Maintenance Plan for the Illinois Portion of the Chicago Ozone Nonattainment Area for the 1997 8-Hour Ozone Standard

AQPSTR 09-04

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EXECUTIVE SUMMARY

This document describes Illinois' Maintenance Plan for the Illinois portion of the Chicago ozone nonattainment area. A Maintenance Plan is required before the area can be redesignated from nonattainment to attainment of the 8-hour ozone National Ambient Air Quality Standard (NAAQS) promulgated in 1997. This document also provides technical information required to support a redesignation request. Illinois intends to submit such a request to the U. S. Environmental Protection Agency (U.S. EPA). The Illinois Environmental Protection Agency (Illinois EPA) has prepared this plan in consultation with the Indiana Department of Environmental Management (IDEM), the Wisconsin Department of Natural Resources (WDNR), and the Michigan Department of Environmental Quality (MDEQ), the Lake Michigan Air Directors Consortium (LADCO), and the U.S. EPA. The IDEM is preparing a similar plan for the Indiana portion of the Chicago nonattainment area.

Ozone air quality has dramatically improved in the Lake Michigan region as a result of implementation of State and Federal control measures since the designation of the Chicago area as nonattainment in 2004. With the exception of Holland, Michigan, the entire Lake Michigan region, including the Chicago nonattainment area, has at least three years of complete, quality assured ambient air quality monitoring data for 2006-2008 that demonstrates compliance with the 1997 8-hour ozone NAAQS. These air quality improvements are due to permanent and enforceable emission control measures.

This Maintenance Plan provides for continued attainment of the 1997 8-hour ozone air quality standard for the Chicago nonattainment area for a period of ten years after U.S. EPA has formally redesignated the area to attainment. The Plan also provides assurances that, even if there is a subsequent violation of the air quality standard, measures listed in the Plan will prevent any future occurrences through contingency measures that would be triggered upon such an occurrence. Finally, the Plan includes on-road motor vehicle emissions budgets for use in transportation conformity determinations to assure that any increases in emissions from this sector do not jeopardize continued attainment of the 8-hour ozone standard during the ten-year maintenance period.

1.0 INTRODUCTION

This document describes Illinois' Maintenance Plan for the Illinois portion of the Chicago ozone nonattainment area. A maintenance plan is required before the area can be redesignated from nonattainment to attainment of the 8-hour ozone National Ambient Air Quality Standard (NAAQS) promulgated by the U. S. Environmental Protection Agency (U.S. EPA) in 1997. Illinois intends to submit such a request to the U.S. EPA in conjunction with this Maintenance Plan. The Illinois EPA has prepared this plan in consultation with the Indiana Department of Environmental Management (IDEM), the Wisconsin Department of Natural Resources (WDNR), and the Michigan Department of Environmental Quality (MDEQ), the Lake Michigan Air Directors Consortium (LADCO), and U.S. EPA. The IDEM is preparing a similar plan for the Indiana portion of the Chicago nonattainment area. With the exception of Holland, Michigan, the entire Lake Michigan region, including the Chicago area, has at least three years of complete, quality assured ambient air quality monitoring data for 2006-2008, demonstrating attainment with the 1997 8-hour ozone NAAQS.

This document also provides the technical information needed to support a request to redesignate the Chicago area to attainment of the 8-hour ozone NAAQS. Section 107 of the Clean Air Act (CAA) establishes specific requirements to be met in order for a nonattainment area to be considered for redesignation. Before an area can be reclassified to attainment, U.S. EPA must make a determination that the area has attained the 8-hour ozone NAAQS based on at least three complete years of ambient monitoring data. U.S. EPA must have approved a State Implementation Plan (SIP) for the area under Section 110 and Part D of the CAA. The state must demonstrate that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP and other federal requirements. Finally, the state must submit, and U.S. EPA must approve, a maintenance plan under Section 175(A) of the CAA, including provisions for contingency measures that will be implemented if future violations of the 8-hour ozone NAAQS are measured.

This Maintenance Plan provides for the continued attainment of the 8-hour ozone NAAQS for the Chicago nonattainment area (NAA) for a period of ten years after U.S. EPA has formally redesignated the area to attainment. The Plan also provides assurances that even if a subsequent violation of the ozone NAAQS occurs, provisions in the Plan will prevent any future occurrences through contingency measures that would be triggered upon such occurrence.

This document addresses the maintenance plan requirements established by the CAA and U.S. EPA, and includes additional information to support continued compliance with the 8-hour ozone NAAQS.

1.1 Regulatory Background

The CAA, as amended in 1990, requires areas that fail to meet the NAAQS for ozone to develop SIPs to expeditiously attain and maintain the NAAQS. Historically, exceedances of the ozone NAAQS have been monitored in Cook and Lake Counties in Illinois, and in

portions of Wisconsin, Indiana, and Michigan immediately downwind of the Chicago, Gary, and Milwaukee metropolitan areas.

The Chicago NAA, which includes Lake and Porter Counties in northwest Indiana, was originally designated as nonattainment in 2004 pursuant to the 1997 revisions to the ozone NAAQS. Several counties in eastern Wisconsin, and one county in western Michigan adjacent to Lake Michigan were also designated as nonattainment of the 8-hour ozone NAAQS, although these areas are separate from the Chicago NAA. Figure 1.1 depicts the current NAAs in the Lake Michigan region.

Figure 1.1
Map of the Lake Michigan Ozone Nonattainment Areas

The following is a list of the counties, and portions thereof, contained in the Chicago 8-hour ozone severe nonattainment area:

- Cook County, IL
- Lake County, IL
- DuPage County, IL
- McHenry County, IL

- Kane County, IL
- Will County, IL
- Grundy County, IL (Aux Sable and Goose Lake Townships)
- Kendall County, IL (Oswego Township)
- Lake County, IN
- Porter County, IN

As a result of the designation as nonattainment and the accompanying classification as moderate, these areas were subject to new requirements, including development of a plan demonstrating that the area would meet the federal 8-hour NAAQS for ozone by June 15, 2010.

Recognizing the need for a regional solution, the States of Illinois, Indiana, Michigan, Ohio, and Wisconsin worked cooperatively, under the auspices of the Lake Michigan Air Directors Consortium (LADCO), to jointly develop and evaluate an effective regional attainment strategy to enable the Lake Michigan region to attain the 8-hour ozone NAAQS. The attainment strategy recognizes the importance of both locally generated ozone precursor emissions and the need for significant reductions of incoming (transported) ozone and ozone precursor emissions (including oxides of nitrogen, or NOx) to allow the States to attain the NAAQS. The emission reductions needed to attain the 8-hour ozone NAAQS include both State and Federal measures that have reduced ozone precursor emissions both locally and regionally. These measures have allowed the Chicago nonattainment area to attain the 8-hour ozone standard by the attainment deadline established by the U.S. EPA.

1.2 Status of Air Quality

Ozone monitoring data for the most recent three-year period, 2006 through 2008, demonstrates that air quality has met the 1997 8-hour ozone NAAQS in the entire Lake Michigan region, including the Chicago nonattainment area, with the exception of Holland, Michigan. Modeling performed by LADCO shows that Holland, MI will attain the 1997 ozone NAAQS by 2012.

2.0 REDESIGNATION AND MAINTENANCE PLAN REQUIREMENTS

Sections 107 and 110 of the CAA list a number of requirements that must be met by nonattainment areas prior to consideration for redesignation to attainment. One of those requirements is the maintenance plan, which describes a state's plan for maintaining the NAAQS for a ten-year period after redesignation to attainment. U.S. EPA has published guidance for the preparation of maintenance plans and redesignation requests. This guidance is contained in a document entitled "Procedures for Processing Requests to Redesignate Areas to Attainment" (September 4, 1992).

Before a redesignation to attainment can be promulgated, U.S. EPA must:

- Determine that the NAAQS for ozone, as published in 40 CFR 50.4, has been attained. Ozone monitoring data must show that violations of the ambient NAAQS are no longer occurring. This showing must rely on three consecutive years of data. The ambient air monitoring data must be quality assured in accordance with 40 CFR 58.10, recorded in U.S. EPA's Air Quality System (AQS) data base, and is available to the public.

- Approve the state's plan for demonstrating attainment. The attainment plan, which is based on air quality modeling, must contain enforceable control measures and must be submitted as a revision to the state's SIP after a public hearing.

- Determine that the improvement in air quality between the year violations occurred and the year that attainment was achieved is based on permanent and enforceable emission reductions.

- Approve the state's maintenance plan. The requirements for the maintenance plan are discussed below.

- Determine that all other requirements applicable to nonattainment areas have been met.

A maintenance plan provides for the continued attainment of the 8-hour ozone NAAQS for a nonattainment area for a period of ten years after U.S. EPA has formally redesignated the area to attainment. The plan also provides assurances that even if a subsequent violation of the NAAQS occurs, provisions in the plan will prevent any future occurrences through contingency measures that would be triggered upon such occurrence. To be approvable, the state is required to have a public hearing on the maintenance plan prior to adoption. The maintenance plan must contain the following elements:

- A comprehensive emission inventory of the precursors of ozone completed for the "attainment year";

- A projection of the emission inventory forward to a year at least ten years after redesignation and a demonstration that the projected level of emissions is sufficient to maintain the ozone NAAQS;

- A commitment that, once redesignated, the state will continue to operate an appropriate monitoring network to verify maintenance of the attainment status;

- A demonstration of legal authority to implement and enforce all control measures contained in the SIP;

- Provisions for future updates of the inventory to enable tracking of emission levels, including an annual emission statement from major sources;

- Motor vehicle emissions budgets for transportation conformity for the ten-year maintenance period;

- A commitment to submit a revised maintenance plan eight years after redesignation;

- A commitment to enact and implement additional contingency control measures expeditiously in the event that future violations of the NAAQS occur;

- A list of potential contingency measures that would be implemented in such an event.

Illinois' Maintenance Plan has been prepared in accordance with the requirements specified in U.S. EPA's guidance document and additional guidance received from U.S. EPA staff.

The following sections of this document describe how U.S. EPA's requirements have been met.

3.0 OZONE MONITORING

U.S. EPA's published guidance document, "Procedures for Processing Requests to Redesignate Areas to Attainment" (September 4, 1992), details specific requirements regarding the collection and use of ambient air monitoring data needed to support a redesignation request. Before the Chicago NAA can be redesignated, Illinois must demonstrate that the NAAQS for ozone, as published in 40 CFR 50.4, has been attained. Ozone monitoring data must show that violations of the NAAQS are no longer occurring within the nonattainment area. This showing must rely on three complete, consecutive calendar years of quality assured data. Further, the air monitoring data must be quality assured in accordance with 40 CFR 58.10, recorded in U.S. EPA's AQS data base, and made available to the public. Finally, Illinois must commit to continue to operate an appropriate monitoring network to verify the maintenance of the attainment status, once the area has been redesignated.

The following subsections describe how each of these requirements has been addressed.

3.1 Monitored Design Values

Currently there are 55 ozone monitors located in the nonattainment counties in the Lake Michigan region; 9 are located in northwestern Indiana, 17 in northeastern Illinois, 13 in western Michigan, and 16 in eastern Wisconsin.

