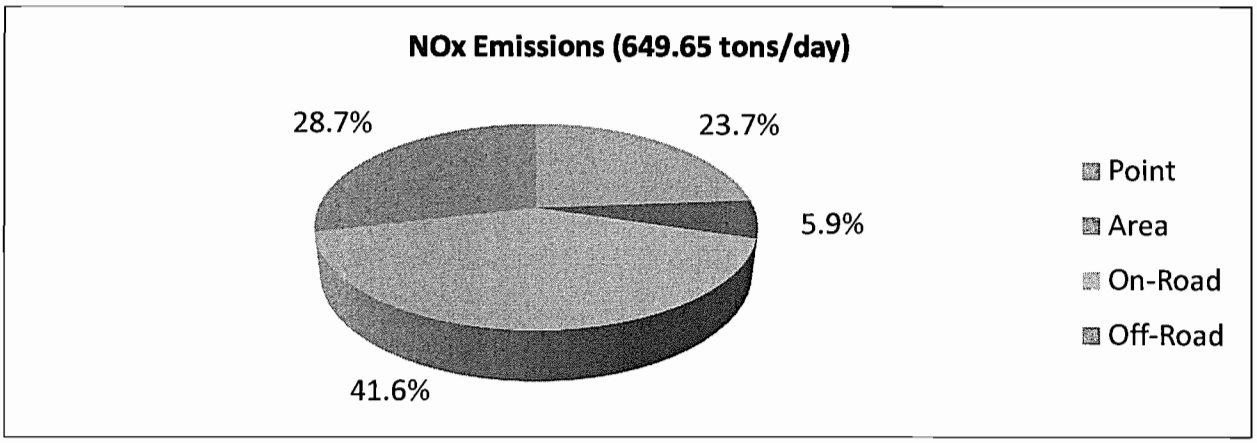


Figure 2-9: Chicago NAA Ozone Precursor Daily Emissions (tons/day)





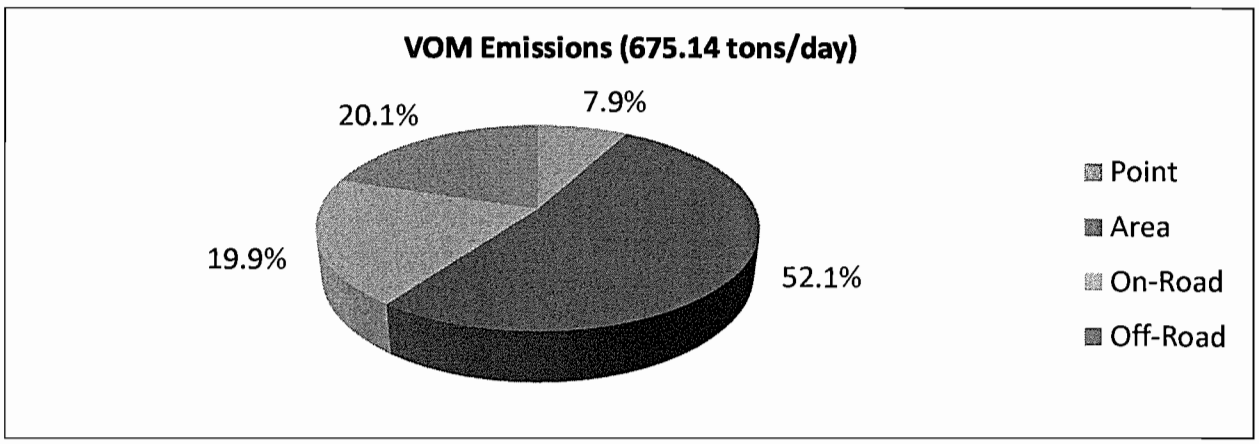
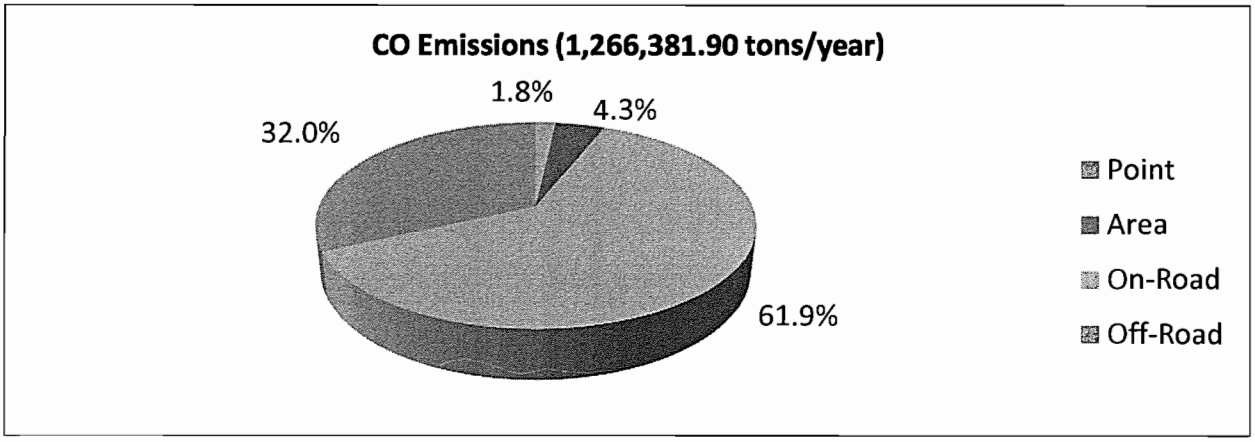
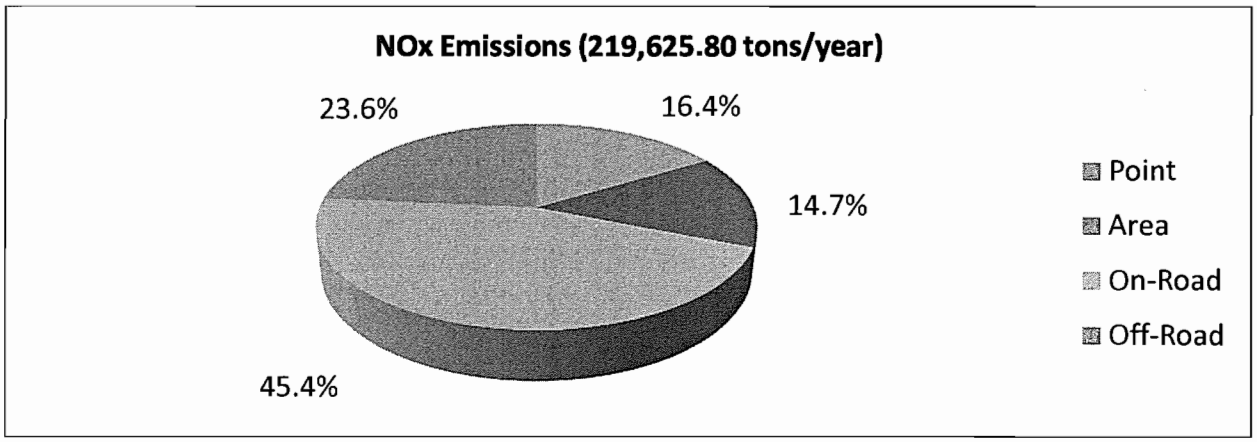


Figure 2-10: Chicago NAA Ozone Precursor Annual Emissions (tons/year)





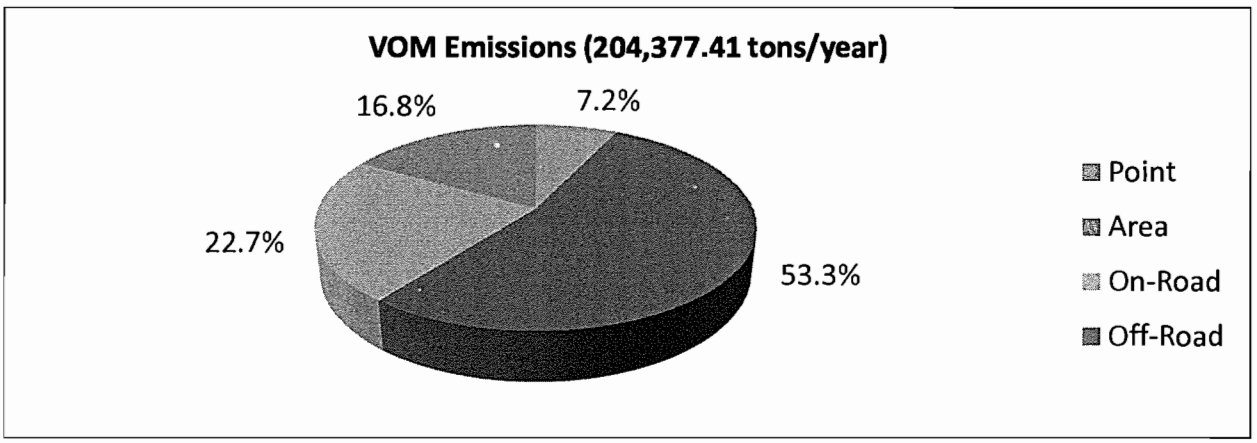
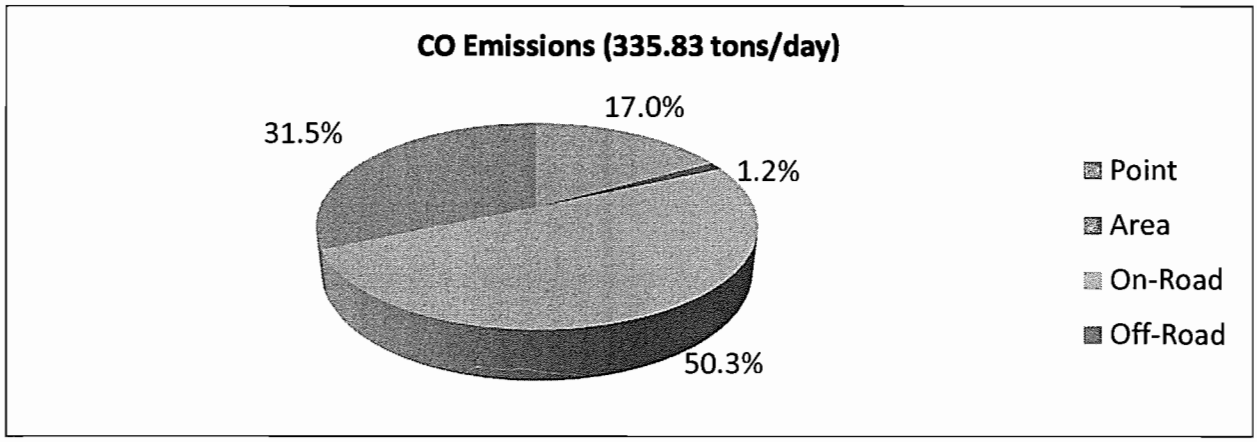
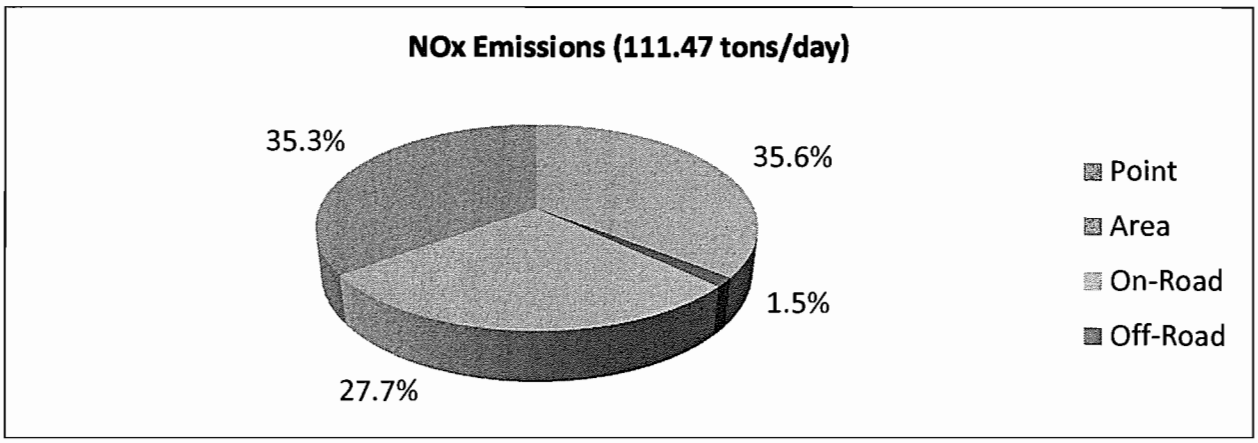


Figure 2-11: Metro-East NAA Ozone Precursor Daily Emissions (tons/day)





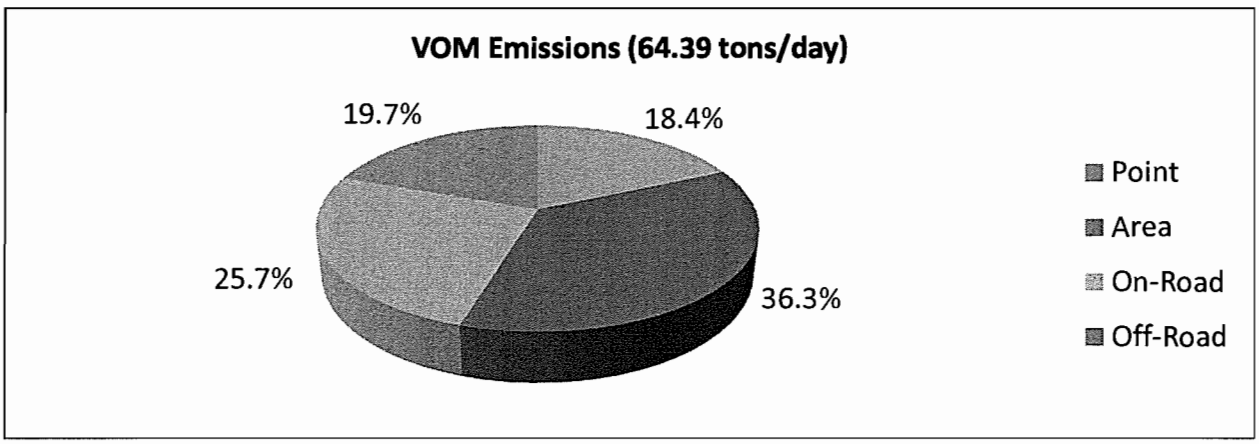
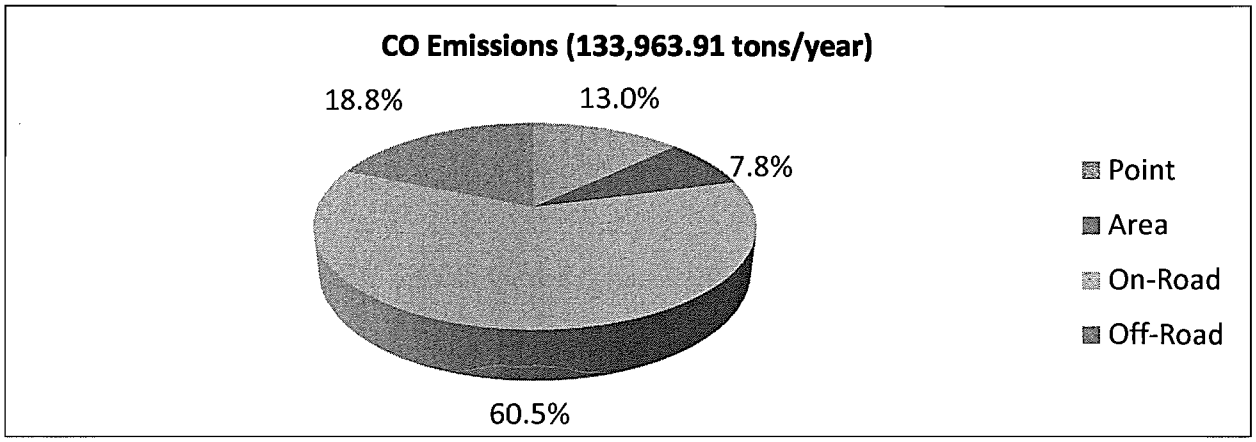
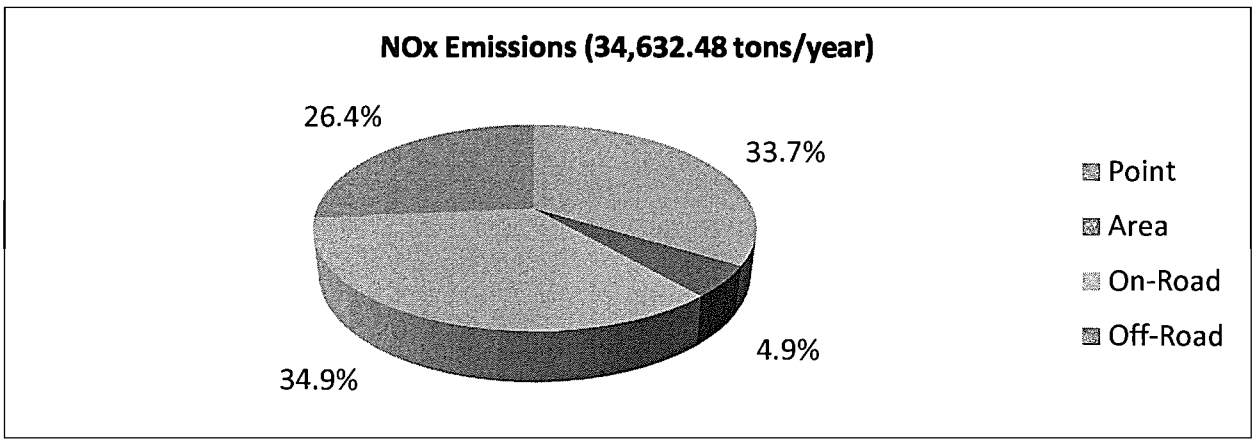


Figure 2-12: Metro-East NAA Ozone Precursor Annual Emissions (tons/year)





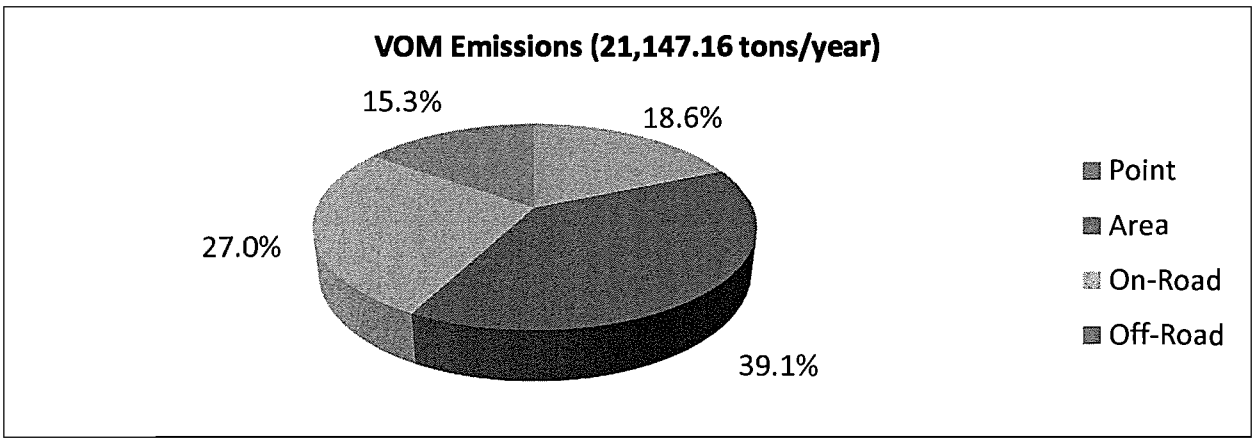
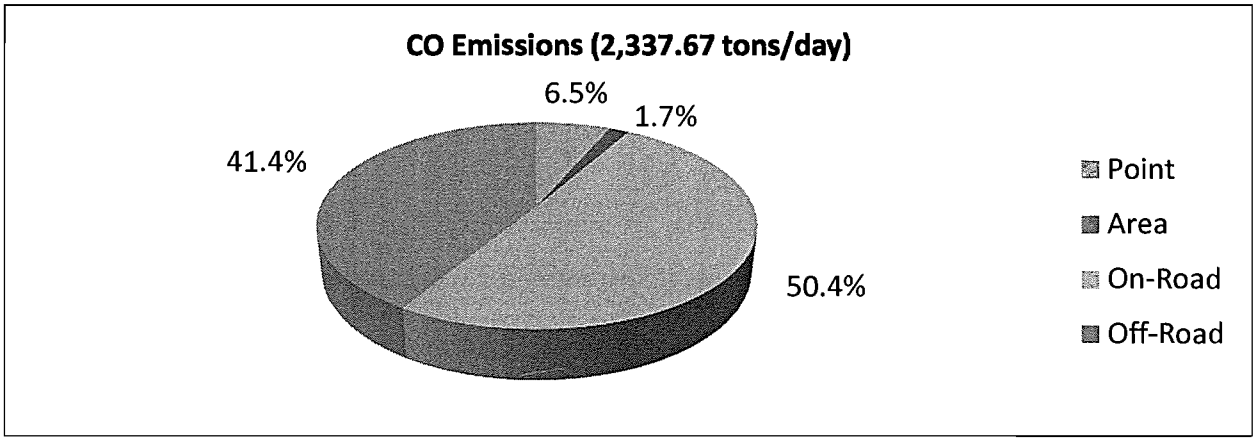
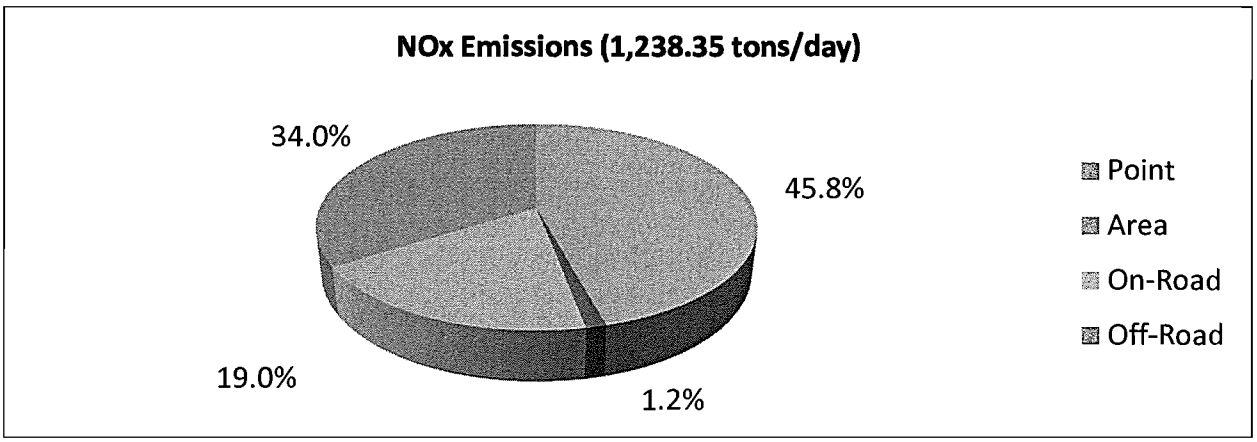


Figure 2-13: Attainment Area Ozone Precursor Daily Emissions (tons/day)





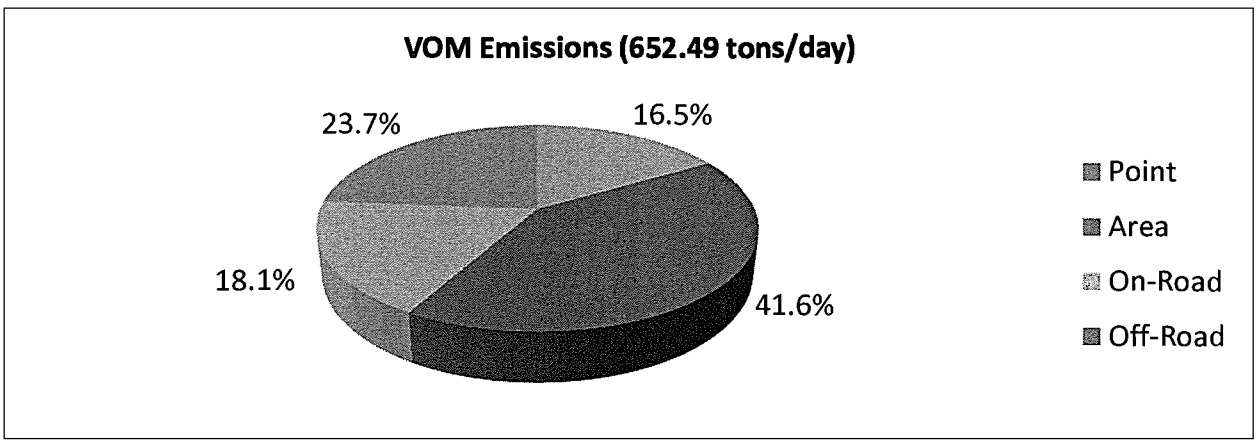
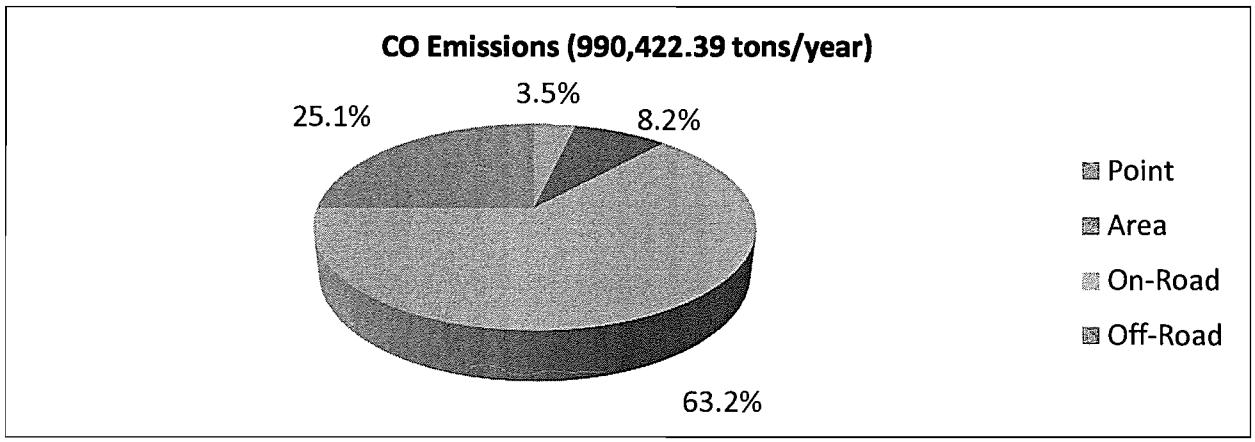
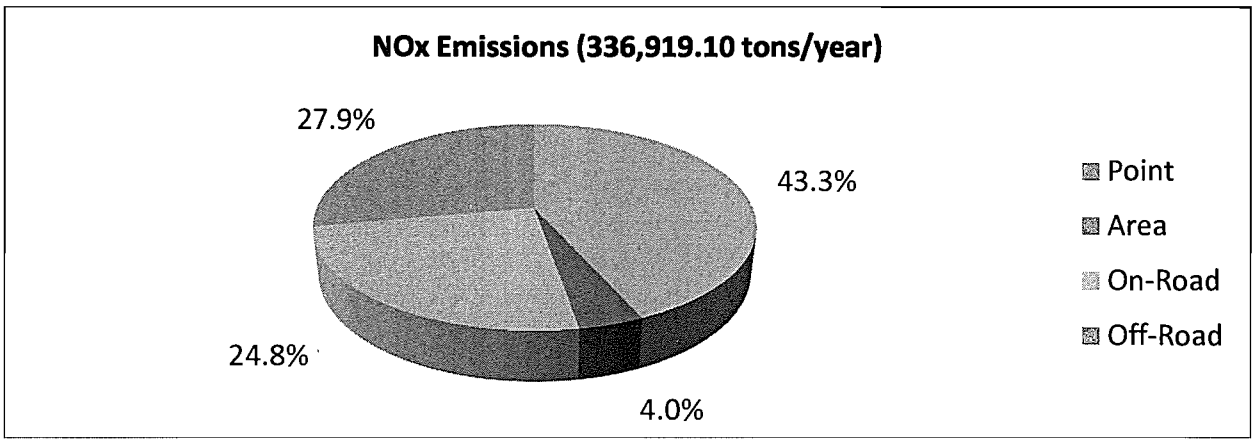


Figure 2-14: Attainment Area Ozone Precursor Annual Emissions (tons/year)





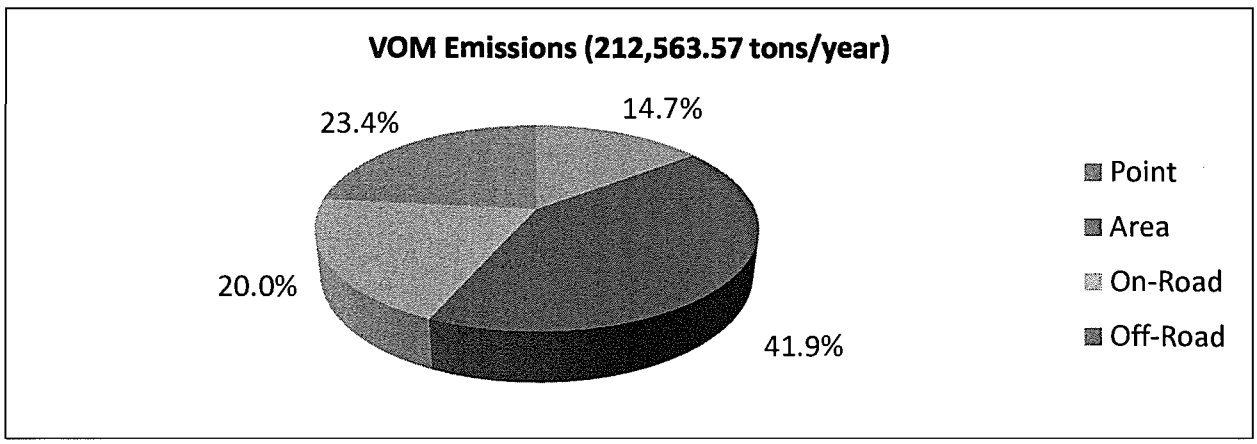
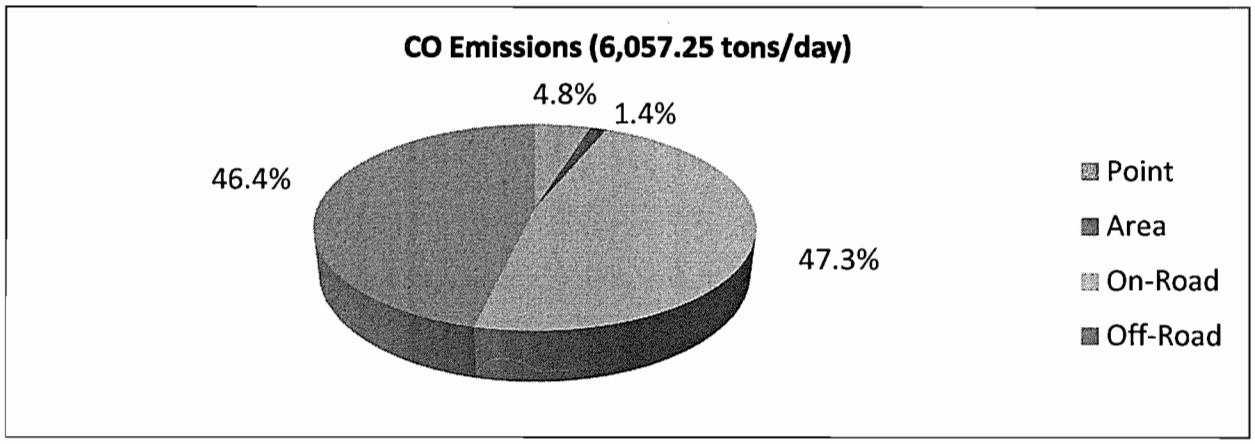
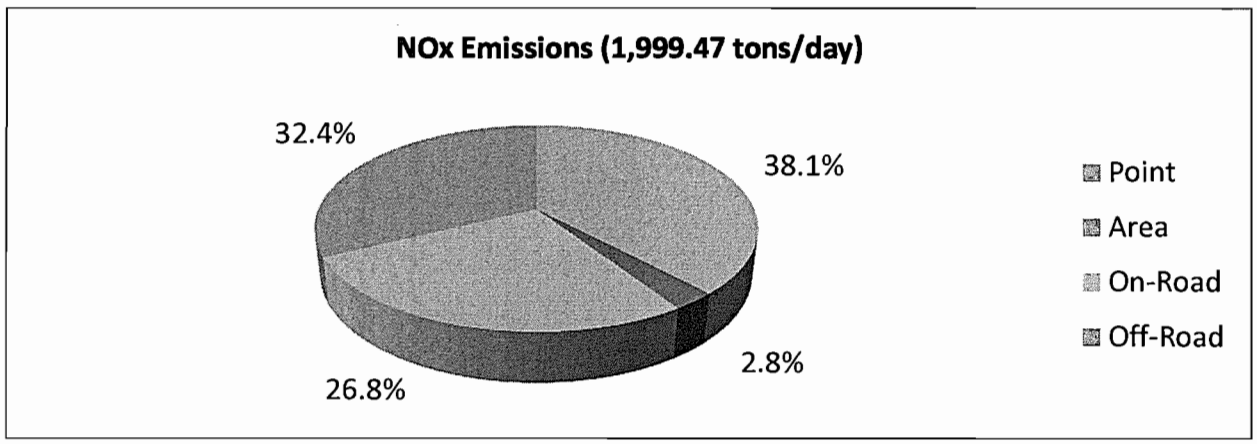


Figure 2-15: Statewide Ozone Precursor Daily Emissions (tons/day)





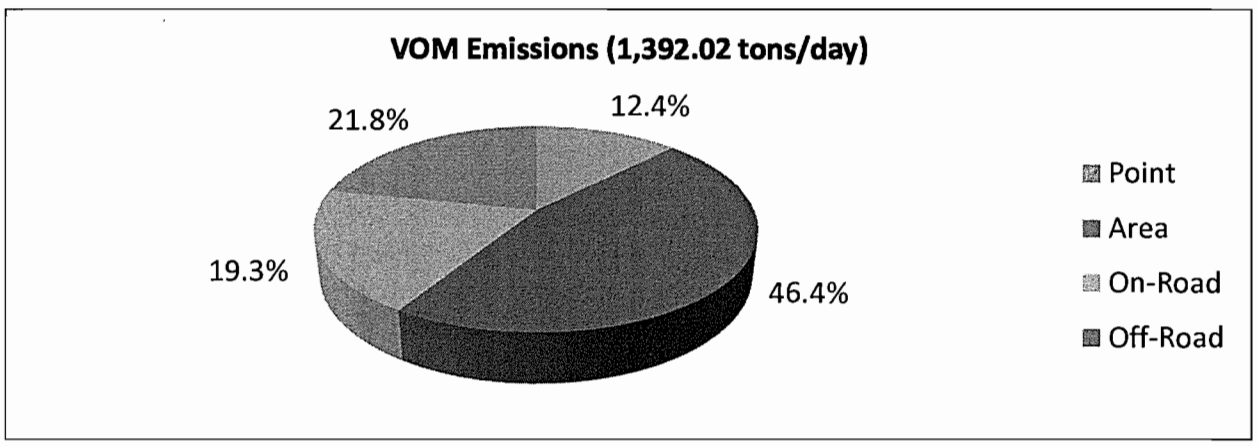
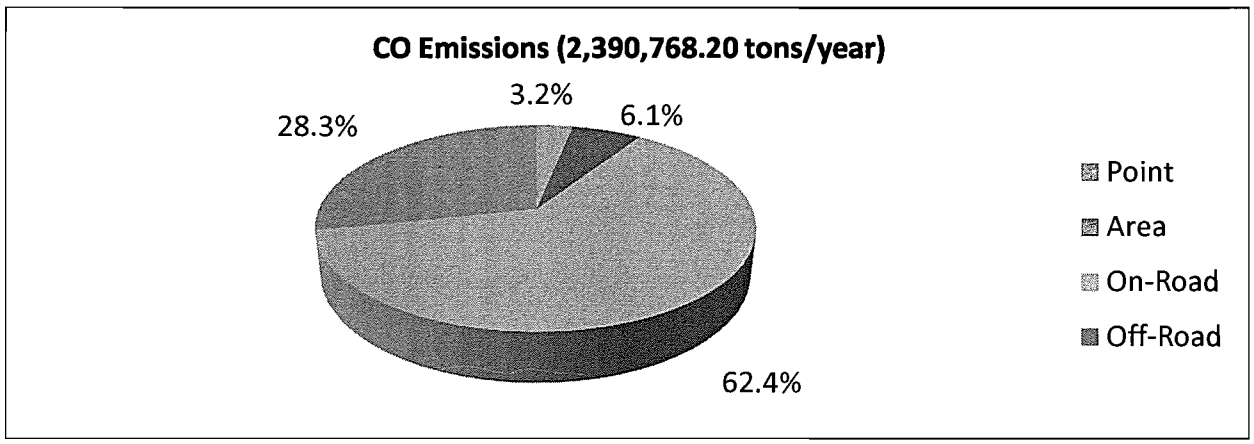
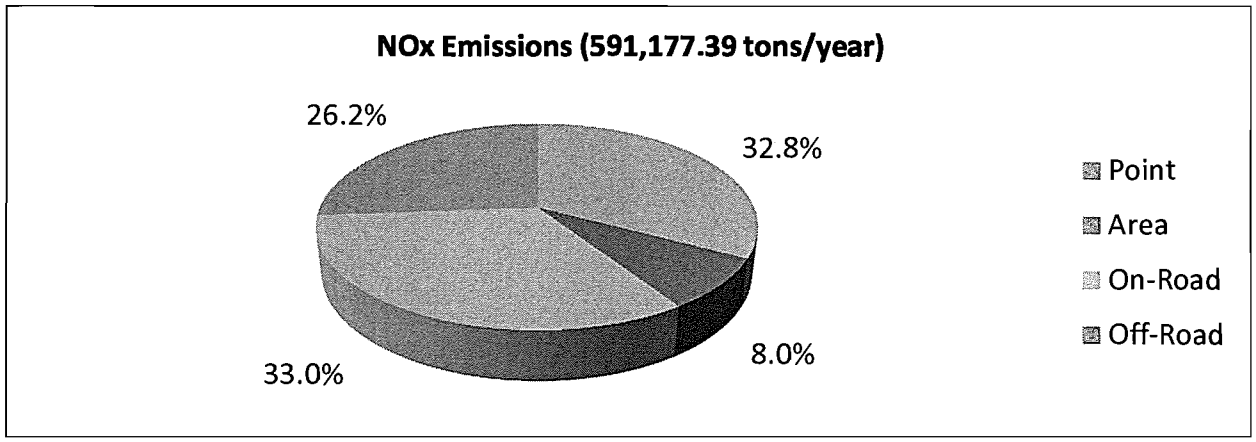


