DOCUMENTATION FOR THE FINAL 2002 MOBILE NATIONAL EMISSIONS INVENTORY, VERSION 3

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DOCUMENTATION FOR THE FINAL 2002 MOBILE NATIONAL EMISSIONS INVENTORY, VERSION 3

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TABLES

ACRONYMS AND ABBREVIATIONS

AAMA	Alliance of Automobile Manufacturers of America
ALVW	adjusted loaded vehicle weight
ASOS	Automated Surface Observing System
AWOS	Automated Weather Observing System
ATV	all-terrain vehicle
BSFC	brake-specific fuel consumption
CAP	criteria air pollutant
CASRN	Chemical Abstracts Service Registry Numbers
CENRAP	Central Regional Air Planning Association
CERR	Consolidated Emissions Reporting Rule
CNG	compressed natural gas
CO	carbon monoxide
EC	elemental carbon
EIG	Emission Inventory Group
EPA	U.S. Environmental Protection Agency
ERG	Eastern Research Group, Inc
ETBE	ethyl tertiary butyl ether
ETOH	ethanol
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FID	flame ionization detection
FIPS	Federal Information Processing System
GSE	ground support equipment
GUI	graphical user interface
GVWR	gross vehicle weight rating
HAPs	hazardous air pollutants
HC	hydrocarbons
HDDV	heavy duty diesel vehicle
HDGV	heavy duty gasoline vehicle
HHDDV	heavy heavy-duty vehicle
HPMS	Highway Performance Monitoring System
I/M	inspection and maintenance
LDDT	light duty diesel truck
LDGT	light duty gasoline truck
LDDV	light duty diesel vehicle
LDGV	light duty gasoline vehicle
LDV	light duty vehicle
LEV	low emission vehicle
LHDDV	light heavy-duty diesel vehicle
LPG	liquefied petroleum gas
LVW	loaded vehicle weight
MC	motorcycle
MHDDV	medium heavy-duty diesel vehicle
mph	miles per hour
MTBE	methyl tertiary butyl ether
NAPAP	National Acid Precipitation Assessment Program

NCD	NMIM County Database
NCDC	National Climatic Data Center
NEI	National Emissions Inventory
NGV	natural gas vehicle
NH_3	ammonia
NIF	NEI Input Format
NMHC	nonmethane hydrocarbons
NMIM	National Mobile Inventory Model
NMOG	nonmethane organic gases
NO_x	oxides of nitrogen
NWS	National Weather Service
OC	organic carbon
OTAQ	Office of Transportation and Air Quality
PAH	polyaromatic hydrocarbons
Pechan	E.H. Pechan & Associates, Inc.
PM	particulate matter
PM10	particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PM2.5	particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
psi	pounds per square inch
QA	quality assurance
REMSAD	Regional Modeling System for Aerosols and Deposition
RFG	reformulated gasoline
RVP	Reid vapor pressure
SCC	source classification code
SEMCOG	South Eastern Michigan Council of Governments
S/L/T	State, local, and tribal
SO_2	sulfur dioxide
SO_4	sulfate
SOA	secondary organic aerosol
TAME	tertiary amyl methyl ether
THC	total hydrocarbons
TOG	total organic gases
U.S.	United States
VOC	volatile organic compounds
VMT	vehicle miles traveled
WO	winter oxygenate

1.0 INTRODUCTION

The National Emissions Inventory (NEI) is a comprehensive inventory covering criteria pollutants and hazardous air pollutants (HAPs) for the 50 United States (U.S.), Washington DC, Puerto Rico, and U.S. Virgin Islands. The NEI was created by the U.S. Environmental Protection Agency's (EPA's) Emission Inventory Group (EIG) in Research Triangle Park, North Carolina.

The NEI will be used to support air quality modeling, rule development, international reporting, air quality trends analysis, and other activities. To this end, the EPA established a goal to compile comprehensive emissions data in the NEI for criteria and HAPs for nonroad mobile, onroad mobile, point, and nonpoint sources.

1.1 WHAT IS THE PURPOSE OF THIS REPORT?

This report summarizes the procedures EPA used to estimate annual emissions for the onroad mobile sector and a portion of the nonroad sector of EPA's 2002 final NEI, also referred to as the 2002 NEI Version 3. Relevant activities for preparing the mobile sector 2002 draft final NEI (i.e., 2002 NEI Version 2) are also summarized. For complete documentation of the 2002 draft mobile NEI, see "Documentation for the Draft 2002 Mobile National Emissions Inventory," (EPA, 2005a). A preliminary 2002 NEI, which preceded the draft 2002 NEI, is also briefly discussed.

The nonroad sector is comprised of nonroad engines in EPA's NONROAD model, as well as other engines not modeled in NONROAD, including aircraft, commercial marine vessels, and locomotives. This report only addresses those categories included in EPA's NONROAD model. Methodologies for other nonroad categories are documented in a separate report entitled, "Aircraft, Commercial Marine Vessel, and Locomotive, and Other Nonroad Components of the National Emissions Inventory" (ERG, 2005).

A summary of national annual onroad mobile and NONROAD model criteria pollutant emissions as calculated for the final 2002 mobile NEI is provided in Table 1-1.

Table 1-1. Final 2002 Mobile National Emissions Inventory, Version 3

Pollutant	Onroad Emissions, tpy	NONROAD Emissions, tpy
VOC	4,917,692	2,838,912
NOx	7,870,197	2,197,879
CO	60,597,280	21,788,376
PM10	202,907	230,577
PM25	147,620	219,219
SO2	245,274	189,347
NH3	294,016	1,884

1.2 WHAT CATEGORIES ARE COVERED IN THIS REPORT?

The "on-road vehicles" category includes motorized vehicles that are normally operated on public roadways. This includes passenger cars, motorcycles, minivans, sport-utility vehicles, light-duty trucks, heavy-duty trucks, and buses.

NONROAD model categories include recreational marine and land-based vehicles, farm and construction machinery, industrial, commercial, logging, and lawn and garden equipment. Aircraft ground support equipment (GSE) and rail maintenance equipment are also included in NONROAD. These equipment are powered by compression-ignition engines, which are typically diesel-fueled, as well as spark-ignition or gasoline-fueled engines. Compressed natural gas (CNG) and liquefied petroleum gas (LPG) engines may also power certain types of nonroad equipment.

1.3 HOW IS THIS REPORT ORGANIZED?

Chapter 2 provides an overview of the procedures used to develop the 2002 nonroad and onroad mobile emission estimates, as well as a summary of methodologies used for developing historic year mobile emission estimates. Chapter 3 presents a discussion of EPA's National Mobile Inventory Model (NMIM), as well as a description of the inputs used in the NMIM County Database (NCD). Chapters 4 and 5 describe how NMIM results and State, local, and tribal emissions data were used to develop the onroad mobile, and NONROAD model emissions inventory, respectively. Finally, Chapter 6 describes the procedures used to estimate mobile source refueling (i.e., Stage II) emission estimates.

The report also contains three appendices. Appendix A contains a detailed listing of the local inputs used for the NCD as referenced in Chapter 3. Appendix B provides a listing of the onroad mobile emissions data received and the corrections and additions EPA made to the S/L/T data submissions. Appendix C provides a comparable listing for NONROAD model emissions data.

2.0 SUMMARY OF 2002 NONROAD AND ONROAD MOBILE METHODOLOGIES

This section provides an overview of the methods used to develop the preliminary 2002 NEI, draft 2002 NEI, and the 2002 NEI Versions 2 and 3. Though the focus of this documentation is on describing the methodologies and data used for 2002, section 2.1 of this document provides an overview of methodologies used for developing historic year mobile emission estimates, including onroad and all nonroad mobile categories.

2.1 WHAT ARE THE GENERAL METHODOLOGIES EPA USED TO DEVELOP PREVIOUS MOBILE NEIS?

Criteria air pollutant (CAP) emission estimates for mobile sources have been developed for the years 1970, 1975, and 1978 through 2002. HAP emission estimates for mobile sources have been prepared for the years 1990, 1996, 1999, and 2002. Table 2-1a provides a summary of the methods used for preparing current base year (2002) and historic year HAP and CAP onroad mobile emission estimates. Table 2-1b lists the methods used to prepare various subsectors of the nonroad mobile sector inventory, for 2002 and previous inventory years.

2.2 HOW HAVE EMISSION ESTIMATES CHANGED FROM THE 2002 PRELIMINARY NEI?

This section provides an overview of the basis of the 2002 preliminary mobile NEI and the 2002 draft NEI. The basis for some of the differences is also highlighted.

2.2.1 Basis for 2002 Preliminary Mobile NEI

EPA's Office of Transportation and Air Quality (OTAQ) has developed a model known as the NMIM. NMIM includes a county-level database with parameters specific to each county. The data in this county-level database are used to develop MOBILE6.2 and NONROAD model input files within NMIM. NMIM is described in more detail in Section 3.1 of this document. EPA's NMIM was used to generate the preliminary nonroad estimates for the 2002 NEI, but not to generate the onroad estimates. Documentation of the procedures for the 2002 preliminary NONROAD model NEI is available in a December 2003 report (EPA, 2003a).

The preliminary onroad estimates were developed by E.H. Pechan & Associates, Inc. (Pechan), but using many of the same data and methods being used in NMIM (EPA, 2004a). Both the preliminary and the draft NEI were based on version MOBILE6.2.03 of the MOBILE6 emission factor model to generate emission rates and for any default values used.

Table 2-1a. Methods Used to Develop Emission Estimates for Onroad Vehicle Sources

(Years addressed in this report are noted in bold print)

Base Year(s)	Pollutant(s)	Geographic Area	Emission Estimation Method
1970, 1975	All Criteria	US	Linear extrapolation at national vehicle type level based on 1978 and 1987 national data
1978, 1987, 1990, 1996, 2000	All Criteria	US	Calculated at State/county/source classification code (SCC) level by month using MOBILE6, no State data incorporated
1979-1986	All Criteria	US	Linear interpolation at State/count/SCC level based on 1978 and 1987 State/count/SCC level data
1988-1989	All Criteria	US	Linear interpolation at State/count/SCC level based on 1987 and 1990 State/count/SCC level data
1991-1995	All Criteria	US	Linear interpolation at State/count/SCC level based on 1990 and 1996 State/count/SCC level data
1990, 1996	HAPs	US	MOBILE6 emission factors calculated at State/county/SCC level by season; applied to Federal Highway Administration (FHWA)-based vehicle miles traveled (VMT)
1997-1998	All Criteria	US	2-step linear interpolation at State/count/SCC level based on 1996 and 1999 State/count/SCC level data
1999	All Criteria	AL; ME; MA; MS; UT; VA; WV; Maricopa County, AZ; Hamilton County, TN	Calculated at State/county/SCC level by month using MOBILE6; State-provided VMT data used
1999	VOC, NO_x, CO, SO_2, PM10, PM2.5	California	Emissions and VMT provided by California at county/vehicle type level; State-provided emissions expanded to county/SCC level by EPA
1999	NH_3	California	Calculated at State/county/SCC level by month using MOBILE6 emission factors with State-provided VMT data
1999	PM10 Exhaust	Colorado	PM10 emissions and VMT provided by State
1999	VOC, NO_x, CO, SO_2, PM10 brake and tire wear, PM2.5, NH_3	Colorado	Calculated at State/county/SCC level by month using MOBILE6; State-provided VMT data used
1999	All Criteria	Oregon	Emissions and VMT provided by Oregon at county/vehicle type level; State-provided emissions expanded to county/SCC level by EPA
1999	All Criteria	Rest of US, Puerto Rico, and US Virgin Islands	Calculated at State/county/SCC level by month using MOBILE6 and FHWA-based VMT
1999	HAPs	California	HAP emissions and VMT provided by California at county/vehicle type level; emissions allocated to SCC level by EPA
1999	HAPs	Rest of US, Puerto Rico, and US Virgin Islands	MOBILE6 emission factors calculated at State/county/SCC level by season; applied to FHWA-based VMT
2001	VOC, NO_x, CO, SO_2, PM10,	California	Emissions and VMT provided by California at county/vehicle type level; State-provided emissions