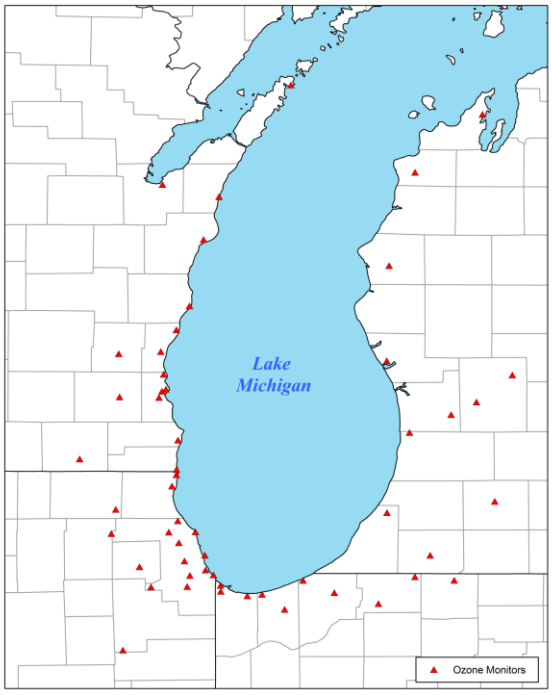
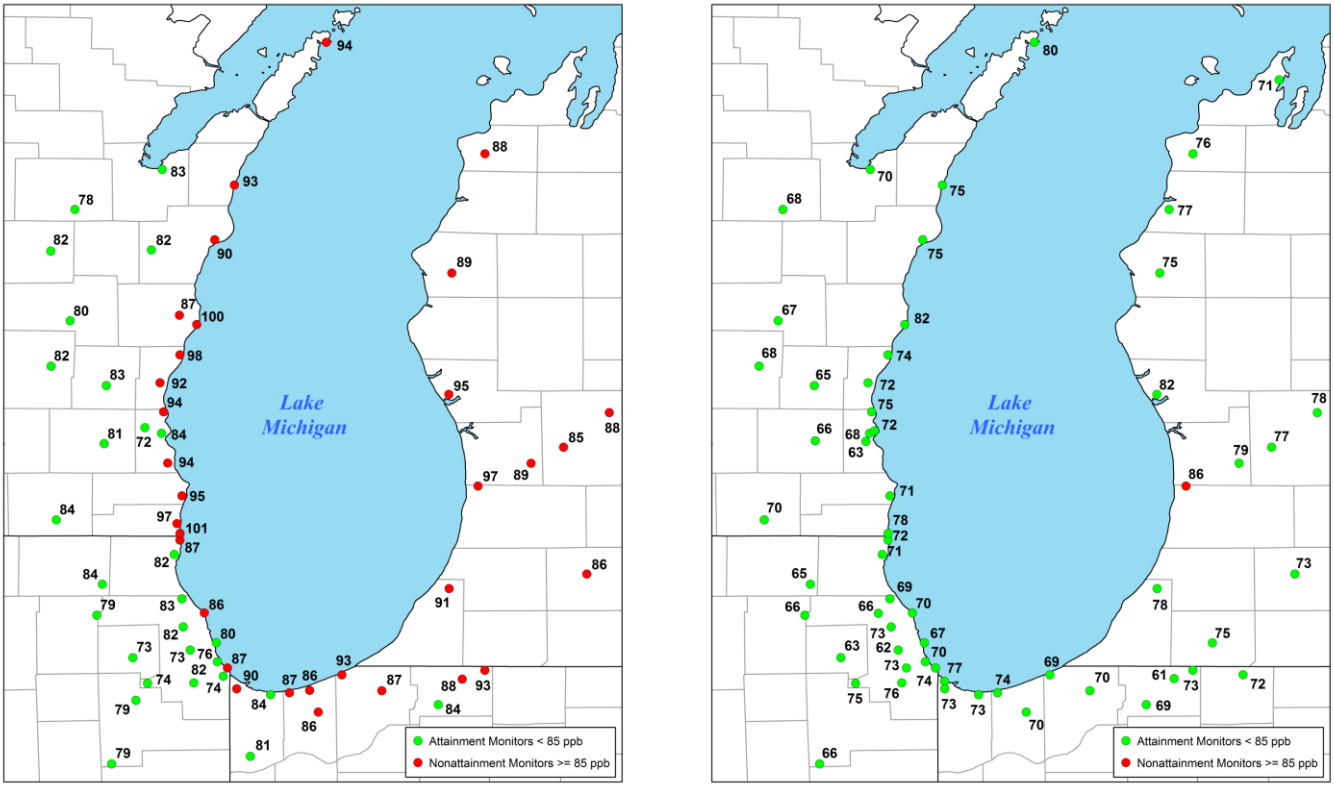


Figure 3.1 Ozone Monitors in the Lake Michigan Area

To determine whether the NAAQS is being exceeded, the design value must be calculated. The current U.S. EPA method for calculating the ozone design value is to average the 4th highest daily maximum 8-hour value for each year over the 3-year period. The calculated 8-hour ozone design values for the monitors in the Lake Michigan region for 2006-2008 are included as Appendix A of this report. Figure 3.2 compares the design values for the 2001-2003 period for monitoring stations in the Lake Michigan region to the corresponding design values from 2006-2008. The data demonstrate that ozone air quality has improved dramatically throughout the Lake Michigan region and that the NAAQS for ozone has been attained for the 2006-2008 period at all locations except Holland, Michigan.

Figure 3.2
Comparison of 8-Hour Ozone Design Values for the Lake Michigan Region Between 2001-2003 and 2006-2008

2001-2003 **2006-2008**



3.2 Quality Assurance

Illinois EPA has quality assured all data shown in Appendix A for all sites located in Illinois in accordance with 40 CFR 58.10 and the Illinois EPA 's Quality Assurance Plan, which describes Illinois EPA's standard operating procedures for operating the ambient monitoring network and validating the data. The other states in the Lake Michigan region have similar quality assurance plans. Illinois EPA has recorded the data in the U.S. EPA's AQS database, as have the other Lake Michigan states. U.S. EPA's AQS database is available to the public.

3.3 Continued Monitoring

Illinois commits to continue monitoring ozone levels according to a U.S. EPA approved monitoring plan, as required to ensure maintenance of the ozone NAAQS. Should changes in the location of an ozone monitor become necessary, Illinois EPA will work with U.S. EPA to ensure the adequacy of the monitoring network. Illinois EPA will continue to quality assure the monitoring data to meet the requirements of 40 CFR 58. Illinois EPA will continue to enter all data into AQS on a timely basis in accordance with federal guidelines.

4.0 EMISSIONS INVENTORY

A redesignation request must contain a demonstration that the improvement in air quality between the year that violations occurred and the year that attainment was achieved is based on permanent and enforceable emission reductions. As described previously in Section 3.0, a three-year monitoring period is used to evaluate whether attainment has been achieved. In this Section, the "attainment year" refers to the first year (2006) of the three-year period (2006-2008) used to demonstrate attainment. The request should also include a projection of the emission inventory to a year at least 10 years following redesignation, a demonstration that the projected level of emissions is sufficient to maintain the ozone NAAQS, and a commitment to provide future updates of the inventory to enable tracking of emission levels during the 10-year maintenance period.

4.1 Attainment Year Inventory, 2006

Illinois EPA has prepared a comprehensive emissions inventory for the Illinois portion of the Chicago ozone nonattainment area, including point, area, and on-road and off-road mobile sources for precursors of ozone (VOM and NOx) for the attainment year, 2006. This inventory is based on Illinois EPA's SIP submittal entitled, "Illinois Base Year Ozone Inventory for 2002", (June 2006). Point source information was compiled from 2006 annual emission reports submitted to the Illinois EPA by emission sources and the U.S. EPA's Clean Air Markets Division database for electric utilities. Area source emissions were "grown" from 2002 activity levels appropriate for each source category. Biogenic emissions are not included in these summaries. On-road mobile source emissions were calculated using U.S. EPA's MOBILE6 emissions model with vehicle miles traveled (VMT) data provided by the Illinois Department of Transportation (IDOT). Off-road mobile source emissions were calculated using U.S. EPA's NONROAD emissions model.

Table 4.1 summarizes the 2006 emissions estimates for the Chicago ozone nonattainment area.

Table 4.1
2006 Chicago Ozone Nonattainment Area
VOM and NOx Emissions
(Emissions stated in tons per ozone season weekday)

Source Category	**VOM**	**NOx**
Point Sources	61.20	194.03
Area Sources	281.43	35.64
On-Road Mobile Sources	130.03	302.43
Off-Road Mobile Sources	152.90	279.95
Total	625.56	812.05

4.2 Air Quality Improvements and Emission Controls

The Chicago area was designated nonattainment in 2004, based on ozone air quality monitoring data collected between 2001 and 2003. Since that time, permanent and enforceable reductions of ozone precursor emissions have contributed to improvements in ozone air quality and to the attainment of the ozone NAAQS. Some of these emission reductions were due to the application of tighter federal emission standards on motor vehicles and fuels, and some due to the requirements of the federal NOx SIP Call. Section 5.0 of this report describes these reductions in more detail, along with an explanation of their regulatory status. In this subsection, the emission levels from 2006 are compared to emission levels estimated in 2002 when the Chicago area was first proposed for a nonattainment designation for the 1997 8-hour ozone standard.

U.S. EPA's 8-hour ozone Implementation Rule required that states with ozone nonattainment areas prepare and submit a 2002 base year anthropogenic inventory of sources of ozone precursor emissions. The base year inventory included emissions from point, area, on-road mobile and off-road mobile emissions. Illinois EPA prepared and submitted this inventory in June 2006. Table 4.2 summarizes 2002 emissions by major source category and by pollutant for the Illinois portion of the Chicago nonattainment area.

Table 4.2
2002 Chicago Ozone Nonattainment Area
VOM and NOx Emissions
(Emissions stated in tons per ozone season weekday)

Source Category	**VOM**	**NOx**
Point Sources	76.62	307.73
Area Sources	273.33	42.93
On-Road Mobile Sources	168.63	408.88
Off-Road Mobile Sources	233.77	326.65
Total	752.35	1086.19

Comparing the 2002 inventory to that for 2006 indicates that total VOM emissions in the Chicago area decreased by about 126 tons per day (tpd), due largely to reductions from on-road and off-road mobile sources. NOx emissions in the Chicago NAA decreased significantly, about 274 tpd, during the same time period. These sizeable emission reductions in ozone precursor emissions, plus reductions in upwind areas in Illinois and other nearby states, resulted in a substantial improvement in ozone air quality in the Chicago area, ultimately resulting in attainment of the 1997 8-hour ozone NAAQS.

4.3 Emission Projections

A maintenance plan must contain a demonstration that the level of emissions projected for the ten-year period following redesignation are sufficient to maintain the ozone NAAQS. Accordingly, Illinois EPA has projected VOM and NOx emissions for the Illinois portion of the Chicago nonattainment area for 2020. Illinois EPA has also projected emissions to 2013, to represent a midpoint during the ten-year maintenance period. Emissions for these two projection years are compared to emission levels in 2006 to determine if emissions are sufficient to maintain the NAAQS during this period.

Chicago area point source emissions for 2013 and 2020 were estimated using the 2002 base year inventory and growth factors appropriate for each source category. Area source emissions were projected by applying category-specific growth factors to estimates contained in the 2002 base year inventory. County population projections for 2013 and 2020 were used to estimate emissions for categories which rely on a per capita emissions factors. Off-road emissions projections were also developed using the 2002 inventory and growth factors contained in U.S. EPA's NONROAD model. On-road motor vehicle emissions were estimated using U.S. EPA's MOBILE6 motor vehicle emissions model. The figures assume the continued use of reformulated gasoline, the continued phase-in of the Tier 2 motor vehicle emissions standards, and operation of an enhanced vehicle inspection and maintenance program. Total vehicle miles of travel (VMT) for 2013 and 2020 were assumed to increase at a rate of 1.27 percent per year from 2002.

Tables 4.3 and 4.4 include the VOM and NOx emissions estimates for the years 2013 and 2020, respectively, for the Illinois portion of the Chicago nonattainment area.

Table 4.3
2013 Chicago Ozone Nonattainment Area
VOM and NOx Emissions
(Emissions stated in tons per ozone season weekday)

Source Category	**VOM**	**NOx**
Point Sources	70.27	155.02
Area Sources	266.33	37.58
On-Road Mobile Sources	94.16	179.14
Off-Road Mobile Sources	122.82	249.28
Total	553.58	621.02

Table 4.4
2020 Chicago Ozone Nonattainment Area
VOM and NOx Emissions
(Emissions stated in tons per ozone season weekday)

Source Category	**VOM**	**NOx**
Point Sources	81.43	153.12
Area Sources	293.25	39.62
On-Road Mobile Sources	73.68	88.17
Off-Road Mobile Sources	129.15	246.54
Total	577.51	527.45

4.4 Demonstration of Maintenance

Table 4.5 demonstrates that the level of emissions projected for the ten-year period following redesignation is sufficient to maintain the ozone NAAQS. As shown in the table, both VOM and NOx emissions within the nonattainment area are expected to decrease significantly between 2006 and 2020. Projected VOM and NOx emissions for the mid-point year, 2013, are also less than the emission levels in 2006. Based on these emission trends it is expected that air quality will continue to meet the 8-hour ozone NAAQS throughout the maintenance period.

In addition to the overall emission reductions projected to occur within the nonattainment area, significant reductions of statewide NOx emissions resulting from implementation of Illinois' multi-pollutant standards affecting electric utilities by 2012, will also help to ensure continued attainment of the 8-hour ozone NAAQS. Table 4.6 provides a summary of the expected reductions of NOx emissions resulting from implementation of Illinois' multi-pollutant standards.

TABLE 4.5
Comparison of 2006, 2013 and 2020 Emission Estimates
Chicago Nonattainment Area
(Emissions stated in tons per ozone season weekday)

	2006	**2013**	**Difference (2006 – 2013)**	**2020**	**Difference (2006 – 2020)**

VOM	625.56	553.58	71.98	577.51	48.05
NOx	812.05	621.02	191.03	527.45	284.60

Table 4.6
Estimated NOx Emission Reductions From Utility Boilers
Resulting from Implementation of Illinois' Multi-Pollutant Standards
(Emissions stated in tons per day)

2006 NOx Emissions	256.0
2012 NOx Emissions	130.5
Net reduction	125.5

4.5 Provisions for Future Updates

As required by Section 175A(b) of the CAA, Illinois commits to submit to U.S. EPA, eight years after redesignation, a revised version of this Maintenance Plan. The revision will contain Illinois' plan for maintaining the 8-hour ozone NAAQS for ten years beyond the first 10-year period after redesignation.