Figure 2-16: Statewide Ozone Precursor Annual Emissions (tons/year)





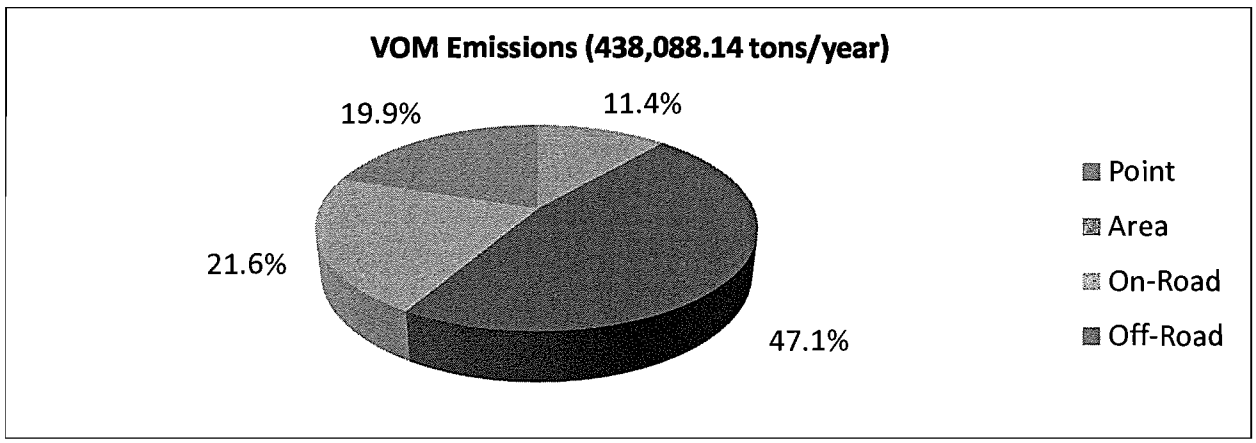


Figure 2-17: Historical Daily CO Emissions (tons/day)

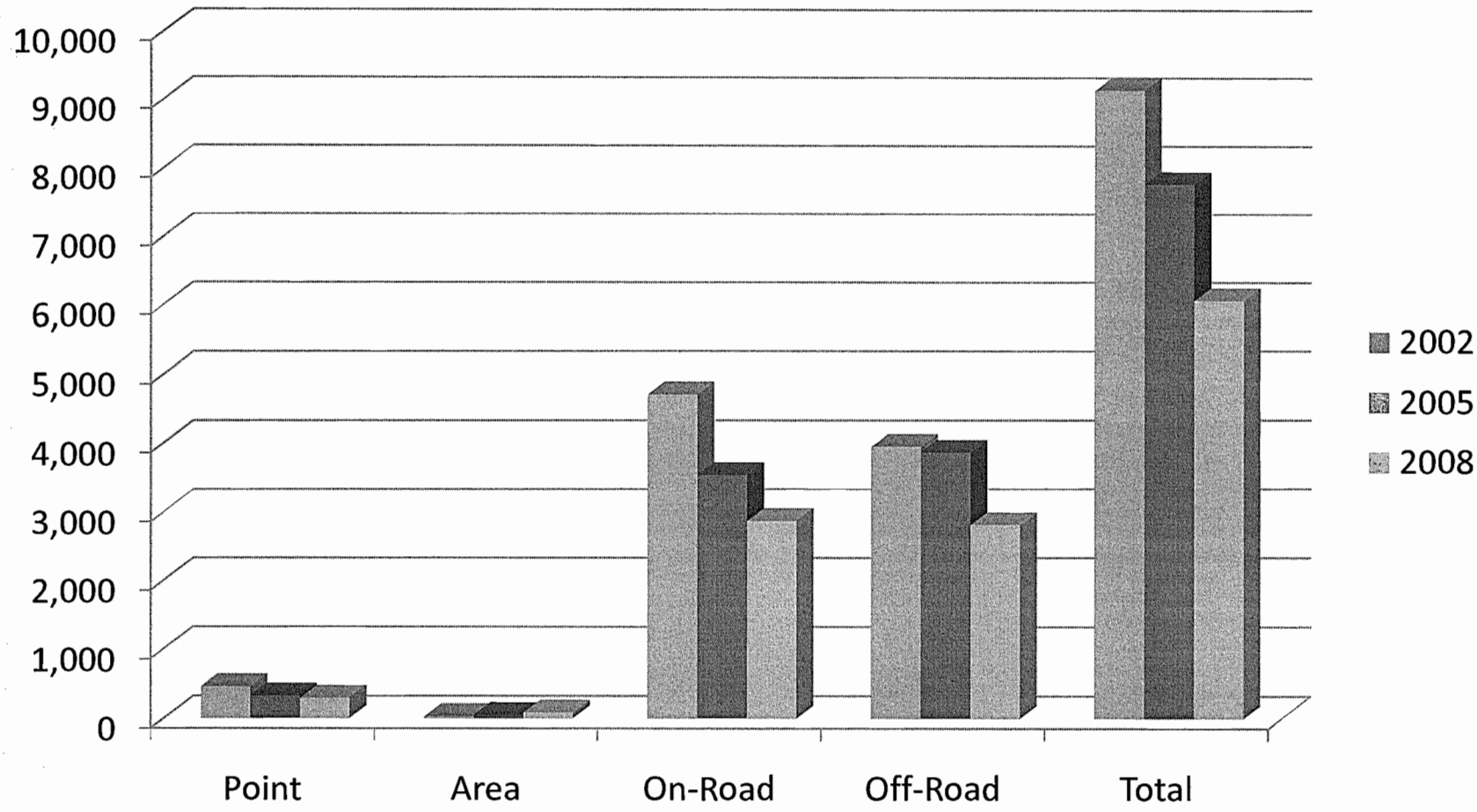


Figure 2-18: Historical Annual CO Emissions (tons/year)

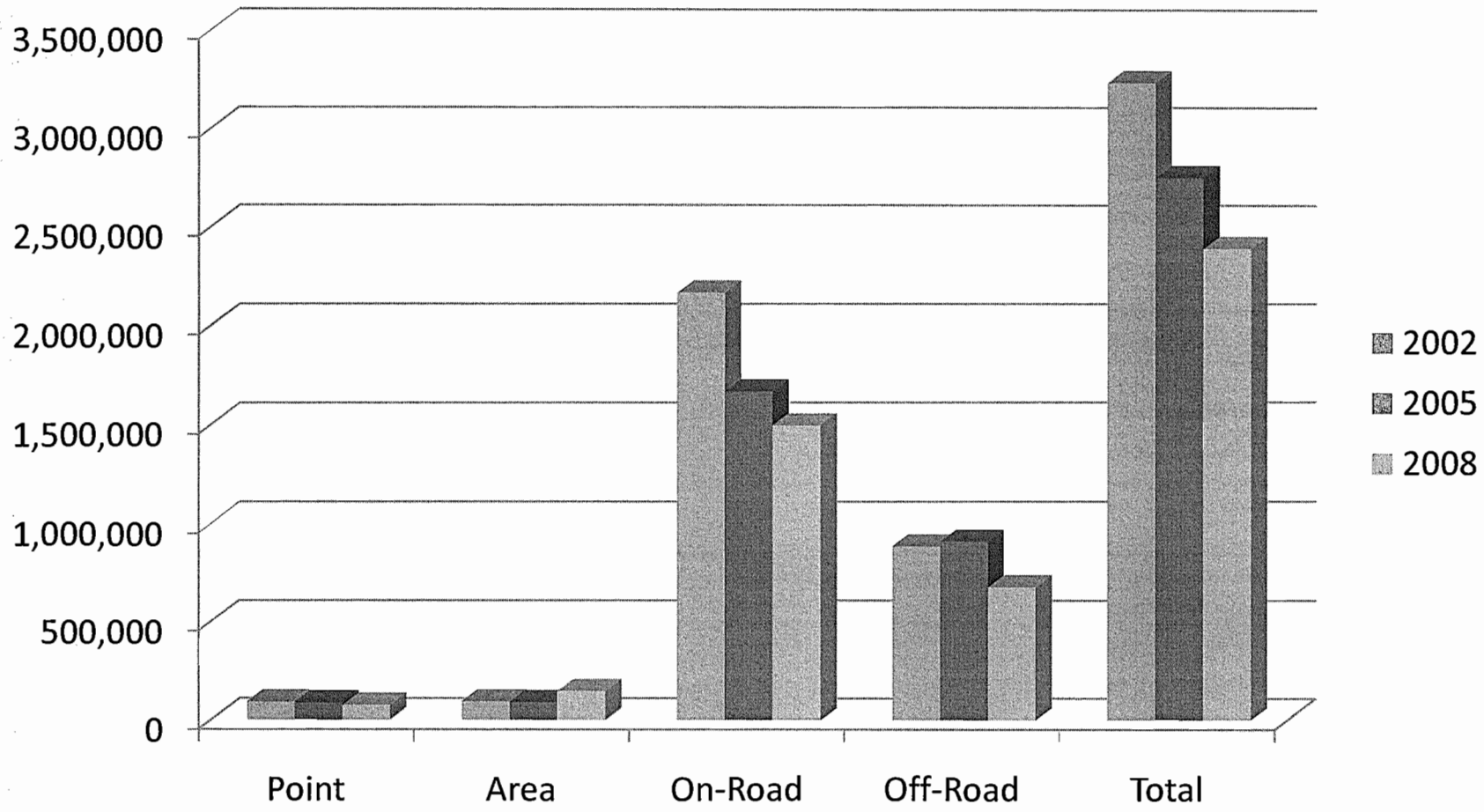


Figure 2-19: Historical Daily NOx Emissions (tons/day)

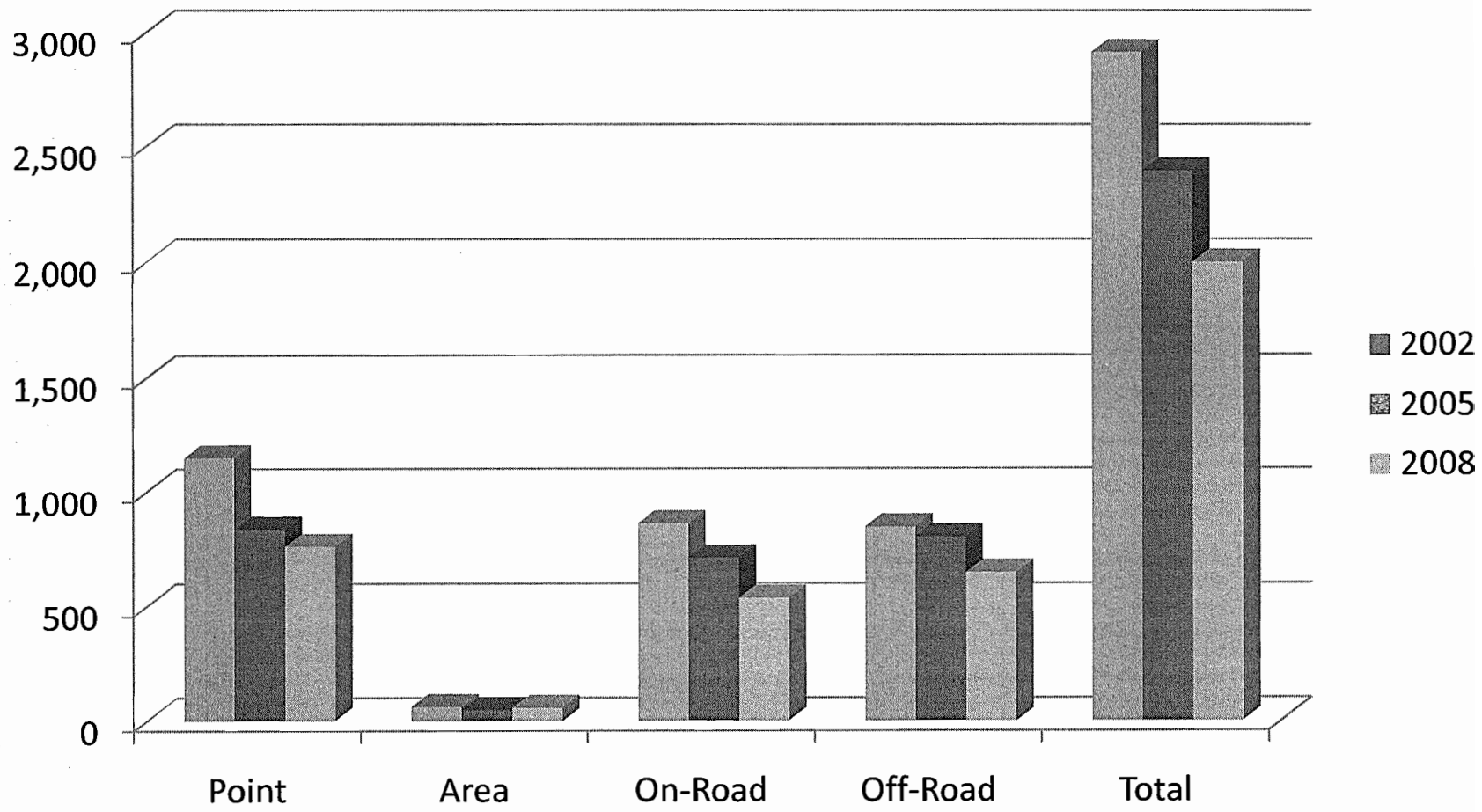


Figure 2-20: Historical Annual NOx Emissions (tons/year)

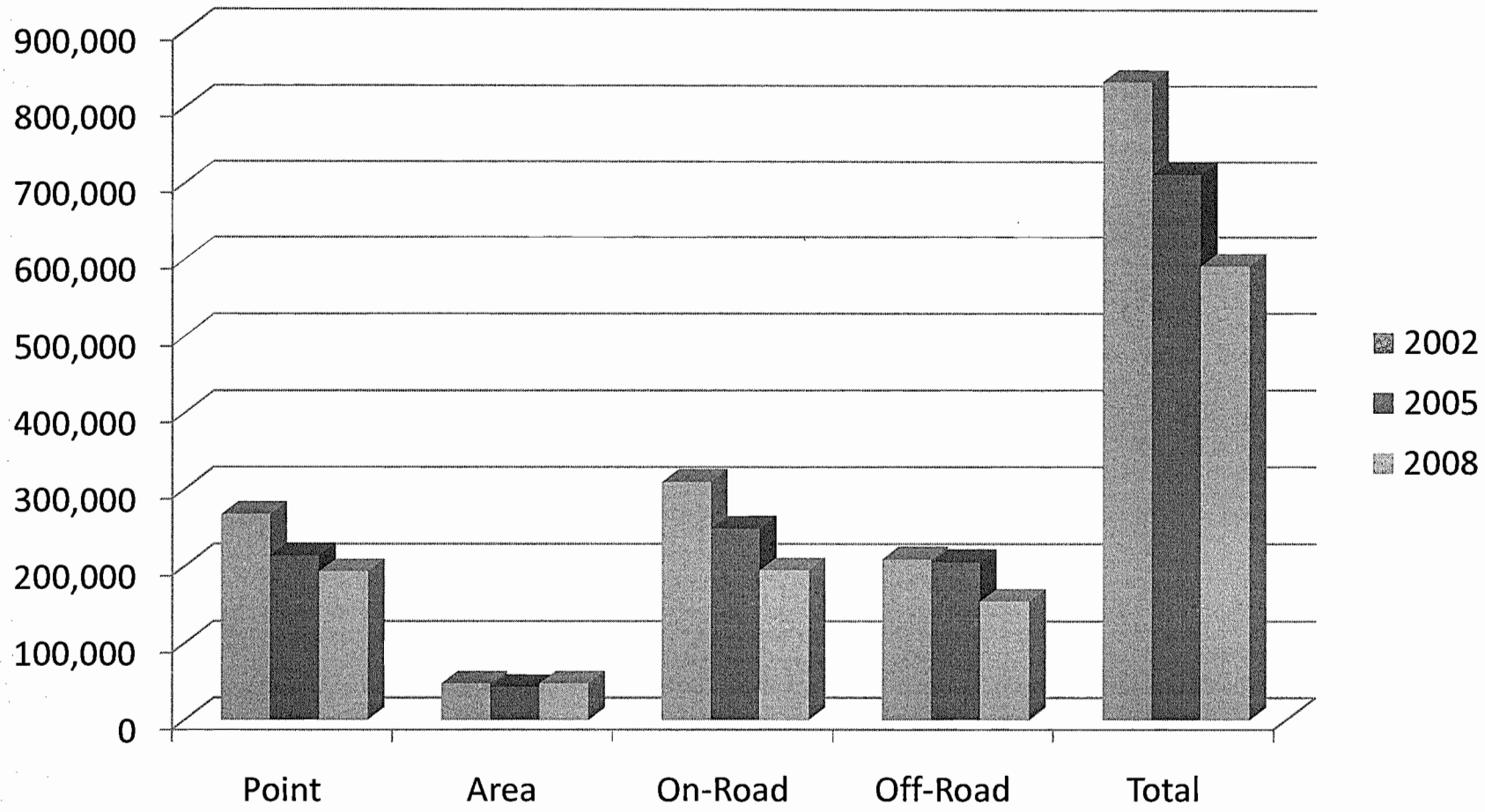


Figure 2-21: Historical Daily VOM Emissions (tons/day)

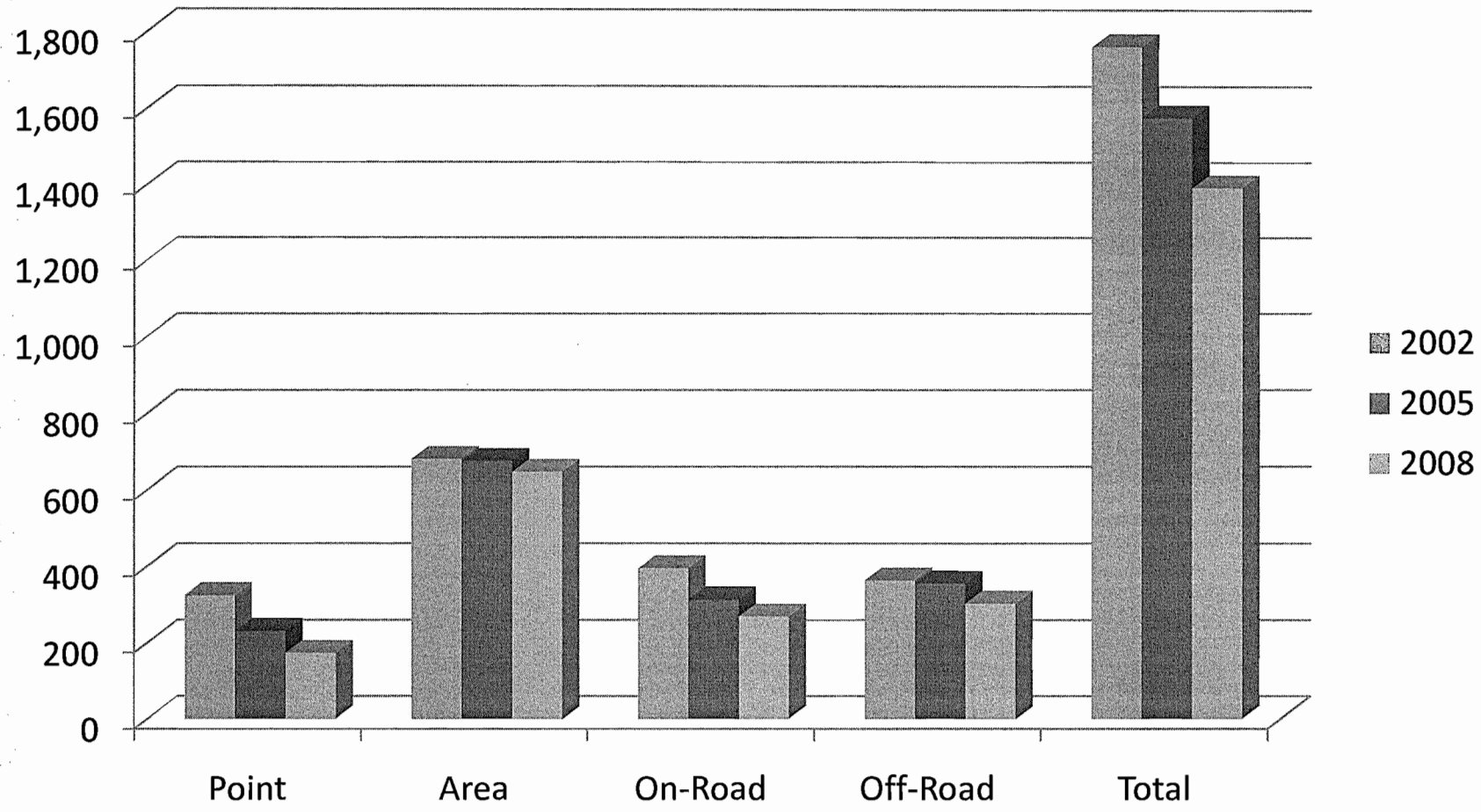
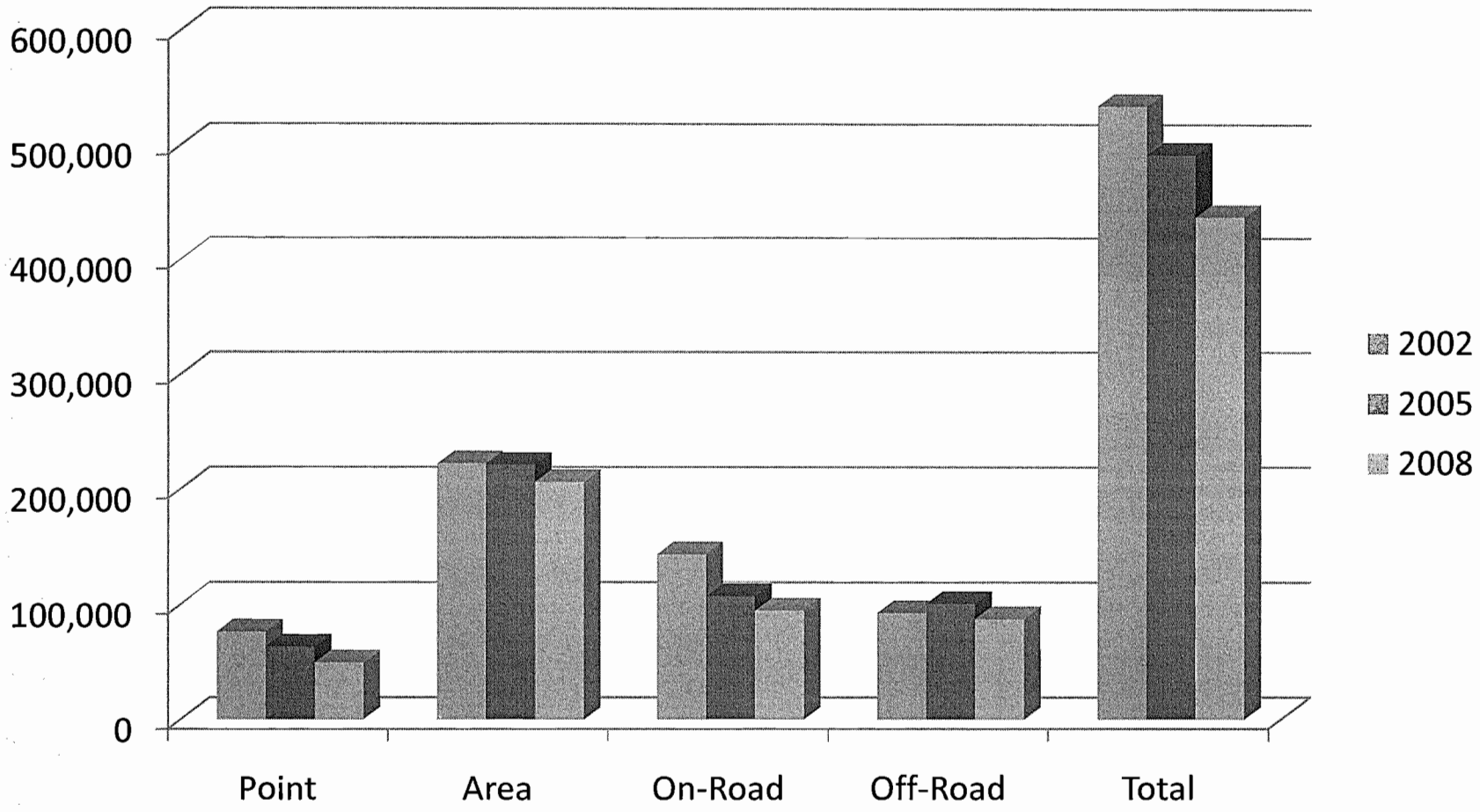


Figure 2-22: Historical Annual VOM Emissions (tons/year)



3 Point Sources

A major distinction typically made in emission inventories is the distinction between point and area sources. The Illinois EPA maintains detailed, unit-by-unit data for permitted sources. This data is obtained from permit applications and annual emission reports. Since the Illinois EPA has very few de minimus emission exemptions from permitting, the 10 ton per year inventory requirement imposed by USEPA inventory guidance is more than adequately met for Illinois sources with permits. It is not uncommon for emissions from a permitted source to be much less than 10 tons/year.

The sources described above are known as point sources. The area source inventory includes all other stationary sources not included in the point source inventory. In cases where the two categories overlap (e.g., fuel combustion and solvent use), care has been taken to not double-count emissions. Area sources are covered in Section 4. The point source inventory described herein is considered to be the most current and accurate source of emission data available for 2008.

3.1 Source Identification and Data Collection

The sources to be included in the 2008 inventory were identified using the Illinois EPA's ICEMAN database. All operating sources that existed in ICEMAN as of the end of 2008 are included in this inventory.

The 2008 point source inventory was prepared by the Illinois EPA using source reported data from AERs. When a source failed to submit an AER for 2008, other data such as previous Illinois EPA estimates were used.

3.2 Emission Estimation Methodologies

Source reported actual emissions are used in the 2008 ozone inventory. Annual emission reports provided the ozone season hourly emissions and operating schedules that enabled the calculation of ozone season weekday emissions. Where operating schedules were missing or not required to be reported, Illinois EPA estimates were used. These estimates came from previously submitted annual emission reports or from permit applications. Typical emission estimation methodologies include material balance and emission factors.

In cases where specific ozone season data was not required to be reported, emissions were calculated using the ratio of the reported summer throughput to 25 percent (constant production level throughout the year) times the reported annual emission rate. For example, a source that reported a summer throughput of 5 percent for their boiler burning natural gas, resulting in multiplying the reported annual emission rate by 5/25.

Since the inventory included VOM emissions, care was taken to exclude materials of photochemically non-reactive VOM. Emission rates from these types of materials are stored separately in ICEMAN from VOM so it was a simple task to exclude their emissions. The list of the compounds that USEPA has identified as being photochemically non-reactive is included in Section 2.2.

3.3 Point Source Emissions

Table 3-1 includes the emissions from all sources classified as point sources.

Table 3-1: Point Source Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	47.21	12,430.46	48.47	10,001.76	29.82	8,068.30
DuPage	3.30	677.02	4.53	707.86	4.51	1,216.27
Grundy Twps	1.44	538.94	3.49	1,109.15	2.15	725.38
Kane	1.89	476.32	2.22	543.77	3.70	1,018.71
Kendall Twps	0.36	103.69	0.34	85.18	0.62	145.98
Lake	7.14	1,555.47	22.13	3,828.54	2.45	544.64
McHenry	1.50	269.24	2.19	314.38	1.75	419.60
Will	22.63	6,733.99	70.88	19,348.43	8.11	2,532.89
Chicago NAA	**85.48**	**22,785.13**	**154.25**	**35,939.07**	**53.11**	**14,671.77**
Jersey	0.00	0.10			0.03	9.66
Madison	55.16	16,834.44	37.84	11,353.55	9.73	3,205.15
Monroe	0.16	3.19	0.50	10.64	0.08	17.74
St. Clair	1.77	549.14	1.34	316.41	2.00	695.92
Metro-East NAA	**57.09**	**17,386.87**	**39.68**	**11,680.60**	**11.85**	**3,928.46**
Attainment Area	**151.00**	**35,144.61**	**566.89**	**145,992.93**	**107.95**	**31,171.21**
State Total	**293.57**	**75,316.62**	**760.82**	**193,612.60**	**172.91**	**49,771.44**

4 Area Sources

Area sources are those activities for which aggregated source and emission information is maintained for entire source categories rather than for each individual source. The Illinois EPA is responsible for preparing the area source emission inventory. The area source inventory includes CO, NOx and reactive VOM for the entire state. Emission estimates are presented for the ozone nonattainment areas of Chicago and Metro-East St. Louis, as well as the remaining part of the state, which is in attainment with the 8-hour ozone standard. Where no township-specific information was available for the Chicago NAA counties of Grundy and Kendall, apportioning factors were developed and applied to estimate area source activity.

4.1 Source Identification

Area source categories of CO, NOx and VOM emissions have been identified primarily through previous inventories. These inventories have followed previous guidance and have been found to be complete. As more is learned of emissions and emission sources, USEPA introduces new source categories for area sources. Illinois EPA reviewed this list and incorporated the new categories, as appropriate, added since the last inventory.

Care is also taken when identifying potential area source categories. As stated previously, Illinois EPA's point source inventory has a very low threshold of emission rates. This means that categories classified as area sources in other states are included solely in the point source inventory for Illinois. The best example of this is coal combustion in industrial and commercial boilers. It is believed that all boilers of this type are permitted and therefore exist in the point source inventory. In cases such as this, Illinois EPA reports zero emissions for the category to USEPA. Reporting zero emissions removes all doubt whether the category was overlooked or not.

4.2 Emission Estimation Methods

4.2.1 Calculation Methodologies

Several methodologies have been used in estimating area source emissions.

- Emission factors
    - Standard (e.g., lb/person, lb/acre)
    - Formula (methods that may require multiple data values)
- Growth factors
- Data from inventories compiled by others

In most cases, emissions were calculated by an emission factor. A listing of these emission factors can be found in Appendix G. The categories that used a formula to calculate emissions include:

- Gasoline Marketing – Stage I
- Gasoline Marketing – Storage Tank Breathing
- Gasoline Marketing – Tank Truck Leaks

In two cases, emissions were calculated by using a growth factor to convert 2005 emissions to 2008 emissions. It should also be noted that for some of the fuel combustion categories, consumption data for some fuels was only available for calendar year 2007. However, the natural gas consumption rate was available for 2008. If the most recent year of data for a fuel was 2007, it was grown to a 2008 value by using the ratio of natural gas consumption for 2008 to that of 2007. Growth factors used are as follows:

- Marine vessel loading – 1.051
- Industrial waste water treatment – 1.088

In some cases, data provided by the USEPA was used in compiling the 2008 area source inventory. These area source categories include:

- Aircraft refueling
- Residential wood combustion

4.2.2 Sources of Data

Various sources have been used to determine activity/commodity level data and emission information for area source inventory purposes. Among these are the USEPA's AP-42, USEPA's FIRE emission factor database, and data from federal and state agencies including USEPA's Office of Air Quality Planning and Standards, the US Department of Energy, US Bureau of Labor Statistics, Illinois Department of Transportation, Illinois Department of Agriculture, and so on.

4.2.3 Rule Effectiveness and Rule Penetration

For area sources subject to a VOM control equipment regulation, a rule effectiveness (RE) factor has been applied to the control efficiency when determining the emission rates. The RE adjustment reflects the assumption that regulations typically are not 100 percent effective at all sources at all times. For example, if a RE factor of 95 percent

has been assumed, a value of 0.95 is multiplied against the control efficiency before subtracting the efficiency from unity.

In cases where a control regulation is applied to an area source category, a rule penetration (RP) adjustment may be required. The RP factor takes into account the fact that, due to exemptions within the rule, all sources within the category may not be regulated. Illinois EPA has used best judgment in the development and application of such factors.

Due to the use of emission factors, rather than the independent calculation of uncontrolled emissions and subsequent control efficiencies, the use of RE and RP factors is limited. In addition, a number of rules regulating area source emissions deal with operational behavior (e.g., keeping the lid closed on a cold-cleaner) rather than the addition of control equipment.

4.2.4 Double Counting of Emissions

A major concern in the development of an area source inventory is the possibility of double-counting emissions. Because some area source methodologies estimate emissions from all sources within a category, emissions already contained in the point source inventory may also be included in the area source estimate. In these instances, the point source emissions must be subtracted from the gross area source estimate to determine the net area source estimate. Commonly affected area source categories are:

- Dry Cleaning
- Fuel Combustion
- Graphic Arts
- Incineration
- Solvent Cleaning

4.2.5 Annual Emissions to Daily Emissions Calculation

Emissions contained in this Section have been expressed in tons/day and tons/year. Activity levels and/or emission factors are frequently based on longer timeframes than a daily timeframe, so adjustment factors have been applied to estimate the typical summer weekday emissions. In order to determine the ozone season activity fraction, a seasonal adjustment factor is applied to the annual emission estimate. This factor compares the summer season percentage of annual activity for the specific category to a uniform seasonal activity level (25 percent). Therefore, if 30 percent of a certain activity occurs during the summer season, the seasonal adjustment factor would by 30 ÷ 25 or 1.2.

In order to estimate emissions on a typical weekday, an activity adjustment factor is applied to the annual emission estimate. This factor is developed in one of two ways. First, the factor can be developed by dividing by the number of days per week an activity occurs and that total divided by 52, the number of weeks in the year. Therefore, the activity adjustment factor for an activity which occurs uniformly, seven days a week is calculated using the following equation: $1 \div 7 \div 52 = 0.00275$.

The second method is used when a percentage of work-week (Monday-Friday) activity has been developed. In this case, a work-week percentage of 33 percent activity converts into an activity adjustment factor by dividing 0.33 by 5 for the number of days the activity occurs divided by 52 which equals 0.00127.

A listing of these seasonal and daily adjustment factors can be found in Appendix G.

4.2.6 Estimating Emissions at the Township Level

In addition to the counties of Cook, DuPage, Kane, Lake, McHenry and Will, the Chicago NAA also includes Aux Sable and Goose Lake Townships in Grundy County and also Oswego Township in Kendall County. Township-specific area source activity data is not always available. County emissions are apportioned to the township level using other surrogates related to the activity being estimated. These surrogates and their resulting percentages are included in Appendix H.

4.3 Categorical Emission Summary

The following tables identify the emissions of each area source category that was calculated for the 2008 inventory.

