

## **Transportation Conformity**

This section describes the development of the Chicago nonattainment area motor vehicle emissions budgets associated with the 8-hour ozone attainment demonstration State Implementation Plans (SIP). An average summer weekday motor vehicle emissions budget is being proposed for the year 2009 for the precursor pollutants volatile organic material (“VOM”) and oxides of nitrogen (“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 and which was supplied to the Lake Michigan Air Directors Consortium (“LADCO”) for use in the attainment demonstration photochemical modeling 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 (“USEPA”) 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 EPA, consultation among federal, State, and local agencies occurred: full implementation plan documentation was provided to [US]EPA; and [US]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 with this submission. One comment received and

discussed in the “Responsiveness Summary” deals with the use of an updated vehicle Registration Distribution. This response to this comment is incorporated into this Section and directly affects the motor vehicle emissions budgets being proposed.

In compliance with adequacy criterion #2, interagency consultation meetings were held with members of the Chicago Metropolitan Agency for Planning (CMAP) Tier 2 Consultation Team on July 2, 2008 and on January 30, 2009. At these meetings, the IEPA representative discussed the requirements for the attainment demonstration as they relate to transportation conformity and explained the derivation of the proposed motor vehicle emissions budgets. Also discussed was the response to the comment concerning the use of an updated registration distribution dataset which resulted in a revised motor vehicle emissions budget for both VOC and NOx. Compliance with the remaining adequacy criteria is contained within the narrative of the attainment demonstration document and this transportation conformity section.

### **The 8-Hour Ozone Attainment Demonstration**

The Lake Michigan Air Director’s Consortium along with the States of Illinois, Indiana, Michigan, Ohio, and Wisconsin, have developed a strategy to demonstrate attainment of achieve the 8-hour ozone NAAQS in the lower Lake Michigan area in the year 2009. This plan incorporates base year emissions from all source categories (i.e., point, area, on-road, off-road), projections of emissions growth, and the inclusion of emissions reduction strategies. Transportation network data (e.g., road links, traffic volumes and speeds) and assumptions (e.g., fleet mix, VMT mix) were provided to LADCO by the CMAP for use in the modeling.

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 Demonstrations as well as the 8-hour ozone Reasonable Further Progress plan (RFP). The effects of these controls are incorporated into the emissions factors produced by the USEPA’s MOBILE6 model. Following is a discussion of the inputs and assumptions incorporated into the development of the motor vehicle emissions budgets.

The RFP plan described in Section 5.0 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 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. The projected 2009 ADVMT level for the Chicago NAA was 175.7 million miles. To account for ozone season weekday traffic, the average daily VMT estimates were multiplied by Chicago-area-specific Average-Daily-to-Average Summer Weekday conversion factors supplied by IDOT. The forecast 2009 average summer weekday VMT (ASWVMT) level used to establish the motor vehicle emissions budgets for the Chicago NAA was 195.5 million miles, or a little more than 11% greater than the forecast 2009 ADVMT. This level is consistent with the VMT level used in the attainment demonstration, and since it results in a lower, more conservative VMT level. The Illinois EPA believes that basing the motor vehicle emissions on this lower total demonstrates consistency with the attainment demonstration. An ASWVMT level of approximately 193.1 million miles was used in the development of the 2008 RFP plan. 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 2008 for the RFP demonstration, and for 2009 for the modeled attainment demonstration.

**Typical Ozone Season Weekday:** The 2002 Chicago Area ozone precursor 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 National Weather Service's climatological average minimum and maximum temperatures at Chicago's O'Hare Airport for the summer months of June, July, and August. Those are 61 °F and 81 °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 2008 and 2009 are (1) an OBD-II-based vehicle emissions testing program, and the requirement that gasoline sold in the area be "reformulated gasoline", fuel that 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 (that is, a MY 2004 car would be tested every other year starting in 2008.) See Attachment A for more information. 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 2008 and 2009 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 2009 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 2009 as well.

**VMT Mix:** The regional VMT mix inputs used for 2009 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:** An updated Chicago-area-specific vehicle registration distribution profile, based upon 2008 information data was supplied 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 2009 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 nonattainment area for use in determining transportation conformity.

**Proposed Chicago NAA 2009 Motor Vehicle Emissions Budgets**

(tons per ozone season weekday)

<b>Pollutant</b>	<b>Emissions</b>
<b>VOC</b>	133.78
<b>NO<sub>x</sub></b>	284.65

## Attachment A

### 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). The effective I/M emission rate in 2008 is thus 25% of ILLOBDIM's plus 75% of IM07ON's. 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 2009 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, so are deemed representative of 2009. In this case the comment stating that fact is allowed in the same line as the data.

**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—in this case MY2006, '07, '08, and '09—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**

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**

```
* CNA A 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

* CNA A 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

\* CNA A 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

\* CNA A 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

\* CNA A 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 CHR08AA.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 vehicles 3, 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 CHR08AA.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 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 Attachment, 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 vtype 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,  
 \* HDBBT and HDBBS]) 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
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
	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
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 SVMTC07.DEF, shown below. It represents 2007 CMAP transportation model output, deemed representative for 2009 as well.

```

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] spdvtm" 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 VBYSPPD.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 2000-2010+ 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.