5.0 CONTROL MEASURES AND REGULATIONS

This section provides specific information on the control measures implemented in the Chicago nonattainment area, including the measures that were part of Illinois' Attainment Demonstration, Reasonable Further Progress (RFP) demonstration, CAA requirements, and other state and federal measures. The control measures required in past ozone SIP revisions have been fully implemented, and other, more recent control programs will continue to provide emission reductions in future years. Illinois EPA commits to keep these measures in effect after redesignation, or to provide equivalent emissions levels using alternate measures. Illinois' SIP contains acceptable provisions to provide for preconstruction review of new emission sources. After redesignation to attainment, Prevention of Significant Deterioration (PSD) requirements will apply to the construction of new major sources and to significant modifications of existing sources. Illinois has accepted delegation from U.S. EPA of this program. Illinois further commits to continue to require that all future transportation plans in the Chicago area conform with the SIP.

5.1 Attainment Demonstration Control Measures

Illinois' attainment demonstration for the Chicago nonattainment area identifies control measures that have been promulgated at either the state or federal level that are sufficient to allow the Lake Michigan region, with the exception of Holland, MI, to meet the 1997 8-hour ozone NAAQS by the required attainment date. The attainment demonstration, which was submitted to U.S. EPA after a public hearing and public comment period, is described in the Illinois EPA's document: "Attainment Demonstration for the 1997 8-Hour Ozone National Ambient Air Quality for the Chicago Nonattainment Area" (Report Number AQPSTR 09-03, March 18, 2009). The primary emission reduction measures for demonstrating attainment of the ozone standard are as follows:

- NOx SIP Call
- New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPS)/Maximum Achievable Control Technology (MACT) Standards
- VOM Solvent Categories: Aerosol Coatings, Architectural and Industrial Maintenance (AIM) Coatings, Consumer Solvents
- Enhanced Vehicle Inspection & Maintenance Program
- Reformulated Gasoline
- Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements

- On-Highway Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements

- Federal Control Programs Incorporated into NONROAD Model (e.g., Nonroad Diesel Rule), plus Evaporative Large Spark Ignition and Recreational Vehicle Standards

- Tier 4 Nonroad Diesel Engine Standards and Diesel Fuel Sulfur Content Restrictions

- Marine Compression-Ignition Engine Standards and Locomotive Engine Standards

- Consent Decrees---Dynegy Midwest Generation, ConocoPhillips, CITGO, Exxon-Mobil, Marathon Ashland, Archer Daniels Midland

5.2 Reasonable Further Progress (RFP)

Since the Chicago region is classified as a moderate nonattainment area for the 8-hour ozone standard, a 15 percent net reduction in VOM emissions from 2002 levels is required by 2008 in order to meet the RFP requirement. The Illinois EPA has not relied on NOx substitution to meet its 15 percent RFP reduction, relying solely on VOM emission reductions.

Reductions in VOM emissions are primarily achieved through implementation of the control measures listed in Section 5.1.

The RFP demonstration is contained in Illinois EPA's document: "Chicago Nonattainment Area 8-Hour Ozone Reasonable Further Progress Demonstration", (Report Number AQPSTR 09-05, March 18, 2009). The control measures identified in the RFP document, including those listed above, will result in a 15.7 percent reduction in VOM emissions from 2002 emissions levels by the year 2008. In addition, continuing reductions in 2009 and 2010 are estimated to result in year 2010 VOM emissions at 21.0 percent below 2002 levels. These emission reductions achieve the 15% RFP target for the Chicago nonattainment area.

5.3 Reasonably Available Control Technology (RACT)

Pursuant to Sections 172, 182(b) and (f) of the CAA, RACT is required for all existing major sources of the applicable criteria pollutant and its precursors (VOM and NOx) located in NAAs. U.S. EPA defines RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological feasibility and economic reasonableness (70 *FR* 71612; November 29, 2005). The major source threshold for moderate NAAs is

defined as 100 tpy. A source generally consists of several units that emit pollutants. The sum of emissions from all units at the source determines if a unit is major and thus subject to RACT requirements.

RACT is not a new requirement under the CAA. Illinois previously addressed RACT requirements in the Chicago area in developing attainment plans for the 1-hour ozone standard. The RACT requirement for NOx was previously waived under the 1-hour ozone standard, and Illinois must adopt new regulations to implement NOx RACT in the NAA. However, Illinois has previously adopted RACT requirements for VOM emissions in the NAA. (See 35 Ill. Adm. Code Part 219) The Illinois EPA has evaluated the previously adopted regulations to determine if the RACT requirement is still being met for 8-hour ozone.

Sections 172, 182(b)(2), and 182(f) of the CAA require implementation of RACT for sources that are subject to Control Techniques Guidelines (CTGs) that are promulgated by U.S. EPA.
The U.S. EPA has issued CTGs defining RACT for those categories of sources that emit the greatest amounts of VOM emissions. Illinois EPA will soon be proposing regulations to implement the revised CTGs issued by the U.S. EPA in 2006. Other than the 2006 CTGs, Illinois has adopted applicable rules addressing all CTGs published by U.S. EPA for which there are existing sources in the Chicago NAA.

Non-CTG sources are defined as major VOM sources which are not subject to CTGs, but for which RACT is required. All major sources of ozone precursors located in the ozone NAA that are not subject to individual RACT rules are subject to a generic RACT rule. These rules apply to non-CTG sources that have the potential to emit 100 tons or more per year of VOM. Thus, Illinois has met the obligation to implement RACT on non-CTG VOM sources in the NAA.

It should be noted that other regulatory requirements also affect VOM emission sources within the Chicago ozone NAA. These include Maximum Achievable Control Technology (MACT), federal New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAPS). These programs satisfy the RACT requirements for specific source categories because these rules are more stringent than RACT. It is concluded from this review that Illinois' existing VOM RACT rules fulfill U.S. EPA's RACT requirements for VOM sources in the NAA.

As mentioned previously, the RACT requirement for NOx was previously waived under the 1-hour ozone NAAQS. With respect to the 8-hour ozone NAAQS, the Illinois Pollution Control Board (Illinois PCB) is now considering two regulatory proposals prepared by the Illinois EPA. The Illinois EPA will submit Illinois' NO_x RACT rules as a SIP revision once these requirements have been adopted by the Illinois PCB. It should be noted however that the attainment demonstration for the Chicago NAA for the 1997 ozone NAAQS does not rely on emission reductions from the Illinois EPA's NOx RACT proposal. The reductions resulting from this program, when implemented, will help the

area to maintain the NAAQS in future years.

5.4 Controls to Remain in Effect

Illinois will maintain all of the control measures listed in this Section to ensure maintenance of the 8-hour ozone NAAQS. Any revisions to the control measures included as part of the Maintenance Plan will be submitted as a SIP revision to U.S. EPA for approval, and will be accompanied by a showing that such changes will not interfere with maintenance of the NAAQS.

Illinois EPA has the necessary resources to enforce any violations of its rules or permit provisions. After redesignation, it intends to continue enforcing all rules that relate to the emission of ozone precursors in the Chicago nonattainment area.

5.5 Provisions for Permitting New or Modified Emission Sources

Illinois has longstanding and fully implemented programs for the review of new major sources and significant modifications of existing sources. The Prevention of Significant Deterioration (PSD) program, which includes requirements for Best Available Control Technology (BACT) on major new sources or significant modifications of existing sources, will be applicable in the Chicago area once the area has been redesignated to attainment. Illinois has been delegated full authority to implement the PSD program by U.S. EPA.

5.6 Transportation Conformity

The purpose of this section is to describe and establish the Chicago nonattainment area motor vehicle emissions budgets associated with the 8-hour ozone Maintenance Plan SIP. Average summer weekday motor vehicle emissions budgets are being proposed for the final year of the Maintenance Plan, 2020, and for the precursor pollutants VOM and NOx. These budgets were developed consistent with the motor vehicle activity assumptions and emissions control strategies incorporated into the 8-hour ozone attainment demonstration analysis. The budgets reflect an emissions level determined using motor vehicle VMT and fleet mix provided by the Chicago Metropolitan Agency for Planning (CMAP) and are consistent with the emission levels used in the attainment demonstration.

A motor vehicle emissions budget is that portion of the total allowable emissions allocated to highway and transit vehicle use that are defined in the SIP for a certain year. The rules governing transportation conformity require certain transportation activities to be consistent with motor vehicle emissions budgets contained in control strategy implementation plans (40 CFR § 93.118). Section 93.101 of the rule defines a "control strategy [State] implementation plan revision" as a "plan which contains specific strategies for controlling the emissions and reducing ambient levels of pollutants in order to satisfy CAA requirements of reasonable further progress and attainment." In order to

demonstrate conformity to the motor vehicle emissions budget, emissions from the implementation of a transportation plan or a transportation improvement program must be less than or equal to the budget level (40 CFR § 93.118(a)).

The motor vehicle emissions budgets established and described herein were developed consistent with the methodology and control strategy assumptions used in the 8-hour ozone attainment demonstration. The effects of motor vehicle control measures are incorporated into the emissions factors produced by the U.S. EPA's MOBILE6 model. These control measures include motor vehicle emissions standards, the operation of a vehicle inspection and maintenance (I/M) program, and the required use of reformulated gasoline and low sulfur gasoline and diesel fuel.

The budgets also incorporate responses to comments raised during the public comment period. These comments concerned the use of an updated vehicle registration distribution dataset and the incorporation of a "safety margin" into the year 2020 motor vehicle emissions budgets. Discussion of these comments is included in Appendix B of this report as well as the Responsiveness Summary prepared by the Illinois EPA subsequent to the public hearing and comment period. The motor vehicle emissions budgets, which reflect the VMT and control program assumptions and methodology described here, are listed in Table 5.1.

Table 5.1
Proposed Chicago NAA Year 2020 Motor Vehicle Emissions Budgets
For the 1997 8-Hour Ozone NAAQS
(tons per ozone season weekday)

VOM	73.68
NOx	88.17

Complete details on the derivation of the motor vehicle emissions budgets, including discussion of the MOBILE6 model inputs and assumptions are included in Appendix B of this report.

6.0 CONTINGENCY MEASURES

6.1 Contingency Measures

Section 175(A) of the CAA specifies the requirements for maintenance plans, including provisions for contingency measures that will be implemented if violations of the 8-hour ozone NAAQS are measured after redesignation to attainment. A list of potential contingency measures that would be implemented in such an event should also be included in the Maintenance Plan. Finally, the plan should provide a commitment to submit a revised maintenance plan eight years after redesignation to ensure continued maintenance for the next ten-year maintenance period.

Contingency measures are intended to provide further emission reductions in the event that violations of the 8-hour ozone NAAQS occur after redesignation to attainment. While these measures do not need to be fully adopted by the IPCB prior to the occurrence of NAAQS violations, the contingency plan should ensure that the contingency measures are adopted expeditiously once they are triggered. The Maintenance Plan must identify the triggers that determine when contingency measures will be adopted, and the measures that the state will consider.

Illinois EPA's contingency plan for the Chicago NAA is described in Table 6.1. Consistent with this plan, Illinois agrees to adopt and implement, as expeditiously as is practicable, the necessary corrective actions in the event that violations of the 8-hour ozone NAAQS occur within the Chicago maintenance area after redesignation to attainment. Further, Illinois commits to continue to implement the control measures identified in the attainment demonstration and RFP demonstration. As described in Section 5.0 of this report, Illinois has adopted and is continuing to implement a range of control measures that will greatly reduce precursor emissions, both locally and statewide. The contingency plan anticipates that these emission reductions will be sufficient to mitigate exceedances or violations of the NAAQS that may occur in the coming years without further regulatory action.

The contingency plan provides for different levels of corrective responses should ambient 8-hour ozone levels exceed the NAAQS in any year, if emissions in the NAA increase significantly above current attainment levels, or if the NAAQS is violated. A Level I response would occur in the event that: 1) the fourth highest 8-hour ozone concentration at any monitoring site in the Chicago NAA exceeds 84 ppb in any year, or 2) if VOM or NOx emissions increase more than 5% above the levels contained in the attainment year (2006) emissions inventory. It should be noted that U.S. EPA does not require a state to implement contingency measures when occasional exceedances are recorded. IEPA's voluntary commitment to initiate a Level I response is intended to prevent future violations of the NAAQS from ever occurring.