Table 4-1: Agricultural Pesticide Application Emissions

County	VOM (tpd)	VOM (tpy)
Cook	0.01	3.11
DuPage	0.06	13.45
Grundy Twps	0.11	26.91
Kane	0.59	141.79
Kendall Twps	0.07	17.39
Lake	0.07	17.59
McHenry	0.65	156.28
Will	0.85	202.86
Chicago NAA	**2.42**	**579.39**
Jersey	0.54	1,239.38
Madison	0.98	233.91
Monroe	0.50	120.06
St. Clair	0.85	203.89
Metro-East NAA	**2.87**	**687.24**
Attainment Area	**86.71**	**20,778.87**
State Total	**91.99**	**22,045.50**

Table 4-2: Aircraft Refueling Emissions

County	VOM (tpd)	VOM (tpy)
Cook	0.45	135.92
DuPage	0.36	109.28
Grundy Twps	0.00	0.00
Kane	0.15	45.03
Kendall Twps	0.00	0.00
Lake	0.19	57.67
McHenry	0.23	67.92
Will	0.56	169.12
Chicago NAA	**1.95**	**584.93**
Jersey	0.00	0.00
Madison	0.19	56.18
Monroe	0.03	8.32
St. Clair	0.24	72.65
Metro-East NAA	**0.46**	**137.15**
Attainment Area	**5.11**	**1,535.15**
State Total	**7.51**	**2,257.22**

Table 4-3: Architectural Coating Emissions

County	VOM (tpd)	VOM (tpy)
Cook	26.32	7,362.23
DuPage	4.63	1,293.90
Grundy Twps	0.04	11.34
Kane	2.52	705.79
Kendall Twps	0.27	74.81
Lake	3.54	990.67
McHenry	1.58	443.07
Will	3.39	947.07
Chicago NAA	**42.29**	**11,828.86**
Jersey	0.11	31.46
Madison	1.33	372.76
Monroe	0.16	45.61
St. Clair	1.30	364.72
Metro-East NAA	**2.91**	**814.55**
Attainment Area	**18.93**	**5,296.21**
State Total	**64.13**	**17,939.62**

Table 4-4: Asphalt Paving Emissions – Cutback Asphalt

County	VOM (tpd)	VOM (tpy)
Cook	0.00	502.07
DuPage	0.00	136.86
Grundy Twps	0.00	4.59
Kane	0.00	94.72
Kendall Twps	0.00	9.35
Lake	0.00	119.42
McHenry	0.00	84.35
Will	0.00	130.65
Chicago NAA	**0.00**	**1,082.00**
Jersey	0.00	30.76
Madison	0.00	116.69
Monroe	0.00	32.15
St. Clair	0.00	103.26
Metro-East NAA	**0.00**	**282.86**
Attainment Area	**0.00**	**4,828.55**
State Total	**0.00**	**6,193.41**

Table 4-5: Asphalt Paving Emissions – Emulsified Asphalt

County	VOM (tpd)	VOM (tpy)
Cook	0.34	52.49
DuPage	0.09	14.31
Grundy Twps	0.00	0.48
Kane	0.06	9.90
Kendall Twps	0.01	0.98
Lake	0.08	12.48
McHenry	0.06	8.82
Will	0.09	13.66
Chicago NAA	**0.73**	**113.12**
Jersey	0.02	3.22
Madison	0.08	12.20
Monroe	0.02	3.36
St. Clair	0.07	10.80
Metro-East NAA	**0.19**	**29.57**
Attainment Area	**3.24**	**504.80**
State Total	**4.15**	**647.49**

Table 4-6: Automobile Refinishing Emissions

County	VOM (tpd)	VOM (tpy)
Cook	0.19	49.74
DuPage	0.06	16.01
Grundy Twps	0.00	0.10
Kane	0.02	4.68
Kendall Twps	0.00	0.40
Lake	0.04	9.46
McHenry	0.01	2.75
Will	0.03	6.90
Chicago NAA	**0.35**	**90.05**
Jersey	0.00	0.21
Madison	0.01	3.39
Monroe	0.00	0.50
St. Clair	0.01	3.36
Metro-East NAA	**0.03**	**7.46**
Attainment Area	**0.36**	**94.07**
State Total	**0.73**	**191.58**

Table 4-7: Commercial Cooking Emissions

County	CO (tpd)	CO (tpy)	VOM (tpd)	VOM (tpy)
Cook	1.38	503.36	1.21	191.47
DuPage	0.24	88.47	0.21	33.65
Grundy Twps	0.00	0.78	0.00	0.29
Kane	0.13	48.26	0.12	18.36
Kendall Twps	0.01	5.11	0.01	1.95
Lake	0.19	67.73	0.16	25.76
McHenry	0.08	30.29	0.07	11.52
Will	0.18	64.75	0.16	24.63
Chicago NAA	**2.22**	**808.75**	**1.94**	**307.63**
Jersey	0.01	2.15	0.01	0.82
Madison	0.07	25.49	0.06	9.69
Monroe	0.01	3.12	0.01	1.19
St. Clair	0.07	24.94	0.06	9.49
Metro-East NAA	**0.15**	**55.69**	**0.13**	**21.18**
Attainment Area	**1.00**	**362.11**	**0.87**	**137.74**
State Total	**3.37**	**1,226.55**	**2.94**	**466.55**

Table 4-8: Consumer Solvent Use Emissions

County	VOM (tpd)	VOM (tpy)
Cook	57.01	20,732.50
DuPage	10.02	3,643.70
Grundy Twps	0.09	31.92
Kane	5.47	1,987.54
Kendall Twps	0.58	210.66
Lake	7.67	2,789.78
McHenry	3.43	1,247.71
Will	7.33	2,667.00
Chicago NAA	**91.60**	**33,310.82**
Jersey	0.24	88.58
Madison	2.89	1,049.72
Monroe	0.35	128.45
St. Clair	2.82	1,027.06
Metro-East NAA	**6.31**	**2,293.82**
Attainment Area	**41.01**	**14,914.46**
State Total	**138.92**	**50,519.10**

Table 4-9: Dry Cleaning Emissions

County	VOM (tpd)	VOM (tpy)
Cook	1.24	298.50
DuPage	0.20	50.24
Grundy Twps	0.00	0.18
Kane	0.14	38.55
Kendall Twps	0.01	2.32
Lake	0.21	53.53
McHenry	0.09	24.14
Will	0.29	75.75
Chicago NAA	**2.18**	**543.22**
Jersey	0.01	1.40
Madison	0.07	19.84
Monroe	0.00	0.00
St. Clair	0.06	13.67
Metro-East NAA	**0.14**	**34.92**
Attainment Area	**0.81**	**188.64**
State Total	**3.13**	**766.78**

Table 4-10: Forest Fire Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.01	1.28	0.00	0.03	0.00	0.06
DuPage	0.00	0.59	0.00	0.01	0.00	0.03
Grundy Twps	0.00	0.01	0.00	0.00	0.00	0.00
Kane	0.00	0.42	0.00	0.01	0.00	0.02
Kendall Twps	0.00	0.01	0.00	0.00	0.00	0.00
Lake	0.00	0.00	0.00	0.00	0.00	0.00
McHenry	0.00	0.48	0.00	0.01	0.00	0.02
Will	0.00	0.55	0.00	0.01	0.00	0.03
Chicago NAA	**0.02**	**3.35**	**0.00**	**0.07**	**0.00**	**0.16**
Jersey	0.00	0.47	0.00	0.01	0.00	0.02
Madison	0.00	0.85	0.00	0.02	0.00	0.04
Monroe	0.00	0.53	0..00	0.01	0.00	0.02
St. Clair	0.00	0.70	0.00	0.01	0.00	0.03
Metro-East NAA	**0.01**	**2.55**	**0.00**	**0.05**	**0.00**	**0.12**
Attainment Area	**0.27**	**46.12**	**0.01**	**0.99**	**0.01**	**2.17**
State Total	**0.30**	**52.01**	**0.00**	**1.11**	**0.01**	**2.44**

Table 4-11: Fuel Combustion Emissions – Commercial/Institutional – Coal

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	0.00	0.00	0.00	0.00	0.00
DuPage	0.00	0.00	0.00	0.00	0.00	0.00
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	0.00	0.00	0.00	0.00	0.00	0.00
Kendall Twps	0.00	0.00	0.00	0.00	0.00	0.00
Lake	0.00	0.00	0.00	0.00	0.00	0.00
McHenry	0.00	0.00	0.00	0.00	0.00	0.00
Will	0.00	0.00	0.00	0.00	0.00	0.00
Chicago NAA	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Jersey	0.00	0.00	0.00	0.00	0.00	0.00
Madison	0.00	0.00	0.00	0.00	0.00	0.00
Monroe	0.00	0.00	0.00	0.00	0.00	0.00
St. Clair	0.00	0.00	0.00	0.00	0.00	0.00
Metro-East NAA	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Attainment Area	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
State Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Table 4-12: Fuel Combustion Emissions – Commercial/Institutional – Distillate Oil

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.06	68.57	0.25	274.46	0.01	4.69
DuPage	0.02	15.06	0.07	60.25	0.00	1.02
Grundy Twps	0.00	0.05	0.00	0.20	0.00	0.00
Kane	0.01	5.10	0.01	20.39	0.00	0.35
Kendall Twps	0.00	0.25	0.00	1.01	0.00	0.02
Lake	0.01	7.24	0.04	29.79	0.00	0.52
McHenry	0.00	2.35	0.01	9.40	0.00	0.16
Will	0.01	4.38	0.02	17.51	0.00	0.30
Chicago NAA	**0.10**	**103.01**	**0.40**	**413.00**	**0.01**	**7.06**
Jersey	0.00	0.09	0.00	0.37	0.00	0.01
Madison	0.00	2.00	0.00	8.04	0.00	0.14
Monroe	0.00	0.15	0.00	0.61	0.00	0.01
St. Clair	0.00	2.44	0.01	9.74	0.00	0.17
Metro-East NAA	**0.01**	**4.68**	**0.01**	**18.76**	**0.00**	**0.32**
Attainment Area	**0.03**	**30.22**	**0.11**	**120.54**	**0.00**	**2.08**
State Total	**0.13**	**137.90**	**0.53**	**552.30**	**0.01**	**9.45**

Table 4-13: Fuel Combustion Emissions – Commercial/Institutional – Kerosene

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	0.00	0.00	0.00	0.00	0.00
DuPage	0.00	0.00	0.00	0.00	0.00	0.00
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	0.00	0.00	0.00	0.00	0.00	0.00
Kendall Twps	0.00	0.00	0.00	0.00	0.00	0.00
Lake	0.00	0.00	0.00	0.00	0.00	0.00
McHenry	0.00	0.00	0.00	0.00	0.00	0.00
Will	0.00	0.00	0.00	0.00	0.00	0.00
Chicago NAA	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Jersey	0.00	0.00	0.00	0.00	0.00	0.00
Madison	0.00	0.00	0.00	0.00	0.00	0.00
Monroe	0.00	0.00	0.00	0.00	0.00	0.00
St. Clair	0.00	0.00	0.00	0.00	0.00	0.00
Metro-East NAA	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Attainment Area	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
State Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Table 4-14: Commercial Fuel Combustion Emissions – Commercial/Institutional – LPG

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.13	110.76	0.15	129.76	0.01	4.82
DuPage	0.03	23.83	0.03	27.92	0.00	1.04
Grundy Twps	0.00	0.08	0.00	0.09	0.00	0.00
Kane	0.01	8.10	0.01	9.48	0.00	0.35
Kendall Twps	0.00	0.40	0.00	0.47	0.00	0.02
Lake	0.01	12.21	0.02	14.31	0.00	0.53
McHenry	0.00	3.72	0.01	4.36	0.00	0.16
Will	0.01	6.92	0.01	8.11	0.00	0.30
Chicago NAA	**0.20**	**166.02**	**0.23**	**194.50**	**0.01**	**7.22**
Jersey	0.00	0.15	0.00	0.17	0.00	0.01
Madison	0.00	3.63	0.01	4.25	0.00	0.16
Monroe	0.00	0.24	0.00	0.28	0.00	0.01
St. Clair	0.00	3.85	0.01	4.51	0.00	0.17
Metro-East NAA	**0.01**	**7.87**	**0.01**	**9.22**	**0.00**	**0.34**
Attainment Area	**0.06**	**50.18**	**0.07**	**58.27**	**0.00**	**2.17**
State Total	**0.26**	**224.07**	**0.30**	**261.99**	**0.01**	**9.74**

Table 4-15: Fuel Combustion Emissions – Commercial/Institutional – Natural Gas

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	3.32	3,724.89	3.48	4,290.72	0.22	233.64
DuPage	0.98	907.58	1.09	1,051.91	0.06	57.40
Grundy Twps	0.00	3.18	0.00	3.78	0.00	0.21
Kane	0.28	297.75	0.28	348.21	0.02	19.35
Kendall Twps	0.02	3.35	0.02	3.99	0.00	0.21
Lake	0.30	446.87	0.15	502.12	0.02	28.83
McHenry	0.17	146.97	0.20	174.96	0.01	9.62
Will	0.26	257.78	0.30	306.88	0.02	16.65
Chicago NAA	**5.33**	**5,788.36**	**5.52**	**6,682.57**	**0.35**	**365.92**
Jersey	0.01	5.95	0.01	7.09	0.00	0.39
Madison	0.15	139.08	0.19	166.34	0.01	9.13
Monroe	0.01	9.85	0.01	11.73	0.00	0.65
St. Clair	0.14	139.39	0.18	165.30	0.01	9.14
Metro-East NAA	**0.32**	**294.28**	**0.39**	**350.45**	**0.02**	**19.30**
Attainment Area	**1.60**	**1,743.33**	**1.77**	**1,999.13**	**0.13**	**113.15**
State Total	**7.24**	**7,825.97**	**7.68**	**9,032.14**	**0.50**	**498.37**

Table 4-16: Fuel Combustion Emissions – Commercial/Institutional – Residual Oil

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	0.08	0.00	0.91	0.00	0.01
DuPage	0.00	0.02	0.00	0.25	0.00	0.01
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	0.00	0.01	0.00	0.09	0.00	0.00
Kendall Twps	0.00	0.00	0.00	0.00	0.00	0.00
Lake	0.00	0.01	0.00	0.13	0.00	0.00
McHenry	0.00	0.00	0.00	0.04	0.00	0.00
Will	0.00	0.01	0.00	0.07	0.00	0.00
Chicago NAA	**0.00**	**0.13**	**0.00**	**1.49**	**0.00**	**0.03**
Jersey	0.00	0.00	0.00	0.00	0.00	0.00
Madison	0.00	0.00	0.00	0.04	0.00	0.00
Monroe	0.00	0.00	0.00	0.00	0.00	0.00
St. Clair	0.00	0.00	0.00	0.02	0.00	0.00
Metro-East NAA	**0.00**	**0.01**	**0.00**	**0.06**	**0.00**	**0.00**
Attainment Area	**0.00**	**0.05**	**0.00**	**0.52**	**0.00**	**0.01**
State Total	**0.00**	**0.18**	**0.00**	**2.07**	**0.00**	**0.03**

Table 4-17: Fuel Combustion Emissions – Industrial – Coal

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	0.00	0.00	0.00	0.00	0.00
DuPage	0.00	0.00	0.00	0.00	0.00	0.00
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	0.00	0.00	0.00	0.00	0.00	0.00
Kendall Twps	0.00	0.00	0.00	0.00	0.00	0.00
Lake	0.00	0.00	0.00	0.00	0.00	0.00
McHenry	0.00	0.00	0.00	0.00	0.00	0.00
Will	0.00	0.00	0.00	0.00	0.00	0.00
Chicago NAA	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Jersey	0.00	0.00	0.00	0.00	0.00	0.00
Madison	0.00	0.00	0.00	0.00	0.00	0.00
Monroe	0.00	0.00	0.00	0.00	0.00	0.00
St. Clair	0.00	0.00	0.00	0.00	0.00	0.00
Metro-East NAA	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Attainment Area	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
State Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Table 4-18: Fuel Combustion Emissions – Industrial – Distillate Oil

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.08	64.66	0.47	288.76	0.01	2.45
DuPage	0.04	19.81	0.18	79.22	0.00	0.79
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	0.02	10.87	0.10	43.49	0.00	0.43
Kendall Twps	0.00	0.22	0.00	0.90	0.00	0.01
Lake	0.04	17.42	0.16	69.66	0.00	0.70
McHenry	0.01	6.16	0.06	25.08	0.00	0.24
Will	0.00	5.30	0.04	21.17	0.00	0.16
Chicago NAA	**0.21**	**124.44**	**1.00**	**528.29**	**0.01**	**4.78**
Jersey	0.00	0.01	0.00	0.02	0.00	0.00
Madison	0.00	1.01	0.01	11.03	0.00	0.02
Monroe	0.00	0.04	0.00	0.17	0.00	0.00
St. Clair	0.00	1.46	0.00	5.83	0.00	0.06
Metro-East NAA	**0.00**	**2.52**	**0.01**	**17.05**	**0.00**	**0.09**
Attainment Area	**0.11**	**48.45**	**0.42**	**193.12**	**0.00**	**1.86**
State Total	**0.32**	**175.40**	**1.42**	**738.46**	**0.01**	**6.73**

Table 4-19: Fuel Combustion Emissions – Industrial – Natural Gas

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	7.36	3568.36	8.37	4155.51	0.47	224.44
DuPage	2.14	1029.74	2.65	1243.69	0.15	68.57
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	1.05	513.05	0.96	524.31	0.06	32.52
Kendall Twps	0.03	12.60	0.03	14.87	0.00	0.82
Lake	1.87	913.97	2.08	1057.44	0.11	56.87
McHenry	0.72	333.86	0.89	406.58	0.04	21.16
Will	0.28	161.54	0.21	152.90	0.02	11.79
Chicago NAA	**13.45**	**6,533.11**	**15.21**	**7,555.30**	**0.85**	**416.18**
Jersey	0.00	0.31	0.00	0.37	0.00	0.02
Madison	0.21	132.49	0.00	25.99	0.01	9.12
Monroe	0.01	1.05	0.00	0.00	0.00	0.07
St. Clair	0.13	65.68	0.07	44.33	0.00	1.67
Metro-East NAA	**0.35**	**199.53**	**0.07**	**70.70**	**0.02**	**10.88**
Attainment Area	**3.38**	**1,726.43**	**3.68**	**1,899.96**	**0.24**	**109.04**
State Total	**17.17**	**8,459.06**	**18.95**	**9,525.95**	**1.10**	**536.10**

Table 4-20: Fuel Combustion Emissions – Industrial – Residual Oil

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.01	4.17	0.11	45.82	0.00	0.23
DuPage	0.00	0.80	0.03	8.81	0.00	0.04
Grundy Twps	0.00	0.00	0.00	0.04	0.00	0.00
Kane	0.00	0.60	0.01	6.63	0.00	0.03
Kendall Twps	0.00	0.01	0.00	0.14	0.00	0.00
Lake	0.00	0.97	0.02	10.62	0.00	0.05
McHenry	0.00	0.33	0.01	3.69	0.00	0.02
Will	0.00	0.37	0.01	4.06	0.00	0.02
Chicago NAA	**0.02**	**7.25**	**0.19**	**79.79**	**0.00**	**0.40**
Jersey	0.00	0.00	0.00	0.00	0.00	0.00
Madison	0.00	0.00	0.00	0.00	0.00	0.00
Monroe	0.00	0.00	0.00	0.03	0.00	0.00
St. Clair	0.00	0.08	0.00	0.90	0.00	0.00
Metro-East NAA	**0.00**	**0.09**	**0.00**	**0.93**	**0.00**	**0.00**
Attainment Area	**0.01**	**2.51**	**0.07**	**27.91**	**0.00**	**0.14**
State Total	**0.02**	**9.84**	**0.25**	**108.62**	**0.00**	**0.54**

Table 4-21: Fuel Combustion Emissions – Residential – Coal

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	1537.12	0.00	50.86	0.00	55.90
DuPage	0.00	48.32	0.00	1.60	0.00	1.76
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	0.00	29.91	0.00	0.99	0.00	1.09
Kendall Twps	0.00	0.00	0.00	0.00	0.00	0.00
Lake	0.00	0.00	0.00	0.00	0.00	0.00
McHenry	0.00	4.60	0.00	0.15	0.00	0.17
Will	0.00	29.91	0.00	0.99	0.00	1.09
Chicago NAA	**0.00**	**1,649.87**	**0.00**	**54.60**	**0.00**	**60.00**
Jersey	0.00	0.00	0.00	0.00	0.00	0.00
Madison	0.00	4.60	0.00	0.15	0.00	0.17
Monroe	0.00	6.90	0.00	0.23	0.00	0.25
St. Clair	0.00	0.00	0.00	0.00	0.00	0.00
Metro-East NAA	**0.00**	**11.51**	**0.00**	**0.38**	**0.00**	**0.42**
Attainment Area	**0.00**	**727.14**	**0.00**	**24.06**	**0.00**	**26.44**
State Total	**0.00**	**2,388.51**	**0.00**	**79.03**	**0.00**	**86.85**

Table 4-22: Fuel Combustion Emissions – Residential – Distillate Oil

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.01	6.83	0.02	24.57	0.00	0.96
DuPage	0.00	0.26	0.00	0.92	0.00	0.04
Grundy Twps	0.00	0.01	0.00	0.04	0.00	0.00
Kane	0.00	0.36	0.00	1.29	0.00	0.05
Kendall Twps	0.00	0.12	0.00	0.42	0.00	0.02
Lake	0.00	0.37	0.00	1.34	0.00	0.05
McHenry	0.00	0.22	0.00	0.81	0.00	0.03
Will	0.00	0.29	0.00	1.05	0.00	0.04
Chicago NAA	**0.01**	**8.46**	**0.03**	**30.44**	**0.00**	**1.18**
Jersey	0.00	0.12	0.00	0.42	0.00	0.02
Madison	0.00	1.09	0.00	3.94	0.00	0.15
Monroe	0.00	0.09	0.00	0.32	0.00	0.01
St. Clair	0.00	0.62	0.00	2.25	0.00	0.09
Metro-East NAA	**0.00**	**1.93**	**0.01**	**6.94**	**0.00**	**0.27**
Attainment Area	**0.01**	**10.93**	**0.03**	**39.34**	**0.00**	**1.53**
State Total	**0.01**	**21.31**	**0.06**	**76.71**	**0.00**	**2.98**

Table 4-23: Fuel Combustion Emissions – Residential – Kerosene

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	0.84	0.00	3.06	0.00	0.12
DuPage	0.00	0.03	0.00	0.11	0.00	0.00
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	0.00	0.04	0.00	0.16	0.00	0.01
Kendall Twps	0.00	0.01	0.00	0.05	0.00	0.00
Lake	0.00	0.05	0.00	0.17	0.00	0.01
McHenry	0.00	0.03	0.00	0.10	0.00	0.00
Will	0.00	0.04	0.00	0.13	0.00	0.01
Chicago NAA	**0.00**	**1.04**	**0.00**	**3.79**	**0.00**	**0.15**
Jersey	0.00	0.01	0.00	0.05	0.00	0.00
Madison	0.00	0.14	0.00	0.49	0.00	0.02
Monroe	0.00	0.01	0.00	0.04	0.00	0.00
St. Clair	0.00	0.08	0.00	0.28	0.00	0.01
Metro-East NAA	**0.00**	**0.24**	**0.00**	**0.86**	**0.00**	**0.03**
Attainment Area	**0.00**	**1.35**	**0.00**	**4.89**	**0.00**	**0.19**
State Total	**0.00**	**2.63**	**0.00**	**9.54**	**0.00**	**0.37**

Table 4-24: Fuel Combustion Emissions – Residential – LPG

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.04	50.86	0.15	179.36	0.01	6.96
DuPage	0.00	2.82	0.01	9.93	0.00	0.39
Grundy Twps	0.00	0.43	0.00	1.52	0.00	0.06
Kane	0.00	4.26	0.01	15.03	0.00	0.58
Kendall Twps	0.00	1.83	0.01	6.47	0.00	0.25
Lake	0.00	2.92	0.01	10.31	0.00	0.40
McHenry	0.00	5.39	0.02	19.01	0.00	0.74
Will	0.01	8.13	0.02	28.68	0.00	1.11
Chicago NAA	**0.06**	**76.65**	**0.23**	**270.30**	**0.01**	**10.49**
Jersey	0.00	5.49	0.02	19.38	0.00	0.75
Madison	0.01	10.66	0.03	37.59	0.00	1.46
Monroe	0.00	5.65	0.02	19.92	0.00	0.77
St. Clair	0.01	9.97	0.03	35.15	0.00	1.36
Metro-East NAA	**0.03**	**31.77**	**0.09**	**112.03**	**0.00**	**4.35**
Attainment Area	**0.26**	**303.53**	**0.90**	**1,070.36**	**0.03**	**41.54**
State Total	**0.34**	**411.95**	**1.22**	**1,452.68**	**0.04**	**56.37**

Table 4-25: Fuel Combustion Emissions – Residential – Natural Gas

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	3.44	4,088.41	8.08	9,607.76	0.47	562.16
DuPage	0.58	692.49	1.37	1,627.35	0.08	95.22
Grundy Twps	0.00	5.19	0.01	12.19	0.00	0.71
Kane	0.29	342.98	0.68	806.01	0.04	47.16
Kendall Twps	0.03	33.13	0.07	77.85	0.00	4.56
Lake	0.41	491.64	0.97	1,155.35	0.06	67.60
McHenry	0.19	221.42	0.44	520.34	0.03	30.45
Will	0.39	458.09	0.91	1,076.52	0.05	62.99
Chicago NAA	**5.32**	**6,333.35**	**12.51**	**14,883.38**	**0.73**	**870.84**
Jersey	0.01	8.86	0.02	20.81	0.00	1.22
Madison	0.16	186.53	0.37	438.35	0.02	25.65
Monroe	0.01	12.73	0.03	29.92	0.00	1.75
St. Clair	0.15	180.26	0.36	423.61	0.02	24.79
Metro-East NAA	**0.33**	**388.38**	**0.77**	**912.68**	**0.04**	**53.40**
Attainment Area	**2.16**	**2,565.51**	**5.07**	**6,028.95**	**0.30**	**352.76**
State Total	**7.80**	**9,287.24**	**18.34**	**21,825.01**	**1.07**	**1,276.99**

Table 4-26: Fuel Combustion Emissions – Residential – Wood Firelog

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	747.63	0.00	45.93	0.00	236.46
DuPage	0.00	126.89	0.00	7.79	0.00	40.13
Grundy Twps	0.00	1.08	0.00	0.07	0.00	0.34
Kane	0.00	60.98	0.00	3.75	0.00	19.29
Kendall Twps	0.00	6.32	0.00	0.39	0.00	2.00
Lake	0.00	88.55	0.00	5.44	0.00	28.01
McHenry	0.00	40.45	0.00	2.48	0.00	12.79
Will	0.00	80.45	0.00	4.94	0.00	25.44
Chicago NAA	**0.00**	**1,152.34**	**0.00**	**70.79**	**0.00**	**364.46**
Jersey	0.00	3.16	0.00	0.19	0.00	1.00
Madison	0.00	39.13	0.00	2.40	0.00	12.38
Monroe	0.00	4.36	0.00	0.27	0.00	1.38
St. Clair	0.00	37.95	0.00	2.33	0.00	12.00
Metro-East NAA	**0.00**	**84.60**	**0.00**	**5.20**	**0.00**	**26.76**
Attainment Area	**0.00**	**493.51**	**0.00**	**30.32**	**0.00**	**156.08**
State Total	**0.00**	**1,730.45**	**0.00**	**106.30**	**0.00**	**547.30**

Table 4-27: Fuel Combustion Emissions – Residential – Wood Fireplaces

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	7,808.82	0.00	121.80	0.00	1,242.41
DuPage	0.00	1,331.33	0.00	20.77	0.00	211.82
Grundy Twps	0.00	11.34	0.00	0.18	0.00	1.80
Kane	0.00	644.02	0.00	10.05	0.00	102.46
Kendall Twps	0.00	69.70	0.00	1.09	0.00	11.10
Lake	0.00	970.40	0.00	15.14	0.00	154.39
McHenry	0.00	447.23	0.00	6.98	0.00	71.16
Will	0.00	840.14	0.00	13.10	0.00	133.67
Chicago NAA	**0.00**	**12,122.98**	**0.00**	**189.09**	**0.00**	**1,928.81**
Jersey	0.00	78.01	0.00	1.14	0.00	13.79
Madison	0.00	923.54	0.00	13.47	0.00	163.30
Monroe	0.00	112.89	0.00	1.65	0.00	19.95
St. Clair	0.00	962.57	0.00	14.03	0.00	170.20
Metro-East NAA	**0.00**	**2,077.00**	**0.00**	**30.28**	**0.00**	**367.25**
Attainment Area	**0.00**	**14,417.83**	**0.00**	**207.80**	**0.00**	**2,591.31**
State Total	**0.00**	**28,617.80**	**0.00**	**427.17**	**0.00**	**4,887.36**

Table 4-28: Fuel Combustion Emissions – Residential – Wood Furnaces

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	5,464.87	0.00	53.46	0.00	347.49
DuPage	0.00	931.57	0.00	9.11	0.00	59.24
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	0.00	431.23	0.00	4.22	0.00	27.42
Kendall Twps	0.00	40.11	0.00	0.39	0.00	2.55
Lake	0.00	671.48	0.00	6.57	0.00	42.70
McHenry	0.00	302.39	0.00	2.96	0.00	19.23
Will	0.00	559.36	0.00	5.47	0.00	35.57
Chicago NAA	**0.00**	**8,401.01**	**0.00**	**82.18**	**0.00**	**534.19**
Jersey	0.00	109.83	0.00	1.07	0.00	6.98
Madison	0.00	1,327.94	0.00	12.99	0.00	84.44
Monroe	0.00	157.05	0.00	1.54	0.00	9.99
St. Clair	0.00	1,366.74	0.00	13.37	0.00	86.91
Metro-East NAA	**0.00**	**2,961.56**	**0.00**	**28.97**	**0.00**	**188.32**
Attainment Area	**0.00**	**18,556.42**	**0.00**	**181.53**	**0.00**	**1,179.95**
State Total	**0.00**	**29,918.99**	**0.00**	**292.68**	**0.00**	**1,902.45**

Table 4-29: Fuel Combustion Emissions – Residential – Wood Hydronic Heaters

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	0.00	0.00	0.00	0.00	0.00
DuPage	0.00	0.00	0.00	0.00	0.00	0.00
Grundy Twps	0.00	10.67	0.00	0.10	0.00	0.68
Kane	0.00	0.00	0.00	0.00	0.00	0.00
Kendall Twps	0.00	0.00	0.00	0.00	0.00	0.00
Lake	0.00	0.00	0.00	0.00	0.00	0.00
McHenry	0.00	0.00	0.00	0.00	0.00	0.00
Will	0.00	0.00	0.00	0.00	0.00	0.00
Chicago NAA	**0.00**	**10.67**	**0.00**	**0.10**	**0.00**	**0.68**
Jersey	0.00	74.43	0.00	0.73	0.00	4.73
Madison	0.00	862.08	0.00	8.43	0.00	54.82
Monroe	0.00	105.35	0.00	1.03	0.00	6.70
St. Clair	0.00	899.91	0.00	8.80	0.00	57.22
Metro-East NAA	**0.00**	**1,941.76**	**0.00**	**19.00**	**0.00**	**123.47**
Attainment Area	**0.00**	**14,078.16**	**0.00**	**137.72**	**0.00**	**895.19**
State Total	**0.00**	**16,030.59**	**0.00**	**156.82**	**0.00**	**1,019.33**

Table 4-30: Fuel Combustion Emissions – Residential – Wood Stoves

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	3,811.63	0.00	61.09	0.00	765.91
DuPage	0.00	649.83	0.00	10.41	0.00	130.59
Grundy Twps	0.00	5.67	0.00	0.13	0.00	1.11
Kane	0.00	314.24	0.00	5.03	0.00	63.15
Kendall Twps	0.00	33.91	0.00	0.54	0.00	6.83
Lake	0.00	473.27	0.00	7.52	0.00	95.16
McHenry	0.00	218.17	0.00	3.46	0.00	43.88
Will	0.00	410.26	0.00	6.58	0.00	82.43
Chicago NAA	**0.00**	**5,916.98**	**0.00**	**94.75**	**0.00**	**1,189.05**
Jersey	0.00	46.80	0.00	0.80	0.00	9.38
Madison	0.00	553.89	0.00	9.51	0.00	110.74
Monroe	0.00	67.48	0.00	1.14	0.00	13.51
St. Clair	0.00	576.61	0.00	9.74	0.00	115.41
Metro-East NAA	**0.00**	**1,244.78**	**0.00**	**21.19**	**0.00**	**249.03**
Attainment Area	**0.00**	**10,478.55**	**0.00**	**173.63**	**0.00**	**2,100.39**
State Total	**0.00**	**17,640.30**	**0.00**	**289.57**	**0.00**	**3,538.47**

Table 4-31: Gasoline Marketing Emissions – Stage I

County	VOM (tpd)	VOM (tpy)
Cook	1.13	404.84
DuPage	0.29	104.36
Grundy Twps	0.01	1.96
Kane	0.13	44.84
Kendall Twps	0.01	3.27
Lake	0.20	69.69
McHenry	0.07	26.81
Will	0.20	70.61
Chicago NAA	**2.03**	**726.37**
Jersey	0.07	25.72
Madison	0.15	53.58
Monroe	0.02	6.81
St. Clair	0.14	50.31
Metro-East NAA	**0.38**	**136.42**
Attainment Area	**12.71**	**4,689.08**
State Total	**15.12**	**5,551.87**

Table 4-32: Gasoline Marketing Emissions – Stage II

County	VOM (tpd)	VOM (tpy)
Cook	2.09	734.18
DuPage	0.54	189.25
Grundy Twps	0.01	3.56
Kane	0.23	81.28
Kendall Twps	0.02	5.93
Lake	0.36	126.35
McHenry	0.14	48.57
Will	0.36	128.06
Chicago NAA	**3.75**	**1,317.18**
Jersey	0.05	18.52
Madison	0.67	225.64
Monroe	0.08	28.68
St. Clair	0.63	211.95
Metro-East NAA	**1.44**	**484.79**
Attainment Area	**11.05**	**3,770.50**
State Total	**16.24**	**5,572.46**

Table 4-33: Gasoline Marketing Emissions – Storage Tank Breathing

County	VOM (tpd)	VOM (tpy)
Cook	0.06	20.23
DuPage	0.01	5.21
Grundy Twps	0.00	0.10
Kane	0.01	2.24
Kendall Twps	0.00	0.16
Lake	0.01	3.48
McHenry	0.00	1.34
Will	0.01	3.53
Chicago NAA	**0.10**	**36.29**
Jersey	0.01	4.48
Madison	0.01	2.88
Monroe	0.00	0.37
St. Clair	0.01	2.70
Metro-East NAA	**0.03**	**10.42**
Attainment Area	**2.49**	**914.99**
State Total	**2.61**	**961.70**

Table 4-34: Gasoline Marketing Emissions – Tank Truck Leaks

County	VOM (tpd)	VOM (tpy)
Cook	0.24	86.69
DuPage	0.06	22.35
Grundy Twps	0.00	0.42
Kane	0.03	9.60
Kendall Twps	0.00	0.70
Lake	0.04	14.92
McHenry	0.02	5.74
Will	0.04	15.12
Chicago NAA	**0.44**	**155.54**
Jersey	0.00	0.99
Madison	0.04	12.77
Monroe	0.00	1.62
St. Clair	0.03	11.99
Metro-East NAA	**0.08**	**27.38**
Attainment Area	**0.54**	**199.01**
State Total	**1.05**	**381.93**

Table 4-35: Graphic Arts Emissions

County	VOM (tpd)	VOM (tpy)
Cook	95.55	24,786.96
DuPage	27.56	7,147.84
Grundy Twps	0.04	10.37
Kane	7.20	1,909.92
Kendall Twps	0.15	39.27
Lake	9.72	2,530.24
McHenry	5.97	1,521.79
Will	5.90	1,528.39
Chicago NAA	**152.09**	**39,474.79**
Jersey	0.28	73.36
Madison	1.41	367.51
Monroe	0.45	115.29
St. Clair	1.32	342.53
Metro-East NAA	**3.47**	**898.70**
Attainment Area	**50.50**	**12,945.55**
State Total	**206.05**	**53,319.04**

Table 4-36: Industrial/Commercial/Institutional Incineration Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	6.32	2,301.06	1.88	684.81	1.23	446.45
DuPage	1.11	404.03	0.33	120.75	0.22	78.82
Grundy Twps	0.01	3.55	0.00	1.06	0.00	0.69
Kane	0.61	220.64	0.18	65.99	0.12	43.14
Kendall Twps	0.06	23.40	0.02	6.99	0.01	4.57
Lake	0.85	309.84	0.25	92.59	0.17	60.56
McHenry	0.38	138.59	0.11	41.35	0.07	27.08
Will	0.78	286.22	0.22	80.26	0.15	54.61
Chicago NAA	**10.13**	**3,687.33**	**3.01**	**1,093.81**	**1.97**	**715.93**
Jersey	0.03	9.74	0.01	2.94	0.01	1.92
Madison	0.32	116.58	0.10	34.85	0.06	22.79
Monroe	0.04	14.27	0.01	4.26	0.01	2.79
St. Clair	0.31	112.35	0.00	0.00	0.06	22.10
Metro-East NAA	**0.69**	**252.94**	**0.12**	**42.06**	**0.14**	**49.60**
Attainment Area	**4.43**	**1,621.52**	**1.35**	**490.86**	**0.89**	**322.83**
State Total	**15.25**	**5,561.78**	**4.47**	**1,626.72**	**2.98**	**1,088.36**

Table 4-37: Industrial Surface Coating Emissions – Maintenance Coatings

County	VOM (tpd)	VOM (tpy)
Cook	6.37	1,654.05
DuPage	1.12	290.70
Grundy Twps	0.01	2.55
Kane	0.61	158.57
Kendall Twps	0.06	16.81
Lake	0.86	222.57
McHenry	0.38	99.54
Will	0.82	212.77
Chicago NAA	**10.23**	**2,657.56**
Jersey	0.03	7.07
Madison	0.32	83.75
Monroe	0.04	10.25
St. Clair	0.32	81.94
Metro-East NAA	**0.70**	**183.00**
Attainment Area	**4.58**	**1,189.89**
State Total	**15.51**	**4,030.44**

Table 4-38: Industrial Surface Coating Emissions – Other Special Purpose Coatings

County	VOM (tpd)	VOM (tpy)
Cook	0.07	18.53
DuPage	0.01	3.26
Grundy Twps	0.00	0.03
Kane	0.01	1.78
Kendall Twps	0.00	0.19
Lake	0.01	2.49
McHenry	0.00	1.12
Will	0.01	2.38
Chicago NAA	**0.11**	**29.77**
Jersey	0.00	0.08
Madison	0.00	0.94
Monroe	0.00	0.11
St. Clair	0.00	0.92
Metro-East NAA	**0.01**	**2.05**
Attainment Area	**0.05**	**13.33**
State Total	**0.17**	**45.15**

Table 4-39: Marine Vessel VOL Loading and Transport Emissions

County	VOM (tpd)	VOM (tpy)
Cook	0.39	122.00
DuPage	0.00	0.00
Grundy Twps	0.02	6.97
Kane	0.00	0.00
Kendall Twps	0.00	0.00
Lake	0.00	0.00
McHenry	0.00	0.00
Will	0.40	125.49
Chicago NAA	**0.82**	**254.46**
Jersey	0.07	20.91
Madison	0.54	167.31
Monroe	0.10	31.37
St. Clair	0.02	6.97
Metro-East NAA	**0.73**	**226.57**
Attainment Area	**1.83**	**571.66**
State Total	**3.37**	**1,052.68**

Table 4-40: Open Burning Emissions – Prescribed Burning

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	0.00	0.00	0.00	0.00	0.00
DuPage	0.00	0.00	0.00	0.00	0.00	0.00
Grundy Twps	0.00	0.38	0.00	0.01	0.00	0.02
Kane	0.00	0.00	0.00	0.00	0.00	0.00
Kendall Twps	0.00	0.85	0.00	0.02	0.00	0.04
Lake	0.00	0.00	0.00	0.00	0.00	0.00
McHenry	0.00	0.00	0.00	0.00	0.00	0.00
Will	0.00	243.19	0.00	5.22	0.00	11.45
Chicago NAA	**0.00**	**244.41**	**0.00**	**5.24**	**0.00**	**11.50**
Jersey	0.00	11.74	0.00	0.25	0.00	0.55
Madison	0.00	63.85	0.00	1.37	0.00	3.00
Monroe	0.00	4.69	0.00	0.10	0.00	0.22
St. Clair	0.00	1.88	0.00	0.04	0.00	0.09
Metro-East NAA	**0.00**	**82.16**	**0.00**	**1.76**	**0.00**	**3.87**
Attainment Area	**0.00**	**2,851.69**	**0.00**	**61.17**	**0.00**	**134.21**
State Total	**0.00**	**3,178.26**	**0.00**	**68.17**	**0.00**	**149.57**

Table 4-41: Open Burning Emissions – Residential Household Waste

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.11	39.10	0.01	2.76	0.01	3.94
DuPage	0.02	6.87	0.00	0.49	0.00	0.69
Grundy Twps	0.10	36.12	0.01	2.55	0.01	3.64
Kane	0.64	232.37	0.05	16.40	0.06	23.40
Kendall Twps	0.07	26.29	0.01	1.86	0.01	2.65
Lake	0.26	94.69	0.02	6.68	0.03	9.54
McHenry	0.79	287.04	0.06	20.26	0.08	28.91
Will	0.91	331.92	0.06	23.43	0.09	33.43
Chicago NAA	**2.90**	**1,054.42**	**0.20**	**74.43**	**0.29**	**106.19**
Jersey	0.28	102.23	0.02	7.22	0.03	10.30
Madison	0.78	285.04	0.06	20.12	0.08	28.71
Monroe	0.30	107.55	0.02	7.59	0.03	10.83
St. Clair	0.56	205.30	0.04	14.49	0.06	20.67
Metro-East NAA	**1.93**	**700.12**	**0.14**	**49.42**	**0.19**	**70.51**
Attainment Area	**26.73**	**9,719.46**	**1.89**	**686.08**	**2.69**	**978.81**
State Total	**31.55**	**11,473.99**	**2.22**	**809.92**	**3.17**	**1,155.49**