Table 2-1a (continued)

Base Year(s)	Pollutant(s)	Geographic Area	Emission Estimation Method
	PM2.5		expanded to county/SCC level by EPA
2001	NH_3	California	Calculated at State/county/SCC level by month using MOBILE6 emission factors with State-provided VMT data
2001	All Criteria	AL; CO; ME; MA; MS; OR; UT; VA; WV; Maricopa County, AZ; Hamilton County, TN	State-provided VMT grown to 2001; emissions calculated by EPA using MOBILE6 emission factors
2001	All Criteria	Rest of US	Calculated at State/county/SCC level by month using MOBILE6 and FHWA-based VMT
2002	**All Criteria, HAPs**	**US, Puerto Rico, Virgin Islands**	**Emission estimates for all pollutants were developed using EPA's National Mobile Inventory Model (NMIM), which uses MOBILE6 to calculate onroad emission factors. Where States provided alternate onroad MOBILE6 inputs or VMT, these data replaced EPA default inputs. California-supplied emissions data which replaced default EPA emission estimates for this state. Default VMT is based on FHWA 2002 data and population data from 2000 Census.**

Table 2-1b. Methods Used to Develop Annual Emission Estimates for Nonroad Mobile Sources

(Categories/years addressed in this report are noted in bold print)

Category	Base Year	Pollutant(s)	Estimation Method*
NONROAD Categories			
Nonroad Gasoline, Diesel, LPG, CNG	**2002**	**VOC, NO_x, CO, SO_2, PM10, PM2.5, NH_3, & HAPs**	**Emission estimates for NONROAD model engines were developed using EPA's National Mobile Inventory Model (NMIM), which incorporates NONROAD2005. Where States provided alternate nonroad inputs, these data replaced EPA default inputs. California-supplied emissions data also replaced EPA emission estimates for this State.**
	1999	VOC, NO_x, CO, SO_2, PM10, PM2.5	Using emission estimates from two emission inventories including: 1) a 1996 county-level inventory, developed using EPA's October 2001 draft NONROAD model; and 2) an updated 1999 national inventory, based on EPA's draft Lockdown C NONROAD model (dated May 2002). Using the 1996 county-level emission estimates, seasonal and daily county-to-national ratios were then developed for application to updated national estimates per season estimated from the Lockdown C model. Replaced State-submitted data for California for all NONROAD model categories; Pennsylvania for recreational marine and aircraft ground support equipment, and Texas for select equipment categories.
	1996, 1997, 1998, 2000 & 2001	VOC, NO_x, CO, SO_2, PM10, PM2.5	Using emission estimates from two emission inventories including: 1) a 1996 county-level inventory, developed using EPA's October 2001 draft NONROAD model; and 2) updated year-specific national and California inventories, based on EPA's draft Lockdown C NONROAD model (dated May 2002). Using the 1996 county-level emission estimates, seasonal and daily county-to-national ratios and California county-to-State ratios were then developed for application to updated national estimates per season estimated from the Lockdown C model. California results replace the diesel equipment emissions generated from prior application of county-to-national ratios.
	1991-1995	VOC, NO_x, CO, SO_2, PM10, PM2.5, NH_3	Using 1990 and 1996 county-level emissions inventories, estimated emissions using linear interpolation of national emissions between 1990 and 1996. From these emissions, calculated the average annual growth rate for each pollutant/SCC combination for each year, and then applied the growth factors to 1990 county-level emissions to estimate 1991-1995 emissions.

Table 2-1b (continued)

Category	Base Year	Pollutant(s)	Estimation Method*
Nonroad Gasoline, Diesel, LPG, and CNG (Continued)	1990	VOC, NO_x, CO, SO_2, PM10, PM2.5	Using emission estimates from two emission inventories including: 1) a 1996 county-level inventory, developed using EPA's October 2001 draft NONROAD model; and 2) updated 1990 national inventory, based on EPA's draft Lockdown C NONROAD model (dated May 2002). Using the 1996 county-level emission estimates, seasonal and daily county-to-national ratios were then developed for application to updated national estimates per season estimated from the Lockdown C model.
	1986, 1988, & 1989	VOC, NO_x, CO, SO_2, PM10, PM2.5, NH_3	Using 1985 and 1990 county-level emissions inventories, estimated emissions using linear interpolation of national emissions between 1985 and 1990. From these emissions, calculated the average annual growth rate for each pollutant/SCC combination for each year, and then applied the growth factors to 1985 county-level emissions to estimate 1986-1989 emissions.
	1987	VOC, NO_x, CO, SO_2, PM10, PM2.5	Using EPA's draft Lockdown C NONROAD model (dated May 2002), developed updated national emissions for 1987 by running 4 seasonal NONROAD model runs to estimate annual criteria pollutant emissions. Also performed national NONROAD model runs to estimate typical summer weekday emissions.
	1985	VOC, NO_x, CO, SO_2, PM10, PM2.5	Using emission estimates from two emission inventories including: 1) a 1996 county-level inventory, developed using EPA's October 2001 draft NONROAD model; and 2) updated 1985 national inventory, based on EPA's draft Lockdown C NONROAD model (dated May 2002). Using the 1996 county-level emission estimates, seasonal and daily county-to-national ratios were then developed for application to updated national estimates per season estimated from the Lockdown C model.
	1970, 1975, 1978, & 1980	VOC, NO_x, CO, SO_2, PM10, PM2.5	Using EPA's draft Lockdown C NONROAD model (dated May 2002), developed updated national emissions for all years by running 4 seasonal NONROAD model runs to estimate annual criteria pollutant emissions. Also performed national NONROAD model runs to estimate typical summer weekday emissions.

Table 2-1b (continued)

Category	Base Year	Pollutant(s)	Estimation Method*
Nonroad Gasoline, Diesel, LPG, and CNG (Continued)	1996, 1997, 1998, 1999, 2000, & 2001	NH_3	Obtaining national fuel consumption estimates from the Lockdown C NONROAD model, multiplying by NH_3 emission factors, and distributing to counties using 1996 inventory, based on October 2001 draft NONROAD. NH_3 emissions for California were also recalculated using updated diesel fuel consumption values generated for California-specific runs, and assuming the 1996 county-level distribution.
	1985 & 1990	NH_3	Obtaining national fuel consumption estimates from the Lockdown C NONROAD model, multiplying by NH_3 emission factors, and distributing to counties using 1996 inventory, based on October 2001 draft NONROAD.
	1987	NH_3	Obtaining 1987 national fuel consumption estimates from Lockdown C NONROAD model and multiplying by NH_3 emission factors.
	1970, 1975, 1978, & 1980	NH_3	Obtaining national fuel consumption estimates from the Lockdown C NONROAD model and multiplying by NH_3 emission factors.
	1990, 1996, & 1999	HAPs	Speciation profiles applied to county VOC and PM estimates. Metal HAPs were calculated using fuel and activity-based emission factors. Some State data were provided and replaced national estimates. (2003)
Aircraft			
Commercial Aircraft	2002	Criteria and HAPs	Federal Aviation Administration (FAA) Emissions and Dispersion and Modeling System (EDMS) was run for criteria pollutants, VOC and PM emissions were speciated into HAP components. (2004)
	1990, 1996, 1999, 2000, 2001	VOC, NO_x, CO, SO_X	Input landing and take-off (LTO) data into FAA EDMS. National emissions were assigned to airports based on airport specific LTO data and BTS GIS data. State data replaced national estimates. (2003)
	1970-1998	VOC, NO_x, CO, SO_X	Estimated emissions for interim years using linear interpolation between available base years. (2003)
	1990, 1996, 1999	HAPs	Speciation profiles were applied to VOC estimates to get national HAP estimates. State data replaced national estimates. (2003)

Table 2-1b (continued)

Category	Base Year	Pollutant(s)	Estimation Method*
General Aviation, Air Taxis	1978, 1987, 1990, 1996, 1999, 2000, 2001, & 2002	VOC, NO_x, CO, SO_2, PM10, PM2.5	Used FAA LTO data and EPA approved emission factors for criteria estimates. Speciation profiles were applied to VOC estimates to get national HAP estimates. State data replaced national estimates. (2004)
	1970-1998	VOC, NO_x, CO, SO_X, PM10, PM2.5	Estimated emissions for interim years using linear interpolation between available base years. (2003)
	1990, 1996, 1999, & 2002	HAPs	Used FAA LTO data and EPA approved emission factors for criteria estimates. Speciation profiles were applied to VOC estimates to develop national HAP estimates. (2004)
	1990, 1996, 1999, & 2002	Pb	Used Department of Energy (DOE) aviation gasoline usage data with lead concentration of aviation gasoline. (2004)
	1996	NH_3	Applied NH_3 emissions factors to 1996 national jet fuel and aviation gasoline consumption estimates.
Military Aircraft	1978, 1987, 1990, 1996, 1999, 2000, 2001, & 2002	VOC, NO_x, CO, SO_2, PM10, PM2.5	Used FAA LTO data and EPA approved emission factors for criteria estimates. Representative HAP profiles were not readily available, therefore HAP estimates were not developed. State data replaced national estimates. (2004)
	1970-1998	VOC, NO_x, CO, SO_X, PM10, PM2.5	Estimated emissions for interim years using linear interpolation between available base years. (2003)
Auxiliary Power Units	1985-2001	VOC, NO_x, CO, SO_2, PM10, PM2.5	Grew 1996 emissions to each year using LTO operations data from the FAA. Estimation methods prior to 1996 reported in EPA, 1998.
Unpaved Airstrips[1]	1985-2001	PM10, PM2.5	Grew 1996 emissions to each year using SIC 45-Air Transportation growth factors, consistent with the current draft version of EGAS. Estimation methods prior to 1996 reported in EPA, 1998.
Aircraft Refueling[1]	1985-2001	VOC	Grew 1996 emissions to each year using SIC 45-Air Transportation growth factors, consistent with the current draft version of EGAS. Estimation methods prior to 1996 reported in EPA, 1998.
Commercial Marine Vessel (CMV)			
All CMV Categories	2002	VOC, NO_x, CO, SO_2, PM10, PM2.5	2001 Estimates carried over. Used State data when provided. (2004)
		HAPs	1999 Estimates carried over. Used State data when provided. (2004)

Table 2-1b (continued)

Category	Base Year	Pollutant(s)	Estimation Method*
CMV Diesel	1978, 1987, 1990, 1996, 1999, 2000, & 2001	VOC, NO_x, CO, SO_x, PM10, & PM2.5,	Used criteria emission estimates in the background document for marine diesel regulations for 2000. Adjusted 2000 criteria emission estimates for other used based on fuel usage. Emissions were disaggregated into port traffic and underway activities. Port emissions were assigned to specific ports based on amount of cargo handled. Underway emissions were allocated based on Army Corp of Engineering waterway data. State data replaced national estimates. (2003)
	1970-1998	VOC, NO_x, CO, SO_X, PM10, PM2.5	Estimated emissions for interim years using linear interpolation between available base years. (2003)
	1990, 1996, 1999	HAPs	VOC and PM emission estimates were speciated into HAP components. State data replaced national estimates. (2003)
	1996	NH_3	Applied NH_3 emissions factors to 1996 distillate and residual fuel oil estimates (i.e., as reported in EIA, 1996).
	1990-1995	NH_3	Estimation methods reported in EPA, 1998.
CMV Steam Powered	1978, 1987, 1990, 1996, 1999, 2000, & 2001	VOC, NO_x, CO, SO_x, PM10, & PM2.5	Calculated criteria emissions based on EPA SIP guidance. Emissions were disaggregated into port traffic and under way activities. Port emissions were assigned to specific ports based on amount of cargo handled. Underway emissions were allocated based on Army Corp of Engineering waterway data. State data replaced national estimates. (2003)
	1970-1998	VOC, NO_x, CO, SO_X, PM10, PM2.5	Estimated emissions for interim years using linear interpolation between available base years. (2003)
	1990, 1996, & 1999	HAPs	VOC and PM emission estimates were speciated into HAP components. State data replaced national estimates. (2003)
Military Marine	1997-2001	VOC, NO_x, CO, SO_2, PM10, PM2.5	Applied EGAS growth factors to 1996 emissions estimates for this category.
CMV Coal,[2] CMV, Steam powered, CMV Gasoline[2]	1997-1998	VOC, NO_x, CO, SO_2, PM10, PM2.5	Applied EGAS growth factors to 1996 emissions estimates for this category.
CM Coal, CMV, Steam powered, CMV Gasoline, Military Marine	1991-1995	VOC, NO_x, CO, SO_2, PM10, PM2.5	Estimation methods reported in EPA, 1998.