Illinois commits to compiling VOM and NOx emissions inventories every three years for the duration of the Maintenance Plan to facilitate the emissions trends analysis included

Table 6.1

Contingency Plan for the Chicago 8-Hour Ozone Nonattainment Area

Contingency Measure Trigger	Action to be Taken	List of Potential Contingency Measures
Level I Trigger • Fourth highest monitored 8-hour average ozone concentration exceeding 84 ppb in any year at any monitoring station in the Chicago maintenance area. • The Chicago maintenance area's NOx or VOM emissions inventories increase more than 5% above the levels included in the 2006 emissions inventories.	IL will evaluate air quality, or determine if adverse emissions trends are likely to continue. If so, IL will determine what and where controls may be required, as well as level of emissions reductions needed, to avoid a violation of the NAAQS. The study shall be completed within 9 months. If necessary, control measures shall be adopted within 18 months of determination and implemented as expeditiously as practicable, taking into consideration the ease of implementation and the technical and economic feasibility of the selected measures.	**Point Source Measures** • IL Multi-Pollutant Program for electric generating units • Reinstate requirements for Offsets and/or LAER • Apply RACT to smaller existing sources • Tighten RACT for existing sources covered by US EPA CTGs. • Expanded geographic coverage of NOx RACT • MACT controls for industrial sources • Other measures to be identified **Mobile Source Measures** • Tier 2 Vehicle Standards and Low Sulfur Fuel • Heavy Duty Diesel Standards and Low Sulfur Diesel Fuel • High-enhanced I/M (OBDII) • California Engine Standards • Other measures to be identified **Area Source Measures** • Architectural/Industrial Maintenance (AIM) Coatings • Commercial and Consumer Products • Aerosol coatings • Broader geographic applicability of existing measures • Other measures to be identified
Level II Trigger • A violation of the NAAQS at any monitoring station in the Chicago maintenance area.	IL will conduct a thorough analysis to determine appropriate measures to address the cause of the violation. Analysis shall be completed within 6 months. Selected measures shall be implemented within 18 months of a violation.	

in the contingency plan under Level I. Illinois will coordinate with LADCO and other Lake Michigan states to evaluate the causes of high ozone levels or the emissions trends and to determine appropriate control measures needed to assure continued attainment of 8-hour ozone NAAQS. Under Level I, measures that could be implemented in a short time would be selected so as to be in place quickly after the Illinois EPA is aware that corrective measures have been triggered. Control measures selected under Level I will be adopted in most cases within 18 months after a determination is made, and implemented, generally, within 24 months of adoption by the IPCB.

A Level II response would be implemented in the event that a violation of the 8-hour ozone NAAQS were to be measured at a monitoring site within the Chicago maintenance area. In order to select appropriate corrective measures, Illinois will work with LADCO and other Lake Michigan States to conduct a comprehensive study to determine the causes of the violation and the control measures necessary to mitigate the problem. The analysis will examine the following factors:

- the number, location, and severity of the ambient ozone concentrations;
- the weather patterns contributing to ozone levels;
- potential, contributing emissions sources;
- the geographic applicability of possible contingency measures;
- emissions trends, including timeliness of implementation of scheduled control measures;
- current and recently identified control technologies;
- air quality contributions from outside the maintenance area.

Contingency measures will be selected from those listed in Table 6.1 or from any other measure deemed appropriate and effective at the time the selection is made. This list of contingency measures is comprehensive, and it is expected that only a few of these measures would be required. The selection between measures will be based upon cost-effectiveness, emission reduction potential, economic and social considerations, ease and timing of implementation, or other appropriate factors. Implementation of necessary controls in response to a Level II trigger will take place as expeditiously as possible, but in no event later than 18 months after Illinois makes a determination, based on quality-assured ambient data, that a violation of the NAAQS has occurred.

Adoption of additional control measures is subject to necessary administrative and legal processes. Illinois EPA will solicit input from all interested and affected persons in the area prior to selecting appropriate control measures. No contingency measure will be implemented without providing the opportunity for full public participation. This process will include publication of notices, an opportunity for public hearing, and other measures required by Illinois law.

6.2 Commitment to Revise Plan

As noted in Section 4.5 above, Illinois commits to review its Maintenance Plan eight years after redesignation, as required by Section 175(A) of the CAA. The Maintenance Plan revision is intended to ensure continued attainment of the 8-hour ozone NAAQS for an additional ten-year period.

6.3 Public Participation

In accordance with Section 110(a)(2) of the CAA, Illinois is required to hold a public hearing prior to adoption of this Maintenance Plan and submittal to U.S. EPA. Public participation in the SIP process is provided for as follows:

- Notice of availability of the Maintenance Plan document and the time and date of the public hearing was published in the local papers for the Chicago nonattainment area on November 15, 2008.

- The public hearing to receive comments on the Maintenance Plan was held on December 16, 2008.

- A 30-day public comment period was also available after the public hearing to receive comments on the Maintenance Plan. A summary of the comments received and Illinois EPA's responses thereto is included as part of the submittal to U.S. EPA.

6.4 Legal Authority to Implement and Enforce

The Maintenance Plan must contain a demonstration that the State of Illinois has the necessary legal authority to implement and enforce the measures relied upon to attain and maintain the NAAQS. Illinois has the legal authority to implement and enforce the requirements of this SIP submittal pursuant to the Illinois Environmental Protection Act.

7.0 CONCLUSIONS

The Chicago nonattainment area has attained the 8-hour ozone NAAQS established in 1997 and has complied with the applicable provisions of the Clean Air Act required of moderate ozone nonattainment areas. Illinois has submitted an attainment demonstration that was based on air quality modeling and contains enforceable control measures. Illinois has performed an analysis that demonstrates that the Chicago NAA has attained the 1997 8-hour ozone NAAQS and believes the air quality improvements are due to permanent and enforceable control measures. Supporting documentation is contained herein.

Illinois has prepared a Maintenance Plan that meets the requirement of the Clean Air Act. This Maintenance Plan provides for the continued attainment of the 1997 8-hour ozone NAAQS for a period of ten years after U.S. EPA has formally redesignated the area to attainment. This Maintenance Plan provides adequate contingency measures for potential, additional emission reductions in the event that future violations of the 8-hour ozone NAAQS are observed in the area.

Illinois has prepared a comprehensive emission inventory of the precursors of ozone completed for the "attainment" year 2006, and has prepared a projection of the emission inventory to a year at least 10 years following redesignation. These projections indicate that emissions levels in the Chicago nonattainment area will continue to decrease, thereby maintaining the ozone NAAQS in future years. Illinois commits to continue to operate an appropriate monitoring network to verify the maintenance of the attainment status once the area has been redesignated. Illinois EPA has the legal authority to implement and enforce all control measures.

Finally, the Maintenance Plan includes on-road motor vehicle emissions budgets for use in transportation conformity determinations to assure that any increases in emissions from this sector do not jeopardize continued attainment of the 8-hour ozone standard during the ten-year maintenance period. This Maintenance Plan has been prepared in accordance with the requirements specified in U.S. EPA's guidance document, and additional guidance received from U.S. EPA staff.

APPENDIX A

Summary of Ambient Air Monitoring Data (2006-2008)

Table A.1
2006-2008 8-hour Ozone Design Values
for Monitors in the Lake Michigan Region

State of Illinois

County	AQS Code	Site Name	Design Value	4th High 2006	4th High 2007	4th High 2008
Cook	170310001	Alsip	76	78	85	66
Cook	170310032	Chicago (SWFP)	74	75	82	67
Cook	170310064	Chicago (U. of Chicago)	70	70	79	63
Cook	170310072	Chicago (Jardine)	67	65	75	63
Cook	170310076	Chicago (ComED)	73	75	80	66
Cook	170311003	Chicago (Taft)	73	77	79	64
Cook	170311601	Lemont	75	70	85	71
Cook	170314002	Cicero	62	60	68	60
Cook	170314007	Des Plaines	66	65	78	57
Cook	170314201	Northbrook	69	68	76	65
Cook	170317002	Evanston	70	72	80	58
DuPage	170436001	Lisle	63	62	72	57
Kane	170890005	Elgin	66	62	75	61
Lake	170971002	Waukegan	71	71	81	63
Lake	170971007	Zion	72	68	80	69
McHenry	171110001	Cary	65	57	74	65
Will	171971011	Braidwood	66	68	71	60

State of Indiana

County	AQS Code	Site Name	Design Value	4th High 2006	4th High 2007	4th High 2008
Elkhart	180390007	Bristol	72	67	82	68
Lake	180890022	Gary	73	73	85	62
Lake	180890030	Whiting	77	81	88	62
Lake	180892008	Hammond	73	75	77	68
La Porte	180910005	Michigan City	69	75	73	59
La Porte	180910010	La Porte	70	69	78	65
Porter	181270026	Valparaiso	70	71	80	61
St. Joseph	181410010	Potato Creek St Park	69	69	75	63
St. Joseph	181410015	South Bend	61	58	67	58
St. Joseph	181411007	Granger	73	70	82	69

State of Michigan

County	AQS Code	Site Name	Design Value	4th High 2006	4th High 2007	4th High 2008
Allegan	260050003	Holland	86	91	94	73
Benzie	260190003	Frankfort/Benzonia	76	80	82	66
Berrien	260210014	Coloma	78	76	86	73
Cass	260270003	Cassopolis	75	73	83	71
Kalamazoo	260770008	Kalamazoo	73	68	81	70
Kent	260810020	Grand Rapids	77	82	84	66
Kent	260810022	Evans/Oakfield	78	81	85	69
Leelanau	260890001	Peshawbestown	71	73	79	62
Manistee	261010922	Manistee	77	83	83	65
Mason	261050007	Scottville	75	76	83	68
Missaukee	261130001	Houghton Lake	71	73	76	66
Muskegon	261210039	Muskegon	82	90	86	72
Ottawa	261390005	Jenison	79	83	88	67
Schoolcraft	261530001	Seney	75	76	85	64

State of Wisconsin

County	AQS Code	Site Name	Design Value	4th High 2006	4th High 2007	4th High 2008
Brown	550090026	Green Bay	70	66	82	63
Door	550290004	Newport Beach	80	79	92	69
Kenosha	550590019	Chiwaukee	78	79	85	72
Kewaunee	550610002	Kewaunee	75	77	85	65
Manitowoc	550710007	Manitowoc (Two Rivers)	75	78	85	64
Milwaukee	550790010	Milwaukee (16th St.)	63	64	67	60
Milwaukee	550790026	DNR SE Region	68	68	75	63
Milwaukee	550790041	Milwaukee (UWM-North)	72	73	78	65
Milwaukee	550790085	Milwaukee (Bayside)	75	73	83	69
Ozaukee	550890008	Grafton	72	71	82	64
Ozaukee	550890009	Harrington Beach	74	72	84	67
Racine	551010017	Racine	71	71	77	65
Sheboygan	551170006	Sheboygan	82	83	88	75
Walworth	551270005	Lake Geneva	70	72	75	64
Washington	551310009	Slinger	65	66	71	60
Waukesha	551330027	Waukesha	66	67	72	60

APPENDIX B

Transportation Conformity

TRANSPORTATION CONFORMITY

This section describes the development of the Chicago nonattainment area motor vehicle emissions budgets associated with the Maintenance Plan for the 1997 8-hour NAAQS. An average summer weekday motor vehicle emissions budget is being proposed for the year 2020 for the precursor pollutants VOM and NOx. These budgets were developed consistent with the motor vehicle activity assumptions (e.g., fleet mix, registration distribution,…) and emissions control strategies incorporated into the 8-hour ozone attainment demonstration analysis.

Background

Section 176(c)(4) of the Clean Air Act Amendments of 1990 requires that transportation plans, programs, and projects which are funded or approved under Title 23 USC must be determined to conform with State or Federal air implementation plans. A motor vehicle emissions budget is that portion of the total allowable emissions allocated to highway and transit vehicle use that are defined in the SIP for a certain year. Section 93.101 of the rule defines a "control strategy [State] implementation plan revision" as a "plan which contains specific strategies for controlling the emissions and reducing ambient levels of pollutants in order to satisfy Clean Air Act ("CAA") requirements of reasonable further progress and attainment." In order to demonstrate conformity to the motor vehicle emissions budget, emissions from the implementation of a transportation plan or a transportation improvement program ("TIP") must be less than or equal to the budget level (40 CFR § 93.118(a)).

Transportation conformity will be based on these submitted on road motor vehicle emissions budgets after the U.S. Environmental Protection Agency ("U.S. EPA") determines that the budgets meet the adequacy criteria of the transportation conformity rule under §93.118(e). The motor vehicle emissions budgets in this submittal are adequate as each of the six criteria under §93.118(e) is satisfied. These six criteria include:

1. The submitted control strategy implementation plan revision or maintenance plan was endorsed by the Governor (or his or her designee) and was subject to a State public hearing.

2. Before the control strategy implementation plan or maintenance plan was submitted to U.S. EPA, consultation among federal, State, and local agencies occurred; full implementation plan documentation was provided to U.S. EPA; and U.S. EPA's stated concerns, if any, were addressed;

3. The motor vehicle emissions budgets(s) is clearly identified and precisely quantified;

4. The motor vehicle emissions budget(s), when considered together with all other emission sources, is consistent with all applicable requirements for reasonable further progress, attainment, or maintenance (whichever is relevant to the given implementation plan submission);

5. The motor vehicle emissions budget(s) is consistent with and clearly related to the emissions inventory and the control measures in the submitted control strategy implementation plan revision or maintenance plan, and

6. Revisions to previously submitted control strategy implementation plans explain and document any changes to previously submitted budgets and control measures, impacts on point and area source emissions; any changes to established safety margins; and reasons for the changes (including the basis for any changes related to emission factors or estimates of vehicle miles traveled).