Table 4-42: Open Burning Emissions – Yard Waste – Brush

County	CO (tpd)	CO (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	0.00	0.00	0.00
DuPage	0.00	0.00	0.00	0.00
Grundy Twps	0.00	0.00	0.00	0.00
Kane	0.00	0.00	0.00	0.00
Kendall Twps	0.00	0.94	0.00	0.13
Lake	0.00	0.00	0.00	0.00
McHenry	0.00	0.00	0.00	0.00
Will	0.00	0.00	0.00	0.00
Chicago NAA	**0.00**	**0.94**	**0.00**	**0.13**
Jersey	0.00	3.65	0.00	0.50
Madison	0.00	0.00	0.00	0.00
Monroe	0.00	7.68	0.00	1.04
St. Clair	0.00	0.00	0.00	0.00
Metro-East NAA	**0.00**	**11.34**	**0.00**	**1.54**
Attainment Area	**0.00**	**406.11**	**0.00**	**55.12**
State Total	**0.00**	**418.39**	**0.00**	**56.78**

Table 4-43: Open Burning Emissions – Yard Waste – Leaves

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.00	0.00	0.00	0.00	0.00	0.00
DuPage	0.00	0.00	0.00	0.00	0.00	0.00
Grundy Twps	0.00	0.00	0.00	0.00	0.00	0.00
Kane	0.00	0.00	0.00	0.00	0.00	0.00
Kendall Twps	0.00	0.75	0.00	0.04	0.00	0.19
Lake	0.00	0.00	0.00	0.00	0.00	0.00
McHenry	0.00	0.00	0.00	0.00	0.00	0.00
Will	0.00	0.00	0.00	0.00	0.00	0.00
Chicago NAA	**0.00**	**0.75**	**0.00**	**0.04**	**0.00**	**0.19**
Jersey	0.00	2.92	0.00	0.16	0.00	0.73
Madison	0.00	0.00	0.00	0.00	0.00	0.00
Monroe	0.00	6.15	0.00	0.34	0.00	1.54
St. Clair	0.00	0.00	0.00	0.00	0.00	0.00
Metro-East NAA	**0.00**	**9.07**	**0.00**	**0.50**	**0.00**	**2.27**
Attainment Area	**0.00**	**324.89**	**0.00**	**17.99**	**0.00**	**81.22**
State Total	**0.00**	**334.71**	**0.00**	**18.52**	**0.00**	**83.67**

Table 4-44: Pavement Marking Emissions

County	VOM (tpd)	VOM (tpy)
Cook	0.62	92.98
DuPage	0.17	25.74
Grundy Twps	0.00	0.57
Kane	0.11	16.70
Kendall Twps	0.00	0.55
Lake	0.15	22.42
McHenry	0.08	11.61
Will	0.16	23.46
Chicago NAA	**1.28**	**194.04**
Jersey	0.01	1.63
Madison	0.09	13.57
Monroe	0.01	1.77
St. Clair	0.08	12.65
Metro-East NAA	**0.20**	**29.63**
Attainment Area	**2.28**	**344.52**
State Total	**3.76**	**568.18**

Table 4-45: Portable Fuel Container Emissions – Commercial

County	VOM (tpd)	VOM (tpy)
Cook	1.72	429.40
DuPage	0.28	70.75
Grundy Twps	0.00	0.62
Kane	0.14	34.25
Kendall Twps	0.01	3.54
Lake	0.04	9.71
McHenry	0.09	22.75
Will	0.18	45.60
Chicago NAA	**2.47**	**616.62**
Jersey	0.01	1.94
Madison	0.09	23.17
Monroe	0.01	2.54
St. Clair	0.09	22.70
Metro-East NAA	**0.20**	**50.35**
Attainment Area	**1.48**	**370.25**
State Total	**4.14**	**1,037.21**

Table 4-46: Portable Fuel Container Emissions – Residential

County	VOM (tpd)	VOM (tpy)
Cook	15.26	3,816.13
DuPage	2.51	628.73
Grundy Twps	0.02	5.50
Kane	1.22	304.38
Kendall Twps	0.13	31.50
Lake	0.35	86.29
McHenry	0.81	202.16
Will	1.62	405.27
Chicago NAA	**21.92**	**5,479.98**
Jersey	0.07	17.23
Madison	0.82	205.88
Monroe	0.09	22.59
St. Clair	0.81	201.77
Metro-East NAA	**1.79**	**447.47**
Attainment Area	**13.16**	**3,290.39**
State Total	**36.87**	**9,217.84**

Table 4-47: Solvent Cleaning Emissions

County	VOM (tpd)	VOM (tpy)
Cook	3.57	1,143.61
DuPage	1.09	338.44
Grundy Twps	0.00	1.02
Kane	0.50	160.77
Kendall Twps	0.07	21.69
Lake	0.78	242.12
McHenry	0.31	103.12
Will	0.30	92.32
Chicago NAA	**6.62**	**2,103.10**
Jersey	0.01	3.63
Madison	0.33	103.57
Monroe	0.01	3.94
St. Clair	0.06	20.25
Metro-East NAA	**0.42**	**131.39**
Attainment Area	**4.57**	**1,420.32**
State Total	**11.61**	**3,654.80**

Table 4-48: Structure Fire Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	0.73	280.48	0.02	6.54	0.13	51.42
DuPage	0.11	46.85	0.00	1.09	0.02	8.59
Grundy Twps	0.00	0.45	0.00	0.01	0.00	0.08
Kane	0.07	28.98	0.00	0.68	0.01	5.31
Kendall Twps	0.00	1.90	0.00	0.04	0.00	0.35
Lake	0.03	10.45	0.00	0.24	0.00	1.92
McHenry	0.04	18.32	0.00	0.43	0.01	3.36
Will	0.08	32.19	0.00	0.75	0.01	5.90
Chicago NAA	**1.07**	**419.62**	**0.03**	**9.79**	**0.20**	**76.93**
Jersey	0.00	0.66	0.00	0.02	0.00	0.12
Madison	0.05	20.77	0.00	0.48	0.01	3.81
Monroe	0.00	1.73	0.00	0.04	0.00	0.32
St. Clair	0.10	40.40	0.00	0.94	0.02	7.41
Metro-East NAA	**0.15**	**63.55**	**0.00**	**1.48**	**0.03**	**11.65**
Attainment Area	**0.86**	**356.94**	**0.02**	**8.33**	**0.16**	**65.44**
State Total	**2.08**	**840.10**	**0.04**	**19.60**	**0.38**	**154.02**

Table 4-49: Waste Water Treatment Emissions – Industrial

County	VOM (tpd)	VOM (tpy)
Cook	0.52	237.91
DuPage	0.06	21.56
Grundy Twps	0.02	6.12
Kane	0.06	22.04
Kendall Twps	0.00	0.00
Lake	0.09	42.25
McHenry	0.14	50.12
Will	0.20	73.78
Chicago NAA	**1.08**	**453.79**
Jersey	0.00	0.00
Madison	0.29	107.26
Monroe	0.00	0.00
St. Clair	0.11	35.90
Metro-East NAA	**0.40**	**143.16**
Attainment Area	**4.74**	**1,825.80**
State Total	**6.21**	**2,422.74**

Table 4-50: Waste Water Treatment Emissions – POTWs

County	VOM (tpd)	VOM (tpy)
Cook	0.55	214.53
DuPage	0.05	21.01
Grundy Twps	0.00	0.12
Kane	0.03	13.00
Kendall Twps	0.00	0.25
Lake	0.03	12.85
McHenry	0.01	4.14
Will	0.02	9.33
Chicago NAA	**0.69**	**275.23**
Jersey	0.00	0.28
Madison	0.02	5.84
Monroe	0.00	0.15
St. Clair	0.02	5.75
Metro-East NAA	**0.03**	**12.02**
Attainment Area	**0.22**	**86.52**
State Total	**0.94**	**373.76**

Table 4-51: Total Area Source Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	23.01	34,183.78	22.99	20,027.97	217.47	67,280.57
DuPage	5.28	6,327.19	5.76	4,282.38	49.93	14,936.78
Grundy Twps	0.12	78.96	0.03	21.97	0.40	125.07
Kane	3.12	3,194.17	2.30	1,882.18	19.65	6,191.87
Kendall Twps	0.23	261.23	0.16	117.54	1.44	478.03
Lake	3.98	4,580.10	3.71	2,985.41	24.98	8,009.58
McHenry	2.40	2,208.03	1.80	1,242.46	14.40	4,414.56
Will	2.91	3,781.79	1.81	1,757.83	23.25	7,450.74
Chicago NAA	**41.05**	**54,615.25**	**38.56**	**32,317.73**	**351.51**	**108,887.21**
Jersey	0.34	466.77	0.07	63.22	1.58	514.10
Madison	1.76	4,700.38	0.75	799.86	10.59	3,778.09
Monroe	0.38	629.58	0.09	81.22	1.94	636.95
St. Clair	1.49	4,633.17	0.70	755.69	9.24	3,346.74
Metro-East NAA	**3.98**	**10,429.90**	**1.62**	**1,699.99**	**23.35**	**8,275.88**
Attainment Area	**40.88**	**80,922.93**	**15.39**	**13,463.48**	**271.73**	**89,123.95**
State Total	**85.91**	**145,968.07**	**55.57**	**47,481.20**	**646.59**	**206,287.04**

5 Mobile Sources

A mobile source of air pollution is a self-propelled or portable emitter of air pollutants. Emissions are generated by the engines or motors that power such sources. Most mobile sources, except jet or turboprop aircraft, are powered by internal combustion piston engines and nearly all use liquid fuels. Gaseous fuels, such as compressed natural gas (CNG) or liquefied petroleum gas (LPG), have a very small fraction of the motor fuel market in Illinois. Solid fuels have not been used by mobile sources in significant amounts since railroads retired their coal-powered steam locomotives in the 1950s.

For inventory and planning purposes, mobile sources are divided into two major categories.

1. On-road mobile sources (e.g., motor vehicles such as cars, vans, trucks, buses and motorcycles) used for transportation of goods and passengers on roads and streets
2. Off-road mobile sources including:
   - Modes of powered transportation that do not use roads, such as aircraft, trains, ships and boats, and motor vehicles used off-road; and
   - Self-propelled or portable motorized machines or equipment not used for transportation, ranging from construction equipment and farm tractors to lawnmowers and hand-held power weed choppers.

All on-road mobile sources are self-propelled. Some off-road mobile sources (e.g., farm tractors), are self-propelled, but many off-road sources are not. A gasoline-powered chain saw is a familiar example of a non-self-propelled off-road mobile source. Not all movable or portable emission sources are mobile sources, however. A small truck-portable cement or hot-mix asphalt plant, for example, may be set up near a construction or road-building site. Such plants are classified as stationary sources, not mobile sources for two reasons: (1) they may operate for weeks or months at a single location, and (2) the trucks that move the plants do not supply power for them.

Not all internal combustion or turbine engines are mobile sources. Fixed internal combustion engines are classified as stationary sources.

There are three categories of mobile source emissions:

- Exhaust or tailpipe emissions, which result from the combustion of fuel in the source's engine
- Evaporative emissions, which result from evaporation of fuel from the engine or its fuel system; and
- Refueling emissions

Exhaust emissions are the result of fuel combustion and occur only when the engine is running.

Evaporative emissions are VOM only and are continuously emitted from an engine's fuel system, whether the engine is running or not. Evaporative and exhaust VOM emissions were calculated separately for most mobile source categories in this inventory, but for purposes of this report they have been combined. Evaporative emissions do not include VOM emissions that occur during refueling.

Refueling emissions are a third category of mobile source emissions. Refueling emissions are entirely VOM. Although they result from the evaporation of fuel, they are distinct from, and not directly related to, evaporative emissions as defined above. Refueling emissions have two subcomponents:

- Displacement emissions. Occur when new fuel is transferred into a partly filled tank (be it a service station storage tank, a portable fuel container or gas can, or a vehicle or engine's fuel tank), displacing the air in the tank and forcing that vapor-rich air out the inlet pipe or other vent. There are two stages of displacement emissions:
    - "Stage I" emissions occur when the underground storage tanks at a service station are being refilled;
    - "Stage II" emissions occur when a motor vehicle (or gas can) is being refueled.
- Spill emissions. These occur when drops of fuel drip or splash on the ground during or after refueling and evaporate away.

Refueling emissions from on-road sources occur almost entirely at commercial or private service stations and have been included in the area source category.

Off-road sources also have refueling emissions. Some off-road sources (e.g., locomotives, aircraft and boats) are refueled at fixed locations. However, many small non-highway sources (e.g., lawnmowers) are refueled where they are used from mobile or portable tanks or fuel containers. In this inventory, refueling emissions from non-road categories (except aircraft refueling) are not reported separately from exhaust and evaporative emissions, but rather are included in the reported overall non-road VOM emissions. Emissions from portable fuel containers are included in the area source category.

5.1 On-Road Mobile Source Inventory

The inventory of on-highway mobile source emissions contains Illinois EPA's estimates of the amounts of CO, NOx and VOM from highway vehicles statewide by county as calculated using USEPA's MOBILE6.2 program. Exhaust and evaporative VOM emissions are combined. Emissions were calculated for a typical ozone season weekday for the summer of 2008 in accordance with USEPA's guidance. The estimates given here are for on-highway sources do not include refueling emissions. On-road motor vehicle refueling emissions are found in the Section 4.

5.1.1 On-Road Motor Vehicle Types

Emissions are reported for eight vehicle types corresponding to the vehicle types for which the MOBILE emission factor model normally reports emission factors. The vehicle types are described below.

Table 5-1: Vehicle Types in MOBILE6.2

Inventory Vehicle Type	Vehicle Type Description
LDGV	Light-duty gasoline powered vehicles – passenger cars, including station wagons. Some small SUVs and vans are in this category.
LDGT12	Light-duty gasoline powered trucks types 1 & 2 – small trucks up to 6,000 lb GVW, consisting of M6 vehicle types LDGT1 (LVW < 3,750 lb) and LDGT2 (LVW between 3,750 and 6000 lb). Most pickups, small vans and SUVs are in this category.
LDGT34	Light-duty gasoline powered trucks – larger trucks between 6,000 and 8,500 lb GVW, consisting of M6 vehicle types LDGT3 (ALVW < 5,750 lb) and LDGT4 (ALVW > 5,750 lb). Typical of this category are delivery vans and large SUVs.
HDGV	Heavy-duty gasoline powered vehicles – larger vans, trucks and buses, GVW > 8,500 lb, consisting of eight M6 HDGV weight classes (2b, 3, 4, 5, 6, 7, 8a and 8b) and gasoline buses (HDGB).
LDDV	Light-duty diesel powered vehicles – diesel passenger cars.
LDDT	Light-duty diesel powered trucks – diesel trucks up to 8,500 lb GVW, including diesel pickups, vans, delivery vehicles, etc. This small category consists of M6 vehicle types LDDT12 and LDDT34 (cf. the two LDGT types) defined the same as the corresponding gasoline truck types.
HDDV	Heavy-duty diesel vehicles – large diesel trucks and buses. GVW > 8,500 lb, including large trucks, tractor-trailers and diesel buses, and consisting of eight M6 HDDV weight classes (2b, 3, 4, 5, 6, 7, 8a and 8b, defined the same as the corresponding gasoline truck types) and two diesel bus types (HDDBT [transit buses] and HDDBS [school buses]).
MC	On-road motorcycles. All are gasoline powered. Off-road motorcycles are treated as recreational vehicles in the non-road category.

Different types of vehicles have different emission characteristics. Larger and heavier vehicles emit more than smaller, lighter vehicles using the same fuel. Generally speaking, diesel vehicles also emit less CO and VOM but more NOx than their gasoline equivalents.

5.1.2 Roadway Types

Public roads are classified according to their function in the highway system. The Federal Highway Administration's Highway Performance Monitoring System (HPMS), the most widely used classification, defines twelve functional classes (FCs) of roads as in Table 5-2. In this inventory, emissions are estimated for each of the twelve HPMS functional classes.

Table 5-2: HPMS Functional Classes of Roads and Their Codes

Functional Class	Abbreviation	Code
Rural Interstates	R-Int	01
Rural Other Principal Arterials	R-OPA	02
Rural Minor Arterials	R-MA	06
Rural Major Collectors	R-MaC	07
Rural Minor Collectors	R-MiC	08
Rural Local Roads	R-Lcl	09
Urban Interstates	U-Int	11
Urban Other Freeways and Expressways	U-OFE	12
Urban Other Principal Arterials	U-OPA	14
Urban Minor Arterials	U-MA	16
Urban Collectors	U-C	17
Urban Local Streets	U-Lcl	19

5.1.3 Calculation of Emissions

On-highway emissions for the vehicle types or categories are estimated in essentially the same way as point and area emissions are. For a given pollutant, emissions are given by the following equation.

$$E = AF \times EF \times CF \quad (5.1)$$

where:

E = emission rate for that particular pollutant
AF = activity factor
EF = emission factor for that particular pollutant
CF = conversion factor to obtain emissions in desired units

For motor vehicles, the activity factor can be expressed as output (e.g., distance traveled) or input (e.g., amount of fuel used) per unit time. The activity factor of choice for estimating on-highway exhaust and evaporative emissions is distance traveled, but the preferred activity factor for estimating on-highway refueling emissions is fuel consumption derived from data on fuel sales. The emission factor must be in units corresponding to those of the activity factor (i.e., mass of pollutant per unit distance or fuel amount). In this inventory, the on-highway activity factor is typically daily VMT.

Equation 5.1 is simple, but the actual emission estimating process is more complex. An accurate emission inventory is not the result of multiplying a total area-wide VMT by some single average all-vehicle emission factor to obtain an emission value for a given pollutant. There are two reasons for this:

- Emission factors generated, especially for CO and VOM, are very sensitive to vehicle speed and the relationship between speed and emission factor is not linear.
- Different vehicle types have different emission characteristics and therefore different emission factors.

Different road types have different average speeds. Thus, emission rates for a vehicle type on freeways are different from those on local roads or streets for the same vehicle type. Roads of a given type also have different average speeds under different traffic conditions. Speeds are lower during rush-hour congestion than during free traffic flow at 4 AM. It is difficult to estimate a single speed that would be representative of all the traffic in a county or region for an entire day. However, reasonably accurate speed estimates can be made for various functional classes or for individual segments or "links" on a transportation model network. Emissions by functional class or by link can then be calculated and summed to obtain regional emissions.

USEPA requires emissions to be reported separately for each of the eight vehicle types in Table 5-1. The shares of the total VMT generate by each vehicle type, VMT fractions, are used to calculate the VMT by vehicle type (VT) according to the formula:

$$VMT_{VT} = \text{Total all-vehicle VMT} \times \text{VMT Fraction}_{VT} \quad (5.2)$$

The VMT for a vehicle type is multiplied by the emission rate for the vehicle type to give emissions for that vehicle type. The vehicle-type emissions are then summed to obtain total emissions for all vehicle types.

Region-wide activity factors and emission factors must both be broken down into spatial, temporal and other components and each activity factor multiplied by its corresponding emission factor to get component emission estimates on at least a by-vehicle-type basis. The process of breaking down activity factors and emission factors into components is called "disaggregation." The disaggregated emissions, calculated from disaggregated components, are summed to get emissions on a county or regional basis. This is best expressed by rewriting Equation 5.1 as:

$$E = CF \times \sum_{\text{first C}}^{\text{last C}} (AF_C \times EF_C) \quad (5.3)$$

Since the activity factor is the VMT from Equation 5.3, we can rewrite as:

$$E_{\text{all C}} = CF \times \sum_{\text{first C}}^{\text{last C}} (VMT_{C\,\text{Total}} \times \text{VMT Fraction}_C \times EF_C) \quad (5.4)$$

where the subscript C refers to the component(s) into which the activity factors (i.e., VMT and VMT fraction) and emission factors have been disaggregated, such as county or link or functional class of road, or even time of day. Since there are usually several components or levels of disaggregation, there may actually be several summations to be completed before the total emissions for the whole region or state is calculated.

Representative region-wide VMT mixes are hard to estimate accurately, but reasonably accurate VMT mixes by functional class or even network link are often available, or can be made, from data supplied by transportation agencies.

The VMT fractions used to calculate emissions in this inventory are shown in Table 5-3 below. The all-vehicle VMT mix in the table is the most representative VMT mix for the State as a whole. The VMT fractions are closely related to, but are not the same as, the VMT fractions used as inputs to the MOBILE model. See the MOBILE inputs section below for more information on VMT fractions used with the MOBILE model.

Table 5-3: Statewide Average VMT Mixes

HPMS Code	HPMS *Functional Class (FC)*	Vehicle Type							
		LDGV	**LDGT12**	**LDGT34**	**HDGV**	**LDDV**	**LDDT**	**HDDV**	**MC**
01	Rural Interstate	0.2880	0.2774	0.0947	0.1060	0.0003	0.0012	0.2268	0.0055
02	Rural OPA	0.3673	0.3537	0.1208	0.0477	0.0003	0.0015	0.1031	0.0055
06	Rural Minor Art	0.3768	0.3628	0.1239	0.0395	0.0003	0.0016	0.0896	0.0055
07	Rural Major Collectors	0.3910	0.3766	0.1286	0.0295	0.0004	0.0016	0.0668	0.0055
08	Rural Minor Collectors	0.4109	0.3957	0.1351	0.0121	0.0004	0.0017	0.0386	0.0055
09	Rural Local Roads	0.4018	0.3869	0.1321	0.0186	0.0004	0.0017	0.0530	0.0055
11	Urban Interstate	0.3667	0.3532	0.1206	0.0476	0.0003	0.0015	0.1046	0.0055
12	Urban OEF	0.3945	0.3799	0.1297	0.0274	0.0004	0.0017	0.0610	0.0055
14	Urban OPA	0.3965	0.3818	0.1304	0.0245	0.0004	0.0017	0.0593	0.0055
16	Urban Minor Arts	0.4000	0.3852	0.1315	0.0215	0.0004	0.0017	0.0543	0.0055
17	Urban Collectors	0.4065	0.3914	0.1337	0.0184	0.0004	0.0017	0.0425	0.0055
19	Urban Local Streets	0.4187	0.4032	0.1377	0.0088	0.0004	0.0018	0.0240	0.0055
	Overall VMT Mix	0.3528	0.3397	0.1160	0.0574	0.0003	0.0015	0.1267	0.0055
	Overall Rural VMT Mix	0.3944	0.3799	0.1297	0.0264	0.0004	0.0017	0.0621	0.0055
	Overall Urban VMT Mix	0.3717	0.3579	0.1222	0.0434	0.0003	0.0016	0.0974	0.0055

Different combinations of emission control strategies (scenarios) will give rise to different emission factors. The difference in the emission factors for various scenarios is used to calculate the emission reductions arising from them. Illinois EPA estimates and reports emission reductions from its vehicle inspection and maintenance (I/M) program in this manner, by comparing emission factors for a no-I/M scenario with those from an I/M scenario.

As noted above, the activity factor used in this inventory is VMT. VMT in a region is the total number of miles driven by all the vehicles operating in the region over a given period of time. Statewide average daily VMT (ADVMT) in Illinois was about 289 million miles per day in 2008 as identified in the following table.

Table 5-4: Summary of ADVMT

Area/County	2008 ADVMT
Chicago NAA	
Cook	89,725,121
DuPage	23,128,616
Grundy NAA Twps	434,706
Kane	9,936,634
Kendall NAA Twp	724,924
Lake	15,444,172
McHenry	5,939,653
Will	15,650,342
Metro-East NAA	
Jersey	525,625
Madison	7,774,409
Monroe	987,806
St. Clair	7,301,157
Rest of Illinois	112,366,634
State Total	289,414,174

Illinois EPA uses IDOT's Roadway File VMT data in the form of Average Daily VMT, that is, reported Annual VMT divided by 365. Traffic counts at continuous count stations show overall traffic in Illinois is higher than average in summer and lower than average in the middle of winter. ADVMT data from IDOT were adjusted for seasonal variations in traffic by using adjustment factors by functional class from Table 5-5 below to get average summer weekday VMT (ASWVMT).

Table 5-5: Weekday Seasonal Division Factors for Application to Weekday (Monday – Thursday) Traffic Counts

Month	Rural Interstates	Other Rural Functional Classes	Urban Interstates	Other Urban Functional Classes
January	0.8572	0.9643	0.9192	0.9267
February	0.8789	0.8560	0.9291	0.9379
March	0.9585	0.9461	0.9519	0.9736
April	0.9861	1.0107	0.9981	1.0177
May	1.0323	1.0114	1.0047	1.0280
June	1.1064	1.0688	1.0395	1.0417
July	1.1177	1.0619	1.0538	1.0114
August	1.1050	1.0509	1.0669	1.0183
September	1.0210	1.0192	1.0396	1.0143
October	0.9931	1.0124	1.0203	0.9923
November	0.9844	0.9899	1.0207	1.0195
December	0.9594	1.0084	0.9562	1.0186
June-July-August Average	1.1097	1.0605	1.0534	1.0238

IDOT has similar factors for estimating monthly VMT from ADVMT. These factors were used to estimate VMT by month. The VMT-by-month data were used to estimate annual emissions of the various pollutants. The monthly factors shown in the table are applicable statewide and are specific to Illinois. Previous versions of the seasonal adjustment factors, covering earlier three-year periods are very similar to those given above.

All these tables contain subtotals for the NAAs and attainment counties. The ADVMT and ASWVMT tables have VMT totals by county and by MOBILE6.2 facility type fractions. The statewide MOBILE6.2 facility type fractions are close to MOBILE6.2's default fractions, but the facility type fractions for individual counties vary widely. Half a dozen very rural counties, for example, have no freeway VMT. On the other hand, 14 other rural counties, through which interstates pass, have freeway fractions over 50 percent because the bulk of their VMT is from traffic passing through the county on the interstate. Three of those counties have freeway fractions over 60 percent.

Table 5-6: Monthly Factors to Convert ADVMT to Total Monthly VMT

	Rural		Urban	
Month	**Interstates**	**Other FCs**	**Interstates**	**Other FCs**
January	26.573	29.893	28.495	28.728
February	24.609	23.968	26.015	26.261
March	29.714	29.329	29.509	30.182
April	29.583	30.321	29.943	30.531
May	32.001	31.353	31.146	31.868
June	33.192	32.064	31.185	31.251
July	34.649	32.919	32.668	31.353
August	34.255	32.578	33.074	31.567
September	30.630	30.576	31.188	30.429
October	30.786	31.384	31.629	30.761
November	29.532	29.697	30.621	30.585
December	29.741	31.260	29.642	31.577
Annual	365.265	365.343	365.115	365.093
June-August	102.096	97.561	96.927	94.172

Every MOBILE6.2 input file must have at least seven commands: `MOBILE6 INPUT FILE` to start it, `END OF RUN` to end it, `RUN DATA` and `SCENARIO RECORD` to control it, and three parameters. The parameters are temperature (`MIN/MAX TEMPERATURE`), gasoline volatility (`FUEL RVP`) and `CALENDAR YEAR` of evaluation. Vehicle speed is not a required input to MOBILE6. There are, however, many options available to make an input file (and hence the output) more representative of specific areas and conditions, or to take into account various control programs, or to obtain output in greater or lesser detail. Examples of the types of data provided in the input file include:

- Evaluation month and calendar year
- Maximum and minimum temperatures (daily or monthly, as necessary)
- Absolute humidity
- Fuel inputs (type of gasoline blend, RVP, etc.)
- Speed
- I/M Program (as necessary, see Table 5-xx)
- Registration distribution
- VMT fraction
- VMT by functional class, hour and speed
- Diesel sulfur content
- Particle size (when calculating PM emissions)

Not all areas of the state are subject to I/M and not all vehicles in the subject areas are required to be tested. The follow table shows the assumed I/M fraction for the applicable areas.

Table 5-7: I/M Fraction for Illinois Counties

County	I/M Fraction
Chicago NAA	
Cook	0.98
DuPage	0.98
Grundy NAA Twps	0.25
Kane	0.60
Kendall NAA Twp	0.81
Lake	0.95
McHenry	0.50
Will	0.65
Metro-East NAA	
Jersey	0.00
Madison	0.90
Monroe	0.20
St. Clair	0.90
Downstate (all other counties and attainment townships for Grundy and Kendall)	0.00

The resulting daily emission factors (one for each vehicle type and roadway combination) are then multiplied by the appropriate VMT of the applicable vehicle type on the corresponding roadway type to obtain emissions. Annual emissions are calculated in the same manner except 12 emission factors (one for each month) are obtained from the model for each vehicle type. Each of these values are multiplied by their corresponding monthly VMT and summed to obtain annual emissions.

5.1.4 On-Road Mobile Source Emissions Summary

Table 5-8 is a summary of the on-highway mobile source emissions of CO, NOx and VOM in tons per summer weekday and tons per year. Detailed tables of on-highway mobile source emissions are given in the appendices.

Table 5-8: On-Road Mobile Source Emissions

County	CO (tpd)	CO (t,py)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	837.69	432,879.00	150.73	55,167.72	73.85	25,568.07
DuPage	215.63	111,577.61	38.81	14,220.39	19.13	6,590.68
Grundy Twps	4.54	2,257.56	0.84	328.63	0.36	135.48
Kane	98.14	50,603.82	16.46	6,262.82	8.76	2,954.25
Kendall Twps	6.92	3,498.39	1.07	532.56	0.66	210.22
Lake	144.72	74,790.36	24.52	9,512.46	13.14	4,419.30
McHenry	58.89	30,616.45	9.92	3,765.73	5.39	1,807.44
Will	153.31	79,237.74	27.93	9,836.28	13.32	4,669.42
Chicago NAA	**1,519.84**	**785,460.92**	**270.28**	**99,626.59**	**134.60**	**46,384.86**
Jersey	5.30	2,824.12	0.85	386.22	0.56	203.57
Madison	78.45	37,621.25	15.08	5,656.45	7.68	2,653.63
Monroe	10.87	5,197.98	1.76	745.39	1.04	358.63
St. Clair	74.28	35,354.87	13.15	5,312.91	7.25	2,492.26
Metro-East NAA	**168.91**	**80,998.22**	**30.84**	**12,100.97**	**16.53**	**5,708.08**
Attainment Area	**1,178.56**	**626,218.57**	**235.07**	**83,523.64**	**117.91**	**42,558.03**
State Total	**2,867.31**	**1,492,677.71**	**536.20**	**195,251.20**	**269.04**	**94,650.98**

5.2 Off-Road Mobile Source Inventory

Off-road modes of transportation include trains (i.e., locomotives), aircraft, ships and boats, and motor vehicles used off-road. Several factors make off-road emissions important in Illinois. Illinois is at the heart of commercial aviation and the railroad network in the United States and much of the waterborne commerce originates in or passes through Illinois waters. In particular, the Chicago and the St. Louis area are both major centers of air and rail traffic. O'Hare Airport in Chicago is one of the busiest in the world. Waterborne commerce on the Illinois, Mississippi and Ohio Rivers and on Lake Michigan is considerable, and the state is well supplied with rivers and lakes where much recreational boating takes place.

5.2.1 Railroad Locomotives

Rail traffic in Illinois is powered almost entirely by diesel locomotives. Most rail traffic in Illinois is freight, but there are several major Amtrak passenger routes in Illinois and an extensive diesel-powered commuter rail network (METRA) centered on Chicago. The major (Class I) railroads – Burlington Northern, Santa Fe, Canadian National, Canadian Pacific, CSX, Kansas City Southern, Norfolk Southern and Union Pacific – all operate in Illinois, and most rail traffic is on their routes. There are also nearly 40 regional and short lines in the state. Most of these smaller railroads are very small – a few miles of track and an engine or two – but some have several hundred miles of track in the state and transport millions of tons of freight.

5.2.1.1 Calculation of Emissions

For the 2008 inventory, the Eastern Regional Technical Advisory Committee (ERTAC) was established by a group of states to support effective air quality planning. One of the categories of interest to standardize the inventory and improve data quality was the calculation of railroad locomotives. The major goal of the group was to build a link-level, spatially and temporally allocated emission inventory.

The calculation of emissions for locomotives is similar to that of on-road mobile sources. Each railroad company operates on certain rail lines. Each company has a set of locomotives each with a different emission factor. Based upon the mix of locomotives a company has, a weighted emission factor for that company can be obtained. The fuel use by each company can then be multiplied by the appropriate emission factor to obtain the appropriate emission rate.

The ERTAC Rail group used annual gross ton miles (GTM) and total amount of fuel used for each railroad to calculate a railroad fuel consumption index for each railroad in terms of GTM/gallon fuel. The GTM for a given link was then divided by the average fuel consumption index for all railroads on that link to obtain the fuel consumption for the link. In cases where more than one railroad operated on the link, the resulting average fuel consumption index was the straight average of the number of railroads operating on the link. The fuel use was then multiplied by the emission factor to obtain emissions for the link. Using a GIS, the links were summed to the appropriate counties to obtain county level emissions. Daily emissions were calculated by dividing the annual emissions by 365.

5.2.1.2 Railroad Locomotive Emissions

The following table represents the emissions calculated in Round 5 of the ERTAC Rail Committee.

Table 5-9: Railroad Locomotive Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	1.44	527.22	10.17	3,711.13	0.53	192.72
DuPage	0.43	155.88	2.92	1,066.43	0.15	56.51
Grundy Twps	0.05	16.54	0.31	114.52	0.02	5.94
Kane	0.34	124.49	2.34	852.43	0.12	45.13
Kendall Twps	0.02	6.05	0.12	42.11	0.01	2.18
Lake	0.27	99.28	1.93	705.65	0.10	36.03
McHenry	0.07	26.93	0.51	186.56	0.03	9.88
Will	0.41	151.16	2.91	1,063.75	0.15	54.44
Chicago NAA	**3.03**	**1,107.56**	**21.21**	**7,742.56**	**1.10**	**402.82**
Jersey	0.01	2.93	0.06	22.46	0.00	1.05
Madison	0.27	96.99	1.80	657.63	0.10	35.25
Monroe	0.30	110.77	2.06	750.31	0.11	39.61
St. Clair	0.25	91.23	1.72	626.11	0.09	33.14
Metro-East NAA	**0.83**	**301.93**	**5.63**	**2,056.51**	**0.30**	**109.05**
Attainment Area	**11.96**	**4,364.75**	**82.65**	**30,165.43**	**4.34**	**1,582.82**
State Total	**15.82**	**5,774.24**	**109.49**	**39,964.51**	**5.74**	**2,094.69**

5.2.2 Aircraft

This inventory deals with aircraft emissions at Public Use Airports and military airfields in Illinois. There are many small, private airstrips and restricted landing areas scattered around the state. These airstrips are not public use in that they are not open to the flying public. Data, in general, is not available for these private airstrips, but few have more than a handful of operations a month involving small piston engine aircraft which results in extremely negligible emissions. Emissions from these private airstrips have not been included in the inventory.

5.2.2.1 Aircraft Description

The FAA recognizes four categories of aircraft operations:

- Air Carrier or Commercial operations: those for large aircraft capable of carrying more than 60 passengers or 18,000 pounds cargo, i.e., scheduled major airline operations
- Air Taxi operations: those in smaller aircraft than air carrier, i.e., small-scale passenger operations
- General Aviation: all other non-military aircraft operations including private, business and civilian government operations
- Military: all operations by military aircraft

The FAA collects and published statistics on these categories for many airports nationwide. Large commercial airports usually have detailed information on aircraft operations by various aircraft makes and models and sometimes even engine types.

There are two basic types of aircraft engines:

- Turbine, turboprop or turbojet engines which power virtually all military and commercial and many business aircraft. These use jet fuel, a kerosene blend of low volatility.
- Piston engines which power most small general aviation aircraft, private planes and some business aircraft. These use a special high-octane aviation gasoline.

These aircraft operate chiefly in five modes:

- Taxi/Idle: at very low power when idling or during taxiing before taking off or after landing
- Takeoff: at full power during takeoff until the aircraft is about 500 feet above the ground
- Climbout: at slightly reduced power during which the aircraft climbs to its cruising altitude
- Cruise: at further reduced power level at cruise where the aircraft maintains a constant speed and altitude
- Approach: at a moderate to low power level during descent and the approach to landing

Cruising emissions are not included in the inventory.

5.2.2.2 Estimating Emissions from Aircraft Operations

Emission factors for aircraft are usually expressed as mass of pollutant per LTO and are derived from measurements made by engine manufacturers. The emission factor for a given aircraft is a function of the make and model of the aircraft and its engine(s), the number of engines on the aircraft, the fuel flow rate for each mode and the time the aircraft spends in each mode.

Emissions are calculated by summing the emissions factors each of the four modes of operation (taxi, takeoff, climbout and approach) to obtain a single emission factor for a single LTO. This value is then multiplied by the number of LTOs for the given aircraft/engine type to obtain emissions. Emission factors used in calculating the inventory are given below.

Table 5-10: Fleetwide Aircraft Emission Factors (lb/LTO)

Pollutant	Commercial	Air Taxi	General Aviation	Military
CO	24.0	30.0	13.0	40.0
NOx	24.0	2.0	0.1	10.0
VOM	4.38	4.96	0.485	11.05

APUs are small turbine engines installed in the hulls of many large and medium aircraft to generate electricity and compressed air to keep the aircraft's systems operating when the main engines are off. APUs use jet fuel and generate exhaust emissions like the main engines do. Most aircraft in the commercial category have APUs, but comparatively few air taxi or general aviation aircraft have them.

APU emissions for an aircraft are the product of its APU's emission factor (pounds per hour of operation), the time in use (hours per LTO) and the number of LTOs. APU emissions are assumed to be negligible for all airports except Midway and O'Hare.

5.2.2.3 Aircraft Emissions

The following tables are the emissions calculated for aircraft for the 2008 inventory.

Table 5-11: Aircraft Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	21.16	7,256.23	10.20	3,589.95	4.37	1,516.73
DuPage	1.71	517.01	0.01	2.85	0.16	46.32
Grundy Twps						
Kane	0.72	200.76	0.00	1.09	0.07	18.54
Kendall Twps						
Lake	1.02	287.13	0.01	1.89	0.09	24.96
McHenry	0.93	294.34	0.01	1.59	0.09	27.66
Will	2.31	732.85	0.01	3.96	0.22	68.87
Chicago NAA	**27.85**	**9,288.33**	**10.24**	**3,601.34**	**4.99**	**1,703.08**
Jersey	0.00	0.00	0.00	0.00	0.00	0.00
Madison	0.84	259.41	0.00	1.42	0.07	23.22
Monroe	0.11	36.04	0.00	0.19	0.01	3.39
St. Clair	1.59	559.20	0.01	4.82	0.10	35.58
Metro-East NAA	**2.54**	**854.65**	**0.02**	**6.43**	**0.19**	**62.19**
Attainment Area	**15.48**	**5,156.38**	**0.43**	**158.21**	**1.40**	**469.46**
State Total	**45.87**	**15,299.36**	**10.69**	**3,765.98**	**6.58**	**2,234.72**

Table 5-12: Emissions from APUs

Airport	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Midway	0.14	51.10	0.09	32.85	0.00	1.46
O'Hare	0.59	215.35	0.37	135.05	0.04	14.60

5.2.3 Commercial Marine Vessels

This category includes large cargo ships, passenger ships, oil tankers, etc., powered by steam or internal combustion engines and used for commercial purposes such as transport of passengers, cargo movement, commercial fishing and the like. Tugboats and pushboats, both used in harbors and used to propel barges on rivers are included in this category. Emissions for pleasure boats are not included in this category, but rather in the other non-road engines and vehicles category.