Table 2-1b (continued)

Category	Base Year	Pollutant(s)	Estimation Method*
Locomotives			
Class I, Class II, Commuter, Passenger, and Yard Locomotives	1978, 1987, 1990, 1996, 1999, 2000, 2000, & 2002	VOC, NO_x, CO, PM10, PM2.5	Criteria pollutants were estimated by using locomotive fuel use data from DOE EIA and available emission factors. County-level estimates were obtained by scaling the national estimates with the rail GIS data from DOT. State data replaced national estimates. (2004)
	1978, 1987, 1990, 1996, 1999, 2000, 2001, & 2002	SO_2	SO_x emissions were calculated by using locomotive fuel use and fuel sulfur concentration data from EIA. County-level estimates were obtained by scaling the national estimates with the county level rail activity data from DOT. State data replaced national estimates. (2004)
	1970-1998	VOC, NO_x, CO, SO_X, PM10, PM2.5	Estimated emissions for interim years using linear interpolation between available base years. (2003)
	1990, 1996, 1999, & 2002	HAPs	HAP emissions were calculated by applying speciation profiles to VOC and PM estimates. County-level estimates were obtained by scaling the national estimates with the county level rail activity from DOT. State data replaced national estimates. (2004)
	1997-1998	NH_3	Grew 1996 base year emissions using EGAS growth indicators.
	1996	NH_3	Applied NH_3 emissions factors to diesel consumption estimates for 1996.
	1990-1995	NH_3	Estimation methods reported in EPA, 1998.

Notes:

* Dates included at the end of Estimation Method represent the year that the section was revised.

1. Emission estimates for unpaved airstrips and aircraft refueling are included in the area source NEI, since they represent non-engine emissions.
2. National Emission estimates for CMV Coal and CMV Gasoline were not developed though States and local agencies may have submitted estimates for these source categories.
   EPA, 1998. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emission Factors and Inventory Group, *National Air Pollutant Emission Trends, Procedures Document*, 1900–1996, EPA-454/R-98-008. May 1998.

2.2.2 Basis for 2002 Draft Mobile NEI

In developing the 2002 draft mobile NEI, EPA provided State, local, and tribal (S/L/T) agencies the opportunity to review and provide comment on the preliminary NEI. EPA prepared instructions for S/L/T agencies to explain the preferred methods for submitting either NMIM inputs and/or emissions data (EPA, 2004b). Air agencies were required to submit these data to EPA by June 1, 2004, according to the Consolidated Emissions Reporting Rule (CERR) requirements. Once submitted, these data were logged, reviewed, and quality-assured by EPA. Table 2-2 provides a summary of the data submitted by S/L/T agencies for the CERR.

As a first step, all emission estimates for the draft 2002 onroad and NONROAD model (hereafter referred to as simply "nonroad") NEI were made using NMIM and the updated NCD. The NMIM county-level database for 2002 was updated with local data submitted by State and local agencies and EPA's most current default 2002 data where local data were not provided. As seen in Table 2-2, many States provided emissions estimates to EPA directly as part of the June 2004 CERR requirements, and these emission estimates replaced the default EPA estimates.

Some updates were also made by EPA to NMIM between the preliminary and draft version of the NEI. The 2002 preliminary nonroad inventory was based on an assumption that the diesel fuel used by all nonroad sources in a county would be the same in terms of sulfur content. The version of NMIM used for the draft NEI reflects a difference in the sulfur content of diesel fuel used by recreational marine engines compared to the sulfur content of diesel fuel used by other nonroad engines in the county.

There was also a change in the method used to assign the MOBILE6 evaluation year and month. The preliminary inventory used January for all months from January through June and July for the months July through December. The version of NMIM used for the draft NEI uses January for January through March, July for April through September and January of the following calendar year (2003) for the months October through December. Also, the draft NEI used county specific hourly average temperature values and the preliminary NEI used State average minimum and maximum values.

A more detailed listing by parameter of S/L/T inputs used in the updated NCD for the draft 2002 NEI is presented in Section 3.2 of this document.

Table 2-2. Summary of Onroad and Nonroad 2002 CERR Data Submissions

State ID		State Name	Data Provided For	NCD Files	MOBILE6 Input Files	Onroad NIF Emission Files	NONROAD Model NIF Emission Files	NONROAD/NMIM external files
01	AL	Alabama	All Counties			√	√	
02	AK	Alaska						
04	AZ	Arizona	Maricopa County			√	√	
			Pima County		√	√		
			Rest of State					
05	AR	Arkansas	All Counties			√	√	
06	CA	California	All Counties			√	√	
			La Posta Tribe				√	
08	CO	Colorado	All Counties	√		√	√	√
09	CT	Connecticut						
10	DE	Delaware	All Counties	√		√	√	√
11	DC	District of Columbia		√	√			
12	FL	Florida	Pinnelas County			√		
			Broward County			√		
			Rest of State					
13	GA	Georgia	All Counties			√	√	
15	HI	Hawaii						
16	ID	Idaho	All Counties		√	√	√	
17	IL	Illinois	All Counties		√	√	√	√ (opt files only)
18	IN	Indiana						√
19	IA	Iowa	All Counties			√ Onroad NIF only for ammonia	√ Only for ammonia	
20	KS	Kansas	All Counties				√ Only for ammonia	
21	KY	Kentucky	Jefferson County		√	√	√	
			Rest of State					
22	LA	Louisiana	All Counties				√ Only for ammonia	
23	ME	Maine	All Counties			√	√	
24	MD	Maryland	All Counties	√	√		√ (seasonal only)	
25	MA	Massachusetts	All Counties		√	√		
26	MI	Michigan	All Counties		√		√	√
			SEMCOG	√	√	√		
27	MN	Minnesota	All Counties			√ Onroad NIF only for ammonia	√ Only for ammonia	
28	MS	Mississippi	All Counties			√	√	
29	MO	Missouri	All Counties			√	√ Only for ammonia	
30	MT	Montana						
31	NE	Nebraska	Lancaster County			√	√	
			Rest of State					
32	NV	Nevada	15 of 17 Counties			√	√	
			Clark County			√	√	
			Washoe County					
33	NH	New Hampshire	All Counties				√	
34	NJ	New Jersey	All Counties	√	√		√	
35	NM	New Mexico						
36	N Y	New York	All Counties		√	√	√	
37	NC	North Carolina	All Counties			√	√	
38	ND	North Dakota						
39	OH	Ohio	All Counties		√			√
40	OK	Oklahoma						
41	OR	Oregon	All Counties		√		√	
42	PA	Pennsylvania	All Counties			√	√	
72	PR	Puerto Rico						
44	RI	Rhode Island		√				√
45	SC	South Carolina						
46	SD	South Dakota						

Table 2-2 (continued)

State ID		State Name	Data Provided For	NCD Files	MOBILE6 Input Files	Onroad NIF Emission Files	NONROAD Model NIF Emission Files	NONROAD/NMIM external files
47	TN	Tennessee	91 of 95 Counties		√	√	√	√ (opt files only)
			Davidson County	√	√	√	√	√ (opt files only)
			Hamilton County		√			
			Knox County		√	√		
			Shelby County		√			
48	TX	Texas	All Counties		√	√	√	
49	UT	Utah	All Counties	√	√	√	√	
50	VT	Vermont	All Counties		√	√		
78	VI	Virgin Islands						
51	VA	Virginia	All Counties	√			√ (seasonal only)	
53	WA	Washington	All Counties	√		√	√ (except 4 counties)	√
54	WV	West Virginia	All Counties			√	√	
55	WI	Wisconsin	All Counties		√			√
56	WY	Wyoming						

2.2.3 Onroad Mobile Pollutant Emission Comparisons

For the onroad sources, the primary differences between the preliminary 2002 NEI estimates and the draft 2002 NEI estimates stem from changes in the default vehicle miles traveled (VMT), county-specific temperature and humidity information used in NMIM, S/L/T-provided emission estimates or MOBILE6 and NMIM inputs, and sulfur inputs. Table 2-4 summarizes the differences in criteria pollutant emissions and VMT between these two versions of the NEI for the entire United States, Puerto Rico, and the Virgin Islands. At the national level, the changes are relatively small, with oxides of nitrogen (NO_x) and sulfur dioxide (SO_2) showing the greatest differences. When viewed at the State level, however, the changes between the two versions become much more significant.

Annual VMT

The annual VMT used in the preliminary version of the NEI was based on growing the 2001 VMT estimates to 2002, based on preliminary national 2002 VMT estimates made by the Federal Highway Administration (FHWA). The default VMT values used in the draft version of the NEI include both actual 2002 FHWA data at the State and roadway type level and the State/urban area/roadway type level and a change to the underlying population data that is used to allocate the VMT by county and road type from the 1990 Census to the 2000 Census. In addition, the draft 2002 NEI includes VMT values provided by S/L/T agencies. The resulting change in VMT for the entire inventory is only a 0.7 percent increase from the preliminary to the draft 2002 NEI. However, at the State level, the VMT changes range from a 22 percent decrease from the preliminary to the draft version in Nevada to an increase in VMT of 13 percent in Florida.

Total Annual Emissions

The onroad emission estimates in both the preliminary and draft versions of the NEI are based on running the MOBILE6 model to generate emission factors in grams per mile and then determining total annual tons using annual VMT. Although both inventories used the same emission factor model, any changes in the methodology, the input values to MOBILE6, and the VMT estimates will affect the inventory results.

The NMIM tool was designed to replicate the methodology used in the 1999 NEI onroad emission inventory calculations, which was also used for the 2002 preliminary NEI estimates. However, in the draft version of the NEI, there have been changes in many of the MOBILE6 input values. Some of these changes were submitted by individual S/L/T agencies. These include inputs such as vehicle distributions by age, speeds, and distribution of VMT by vehicle type. Changes in any of these inputs can cause significant changes in the resulting emission values. In addition, some changes were made by EPA to update the default values. This includes a change from state-level monthly minimum and maximum average daily temperatures to county-level monthly average hourly temperatures and updates to fuel parameters, including diesel sulfur contents.

As shown in Table 2-3, the SO_2 emission estimates decreased by about 6 percent from the preliminary to draft versions of the NEI. Emissions of SO_2 are assumed to be directly proportional to the content of sulfur in the fuel. In the preliminary version of the NEI, a sulfur content of 500 parts per million (ppm) had been modeled nationwide. The draft version incorporated diesel sulfur content survey data from 2000, showing diesel sulfur contents generally in the range of 300 to 400 ppm. This change caused a direct reduction in the SO_2 emission values. Changes in fuel properties have also directly impacted the methyl tertiary butyl ether (MTBE) emission estimates, resulting in lower MTBE emission estimates in the draft version of the NEI.

The relatively large increase in the NO_x emissions of 10.9 percent is caused, in part, by the introduction of county-by-county humidity values to the calculations. Humidity has a large affect on the NO_x output from the MOBILE6 model. The preliminary NEI results used a constant default humidity value for all counties in all seasons.

Differences among all pollutants and VMT are also caused by the use of S/L/T provided emissions data. In cases where the supporting MOBILE6 inputs were not supplied, it is not possible to determine the specific reasons for the differences. However, the methodology and the source of data inputs used in the calculation of onroad emissions inventories generally differs for each individual State.