This State Implementation Plan and the associated motor vehicle emissions budgets have been developed by the Illinois Environmental Protection Agency (Illinois EPA), the designated air quality agency for the State of Illinois. The required public hearing to accept public comment on the proposed motor vehicle emissions inventory was held on December 16, 2008 in Room 9-031 of the James R. Thompson Center in downtown Chicago. Notification of this hearing was printed in the Chicago Sun Times on November 15, 2008. Comments on the proposed attainment demonstration and motor vehicle emissions budgets were accepted for 30 days after the public hearing. A "Responsiveness Summary" which addresses the written comments received has been prepared and is included in the final submission.

Two comments pertinent to the proposed motor vehicle emissions budgets were received after the public hearing. The first comment, from the Chicago Metropolitan Agency for Planning (CMAP), pointed out that that the vehicle Registration dataset incorporated into the proposed budgets was from the 2003-2004 time frame and recommended that it be updated in order to comply with the transportation conformity requirement for the use of "updated planning assumptions." An updated vehicle registration distribution dataset, representative of the Chicago area's 2008 vehicle fleet was developed and has been incorporated into the motor vehicle emissions budgets estimation. The CMAP also requested the inclusion of a "safety margin" within the Maintenance Plan's motor vehicle emissions budgets. As the total emissions for the region were well below the attainment year emissions level, an additional 10% of the total of both the 2020 VOM and NOx emissions was included.

In compliance with criterion #2 above, a Tier 2 Conformity Consultation Team meeting

was held on January 30, 2009 to discuss the proposed Maintenance Plan and associated motor vehicle emissions budgets. The Consultation Team includes representatives from the Federal Highway Administration, Federal Transit Authority, U.S. EPA, Chicago Metropolitan Agency for Planning, Illinois Department of Transportation, Regional Transportation Authority, and the Illinois EPA. In addition, the development of the Maintenance Plan was discussed at length by the LADCO Project Team, which includes a representative from the U.S. EPA Region V office. The draft Maintenance Plan was also forwarded to the Region V representative for his review and comment.

The motor vehicle emissions budgets established and described herein were developed consistent with the methodology and control strategy assumptions used in the 1997 8-hour ozone attainment demonstration as well as the 8-hour ozone RFP plan . The effects of these controls are incorporated into the emissions factors produced by the U.S. EPA's MOBILE6 model. Following is a discussion of the inputs and assumptions incorporated into the development of the proposed Maintenance Plan motor vehicle emissions budgets.

Vehicle Miles Traveled

The RFP plan described in attainment demonstration incorporates county-level base year 2002 average daily vehicle miles traveled (ADVMT) levels from the Illinois Department of Transportation (IDOT). The 2002 ADVMT total for the 6-county-3-township Chicago NAA was approximately 160.8 million miles. This total was projected to the modeled attainment year, 2009, using an area-wide vehicle miles traveled (VMT) growth rate of 1.27 percent per year, determined through consultation between the Illinois EPA, CMAP, and LADCO. This growth rate has also been applied to project year 2020 VMT. Using this growth rate, the projected 2020 ADVMT level for the Chicago NAA was 201.8 million miles. To account for ozone season weekday traffic, the average daily VMT estimates were multiplied by Chicago area and facility type -specific Average-Daily-to-Average Summer Weekday conversion factors supplied by IDOT. Applying these factors resulted in an average summer weekday VMT *(ASWVMT) that is 11.3 percent greater than the average daily VMT. Applying this 11.3 percent factor yields a year 2020 ASWVMT total of 224.6 million. Following is a summary of the information and MOBILE6 model assumptions used included in the development of the draft motor vehicle emissions budgets.

Year: VMT estimates and motor vehicle emissions factors were developed representative of summer 2020

Typical Ozone Season Weekday: The 2002 Chicago NAA ozone emissions inventory, which established the baseline for the CAA-required RFP emissions reductions, is based on activity on a typical ozone season weekday. The primary parameters affected by this choice of temporal time frame are the temperature and the adjustment of VMT to account for increased travel during the summer.

Temperature: U.S. EPA guidance for the use of the MOBILE6 model calls for the use of representative summer daily temperatures. For future years, the representative

summer temperatures are the climatological average minimum and maximum temperatures at Chicago's O'Hare Airport for the summer months of June, July, and August. Those are 61 ^{o} F and 81 ^{o} F, respectively.

Absolute Humidity: U.S. EPA guidance calls for the use of the lowest absolute humidity on days corresponding to the summer climatological temperatures in the region as calculated from local climatological data published by the National Weather Service. A climatological average summer weekday absolute humidity value of 97 grains of water (vapor) per pound of dry air was calculated for O'Hare Airport.

Motor Vehicle Emission Controls: The primary motor vehicle emission control programs that will be in place in the Chicago NAA in 2020 are (1) an OBD-II-based vehicle emissions testing program, and the requirement that gasoline sold in the area be "reformulated gasoline", which is specially formulated to reduce emissions.

Inspection and Maintenance (I/M): The I/M program in effect since 2007 requires biennial On-Board Diagnostics (OBD) testing on all model year (MY) 1996 and newer (MY96+) light duty gasoline vehicles, and biennial exhaust idle and gas cap testing on MY96+ heavy duty gasoline vehicles including gasoline-powered buses, registered in the I/M area (the "testable area"). The program includes a 4 year grace period for new vehicles. This post-2007 I/M program was established after the Illinois legislature amended the Illinois Vehicle Inspection law in 2005 to (a) drop dynamometer testing of vehicles, (b) require an OBD-based program beginning in February 2007, and (c) remove the requirement for testing compliant pre-MY-1996 vehicles. (Motorcycles and diesel vehicles are not subject to I/M.)

The Chicago testable area is based upon urbanized areas and includes all of Cook, DuPage, and Lake Counties, and parts of Kane, McHenry, Will, and Kendall Counties. Some of the VMT in the Chicago testable area is generated by vehicles that come from outside the testable area and are therefore not required to undergo I/M testing. Conversely, some VMT in an area without I/M (such as Grundy County's NAA townships) may be generated by I/M vehicles from a neighboring testable area. The VMT estimates used when calculating I/M emission credits for a county or township must be adjusted to reflect VMT from vehicles subject to I/M only. This is done using I/M coverage factors derived ultimately from transportation modeling outputs. (I/M Credits are subtracted from emissions calculated assuming no I/M to give Net Emissions with I/M.) The coverage factors are 98% for Cook and DuPage Counties (that is, 98% of the gasoline-vehicle VMT in the county is from vehicles subject to I/M) , 95% for Lake County, 81% for Kendall County's NAA township, 65% for Will County, 60% for Kane County, 50% for McHenry County, and 25% for Grundy County's NAA townships.

Fuels: Reformulated gasoline (RFG) has been required in the Chicago NAA since 1995. The attainment demonstration and RFP plan both assume all gasoline sold in the Chicago NAA since 1995 is "Northern" RFG, and that this will continue through and beyond 2008 and 2009. Although a small amount of non-RFG fuel comes into the NAA in the fuel tanks of vehicles from outside the area, it is assumed that the use of non-reformulated gasoline fuel in the Chicago area is negligible.

Gasoline Sulfur: Gasoline sulfur levels were assumed to be 30 parts per million (ppm) in 2020 in accordance with the federal Tier 2 gasoline regulations which required the 30 ppm level beginning in 2006.

Diesel Sulfur: Diesel sulfur levels were assumed to be 15 parts per million in 2020 in accordance with the U.S. EPA's Highway Diesel Rule which was finalized in January 2001. This regulation required the sale of on-road diesel fuel with no greater than 15 ppm of sulfur beginning in June 2006.

Speeds: For the Chicago area, the Illinois EPA assumed an area-specific vehicle speed distribution that appears in the VMT-by-Speed-Bin external file SVMTCH07.DEF, which is described in more detail later in this document. The speed distribution in this file is for freeways and arterials only (local roads and ramps have a fixed speed in MOBILE6), and was based on transportation model output (modeled speeds on links of various classes of roads by modeling period) from CMAP (CATS) for the year 2007 (the most recent available). This speed distribution is assumed valid for 2020 as well.

VMT Mix: The regional VMT mix inputs used for 2020 were based on Chicago-area-specific 2005 VMT-by-vehicle-type data supplied by IDOT, modified to reflect expected changes in the ratio of cars to light trucks. This information is used in the MOBILE model to compute the average emission factors for certain combined vehicle classes, and the all-vehicle emission rate.

Registration Distribution: A Chicago-area-specific vehicle registration distribution profile based upon 2008 information data was developed by Illinois EPA's Division of Mobile Source Programs from data provided by the Illinois Secretary of State's Department of Motor Vehicles.

Emissions Computation: Illinois EPA calculates emissions budgets using the following formula:

1. No-I/M County Emissions by vehicle type (VT) and functional class (FC) = (County ASWVMT by FC) * (VMT Mix by VT and FC) * No-I/M emission factors (EF) by pollutant, VT, and FC) * 1.102 (grams to ton conversion factor). For areas without I/M, this is the only calculation.

2. I/M Credits by VT and FC = (County ASWVMT by FC) * (VMT Mix by

VT and FC) * (No-I/M EF – I/M EF [both by pollutant, VT, and FC]) * I/M coverage factor * 1.102. This is for areas with I/M only.

3. Net County Emissions by VT and FC = (I/M County Emissions by VT and FC) – (I/M Credits by VT and FC). This is for areas with I/M only.

The Illinois EPA performs these above calculations on a multi-page spreadsheet which automatically calculates emissions and I/M credits by county or township for each pollutant, VT, and FC, sums them by VT and FC, and aggregates them into area totals. Attachment A of this section provides additional details on the MOBILE6 model inputs used in the development of the 2020 Chicago NAA motor vehicle emissions budgets.

Motor Vehicle Emissions Budgets

Using the above VMT and control program assumptions and methodology, following are the 8-hour ozone motor vehicle emissions budgets for the Chicago area for use in determining transportation conformity.

Proposed Chicago Area Maintenance Plan 2020 Motor Vehicle Emissions Budgets (tons per ozone season weekday)	
Pollutant	**Emissions**
VOM	73.68
NOx	88.17

Transportation Conformity

External MOBILE6.2 Inputs:

In the examples of external files shown below, the actual command lines are **boldfaced**; the unbolded lines represent comments. The actual text files have no such distinction in typefaces. The unbolded lines have been "commented out" and have no effect on the MOBILE model. They may therefore be omitted, but it is suggested that they remain in the files for documentation, and to make the files easier for the user to read and understand.

The comments and other text in the External Files have been shown in the `Courier New` typeface. Actual command lines—the inputs that MOBILE actually uses—are shown in **`Courier New Bold`**

In certain cases (especially the VMT-by-Speed-Bin files) the typeface has been reduced in size so that the lines would fit within the margins of the page. This makes them easier to read.

Vehicle Inspection and Maintenance (I/M) Program

The External I/M files giving the inputs used in the MOBILE6 model in this exercise were ILLOBDIM.D (for 2002 and through 2006) and IM07ON.D (for 2007 and later years). When evaluating I/M credits for 2008, the residual effect of the ILLOBDIM program in the summer of '08 is taken into account by assuming that 75% of the vehicle fleet subject to I/M has been tested under the IM07ON program by that time, and that the other 25% have been tested under the ILLOBDIM in late 2006 and have not yet come up for retesting under IM07ON by summer 2008 (both programs are biennial). By summer 2009, all vehicles subject to I/M will have been tested under IM07ON, so this question does not arise: the I/M emission rate is simply that for the IM07ON program.

The IM07ON.D File, used for the 2020 target year inventory

The external I/M file IM07ON.D is described below. It represents an I/M program with four components, chief of which is an OBD (on-board diagnostics) test for vehicles of model year (MY) 1996 and newer. The order in which the components appear in the external file is not significant, but they must be numbered consecutively. Illinois EPA begins IM07ON.D with identifying comments, and adds other comment lines or blank lines to make the file easier to read and understand. Programs after the first need comparatively few comments because the commands are largely self-descriptive.

```
* ILLINOIS ENHANCED I/M DESCRIPTION

*  Filename: IM07ON.D

* External input file for Illinois' OBD-only I/M program
*  from 2007 on.
*  OBD-only applies to light-duty vehicles only; HDVs still get
*   an Idle Test & Gas Cap Check.
*  All program start years set to 1986 per U.S. EPA guidance in
*   "Frequently Asked Questions on MOBILE6" from U.S. EPA/OTAQ.

*  This represents the NEW I/M program in which only 1996 &
*   newer vehicles are tested with an OBD test; and the OBD test
*   applies only to LDVs.
*  This program came into effect in February 2007.


*-----------------------------------------------
*  Program description for post MY'96 LDV OBD I/M
*===============================================

* FIRST I/M program--"Evaporative]" OBD for MY 1996+ LDVs
*-------------------------------------------------------
I/M PROGRAM         : 1 1986 2050 2 T/O EVAP OBD
I/M MODEL YEARS     : 1 1996 2050
I/M VEHICLES        : 1 22222 11111111 1
I/M STRINGENCY      : 1 20.0
I/M COMPLIANCE      : 1 95.0
I/M WAIVER RATES    : 1 0.5 2.2     '01 data
I/M EXEMPTION AGE   : 1 25
I/M GRACE PERIOD    : 1 4
```

In each case, the first number after the colon refers to the I/M program's component number.