Emissions for the 2008 inventory were grown from the 2005 inventory using the following growth factors. That is, the 2005 emission rate was multiplied by the appropriate growth factor to obtain 2008 emissions.

Table 5-13: Commercial Marine Growth (2005 to 2008) Factors

Pollutant	Growth Factor
Chicago NAA	1.051
Metro-East NAA	1.050
Other areas of the state	1.056

Table 5-14: Commercial Marine Vessel Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	1.41	289.58	8.02	1,641.16	0.19	38.49
DuPage	0.22	45.24	1.15	235.25	0.03	5.15
Grundy Twps	0.19	39.57	1.04	213.35	0.02	4.89
Kane	0.00	0.00	0.00	0.00	0.00	0.00
Kendall Twps	0.00	0.00	0.00	0.00	0.00	0.00
Lake	0.00	0.00	0.00	0.00	0.00	0.00
McHenry	0.00	0.00	0.00	0.00	0.00	0.00
Will	0.15	31.37	0.83	169.11	0.02	3.88
Chicago NAA	**1.98**	**405.77**	**11.03**	**2,258.88**	**0.25**	**52.41**
Jersey	0.57	117.29	3.09	632.39	0.07	14.50
Madison	1.87	383.79	9.83	2,012.36	0.22	44.51
Monroe	0.67	136.19	3.59	734.24	0.08	16.84
St. Clair	0.27	54.47	1.43	293.69	0.03	6.73
Metro-East NAA	**3.38**	**691.74**	**17.94**	**3,672.68**	**0.40**	**82.57**
Attainment Area	**12.98**	**2,656.68**	**69.90**	**14,313.93**	**1.60**	**327.94**
State Total	**18.33**	**3,754.19**	**98.86**	**20,245.49**	**2.26**	**462.91**

5.2.4 Other Off-Road Engines and Vehicles

This category includes all other portable motorized equipment, from lawnmowers to snowblowers, and farm tractors to earthmoving equipment. Engines are powered by spark-ignition (usually fueled by gasoline) and some by compression ignition (diesels). There are two types of spark-ignition engines: 2-stroke and 4-stroke. The three types of engines, 2-stroke, 4-stroke and diesel, have very different emission characteristics so, they are treated separately in the inventory. Some non-road emission sources use CNG or LPG as a fuel.

For this inventory, Illinois EPA used the NONROAD 2008 model to estimate non-road emissions by county. The NONROAD model estimates emissions of hydrocarbons, CO, NOx, SOx and PM (both PM10 and PM2.5) from all non-road categories except aircraft operations, locomotives and commercial marine vessels. The model takes into account growth, fuel characteristics and control programs. The inputs used in the NONROAD model when estimating summer weekday emissions are shown in Table 5-15.

Table 5-15: NONROAD Input Parameters for Summer Daily Emissions

NONROAD Input Parameter	Chicago NAA	Downstate North	Downstate South	Metro-East NAA
Fuel RVP (psi)	6.7	8.6	8.6	6.9
Oxygen %	2.7	3.5	3.5	2.7
Gasoline sulfur content (ppm)	25	25	25	25
Diesel sulfur content (ppm)	15	15	15	15
CNG/LPG sulfur content (ppm)	0	0	0	0
Minimum temperature (F)	63	63	68	68
Maximum temperature (F)	82	82	87	87
Average temperature (F)	76	76	81	81
Stage II control (%)	0	0	0	0

Summer daily emission totals were obtained by running the NONROAD model for the Chicago, Downstate North, Downstate South and Metro-East areas with appropriate inputs from Table 5-15. The output files from the NONROAD model were imported into database software and emissions by county and category and engine type were generated.

Annual emissions were calculated in essentially the same manner. The annual totals for the four areas of the state were obtained by running the NONROAD model four times for each area using the seasonal inputs shown in table 5-16.

Table 5-16: NONROAD Input Parameters for Annual Emissions

NONROAD Input Parameter	Season	Chicago NAA	Downstate North	Downstate South	Metro-East NAA
Fuel RVP (psi)	Winter	14.0	13.0	13.0	13.4
	Spring	9.5	11.0	11.0	9.6
	Summer	6.7	8.5	8.5	6.9
	Fall	8.1	10.3	10.3	8.2
Gasoline sulfur content (ppm)	All seasons	25	25	25	25
Diesel sulfur content (ppm)	All seasons	15	15	15	15
Minimum temperature (F)	Winter	18	18	25	25
	Spring	37	37	44	44
	Summer	63	63	68	68
	Fall	44	44	49	49
Maximum temperature (F)	Winter	32	32	42	42
	Spring	56	56	63	63
	Summer	82	82	88	88
	Fall	61	61	67	67

Emissions calculated other off-road engines and vehicles for the 2008 inventory are as follows:

Table 5-17: Other Off-Road Engine Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	805.59	194,236.21	68.85	18,977.81	60.29	15,205.67
DuPage	298.12	66,699.36	18.74	4,971.61	19.83	4,771.23
Grundy Twps	2.67	694.16	0.44	93.90	0.64	174.27
Kane	141.67	30,249.37	13.80	3,425.56	10.06	2,356.40
Kendall Twps	8.71	2,757.82	1.24	313.95	1.19	661.67
Lake	242.62	52,393.96	14.66	3,805.11	20.26	4,892.50
McHenry	80.09	17,899.25	9.54	2,311.95	6.56	1,592.24
Will	124.33	27,522.37	16.35	4,071.84	10.71	2,605.23
Chicago NAA	**1,703.78**	**392,452.50**	**143.62**	**37,971.73**	**129.53**	**32,259.20**
Jersey	5.83	1,446.02	1.54	281.28	1.27	331.65
Madison	47.94	11,382.54	6.90	1,586.73	5.53	1,400.91
Monroe	8.01	1,895.53	1.87	359.07	1.28	333.61
St. Clair	37.32	8,576.50	5.41	1,188.22	3.70	914.75
Metro-East NAA	**99.11**	**23,300.59**	**15.73**	**3,415.30**	**11.77**	**2,980.92**
Attainment Area	**926.82**	**235,958.46**	**268.04**	**49,301.48**	**147.57**	**47,330.18**
State Total	**2,729.71**	**651,711.56**	**427.39**	**90,688.51**	**288.87**	**82,570.30**

5.2.5 Total Off-Road Engine Emissions

The following table is the total of the commercial marine vessels, locomotives, aircraft and other off-road engine emissions.

Table 5-18: Total Off-Road Engine Emissions

County	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Cook	830.34	202,575.70	97.70	28,087.95	65.41	16,969.67
DuPage	300.48	67,417.49	22.82	6,276.14	20.17	4,879.20
Grundy Twps	2.91	750.28	1.79	421.77	0.67	185.09
Kane	142.73	30,574.62	16.14	4,279.08	10.25	2,420.07
Kendall Twps	8.73	2,763.87	1.35	356.06	1.20	663.84
Lake	243.90	52,780.37	16.60	4,512.65	20.45	4,953.49
McHenry	81.09	18,220.53	10.05	2,500.10	6.67	1,629.79
Will	127.21	28,437.75	20.10	5,308.66	11.09	2,732.41
Chicago NAA	**1,737.38**	**403,520.60**	**186.56**	**51,742.40**	**135.91**	**34,433.57**
Jersey	6.41	1,566.25	4.69	936.13	1.34	347.20
Madison	50.92	12,122.73	18.54	4,258.14	5.92	1,503.88
Monroe	9.09	2,178.54	7.51	1,843.81	1.48	393.44
St. Clair	39.43	9,281.40	8.57	2,112.84	3.92	990.20
Metro-East NAA	**105.85**	**25,148.92**	**39.32**	**9,150.92**	**12.66**	**3,234.73**
Attainment Area	**967.23**	**248,136.27**	**421.01**	**93,939.06**	**154.91**	**49,710.39**
State Total	**2,810.47**	**676,805.79**	**646.89**	**154,832.38**	**303.48**	**87,378.69**

6 Quality Assurance

6.1 Purpose of the Inventory

The objective of this emission inventory is to present an accurate and comprehensive account of all ozone precursor emissions from point, area and mobile sources for the entire State of Illinois in accordance with the requirements of the CAA. The ozone precursors included in the inventory are CO, NOx and VOM. Emissions presented in the 2008 emission inventory are typical summer day and annual.

6.2 Scope of the Quality Assurance Plan

The Illinois EPA has implemented quality assurance (QA) procedures and quality control (QC) checks at various stages in the inventory process. The QA preparations involved in the development of the emission inventory were based on the procedures as outlined in the USEPA's publications EPA-450-4-88-023, *Guidance for the Preparation of Quality Assurance Plans for O3/CO SIP Emission Inventories* and EPA-450/4-91-022, *Quality Review Guidelines for 1990 Base Year Emission Inventories* and Illinois EPA's document, *Illinois Environmental Protection Agency Point Source Emissions Inventory Quality Assurance/Quality Control (QA/QC) Plan* by the Radian Corporation (November 1991). Details of the QA program are discussed in the following sections.

6.3 Summary of QA Activities

In general, four basic stages were involved in the preparation of the 2008 emission inventory: planning, data collection, data analysis and data reporting. Data analyses include estimation of emissions for point sources that failed to report ozone season emissions in their annual emission report to the Illinois EPA. The reporting stage includes the presentation of summer ozone season data and emission estimates as a finished product in the required format. As a first step, the QA program was conceived earlier in the process and was implemented throughout the various stages of inventory development. Second, the collection of data (or representative samples of it) had undergone review for suitability, completeness and correctness. Next, all the methodologies used in the calculation of missing or unreported emission data and those methodologies used for various data analyses were all reviewed to ensure the inventory of such emission data were appropriate representations of each respective emission category. Lastly, the finished periodic emission inventory product was checked and audited for completeness and accuracy.

6.3.1 Inventory and QA Planning

Illinois EPA's Air Quality Planning Section inventory staff used a QA plan largely based on requirements according to the CAA and USEPA quality assurance and quality control guidance documents. Also, the overall inventory QA plan was influenced by experiences gained in the development previous inventories.

6.3.2 Resource Allocation for QA

In-house quality assurance activities required a person with experience and authority to carry out QA duties. The QA coordinator (QAC) interacts directly with the inventory staff or specialists for point, area and mobile sources. The person responsible for this activity is the manager of the Inventory and Data Support Unit of the Air Quality Planning Section. Their currently exists six staff under this manager whose jobs are to compile the point source inventory, review annual emission reports and compile the area source inventory.

6.3.3 Schedule and Project Planning

The Air Quality Planning Section's inventory staff's experience in the compilation of previous inventories was drawn upon in preparing the QA plan for the 2008 emission inventory.

To prepare the 2008 AER data for inventory use, inventory staff reviewed the emission data that was submitted. The experiences in such review were also included as bases in developing the QA plan for this inventory. Many data range checks are built into the CAERS and ISSIS systems. This ensures values entered into the database are within acceptable levels such as those ranges of values for parameters indicated in Section 6.4. Knowledge that such input value ranges are automatically validated contributed to the overall design of the QA plan.

As permits are issued, the emission data contained in the permit and application are compiled into the point source emission inventory by the inventory staff. Each source that is added to the inventory is reviewed for correctness and completeness by the Unit Manager. This review also contributes to the contribution of the overall design of the QA plan.

A review of the results of the AER data became the groundwork for planning and scheduling the QA efforts for the 2008 inventory. Specific key parameters identified in the inventory were tagged as a potential focus for QA work and incorporated in the planning for reviewing the point source emissions data.

The inventory staff charged with the mobile and area source portions of the inventory began their parallel QA efforts to enable a timely completion of the inventory. For on-road and off-road sources, review of emission factors was primarily confined to QA of the inputs to the appropriate model. The non-road source methodology and emission data were compared with previous studies done on this category.

6.4 QA Technical Information

As noted above, the emission inventory system the DAPC uses contributes to the overall quality assurance aspect for this inventory. The emission inventory data has already been range checked for the following parameters:

- Stack height ≤ 1250 feet
- Stack diameter ≤ 99.99 feet
- Hours per year ≤ 8760
- Peak ozone season hours ≤ 2190
- Weeks per year ≤ 52
- Peak ozone season weeks ≤ 13
- Days per week ≤ 7
- Hours per day ≤ 24
- Seasonal throughput totals = 100 percent

In addition to the validation of input data ranges, ISSIS and CAERS also perform automated validation of codes such as SIC and SCC. With such tasks performed, the inventory staff is more focused on reviewing key parameters and other aspects of the inventory that may significantly affect the accurate representation of typical summer weekday emissions.

6.4.1 Prioritizing Sources and Data Elements

The data elements of the 2008 periodic emission inventory were based on the source reported emissions for 2008. This reported data was deemed more representative compared to the emissions from growing a previous point source inventory. An analysis was performed by comparing the emission level in 2005 and 2008 on a point-by-point basis. With tens of thousands of records statewide to QA for purposes of this inventory, this methodology helped to focus resources towards emission points that were found to have a significant increase or decrease in emissions from 2005 to 2008.

Sources whose summation of emissions from the individual emission units at the source were significantly different than the source-reported total were sent a letter identifying the discrepancy. As revised data was received, it was check to make sure the error was corrected. This updated data was entered into ICEMAN and used for the inventory.

6.4.2 Data Sources and Checking Procedures

Although the data used in the point source emission inventory came directly from the sources themselves, some data were deemed incorrectly represented and corrected accordingly. If necessary, all possible sources of information were used in this QA effort, including AERs from previous years, to determine reliability of the data for inclusion in the inventory. The inventory staff assessed all data that were presented and took into account the capabilities and biases of the organization supplying the data, the techniques used to collect the data and the purpose for which the data had been compiled. All of these provided an overall understanding of the limitations of reported data and served as a guide in choosing the best data for use in the inventory.

All reported data from a source's 2008 AER were checked and entered into CAERS. The point source reported data were reviewed and, in general, found acceptable as most companies have provided the necessary information required by Illinois EPA. Area source data, such as census and meteorological information, sales of taxable substances like motor fuels, landings and takeoffs at airports, etc. came from federal or state government sources and are relatively accurate and found to be appropriate for use in this inventory. VMT data for mobile sources are published by IDOT and are reasonably accurate as well. Data from high-quality sources are still subjected to QA checks for relevance and suitability for the inventory. Other data for area sources may be several years old or were obtained in aggregate form (i.e., nationwide or statewide rather than by county or city) and are subject to further scrutiny. These sets of data underwent the same checks as the higher quality data and were reviewed with greater attention to bias and collection techniques.

Review of the emission data was generally performed several times in the inventory development process. The inventory staff reviews the data as presented by each source to Illinois EPA. The QA Coordinator, through comparative analysis and other database review/manipulations sorts and flags suspect emission points and values and returns them to the responsible inventory staff for another round of QA review and scrutiny. Finally, after the consolidated emission results are being finalized, the inventory staff performs a final review of emission values for inclusion in the inventory. The second independent QA check is more formal than the other two and is usually done on a sample of the data. The first and third checks cover all data used.

6.5 Data Collection and Analysis

The following sections describe Illinois EPA's plans in collecting and analyzing emission data and the QA procedures used by the inventory staff in evaluating them.

6.5.1 Identification of Emission Sources

For point sources, all sources that (a) are located in the State of Illinois and (b) are shown to have emissions of CO, NOx or VOM are automatically included in the inventory. Illinois EPA is confident all significant point sources are included in ISSIS. The Illinois EPA also identified sources that were known to have operated in 2008 but which did not have their emission data entered into the system by the end of 2008.

The 2005 periodic emission inventory was used as a comparison for all point emission categories in the 2008 inventory. The 2008 area source categories were also checked against the 2005 inventory. All area source and mobile source categories listed in the federal guidance are included in the inventory. Illinois EPA checks MOBILE model inputs (particularly temperatures and volatility) and VMT data for completeness, in order to ensure their suitable use in the model. For example, published gasoline volatility data was compared with those reported by the Illinois Department of Agriculture, which normally performs various tests on gasoline in the state.

For area sources, the preliminary 2008 inventory developed by USEPA was used to identify additional source categories that may have not been calculated in previous years. There were very few categories that were not already inventoried (and some were exclusively in the point source inventory) and they were included in the inventory.

6.5.2 Data Quality

To ensure the emission inventory is of the highest quality, QA procedures were in place for evaluating the quality and reliability of data for use in the inventory. These evaluation processes enable the inventory staff to make informed choices between sources of information, especially if the data from one source differs significantly in comparison with those that were obtained from another source. Also, the evaluation process allows the inventory staff and users of the inventory to make informed judgments about the validity of the emissions in any particular category.

Representative QA actions include checking the base year relevancy of the data; the use of 2008 data where possible, is emphasized. However, if such base year data are unavailable, the most recent reliable data is used and noted accordingly in the inventory documentation.

Data were crosschecked with similarly published data. Appropriate caution was taken in the choice of "other published data", especially when such data may have originated from the same source that produced the original data. In such cases, the actual data is not easily verifiable, but some credibility and support is given for such data, especially when an independent organization had chosen to publish such data. Checking 2008 inventory data against those reflected in the past year or years is useful since magnitudes and trends may be verified in this manner. This is especially applicable for such data as VMT by road type.

Some QA actions were more subjective, i.e., the judgment and experience of the inventory staff is important in these evaluations. The professional capabilities and biases, if any, of the suppliers of the data were taken into consideration, including the purpose for which the data were collected. Data organized by government agencies for taxation purposes (e.g., gasoline sales) and industry information on purchases and sales of materials and products (e.g., coal usage at the power plant), were considered of acceptable quality since both entities have a specific incentive to obtain the most accurate information. Data collection techniques, if known, were assessed accordingly. For example, information from plant inspections was considered more reliable than data from mail surveys. However, unless the inventory staff or the QA Coordinator had any significant comment about one or more of these subjective assessments (for example, when one source of data for a category was chosen over another), such assessments, as a rule, are not part of the inventory documentation.

6.5.3 Emission Estimation Methods

Illinois EPA estimates emissions following the procedures outlined in these USEPA publications:

- EPA-450/4-88-019, Inventory Requirements for Post-1987 Ozone State Implementation Plans, December 1988
- EPA-450/88-021, Procedures for the Preparation of Emission Inventories for Precursors of Ozone: Volume I, Third Edition, December 1999
- EPA-450/4-81-026d (Revised), Procedures for the Preparation of Emission Inventories for Precursors of Ozone: Volume IV: Mobile Sources, July 1989
- AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, January 1995 and supplements

Where specific USEPA guidance was not available, Illinois EPA used generally accepted engineering principles, calculations and judgment, supplemented by technical information from other sources, in estimating emissions. In all such cases, the method, data and other relevant information were identified accordingly.

The emission estimates were adjusted to reflect conditions on a typical 2008 summer weekday as follows:

- Point Sources: Emissions were calculated using peak ozone season emission rates from source submitted 2008 AERs.
- Area Sources: Emissions were calculated using seasonal adjustment factors such as those reflected in USEPA guidance and by adjustments for representative 2008 summertime temperatures and volatility for certain categories (e.g., storage of gasoline and other VOM).

- Mobile Sources: by adjusting VMT for 2008 summertime conditions and using representative 2008 summertime temperatures and fuel volatility when calculating the MOBILE model's emission rates. The MOBILE6 model used in the CAA inventories calculates midyear (summer) emission rates directly so no adjustments were made to the emission rates on that account.

6.5.4 Consistency with Other States

Several conference calls were held early in the inventory development process with the states of Indiana, Michigan, Minnesota, Ohio and Wisconsin through LADCO to identify the emission factors or calculations methods to be used in calculating emissions from certain area source categories.

6.5.5 Calculations and Data Handling

Computers were employed in all calculations for the inventory. Arithmetic errors are minimized in these calculations. Typographical errors and incomplete algorithms are of concern. For this situation, sample manual calculations were done for comparative purposes. At least one such calculation was made for every category.

Computerized information was stored on the BOA's network and was backed up nightly. Original inventory data continued to be maintained in the database. This data was extracted from the database and was maintained in an Access® database on the network. The Access® database was manipulated to obtain the 2008 point source inventory.

6.5.6 Validation Procedures

Point and area sources were also checked against the list of categories shown in the QA Guidance to ensure all emission categories were covered.

- Data consistency: The input and output data are consistent with USEPA guidance documents as to the (1) area of coverage, (2) pollutants, (3) methodologies and (4) units of measurement employed.
- Area covered: This inventory was compiled on a statewide basis.
- Pollutants covered: CO, NOx and VOM, all ozone precursors, were inventoried in accordance with USEPA guidance requirements.
- Double-counting of emissions: This could occur in categories which have both point and area source emissions represented in the inventory (e.g., the dry cleaning category). The category's point source emissions are assumed to be included in the total or gross emissions, which are generally estimated based on

a surrogate factor such as population. The net area source emissions are then calculated by subtracting the calculated point source emissions from the total in order to avoid accounting for point source emissions twice. Some other area source categories which have the potential for double counting of emission are Graphic Arts, Commercial/Institutional fuel use and Waste Disposal. These were reviewed to make sure no double counting occurred in the inventory.

- Methods and units used: This procedure ensures the methods of calculations employed are consistent with USEPA guidance and usage of such units is correct.

6.6 Data Handling

6.6.1 Data Coding and Recording

Coding and recording of data into the ISSIS and CAERS database is done by trained inventory staff and is subject to standard operating procedures (SOPs). Similarly, updates and corrections discovered in the course of QA efforts were updated by the inventory staff. Any changes to the database are monitored and reviewed by the Inventory and Data Support Unit Manager. QA of information was further carried out by the QA Coordinator before any inclusions were considered into the 2008 inventory.

6.6.2 Data Tracking

Illinois EPA keeps its data and calculations mainly on personal computers and/or the BOA's network. Raw data, especially for area sources, are obtained in various forms which are kept in files by the inventory staff for future reference purposes. Such files may include other information (e.g., sample calculations, estimates, sources of information, various relevant notes and correspondence, etc.) also for reference purposes. Any data in electronic form was backed up so that every file is available for quick recovery and reconstruction of data.

6.6.3 Correcting Data

When an inventory staff member discovers an error in reported data, that data is corrected in both the extracted data for the inventory and the originating data source. First, the person identifying the error consults with the Inventory and Data Support Unit Manager to determine whether a correction is truly necessary. If a correction is warranted, the person responsible for maintaining the extracted data is notified on what changes to make to that data set. Updates to the originating data set are performed by the inventory staff designated by the Inventory and Data Support Unit Manager.

6.6.4 Missing Data

This applies mainly to point source data. As noted above, missing emission data was not a major problem for Illinois EPA, but point source data have been known to be missing or in error for many small sources, and their absence, while not affecting emission totals, could be significant. For point sources, permit data has been used to obtain estimated values for missing data. In other categories, missing data, if they occur, were treated as data needing correction and dealt with accordingly. Where any missing data could not be obtained, a note was made of the fact, and suitable values estimated. The methods used to estimate the data is documented in detailed records.

6.7 QA Audits

6.7.1 Internal

The Illinois EPA did not perform a complete internal or agency QA audit during its work on the 2008 inventory. If the rationale for the choice of one particular data set or methodology over another was an issue, such an issue is discussed. Comments about the reliability or quality of the data (and hence the emission estimate) are also documented. In this sense the inventory documentation is its own audit.

A review of the initial data in the point source inventory was compared against the annual totals reported on the source's AER. Sources where the difference was greater than 10 tons were reviewed and updated as necessary.

6.7.2 External

The 2008 inventory data was required to be submitted to the USEPA by June 1, 2010. As of the writing of this report, the USEPA is just beginning to make available QA reports to the states. Based on the current reports available to Illinois EPA, there does not seem to be any significant problems. Most of the issues identified are minor in nature. In fact, some of the issues identified by USEPA are, in fact, errors in analyzing the data. This includes items such as:

- Identifying stacks whose coordinate is more than one kilometer from the source coordinate when the stack is clearly identified as no longer in operation
- Problems with identifying sources that are not in the county the data says they are in
- Misidentifying the number of critical area source categories not reported by the state

- Also, since USEPA can't be intimately familiar with every state's data, some of these categories are included exclusively in the point source inventory

QA reports provided by USEPA will be reviewed and appropriate data will be corrected. USEPA has already been notified of the errors in their QA reports. Corrections to the data need to be submitted to USEPA by November 1, 2010. At this time, there does not seem to be a need to change previously calculated emissions or add new area source categories to the inventory.

7 Conclusion

This report summarizes and documents Illinois' 2008 inventory of ozone precursor emissions. This report includes emissions for the entire state, plus identification of emissions for the two nonattainment areas of the state and the remaining attainment area. The inventory was developed using actual 2008 emissions and data except in cases where noted.

This document presents the 2008 base year ozone inventory for both typical summer day and annual emissions for reactive CO, NOx and VOM from point, area, on-road mobile and off-road mobile sources for the State of Illinois. In producing this document, Illinois EPA has followed the procedures outlined in USEPA's guidance documents pertaining to both preparation and quality assurance of the inventory and therefore believes the inventory to be complete, accurate and of high quality.

Table 7-1: Daily Emission Summary (tons/day)

Area	CO	NOx	VOM
Chicago NAA	3,383.75	649.65	675.14
Metro-East NAA	335.83	111.47	64.39
Attainment Area	2,337.67	1,238.35	652.49
Total	**6,057.25**	**1,999.47**	**1,392.02**

Table 7-2: Annual Emission Summary (tons/year)

Area	CO	NOx	VOM
Chicago NAA	1,266,381.90	219,625.80	204,377.41
Metro-East NAA	133,963.91	34,632.48	21,147.16
Attainment Area	990,422.39	336,919.10	212,563.57
Total	**2,390,768.20**	**591,177.39**	**438,088.14**

Table 7-3: Statewide Emission Contributions (percent)

Category	CO Daily	CO Annual	NOx Daily	NOx Annual	VOM Daily	VOM Annual
Point	4.8	3.2	38.1	32.8	12.4	11.4
Area	1.4	6.1	2.8	8.0	46.4	47.1
On-Road	47.3	62.4	26.8	33.0	19.3	21.6
Off-Road	46.4	28.3	32.4	26.2	21.8	19.9

Table 7-4: Chicago NAA Emission Contributions (percent)

Category	CO Daily	CO Annual	NOx Daily	NOx Annual	VOM Daily	VOM Annual
Point	2.5	1.8	23.7	16.4	7.9	7.2
Area	1.2	4.3	5.9	14.7	52.1	53.3
On-Road	44.9	61.9	41.6	45.4	19.9	22.7
Off-Road	51.3	32.0	28.7	23.6	20.1	16.8

Table 7-5: Metro-East NAA Emission Contributions (percent)

Category	CO Daily	CO Annual	NOx Daily	NOx Annual	VOM Daily	VOM Annual
Point	17.0	13.0	35.6	33.7	18.4	18.6
Area	1.2	7.8	1.5	4.9	36.3	39.1
On-Road	50.3	60.5	27.7	34.9	25.7	27.0
Off-Road	31.5	18.8	35.3	26.4	19.7	15.3

Table 7-6: Attainment Area Emission Contributions (percent)

Category	CO Daily	CO Annual	NOx Daily	NOx Annual	VOM Daily	VOM Annual
Point	6.5	3.5	45.8	43.3	16.5	14.7
Area	1.7	8.2	1.2	4.0	41.6	41.9
On-Road	50.4	63.2	19.0	24.8	18.1	20.0
Off-Road	41.4	25.1	34.0	27.9	23.7	23.4

Table 7-7: Geographic Contributions (percent)

Area	CO Daily	CO Annual	NOx Daily	NOx Annual	VOM Daily	VOM Annual
Chicago NAA	55.9	53.0	32.5	37.2	48.5	46.7
Metro-East NAA	5.5	5.6	5.6	5.9	4.6	4.8
Attainment Area	38.6	41.4	61.9	57.0	46.9	48.5

Appendix A

2008
Statewide Emissions by Category

Table A-1: Statewide Emissions

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Point Sources						
External Fuel Combustion						
Electric Generation						
Coal	50.27	15,169.33	410.39	121,540.42	5.15	1,551.47
Distillate Oil	1.23	8.71	5.84	40.02	0.05	0.37
Natural Gas	9.64	150.66	39.96	210.80	0.98	13.71
Residual Oil	0.67	0.91	3.23	4.90	0.10	0.14
Other	0.11	36.79	0.10	31.37	0.00	0.52
Industrial						
Coal	8.39	3,069.70	18.97	6,877.22	0.15	53.73
Distillate Oil	0.14	20.86	0.37	47.28	0.00	1.15
Natural Gas	9.97	3,197.57	14.21	4,528.38	0.79	279.39
Residual Oil	0.00	1.91	0.03	17.68	0.00	0.19
Other	2.50	827.86	5.27	1,738.49	0.10	36.62
Commercial/Institutional						
Coal	1.18	322.40	1.80	479.19	0.01	3.69
Distillate Oil	0.06	6.09	0.27	17.42	0.00	0.29
Natural Gas	3.75	1,289.20	5.65	1,870.84	0.25	103.51
Residual Oil	0.00	0.33	0.00	1.92	0.00	0.01
Other	0.16	42.37	0.21	52.00	0.01	2.83
Space Heating						
Natural Gas	0.10	38.65	0.28	88.62	0.02	5.69
Internal Fuel Combustion						
Electric Generation						
Distillate Oil	3.24	44.50	14.81	180.84	0.51	6.71
Landfill Gas	5.14	1,674.07	2.92	954.30	0.39	132.48
Natural Gas	17.41	1,144.37	25.96	1,399.97	4.12	553.24
Industrial						
Diesel	1.12	8.56	2.52	24.39	0.08	0.77
Distillate Oil	1.44	107.46	3.99	261.79	0.20	14.86
Natural Gas	22.66	5,327.65	84.82	20,787.76	4.57	1,028.52
Other	0.31	50.14	2.82	44.13	0.01	3.28

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Commercial/Institutional						
Distillate Oil	1.87	34.63	7.27	134.47	0.24	4.25
Landfill Gas	0.22	30.63	0.13	20.88	0.01	2.74
Natural Gas	0.74	111.45	1.77	215.37	0.16	22.85
Other	0.03	14.03	0.04	16.08	0.00	2.02
Engine Testing						
Diesel	0.40	110.80	3.33	682.93	0.11	31.45
Distillate Oil	0.03	9.46	0.90	231.94	0.02	5.17
Jet Fuel	0.00	0.07	0.00	0.00	0.00	0.00
Other	1.04	174.35	0.05	7.43	0.07	21.24
Industrial Processes						
Chemical Manufacturing						
Adhesives					0.06	20.59
Fixed Roof Tanks			0.01	6.14	0.06	16.29
Ink					0.46	122.16
Nitric Acid			0.29	103.27		
Paint					1.36	350.50
Pharmaceuticals	0.00	0.83	0.00	1.03	0.15	47.45
Phthalic Anhydride	0.38	118.49	0.26	94.72	0.61	205.46
Plastics	0.00	2.77	0.01	6.25	2.11	609.70
Pressure Tanks					0.00	0.05
Sulfuric Acid			0.00	0.28		
Synthetic Organic Fiber					0.17	46.42
Synthetic Rubber					0.05	14.62
Varnish					0.07	21.03
Other	5.67	2,015.81	3.50	674.88	14.54	4,366.16
Fuel Combustion	0.70	247.14	1.21	349.71	0.54	179.92
Fugitives	0.00	0.00	0.00	0.00	1.43	466.44

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Food/Agriculture						
Bakeries	0.04	14.63	0.07	27.33	3.29	1,060.11
Candy			0.00	0.00	0.86	218.86
Feed Manufacturing	0.26	84.22	0.19	56.64	0.08	34.97
Grain Elevators	0.02	6.16	0.10	10.65	0.01	4.46
Milling	0.44	93.39	0.24	57.47	3.69	1,220.03
Smokehouses	0.06	26.34	0.00	1.17	0.04	14.46
Starch Manufacturing	0.12	46.53	0.25	94.94	0.62	129.05
Vegetable Oil	0.00	3.71	0.01	7.48	9.75	3,305.79
Other	5.56	1,926.84	0.78	266.11	10.91	3,589.37
Fuel Combustion	2.90	990.18	1.76	603.10	2.34	944.74
Fugitives					2.78	1,170.24
Primary Metal Production						
Aluminum					0.01	3.33
By-product Coke	0.09	36.68	0.34	178.23	0.24	82.75
Ferroalloy	0.00	0.23	0.00	0.11	0.02	9.17
Iron			0.05	15.31	0.36	113.20
Steel	71.42	20,514.08	3.69	983.65	1.62	432.50
Other	0.33	132.29	0.00	1.17	0.03	11.34
Fuel Combustion	1.25	379.07	4.77	1,029.52	0.02	6.29
Secondary Metal Production						
Aluminum	0.14	40.32	0.13	37.80	0.25	75.37
Copper	3.08	1,079.56	0.12	41.98	0.03	8.51
Gray Iron	1.99	643.44	0.11	36.97	1.78	499.39
Heat Treating	0.01	2.93	0.03	8.38	0.16	44.46
Lead	0.00	0.35	0.00	0.34	0.01	0.54
Lead Battery					0.00	0.11
Steel	0.50	141.95	0.20	42.29	0.46	103.19
Zinc	0.23	71.31	0.24	74.80	0.04	12.45
Other	2.39	747.07	0.11	33.96	0.36	107.90
Fuel Combustion	1.54	430.07	2.16	609.03	0.08	25.61

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Mineral Products						
Asphalt Manufacturing	16.06	1,402.66	5.15	403.12	3.80	384.71
Asphalt Roofing	0.11	35.39	0.00	3.41	0.17	54.84
Brick	0.16	57.51	0.06	21.71	0.01	5.34
Bulk Materials	0.00	0.23	0.00	0.28	0.03	10.04
Cement Manufacturing	6.69	1,952.06	20.83	6,623.70	0.72	213.52
Concrete Manufacturing	0.00	0.33	0.00	0.99	0.02	6.66
Glass Manufacturing	0.24	95.04	11.73	4,714.53	0.32	117.72
Sand/Gravel	0.01	2.20	0.02	4.50	0.00	0.50
Stone Quarrying					0.01	3.02
Other	1.93	548.16	3.98	1,152.64	1.59	482.25
Fuel Combustion	0.74	226.20	0.81	225.58	0.19	62.46
Fugitives	0.00	0.22			0.01	6.07
Petroleum Industry						
Cooling Towers					0.20	74.26
Desulfurization	0.00	3.98	0.01	5.58	0.12	46.44
FCCU	2.93	1,053.71	6.68	2,427.05	0.30	93.55
Flares	0.79	318.55	0.15	66.76	0.46	167.59
Process Heaters	6.02	2,165.88	15.56	5,605.08	0.54	188.89
Waste Water	0.01	7.14	0.00	1.77	0.55	207.34
Other	0.32	158.56	1.06	488.62	1.14	417.16
Fugitives	2.60	1,006.36	0.10	35.79	2.75	1,005.84
Paper and Wood Products						
Plywood	0.00	0.39	0.00	0.47	0.00	0.16
Pulpboard					0.08	23.93
Woodworking					0.00	0.43
Other	0.08	7.97	0.06	6.36	0.46	90.15
Fugitives					0.01	3.86

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Rubber and Plastic Products						
Plastic Foam					2.08	757.33
Plastic Products	0.01	3.33	0.00	4.27	2.50	604.84
Tire Manufacturing					2.06	605.96
Other	0.00	1.47	0.00	0.56	0.56	172.33
Fuel Combustion	0.02	9.95	0.03	11.86	0.00	0.58
Fabricated Metal Products						
Drum Reclamation			0.00	0.76	0.01	3.03
Plating	0.00	0.11	0.01	3.06	0.01	5.37
Welding					0.05	17.67
Other	0.18	59.04	0.24	70.07	2.97	650.13
Fuel Combustion	0.50	167.32	0.63	195.34	0.07	22.41
Fugitives					0.00	2.72
Oil and Gas Production						
Crude Oil					0.33	132.33
Natural Gas	1.68	239.09	5.27	879.70	0.34	96.81
Other	0.00	2.56	0.00	0.86	0.32	49.60
Fuel Combustion	0.04	15.97	0.11	22.14	0.00	2.33
Fugitives					0.07	27.87
Miscellaneous Machinery			0.00	1.00	0.21	55.71
Electrical Equipment	0.00	1.05	0.00	2.09	0.19	53.96
Transportation Equipment					0.42	217.45
Health Services						
Crematories	0.57	135.78	0.00	1.86	0.00	0.03
Labs					0.00	0.48
Sterilizers					0.03	12.12
Leather and Leather Products					0.20	53.24
Textile Products			0.00	0.82	0.01	3.64
Process Cooling					0.23	75.96
In-Process Fuel Use						
Coal	0.00	3.37	0.00	3.91	0.00	0.23
Natural Gas	0.01	4.19	0.00	0.79	0.00	1.57
Other	1.07	338.52	5.08	1,604.06	0.05	18.39

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Miscellaneous Manufacturing						
Miscellaneous Manufacturing	0.08	29.77	0.01	4.67	0.78	210.35
Fuel Combustion	0.11	34.80	1.26	15.23	0.00	7.54
Organic Solvent Emissions						
Organic Solvent Use						
Cold Cleaning					0.82	250.04
Degreasing					1.20	319.21
Dry Cleaning					1.73	461.69
Fugitives					0.17	48.35
Surface Coating Operations						
Adhesives					0.94	216.37
Aircraft			0.00	0.96	0.07	21.11
Automobiles	0.04	8.79	0.12	24.95	4.63	925.76
Fabric					0.00	0.88
Flatwood Products					0.49	109.62
Glass					0.00	0.06
Large Appliances					0.14	39.77
Magnet Wire					0.01	3.24
Metal Cans	0.01	5.45	0.02	6.84	2.45	711.66
Metal Coils	0.00	7.11	0.00	8.47	0.73	179.79
Metal Furniture					0.55	133.02
Miscellaneous Metal Parts	0.00	0.07	0.00	0.99	3.11	891.31
Ovens	0.33	104.55	0.44	151.03	0.10	26.56
Paper					0.96	281.94
Plastic Parts					0.99	302.34
Steel Drums					0.87	208.73
Thinning Solvents					0.70	181.33
Wood Furniture					2.22	543.66
Other	0.00	0.89	0.00	2.04	9.41	2,282.28
Fuel Combustion	0.15	56.90	0.18	68.48	0.01	4.46
Fugitives	0.00	0.01	0.00	0.00	0.23	64.15