Table 2-3. Comparison of 2002 Onroad Mobile Draft and Preliminary NEI

	Preliminary 2002 NEI, tpy	Draft 2002 NEI, tpy	Percent Difference
VOC	4,543,183	4,661,574	2.6
NOX	7,365,121	8,167,031	10.9
CO	62,160,738	62,731,794	0.9
PM10-PRI	203,518	204,097	0.3
PM25-PRI	148,502	149,265	0.5
SO2	275,487	258,942	-6.0
NH3	286,803	288,644	0.6
VMT (million miles)	2,821,912	2,841,676	0.7

2.2.4 NONROAD Model Pollutant Emission Comparisons

Table 2-4 summarizes the differences in NONROAD model criteria pollutant emissions between the preliminary and draft versions of the 2002 NEI for the entire US, Puerto Rico, and the Virgin Islands. At the national level, the changes are relatively small, with the exception of ammonia (NH_3). When viewed at the State level, however, the changes in pollutant emissions between the two versions become much more apparent.

For nonroad, differences between the preliminary and draft NEI are due in part to changes in the NONROAD model, and category-level emissions differences are consistent with the changes in the model for certain equipment categories. Diesel recreational marine populations and horsepower increased significantly, explaining large increases in particulate matter (PM), volatile organic compounds (VOCs), and the HAPs (which are calculated as ratios to PM and VOC) for those source category codes (SCCs). Gasoline recreational equipment PM increased due to increased emission factors for all-terrain vehicles (ATVs) and motorcycles. Decrease in SO_2 and NH_3 are explained by large decreases in brake-specific fuel consumption (BSFC) for the same two recreational equipment categories.

As shown in Table 2-4 though, some of these changes are reversed by the incorporation of State-supplied emissions data to the draft NEI. Overall, VOC, PM10-PRI, and PM25-PRI showed relatively small decreases. It should be noted that the addition of emissions for PM10-FIL and PM25-FIL (from California) to PM-PRI totals would make these totals more comparable. Carbon monoxide (CO) and SO_2 showed decreases of approximately 10 percent. Though NO_x emissions increased a small percentage (4 percent), NH_3 showed a significant increase. Again, more meaningful comparisons would need to be conducted on a State-by-State basis.

Table 2-4. Comparison of 2002 NONROAD Model Draft and Preliminary NEI

	Preliminary 2002 NEI, tpy	Draft 2002 NEI, tpy	Percent Difference
VOC	2,600,466	2,513,340	-3.4
NOX	2,105,334	2,194,924	4.3
CO	23,971,684	21,580,651	-10.0
PM10-PRI	242,314	228,695	-5.6
PM25-PRI	223,039	211,625	-5.1
PM10-FIL	NA	18,634	NA
PM25-FIL	NA	16,374	NA
SO2	205,853	183,733	-10.7
NH3	3,163	14,198	348.9

2.3 HOW HAVE 2002 VERSION 2 EMISSION ESTIMATES CHANGED FROM THE 2002 DRAFT NEI?

This section provides an overview of the differences in the 2002 mobile NEI Version 2 compared to the 2002 draft NEI. In developing Version 2 of the NEI, EPA provided State, local, and tribal (S/L/T) agencies the opportunity to review and provide comment on the draft NEI posted in February 2005. Tables 2-5 and 2-6 summarizes the differences in national (including Puerto Rico, and the Virgin Islands) mobile source criteria pollutant emissions between the Version 2 and draft versions of the 2002 NEI for the onroad mobile and NONROAD model sector, respectively. Differences result from the incorporation of new State data or NMIM inputs for the Version 2 NEI. However, some of the differences are due to changes in the default EPA NMIM emission estimates, as described in the sections below. Generally, the overall differences are minimal, with the differences in nonroad SO_2 and NH_3 being relatively greater.

Table 2-5. Comparison of 2002 Onroad Mobile Version 2 and Draft NEI

	Draft 2002 NEI, tpy	Version 2 2002 NEI, tpy	Percent Difference
VOC	4,661,574	4,660,584	0.0
NOX	8,167,031	8,133,574	-0.4
CO	62,731,794	62,957,988	0.4
PM10-PRI	204,097	203,258	-0.4
PM25-PRI	149,265	148,433	-0.6
SO2	258,942	257,520	-0.5
NH3	288,644	289,567	0.3

Table 2-6. Comparison of 2002 NONROAD Model Version 2 and Draft NEI

	Preliminary 2002 NEI	Version 2 2002 NEI	Percent Difference
VOC	2,513,340	2,492,244	-0.8
NOX	2,194,924	2,202,898	0.4
CO	21,580,651	21,520,638	-0.3
PM10-PRI	228,695	230,423	0.8
PM25-PRI	211,625	213,161	0.7
PM10-FIL	18,634	18,634	NA
PM25-FIL	16,374	16,374	NA
SO2	183,733	196,410	6.9
NH3	14,198	13,263	-6.6

2.3.1 Ammonia Calculations for Nonroad Engines

The emission factors used to calculate ammonia inventories from nonroad equipment in NMIM were updated from 153 to 116 mg/gallon for gasoline and from 166 to 83 mg/gal for diesel engines based on an EPA internal memo dated April 8, 2004, which summarizes our current knowledge of NH_3 emission factors. The updated factors are consistent with those used in MOBILE6.2 for onroad sources (EPA, 2004f).

2.3.2 Temperature and Humidity Data

New temperature and relative humidity values have been calculated for use in determining the EPA default emission inventories for the 2002 NEI Version 2. The original humidity values were improperly calculated, so that, in some cases, relative humidity values could exceed 100%. Some of the averaged temperature values have also changed. The new temperature values include some new temperature and humidity measurements as a result of updates in the source data from the National Weather Service (NWS) and its Cooperative Observation branches (over 6000 sites) and the Federal Aviation Administration (FAA) as of June 2005. The method for calculating average temperature and humidity values was not changed.

There are temperature and relative humidity changes in every state. Since temperature and humidity values are calculated using interpolation, changes in individual weather stations may affect many neighboring areas, even across state lines. However, only 2.3% of all temperature values had changes of more than one degree Fahrenheit. The average relative humidity change in any state is less than 2%.

2.3.3 Fuel Properties

Changes were made to some of the fuel IDs in some of the counties in the following states:

- Colorado (FIPSStateID=8)
- Delaware (10)
- Maryland (24)

- Michigan (26)
- Virginia (51)
- Washington (53)

These changes had been submitted for the draft version of the 2002 NEI, but had not been reviewed in time to be used for the draft inventory estimates. These changes have now been included in the Version 2 2002 NEI emission inventory estimates from NMIM. Below is a brief description of the types of changes in the fuel specifications provided by states for the 2002 NEI.

Colorado (8)

The highway and nonroad gasolines in Boulder County were all switched to the same gasolines used in Adams, Arapahoe, Denver, Douglas and Jefferson Counties (FIPS 1, 5, 31, 35 and 59). The new county, Broomfield, is assumed to have all the same fuel properties as Boulder County and was also changed.

Delaware (10)

The gasolines used in October were set to be the same as the gasolines used in November in all three counties.

Maryland (24)

The highway diesel sulfur values were changed in all counties with values provided by Maryland. All new values are between 300 and 500 ppm. These values were obtained by Maryland from monthly retail fuel data from the State comptroller office fuel laboratory.

Michigan (26)

Livingston and Washtenaw County highway and nonroad gasolines were switched to the same gasolines used in Lapeer, Macomb, Monroe, Oakland, St. Clair and Wayne County (FIPS 87, 99, 115, 125, 147 and 163). These changes were provided by the South Eastern Michigan Council of Governments (SEMCOG).

Virginia (51)

In the default, Charles City was using the same gasoline as Chesterfield, Hanover, Henrico, Colonial Heights City, Hopewell City and Richmond Counties (41, 85, 87, 570, 670 and 760). Charles City now uses the gasoline used in the rest of the state instead.

Washington (53)

All diesel fuel assignments for all counties were updated to be consistent with Western Regional Air Partnership Section 309 modeling inventories and EPA's draft regulatory impact analysis document for nonroad diesel engines.

All nonroad diesel sulfur values were increased from 2457 to 3400 ppm, except for Kitsap (53035) and Pierce (53053) Counties. These counties were left at 2457 ppm. This was done at the direction of the Puget Sound Clean Air Agency (agency having jurisdiction in those counties). It is noted that this creates an inconsistency in the NMIM database for western Washington counties in the central Puget Sound area.

All highway diesel in eastern WA was set to 310 ppm for all months of the year. In western WA, the summer months (May through September) use 260 ppm and the remaining months use 320 ppm.

The default gasoline assignments for Adams County (eastern WA), and Island, King and Snohomish Counties (western WA) were reasonable, and were not changed. The gasoline assignments for the remaining counties required updating. Counties were grouped into one of three groups:

- Eastern WA,
- Spokane County, or
- Western WA.

Each is briefly discussed below.

Eastern WA: All counties in eastern WA (except Spokane) were changed to have the same assignment. In eastern WA the gasoline primarily comes from sources further east, so all eastern WA counties were assigned to TRW District 9 (Northern Mountain) rather than the default of District 13 (Pacific Northwest). The Adams County gasoline (District 9) assignments were used for all remaining eastern WA counties.

Spokane County: Spokane County (53063) operates an oxygenated fuel program September through February. To capture this program, the default winter gasoline assignment for Missoula County (30063), Montana, was used for September through February for Spokane County. Missoula is in District 9, like Spokane, and the record indicated the presence of oxygenated fuels at approximately the same level as Spokane. For the remaining months, the regular eastern WA (Region 9) assignment above was used for Spokane County.

Western WA: The assignments made to Island, King and Snohomish Counties were identical and were assigned throughout western WA. The AAMA was the source of the data. In particular, the summer RVP of the AAMA data seemed a closer match than the default District 13 data. There are problems with accounting for some special summertime situations. In Clark County, gasoline is primarily obtained from the Portland, OR suppliers and therefore has a lower RVP (7.8 required in Portland, 9.0 in WA). In King, Pierce and Snohomish Counties, there is a voluntary agreement to supply 7.8 RVP gasoline during July and August. These are not captured in the fuel records. The state has been using these special RVP values in emissions calculations, but without changing the other fuel parameters. At this time it seems that some error cannot be avoided: the special RVPs will not be captured in NMIM, which will result in some error. The state data will have some internal fuel inconsistencies since it is using the special RVPs without changing the other parameters. WA looks forward to getting better resolution on this issue in the future.

After the highway gasoline reassignments, all nonroad gasoline assignments were set to be identical to the highway gasoline assignments for all counties in WA in all months.

2.3.4 I/M Program Changes

All of the I/M program description files used to generate the EPA estimates for the 2002 NEI Version 2, both those submitted by states and those previously created for EPA were given a final review by EPA. Many changes were made in these external data files, some new I/M program files were made, and all files were made consistent with the NMIM file naming conventions.

The original set of I/M description files, shown in Table 2-5, were intended to represent the I/M programs only in the 1999 calendar year for the 1999 National Emission Inventory (NEI). For the 2002 NEI, these I/M description files were adapted so that they would apply to calendar year 2002 as well. This was done using a summary of the features of current I/M programs updated annually by EPA (see Table 2-6).

States were encouraged to supply EPA with MOBILE6 input file information used by the counties, including I/M description files, representative of the 2002 calendar year for use in the development of the 2002 NEI. Many states provided new I/M description files to EPA for this purpose.

EPA has reviewed all of the I/M programs descriptions that were to be used for the 2002 NEI Version 2, both those generated by EPA contractors and those provided by states, to assure that the I/M program descriptions both accurately account for changes in the programs between 1999 and 2002 and can be used for projections beyond the 2002 calendar year. This review has revealed a number of errors and ambiguities. Some changes were also needed in order to allow the I/M program descriptions to be used for all calendar years. These problems and our proposed solutions are described below.

Most of the errors involved switching from an existing inspection of 1996 and newer vehicles from a previous test procedure to an OBD inspection and in some cases, would not have affected the results for calendar year 2002. Most of the additional I/M description files created were necessary for calendar years before or after calendar year 2002 and would not affect the results for the 2002 NEI. The list of I/M Program file names used for the 2002 NEI Version 2 are presented in Table 2-7.

Alaska (02)

No additional data was provided by AK. The EPA generated descriptions were renamed using the NMIM naming convention.