I/M PROGRAM : 1 1986 2050 2 T/O EVAP OBD

Testing began in 1986 and runs into the indefinite future (2050). The program is a biennial test-only (2 T/O, here and in other program components) program, in this case an Evaporative On-Board Diagnostics (OBD) test. The On-Board Diagnostic program in a vehicle's engine computer records information from sensors in the engine and fuel system. Indications of malfunctions or out-of-specification operations of the engine or fuel and evaporative emission control systems are stored in the engine computer as "fault codes". An OBD test consists of plugging a special scanner into an output jack from vehicle's engine computer. The scanner queries the computer and records any fault codes that the computer's OBD system has saved. OBD tests are quick, dependable, and clean, and, if a vehicle fails an OBD test, the fault codes that the scanner displays help mechanics diagnose the problem.

I/M MODEL YEARS : 1 1996 2050

This program component covers only vehicles manufactured between model year (MY) 1996 (start year) and the indefinite future (MY 2050, the end year). More and more vehicles are becoming subject to this test as new vehicles are bought and older (pre-MY-1996) ones are scrapped vehicles.

I/M VEHICLES : 1 22222 11111111 1

Only the five light-duty vehicle types (cars [LDGVs], and light trucks [LDGTs 1, 2, 3, and 4]) are covered by this program component (22222). Heavy-duty gasoline trucks (eight types) and gasoline buses are not covered by this program component (11111111 1), but rather by Programs 3 and 4, described below.

I/M STRINGENCY : 1 20.0

Stringency (exhaust inspection failure rate) is 20%. A Stringency entry is necessary for an Exhaust test, but not an Evaporative test, so this entry can be omitted or "commented out". In this Evap test case, it will be ignored by the model, but is included for reference.

I/M COMPLIANCE : 1 95.0

Compliance rate (tested vehicles as percent of all vehicles subject to I/M) is 95%

I/M WAIVER RATES : 1 0.5 2.2 '01 data

The Waiver Rate is the fraction of tested vehicles that get a waiver—i.e., do not pass the I/M test but, because repairs cost more than a specified amount, get a certificate of compliance. Waiver rate is 0.5% for MY 1980 and earlier vehicles (irrelevant now that pre-MY-96 vehicles are not tested), and 2.2% for MY 1981 and later vehicles. These figures are from VIM's actual 2001 waiver statistics, and have been representative of the last few years.

I/M EXEMPTION AGE : 1 25

Vehicles older than 25 years are not subject to this program. This will not happen until at least 2021. The default is 25, and the model does not calculate benefits for vehicles older than 25 years, so in essence this command has no effect. It could be omitted, but is included for completeness.

I/M GRACE PERIOD : 1 4

Vehicles less than 4 model years old are exempt from I/M testing.

Most of the inputs to the second and subsequent program components are the same as those for the first program, so the description of the components will be abbreviated and summarized as below, rather than after each command line as above.

* Second I/M program--"Exhaust" OBD for MY 1996+ LDVs

```
*-----------------------------------------------------
I/M PROGRAM         : 2 1986 2050 2 T/O OBD I/M
I/M MODEL YEARS     : 2 1996 2050
I/M VEHICLES        : 2 22222 11111111 1
I/M STRINGENCY      : 2 20.0
I/M COMPLIANCE      : 2 95.0
I/M WAIVER RATES    : 2 0.5 2.2      '01 data
I/M EXEMPTION AGE   : 2 25
I/M GRACE PERIOD    : 2 4
*
```

The second program component is a biennial, test-only Exhaust OBD test for MY 1996 and later LDGVs and LDGTs. In this OBD test, the scanner queries the vehicle's computer for fault codes concerning exhaust emissions. Stringency, Compliance, Waiver Rates, Exemption Age, and Grace Period are the same as in the first program. An entry for I/M STRINGENCY (20%) is required for an Exhaust I/M program.

```
*-----------------------------------------------------
*  Program description for post MY'96 HDV Idle & GC I/M
*=====================================================

* Third I/M program--HDV IDLE for MY 1996+ HDVs
*-----------------------------------------------
I/M PROGRAM         : 3 1986 2050 2 T/O IDLE
I/M MODEL YEARS     : 3 1996 2050
I/M VEHICLES        : 3 11111 22222222 2
I/M STRINGENCY      : 3 20.0
I/M COMPLIANCE      : 3 95.0
I/M WAIVER RATES    : 3 1.2 1.5      '01 data
I/M EXEMPTION AGE   : 3 25
I/M GRACE PERIOD    : 3 4
```

The third program component is a biennial, test-only Idle test for MY 1996 and later HDGVs and Gas Buses (22222222 2). Light-duty vehicles are not subject to this component (11111), but rather to components 1 and 2. Stringency, Compliance, Exemption Age, and Grace Period are the same as in component 1, but the pre- and post-MY 1981 Waiver Rates (1.2% and 1.5%, respectively), are slightly different from those in components 1 and 2. HDGVs are few in number, and most of them are commercial vehicles.

```
* Fourth I/M program--Gas Cap Check for MY 1996+ HDVs
*-------------------------------------------------
I/M PROGRAM         : 4 1986 2050 2 T/O GC
I/M MODEL YEARS     : 4 1996 2050
```

```
I/M VEHICLES        : 4 11111 22222222 2
I/M COMPLIANCE      : 4 95.0
I/M WAIVER RATES    : 4 1.2 1.5      '01 data
I/M EXEMPTION AGE   : 4 25
I/M GRACE PERIOD    : 4 4
```

The fourth program component is a biennial, test-only Gas Cap Check for MY 1996 and later HDVs. Compliance, Waiver Rates, Exemption Age, and Grace Period are the same as in the third program. Since a Gas Cap Check is an evaporative I/M test, the I/M STRINGENCY command is not necessary and is not included here.

Illinois EPA includes further notes and comments in the I/M file to document it further, as shown below:

```
* NOTES

*  This is a standard Illinois I/M input, describing the I/M
*   program with OBD Only as it is supposed to exist after
*   January 2007.  It is the file to be used for regular M6
*   I/M runs for 2007 and future years.
*
*  This file was originally SB397.D, supplied 24.viij.05.
*   Original SB397.D has been slightly revised by
*   the addition of comments such as this one.  The actual
*   inputs have not been changed.  This was done to put the two
*   LDV OBD programs (exhaust and evaporative) together, and the
*   two HDV programs together too.  The order of the programs in
*   the I/M file is not significant and has no effect in M6, but
*   the programs must be numbered sequentially.
* DVIM verified that this file as shown is correctly describes the
*   I/M program planned for introduction in January '07.
* ----------------
* COMPARISON WITH ILLOBDIM.D:
* The first three programs in ILLOBDIM.D, covering the idle
*  test for MY'68-'81 LDVs, IM240 for '81-'95 LDVs, and gas
*  cap check for MY'68-'95 LDVs have been eliminated from
*  IM07ON; and the two HDV programs now refer only to MY'96
*  and later.
```

There is no “MYCUTS.D” file associated with IM07ON.D, as there was in the previous ILLOBDIM.D file. The old ILLOBDIM.D file is not included here.

The Registration Distribution (RD) for a vehicle type is an indication of the fraction of the vehicle fleet of that type that is made up of vehicles of a given age.

The following is based on 2008 registration data from the Illinois Secretary of State’s office (ISOS). It and its contents are described in detail in the comments to the file. This file contains data (commented out so not used) from the 2001 RD file (CHIRD01) for historical and reference purposes. As noted above, those data may be deleted.

```
REG DIST

* CNAA M6 LDV RD = SOSLDV (Light-duty Vehicles--passenger cars) RD from
*  08VADbyCounty.xls for Chicago omitting '09 counts & '08 = 75% of '07
 1 0.0550  0.0733  0.0675  0.0656  0.0649  0.0666  0.0698  0.0665  0.0680
0.0598
   0.0524  0.0500  0.0415  0.0421  0.0325  0.0263  0.0218  0.0166  0.0134
0.0103
   0.0074  0.0057  0.0043  0.0033  0.0154


* CNAA M6 LDT1 RD = SOSLDT1 (ISOS "light" or type 1 LD trucks) RD from
*  08VADbyCounty.xls for Chicago omitting '09 counts & '08 = 75% of '07
 2 0.0526  0.0702  0.0769  0.0872  0.0796  0.0729  0.0835  0.0670  0.0669
0.0586
   0.0583  0.0478  0.0385  0.0342  0.0294  0.0219  0.0148  0.0118  0.0076
0.0065
   0.0051  0.0031  0.0020  0.0012  0.0024


* CNAA M6 LDT2 RD = Same as M6 LDT1 RD; see above.
 3 0.0526  0.0702  0.0769  0.0872  0.0796  0.0729  0.0835  0.0670  0.0669
0.0586
   0.0583  0.0478  0.0385  0.0342  0.0294  0.0219  0.0148  0.0118  0.0076
0.0065
   0.0051  0.0031  0.0020  0.0012  0.0024


* CNAA M6 LDT3 = SOSLDT21 (ISOS "heavy" or type 2 LD trucks) RD from
*  08VADbyCounty.xls for Chicago omitting '09 counts & '08 = 75% of '07
 4 0.0457  0.0609  0.0635  0.0720  0.0854  0.0843  0.0729  0.0689  0.0705
0.0800
   0.0517  0.0472  0.0349  0.0375  0.0294  0.0203  0.0162  0.0095  0.0104
0.0099
   0.0075  0.0049  0.0041  0.003  0.0094


* CNAA M6 LDT4 = same as LDT3 RDs; see above.
 5 0.0457  0.0609  0.0635  0.0720  0.0854  0.0843  0.0729  0.0689  0.0705
0.0800
   0.0517  0.0472  0.0349  0.0375  0.0294  0.0203  0.0162  0.0095  0.0104
0.0099
   0.0075  0.0049  0.0041  0.003  0.0094


*  Above from 2008 Chicago-area data from DVIM (Gebhardt), as modified by
*   OTAQ (16.j.09) from SL's CRD08X09.d file, & renamed CHRD08AA.d.
*
*  Heavy-Duty & MC RDs below are all assumed same as M6 default RD.
*
* HDV2B (Heavy-duty vehicles 2B--M6 Default RDs)
 6 0.0503 0.0916 0.0833 0.0758 0.0690 0.0627 0.0571 0.0519 0.0472 0.0430
   0.0391 0.0356 0.0324 0.0294 0.0268 0.0244 0.0222 0.0202 0.0184 0.0167
   0.0152 0.0138 0.0126 0.0114 0.0499
* HDV3 (Heavy-duty vehicles3, same RD as HDV2B, M6 Default RDs)
 7 0.0503 0.0916 0.0833 0.0758 0.0690 0.0627 0.0571 0.0519 0.0472 0.0430
   0.0391 0.0356 0.0324 0.0294 0.0268 0.0244 0.0222 0.0202 0.0184 0.0167
   0.0152 0.0138 0.0126 0.0114 0.0499
* HDV4 (Heavy-duty vehicles 4, M6 default RDs)
 8 0.0388 0.0726 0.0679 0.0635 0.0594 0.0556 0.0520 0.0486 0.0455 0.0425
   0.0398 0.0372 0.0348 0.0326 0.0304 0.0285 0.0266 0.0249 0.0233 0.0218
   0.0204 0.0191 0.0178 0.0167 0.0797
* HDV5 (Heavy-duty vehicles 5, same RD as HDV4, M6 Default)
```

```
 9 0.0388 0.0726 0.0679 0.0635 0.0594 0.0556 0.0520 0.0486 0.0455 0.0425
   0.0398 0.0372 0.0348 0.0326 0.0304 0.0285 0.0266 0.0249 0.0233 0.0218
   0.0204 0.0191 0.0178 0.0167 0.0797
* HDV6 (Heavy-duty vehicles 6, same RD as HDV4, M6 Default)
10 0.0388 0.0726 0.0679 0.0635 0.0594 0.0556 0.0520 0.0486 0.0455 0.0425
   0.0398 0.0372 0.0348 0.0326 0.0304 0.0285 0.0266 0.0249 0.0233 0.0218
   0.0204 0.0191 0.0178 0.0167 0.0797
* HDV7 (Heavy-duty vehicles 7, same RD as HDV4, M6 Default)
11 0.0388 0.0726 0.0679 0.0635 0.0594 0.0556 0.0520 0.0486 0.0455 0.0425
   0.0398 0.0372 0.0348 0.0326 0.0304 0.0285 0.0266 0.0249 0.0233 0.0218
   0.0204 0.0191 0.0178 0.0167 0.0797
* HDV8A (Heavy-duty vehicles 8A same RD as HDV4, M6 Default)
12 0.0388 0.0726 0.0679 0.0635 0.0594 0.0556 0.0520 0.0486 0.0455 0.0425
   0.0398 0.0372 0.0348 0.0326 0.0304 0.0285 0.0266 0.0249 0.0233 0.0218
   0.0204 0.0191 0.0178 0.0167 0.0797
* HDV8B (Heavy-duty vehicles 8B,same RD as HDV4, M6 Default)
13 0.0388 0.0726 0.0679 0.0635 0.0594 0.0556 0.0520 0.0486 0.0455 0.0425
   0.0398 0.0372 0.0348 0.0326 0.0304 0.0285 0.0266 0.0249 0.0233 0.0218
   0.0204 0.0191 0.0178 0.0167 0.0797
* HDBS (HDV School buses; this M6 RD default is assumed)
14 0.0393 0.0734 0.0686 0.0641 0.0599 0.0559 0.0522 0.0488 0.0456 0.0426
   0.0398 0.0372 0.0347 0.0324 0.0303 0.0283 0.0264 0.0247 0.0231 0.0216
   0.0201 0.0188 0.0176 0.0165 0.0781
* HDBT (HDV Transit buses; this M6 RD default is assumed)
15 0.0307 0.0614 0.0614 0.0614 0.0614 0.0614 0.0614 0.0614 0.0614 0.0613
   0.0611 0.0607 0.0595 0.0568 0.0511 0.0406 0.0254 0.0121 0.0099 0.0081
   0.0066 0.0054 0.0044 0.0037 0.0114
* MC (Motorcycles; this M6 default RD is assumed)
16 0.1440 0.1680 0.1350 0.1090 0.0880 0.0700 0.0560 0.0450 0.0360 0.0290
   0.0230 0.0970 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
   0.0000 0.0000 0.0000 0.0000 0.0000
```