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Petroleum Product Storage						
Fixed Roof Tanks					3.14	1,058.76
Floating Roof Tanks					3.86	1,612.35
Variable Vapor Space Tanks					0.12	42.19
Fugitives					0.11	42.13
Bulk Terminals/Plants						
Fixed Roof Tanks					0.59	187.72
Floating Roof Tanks					1.45	525.52
Losses	0.01	4.74	0.02	8.25	0.88	304.43
Variable Vapor Space Tanks					0.01	4.66
Printing/Publishing						
Cleanup					0.72	188.48
Dryers	0.01	1.79	0.02	1.56	0.39	109.75
Flexographic	0.01	3.29	0.01	5.14	2.92	686.80
Letterpress					0.28	77.30
Lithographic					5.44	1,564.80
Rotogravure	0.00	0.61	0.00	0.70	4.05	1,376.08
Screen Printing					0.43	118.12
Thinning Solvents			0.00	0.03	0.34	79.75
Other					0.20	65.24
Fugitive					0.01	3.93
Petroleum Marketing/Transport						
Pipelines					0.00	1.80
Stage I					0.02	5.78
Stage II					0.04	9.40
Tank Cars	0.00	0.48	0.00	0.19	0.88	163.94
Transportation					0.35	104.79
Fugitives					0.25	92.16
Organic Chemical Storage						
Fixed Roof Tanks					2.06	738.12
Floating Roof Tanks	0.00	1.97	0.00	1.18	0.18	58.05
Pressure Tanks					0.01	6.60

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Organic Chemical Transport					0.43	108.99
Organic Solvent Evaporation						
Evaporation	0.00	0.21	0.00	0.09	0.24	75.77
Other					1.23	325.04
Fuel Combustion	0.05	14.54	0.02	8.30	0.00	0.12
Solid Waste Disposal						
Government						
Incineration	0.00	0.05				
Landfills	4.21	1,470.13	1.33	491.28	0.56	222.33
Sewage Treatment	0.15	37.84	0.07	23.61	0.13	39.21
Other	0.00	0.44	0.00	0.44	0.03	6.66
Commercial/Institutional						
Incineration	0.11	33.04	0.07	20.15	0.01	4.74
Other	0.00	0.75	0.00	0.16	0.00	0.59
Fuel Combustion	0.10	14.81	0.01	1.61	0.02	3.78
Industrial						
Incineration	0.05	17.29	0.16	63.40	0.01	3.52
Landfills	1.83	617.28	0.40	143.49	0.10	41.69
TSDFs					0.01	3.75
Other	0.00	0.38	0.00	1.90	0.03	12.25
Site Remediation						
Air Stripping					0.16	58.93
Soil Venting	0.02	1.26	0.02	1.53	0.42	55.02
Other	0.01	0.76	0.00	0.92	0.86	265.61
Point Source Total	**293.57**	**75,316.62**	**760.82**	**193,612.60**	**172.91**	**49,771.44**
Area Sources						
Agricultural Pesticide Application					91.99	22,045.50
Aircraft Refueling					7.51	2,257.22
Architectural Coating					64.13	17,939.62
Asphalt Paving						
Cutback					0.00	6,193.41
Emulsion					4.15	647.49

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Automobile Refinishing					0.73	191.58
Commercial Cooking	3.37	1,226.55			2.94	466.55
Consumer Solvent Use					138.92	50,519.10
Dry Cleaning					3.13	766.78
Forest Fires	0.30	52.01	0.00	1.11	0.01	2.44
Fuel Combustion – Commercial/Institutional						
Coal	0.00	0.00	0.00	0.00	0.00	0.00
Distillate Oil	0.13	137.90	0.53	552.30	0.01	9.45
Kerosene	0.00	0.00	0.00	0.00	0.00	0.00
LPG	0.26	224.07	0.30	261.99	0.01	9.74
Natural Gas	7.24	7,825.97	7.68	9,032.14	0.50	498.37
Residual Oil	0.00	0.18	0.00	2.07	0.00	0.03
Fuel Combustion – Industrial						
Coal	0.00	0.00	0.00	0.00	0.00	0.00
Distillate Oil	0.32	175.40	1.42	738.46	0.01	6.73
Natural Gas	17.17	8,459.06	18.95	9,525.95	1.10	536.10
Residual Oil	0.02	9.84	0.25	108.62	0.00	0.54
Fuel Combustion – Residential						
Coal	0.00	2,388.51	0.00	79.03	0.00	86.85
Distillate Oil	0.01	21.31	0.06	76.71	0.00	2.98
Kerosene	0.00	2.63	0.00	9.54	0.00	0.37
LPG	0.34	411.95	1.22	1,452.68	0.04	56.37
Natural Gas	7.80	9,287.24	18.34	21,825.01	1.07	1,276.99
Wood						
Firelog	0.00	1,730.45	0.00	106.30	0.00	547.30
Fireplaces	0.00	28,617.80	0.00	427.17	0.00	4,887.36
Furnace	0.00	29,918.99	0.00	292.68	0.00	1,902.45
Hydronic Heater	0.00	16,030.59	0.00	156.82	0.00	1,019.33
Wood Stoves	0.00	17,640.30	0.00	289.57	0.00	3,538.47

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Gasoline Marketing						
Stage I					15.12	5,551.87
Stage II					16.24	5,572.46
Storage Tank Breathing					2.61	961.70
Tank Truck Leaks					1.05	381.93
Graphic Arts					206.05	53,319.04
Incineration	15.25	5,561.78	4.47	1,626.72	2.98	1,088.36
Industrial Surface Coating						
Maintenance					15.51	4,030.44
Other Special Purpose					0.17	45.15
Marine Vessel Loading and Transport					3.37	1,052.68
Open Burning						
Prescribed Burning	0.00	3,178.26	0.00	68.17	0.00	149.57
Residential Household Waste	31.55	11,473.99	2.22	809.92	3.17	1,155.49
Yard Waste						
Brush	0.00	418.39			0.00	56.78
Leaves	0.00	334.71	0.00	18.52	0.00	83.67
Pavement Marking					3.76	568.18
Portable Fuel Containers						
Commercial					4.14	1,037.21
Residential					36.87	9,217.84
Solvent Cleaning					11.61	3,654.80
Structure Fires	2.08	840.10	0.04	19.60	0.38	154.02
Waste Water Treatment						
Industrial					6.21	2,422.74
POTW					0.94	373.76
Area Source Totals	**85.91**	**145,968.07**	**55.57**	**47,481.20**	**646.59**	**206,287.04**

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
On-road Mobile Sources						
HDDV	60.22	21,904.25	254.08	83,793.71	11.84	4,279.25
HDGV	121.55	48,731.92	38.16	12,779.35	12.02	4,220.82
LDDT	0.46	153.20	0.50	166.94	0.28	92.08
LDDV	0.15	47.80	0.09	29.44	0.04	13.40
LDGT12	1,114.77	596,147.50	102.21	41,775.69	90.44	32,179.23
LDGT34	462.43	238,836.64	50.94	21,010.97	38.11	14,264.31
LDGV	1,084.77	578,638.87	87.91	34,687.78	112.24	38,303.35
MC	22.94	8,217.52	2.28	1,007.29	4.03	1,298.50
On-road Mobile Source Totals	**2,867.31**	**1,492,677.71**	**536.20**	**195,251.20**	**269.04**	**94,650.98**
Off-road Mobile Sources						
Agricultural Equipment						
2-stroke	0.46	73.71	0.00	0.86	0.12	20.85
4-stroke	92.93	14,300.44	2.14	375.02	3.90	663.19
CNG	0.26	41.22	0.05	9.18	0.06	9.99
Diesel	115.08	18,085.21	221.04	34,737.57	22.16	3,483.88
LPG	0.03	4.92	0.00	1.00	0.00	0.27
Aircraft						
Air Taxi	8.95	3,059.13	0.05	17.17	1.07	364.53
APUs	0.73	266.45	0.46	167.90	0.03	16.06
Commercial	12.65	4,465.72	10.50	3,706.66	3.31	1,170.90
General Aviation	23.23	7,441.13	0.12	40.25	2.18	699.27
Military	1.02	333.36	0.00	1.87	0.00	0.00
Airport Ground Support Equipment						
4-stroke	1.04	370.97	0.04	19.35	0.04	18.27
Diesel	1.33	491.51	3.05	1,126.05	0.22	84.38
LPG	0.32	118.73	0.05	19.85	0.01	5.60
Commercial Equipment						
2-stroke	5.33	1,682.02	0.05	16.19	1.61	500.98
4-stroke	446.09	135,606.17	5.34	2,072.67	21.29	6,523.06
CNG	1.79	565.30	0.49	157.15	0.29	93.34
Diesel	6.81	2,149.16	11.55	3,645.25	1.70	536.59
LPG	7.36	2,323.61	1.98	626.42	0.43	136.83

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Construction and Mining Equipment						
CNG	0.00	1.06	0.00	0.22	0.00	0.21
LPG	1.45	387.47	0.26	71.50	0.07	19.98
Construction Equipment						
2-stroke	8.14	2,172.63	0.04	11.73	1.90	505.67
4-stroke	43.65	11,268.35	0.65	210.02	1.75	472.10
Diesel	47.01	12,545.29	89.37	23,848.13	9.30	2,482.81
Industrial Equipment						
2-stroke	0.05	13.25	0.00	0.11	0.01	3.10
4-stroke	31.87	8,097.79	1.28	405.86	1.42	383.66
CNG	12.53	3,292.68	2.18	574.81	1.86	490.58
Diesel	9.82	2,699.40	20.04	5,511.08	1.84	507.06
LPG	175.96	46,205.62	30.81	8,090.68	8.69	2,283.60
Lawn and Garden Equipment						
2-stroke	89.74	24,011.88	0.67	156.80	25.64	7,234.34
4-stroke	1,308.06	253,641.90	14.71	3,204.28	68.64	13,803.88
Diesel	3.02	501.45	6.47	1,076.95	0.76	126.58
LPG	1.55	255.44	0.26	42.61	0.07	12.06
Locomotives						
Class I	15.20	5,549.16	103.22	37,678.64	5.49	2,005.81
Class II/III	0.61	225.07	6.26	2,285.86	0.24	88.87
Logging Equipment						
2-stroke	0.38	121.70	0.00	0.66	0.09	30.54
4-stroke	0.84	256.27	0.00	3.45	0.03	9.95
Diesel	0.09	31.06	0.27	85.88	0.02	6.42
Marine Vessels						
Commercial	18.33	3,754.18	98.86	20,245.48	2.25	462.91
Recreational						
2-stroke	105.66	32,926.53	3.28	1,023.41	61.38	18,067.04
4-stroke	52.50	16,163.53	3.80	1,266.70	4.98	1,294.06
Diesel	0.60	189.92	3.61	1,127.37	0.14	46.71

Table A-1: Statewide Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Railroad Equipment						
4-stroke	0.69	195.66	0.00	3.11	0.02	7.80
Diesel	0.42	123.75	0.55	161.53	0.10	29.17
LPG	0.00	1.61	0.00	0.33	0.00	0.09
Recreational Equipment						
2-stroke	36.49	30,512.49	0.27	254.47	38.09	20,149.09
4-stroke	118.71	29,942.69	1.38	406.31	9.70	2,448.29
Diesel	0.28	74.38	0.27	70.00	0.07	19.55
LPG	0.09	25.72	0.02	5.80	0.00	1.59
Underground Mining Equipment						
Diesel	1.07	238.85	1.20	267.96	0.25	56.92
Off-road Mobile Source Totals	**2,810.47**	**676,805.79**	**646.89**	**154,832.38**	**303.48**	**87,378.69**
Totals						
Point Source	**293.57**	**75,316.62**	**760.82**	**193,612.60**	**172.91**	**49,771.44**
Area Source	**85.91**	**145,968.07**	**55.57**	**47,481.20**	**646.59**	**206,287.04**
On-road Mobile	**2,867.31**	**1,492,677.71**	**536.20**	**195,251.20**	**269.04**	**94,650.98**
Off-road Mobile	**2,810.47**	**676,805.79**	**646.89**	**154,832.38**	**303.48**	**87,378.69**
Total	**6,057.25**	**2,390,768.20**	**1,999.47**	**591,177.39**	**1,392.02**	**438,088.14**

Appendix B

2008
Chicago NAA Emissions by Category

Table B-1: Chicago NAA Emissions

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Point Sources						
External Fuel Combustion						
Electric Generation						
Coal	10.86	3,396.31	66.45	20,813.37	0.08	24.77
Distillate Oil	1.20	7.86	5.74	37.77	0.05	0.32
Natural Gas	3.07	26.09	18.47	90.23	0.53	2.94
Residual Oil	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.12	36.79	0.10	31.37	0.00	0.52
Industrial						
Coal	0.81	283.23	2.57	914.14	0.01	4.79
Distillate Oil	0.09	16.75	0.24	36.43	0.00	0.89
Natural Gas	4.88	1,589.79	6.59	2,110.17	0.32	109.24
Residual Oil	0.00	0.40	0.00	4.39	0.00	0.03
Other	0.19	71.07	1.85	604.51	0.03	10.00
Commercial/Institutional						
Coal	0.00	9.96	0.00	45.69	0.00	0.15
Distillate Oil	0.02	1.99	0.09	6.97	0.00	0.08
Natural Gas	2.64	960.59	3.98	1,351.92	0.18	75.99
Residual Oil	0.00	0.03	0.00	0.26	0.00	0.01
Other	0.15	40.31	0.18	48.00	0.01	2.64
Space Heating						
Natural Gas	0.05	20.16	0.09	30.80	0.01	2.64
Internal Fuel Combustion						
Electric Generation						
Distillate Oil	0.48	15.59	4.06	69.60	0.08	2.25
Landfill Gas	2.70	885.77	1.81	590.61	0.22	74.49
Natural Gas	2.26	354.64	4.00	399.96	0.25	35.90
Industrial						
Diesel	0.04	0.86	0.19	3.79	0.01	0.07
Distillate Oil	0.69	46.87	2.03	121.96	0.11	7.82
Natural Gas	1.54	258.78	4.56	591.31	0.44	60.35
Other	0.01	0.07	2.56	5.98	0.00	0.02

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Commercial/Institutional						
Distillate Oil	0.41	19.42	2.00	98.03	0.06	2.72
Landfill Gas	0.22	29.69	0.12	16.51	0.02	2.32
Natural Gas	0.69	103.54	1.70	206.07	0.15	19.85
Engine Testing						
Diesel	0.16	28.61	2.25	326.58	0.06	12.45
Distillate Oil	0.04	9.46	0.90	231.94	0.02	5.17
Other	1.04	174.29	0.03	7.30	0.07	21.25
Industrial Processes						
Chemical Manufacturing						
Adhesives					0.03	11.55
Fixed Roof Tanks					0.01	2.01
Ink					0.41	105.34
Paint					0.97	256.12
Pharmaceuticals	0.00	0.83	0.00	1.03	0.15	46.60
Phthalic Anhydride	0.38	118.49	0.26	94.72	0.61	205.46
Plastics	0.00	1.93	0.01	2.35	1.39	398.43
Pressure Tanks					0.00	0.05
Sulfuric Acid			0.00	0.28		
Synthetic Organic Fiber					0.00	0.51
Synthetic Rubber					0.05	12.86
Varnish					0.06	14.69
Other	3.27	1,141.31	1.11	427.31	2.73	903.20
Fuel Combustion	0.52	191.97	0.98	291.26	0.48	161.50
Fugitives	0.00	0.00	0.00	0.00	0.57	210.73
Food/Agriculture						
Bakeries	0.04	14.63	0.08	27.33	2.63	890.00
Candy			0.00	0.00	0.37	98.97
Milling	0.05	15.34	0.03	8.01	0.56	142.23
Smokehouses	0.02	14.66	0.00	1.16	0.03	8.80
Starch Manufacturing	0.05	14.79	0.06	17.63	0.59	114.97
Vegetable Oil	0.01	3.71	0.01	4.41	0.07	23.68
Other	0.02	4.70	0.04	10.02	1.06	285.79

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Fuel Combustion	0.26	89.06	0.30	103.04	0.02	5.63
Fugitives					0.03	164.24
Primary Metal Production						
By-product Coke	0.00	0.00	0.00	0.00	0.00	0.00
Ferroalloy					0.02	9.00
Iron			0.00	0.00	0.00	0.03
Steel	26.60	7,141.46	0.16	44.16	0.06	15.94
Other					0.01	2.67
Fuel Combustion	0.16	45.01	0.25	70.90	0.01	2.96
Fugitives					0.00	0.00
Secondary Metal Production						
Aluminum	0.14	38.35	0.11	33.41	0.15	45.22
Copper	0.01	3.31	0.02	4.26	0.01	2.59
Gray Iron	0.00	0.00	0.00	0.29	0.20	17.14
Heat Treating	0.01	1.51	0.02	5.28	0.10	27.79
Lead	0.00	0.35	0.00	0.34	0.01	0.55
Lead Battery					0.00	0.08
Steel	0.32	96.10	0.06	18.26	0.02	4.66
Zinc	0.02	5.03	0.21	65.82	0.04	11.59
Other	1.08	285.14	0.05	12.80	0.16	39.95
Fuel Combustion	0.21	63.71	0.90	268.85	0.06	16.63
Mineral Products						
Asphalt Manufacturing	5.58	883.74	1.36	208.67	1.37	229.89
Asphalt Roofing	0.07	27.08	0.01	3.41	0.08	27.34
Bulk Materials					0.00	0.00
Concrete Manufacturing					0.00	0.00
Glass Manufacturing	0.08	28.15	1.78	665.56	0.08	27.96
Sand/Gravel	0.01	2.20	0.02	4.51	0.00	0.50
Other	1.63	454.80	2.47	669.92	0.16	41.70
Fuel Combustion	0.43	125.57	0.31	79.05	0.08	19.62
Fugitives	0.00	0.22			0.01	6.07

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Petroleum Industry						
Cooling Towers					0.04	16.36
FCCU	2.31	822.87	3.03	1,129.59	0.01	1.97
Flares	0.00	0.00	0.00	0.00		
Process Heaters	1.39	504.56	4.87	1,696.25	0.18	58.06
Waste Water	0.00	0.57	0.00	0.77	0.10	45.36
Other	0.28	142.40	1.05	483.36	0.14	63.25
Fugitives	2.54	987.54	0.08	30.87	0.35	130.65
Paper and Wood Products						
Plywood					0.00	0.17
Pulpboard					0.06	18.42
Woodworking					0.00	0.43
Other	0.00	0.27	0.00	0.01	0.22	59.66
Fugitives					0.00	1.31
Rubber and Plastic Products						
Plastic Foam					1.88	712.17
Plastic Products	0.01	2.26	0.00	2.70	1.35	357.49
Tire Manufacturing					0.00	0.65
Other	0.01	1.48	0.00	0.57	0.19	62.07
Fuel Combustion	0.03	9.96	0.03	11.87	0.00	0.59
Fabricated Metal Products						
Drum Reclamation	0.00	0.00	0.00	0.77	0.01	3.03
Plating	0.00	0.11	0.01	2.98	0.01	3.85
Welding					0.00	0.60
Other	0.13	45.02	0.17	54.48	1.72	388.44
Fuel Combustion	0.27	93.20	0.34	103.18	0.05	14.08
Fugitives					0.01	2.72
Oil and Gas Production						
Crude Oil					0.00	0.00
Natural Gas	0.05	11.34	0.05	12.88	0.00	0.72
Fuel Combustion	0.00	3.73	0.00	4.42	0.00	0.25
Miscellaneous Machinery					0.08	22.68
Electrical Equipment	0.00	0.39	0.00	0.48	0.19	50.98

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Transportation Equipment					0.02	6.10
Health Services						
Crematories	0.27	77.66				
Labs					0.00	0.48
Sterilizers					0.03	9.41
Leather and Leather Products					0.11	24.02
Textile Products			0.00	0.82	0.01	1.69
Process Cooling					0.07	25.62
In-Process Fuel Use						
Coal	0.01	3.37	0.01	3.91	0.00	0.23
Other	0.00	1.31	0.21	87.11	0.00	0.07
Miscellaneous Manufacturing						
Miscellaneous Manufacturing	0.08	27.34	0.01	3.27	0.50	129.31
Fuel Combustion	0.10	26.30	0.01	3.92	0.00	0.45
Organic Solvent Emissions						
Organic Solvent Use						
Cold Cleaning					0.20	51.24
Degreasing					0.90	237.76
Dry Cleaning					0.90	257.10
Fugitives					0.05	10.24
Surface Coating Operations						
Adhesives			0.00	0.00	0.44	105.05
Aircraft			0.00	0.01	0.03	8.75
Automobiles	0.03	4.98	0.04	5.95	1.84	274.15
Fabric					0.01	0.88
Flatwood Products					0.16	32.93
Magnet Wire					0.02	3.25
Metal Cans	0.00	0.72	0.00	1.20	0.93	294.93
Metal Coils					0.43	105.79
Metal Furniture					0.47	116.07
Miscellaneous Metal Parts			0.00	0.91	1.05	328.55
Ovens	0.17	57.51	0.23	83.99	0.09	23.16
Paper					0.31	85.49

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Plastic Parts					0.08	46.20
Steel Drums					0.67	158.32
Thinning Solvents					0.30	76.45
Wood Furniture					0.53	129.47
Other	0.00	0.42	0.00	1.00	4.44	974.75
Fuel Combustion	0.14	51.72	0.17	62.32	0.01	3.61
Fugitives					0.22	61.14
Petroleum Product Storage						
Fixed Roof Tanks					1.12	328.59
Floating Roof Tanks					1.38	571.06
Variable Vapor Space Tanks					0.08	27.78
Fugitives					0.05	19.25
Bulk Terminals/Plants						
Fixed Roof Tanks					0.08	26.81
Floating Roof Tanks					0.49	189.94
Losses	0.01	3.24	0.02	7.05	0.33	114.61
Variable Vapor Space Tanks					0.00	1.01
Printing/Publishing						
Cleanup					0.36	83.96
Dryers	0.02	1.80	0.02	1.56	0.22	53.48
Flexographic	0.01	1.14	0.01	2.58	1.84	467.78
Letterpress					0.22	56.59
Lithographic					3.20	899.45
Rotogravure	0.01	0.61	0.01	0.70	0.93	253.69
Screen Printing					0.38	83.51
Thinning Solvents			0.00	0.03	0.19	39.50
Other					0.09	21.55
Fugitive					0.02	3.92
Petroleum Marketing/Transport						
Stage I					0.00	1.01
Stage II					0.04	5.94

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Tank Cars	0.00	0.48	0.00	0.19	0.15	36.94
Transportation					0.14	67.95
Fugitives					0.08	28.27
Organic Chemical Storage						
Fixed Roof Tanks					0.41	126.49
Floating Roof Tanks					0.07	22.90
Pressure Tanks					0.02	6.52
Organic Chemical Transport					0.14	13.81
Organic Solvent Evaporation						
Evaporation	0.00	0.21	0.00	0.09	0.05	15.75
Other	0.00	0.00	0.00	0.00	0.70	235.23
Fuel Combustion	0.06	14.43	0.03	8.29	0.01	0.13
Solid Waste Disposal						
Government						
Incineration	0.00	0.04				
Landfills	1.18	375.76	0.37	122.60	0.10	39.53
Sewage Treatment	0.09	17.86	0.01	2.37	0.13	38.70
Other					0.00	0.01
Commercial/Institutional						
Incineration	0.01	3.05	0.01	3.74	0.01	3.83
Other	0.00	0.75	0.00	0.16	0.00	0.59
Fuel Combustion	0.11	14.81	0.01	1.61	0.03	3.78
Industrial						
Incineration	0.03	10.09	0.03	8.35	0.01	3.33
Landfills	0.78	261.01	0.15	49.54	0.06	21.66
TSDFs			0.00	0.00	0.00	1.37
Other	0.00	0.01	0.00	0.01	0.03	10.63
Site Remediation						
Air Stripping					0.01	5.34
Soil Venting					0.32	40.33
Other	0.01	0.76	0.00	0.93	0.03	7.71
Point Source Total	**85.48**	**22,785.13**	**154.25**	**35,939.07**	**53.11**	**14,671.77**

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Area Sources						
Agricultural Pesticide Application					2.42	579.39
Aircraft Refueling					1.95	584.93
Architectural Coating					42.29	11,828.86
Asphalt Paving						
Cutback					0.00	1,082.00
Emulsion					0.73	113.12
Automobile Refinishing					0.35	90.05
Commercial Cooking	2.22	808.75			1.94	307.63
Consumer Solvent Use					91.60	33,310.82
Dry Cleaning					2.18	543.22
Forest Fires	0.02	3.35	0.00	0.07	0.00	0.16
Fuel Combustion – Commercial/Institutional						
Coal	0.00	0.00	0.00	0.00	0.00	0.00
Distillate Oil	0.10	103.01	0.40	413.00	0.01	7.06
Kerosene	0.00	0.00	0.00	0.00	0.00	0.00
LPG	0.20	166.02	0.23	194.50	0.01	7.22
Natural Gas	5.33	5,788.36	5.52	6,682.57	0.35	365.92
Residual Oil	0.00	0.13	0.00	1.49	0.00	0.03
Fuel Combustion – Industrial						
Coal	0.00	0.00	0.00	0.00	0.00	0.00
Distillate Oil	0.21	124.44	1.00	528.29	0.01	4.78
Natural Gas	13.45	6,533.11	15.21	7,555.30	0.85	416.18
Residual Oil	0.02	7.25	0.19	79.79	0.00	0.40
Fuel Combustion – Residential						
Coal	0.00	1,649.87	0.00	54.60	0.00	60.00
Distillate Oil	0.01	8.46	0.03	30.44	0.00	1.18
Kerosene	0.00	1.04	0.00	3.79	0.00	0.15
LPG	0.06	76.65	0.23	270.30	0.01	10.49
Natural Gas	5.32	6,333.35	12.51	14,883.38	0.73	870.84

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Wood						
Firelog	0.00	1,152.34	0.00	70.79	0.00	364.46
Fireplaces	0.00	12,122.98	0.00	189.09	0.00	1,928.81
Furnace	0.00	8,401.01	0.00	82.18	0.00	534.19
Hydronic Heater	0.00	10.67	0.00	0.10	0.00	0.68
Wood Stoves	0.00	5,916.98	0.00	94.75	0.00	1,189.05
Gasoline Marketing						
Stage I					2.03	726.37
Stage II					3.75	1,317.18
Storage Tank Breathing					0.10	36.29
Tank Truck Leaks					0.44	155.54
Graphic Arts					152.09	39,474.79
Incineration	10.13	3,687.33	3.01	1,093.81	1.97	715.93
Industrial Surface Coating						
Maintenance					10.23	2,657.56
Other Special Purpose					0.11	29.77
Marine Vessel Loading and Transport					0.82	254.46
Open Burning						
Prescribed Burning	0.00	244.41	0.00	5.24	0.00	11.50
Residential Household Waste	2.90	1,054.42	0.20	74.43	0.29	106.19
Yard Waste						
Brush	0.00	0.94			0.00	0.13
Leaves	0.00	0.75	0.00	0.04	0.00	0.19
Pavement Marking					1.28	194.04
Portable Fuel Containers						
Commercial					2.47	616.62
Residential					21.92	5,479.98
Solvent Cleaning					6.62	2,103.10
Structure Fires	1.07	419.62	0.03	9.79	0.20	76.93
Waste Water Treatment						
Industrial					1.08	453.79
POTW					0.69	275.23
Area Source Totals	**41.05**	**54,615.25**	**38.56**	**32,317.73**	**351.51**	**108,887.21**

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
On-road Mobile Sources						
HDDV	30.21	10,144.91	117.21	39,651.89	5.96	1,994.16
HDGV	60.32	23,362.63	17.23	5,854.61	5.30	1,837.37
LDDT	0.28	89.32	0.30	95.79	0.17	53.96
LDDV	0.09	27.33	0.05	15.95	0.02	7.46
LDGT12	585.22	311,122.80	56.36	22,675.07	43.72	15,311.29
LDGT34	250.73	127,639.80	29.59	12,034.93	19.52	7,150.83
LDGV	579.32	308,286.00	48.26	18,739.46	57.67	19,315.33
MC	13.68	4,788.12	1.29	558.88	2.23	714.45
On-road Mobile Source Totals	**1,519.84**	**785,460.92**	**270.28**	**99,626.59**	**134.60**	**46,384.86**
Off-road Mobile Sources						
Agricultural Equipment						
2-stroke	0.02	2.51	0.00	0.03	0.00	0.64
4-stroke	3.12	480.12	0.07	11.71	0.12	20.03
CNG	0.01	1.32	0.00	0.29	0.00	0.32
Diesel	3.68	578.64	7.07	1,111.44	0.71	111.47
LPG	0.00	0.16	0.00	0.03	0.00	0.01
Aircraft						
Air Taxi	7.15	2,426.50	0.04	13.62	0.99	335.91
APUs	0.73	266.45	0.46	167.90	0.04	16.06
Commercial	12.23	4,305.74	10.16	3,573.88	3.21	1,128.96
General Aviation	8.39	2,534.77	0.05	13.71	0.79	238.20
Military	0.08	21.32	0.00	0.12	0.00	0.00
Airport Ground Support Equipment						
4-stroke	1.01	356.24	0.04	18.59	0.05	17.53
Diesel	1.28	471.20	2.93	1,079.54	0.22	80.90
LPG	0.31	113.82	0.05	19.03	0.01	5.37
Commercial Equipment						
2-stroke	4.01	1,264.52	0.04	11.72	1.19	370.23
4-stroke	334.39	101,430.90	3.91	1,547.20	15.65	4,802.38
CNG	1.33	418.70	0.37	116.40	0.22	69.14
Diesel	5.05	1,591.80	8.56	2,699.90	1.26	397.44
LPG	5.46	1,721.02	1.47	463.97	0.32	101.35

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Construction and Mining Equipment						
CNG	0.00	0.76	0.00	0.16	0.00	0.15
LPG	1.04	276.97	0.19	51.11	0.05	14.29
Construction Equipment						
2-stroke	5.91	1,576.17	0.03	8.20	1.36	361.31
4-stroke	31.57	8,136.54	0.46	150.92	1.25	336.01
Diesel	33.61	8,967.49	63.88	17,046.87	6.65	1,774.74
Industrial Equipment						
2-stroke	0.03	8.83	0.00	0.07	0.01	2.02
4-stroke	19.65	4,985.15	0.81	261.13	0.89	239.44
CNG	8.07	2,119.72	1.42	371.98	1.22	319.89
Diesel	6.37	1,753.04	12.93	3,558.97	1.19	328.71
LPG	114.83	30,154.37	20.11	5,280.08	5.68	1,490.31
Lawn and Garden Equipment						
2-stroke	69.21	18,277.43	0.50	114.42	19.08	5,309.39
4-stroke	969.41	184,520.80	10.73	2,310.10	48.88	9,571.00
Diesel	2.39	396.46	5.12	851.45	0.60	100.08
LPG	1.23	201.95	0.21	33.69	0.06	9.54
Locomotives						
Class I	2.88	1,051.86	19.66	7,176.95	1.04	380.83
Class II/III	0.15	55.69	1.55	565.61	0.06	21.99
Logging Equipment						
2-stroke	0.04	13.19	0.00	0.06	0.01	3.14
4-stroke	0.09	27.31	0.00	0.36	0.00	0.99
Diesel	0.01	3.18	0.03	8.80	0.00	0.66
Marine Vessels						
Commercial	1.98	405.77	11.03	2,258.88	0.25	52.41
Recreational						
2-stroke	11.60	3,632.60	0.32	98.72	6.21	1,817.64
4-stroke	11.49	3,556.51	0.78	260.72	0.94	235.10
Diesel	0.13	40.02	0.76	238.51	0.03	9.82

Table B-1: Chicago NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Railroad Equipment						
4-stroke	0.20	55.92	0.00	0.88	0.01	2.12
Diesel	0.12	34.37	0.15	44.86	0.03	8.10
LPG	0.00	0.45	0.00	0.09	0.00	0.03
Recreational Equipment						
2-stroke	12.93	4,144.76	0.09	28.90	12.28	3,517.35
4-stroke	44.05	11,103.46	0.49	144.98	3.31	823.38
Diesel	0.10	25.33	0.09	23.84	0.03	6.66
LPG	0.03	8.76	0.01	1.98	0.00	0.54
Underground Mining Equipment					0.00	0.00
Diesel	0.00	0.00	0.00	0.00		
Off-road Mobile Source Totals	**1,737.38**	**405,520.60**	**186.56**	**51,742.40**	**135.91**	**34,433.57**
Totals						
Point Source	**85.48**	**22,785.13**	**154.25**	**35,939.07**	**53.11**	**14,671.77**
Area Source	**41.05**	**54,615.25**	**38.56**	**32,317.73**	**351.51**	**108,887.21**
On-road Mobile	**1,519.84**	**785,460.92**	**270.28**	**99,626.59**	**134.60**	**46,384.86**
Off-road Mobile	**1,737.38**	**405,520.60**	**186.56**	**51,742.40**	**135.91**	**34,433.57**
Total	**3,383.75**	**1,266,381.90**	**649.65**	**219,625.80**	**675.14**	**204,377.41**

Appendix C

2008
Metro-East NAA Emissions by Category

Table C-1: Metro-East NAA Emissions

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Point Sources						
External Fuel Combustion						
Electric Generation						
Coal	1.47	478.22	7.65	2,502.16	0.17	57.38
Distillate Oil	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.05	0.34	0.35	2.38	0.01	0.08
Industrial						
Distillate Oil	0.02	3.11	0.04	5.46	0.00	0.15
Natural Gas	0.39	124.06	0.84	316.06	0.03	10.32
Residual Oil	0.00	0.70	0.03	6.57	0.00	0.14
Other	2.03	660.06	2.13	780.79	0.05	18.50
Commercial/Institutional						
Distillate Oil	0.00	0.30	0.02	1.15	0.00	0.02
Natural Gas	0.06	25.74	0.07	30.51	0.00	1.65
Residual Oil	0.00	0.00	0.00	0.02	0.00	0.00
Space Heating						
Natural Gas	0.00	0.19	0.00	0.23	0.00	0.01
Internal Fuel Combustion						
Electric Generation						
Distillate Oil	0.19	9.24	0.66	33.93	0.05	1.65
Landfill Gas	0.44	125.32	0.24	69.72	0.04	10.40
Natural Gas	1.01	23.93	1.89	36.07	0.10	1.67
Industrial						
Diesel	0.11	0.80	0.41	3.03	0.01	0.08
Distillate Oil	0.00	0.08	0.00	0.37	0.00	0.03
Natural Gas	0.24	54.09	0.32	71.59	0.01	1.53
Other	0.01	1.33	0.03	6.16	0.00	0.60
Commercial/Institutional						
Distillate Oil	0.09	4.31	0.16	7.32	0.00	0.17
Industrial Processes						
Chemical Manufacturing						
Fixed Roof Tanks					0.00	0.03
Paint					0.03	7.02

Table C-1: Metro-East NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Plastics					0.04	14.12
Sulfuric Acid			0.00	0.00		
Synthetic Rubber					0.00	0.10
Other	0.04	15.49	0.00	0.88	0.14	124.67
Fuel Combustion	0.10	29.34	0.03	9.78	0.02	5.59
Fugitives					0.03	11.51
Food/Agriculture						
Bakeries					0.09	21.33
Other	0.00	0.20	0.00	0.10	0.08	25.44
Fuel Combustion	0.01	1.11	0.02	1.33	0.00	0.07
Fugitives						
Primary Metal Production						
By-product Coke	0.10	36.68	0.35	178.23	0.25	82.75
Ferroalloy					0.00	0.00
Iron			0.05	15.31	0.36	113.17
Steel	36.75	11,107.30	1.14	313.36	0.22	53.61
Other	0.33	132.04	0.00	0.87	0.02	8.16
Fuel Combustion	1.08	329.86	4.50	953.62	0.01	3.07
Secondary Metal Production						
Aluminum					0.03	4.40
Copper	3.07	1,076.19	0.11	37.36	0.00	1.16
Gray Iron			0.00	1.01	0.05	10.56
Lead	0.00	0.01	0.00	0.01		
Steel	0.15	39.10	0.11	15.00	0.41	87.22
Zinc	0.00	0.00	0.00	0.00	0.00	0.00
Other	2.38	742.05	0.07	21.16	0.19	63.74
Fuel Combustion	0.12	43.17	0.83	212.66	0.01	2.36
Fugitives					0.00	0.00
Mineral Products						
Asphalt Manufacturing	0.41	93.32	0.17	39.99	0.19	36.06
Asphalt Roofing	0.00	0.40			0.00	0.06
Brick	0.00	0.33	0.00	1.18		

Table C-1: Metro-East NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Concrete Manufacturing	0.00	0.33	0.00	1.00		
Other					0.00	0.03
Petroleum Industry						
Cooling Towers					0.10	37.76
Desulfurization	0.00	0.00	0.00	0.00	0.00	0.00
FCCU	0.12	40.63	3.19	1,123.13	0.04	12.45
Flares	0.50	213.17	0.09	45.92	0.09	31.72
Process Heaters	3.36	1,180.16	8.79	3,152.18	0.23	78.80
Waste Water	0.02	6.57	0.00	1.00	0.42	152.84
Other	0.00	0.00	0.00	0.00	0.00	0.00
Fugitives	0.03	6.71	0.01	2.69	2.01	732.75
Paper and Wood Products						
Pulpboard					0.02	5.52
Rubber and Plastic Products						
Plastic Products					0.02	7.19
Fabricated Metal Products						
Other	0.01	1.84	0.03	6.60	0.01	4.00
Fuel Combustion	0.01	2.01	0.01	2.53	0.01	2.63
Oil and Gas Production						
Natural Gas					0.00	0.00
Transportation Equipment					0.00	0.30
Health Services						
Crematories	0.02	4.51	0.00	0.42		
Sterilizers					0.00	0.17
Leather and Leather Products					0.10	28.86
Textile Products					0.01	1.95
Process Cooling					0.00	1.48
In-Process Fuel Use						
Other	1.01	312.06	4.82	1,494.78	0.01	2.74
Miscellaneous Manufacturing						
Miscellaneous Manufacturing	0.00	0.09	0.00	0.09	0.00	1.13
Fuel Combustion	0.00	0.13	0.00	0.04	0.00	0.03