Arizona (04)

EPA expanded the 2002 I/M program file provided by AZ for Tucson (0401902.imp) to all calendar years.

The 2002 I/M description file provided by AZ for Phoenix (0401302.imp) was changed to use a 5 year grace period (instead of a fixed model maximum of 1997 for the 2002 calendar year) for all program elements. This file was renamed (0401301.imp) to match the file naming convention to use the earliest calendar year the file applies. Another I/M program file was created to apply to the 1999 through 2000 calendar years (0401395.imp) for Phoenix using the same 5 year grace period.

Colorado (08)

No additional data was provided by CO. The EPA generated descriptions were renamed using the NMIM naming convention.

Connecticut (09)

No additional data was provided by CT. The EPA generated I/M program file was changed to properly apply evaporative OBD to heavy duty vehicles. A single file (0900199.imp) was constructed which applies to all the 1999 and later calendar years.

Delaware (10)

The I/M program files provided by DE (1000102.imp, 1000302.imp and 1000502.imp) were changed. Files 1000102 and 1000302 were changed to assume that 1996 and newer model years were inspected for gas caps between 1995 and 2001 and inspected using Evap OBD beginning in 2002. These files were renamed (1000191.imp and 1000383.imp) to match the file naming convention to use the earliest calendar year the file applies. The Sussex County file (1000502.imp) was changed to apply the Idle test to all model year vehicles and renamed (1000591.imp).

District of Columbia (11)

The I/M program file provided by DC (1100102.imp) was applied to calendar years 1999 through 2002. A new file (1100103.imp) with OBD inspections was created to apply to 2003 and later calendar years.

Florida (12)

No additional data was provided by FL. The EPA generated descriptions were renamed using the NMIM naming convention.

Georgia (13)

New I/M description files were provided by Georgia for all calendar years (1305700.imp, 1305702.imp, 1305799.imp, 1306700.imp, 1306702.imp and 1306799.imp).

Idaho (16)

No additional data was provided by ID. The EPA generated descriptions were renamed using the NMIM naming convention.

Illinois (17)

The I/M program file provided by IL (1700002.imp) was changed so that the I/M start date for the 1968 and newer model year vehicles is 1986 (instead of 1999) to allow these vehicles to achieve their full tampering deterrence effect. This file was applied the I/M program file to all 2002 and later calendar years. A new file (1700099.imp) was constructed from the EPA generated and the state supplied files which applies to the 1999 through 2001 calendar years.

The I/M program files were also applied to Monroe County (17133), which was not included in the list of I/M counties for the 1999 NEI.

Indiana (18)

No additional data was provided by IN. The EPA generated I/M program files (IN01.im and IN97.im) were changed to properly apply OBD. Two new files (1808997.imp and 1806101.imp) were constructed which apply to calendar years 1999 and 2000 and the 2001 and later calendar years respectively.

Kentucky (21)

The I/M program file supplied by KY (2111102.imp) were applied to all 2002 and later calendar years. A new file (2111198.imp) was made to apply to 1999 through 2001 calendar years.

Louisiana (22)

No additional data was provided by LA. The EPA generated descriptions were renamed using the NMIM naming convention.

Maine (23)

No additional data was provided by ME. The EPA generated I/M program file was changed to properly apply OBD and the new file (2300599.imp) was applied to all the 1999 and later calendar years.

Maryland (24)

The I/M program file supplied by MD (2400002.imp) was applied to the 1999 through 2002 calendar years. A new file (2400003.imp) was created to apply to 2003 and later calendar years, which includes OBD inspections. These files were applied only to counties 3, 5, 13, 25, 27, 31, 33, 43 and 510.

Two new files (2300998.imp and 2300902.imp), with a different program start date, were created to apply to the five counties (9, 15, 17, 21 and 35) added to the MD program in 1995.

Massachusetts (25)

The I/M program file provided by MA (2500002.imp) was changed so that the I/M start date for the 1984 and newer model year vehicles is 1984 (instead of 2000) to allow these vehicles to achieve their full tampering deterrence effect and applied the I/M program file to calendar years 2000 through 2002. The file was renamed (2500000.imp) to match the file naming convention to use the earliest calendar year the file applies. Separate files were created for the 1999 calendar year (2500099.imp) and for the 2003 and later calendar years (2500003.imp).

Minnesota (27)

No additional data was provided by MN. The EPA generated descriptions were renamed using the NMIM naming convention.

Missouri (29)

No additional data was provided by MO. The EPA generated descriptions were renamed using the NMIM naming convention.

Nevada (32)

No additional data was provided by NV. The EPA generated descriptions were renamed using the NMIM naming convention.

New Hampshire (33)

No additional data was provided by NH. The EPA generated descriptions were renamed using the NMIM naming convention.

New Jersey (34)

The I/M program file provided by NJ (3400102.imp) was changed so that the I/M start date for testing vehicles is 1974 (instead of 2000) to allow these vehicles to achieve their full tampering deterrence effect and applied the I/M program file to the 2000 through 2004 calendar years. The file was renamed (3400100.imp) to match the file naming convention to use the earliest calendar year the file applies.

A new file (3400199.imp) was created that applies to the 1999 calendar year, before the ASM test was introduced. A new file (3400105.imp) was created to apply to 2005 and later calendar years, which includes OBD inspections.

New Mexico (35)

The I/M program file supplied by NM (3500102.imp) was applied to calendar years 1999 through 2002. This file was renamed (3500189.imp) to match the file naming convention to use the earliest calendar year the file applies. A new file (3500103.imp) was constructed to apply OBD and applied to all the 2003 and later calendar years.

New York (36)

The I/M program file provided by NY (3600502.imp) was changed so that the I/M start date for testing vehicles is 1981 (instead of 1999) to allow these vehicles to achieve their full tampering deterrence effect and applied the I/M program file to the 1999 through 2002 calendar years. The file was renamed (3600599.imp) to match the file naming convention to use the earliest calendar year the file applies.

A new file (3600503.imp) was created to apply to 2003 and later calendar years, which includes OBD inspections. A new I/M program file (3600101.imp) was created to apply to the 2001 and 2002 calendar years for upstate NY counties. Another I/M file (3600103.imp) was created to apply to the 2003 and later calendar years in upstate NY.

North Carolina (37)

No additional data was provided by NC.

The existing I/M program file (NC01.im) was changed to properly apply OBD and a new file (3702501.imp) was constructed which applies to all the 1999 and later calendar years.

The existing I/M program file (NC83.im) was changed to properly apply OBD and a new file (3711983.imp) was constructed which applies to all the 1999 and later calendar years.

The existing I/M program file (NC87.im) was changed to properly apply OBD and a new file (3718387.imp) was constructed which applies to all the 1999 and later calendar years.

The existing I/M program file (NC92.im) was changed to properly apply OBD and a new file (3705792.imp) was constructed which applies to all the 1999 and later calendar years.

Ohio (39)

No additional data was provided by OH.

The existing I/M program file (OH96c.im) was changed to properly apply OBD and two new files (3905596.imp and 3905503.imp) were constructed which apply to calendar years 1999 through 2002 and the 2003 and later calendar years respectively.

The existing I/M program file (OH96cl.im) was changed to properly apply OBD and two new files (3910398.imp and 3910303.imp) were constructed which apply to calendar years 1999 through 2002 and the 2003 and later calendar years respectively.

Oregon (41)

Two additional counties (41009 and 41071) were added to the Portland I/M program (41005, 41051 and 41067) in calendar year 2001. Jackson county (41029) has a separate I/M program.

The I/M program file provided by OR for Jackson County (4102902.imp) was changed to extend the programs to 2050 and applied the file to the 2001 and later calendar years. The file was renamed (4102901.imp) to match the file naming convention to use the earliest calendar year the file applies. A new file (4102997.imp) without OBD inspections was created for Jackson County to apply to the 1999 and 2000 calendar years. This file assumes a gas cap inspection for all 1975 and newer light duty cars and trucks beginning in calendar year 1997.

The I/M program file provided by OR for Clackamas County (4100502.imp) was changed to extend the programs to 2050 and applied the file to the 2001 and later calendar years. The file was renamed (4100501.imp) to match the file naming convention to use the earliest calendar year the file applies. A new file (4100597.imp) without OBD inspections was created to apply to the 1999 and 2000 calendar years. This file assumes a gas cap inspection for all 1975 and newer light duty cars and trucks beginning in calendar year 1997.

Pennsylvania (42)

No additional data was provided by PA.

The existing I/M program file (PA98ph.im) was changed to properly apply OBD and a new file (4201797.imp) was constructed which applies to all the 1999 and later calendar years.

The existing I/M program file (PA01ole.im) was changed to properly apply OBD and a new file (4201101.imp) was constructed which applies to all the 1999 and later calendar years.

The existing I/M program file (PA97.im) was changed to properly apply OBD and a new file (4207785.imp) was constructed which applies to all the 1999 and later calendar years.

The existing I/M program file (PA98pt.im) was changed to properly apply OBD and a new file (4200397.imp) was constructed which applies to all the 1999 and later calendar years.

Rhode Island (44)

The 2002 I/M program file provided by RI (4400002.imp) was applied to all calendar years.

Tennessee (47)

The I/M program files provided by TN (4703702.imp, 4714902.imp and 4715702.imp) were changed to extend the programs to 2050. The files were renamed (4703702.imp, 4714995.imp and 4715702.imp) to match the file naming convention to use the earliest calendar year the file applies. These files were applied to all calendar years.

Texas (48)

The 2002 I/M program file provided by TX for counties 39, 71, 157, 167, 291, 339 and 473 for evaporative testing (4803902.imp) was applied to those counties beginning in calendar year 2000.

The 2002 I/M program file provided by TX for El Paso County (4814102.imp) was applied to all calendar years 1999 and later.

The I/M program file provided by TX for Harris County (4820102.imp) was changed to use the I/M GRACE PERIOD command (instead of explicit model year coverage) so that the file could be used for multiple calendar years. This file was applied to calendar years 2002 and later.

A new file (4820197.imp) without OBD inspections was created to apply to the 1999, 2000 and 2001 calendar years for Harris County.

The I/M program file provided by TX for Collin County (85) and Denton (121) Counties (4808502.imp) was changed to use a 2 year grace period (instead of a fixed model maximum of 2000 for the 2002 calendar year) for all programs. The corrected file was applied to all calendar years 2002 and later. A new evaporative testing file (4808500.imp) was constructed to apply to calendar years 2000 and 2001 using the same 2 year grace period.

The I/M program file provided by TX for Dallas County (113) and Tarrant (439) Counties (4811302.imp) were changed to use a 2 year grace period (instead of a fixed model maximum of 2000 for the 2002 calendar year) for all programs. The corrected file was applied to all calendar years 2002 and later. A new file (4811390.imp) was constructed to apply to calendar years 1999, 2000 and 2001 using the same 2 year grace period.

Utah (49)

The I/M program file provided by UT for Davis County (4901102.imp) was changed. The I/M effectiveness can only be applied once to all I/M program elements, so the initial I/M effectiveness values intended for the first I/M program were removed. The program ending dates were all changed to 2050 to allow the file to be used for all calendar years. The file was renamed (4901197.imp) to match the file naming convention to use the earliest calendar year the file applies. This file was applied to all calendar years 1999 and later.

The 2002 I/M program file provided by UT for Salt Lake County (4903502.imp) was applied to calendar years 1999 through 2002. A new file (4903503.imp) with OBD was created to apply to the 2003 and later calendar years for Salt Lake County.

The 2002 I/M program file provided by UT for Utah County (4904902.imp) was applied to calendar years 2002 and later. A new file (4904986.imp) without OBD inspections was created to apply to the 1999, 2000 and 2001 calendar years for Utah County. This file assumes a gas cap inspection for all vehicle types and model years.

The I/M program file provided by UT for Weber County (4905702.imp) was changed to make the I/M program end date 2050 so that the file could be applied to all 2002 and later calendar years. I/M effectiveness can only be applied to all I/M programs, so the initial I/M effectiveness values intended for the first I/M program were removed. A new file (4905792.imp) without OBD inspections was created to apply to the 1999, 2000 and 2001 calendar years for Weber County.