This CHRD08AA.d file is derived ultimately from REGDATA.D, the default MOBILE6 RD file, but more immediately derived from an original CHIRD08.D file calculated using 2008 registration counts by age for light-duty vehicles (LDVs) supplied to SL by Chuck Gebhardt (IEPA/BOA/DMSP) in his spreadsheet *VehicleAgeDistributionByCounty.xls* and rendered into RD form in SL's spreadsheet *08VADbyCounty.xls*, with counts for MY'09 vehicles omitted as non-representative, and counts for MY'08 vehicles set to 75% of those for MY'07 vehicles, in accordance with USEPA practice as given in MOBILE6 training materials available from OTAQ on line. This file was created in January 2009.

This data is ultimately derived from ISOS registration data for LDVs subject to I/M in the Chicago-area counties. Since more than 90% of the light-duty gasoline vehicles in the Chicago NAA are subject to I/M, we assume the RD for Chicago-area LDVs subject to I/M is representative of that for all Chicago-area LDVs.

The ISOS data were counts for what ISOS calls "LDVs", LDT1s", and "LDT2s" by model year (MY). Those appear below as SLDV, SLDT1, and SLDT2 to distinguish them from M6 vehicle types.

- SLDVs correspond to passenger cars, so SLDVs = M6 LDVs.
- SLDT1s correspond to M6 LDT1s and LDT2s. ISOS data do not distinguish between the two M6 categories. For this reason, the RDs for M6 LDT1 and LDT2 are assumed to be the same.

- Similarly, SLDT2s correspond to M6 LDT3s and LDT4s, and ISOS data don't distinguish between those two M6 categories either. Therefore, the RDs for M6 LDT3 and LDT4 are also assumed to be the same.

Of course the SLDT1 (LDT12) and SLDT2 (LDT34) RDs are not the same.

The age distribution fractions have been rounded to 4 decimal places, and where the rounded fractions do not add up to 1.0000 exactly, RD fractions for old (age 22 to 24 years) have at times been modified by +/- 0.0001 so as to make the RDs add up to 1.0000. (This is a requirement of the MOBILE6 model.)

See the default M6 RD file REGDATA.D and especially the M6 Users Guide Section 2.8.7.1 (p. 63 ff) for more detailed information about RD files. See also the actual MOBILE6 source code \SOURCE\BD20.FOR and IEPA's previous local-area RDs (e.g., CHIRD03.D and CHIRD01.D) for further information.

In this RD file, the first number in each distribution is an integer that indicates which of the 16 M6 vehicle classes are represented by the RD in question. That number is followed by 25 age fractions arranged in two rows of 10 values followed by a third row with the last 5 values. (This is similar to the format used in M5b for RDs, and is the same format as the default REGDATA.D file.)

RDs for all vehicle classes are given in this file. This is for completeness even though only those vehicle classes whose RDs were changed from the REGDATA defaults need to be included in this file. Those RDs that were not changed from default values are so noted.

It is assumed that the RDs for diesel vehicles are the same as the RDs for the corresponding gasoline vehicles; in particular, LDDV and LDDT RDs are assumed the same as LDGV and LDGT RDs. Since the (default) HDV RDs are based more on diesel vehicles to start with, and HDGVs are many fewer than HDDVs, especially in the higher weight classes, we feel the default HDV RDs represent both HDGV and HDDV reasonably well.

Default RDs are assumed for the various HDV classes. Good area-specific HDV age distribution data are lacking—the ISOS data covered only light-duty vehicles subject to I/M—and besides, much Chicago-area HDV VMT is from vehicles registered outside the Chicago area and just passing through. The best choice, then, was to go with the HDV defaults. Similarly, accurate local-area registration data for motorcycles are lacking, so the default MC RD is used.

External MOBILE6.2 Activity File Inputs: VMT by Facility Type, VMT by Hour, VMT by Speed Bin.

The following files were used in the 2002 base year and the 2008 and 2009 future year estimates.

VMT by Facility Type

The M6.2 default file is FVMT.D, provided with the MOBILE6 model. The Chicago-area-specific VMT-by-facility-type file is FVMTCH07.D, shown below. It based on the most recent complete data from CMAP on VMT by hour by vehicle class. This is a very long file —about 750 lines—so for the purposes of this Appendix, only the data for vehicle types 1, 6, 11, 13, 24 (LDGV, HDGV2b, HDGV7, HDGV13, and MC) are shown; the others are omitted. See the second paragraph of the introduction to the file.

```
VMT BY FACILITY
*
* This is [F:\]AREASPEC\CHNAA\FVMTCH07.DEF, an FVMT file, which was
*  developed from CATS 2007 transportation model output
*  as given in his MF13.XLS file as sent to and recalculated by
*  SL.  13.xj.02.
*
* VMT fractions are listed for 28 vehicle classes for each hour of
*  the day starting at 6AM, as follows
*   Classes 1-5 (LDGV, LDGT1, LDGT2, LDGT3, and LDGT4), and
*     Classes 14, 15, and 28 (LDDV, LDDT12, LDDT34) were all assumed
*     to have the "Light-duty Vehicle" distribution on page "SL VMT
*     by vehicle type reedited" of the MF13 file.
*   Classes 6-10 and 16-20 (HDGV2b-HDGV6 and HDDV2b-HDDV6) were assumed
*    to have the "LTRK" (light HDV) distribution on that page.
*   Classes 11 & 12 and 21 & 22 (HDGV7 & HDGV8a, and HDDV7 & HDDV8a) were
*    assumed to have the "MTRK" (medium HDV) distribution on that page.
*   Classes 13 and 23 (HDGV8b and HDDV8b) were assumed to have the
*    "HTRK" (heavy HDV) distribution on that page
*   Classes 24 and 25-27 (Motorcycles and the three bus classes [HDGB,
*    HDDBT and HDDBS]) were assumed to have the default distribution
*    for those types in FVMT.DEF.
*
* The four values in each line represent the VMT distribution on
* freeway, arterial, local and ramps--in that order--as shown.
*
* See M6UG 2.8.5.1.f., p. 49, or CLASLIST.TXT for further info.
* (The CLASLIST file describes the vehicle classes.)
*
* Veh   Int&   Arts&   Local
*Class  Fwys   Colls   Rd/St   Ramps
*-----  ----   -----   -----   -----
*
    1  0.3341  0.5393  0.1105  0.0161
       0.2604  0.6106  0.1160  0.0130
       0.2604  0.6106  0.1160  0.0130
       0.2669  0.5831  0.1365  0.0135
       0.2576  0.5823  0.1468  0.0133
       0.2576  0.5823  0.1468  0.0133
       0.2576  0.5823  0.1468  0.0133
       0.2576  0.5823  0.1468  0.0133
       0.2683  0.5830  0.1354  0.0133
       0.2683  0.5830  0.1354  0.0133
       0.2646  0.5911  0.1315  0.0128
```

```
        0.2646  0.5911  0.1315  0.0128
        0.2825  0.5568  0.1468  0.0139
        0.2825  0.5568  0.1468  0.0139
        0.3363  0.5122  0.1358  0.0157
        0.3363  0.5122  0.1358  0.0157
        0.3363  0.5122  0.1358  0.0157
        0.3363  0.5122  0.1358  0.0157
        0.3363  0.5122  0.1358  0.0157
        0.3363  0.5122  0.1358  0.0157
        0.3363  0.5122  0.1358  0.0157
        0.3363  0.5122  0.1358  0.0157
        0.3363  0.5122  0.1358  0.0157
        0.3363  0.5122  0.1358  0.0157
.
```

[Data for Vehicle Types 2 through 5 omitted]

.

```
    6   0.3836  0.5157  0.0827  0.0180
        0.3045  0.5985  0.0822  0.0148
        0.3045  0.5985  0.0822  0.0148
        0.3589  0.5412  0.0829  0.0170
        0.3791  0.5203  0.0826  0.0180
        0.3791  0.5203  0.0826  0.0180
        0.3791  0.5203  0.0826  0.0180
        0.3791  0.5203  0.0826  0.0180
        0.3606  0.5397  0.0827  0.0170
        0.3606  0.5397  0.0827  0.0170
        0.3581  0.5432  0.0816  0.0171
        0.3581  0.5432  0.0816  0.0171
        0.4101  0.4884  0.0815  0.0200
        0.4101  0.4884  0.0815  0.0200
        0.4312  0.4663  0.0818  0.0207
        0.4312  0.4663  0.0818  0.0207
        0.4312  0.4663  0.0818  0.0207
        0.4312  0.4663  0.0818  0.0207
        0.4312  0.4663  0.0818  0.0207
        0.4312  0.4663  0.0818  0.0207
        0.4312  0.4663  0.0818  0.0207
        0.4312  0.4663  0.0818  0.0207
        0.4312  0.4663  0.0818  0.0207
.
```

[Data for Vehicle Types 7 through 11 omitted]

.

```
   11   0.4158  0.4904  0.0752  0.0186
        0.3337  0.5763  0.0749  0.0151
        0.3337  0.5763  0.0749  0.0151
        0.3905  0.5165  0.0755  0.0175
        0.4111  0.4952  0.0752  0.0185
        0.4111  0.4952  0.0752  0.0185
        0.4111  0.4952  0.0752  0.0185
        0.4111  0.4952  0.0752  0.0185
        0.3928  0.5144  0.0753  0.0175
        0.3928  0.5144  0.0753  0.0175
        0.3896  0.5185  0.0742  0.0177
        0.3896  0.5185  0.0742  0.0177
        0.4423  0.4630  0.0743  0.0204
        0.4423  0.4630  0.0743  0.0204
        0.4619  0.4425  0.0745  0.0211
        0.4619  0.4425  0.0745  0.0211
        0.4619  0.4425  0.0745  0.0211
        0.4619  0.4425  0.0745  0.0211
        0.4619  0.4425  0.0745  0.0211
```

```
        0.4619  0.4425  0.0745  0.0211
        0.4619  0.4425  0.0745  0.0211
        0.4619  0.4425  0.0745  0.0211
        0.4619  0.4425  0.0745  0.0211
        0.4619  0.4425  0.0745  0.0211
```

.