Table C-1: Metro-East NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Organic Solvent Emissions						
Organic Solvent Use						
Cold Cleaning					0.16	53.45
Degreasing					0.01	1.60
Dry Cleaning					0.06	23.52
Surface Coating Operations						
Adhesives					0.05	9.10
Aircraft					0.03	9.74
Automobiles					0.01	2.16
Fabric					0.00	0.00
Metal Coils	0.00	7.11	0.00	8.47	0.25	60.13
Miscellaneous Metal Parts	0.00	0.07	0.00	0.09	0.29	99.19
Ovens	0.01	1.22	0.01	1.45	0.00	0.08
Paper					0.11	12.94
Thinning Solvents					0.00	0.68
Other					0.28	91.32
Fuel Combustion	0.00	0.67	0.01	0.79	0.00	0.04
Petroleum Product Storage						
Fixed Roof Tanks					0.97	355.88
Floating Roof Tanks					1.40	633.69
Variable Vapor Space Tanks					0.00	0.52
Fugitives					0.00	0.04
Bulk Terminals/Plants						
Fixed Roof Tanks					0.27	74.94
Floating Roof Tanks					0.61	206.16
Losses					0.19	56.49
Printing/Publishing						
Cleanup					0.03	6.36
Flexographic					0.01	2.97
Lithographic					0.04	9.38
Rotogravure					0.03	10.32
Other					0.02	6.67

Table C-1: Metro-East NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Petroleum Marketing/Transport						
Stage I					0.00	0.08
Stage II					0.00	0.47
Tank Cars					0.59	82.73
Transportation					0.22	36.84
Fugitives					0.03	12.72
Organic Chemical Storage						
Fixed Roof Tanks					0.05	43.20
Floating Roof Tanks					0.10	26.49
Pressure Tanks					0.00	0.00
Organic Solvent Evaporation						
Evaporation					0.01	1.93
Other					0.06	21.56
Solid Waste Disposal						
Government						
Landfills	0.75	257.55	0.21	72.67	0.05	17.77
Sewage Treatment					0.00	0.38
Other	0.00	0.44	0.00	0.44		
Commercial/Institutional						
Incineration	0.00	0.14	0.00	0.00	0.00	0.00
Industrial						
Incineration	0.00	1.74	0.14	54.51	0.00	0.19
Landfills	0.55	190.05	0.10	34.90	0.01	2.37
TSDFs					0.00	0.84
Other					0.00	1.51
Site Remediation						
Air Stripping					0.00	0.71
Soil Venting	0.02	1.26	0.03	1.53	0.01	3.70
Other					0.18	64.68
Point Source Total	**57.09**	**17,386.87**	**39.68**	**11,680.60**	**11.85**	**3,928.46**

Table C-1: Metro-East NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Area Sources						
Agricultural Pesticide Application					2.87	687.24
Aircraft Refueling					0.46	137.15
Architectural Coating					2.91	814.55
Asphalt Paving						
Cutback					0.00	282.86
Emulsion					0.19	29.57
Automobile Refinishing					0.03	7.46
Commercial Cooking	0.15	55.69			0.13	21.18
Consumer Solvent Use					6.31	2,293.82
Dry Cleaning					0.14	34.92
Forest Fires	0.01	2.55	0.00	0.05	0.00	0.12
Fuel Combustion – Commercial/Institutional						
Coal	0.00	0.00	0.00	0.00	0.00	0.00
Distillate Oil	0.01	4.68	0.01	18.76	0.00	0.32
Kerosene	0.00	0.00	0.00	0.00	0.00	0.00
LPG	0.01	7.87	0.01	9.22	0.00	0.34
Natural Gas	0.32	294.28	0.39	350.45	0.02	19.30
Residual Oil	0.00	0.01	0.00	0.06	0.00	0.00
Fuel Combustion – Industrial						
Coal	0.00	0.00	0.00	0.00	0.00	0.00
Distillate Oil	0.00	2.52	0.01	17.05	0.00	0.09
Natural Gas	0.35	199.53	0.07	70.70	0.02	10.88
Residual Oil	0.00	0.09	0.00	0.93	0.00	0.00
Fuel Combustion – Residential						
Coal	0.00	11.51	0.00	0.38	0.00	0.42
Distillate Oil	0.00	1.93	0.01	6.94	0.00	0.27
Kerosene	0.00	0.24	0.00	0.86	0.00	0.03
LPG	0.03	31.77	0.09	112.03	0.00	4.35
Natural Gas	0.33	388.38	0.77	912.68	0.04	53.40

Table C-1: Metro-East NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Wood						
Firelog	0.00	84.60	0.00	5.20	0.00	26.76
Fireplaces	0.00	2,077.00	0.00	30.28	0.00	367.25
Furnace	0.00	2,961.56	0.00	28.97	0.00	188.32
Hydronic Heater	0.00	1,941.76	0.00	19.00	0.00	123.47
Wood Stoves	0.00	1,244.78	0.00	21.19	0.00	249.03
Gasoline Marketing						
Stage I					0.38	136.42
Stage II					1.44	484.79
Storage Tank Breathing					0.03	10.42
Tank Truck Leaks					0.08	27.38
Graphic Arts					3.47	898.70
Incineration	0.69	252.94	0.12	42.06	0.14	49.60
Industrial Surface Coating						
Maintenance					0.70	183.00
Other Special Purpose					0.01	2.05
Marine Vessel Loading and Transport					0.73	226.57
Open Burning						
Prescribed Burning	0.00	82.16	0.00	1.76	0.00	3.87
Residential Household Waste	1.93	700.12	0.14	49.42	0.19	70.51
Yard Waste						
Brush	0.00	11.34			0.00	1.54
Leaves	0.00	9.07	0.00	0.50	0.00	2.27
Pavement Marking					0.20	29.63
Portable Fuel Containers						
Commercial					0.20	50.35
Residential					1.79	447.47
Solvent Cleaning					0.42	131.39
Structure Fires	0.15	63.55	0.00	1.48	0.03	11.65
Waste Water Treatment						
Industrial					0.40	143.16
POTW					0.03	12.02
Area Source Totals	**3.98**	**10,429.90**	**1.62**	**1,699.99**	**23.35**	**8,275.88**

Table C-1: Metro-East NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
On-road Mobile Sources						
HDDV	3.25	1,561.45	14.21	5,657.92	0.65	306.33
HDGV	6.62	3,297.34	2.10	873.47	0.58	272.40
LDDT	0.03	8.68	0.03	9.55	0.02	5.26
LDDV	0.01	2.97	0.01	2.00	0.00	0.95
LDGT12	66.44	32,321.33	6.06	2,353.39	5.69	1,928.97
LDGT34	25.57	12,020.83	2.80	1,094.72	2.13	748.03
LDGV	65.56	31,310.72	5.52	2,055.06	7.23	2,373.26
MC	1.43	474.90	0.12	54.85	0.23	72.88
On-road Mobile Source Totals	**168.91**	**80,998.22**	**30.84**	**12,100.97**	**16.53**	**5,708.08**
Off-road Mobile Sources						
Agricultural Equipment						
2-stroke	0.02	2.62	0.00	0.03	0.00	0.68
4-stroke	3.32	508.84	0.07	11.59	0.13	21.76
CNG	0.01	1.38	0.00	0.31	0.00	0.33
Diesel	3.84	604.22	7.38	1,160.57	0.74	116.40
LPG	0.00	0.16	0.00	0.03	0.00	0.01
Aircraft						
Air Taxi	0.36	127.73	0.00	0.72	0.02	5.78
Commercial	0.01	2.13	0.00	1.76	0.00	0.56
General Aviation	1.79	594.32	0.01	3.22	0.17	55.85
Military	0.39	130.47	0.00	0.73	0.00	0.00
Airport Ground Support Equipment						
4-stroke	0.00	0.38	0.00	0.02	0.00	0.02
Diesel	0.00	0.50	0.00	1.14	0.00	0.09
LPG	0.00	0.12	0.00	0.02	0.00	0.01
Commercial Equipment						
2-stroke	0.13	42.27	0.00	0.39	0.04	12.46
4-stroke	11.39	3,436.79	0.13	48.62	0.55	164.48
CNG	0.04	14.00	0.01	3.89	0.01	2.31
Diesel	0.17	53.22	0.29	90.26	0.04	13.29
LPG	0.18	57.54	0.05	15.51	0.01	3.39

Table C-1: Metro-East NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Construction and Mining Equipment						
CNG	0.00	0.06	0.00	0.01	0.00	0.01
LPG	0.08	20.27	0.01	3.74	0.00	1.05
Construction Equipment						
2-stroke	0.43	115.32	0.00	0.60	0.10	26.51
4-stroke	2.35	603.45	0.03	10.40	0.09	25.06
Diesel	2.46	656.12	4.67	1,247.26	0.49	129.85
Industrial Equipment						
2-stroke	0.00	0.41	0.00	0.00	0.00	0.09
4-stroke	1.11	280.07	0.07	17.62	0.06	14.87
CNG	0.39	101.72	0.04	11.99	0.05	12.57
Diesel	0.34	95.27	0.70	196.05	0.06	17.98
LPG	5.32	1,398.18	0.93	244.82	0.26	69.10
Lawn and Garden Equipment						
2-stroke	2.83	791.37	0.02	5.08	0.86	249.04
4-stroke	46.95	9,517.54	0.48	108.60	2.63	542.40
Diesel	0.08	13.71	0.18	29.44	0.02	3.46
LPG	0.04	6.98	0.01	1.16	0.00	0.33
Locomotives						
Class I	0.82	298.77	5.55	2,024.36	0.30	107.80
Class II/III	0.01	3.17	0.09	32.15	0.00	1.25
Logging Equipment						
2-stroke	0.02	4.96	0.00	0.02	0.00	1.18
4-stroke	0.03	10.41	0.00	0.13	0.00	0.39
Diesel	0.00	1.20	0.01	3.31	0.00	0.25
Marine Vessels						
Commercial	3.38	691.74	17.94	3,672.68	0.40	82.57
Recreational						
2-stroke	6.21	1,944.46	0.17	52.84	3.44	1,001.33
4-stroke	2.72	839.78	0.17	57.69	0.25	61.38
Diesel	0.03	9.36	0.18	55.51	0.01	2.30

Table C-1: Metro-East NAA Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Railroad Equipment						
4-stroke	0.04	11.76	0.00	0.17	0.00	0.45
Diesel	0.02	7.13	0.03	9.31	0.01	1.68
LPG	0.00	0.09	0.00	0.02	0.00	0.01
Recreational Equipment						
2-stroke	1.51	389.67	0.01	2.67	1.43	367.45
4-stroke	6.99	1,755.31	0.07	21.43	0.47	116.12
Diesel	0.01	2.96	0.01	2.78	0.00	0.78
LPG	0.00	1.02	0.00	0.23	0.00	0.06
Underground Mining Equipment						
Diesel	0.00	0.00	0.00	0.00	0.00	0.00
Off-road Mobile Source Totals	**105.85**	**25,148.92**	**39.32**	**9,150.92**	**12.66**	**3,234.73**
Totals						
Point Source	**57.09**	**17,386.87**	**39.68**	**11,680.60**	**11.85**	**3,928.46**
Area Source	**3.98**	**10,429.90**	**1.62**	**1,699.99**	**23.35**	**8,275.88**
On-road Mobile	**168.91**	**80,998.22**	**30.84**	**12,100.97**	**16.53**	**5,708.08**
Off-road Mobile	**105.85**	**25,148.92**	**39.32**	**9,150.92**	**12.66**	**3,234.73**
Total	**335.83**	**133,963.91**	**111.47**	**34,632.48**	**64.39**	**21,147.16**

Appendix D

2008
Attainment Area Emissions by Category

Table D-1: Attainment Area Emissions

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Point Sources						
External Fuel Combustion						
Electric Generation						
Coal	37.95	11,294.80	336.28	98,224.89	4.90	1,469.33
Distillate Oil	0.04	0.86	0.10	2.26	0.00	0.05
Natural Gas	6.52	124.23	21.15	118.19	0.44	10.69
Residual Oil	0.67	0.91	3.23	4.90	0.10	0.14
Industrial						
Coal	7.59	2,786.48	16.41	5,963.08	0.14	48.94
Distillate Oil	0.02	1.01	0.09	5.39	0.00	0.12
Natural Gas	4.70	1,483.73	6.78	2,102.15	0.43	159.84
Residual Oil	0.00	0.81	0.01	6.73	0.00	0.03
Other	0.28	96.73	1.29	353.19	0.03	8.12
Commercial/Institutional						
Coal	1.18	312.44	1.80	433.50	0.01	3.54
Distillate Oil	0.03	3.81	0.17	9.30	0.00	0.20
Natural Gas	1.05	302.87	1.61	488.42	0.07	25.88
Residual Oil	0.00	0.31	0.00	1.65	0.00	0.01
Other	0.01	2.06	0.03	4.01	0.00	0.19
Space Heating						
Natural Gas	0.06	18.31	0.20	57.59	0.01	3.05
Internal Fuel Combustion						
Electric Generation						
Distillate Oil	2.58	19.68	10.08	77.31	0.39	2.83
Landfill Gas	2.00	662.99	0.88	293.97	0.14	47.60
Natural Gas	14.14	765.80	20.07	963.95	3.78	515.67
Industrial						
Diesel	0.97	6.90	1.92	17.57	0.07	0.63
Distillate Oil	0.75	60.52	1.96	139.47	0.09	7.01
Natural Gas	20.89	5,014.78	79.95	20,124.86	4.12	966.65
Other	0.30	48.74	0.22	31.99	0.01	2.66

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Commercial/Institutional						
Distillate Oil	1.38	10.91	5.11	29.13	0.17	1.37
Landfill Gas	0.00	0.94	0.01	4.37	0.00	0.42
Natural Gas	0.05	7.91	0.07	9.30	0.02	3.00
Other	0.04	14.03	0.05	16.08	0.01	2.02
Engine Testing						
Diesel	0.25	82.19	1.08	356.35	0.06	19.00
Jet Fuel	0.00	0.08	0.00	0.01	0.00	0.00
Other	0.01	0.06	0.02	0.14	0.00	0.00
Industrial Processes						
Chemical Manufacturing						
Adhesives					0.04	9.05
Fixed Roof Tanks			0.02	6.15	0.05	14.25
Ink					0.06	16.82
Nitric Acid			0.29	103.27		
Paint					0.36	87.36
Pharmaceuticals					0.00	0.86
Plastics	0.00	0.85	0.01	3.90	0.69	197.15
Synthetic Organic Fiber					0.18	45.91
Synthetic Rubber					0.00	1.67
Varnish					0.02	6.34
Other	2.36	859.02	2.38	246.70	11.68	3,338.30
Fuel Combustion	0.09	25.84	0.20	48.68	0.04	12.83
Fugitives					0.83	244.20
Food/Agriculture						
Bakeries	0.00	0.00	0.00	0.00	0.58	148.79
Candy	0.00	0.00			0.49	119.90
Feed Manufacturing	0.26	84.22	0.20	56.64	0.09	34.97
Grain Elevators	0.02	6.17	0.11	10.65	0.02	4.47
Milling	0.39	78.05	0.22	49.46	3.14	1,077.81
Smokehouses	0.04	11.68	0.00	0.02	0.02	5.67
Starch Manufacturing	0.08	31.74	0.19	77.31	0.04	14.08

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Vegetable Oil			0.01	3.07	9.68	3,282.12
Other	5.54	1,921.94	0.74	255.99	9.78	3,278.14
Fuel Combustion	2.63	900.02	1.44	498.74	2.33	939.05
Fugitives					2.76	1,006.01
Primary Metal Production						
Aluminum					0.01	3.33
Ferroalloy	0.00	0.23	0.00	0.11	0.00	0.18
Steel	8.08	2,265.33	2.39	626.13	1.35	362.96
Other	0.00	0.25	0.00	0.30	0.00	0.51
Fuel Combustion	0.02	4.20	0.02	5.00	0.00	0.27
Secondary Metal Production						
Aluminum	0.01	1.97	0.03	4.40	0.07	25.75
Copper	0.00	0.06	0.00	0.37	0.02	4.77
Gray Iron	1.99	643.44	0.11	35.68	1.53	471.69
Heat Treating	0.01	1.42	0.02	3.11	0.06	16.67
Lead Battery					0.00	0.04
Steel	0.03	6.75	0.03	9.04	0.04	11.31
Zinc	0.03	7.60	0.03	8.99	0.00	0.86
Other	0.00	0.00	0.00	0.00	0.02	4.22
Fuel Combustion	0.35	101.77	0.43	127.53	0.02	6.62
Mineral Products						
Asphalt Manufacturing	10.07	425.60	3.62	154.47	2.26	118.77
Asphalt Roofing	0.04	7.91			0.09	27.44
Brick	0.16	57.19	0.06	20.53	0.02	5.34
Bulk Materials	0.00	0.23	0.00	0.28	0.04	10.04
Cement Manufacturing	6.70	1,952.06	20.84	6,623.70	0.72	213.53
Concrete Manufacturing					0.03	6.66
Glass Manufacturing	0.17	66.90	9.96	4,048.97	0.25	89.76
Stone Quarrying					0.01	3.02
Other	0.31	93.37	1.52	482.72	1.44	440.53
Fuel Combustion	0.32	100.64	0.50	146.53	0.12	42.85

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Petroleum Industry						
Cooling Towers					0.06	20.14
Desulfurization	0.01	3.98	0.01	5.58	0.13	46.44
FCCU	0.51	190.22	0.47	174.33	0.26	79.13
Flares	0.29	105.38	0.06	20.85	0.38	135.87
Process Heaters	1.28	481.17	1.90	756.65	0.14	52.03
Waste Water					0.03	9.14
Other	0.04	16.16	0.01	5.26	1.01	353.91
Fugitives	0.03	12.11	0.01	2.23	0.39	142.45
Paper and Wood Products						
Plywood	0.01	0.39	0.01	0.47		
Other	0.08	7.70	0.07	6.35	0.24	30.50
Fugitives					0.01	2.55
Rubber and Plastic Products						
Plastic Foam					0.20	45.16
Plastic Products	0.00	1.08	0.00	1.57	1.13	240.16
Tire Manufacturing			0.00	0.00	2.06	605.31
Other					0.38	110.27
Fabricated Metal Products						
Plating			0.00	0.08	0.01	1.53
Welding					0.06	17.07
Other	0.05	12.19	0.05	9.01	1.24	257.69
Fuel Combustion	0.23	72.12	0.29	89.63	0.02	5.70
Fugitives			0.00	0.00		
Oil and Gas Production						
Crude Oil					0.33	132.34
Natural Gas	1.64	227.76	5.22	866.82	0.34	96.10
Other	0.01	2.56	0.01	0.86	0.32	49.60
Fuel Combustion	0.04	12.24	0.11	17.73	0.00	2.09
Fugitives					0.08	27.87
Miscellaneous Machinery			0.01	1.00	0.13	33.03
Electrical Equipment	0.00	0.67	0.01	1.61	0.01	2.99

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Transportation Equipment	0.00	0.00	0.00	0.00	0.41	211.06
Health Services						
Crematories	0.29	53.61	0.00	1.44	0.00	0.04
Sterilizers					0.01	2.54
Leather and Leather Products					0.00	0.36
Process Cooling					0.16	48.86
In-Process Fuel Use						
Natural Gas	0.01	4.19	0.00	0.79	0.00	1.57
Other	0.07	25.16	0.06	22.17	0.05	15.58
Miscellaneous Manufacturing						
Miscellaneous Manufacturing	0.01	2.35	0.00	1.32	0.28	79.90
Fuel Combustion	0.02	8.37	1.25	11.27	0.01	7.06
Organic Solvent Emissions						
Organic Solvent Use						
Cold Cleaning					0.48	145.36
Degreasing					0.30	79.86
Dry Cleaning					0.78	181.08
Fugitives					0.13	38.11
Surface Coating Operations						
Adhesives					0.45	102.23
Aircraft			0.00	0.96	0.01	2.63
Automobiles	0.02	3.81	0.08	19.00	2.79	649.46
Flatwood Products					0.33	76.69
Glass			0.00	0.00	0.00	0.06
Large Appliances					0.15	39.78
Metal Cans	0.01	4.74	0.02	5.64	1.53	416.73
Metal Coils					0.06	13.87
Metal Furniture					0.09	16.95
Miscellaneous Metal Parts			0.00	0.00	1.78	463.57
Ovens	0.16	45.82	0.21	65.60	0.01	3.32
Paper					0.54	183.52
Plastic Parts					0.91	256.15

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Steel Drums					0.20	50.42
Thinning Solvents					0.40	104.20
Wood Furniture			0.00	0.00	1.70	414.20
Other	0.00	0.48	0.00	1.04	4.69	1,216.21
Fuel Combustion	0.01	4.52	0.01	5.37	0.00	0.82
Fugitives	0.00	0.01	0.00	0.00	0.01	3.02
Petroleum Product Storage						
Fixed Roof Tanks					1.05	374.29
Floating Roof Tanks					1.09	407.61
Variable Vapor Space Tanks					0.04	13.89
Fugitives					0.06	22.84
Bulk Terminals/Plants						
Fixed Roof Tanks					0.25	85.98
Floating Roof Tanks					0.36	129.42
Losses	0.00	1.50	0.00	1.20	0.37	133.34
Variable Vapor Space Tanks					0.01	3.65
Printing/Publishing						
Cleanup					0.33	98.17
Dryers					0.18	56.28
Flexographic	0.01	2.15	0.01	2.56	1.08	216.05
Letterpress					0.07	20.72
Lithographic					2.21	655.98
Rotogravure					3.10	1,112.08
Screen Printing					0.05	34.62
Thinning Solvents					0.15	40.26
Other					0.10	37.02
Fugitive					0.00	0.02
Petroleum Marketing/Transport						
Pipelines					0.00	1.80
Stage I					0.02	4.69
Stage II					0.01	2.98
Tank Cars					0.15	44.27
Fugitives					0.14	51.18

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Organic Chemical Storage						
Fixed Roof Tanks					1.61	568.44
Floating Roof Tanks	0.00	1.97	0.00	1.18	0.02	8.67
Pressure Tanks					0.00	0.09
Organic Chemical Transport					0.29	95.18
Organic Solvent Evaporation						
Evaporation	0.00	0.00	0.00	0.00	0.19	58.10
Other					0.47	68.26
Fuel Combustion	0.00	0.11	0.00	0.02		
Solid Waste Disposal						
Government						
Incineration	0.00	0.02	0.00	0.00	0.00	0.00
Landfills	2.29	836.82	0.76	296.01	0.41	165.04
Sewage Treatment	0.06	19.99	0.06	21.25	0.00	0.14
Other					0.04	6.65
Commercial/Institutional						
Incineration	0.10	29.85	0.07	16.41	0.00	0.92
Industrial						
Incineration	0.02	5.47	0.00	0.54	0.00	0.00
Landfills	0.51	166.23	0.15	59.05	0.04	17.67
TSDFs					0.00	1.55
Other	0.00	0.37	0.01	1.89	0.00	0.11
Site Remediation						
Air Stripping					0.15	52.88
Soil Venting					0.09	10.99
Other					0.66	193.23
Point Source Total	**151.00**	**35,144.61**	**566.89**	**145,992.93**	**107.95**	**31,171.21**
Area Sources						
Agricultural Pesticide Application					86.71	20,778.87
Aircraft Refueling					5.11	1,535.15
Architectural Coating					18.93	5,296.21

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Asphalt Paving						
Cutback					0.00	4,828.55
Emulsion					3.24	504.80
Automobile Refinishing					0.36	94.07
Commercial Cooking	1.00	362.11			0.87	137.74
Consumer Solvent Use					41.01	14,914.46
Dry Cleaning					0.81	188.64
Forest Fires	0.27	46.12	0.01	0.99	0.01	2.17
Fuel Combustion – Commercial/Institutional						
Coal	0.00	0.00	0.00	0.00	0.00	0.00
Distillate Oil	0.03	30.22	0.11	120.54	0.00	2.08
Kerosene	0.00	0.00	0.00	0.00	0.00	0.00
LPG	0.06	50.18	0.07	58.27	0.00	2.17
Natural Gas	1.60	1,743.33	1.77	1,999.13	0.13	113.15
Residual Oil	0.00	0.05	0.00	0.52	0.00	0.01
Fuel Combustion – Industrial						
Coal	0.00	0.00	0.00	0.00	0.00	0.00
Distillate Oil	0.11	48.45	0.42	193.12	0.00	1.86
Natural Gas	3.38	1,726.43	3.68	1,899.96	0.24	109.04
Residual Oil	0.01	2.51	0.07	27.91	0.00	0.14
Fuel Combustion – Residential						
Coal	0.00	727.14	0.00	24.06	0.00	26.44
Distillate Oil	0.01	10.93	0.03	39.34	0.00	1.53
Kerosene	0.00	1.35	0.00	4.89	0.00	0.19
LPG	0.26	303.53	0.90	1,070.36	0.03	41.54
Natural Gas	2.16	2,565.51	5.07	6,028.95	0.30	352.76
Wood						
Firelog	0.00	493.51	0.00	30.32	0.00	156.08
Fireplaces	0.00	14,417.83	0.00	207.80	0.00	2,591.31
Furnace	0.00	18,556.42	0.00	181.53	0.00	1,179.95
Hydronic Heater	0.00	14,078.16	0.00	137.72	0.00	895.19
Wood Stoves	0.00	10,478.55	0.00	173.63	0.00	2,100.39

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Gasoline Marketing						
Stage I					12.71	4,689.08
Stage II					11.05	3,770.50
Storage Tank Breathing					2.49	914.99
Tank Truck Leaks					0.54	199.01
Graphic Arts					50.50	12,945.55
Incineration	4.43	1,621.52	1.35	490.86	0.89	322.83
Industrial Surface Coating						
Maintenance					4.58	1,189.89
Other Special Purpose					0.05	13.33
Marine Vessel Loading and Transport					1.83	571.66
Open Burning						
Prescribed Burning	0.00	2,851.69	0.00	61.17	0.00	134.21
Residential Household Waste	26.73	9,719.46	1.89	686.08	2.69	978.81
Yard Waste						
Brush	0.00	406.11			0.00	55.12
Leaves	0.00	324.89	0.00	17.99	0.00	81.22
Pavement Marking					2.28	344.52
Portable Fuel Containers						
Commercial					1.48	370.25
Residential					13.16	3,290.39
Solvent Cleaning					4.57	1,420.32
Structure Fires	0.86	356.94	0.02	8.33	0.16	65.44
Waste Water Treatment						
Industrial					4.74	1,825.80
POTW					0.22	86.52
Area Source Totals	**40.88**	**80,922.93**	**15.39**	**13,463.48**	**271.73**	**89,123.95**

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
On-road Mobile Sources						
HDDV	26.76	10,197.89	122.67	38,483.90	5.24	1,978.75
HDGV	54.61	22,071.96	18.82	6,051.27	6.14	2,111.05
LDDT	0.16	55.20	0.18	61.60	0.10	32.86
LDDV	0.05	17.50	0.04	11.49	0.02	4.98
LDGT12	463.12	252,703.40	39.79	16,747.23	41.04	14,938.99
LDGT34	186.14	99,176.00	18.56	7,881.32	16.46	6,365.45
LDGV	439.89	239,042.20	34.14	13,893.27	47.34	16,614.76
MC	7.83	2,954.50	0.88	393.56	1.57	511.18
On-road Mobile Source Totals	**1,178.56**	**626,218.57**	**235.07**	**83,523.64**	**117.91**	**42,558.03**
Off-road Mobile Sources						
Agricultural Equipment						
2-stroke	0.44	68.60	0.01	0.81	0.12	19.54
4-stroke	86.50	13,311.48	2.01	351.72	3.65	621.40
CNG	0.25	38.53	0.05	8.58	0.06	9.34
Diesel	107.56	16,902.35	206.60	32,465.56	20.72	3,256.02
LPG	0.03	4.60	0.01	0.94	0.00	0.26
Aircraft						
Air Taxi	1.45	504.90	0.01	2.83	0.07	22.84
Commercial	0.42	157.86	0.35	131.03	0.11	41.39
General Aviation	13.05	4,312.05	0.07	23.33	1.23	405.22
Military	0.57	181.57	0.00	1.02	0.00	0.00
Airport Ground Support Equipment						
4-stroke	0.04	14.36	0.00	0.75	0.00	0.73
Diesel	0.05	19.81	0.12	45.38	0.01	3.40
LPG	0.01	4.78	0.00	0.80	0.00	0.23
Commercial Equipment						
2-stroke	1.19	375.23	0.01	4.08	0.38	118.30
4-stroke	100.32	30,738.51	1.30	476.85	5.09	1,556.20
CNG	0.42	132.61	0.12	36.86	0.07	21.90
Diesel	1.60	504.14	2.71	855.09	0.40	125.87
LPG	1.73	545.07	0.47	146.94	0.10	32.10

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Construction and Mining Equipment						
CNG	0.00	0.25	0.00	0.05	0.00	0.05
LPG	0.34	90.24	0.06	16.65	0.02	4.66
Construction Equipment						
2-stroke	1.80	481.14	0.01	2.94	0.44	117.85
4-stroke	9.73	2,528.36	0.16	48.71	0.41	111.03
Diesel	10.95	2,921.68	20.82	5,554.01	2.17	578.22
Industrial Equipment						
2-stroke	0.02	4.02	0.00	0.04	0.00	0.99
4-stroke	11.12	2,832.58	0.44	132.74	0.49	131.67
CNG	4.08	1,071.24	0.71	185.21	0.59	155.82
Diesel	3.11	851.09	6.41	1,756.06	0.58	160.38
LPG	55.81	14,653.08	9.77	2,565.78	2.76	724.20
Lawn and Garden Equipment						
2-stroke	17.70	4,943.09	0.15	37.30	5.71	1,675.92
4-stroke	291.71	59,603.53	3.51	785.59	17.13	3,690.49
Diesel	0.55	91.29	1.18	196.06	0.14	23.05
LPG	0.28	46.51	0.05	7.76	0.01	2.20
Locomotives						
Class I	11.50	4,198.54	78.02	28,477.32	4.16	1,517.19
Class II/III	0.46	166.21	4.62	1,688.11	0.18	65.63
Logging Equipment						
2-stroke	0.33	103.56	0.00	0.58	0.08	26.23
4-stroke	0.72	218.55	0.01	2.97	0.03	58.58
Diesel	0.08	26.68	0.23	73.77	0.02	5.52
Marine Vessels						
Commercial	12.98	2,656.68	69.90	14,313.93	1.60	327.94
Recreational						
2-stroke	87.85	27,349.48	2.80	871.85	51.74	15,248.08
4-stroke	38.29	11,767.25	2.85	948.29	3.80	997.58
Diesel	0.45	140.55	2.68	833.35	0.11	34.59

Table D-1: Attainment Area Emissions (continued)

Category	CO (tpd)	CO (tpy)	NOx (tpd)	NOx (tpy)	VOM (tpd)	VOM (tpy)
Railroad Equipment						
4-stroke	0.45	127.99	0.01	2.06	0.02	5.24
Diesel	0.28	82.26	0.37	107.37	0.07	19.39
LPG	0.00	1.07	0.00	0.22	0.00	0.06
Recreational Equipment						
2-stroke	22.05	25,978.06	0.18	222.90	24.38	16,264.30
4-stroke	67.67	17,083.93	0.83	239.91	5.93	1,508.80
Diesel	0.18	46.09	0.17	43.38	0.05	12.12
LPG	0.06	15.94	0.01	3.60	0.00	0.99
Underground Mining Equipment						
Diesel	1.08	238.85	1.21	267.96	0.26	56.93
Off-road Mobile Source Totals	**967.23**	**248,136.27**	**421.01**	**93,939.06**	**154.91**	**49,710.39**
Totals						
Point Source	**151.00**	**35,144.61**	**566.89**	**145,992.93**	**107.95**	**31,171.21**
Area Source	**40.88**	**80,922.93**	**15.39**	**13,463.48**	**271.73**	**89,123.95**
On-road Mobile	**1,178.56**	**626,218.57**	**235.07**	**83,523.64**	**117.91**	**42,558.03**
Off-road Mobile	**967.23**	**248,136.27**	**421.01**	**93,939.06**	**154.91**	**49,710.39**
Total	**2,337.67**	**990,422.39**	**1,238.35**	**336,919.10**	**652.49**	**212,563.57**

Appendix E

2008
County Level Emissions

Table E-1: County Level CO Emissions

County	Point	Area	On-road	Off-road	Total
Adams	0.99 259.08	0.71 1,566.74	13.46 6,961.07	18.04 4,477.55	33.21 13,264.44
Alexander	0.32 88.53	0.12 209.10	3.21 1,730.81	6.55 1,756.83	10.21 3,785.27
Bond	0.31 10.41	0.27 357.12	8.12 4,163.60	4.70 1,093.69	13.40 5,624.82
Boone	1.00 113.32	0.54 1,008.17	17.66 9,358.65	7.38 3,828.88	26.59 14,309.02
Brown	0.17 0.10	0.08 119.68	1.55 840.64	1.67 384.38	3.47 1,344.79
Bureau	1.25 21.52	0.57 841.77	16.04 8,848.73	11.58 2,566.58	29.44 12,278.60
Calhoun	0.00 0.00	0.12 145.21	1.08 582.35	7.27 2,117.29	8.47 2,844.84
Carroll	0.08 23.34	0.31 521.73	3.88 2,233.56	9.43 8,024.79	13.70 10,803.42
Cass	0.16 30.47	0.19 1,649.39	2.95 1,564.69	6.22 1,504.27	9.52 4,748.83
Champaign	2.93 470.62	1.16 3,584.25	52.15 27,937.35	33.38 7,704.48	89.62 39,696.70
Christian	5.71 1,136.58	0.40 708.17	9.20 4,836.64	9.60 2,213.17	24.92 8,894.56
Clark	0.78 196.71	0.26 378.69	10.17 5,312.46	5.45 1,229.47	16.66 7,117.33
Clay	0.69 6.01	0.29 359.16	4.15 2,209.36	5.94 1,379.76	11.07 3,954.29
Clinton	2.08 682.13	0.44 710.45	10.71 5,713.12	13.70 3,557.79	26.93 10,663.49
Coles	0.60 77.23	0.38 1,058.70	16.00 8,114.66	8.82 2,075.30	25.81 11,325.89
Cook	47.21 12,430.46	23.01 34,183.78	837.69 432,879.00	830.34 202,575.70	1,738.25 682,068.93
Crawford	3.41 1,189.08	0.29 439.00	4.71 2,500.40	5.11 1,169.24	13.52 5,297.72
Cumberland	0.00 0.01	0.25 267.61	8.46 4,399.88	2.95 626.74	11.65 5,294.24
DeKalb	0.47 100.29	0.86 788.01	25.53 13,919.42	16.99 4,816.88	43.85 19,624.61
DeWitt	0.59 177.51	0.22 354.09	5.62 3,161.18	6.11 1,442.86	12.54 5,135.64
Douglas	4.15 1,050.10	0.38 505.34	7.73 4,088.06	5.28 1,180.80	17.54 6,824.31
DuPage	3.30 677.02	5.28 6,327.19	215.63 111,577.61	300.48 67,417.49	524.69 185,999.30
Edgar	0.06 15.33	0.27 375.12	4.67 2,478.07	5.81 1,206.27	10.82 4,074.79
Edwards	0.00 0.47	0.15 176.30	1.97 1,062.54	2.54 556.32	4.65 1,795.62

Table E-1: County Level CO Emissions (continued)

County	Point	Area	On-road	Off-road	Total
Effingham	0.24	0.66	18.79	9.94	29.62
	13.76	851.98	9,529.70	2,303.50	12,698.94
Fayette	0.38	0.34	11.99	7.95	20.66
	65.00	483.79	6,168.28	1,886.39	8,603.64
Ford	1.12	0.16	4.52	4.57	10.37
	17.87	389.92	2,564.69	936.31	3,908.78
Franklin	0.03	0.49	14.04	9.83	24.39
	10.42	929.66	7,144.40	2,646.29	10,730.77
Fulton	0.67	0.52	8.90	9.94	20.02
	200.89	1,008.49	5,046.63	2,488.10	8,744.12
Gallatin		0.14	2.12	3.22	5.47
		161.71	1,150.45	715.52	2,027.68
Greene		0.23	3.02	6.25	9.50
		327.63	1,627.96	1,366.30	3,321.88
Grundy	1.74	0.54	19.68	12.46	34.42
	613.93	835.12	10,423.21	3,022.02	14,894.28
Hamilton	0.00	0.13	2.21	2.90	5.24
	0.35	221.00	1,188.73	569.25	1,979.32
Hancock	0.23	0.33	5.26	10.30	16.12
	7.96	488.71	3,030.89	2,555.44	6,083.00
Hardin	0.12	0.10	1.07	2.10	3.40
	5.74	124.89	577.37	533.51	1,241.51
Henderson	0.00	0.17	3.06	6.32	9.55
	0.45	214.33	1,766.99	1,656.35	3,638.12
Henry	2.90	0.61	19.82	11.32	34.66
	705.59	1,124.56	10,780.19	2,614.47	15,224.81
Iroquois	0.34	0.53	14.58	12.16	27.61
	36.92	711.50	8,176.05	2,611.94	11,536.42
Jackson	0.99	0.60	13.92	12.00	27.52
	130.62	1,336.16	7,169.66	3,156.98	11,793.41
Jasper	4.25	0.16	3.55	3.91	11.87
	1,246.54	224.55	1,914.25	834.84	4,220.17
Jefferson	0.14	0.57	20.69	10.71	32.10
	39.09	869.61	10,556.68	2,737.64	14,203.03
Jersey	0.00	0.34	5.30	6.41	12.05
	0.10	466.77	2,824.12	1,566.25	4,857.24
JoDaviess	2.71	0.39	6.51	9.42	19.03
	842.66	602.69	3,712.99	6,572.67	11,731.02
Johnson	0.15	0.26	6.82	3.21	10.44
	24.97	311.20	3,561.75	826.13	4,724.04
Kane	1.89	3.12	98.14	142.73	245.88
	476.32	3,194.17	50,603.82	30,574.62	84,848.93
Kankakee	4.48	0.93	27.82	17.28	50.51
	774.66	2,121.95	14,914.80	4,990.29	22,801.69
Kendall	3.45	0.82	21.65	17.91	43.82
	419.34	975.54	11,466.40	5,501.85	18,363.12
Knox	1.44	0.38	15.38	12.53	29.74
	37.51	1,130.66	8,327.99	2,950.38	12,446.53

Table E-1: County Level CO Emissions (continued)