Vermont (50)

The 2002 I/M program file provided by VT (5000002.imp) was applied to calendar years 2001 and later. A new file (5000097.imp) without OBD inspections was created to apply to the 1999 and 2000 calendar years for Vermont.

Virginia (51)

The 2002 I/M program file provided by VA (5101302.imp) was applied to all calendar years 1999 and later for counties 13, 59, 153, 510, 600, 610, 683 and 685.

The 2002 I/M program file provided by VA (5110702.imp) was applied to all calendar years 1999 and later for counties 107 and 179 (Loudoun and Stafford).

Washington (53)

The 2002 I/M program file provided by WA for Clark County (11) (5301102.imp) was applied to all calendar years 2002 and later. A new file (5301198.imp) without OBD inspections was created to apply to the 1999, 2000 and 2001 calendar.

The 2002 I/M program file provided by WA for Pierce County (53) (5305302.imp) was applied to all calendar years 2002 and later. A new file (5305393.imp) without OBD inspections was created to apply to the 1999, 2000 and 2001 calendar.

The 2002 I/M program file provided by WA for King County (33) (5303302.imp) was applied to all calendar years 2002 and later. A new file (5303382.imp) without OBD inspections was created to apply to the 1999, 2000 and 2001 calendar.

The 2002 I/M program file provided by WA for Snohomish County (61) (5306102.imp) was applied to all calendar years 2002 and later. A new file (5306193.imp) without OBD inspections was created to apply to the 1999, 2000 and 2001 calendar.

The 2002 I/M program file provided by WA for Spokane County (63) (5306302.imp) was applied to all calendar years 2002 and later. A new file (5306385.imp) without OBD inspections was created to apply to the 1999, 2000 and 2001 calendar.

Wisconsin (55)

The 2002 I/M program file provided by WI for Sheboygan County (117) (5511702.imp) was applied to all calendar years 2001 and later. A new file (5511794.imp) without OBD inspections was created to apply to the 1999 and 2000 calendar.

The 2002 I/M program file provided by WI (5505902.imp) for the other counties (59, 79, 89, 101, 131 and 133) was applied to all calendar years 2001 and later. A new file (5505984.imp) without OBD inspections was created to apply to the 1999 and 2000 calendar.

2.3.5 S/L/T Changes

As mentioned above, EPA provided S/L/T agencies with the opportunity to review, comment upon, and revise the draft 2002 NEI. EPA's preferred method for updates for the NEI was the submission of NMIM inputs by S/L/T agencies. However, in some cases, EPA also accepted emission inventory revisions or updates for the NEI Version 2. For the onroad sector, new or revised emission data from Connecticut and Missouri; Clark County, Nevada; and the Penobscot Tribe in Maine were accepted and incorporated in the NEI Version 2. A number of S/L/T agencies also provided onroad NMIM updates, including VMT revisions, that were included in the NMIM runs for the NEI. All NMIM inputs provided by S/L/T agencies are listed in Chapter 3 of this document.

Table 2-7. List of Original I/M Program Description Files Adapted from the 1999 NEI Inputs

AK85A.IM	MA95.IM	PA01OLE.IM
AK85F.IM	MD85.IM	PA97.IM
AZ95P.IM	MD95.IM	PA98PH.IM
AZ95T.IM	ME99.IM	PA98PT.IM
CA95B.IM	MN92.IM	RI97.IM
CA99E.IM	MO97.IM	TN84.IM
CO95C.IM	NC01.IM	TN85.IM
CO95D.IM	NC83.IM	TN95.IM
CT98.IM	NC87.IM	TX98.IM
DC99.IM	NC92.IM	UT97D.IM
DE83.IM	NH02.IM	UT97S.IM
DE90.IM	NJ97.IM	UT97W.IM
FL92.IM	NM97.IM	VA98.IM
GA01.IM	NV95.IM	VT97.IM
GA99.IM	NY01.IM	WA83.IM
ID85.IM	NY99.IM	WA86.IM
IL99.IM	OH96C.IM	WA94.IM
IN01.IM	OH98CL.IM	WI85.IM
IN97.IM	OR01P.IM	WI95.IM
KY98.IM	OR98.IM	
LA00.IM	OR98P.IM	

Table 2-8. List of State Supplied I/M Program Description Files

0401302.imp	4100502.imp	4904902.imp
0401902.imp	4102902.imp	4905702.imp
1000102.imp	4400002.imp	5000002.imp
1000302.imp	4703702.imp	5101302.imp
1000502.imp	4714902.imp	5110702.imp
1100102.imp	4715702.imp	5301102.imp
1700002.imp	4808502.imp	5303302.imp
2111102.imp	4811302.imp	5305302.imp
2400002.imp	4803902.imp	5306102.imp
2500002.imp	4814102.imp	5306302.imp
3400102.imp	4820102.imp	5505902.IMP
3500102.imp	4901102.imp	5511702.IMP
3600502.imp	4903502.imp	

Table 2-9. List of I/M Program File Names Used for Version 2 of the 2002 National Emission Inventory

State	Filename	First Year	Last Year	Counties
ALASKA	0202099.imp	1999	2050	20
ALASKA	0209099.imp	1999	2050	90
ARIZONA	0401395.imp	1999	2001	13
ARIZONA	0401301.imp	2002	2050	13
ARIZONA	0401902.imp	1999	2050	19
CALIFORNIA	0600199.imp	1999	2050	1,13,41,55,75,81,95
CALIFORNIA	0607999.imp	1999	2050	7,11,17,19,21,29,31,37,39,47,53,57,59,61,65,67,69,71,73,77,79,83,85,87,89,97,99,101,103,107,111,113,115
COLORADO	0800199.imp	1999	2050	1,5,13,14,31,35,59
COLORADO	0804199.imp	1999	2050	41,69,97,123
CONNECTICUT	0900199.imp	1999	2050	1,3,5,7,9,11,13,15
DELAWARE	1000191.imp	1999	2050	1
DELAWARE	1000383.imp	1999	2050	3
DELAWARE	1000591.imp	1999	2050	5
DISTRICT OF COLUMBIA	1100102.imp	1999	2002	1
DISTRICT OF COLUMBIA	1100103.imp	2003	2050	1
FLORIDA	1200099.imp	1999	2050	11,31,57,86,99,103
GEORGIA	1305799.imp	1999	1999	57,63,77,97,113,117,151,223,247
GEORGIA	1305700.imp	2000	2001	57,63,77,97,113,117,151,223,247
GEORGIA	1305702.imp	2002	2050	57,63,77,97,113,117,151,223,247
GEORGIA	1306799.imp	1999	1999	67,89,121,135
GEORGIA	1306700.imp	2000	2001	67,89,121,135
GEORGIA	1306702.imp	2002	2050	67,89,121,135
IDAHO	1600099.imp	1999	2050	1
ILLINOIS	1700099.imp	1999	2001	31,43,63,89,93,97,111,119,133,163,197
ILLINOIS	1700002.imp	2002	2050	31,43,63,89,93,97,111,119,133,163,197
INDIANA	1806101.imp	2001	2050	61
INDIANA	1808997.imp	1999	2050	19,43,89,127
KENTUCKY	2111198.imp	1999	2001	15,37,111,117
KENTUCKY	2111102.imp	2002	2050	15,37,111,117
LOUISIANA	2200000.imp	2000	2050	33,121
MAINE	2300599.imp	1999	2050	5
MARYLAND	2400995.imp	1999	2002	9,15,17,21,35
MARYLAND	2400903.imp	2003	2050	9,15,17,21,35
MARYLAND	2400002.imp	1999	2002	3,5,13,25,27,31,33,43,510
MARYLAND	2400003.imp	2003	2050	3,5,13,25,27,31,33,43,510
MASSACHUSETTS	2500099.imp	1999	1999	1,3,5,7,9,11,13,15,17,19,21,23,25,27
MASSACHUSETTS	2500000.imp	2000	2002	1,3,5,7,9,11,13,15,17,19,21,23,25,27
MASSACHUSETTS	2500003.imp	2003	2050	1,3,5,7,9,11,13,15,17,19,21,23,25,27
MINNESOTA	2700099.imp	1999	2050	3,19,37,53,123,139,163,171
MISSOURI	2900099.imp	1999	2050	71,99,183,189,510
NEVADA	3200099.imp	1999	2050	3,31
NEW HAMPSHIRE	3300002.imp	2002	2050	11,15,17
NEW JERSEY	3400199.imp	1999	1999	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41
NEW JERSEY	3400100.imp	2000	2004	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41
NEW JERSEY	3400105.imp	2005	2050	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41

Table 2-9 (continued)

State	Filename	First Year	Last Year	Counties
NEW MEXICO	3500189.imp	1999	2002	1
NEW MEXICO	3500103.imp	2003	2050	1
NEW YORK	3600101.imp	1999	2002	1,3,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,49,51,53,55,57,63,65,67,69,71,73,75,77,79,83,89,91,93,95,97,99,101,105,107,109,111,113,115,117,121,123
NEW YORK	3600103.imp	2003	2050	1,3,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,49,51,53,55,57,63,65,67,69,71,73,75,77,79,83,89,91,93,95,97,99,101,105,107,109,111,113,115,117,121,123
NEW YORK	3600599.imp	1999	2002	5,47,59,61,81,85,87,103,119
NEW YORK	3600503.imp	2003	2050	5,47,59,61,81,85,87,103,119
NORTH CAROLINA	3702501.imp	2001	2050	25,135,179
NORTH CAROLINA	3705792.imp	1999	2050	57,59,63,67,71,77,81
NORTH CAROLINA	3711983.imp	1999	2050	119
NORTH CAROLINA	3718387.imp	1999	2050	183
OHIO	3905596.imp	1999	2002	17,23,35,55,57,61,85,93,113,133,153,165
OHIO	3905503.imp	2003	2050	17,23,35,55,57,61,85,93,113,133,153,165
OHIO	3910398.imp	1999	2002	25,103
OHIO	3910303.imp	2003	2050	25,103
OREGON	4100597.imp	1999	2000	5,51,67
OREGON	4100501.imp	2001	2050	5,51,67
OREGON	4100901.imp	2001	2050	9,71
OREGON	4102997.imp	1999	2000	29
OREGON	4102901.imp	2001	2050	29
PENNSYLVANIA	4201797.imp	1999	2050	17,29,45,91,101
PENNSYLVANIA	4201101.imp	2001	2050	11,13,21,27,41,43,49,69,71,75,79,81,85,133
PENNSYLVANIA	4200397.imp	1999	2050	3,7,73,125,129
PENNSYLVANIA	4207785.imp	1999	2050	77,95
RHODE ISLAND	4400002.imp	1999	2050	1,3,5,7,9
TENNESSEE	4703785.imp	1999	2050	37
TENNESSEE	4714995.imp	1999	2050	149,165,187,189
TENNESSEE	4715784.imp	1999	2050	157
TEXAS	4808500.imp	2000	2001	85,121
TEXAS	4808502.imp	2002	2050	85,121
TEXAS	4811390.imp	1999	2001	113,439
TEXAS	4811302.imp	2002	2050	113,439
TEXAS	4814102.imp	1999	2050	141
TEXAS	4820197.imp	1999	2001	201
TEXAS	4820102.imp	2002	2050	201
TEXAS	4803902.imp	2000	2050	39,71,157,167,291,339,473
UTAH	4901197.imp	1999	2050	11
UTAH	4903502.imp	1999	2002	35
UTAH	4903503.imp	2003	2050	35
UTAH	4904986.imp	1999	2001	49
UTAH	4904902.imp	2002	2050	49
UTAH	4905792.imp	1999	2001	57
UTAH	4905702.imp	2002	2050	57
VERMONT	5000097.imp	1999	2001	1,3,5,7,9,11,13,15,17,19,21,23,25,27
VERMONT	5000002.imp	2002	2050	1,3,5,7,9,11,13,15,17,19,21,23,25,27

Table 2-9 (continued)