[Data for Vehicle Types 7 through 12 omitted]

.

```
   13   0.6106  0.3299  0.0430  0.0165
        0.5563  0.3937  0.0367  0.0133
        0.5563  0.3937  0.0367  0.0133
        0.6241  0.3235  0.0376  0.0148
        0.6260  0.3178  0.0403  0.0159
        0.6260  0.3178  0.0403  0.0159
        0.6260  0.3178  0.0403  0.0159
        0.6260  0.3178  0.0403  0.0159
        0.6561  0.2957  0.0340  0.0142
        0.6561  0.2957  0.0340  0.0142
        0.6029  0.3414  0.0401  0.0156
        0.6029  0.3414  0.0401  0.0156
        0.5776  0.3523  0.0508  0.0193
        0.5776  0.3523  0.0508  0.0193
        0.5737  0.3512  0.0547  0.0204
        0.5737  0.3512  0.0547  0.0204
        0.5737  0.3512  0.0547  0.0204
        0.5737  0.3512  0.0547  0.0204
        0.5737  0.3512  0.0547  0.0204
        0.5737  0.3512  0.0547  0.0204
        0.5737  0.3512  0.0547  0.0204
        0.5737  0.3512  0.0547  0.0204
        0.5737  0.3512  0.0547  0.0204
```

.

[Data for Vehicle Types 14 through 23 omitted]

.

```
   24   0.392   0.457   0.117   0.034
        0.344   0.497   0.129   0.030
        0.338   0.497   0.135   0.029
        0.349   0.492   0.129   0.030
        0.346   0.497   0.127   0.030
        0.333   0.509   0.129   0.029
        0.324   0.516   0.132   0.028
        0.334   0.506   0.131   0.029
        0.334   0.506   0.131   0.029
        0.320   0.519   0.134   0.028
        0.330   0.506   0.135   0.029
        0.312   0.521   0.140   0.027
        0.295   0.538   0.141   0.026
        0.310   0.527   0.137   0.027
        0.329   0.510   0.133   0.029
        0.343   0.497   0.131   0.030
        0.381   0.460   0.126   0.033
        0.405   0.437   0.123   0.035
        0.426   0.418   0.118   0.037
        0.443   0.403   0.115   0.039
        0.457   0.394   0.110   0.040
        0.461   0.391   0.107   0.040
        0.453   0.400   0.108   0.039
        0.418   0.434   0.112   0.036
```

[Data for Vehicle Types 25 through 28 omitted; the file ends after Vehicle Type 28.]

VMT by Hour of the Day

The MOBILE6.2 default file is HVMT.D. The most current Chicago-area-specific file is HVMTCH7R.SL, shown below, derived from 2007 modeling output from CMAP. Again, this file contains "commented-out" data from previous files for comparison purposes.

```
VMT BY HOUR
*  Fraction of all vehicle miles traveled by hour of the day.
*  First hour is 6 a.m.  These data are for the Chicago NAA for
*   2007, derived from CMAP VbyHr07.def file based
*   upon his run iepa07 300_20070830, VMT for 2007.
*
*  This file is HVMTCH7R.SL representing SL's estimate of VMT by hour.
*   IEPA estimates are based on CMAP data, but assume VMT in multi-hour
*   modeling periods is distributed as the default is distributed across
*   the hours in question.  Calculations made from VbyHr07.def
*   in accordance with USEPA guidance on the subject.  See M6 Technical Guidance
*   Document (Jan '02) Section 4.3.3 for details.


0.03358  0.07039  0.06240  0.07658  0.05870  0.06327
0.06609  0.06207  0.06693  0.07118  0.07991  0.07507
0.05924  0.04599  0.02160  0.01851  0.01360  0.01010
0.00757  0.00603  0.00568  0.00561  0.00687  0.01304

*  Here are RP's original fractions from VbyHr07.def
*  0.033579 0.066392 0.066392 0.076578 0.062532 0.062532
*  0.062532 0.062532 0.069056 0.069056 0.077490 0.077490
*  0.052616 0.052616 0.010861 0.010861 0.010861 0.010861
*  0.010861 0.010861 0.010861 0.010861 0.010861 0.010861

*  These following are the default values from HVMT.DEF
*   supplied for comparison.
*      0.0569  0.0740  0.0655  0.0555  0.0540  0.0582
*      0.0608  0.0571  0.0598  0.0636  0.0777  0.0730
*      0.0501  0.0389  0.0308  0.0264  0.0194  0.0144
*      0.0108  0.0086  0.0081  0.0080  0.0098  0.0186
*
*  Following are SL's original HVMTCH07 fractions based upon DE's '07 model
*   runs made in 2002 (for information).
*      0.0443  0.0851  0.0755  0.0577  0.0541  0.0583
*      0.0609  0.0572  0.0659  0.0701  0.0818  0.0769
*      0.0576  0.0447  0.0219  0.0188  0.0138  0.0102
*      0.0077  0.0061  0.0058  0.0057  0.0070  0.0132
```

All these Hourly-VMT files show similar profiles, with morning and afternoon peaks, a noontime dip, and a minimum about 3AM - 4AM, which is to be expected.

VMT by Speed Bin

The MOBILE6.2 default file is SVMT.D. The Chicago-area-specific Speed-bin file is SVMTCH07.DEF, shown below. It represents 2007 CMAP transportation model output.

```
SPEED VMT
  1  1 0.0053 0.0044 0.0088 0.0299 0.0300 0.0484 0.0641 0.0632 0.0709 0.0801 0.0981 0.2160 0.1953
0.0857
  1  2 0.0135 0.0570 0.0859 0.0790 0.0766 0.0954 0.0681 0.0704 0.0722 0.1018 0.0761 0.1084 0.0524
0.0432
  1  3 0.0135 0.0570 0.0859 0.0790 0.0766 0.0954 0.0681 0.0704 0.0722 0.1018 0.0761 0.1084 0.0524
0.0432
  1  4 0.0017 0.0054 0.0027 0.0159 0.0331 0.0451 0.0702 0.0761 0.0892 0.1259 0.1164 0.2390 0.0989
0.0805
  1  5 0.0017 0.0047 0.0109 0.0329 0.0238 0.0300 0.0439 0.0582 0.0740 0.1160 0.1244 0.2584 0.1237
0.0975
  1  6 0.0017 0.0047 0.0109 0.0329 0.0238 0.0300 0.0439 0.0582 0.0740 0.1160 0.1244 0.2584 0.1237
0.0975
  1  7 0.0017 0.0047 0.0109 0.0329 0.0238 0.0300 0.0439 0.0582 0.0740 0.1160 0.1244 0.2584 0.1237
0.0975
  1  8 0.0017 0.0047 0.0109 0.0329 0.0238 0.0300 0.0439 0.0582 0.0740 0.1160 0.1244 0.2584 0.1237
0.0975
  1  9 0.0072 0.0093 0.0142 0.0382 0.0420 0.0478 0.0654 0.0898 0.0849 0.1104 0.1195 0.2126 0.0722
0.0866
  1 10 0.0072 0.0093 0.0142 0.0382 0.0420 0.0478 0.0654 0.0898 0.0849 0.1104 0.1195 0.2126 0.0722
0.0866
  1 11 0.0081 0.0325 0.0434 0.0683 0.0493 0.0530 0.0780 0.0803 0.0773 0.0953 0.1179 0.1443 0.0875
0.0648
  1 12 0.0081 0.0325 0.0434 0.0683 0.0493 0.0530 0.0780 0.0803 0.0773 0.0953 0.1179 0.1443 0.0875
0.0648
  1 13 0.0016 0.0013 0.0059 0.0137 0.0237 0.0247 0.0391 0.0556 0.0479 0.0729 0.0904 0.2202 0.2979
0.1049
  1 14 0.0016 0.0013 0.0059 0.0137 0.0237 0.0247 0.0391 0.0556 0.0479 0.0729 0.0904 0.2202 0.2979
0.1049
  1 15 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  1 16 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  1 17 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  1 18 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  1 19 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  1 20 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  1 21 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  1 22 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  1 23 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  1 24 0.0011 0.0002 0.0000 0.0000 0.0000 0.0038 0.0101 0.0178 0.0386 0.0660 0.0981 0.1509 0.5215
0.0919
  2  1 0.0000 0.0004 0.0017 0.0041 0.0160 0.0461 0.1311 0.1952 0.1835 0.2385 0.0665 0.1170 0.0000
0.0000
  2  2 0.0021 0.0328 0.0517 0.0618 0.0924 0.1181 0.1447 0.1449 0.1170 0.1185 0.0457 0.0704 0.0000
0.0000
  2  3 0.0021 0.0328 0.0517 0.0618 0.0924 0.1181 0.1447 0.1449 0.1170 0.1185 0.0457 0.0704 0.0000
0.0000
  2  4 0.0001 0.0007 0.0025 0.0068 0.0232 0.0572 0.1470 0.2077 0.1791 0.2034 0.0682 0.1041 0.0000
0.0000
  2  5 0.0000 0.0008 0.0029 0.0074 0.0224 0.0565 0.1435 0.1985 0.1862 0.2044 0.0681 0.1093 0.0000
0.0000
  2  6 0.0000 0.0008 0.0029 0.0074 0.0224 0.0565 0.1435 0.1985 0.1862 0.2044 0.0681 0.1093 0.0000
0.0000
  2  7 0.0000 0.0008 0.0029 0.0074 0.0224 0.0565 0.1435 0.1985 0.1862 0.2044 0.0681 0.1093 0.0000
0.0000
  2  8 0.0000 0.0008 0.0029 0.0074 0.0224 0.0565 0.1435 0.1985 0.1862 0.2044 0.0681 0.1093 0.0000
0.0000
  2  9 0.0002 0.0028 0.0064 0.0149 0.0423 0.0779 0.1620 0.1879 0.1732 0.1734 0.0644 0.0947 0.0000
0.0000
  2 10 0.0002 0.0028 0.0064 0.0149 0.0423 0.0779 0.1620 0.1879 0.1732 0.1734 0.0644 0.0947 0.0000
0.0000
  2 11 0.0017 0.0151 0.0292 0.0423 0.0720 0.1030 0.1538 0.1654 0.1429 0.1415 0.0511 0.0821 0.0000
0.0000
  2 12 0.0017 0.0151 0.0292 0.0423 0.0720 0.1030 0.1538 0.1654 0.1429 0.1415 0.0511 0.0821 0.0000
0.0000
  2 13 0.0000 0.0003 0.0018 0.0039 0.0140 0.0369 0.1146 0.1939 0.1865 0.2383 0.0751 0.1348 0.0000
```

```
0.0000
  2 14 0.0000 0.0003 0.0018 0.0039 0.0140 0.0369 0.1146 0.1939 0.1865 0.2383 0.0751 0.1348 0.0000
0.0000
  2 15 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
  2 16 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
  2 17 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
  2 18 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
  2 19 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
  2 20 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
  2 21 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
  2 22 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
  2 23 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
  2 24 0.0003 0.0000 0.0002 0.0008 0.0008 0.0042 0.0749 0.1565 0.1661 0.3285 0.0786 0.1890 0.0000
0.0000
*
* Speed Bins:

*       2.5    5.0    10.0   15.0   20.0   25.0   30.0   35.0   40.0
45.0   50.0   55.0   60.0   65.0+
*
*  Speed bins extend 2.5 mph on either side of the bin name (i.e., the
30 mph speed bin encompasses speeds from 27.5 to 32.5 mph), except for
the 2.5 mph bin (0 to 2.5 mph) and the 65+ mph bin (62.5 mph or above)


*
*  This is SVMTCH07.DEF.
*
*  These data come from a spreadsheet page titled "[DE] spdvmt" in the
Excel file MF13.XLS, supplied to IEPA by CATS, in October '02, being VMT
output from CATS's transportation model aggregated into the
various speed bins by county and M6 road type for the 8 CATS time
periods.  SL
*   slightly modified and reformatted the page, and verified that DE's
vmt-by-speed-bin calculations were correct.  See also CATS's file
titled VBYSPD.DEF
*
*  The information in this file strictly speaking represents a speed
distribution for 2007, but this is assumed (after discussion with
CATS) reasonably valid throughout the 2000-2020 period.
*
*  The above data are for the Chicago NAA, and for Freeways and
Arterials only.
*
*  See M6 User's Guide Sec. 2.8.8.2.c and Appendix B, Table 5: "Average
Speed Ranges for Speed Bins
*   (SPEED VMT Command)" for further information about this file and its
use.
*
*  The first number in each line is roadway type: 1 = Freeways; 2 =
Arterials.  Locals and Ramps have a fixed speed in M6, and therefore are
not affected by this file.
*  The second number is the hour of the day, hour 1 being [hour
beginning at] 6 AM, and hour 24 being [hour beginning at] 5 AM the next
day.
*  The third and subsequent numbers are the fractions of VMT in that
hour that occur within the specified speed bins.  These fractions were
calculated from DE's file, which gave estimates of VMT assigned to each
```

```
of the 8 CATS modeling periods.

*
*  Note that, for Freeways, most VMT is in the 45-50-55-60-mph speed
bins, with lower speeds more common during Peak hours (which is
reasonable).  Much the same holds for Arterials, where most VMT is in
the 30-35-40-45 mph speed bins (also reasonable).

*
*  See also the default VMT-by-speed file SVMT.DEF for more information
and comments.
*

*   --SL, 25.xj.02
*     Revisions:
*        7.ix.06...Small changes made to text of these comments by SL;
no changes to numerical data.
```