County	Point	Area	On-road	Off-road	Total
Lake	7.14	3.98	144.72	243.90	399.74
	1,555.47	4,580.10	74,790.36	52,780.37	133,706.30
LaSalle	4.96	1.14	39.85	28.19	74.13
	1,317.30	2,317.22	21,637.92	6,742.31	32,014.74
Lawrence	0.01	0.21	4.41	4.53	9.17
	4.41	339.15	2,387.10	1,042.05	3,772.71
Lee	3.15	0.49	15.89	10.49	30.02
	798.99	760.96	8,822.02	5,016.17	15,398.15
Livingston	1.58	0.45	15.52	10.71	28.26
	335.99	784.72	8,655.18	2,247.74	12,023.63
Logan	0.16	0.34	14.57	6.47	21.54
	49.24	622.09	8,013.38	1,391.06	10075.76
McDonough	0.63	0.33	7.46	6.03	14.46
	88.07	708.84	4,188.30	1,340.61	6,325.82
McHenry	1.50	2.40	58.89	81.09	143.88
	269.24	2,208.03	30,616.45	18,220.53	51,314.26
McLean	0.94	1.36	52.96	33.36	88.61
	164.40	3190.02	28,178.40	7,286.70	38,819.52
Macon	12.22	0.83	28.08	22.57	63.69
	4,196.78	2,133.02	14,080.89	5,135.38	25,546.08
Macoupin	0.02	0.70	11.59	9.39	21.69
	4.41	1,031.14	6,097.60	2,158.79	9,291.94
Madison	55.16	1.76	78.45	50.92	186.30
	16,834.44	4,700.38	37,621.25	12,122.73	71,278.80
Marion	0.13	0.47	13.57	9.03	23.20
	27.76	879.60	7,021.41	2,256.28	10,185.05
Marshall	0.17	0.24	5.66	6.56	12.63
	27.17	330.35	3,197.02	1,665.86	5,220.39
Mason	1.67	0.23	3.40	10.46	15.75
	454.69	405.68	1,945.63	2,670.94	5,476.94
Massac	6.30	0.19	6.32	3.47	16.28
	1,942.27	336.30	3,216.26	805.02	6,299.84
Menard		0.22	2.71	3.53	6.46
		299.54	1,458.72	776.00	2,534.27
Mercer	0.00	0.31	3.73	6.15	10.20
	0.42	404.79	2,138.88	1,427.59	3,971.68
Monroe	0.16	0.38	10.87	9.09	20.51
	3.19	629.58	5,197.98	2,178.54	8,009.29
Montgomery	3.30	0.39	13.98	8.99	26.66
	876.20	682.92	7,268.98	2,064.03	10,892.13
Morgan	2.54	0.36	9.91	9.41	22.22
	430.90	674.79	5,163.14	2,133.14	8,401.97
Moultrie	0.23	0.28	4.14	5.49	10.15
	0.72	317.20	2,251.72	1,341.42	3,911.06
Ogle	1.07	0.75	19.11	15.79	36.72
	286.34	1,214.14	10,599.15	5,583.93	17,683.56
Peoria	14.28	1.14	50.70	46.69	112.82
	3,138.70	3,805.43	26,867.56	10,627.29	44,438.98

Table E-1: County Level CO Emissions (continued)

County	Point	Area	On-road	Off-road	Total
Perry	1.52 80.85	0.31 521.23	5.23 2,750.79	5.25 1,234.64	12.31 4,587.52
Piatt	1.86 323.18	0.27 406.85	6.50 3,564.25	4.24 867.34	12.87 5,161.62
Pike	0.77 194.61	0.31 412.13	7.02 3,717.40	10.28 2,562.61	18.38 6,886.75
Pope		0.10 112.65	1.32 712.65	1.68 429.65	3.10 1,254.95
Pulaski	0.14 41.11	0.15 180.56	3.40 1,773.54	2.10 504.23	5.79 2,499.44
Putnam	1.51 332.42	0.14 168.39	1.81 1,037.27	4.93 1,308.43	8.38 2,846.51
Randolph	6.29 1,906.90	0.39 666.44	7.09 3,805.68	10.78 2,529.68	24.56 8,908.71
Richland	0.01 1.03	0.20 370.27	4.00 2,104.68	4.51 1,011.27	8.71 3,487.25
Rock Island	2.11 651.54	1.20 3,076.19	36.26 18,967.25	30.75 7842.96	70.32 30,537.94
St. Clair	1.77 549.14	1.49 4,633.17	74.28 35,354.87	39.43 9,281.40	116.97 49,818.58
Saline	0.04 13.74	0.26 547.75	6.81 3,617.79	4.81 1,155.50	11.92 5,334.77
Sangamon	3.97 697.04	1.35 3,665.13	60.19 29,698.86	43.75 9,750.50	109.26 43,811.53
Schuyler	0.11 6.55	0.10 186.29	2.46 1,420.73	2.86 648.59	5.53 2,262.16
Scott	0.14 23.93	0.12 137.76	2.70 1,426.51	2.56 548.66	5.52 2,136.87
Shelby	0.58 8.16	0.40 519.68	7.68 4,123.63	9.21 2,134.83	17.87 6,786.30
Stark		0.14 164.64	1.89 1,077.12	2.39 451.98	4.41 1,693.73
Stephenson	0.21 54.76	0.49 1,036.14	11.98 6,738.14	9.68 4,072.59	22.37 11,901.62
Tazewell	9.78 1,838.66	1.00 2,652.65	37.35 19,776.97	29.08 6,580.10	77.21 30,848.38
Union	0.31 48.58	0.28 430.24	6.71 3,520.09	4.71 1,185.85	12.01 5,184.76
Vermilion	3.39 578.35	0.74 1,754.47	22.90 12,322.54	15.73 3,695.29	42.75 18,350.64
Wabash	0.04 2.48	0.13 268.76	2.61 1,368.94	3.57 856.05	6.35 2,496.23
Warren	0.14 37.21	0.21 402.81	5.87 3,322.13	5.08 1,088.66	11.30 4,850.80
Washington	0.03 7.69	0.29 388.20	10.73 5,608.01	8.17 1,643.41	19.21 7,647.31
Wayne	0.88 201.98	0.28 411.91	6.94 3,639.22	5.66 1,230.21	13.75 5,483.31

Table E-1: County Level CO Emissions (continued)

County	Point	Area	On-road	Off-road	Total
White	3.29 714.30	0.23 369.63	5.83 3,088.17	5.75 1,322.18	15.10 5,494.28
Whiteside	5.35 1,578.67	0.73 1,311.22	14.56 8,059.95	15.01 3,655.54	35.64 14,605.39
Will	22.63 6,733.99	2.91 3,781.79	153.31 79,237.74	127.21 28,437.75	306.06 118,191.26
Williamson	3.85 1,074.42	0.63 1,403.11	23.23 11,936.68	13.75 3,747.47	41.45 18,161.68
Winnebago	1.95 375.57	2.41 6,007.97	76.07 39,506.59	60.84 14,290.26	141.27 60,180.38
Woodford	0.02 5.66	0.62 882.55	12.93 7,282.40	13.71 3,200.12	27.28 11,370.73

Top value has units of tons/day
Bottom value has units of tons/year

Table E-2: County Level NOx Emissions

County	Point	Area	On-road	Off-road	Total
Adams	1.62	0.22	2.27	6.70	10.81
	484.43	262.51	951.84	1,440.70	3,139.49
Alexander	0.66	0.03	0.64	7.89	9.21
	186.34	23.92	236.97	1,729.18	2,176.41
Bond	0.11	0.05	2.10	2.45	4.72
	8.76	47.59	570.78	562.47	1,189.59
Boone	1.18	0.25	3.35	2.26	7.04
	222.51	209.44	1,227.49	485.62	2,145.06
Brown	0.07	0.02	0.26	0.80	1.14
	0.05	15.02	115.02	135.84	265.93
Bureau	3.01	0.17	4.12	7.09	14.39
	33.72	134.81	1,163.77	1,640.79	2,973.09
Calhoun	0.00	0.02	0.17	4.29	4.48
	0.01	17.76	79.68	907.05	1,004.50
Carroll	0.07	0.07	0.64	4.93	5.71
	25.68	59.86	293.07	1,279.89	1,658.51
Cass	0.12	0.05	0.46	5.10	5.73
	33.28	69.86	213.98	1,041.74	1,358.85
Champaign	6.94	0.59	10.69	10.44	28.66
	1,041.08	631.04	3,666.53	2,402.49	7,741.15
Christian	61.74	0.11	1.40	4.82	68.07
	18,590.19	102.95	661.28	947.88	20,302.29
Clark	0.87	0.07	2.89	3.22	7.05
	4.64	57.18	728.78	689.68	1,480.28
Clay	0.94	0.12	0.66	2.69	4.41
	6.50	77.44	302.18	558.02	944.15
Clinton	7.20	0.15	2.17	3.76	13.27
	2,338.00	119.25	782.28	868.45	4,107.97
Coles	0.45	0.13	3.01	3.30	6.89
	112.29	145.54	1,110.05	684.08	2,051.95
Cook	48.47	22.99	150.73	97.70	319.88
	10,001.76	20,027.97	55,167.72	28,087.95	113,285.40
Crawford	9.63	0.07	0.72	2.09	12.51
	3,146.71	60.22	341.97	380.57	3,929.47
Cumberland	0.00	0.04	2.54	2.20	4.77
	0.04	32.79	603.79	495.08	1,131.70
DeKalb	0.45	0.40	4.49	6.87	12.21
	101.36	298.85	1,825.32	1,677.16	3,902.69
DeWitt	0.31	0.05	1.15	2.18	3.69
	73.83	47.80	415.04	387.04	923.71
Douglas	15.34	0.16	1.92	3.34	20.77
	4,184.84	101.51	560.35	750.13	5,596.84
DuPage	4.53	5.76	38.81	22.82	71.93
	707.86	4,282.38	14,220.39	6,276.14	25,486.78
Edgar	0.11	0.09	0.74	3.84	4.78
	19.75	69.31	338.87	721.39	1,149.31
Edwards	0.00	0.02	0.32	1.20	1.54
	0.00	20.16	145.38	230.20	395.74

Table E-2: County Level NOx Emissions (continued)

County	Point	Area	On-road	Off-road	Total
Effingham	0.21 18.06	0.29 184.58	4.48 1,305.59	4.14 987.07	9.13 2,495.30
Fayette	1.47 205.24	0.07 58.01	3.22 845.76	3.95 823.92	8.71 1,932.93
Ford	1.81 49.41	0.05 44.23	0.98 337.00	3.15 579.25	5.98 1,009.89
Franklin	0.09 29.16	0.11 104.23	3.13 978.46	3.28 899.10	6.61 2,010.96
Fulton	10.23 3,405.72	0.13 111.85	1.45 661.81	3.91 820.40	15.72 4,999.79
Gallatin		0.02 20.11	0.36 157.41	3.08 586.34	3.46 763.86
Greene		0.05 43.72	0.48 222.75	6.84 1,330.90	7.38 1,597.36
Grundy	3.74 1,174.75	0.18 149.22	4.40 1401.68	6.45 1,544.66	14.78 4,270.31
Hamilton	0.00 1.02	0.03 25.29	0.35 162.65	2.00 369.13	2.38 558.09
Hancock	0.08 3.79	0.07 59.37	0.88 397.69	6.84 1,427.09	7.87 1,887.95
Hardin	0.07 5.63	0.02 14.36	0.17 79.00	2.31 473.91	2.57 572.90
Henderson	0.00 0.00	0.03 28.69	0.52 231.85	5.77 1,517.63	6.32 1,778.17
Henry	7.91 1,952.46	0.20 175.24	4.74 1,416.92	6.09 1,328.35	18.94 4,872.96
Iroquois	0.21 25.63	0.10 93.25	3.66 1,075.26	9.27 2,064.17	13.25 3,258.31
Jackson	1.24 135.93	0.15 142.75	2.04 979.68	7.09 1,897.93	10.52 3,156.29
Jasper	13.64 3,994.85	0.04 31.16	0.56 261.92	2.47 416.49	16.70 4,704.41
Jefferson	0.14 43.74	0.13 115.54	5.38 1,447.05	4.11 1,081.51	9.77 2,687.84
Jersey		0.07 63.22	0.85 386.22	4.69 936.13	5.62 1,385.57
JoDaviess	5.36 815.61	0.09 87.74	1.08 487.02	5.18 1,386.90	11.71 2,777.27
Johnson	0.13 24.05	0.04 28.43	2.01 488.69	1.19 343.47	3.36 884.65
Kane	2.22 543.77	2.30 1,882.18	16.46 6,262.82	16.14 4,279.08	37.12 12,967.85
Kankakee	8.40 2,326.30	0.31 319.05	4.72 1,955.28	6.48 1,547.38	19.92 6,148.01
Kendall	6.90 1,087.37	0.28 273.71	3.20 1,575.76	4.22 1,023.94	14.60 3,960.79
Knox	0.71 49.13	0.14 165.84	3.30 1,093.58	7.80 2,158.12	11.95 3,466.66

Table E-2: County Level NOx Emissions (continued)

County	Point	Area	On-road	Off-road	Total
Lake	22.13	3.71	24.52	16.60	66.97
	3,828.54	2,985.41	9,512.46	4,512.65	20,839.06
LaSalle	8.89	0.38	8.89	12.04	30.20
	2,476.34	373.35	2,842.15	2,765.57	8,457.41
Lawrence	0.04	0.05	0.72	2.02	2.84
	10.41	46.33	326.61	378.47	761.81
Lee	7.30	0.20	4.16	6.67	18.33
	1,805.99	138.84	1,160.26	1,658.50	4,763.59
Livingston	1.96	0.15	3.78	7.26	13.15
	350.22	130.16	1,137.88	1,371.80	2,990.05
Logan	1.53	0.09	4.08	3.73	9.44
	473.16	84.61	1,054.55	653.38	2265.69
McDonough	1.12	0.13	1.18	4.23	6.67
	124.50	88.59	549.06	977.69	1,739.84
McHenry	2.19	1.80	9.92	10.05	23.96
	314.38	1,242.46	3,765.73	2,500.10	7,822.67
McLean	2.03	0.55	10.94	9.19	22.70
	364.59	485.90	3,698.04	1,779.71	6,328.24
Macon	17.65	0.47	4.56	5.43	28.11
	6339.59	433.79	1,924.29	1,218.66	9,916.33
Macoupin	0.02	0.16	2.38	4.79	7.35
	5.97	146.01	834.95	969.97	1,956.90
Madison	37.84	0.75	15.08	18.54	72.22
	11,353.55	799.86	5,656.45	4,258.14	22,068.00
Marion	0.14	0.16	3.02	3.74	7.06
	21.73	133.31	961.55	950.28	2,066.87
Marshall	0.66	0.05	1.39	5.92	8.03
	165.03	43.43	420.41	1,435.39	2,064.26
Mason	3.12	0.05	0.54	7.97	11.68
	641.30	46.34	255.29	1,587.00	2,529.94
Massac	35.79	0.05	1.42	3.85	41.11
	10,636.84	42.56	440.53	854.39	11,974.32
Menard		0.04	0.43	1.53	2.00
		36.96	199.59	283.97	520.51
Mercer	0.01	0.06	0.60	3.56	4.23
	0.48	50.92	280.65	640.01	972.05
Monroe	0.50	0.09	1.76	7.51	9.86
	10.64	81.22	745.39	1,843.81	2,681.06
Montgomery	36.98	0.11	3.60	4.69	45.38
	9,802.33	97.35	996.46	1,035.66	11,931.81
Morgan	19.01	0.12	2.03	4.79	25.95
	3,093.69	107.75	706.73	1,075.93	4,984.10
Moultrie	0.88	0.10	0.70	2.43	4.11
	2.35	66.70	308.09	508.47	885.61
Ogle	1.42	0.25	4.21	6.40	12.28
	202.24	208.37	1,392.57	1,583.12	3,386.29
Peoria	25.51	0.60	8.48	8.17	42.75
	6,710.99	629.70	3,520.43	2,193.19	13,054.32

Table E-2: County Level NOx Emissions (continued)

County	Point	Area	On-road	Off-road	Total
Perry	0.91 61.66	0.07 55.77	0.82 376.06	2.25 487.81	4.04 981.30
Piatt	9.60 3,176.14	0.06 50.90	1.68 468.80	3.26 665.00	14.59 4,360.83
Pike	6.25 1,707.64	0.06 52.94	1.71 509.49	5.82 1,195.55	13.85 3,465.62
Pope		0.02 12.59	0.21 97.51	2.43 515.12	2.65 625.22
Pulaski	0.16 45.08	0.02 20.38	0.95 243.29	2.29 501.53	3.43 810.29
Putnam	5.12 1,177.64	0.02 20.63	0.30 136.11	2.39 487.31	7.83 1,821.69
Randolph	16.38 4,953.93	0.12 97.42	1.15 520.57	8.45 2,006.10	26.10 7,578.01
Richland	0.01 1.22	0.06 57.97	0.61 287.76	2.16 397.27	2.84 744.22
Rock Island	3.19 706.33	0.92 733.37	5.91 2,484.62	6.82 1,574.90	16.83 5,499.22
St. Clair	1.34 316.41	0.70 755.69	13.15 5,312.91	8.57 2,112.84	23.77 8,497.86
Saline	0.01 3.43	0.08 78.75	1.08 494.74	1.80 372.87	2.97 949.78
Sangamon	27.75 6,797.76	0.80 791.74	10.94 4,061.23	7.56 1,661.03	47.06 13,311.77
Schuyler	0.47 12.45	0.02 18.97	0.42 186.42	1.63 331.29	2.54 549.12
Scott	0.06 7.63	0.02 16.26	0.65 195.52	3.77 762.01	4.51 981.42
Shelby	1.82 34.78	0.08 69.82	1.34 564.39	4.41 853.08	7.64 1,522.08
Stark		0.02 18.82	0.30 141.33	1.71 292.70	2.03 452.85
Stephenson	0.32 95.49	0.15 146.65	1.90 883.36	3.50 680.95	5.87 1,806.45
Tazewell	117.87 31,393.37	0.47 443.78	6.59 2,592.78	8.94 1,868.39	133.87 36,298.32
Union	0.24 52.90	0.05 46.15	1.50 482.08	4.39 1,110.37	6.18 1,691.49
Vermilion	13.35 2,035.17	0.26 282.09	4.18 1,615.97	7.29 1,710.82	25.08 5,644.06
Wabash	0.04 2.36	0.04 37.36	0.40 187.14	1.35 270.62	1.82 497.49
Warren	0.12 42.20	0.06 52.66	0.95 435.64	5.23 1,323.47	6.35 1,853.97
Washington	0.03 9.17	0.05 45.00	3.12 769.38	3.76 748.13	6.97 1,571.69
Wayne	1.49 651.55	0.06 54.46	1.61 498.58	3.00 566.83	6.16 1,771.42

Table E-2: County Level NOx Emissions (continued)

County	Point	Area	On-road	Off-road	Total
White	6.60 1,021.17	0.06 51.03	1.24 422.87	2.76 515.83	10.66 2,010.90
Whiteside	4.55 392.33	0.36 250.27	2.97 1,058.02	7.79 2,035.25	15.67 3,735.87
Will	70.88 19,348.43	1.81 1,757.83	27.93 9,836.28	20.10 5,308.66	120.73 36,251.20
Williamson	15.12 3,347.69	0.17 156.01	4.63 1,633.62	2.29 655.88	22.22 5,793.20
Winnebago	2.01 258.92	2.12 1,527.11	11.53 5,172.34	6.73 1,648.70	22.39 8,607.09
Woodford	0.02 9.60	0.19 141.95	3.29 957.89	4.90 933.81	8.40 2,043.25

Top value has units of tons/day
Bottom value has units of tons/year

Table E-3: County Level VOM Emissions

County	Point	Area	On-road	Off-road	Total
Adams	2.83	4.33	1.42	3.32	11.89
	929.29	1,469.34	501.50	855.09	3,755.22
Alexander	2.28	0.66	0.33	2.05	5.32
	685.38	232.73	125.05	556.90	1,600.06
Bond	0.08	1.62	0.79	0.87	3.36
	21.31	518.88	301.48	214.67	1,056.35
Boone	2.17	3.02	1.72	1.10	8.02
	492.69	1,005.84	611.06	1,262.21	3,371.80
Brown	0.04	0.60	0.16	0.27	1.07
	0.02	195.42	60.67	65.46	321.57
Bureau	0.96	3.72	1.53	1.68	7.90
	56.23	1,172.73	580.46	415.35	2,224.78
Calhoun	0.00	0.67	0.11	2.79	3.57
	0.00	219.78	42.03	785.30	1,047.10
Carroll	0.23	1.49	0.39	3.19	5.31
	60.90	484.80	146.01	3,619.00	4,310.72
Cass	0.10	1.29	0.31	1.38	3.08
	29.03	473.38	112.78	354.34	969.54
Champaign	1.99	13.22	5.18	3.06	23.45
	397.58	4,259.86	1,826.01	749.81	7,233.27
Christian	1.42	3.00	0.98	1.64	7.03
	432.50	947.05	348.43	399.36	2,127.35
Clark	0.21	2.16	0.99	0.78	4.14
	69.82	677.51	385.20	188.92	1,321.46
Clay	0.35	1.47	0.44	1.07	3.33
	70.42	474.81	159.30	258.12	962.66
Clinton	0.50	2.46	1.09	3.55	7.60
	155.81	803.89	412.83	964.28	2,336.81
Coles	2.81	2.80	1.64	0.91	8.17
	912.50	975.50	585.04	216.04	2,689.09
Cook	29.82	217.47	73.85	65.41	386.55
	8,068.30	67,280.57	25,568.07	16,969.67	117,886.62
Crawford	3.98	1.96	0.50	0.61	7.05
	1,361.69	616.16	180.26	143.72	2,301.83
Cumberland	0.08	1.31	0.81	0.40	2.60
	21.83	418.28	319.23	91.83	851.17
DeKalb	0.87	6.14	2.58	1.65	11.24
	238.73	1,899.82	908.65	890.71	3,937.91
DeWitt	0.34	1.97	0.55	1.31	4.18
	108.14	601.47	206.81	348.07	1,264.49
Douglas	1.56	2.02	0.77	0.54	4.89
	467.75	637.07	295.98	122.00	1,522.81
DuPage	4.51	49.93	19.13	20.17	93.74
	1,216.27	14,936.78	6,590.68	4,879.20	27,622.93
Edgar	0.53	2.22	0.49	0.65	3.89
	148.54	668.04	178.59	135.13	1,130.29
Edwards	0.07	0.84	0.20	0.25	1.37
	18.55	260.43	76.68	55.57	411.23

Table E-3: County Level VOM Emissions (continued)

County	Point	Area	On-road	Off-road	Total
Effingham	1.05 310.38	5.84 1,680.91	1.85 689.17	1.19 285.91	9.92 2,966.37
Fayette	0.18 37.19	2.11 693.89	1.17 446.80	1.65 417.01	5.10 1,594.88
Ford	2.15 738.84	1.96 598.75	0.44 168.03	0.50 102.43	5.05 1,608.04
Franklin	0.47 231.38	2.65 903.12	1.39 516.35	2.52 692.82	7.04 2,343.67
Fulton	0.12 39.67	2.84 939.94	0.90 329.55	2.33 642.19	6.18 1,951.35
Gallatin	0.00 0.07	0.88 268.30	0.22 83.02	0.66 163.33	1.76 514.72
Greene	0.00 0.28	1.56 485.69	0.31 117.48	1.08 252.61	2.95 856.07
Grundy	2.71 878.45	2.71 888.50	1.80 670.38	2.28 608.24	9.50 3,045.56
Hamilton	0.01 3.64	0.91 297.81	0.23 85.79	0.36 74.04	1.51 461.28
Hancock	0.05 2.54	2.28 722.28	0.52 198.14	2.36 654.22	5.22 1,577.18
Hardin	0.03 0.70	0.36 128.69	0.11 41.67	0.66 170.95	1.16 342.00
Henderson	0.00 0.26	1.15 355.66	0.30 115.51	1.79 517.61	3.24 989.05
Henry	1.09 208.24	4.21 1,355.44	1.91 706.43	1.72 420.47	8.93 2,690.58
Iroquois	1.29 365.78	4.02 1,234.24	1.39 536.37	2.12 501.04	8.82 2,637.43
Jackson	0.13 26.20	3.19 1,114.83	1.50 515.79	2.42 663.72	7.24 2,320.54
Jasper	0.54 159.91	1.50 455.92	0.37 138.14	0.65 151.36	3.06 905.34
Jefferson	0.68 184.54	2.39 852.19	2.03 764.18	2.11 564.04	7.21 2,364.96
Jersey	0.03 9.66	1.58 514.10	0.56 203.57	1.34 347.20	3.51 1,074.53
JoDaviess	1.59 522.23	2.06 662.85	0.65 242.56	2.75 2,783.14	7.06 4,210.78
Johnson	0.04 4.45	0.72 267.48	0.66 258.34	0.98 255.65	2.39 785.92
Kane	3.70 1,018.71	19.65 6,191.87	8.76 2,984.25	10.25 2,420.07	42.35 12,614.89
Kankakee	3.07 846.09	5.66 1,946.01	2.78 973.13	2.09 938.63	13.60 4,703.87
Kendall	1.32 283.67	3.64 1,207.31	2.19 728.90	2.64 1,367.52	9.79 3,587.40
Knox	0.67 186.05	3.24 1,105.05	1.50 544.86	1.68 436.92	7.09 2,272.88

Table E-3: County Level VOM Emissions (continued)

County	Point	Area	On-road	Off-road	Total
Lake	2.45 544.64	24.98 8,009.58	13.14 4,419.30	20.45 4,953.49	61.02 17,927.01
LaSalle	3.16 836.64	9.35 2,958.70	3.85 1,416.37	4.76 1,236.75	21.11 6,448.46
Lawrence	0.04 5.74	1.81 572.28	0.46 172.27	0.57 134.35	2.87 884.65
Lee	1.07 257.16	3.51 1,102.65	1.52 578.71	2.06 1,775.99	8.16 3,714.51
Livingston	1.33 298.67	4.41 1,334.38	1.49 567.46	1.19 253.95	8.42 2,454.46
Logan	0.10 33.64	2.88 907.53	1.38 526.17	0.69 147.03	5.04 1,614.37
McDonough	0.65 175.66	2.48 814.36	0.76 273.32	0.67 157.87	4.56 1,421.21
McHenry	1.75 419.60	14.40 4,414.56	5.39 1,807.44	6.67 1,629.79	28.20 8,271.38
McLean	3.18 931.41	9.85 3,293.65	5.16 1,841.64	3.14 733.49	21.33 6,800.18
Macon	15.88 5,381.93	5.49 1,907.36	2.99 1,013.08	2.16 521.69	26.53 8,824.06
Macoupin	0.02 4.71	3.60 1,162.57	1.18 440.61	1.46 347.60	6.26 1,955.49
Madison	9.73 3,205.15	10.59 3,778.09	7.68 2,653.63	5.92 1,503.88	33.92 11,140.75
Marion	1.62 554.21	2.72 922.86	1.38 507.36	1.30 333.29	7.02 2,317.72
Marshall	1.94 402.01	1.62 498.64	0.54 209.71	1.51 427.91	5.61 1,538.27
Mason	0.21 56.95	2.68 766.15	0.34 127.19	2.88 805.87	6.11 1,756.16
Massac	1.53 356.08	1.19 397.95	0.63 232.49	0.57 144.10	3.92 1,130.63
Menard	0.02 4.60	1.13 357.04	0.28 105.27	0.65 155.10	2.08 622.01
Mercer	0.00 0.94	1.70 538.59	0.37 139.82	1.35 352.12	3.43 1,031.47
Monroe	0.08 17.74	1.94 636.95	1.04 358.63	1.48 393.44	4.54 1,406.76
Montgomery	0.48 127.44	2.73 878.13	1.38 526.32	1.53 378.75	6.12 1,910.64
Morgan	0.50 137.82	4.73 1,389.87	1.02 372.76	1.34 326.58	7.60 2,227.02
Moultrie	1.19 297.31	1.37 428.94	0.43 162.50	1.15 301.45	4.14 1,190.20
Ogle	3.73 1,178.90	4.21 1,268.42	1.84 694.22	3.80 1,829.22	13.58 4,970.75
Peoria	7.61 2,382.83	8.99 3,132.97	5.08 1,751.26	4.70 1,210.33	26.38 8,477.39

Table E-3: County Level VOM Emissions (continued)

County	Point	Area	On-road	Off-road	Total
Perry	0.21	1.55	0.56	0.91	3.22
	37.42	516.00	198.12	231.93	983.48
Piatt	0.39	2.13	0.61	0.49	3.63
	76.68	653.49	233.84	104.57	1,068.59
Pike	0.22	2.33	0.70	2.79	6.04
	54.83	746.19	269.10	732.46	1,802.58
Pope		0.61	0.14	0.45	1.20
		198.86	51.43	121.46	371.75
Pulaski	0.02	0.62	0.33	0.41	1.39
	6.62	217.30	128.59	106.42	458.92
Putnam	0.47	0.82	0.18	1.51	2.98
	126.19	266.89	67.82	428.22	889.11
Randolph	1.20	2.31	0.74	2.66	6.91
	362.33	761.66	274.46	623.03	2,021.48
Richland	0.03	1.51	0.43	0.56	2.53
	10.89	480.37	151.62	128.57	771.44
Rock Island	3.54	6.52	3.66	5.19	18.92
	752.39	2298.28	1,235.70	1,428.69	5,715.06
St. Clair	2.00	9.24	7.25	3.92	22.42
	695.92	3,346.74	2,492.26	990.20	7,525.12
Saline	0.07	1.76	0.72	0.72	3.27
	24.65	586.65	260.75	181.69	1,053.74
Sangamon	0.87	9.67	6.18	5.49	22.21
	215.00	3,323.36	2,139.58	1,336.70	7,014.65
Schuyler	0.02	0.79	0.24	0.58	1.64
	0.86	260.99	92.88	153.84	508.57
Scott	0.03	0.64	0.27	0.40	1.34
	1.46	201.22	103.27	94.63	400.58
Shelby	0.20	2.52	0.79	1.82	5.33
	68.72	787.49	297.76	454.18	1,608.15
Stark	0.01	1.18	0.19	0.28	1.65
	2.58	342.50	70.41	55.58	471.08
Stephenson	1.04	3.23	1.23	1.04	6.54
	314.56	1,094.06	439.75	1,179.41	3,027.77
Tazewell	3.02	5.73	3.70	3.59	16.05
	823.32	2,162.35	1,290.32	909.45	5,185.45
Union	0.32	1.19	0.68	1.13	3.32
	56.02	419.64	254.40	302.21	1,032.27
Vermilion	9.43	5.06	2.28	2.13	18.90
	2,756.32	1,794.24	804.39	533.04	5,887.98
Wabash	0.01	1.06	0.28	0.63	1.98
	2.35	331.52	98.59	161.81	594.28
Warren	0.03	2.01	0.59	0.65	3.29
	8.09	628.88	216.92	153.95	1,007.84
Washington	0.13	2.06	1.04	0.83	4.06
	29.88	640.14	406.69	180.12	1,256.84
Wayne	0.15	1.97	0.70	0.90	3.72
	59.08	637.83	263.21	208.61	1,168.74

Table E-3: County Level VOM Emissions (continued)

County	Point	Area	On-road	Off-road	Total
White	0.33 40.25	2.04 634.23	0.59 223.14	1.05 262.48	4.02 1,160.10
Whiteside	0.74 194.50	4.01 1,326.09	1.45 527.07	2.46 666.99	8.66 2,714.64
Will	8.11 2,532.89	23.25 7,450.74	13.32 4,669.42	11.09 2,732.41	55.78 17,385.48
Williamson	0.61 174.65	2.54 979.01	2.39 861.45	3.27 892.47	8.81 2,907.58
Winnebago	2.36 598.22	13.67 4,721.63	7.72 2,571.38	5.10 1,301.77	28.85 9,193.00
Woodford	0.40 110.73	2.75 905.50	1.23 477.89	2.62 695.88	7.01 2,190.00

Top value has units of tons/day
Bottom value has units of tons/year

Appendix F

Area Source Emission Factors

Table F-1: Area Source Emission Factors

Area Source Category	CO Emission Factor	NOx Emission Factor	VOM Emission Factor	Units
Agricultural pesticide application			2.07	lb/acre
Architectural coating			3.09	lb/person
Asphalt paving – cutback			88	lb/bbl
Asphalt paving – emulsion			9.2	lb/bbl
Automobile refinishing			89	lb/employee
Commercial cooking	190.14		72.32	lb/1000 persons
Consumer solvent use			8.43	lb/person
Dry cleaning			467	lb/employee
Forest fires	1044.62	22.41	49.16	lb/acre
Fuel combustion – commercial/institutional – distillate oil	5	20	0.34	lb/1000 gallons
Fuel combustion – commercial/institutional – kerosene	5	19.3	0.33	lb/1000 gallons
Fuel combustion – commercial/institutional – LPG	11.95	14	0.52	lb/1000 gallons
Fuel combustion – commercial/institutional – natural gas	84	100	5.5	lb/million ft^3
Fuel combustion – commercial/institutional – residual oil	5	55	1.13	lb/1000 gallons
Fuel combustion – industrial – distillate oil	5	20	0.2	lb/100 gallons
Fuel combustion – industrial – natural gas	84	100	5.5	lb/million ft^3
Fuel combustion – industrial – residual oil	5	55	0.28	lb/1000 gallons
Fuel combustion – residential – coal	275	9.1	10	lb/ton
Fuel combustion – residential – distillate oil	5	18	0.7	lb/1000 gallons
Fuel combustion – residential – kerosene	4.8	17.4	0.675	lb/1000 gallons
Fuel combustion – residential – LPG	3.8	13.4	0.52	lb/1000 gallons
Fuel combustion – residential – natural gas	40	94	5.5	lb/million ft^3
Graphic arts			1482	lb/employee
Incineration	0.87	0.26	0.17	lb/person
Industrial surface coating – maintenance			1.1	lb/person
Industrial surface coating – other special purpose			0.007	lb/person
Open burning – prescribed burning	938.96	20.14	44.19	lb/acre
Open burning – residential waste	85	6	8.56	lb/ton
Open burning – yard waste – brush	140	5	19	lb/ton
Open burning – yard waste – leaves	112	6.2	28	lb/ton

Table F-1: Area Source Emission Factors (continued)

Area Source Category	CO Emission Factor	NOx Emission Factor	VOM Emission Factor	Units
Pavement marking			10.5	lb/lane-mile
Portable fuel containers – commercial			0.03	lb/can/day
Portable fuel containers – residential			0.017	lb/can/day
Solvent cleaning			30.5	lb/employee
Structure fires	69	1.61	12.65	lb/fire
Waste water treatment - POTW			0.85	lb/million gallons

Appendix G

Area Source
Daily Adjustment Factors
Seasonal Adjustment Factors
Control Efficiencies

Table G-1: Area Source Daily Adjustment Factors, Seasonal Adjustment Factors and Control Efficiencies

Area Source Category	Daily Adjustment Factor	Seasonal Adjustment Factor	Control Efficiency (%)
Agricultural pesticide application	0.00321	1.3	
Architectural coating	0.00275	1.3	10
Asphalt paving – cutback		0	
Asphalt paving – emulsion	0.00321	2	
Automobile refinishing	0.00385	1	Note 1
Commercial cooking	0.00275	1	
Consumer solvent use	0.00275	1	7.1
Dry cleaning	0.00385	1	
Forest fires	0.00275	2.1	
Fuel combustion – commercial/institutional – distillate oil	Note 2	Note 2	
Fuel combustion – commercial/institutional – kerosene	Note 2	Note 2	
Fuel combustion – commercial/institutional – LPG	Note 2	Note 2	
Fuel combustion – commercial/institutional – natural gas	Note 2	Note 2	
Fuel combustion – commercial/institutional – residual oil	Note 2	Note 2	
Fuel combustion – industrial – distillate oil	Note 2	Note 2	
Fuel combustion – industrial – natural gas	Note 2	Note 2	
Fuel combustion – industrial – residual oil	Note 2	Note 2	
Fuel combustion – residential – coal	Note 2	Note 2	
Fuel combustion – residential – distillate oil	Note 2	Note 2	
Fuel combustion – residential – kerosene	Note 2	Note 2	
Fuel combustion – residential – LPG	Note 2	Note 2	
Fuel combustion – residential – natural gas	Note 2	Note 2	
Fuel combustion – residential – wood (all types)		0	
Graphic arts	0.00385	1	
Incineration	0.00275	1	
Industrial surface coating – maintenance	0.00385	1	43.2
Industrial surface coating – other special purpose	0.00385	1	
Open burning – prescribed burning		0	
Open burning – residential waste	0.00275	1	
Open burning – yard waste – brush		0	

Table G-1: Area Source Daily Adjustment Factors, Seasonal Adjustment Factors and Control Efficiencies (continued)

Area Source Category	Daily Adjustment Factor	Seasonal Adjustment Factor	Control Efficiency (%)
Open burning – yard waste – leaves		0	
Pavement marking	0.00385	1.72	
Portable fuel containers – commercial	1	1	
Portable fuel containers – residential	1	1	
Solvent cleaning	0.00321	1	
Structure fires	Note 3	Note 3	
Waste water treatment – POTW	0.00275	1	

Notes:

1: 72% for nonattainment areas and 33% for attainment areas

2: Actual consumption data for June, July and August was used so there is no need to convert annual data to peak ozone season. The daily consumption rate was the amount of fuel used in those three months divided by the number of days (92) in those months.

3: The actual number of fires for June, July and August were used so there is no need to convert annual data to peak ozone season. The daily rate was the number of fires in those three months divided by the number of days (92) in those months.

APPENDIX H

Nonattainment Township Surrogates and Apportionment

Table H-1: Nonattainment Township Surrogates and Apportionment

Surrogate	Category	Percent of County Value	
		Grundy County Townships	Kendall County Townships
Area	Agricultural Pesticide Application Forest Fires Prescribed Burning	13.00	12.00
Miles of Roadway	Asphalt Paving Pavement Markings	11.00	23.00
Miles of Water	Marine Vessel VOL Loading and Transport	50.00	0.00
Population	Architectural Coating Automobile Refinishing Commercial Cooking Consumer Solvent Use Dry Cleaning Fuel Combustion – Commercial/Institution Fuel Combustion – Industrial Fuel Combustion Fuel Combustion – Residential Graphic Arts Incineration Industrial Coating Industrial Waste Water Treatment Open Burning Portable Fuel Containers POTWs Solvent Cleaning Structure Fires	17.00	52.00
VMT	Gasoline Marketing On-road Mobile	22.00	30.00