State	Filename	First Year	Last Year	Counties
VIRGINIA	5101302.imp	1999	2050	13,59,153,510,600,610,683,685
VIRGINIA	5110702.imp	1999	2050	107,179
WASHINGTON	5301198.imp	1999	2001	11
WASHINGTON	5301102.imp	2002	2050	11
WASHINGTON	5303382.imp	1999	2001	33
WASHINGTON	5303302.imp	2002	2050	33
WASHINGTON	5305393.imp	1999	2001	53
WASHINGTON	5305302.imp	2002	2050	53
WASHINGTON	5306193.imp	1999	2001	61
WASHINGTON	5306102.imp	2002	2050	61
WASHINGTON	5306385.imp	1999	2001	63
WASHINGTON	5306302.imp	2002	2050	63
WISCONSIN	5505984.imp	1999	2000	59,79,89,101,131,133
WISCONSIN	5505902.imp	2001	2050	59,79,89,101,131,133
WISCONSIN	5511794.imp	1999	2000	117
WISCONSIN	5511702.imp	2001	2050	117

2.4 HOW HAVE 2002 VERSION 3 EMISSION ESTIMATES CHANGED FROM THE 2002 VERSION 2 NEI?

Some updates were made by EPA to the NMIM, MOBILE and NONROAD models between Version 2 of the 2002 NEI and Version 3. In addition, because inputs and algorithms for these core models were revised or in some cases corrected, EPA used these updated onroad and nonroad emission estimates in place of State-supplied emissions data that had been included in the 2002 NEI Version 2. NMIM-generated emissions were used in the onroad and NONROAD model sector of the 2002 NEI Version 3 with the exception of California. California emissions were state-submitted and were based on their submittal for the 2002 NEI Version 2. This exception was made because California has their own onroad mobile source estimation model (EMFAC2002), and nonroad model (OFFROAD). Note that any State-submitted NCD inputs (e.g., I/M inputs described in Section 2.3, and data discussed in Chapter 3) accepted by EPA for earlier versions of the 2002 NEI are reflected in the 2002 NEI Version 3. Version 3 is considered by EPA to be the final version of the 2002 NEI.

Tables 2-10 and 2-11 summarize the differences in national mobile source CAP emissions between the final Version 3 and Version 2 of the 2002 NEI. Differences result from updates to NMIM and the core emission models as described below. VOC emissions for onroad show the largest increase, due primarily to updates to cold start and RVP modeling, discussed in more detail below. For nonroad, VOC also significantly increases, due largely to updates to small gasoline engines and recreational marine inputs. The decrease in NH_3 emissions is due to the removal of State-supplied NH_3 emissions data for select States. Further details on the changes made to the MOBILE and NONROAD model, as well as to NMIM, are described in the following sections.

Table 2-10. Comparison of 2002 Onroad Mobile Final (Version 3) and Version 2 NEI

	Version 2 NEI	Final Version 3 NEI	Percent Difference
VOC	4,660,584	4,917,692	5.5
NOX	8,133,574	7,870,197	-3.2
CO	62,957,988	60,597,280	-3.7
PM10-PRI	203,258	202,907	-0.2
PM25-PRI	148,433	147,620	-0.5
SO2	257,520	245,274	-4.8
NH3	289,567	294,016	1.5

Table 2-11. Comparison of 2002 NONROAD Model Final (Version 3) and Version 2 NEI

	Version 2 NEI	Final Version 3 NEI	Percent Difference
VOC	2,492,244	2,838,912	13.9
NOX	2,202,898	2,197,879	-0.2
CO	21,520,638	21,788,376	1.2
PM10	230,423	230,577	0.1
PM25	213,161	219,219	2.8
SO2	196,410	189,347	-3.6
NH3	13,263	1,884	-85.8

2.4.1 MOBILE Model Changes

Onroad mobile emissions were based on the NMIM model, using a slightly modified version of MOBILE6.2.03 to better estimate the effects of cold temperatures on engine start emissions for hydrocarbons from light-duty gasoline fueled vehicles and to correct two oxygenate-related calculations in MOBILE6. This modified version of MOBILE6 was also used for the final Mobile Source Air Toxics (MSAT) rule (EPA 2007a).

Specifically, the MOBILE6 model was revised for the 2002 NEI Version 3 as follows:

- An adjustment was made for HC to account for vehicle “cold starts” which will greatly increase HC emissions (especially in colder areas) and other pollutants such as HAPs that are a function of HC emissions. Newer vehicles meeting Tier 2 have higher emissions than previously estimated when below 50° F when the engine is first started. A detailed discussion of this can be found in the document, "Cold Temperature Effects on Vehicle HC Emissions," (EPA 2006).
- Two corrections were made to the handling of oxygenates which affects VOC and HAP estimates. The first involved a correction to the calculation of the market-weighted oxygen level. The second correction was related to benzene evaporative emissions. For this calculation, all oxygenates were affecting benzene evaporative emissions, whereas the only oxygenate that should have an effect is MTBE.

2.4.2 NONROAD Model Changes

OTAQ generated monthly nonroad emissions using the NMIM model, including a version of NONROAD2005 called NR05c-BondBase. This version of NONROAD2005 improves inputs and emissions estimates for small spark-ignition (SI) and SI recreational marine equipment, and adds the ability to model the effects of ethanol blends on fuel hose and tank permeation. It is the same version of NONROAD that was used to generate base case inventories for the proposed rule, "Control of Emissions from Marine SI and Small SI Engines, Vessels, and Equipment" (EPA, 2007b). These emission estimates were used for all States with the exception of California, in which data submitted by California for the NEI Version 2 were used.

The version of NONROAD used for the 2002 NEI Version 3 has the following improvements over the version used for the 2002 NEI Version 2. Unless otherwise noted, some of these changes have no appreciable effect on emissions for 2002:

General

- New evaporative emission categories were added for tank permeation, hose permeation, hot soak, and running loss emissions, and the methodology for calculating diurnal emissions was revised. Effects of ethanol blends on permeation were added. This change will substantially increase HC emissions.
- Enhanced the equipment scrappage algorithm.
- Effects of evaporative emission standards for recreational vehicles and large spark ignition equipment were incorporated.
- Geographic allocations were updated.

Small SI Inputs

- Updated emission factors and deterioration rates for Phase 2 engines based on new test data.
- Corrected technology mix for snowblowers to account for 4-stroke engines (previously assumed all 2-stroke).

Recreational Marine Inputs

- Recreational marine horsepower distributions were updated. This change will result in increased emissions for all exhaust pollutants.
- 2-stroke recreational marine PM emission factors were updated, resulting in lower PM emissions.
- Updated many inputs for high performance recreational marine sterndrive/inboard engines >600 hp (population, average hp, median life, activity, emission factors). This change will increase emissions for this category of engines.

2.4.3 Additions and Revisions to NMIM

Updates to NMIM and the NCD, including fuel inputs and emission factors, were completed as described below.

External MOBILE6 data input files were developed to account for the introduction of new California highway vehicle emission standards, beginning with the 2004 model year. These standards have been formally adopted by 11 states (California, Connecticut, Maine, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont and Washington). These standards supersede the federal certification standards for highway vehicles sold in those states. The changes to the external data files to reflect California standards will tend to slightly decrease HC, CO, and NO_x emissions in the affected areas.

Improvements were also made to county-level gasoline Reid Vapor Pressure (RVP) estimates based on an updated analysis of fuels. Previously, the fuel survey results from a few counties in a state were used for all counties in a state. However, often the surveyed counties would have RVP control programs, so that the other counties in the state, without controls, would have inappropriately low RVP. EPA changed the RVP for counties without fuel surveys and without RVP control to use federally-regulated RVP levels instead. The changes in gasoline RVP will tend to result in higher emissions in the non-urban areas affected by the changes, especially for HC emissions in the summer months.

Mercury and arsenic emission factors have been added to the current version of NMIM. For mercury, these emission factors were developed from recent vehicle emissions testing data conducted in EPA. The mercury data include speciation of total mercury by phase (gas and particle) and characterization of reactive gas-phase mercury. For arsenic, the emission factors were developed from data reported for recent tunnel tests (Schauer et al., 2006).

Chromium emission factors have also been revised in NMIM. No speciation of chromium from mobile sources currently exists. The current version of NMIM assumes that 18 percent of the chromium from mobile sources is hexavalent, based on combustion data from stationary combustion turbines that burn diesel fuel (Taylor, 2003). Previously, NMIM had assumed that 34 percent of chromium from mobile sources was hexavalent. This estimate was based on an assumption in the 1996 national scale air toxics assessment that 34 percent of all atmospheric chromium was hexavalent. This percent estimate was based on the high end of the range for utility boilers.

3.0 NMIM

3.1 NMIM METHODOLOGY

3.1.1 Introduction and Overview

EPA's NMIM is a consolidated emissions modeling system for EPA's MOBILE6 and NONROAD models. It was developed to produce, in a consistent and automated way, national, county-level mobile source emissions inventories for the NEI and for EPA rulemaking. When national inventories have previously been constructed from MOBILE6 and NONROAD, the necessary input data have been widely scattered in disparate formats and have required additional specialized software to convert these data into input files for MOBILE6 and NONROAD, to run the models, to integrate the results into a final inventory, and to post-process the results into forms suitable for the national inventories. NMIM is designed to accomplish all of these tasks in a single package.

NMIM comprises a Java framework, graphical and command line user interfaces, the MOBILE6 and NONROAD models, a national county database, and postprocessing and aggregation capabilities. NMIM's primary improvements over MOBILE6 and NONROAD are: 1) the inclusion of all the required county data for the nation in a single database; 2) graphical user interface (GUI); 3) "shortcuts" for generating national inventories; 4) tools for aggregation and post-processing; 5) estimation of 33 HAPs and 17 dioxin/furan congeners by ratio to various MOBILE6 and NONROAD output parameters; and 6) distributed processing capability to enhance performance. NMIM specifically extends MOBILE6's capabilities by producing inventories rather than just emissions factors. NMIM provides consistency across both models and all pollutants by using a single input database for MOBILE6 and NONROAD and for criteria pollutants and HAPs.

An installation package and general information about NMIM may be downloaded from ftp://ftp.epa.gov/EmisInventory/nmimtraining/. This download supports the NMIM training scheduled for April 11, 2005, at the 14th International Emission Inventory Conference in Las Vegas. The posted version of NMIM is identical to that used in the Draft 2002 NEI, except for some bug fixes that do not affect the results. In addition, OTAQ is constructing a website that will have an installation package and other information about NMIM. That site is not available as of this writing, but is expected to be accessible as a link from OTAQ's emissions modeling web page, http://www.epa.gov/otaq/models.htm, which also contains links to the MOBILE and NONROAD models. Questions about NMIM can be emailed to mobile@epa.gov.

This chapter begins with an overall explanation of how NMIM works, followed by the details of how it runs MOBILE6 and NONROAD. Next, it discusses the pollutant and source category inventories available from running NMIM. Then it describe the NCD and plans for updating and improving it through the NEI process. Lastly, there is an explanation of how NMIM estimates various HAPs that are not direct outputs of MOBILE6 and NONROAD.

3.1.2 How NMIM Works

The NMIM user specifies a set of years and months, a geographic region (the whole United States, any combination of whole States, or any combination of particular counties, including Puerto Rico and the Virgin Islands), a set of pollutants, and categories of on-road vehicles and nonroad equipment. This collection of user requests is called a "run specification" or RunSpec, and can be saved in a file for later execution or for text editing. RunSpecs can be produced by the NMIM GUI or by using a text editor. NMIM RunSpecs can be executed from the GUI or from the command line.

Based on the RunSpec and information in the NCD, NMIM writes input files for the MOBILE6 and NONROAD models. NMIM then runs these models, reads their output files, performs additional processing if necessary, and puts the inventories into an output database. Additional processing includes multiplying MOBILE6 emission factors by VMT and estimating emissions of some other pollutants (see below) as ratios to pollutant inventories generated by MOBILE6 and NONROAD.

NMIM has post-processing capability that can be applied after the inventory is generated. This includes NEI Input Format Version 3.0 (NIF3), although bugs in the NIF3 converter required separate conversion for this version of the NEI for the 2002 NEI Draft (completed February 2005).

NMIM employs two main techniques, adopted from previous NEIs, to make the production of national inventories tractable. The first is to assume that monthly time resolution is adequate for both meteorology and source activity and therefore to perform 12 monthly runs instead of 365 daily runs. NMIM is designed to do only monthly runs and produces annual inventories by summing the 12 monthly inventories.

The second technique, which was not used for this version of the 2002 NEI Draft, is to group similar counties, allowing NMIM to do a single MOBILE6 or NONROAD run for the entire group. All counties were run individually for this version of the 2002 NEI Draft to make maximum use of county-specific information.

As a way of further improving performance, NMIM may be run in a distributed-processing mode, employing multiple computers. NMIM comprises two programs, Master and Worker. Both Master and Worker(s) have a simple text configuration file which specifies the path to a shared folder through which they communicate. The GUI, used to produce RunSpecs and AgSpecs as discussed above, is on the Master. In standalone mode, one Master, one Worker, and the shared folder are on the same computer. In distributed mode, there are multiple workers on separate computers. For this version of the 2002 Draft NEI, NMIM was run in distributed mode, using one master and 20 workers.

3.1.3 How NMIM Runs Mobile6

NMIM writes a MOBILE6 input file and executes MOBILE6 once for each month for each representing county (if the user chose the Geographic Representation option "County Group") or for each county (if the user chose the Geographic Representation option "County"). The resulting emission factors are multiplied by the VMT for each county. Each MOBILE6 input file is constructed using data obtained from the NCD.

The MOBILE6 input files constructed by NMIM are designed to accommodate detailed user input and to use a consistent set of commands. In order to use consistent fuels data for all pollutants, the AIR TOXICS command is always used, even if no air toxics are requested by the user. To enable the AIR TOXICS command, NMIM always inserts the command to model acrolein in the MOBILE6 input file, whether the user requests it or not. However, if the user does not request acrolein, it will not appear in the output table. Similarly, other commands, such as ALTITUDE, POLLUTANTS and EVALUATION MONTH are always explicitly used, rather than depending on MOBILE6 default settings and will always appear in NMIM MOBILE6 input files. The NMIM MOBILE6 input files always use the HOURLY TEMPERATURES command, rather than MIN/MAX TEMPERATURE command. The hourly RELATIVE HUMIDITY command is always used, rather than the ABSOLUTE HUMIDITY command. The BAROMETRIC PRES command is always used, since this value interacts with the relative humidity values. Average speed distributions are always specified using the SPEED VMT command, rather than the AVERAGE SPEED command.

For consistency, NMIM requires that gasoline fuel parameters have the level of detail to properly model air toxic emissions, even though less detail is required to model criteria pollutants. The OXYGENATE command is used instead of the OXYGENATED FUELS command, so all oxygen content values must be expressed as volume percent instead of weight percent. GAS AROMATIC%, GAS OLEFIN%, GAS BENZENE%, E200 and E300 must always be specified. RVP OXY WAIVER command is always set to 1 (no waiver), because Reid vapor pressure (RVP) values from the fuel surveys are assumed to already account for any RVP effect from oxygenated fuels. The FUEL RVP command is always required. The GASOLINE SULFUR command and FUEL PROGRAM command Option 4 are always used to explicitly set the sulfur content of gasoline. The same gasoline sulfur content is used for both commands and for all years in the FUEL PROGRAM command, although it would normally have different sulfur values for different years. Each MOBILE6 run covers only a single month in a particular calendar year, so NMIM sets all possible sulfur values the same to avoid programming logic to determine which of the possible years to change.

Some counties have local emission control programs. The basic information for these programs is stored in the NCD and used to create the appropriate commands for the input file when needed. Inspection and maintenance (I/M) programs for counties are stored in external data files and accessed using the I/M DESC FILE command.

In addition to the basic required information, NMIM can also include county specific data that is normally provided to MOBILE6 using external data files. Nearly any of the valid MOBILE6 commands can be used, including commands used to model local Low Emission Vehicle (LEV) phase-in programs and local natural gas vehicle fractions. Diesel sales fractions are stored in an external file and used to create the appropriate input command.

Not all MOBILE6 commands are used by NMIM. The VMT FRACTIONS and VMT BY FACILITY commands are not needed, since these commands are only needed to create composite emission rates. NMIM converts all emission rate results from MOBILE6 to tons using the county specific VMT for each vehicle class and roadway type. Since all gasolines are explicitly defined, both the SEASON command and FUEL PROGRAM command Option 2 are never used.

Only weekdays are modeled by NMIM. Commands that apply to weekend variations are not used. This simplification makes sense because most weekend differences in MOBILE6 are temporal distributions, so MOBILE6's emission factors at the day level are little affected by these differences. (Parameters that can differ between weekends and weekdays are hot soak duration distribution, start distribution, starts/day, soak distribution, and trip length distribution.) The major difference between weekdays and weekends is VMT, which is provided by month, vehicle type, and roadway type in the NCD.

MOBILE6 has only 4 facility or roadway types: freeways, arterials, ramps, and locals. Ramp speed is fixed at 34.6 miles per hour (mph) and local speed at 12.9 mph. Distributions of average speeds are specified separately for freeways and arterials using the SPEED VMT command. If only a single MOBILE6 scenario were run, the same distribution of average speeds would be applied to all vehicle types. Separate specification of average speed distributions for all combinations of the 12 roadway types and all 28 MOBILE6 vehicle types would require running 168 MOBILE6 scenarios.

In order to avoid running so many MOBILE6 scenarios, while retaining reasonable flexibility, NMIM groups vehicle class-roadway type combinations into 18 groups, shown in Table 3-1. These groups are those that have been used in past NEI base years, and provide flexibility in assigning average speeds while limiting the number of MOBILE6 runs necessary to generate an inventory. Since nine of these combinations use the MOBILE6 freeway facility type and nine use the arterial facility type, a total of nine MOBILE6 scenarios are needed to model the eighteen vehicle class/roadway type combinations. Average speed distributions for each of these eighteen vehicle class/roadway type combinations can be specified for each county.

Because MOBILE6 can model only one particle size at a time, if both PM10 and PM2.5 are desired, NMIM runs a tenth MOBILE6 scenario to obtain emission factors for the extra particle size. MOBILE6 separates exhaust particulates into sulfate (SO_4), organic carbon (OC), elemental carbon (EC), lead, tire wear, and brake wear. Of these, only SO_4 depends on speed. If either PM10 or PM2.5 is requested, the results are obtained from the standard nine scenarios. If both PM10 and PM2.5 are requested, the nine scenarios are run for PM10. Since all SO_4 is PM2.5, if both PM10 and PM2.5 are requested, the SO_4 emission factor for both is taken from the nine scenarios that are sensitive to speed, and the tenth scenario is used to obtain the emission factors for all the other PM2.5 components.

Table 3-1. The 18 Vehicle Class-roadway Type Combinations in NMIM

M6Vtypes*	***Road Types***	***M6 Ftype***
LDV	Rural Interstate	Freeway
LDT	Rural Interstate	Freeway
HDV	Rural Interstate	Freeway
LDV	Urban Interstate	Freeway
LDT	Urban Interstate	Freeway
HDV	Urban Interstate	Freeway
LDV	Urban Freeways & Expressways	Freeway
LDT	Urban Freeways & Expressways	Freeway
HDV	Urban Freeways & Expressways	Freeway
LDV,LDT	Rural Principal Arterial	Arterial
LDV,LDT	Rural Minor Arterial	Arterial
HDV	Rural Principal Arterial	Arterial
LDV,LDT	Rural Major Collector	Arterial
LDV,LDT	Rural Minor Collector, Rural Local	Arterial
HDV	Rural Minor Arterial	Arterial
LDV,LDT	Urban Principal Arterial, Urban Minor Arterial, Urban Collector	Arterial
HDV	Rural Major Collector, Rural Minor Collector, Rural Local	Arterial
HDV	Urban Principal Arterial, Urban Minor Arterial, Urban Collector	Arterial

* Reference MOBILE6.2 User Guide, Appendix B
LDV = MOBILE6 Vehicle Types 1 and 16.
LDT = MOBILE6 Vehicle Types 2-5.
HDV = MOBILE6 Vehicle Types 6-15.

MOBILE6 specifies a calendar year and an evaluation month of either January or July. This combination determines the fleet composition for which emission factors are generated. For each month of a given inventory year, NMIM writes the MOBILE6 input file using the combination of calendar year and evaluation month shown in Table 3-2.

The reasoning behind this scheme is that the fleet composition in October, November, and December of year Y is more like that of January of year Y+1 than it is like July of year Y. This scheme does not cause a problem with fuel properties, because NMIM always looks up the fuel properties in the NCD for the inventory year and month being modeled. Control programs in MOBILE6 are always assumed to begin on January 1, but MOBILE6 assumes that these programs have no effect on that day, since the program has had no time to get started. Hence NMIM is not erroneously introducing next year's control programs by modeling October, November, and December as January 1 of the following year.

Table 3-2. The MOBILE6 Calendar Years and Evaluation Months That Are Used by NMIM to Produce an Inventory for Each Month of a Given Year, *Y*

NMIM Month of Inventory Year Y	*MOBILE6 calendar year*	*MOBILE6 evaluation month*
1	Y	1
2	Y	1
3	Y	1
4	Y	7
5	Y	7
6	Y	7
7	Y	7
8	Y	7
9	Y	7
10	Y+1	1
11	Y+1	1
12	Y+1	1

3.1.4 How NMIM Runs NONROAD

NONROAD estimates monthly fuel consumption and emissions of total hydrocarbons (THC), CO, NO_x, SO_2, and PM. NMIM then processes the monthly results as needed to produce annual and ozone season day emissions. Additional pollutants are produced by NMIM as ratios to some of these outputs.

The NONROAD Model reads a set of ASCII instructions, known as an “opt file” (for options). NMIM creates this file from data in the NCD. As employed in NMIM, the opt file is limited to one State and specifies month and year, fuel properties, temperature, and the counties for which to calculate emissions, which may be all or a subset of the counties in the State. NONROAD internally produces emissions for the whole State and then allocates the emissions for each SCC to the requested counties. Output is produced only for the county or counties selected in the NMIM RunSpec.

The NONROAD Model includes a group of files that specify equipment populations, emission factors, deterioration rates, activities, and allocations from the State to the county level. County-specific allocation, population, seasonality, and activity files that will override the default files can be specified in the NCD.

The fuel properties required by the NONROAD Model are not the same as those in the NCD. The NONROAD Model requires “Oxygen Weight %” in its opt file. The conversion from NCD fuel properties to oxygen weight percent is performed by NMIM as follows:

```
oxywtpct =
        etohvolume*0.3448*etohmktshare
        + mtbevolume*0.1786*mtbemktshare
        + tamevolume*0.1636*tamemktshare
        + etbevolume*0.1533*etbemktshare
```

These conversion factors are detailed under the OXYGENATE command in the MOBILE6 User's Guide (EPA, 2003b).

How NMIM converts from THC to other hydrocarbon (HC) species

THC is the NONROAD Model's native output. The other HC species that can be requested from NMIM are listed and defined in Table 3-3 below. The conversion from THC to the other HC species differs between exhaust and evaporative emissions. For NONROAD, NMIM classifies all emissions as either exhaust, evaporative, or refueling. NONROAD's crankcase emissions are classified as exhaust.

NMIM uses factors in the SCC table to convert NONROAD exhaust THC to the other HC outputs (VOC, NMHC, TOG, and NMOG). For evaporative emissions except for FuelType=CNG, no conversion is necessary (i.e., VOC = NMHC = TOG = NMOG = THC). For evaporative CNG emissions, TOG = THC, and NMOG = NMHC = VOC = 0.

3.1.5 Pollutants for Which Inventories Are Produced by NMIM

HCs may be expressed in one of five forms, listed in Table 3-3 below. The conversion factors are those used in the MOBILE6 and NONROAD models and depend on fuel and engine type.

Table 3-3. Hydrocarbon Forms Available from NMIM (MOBILE6 User Guide)

Hydrocarbon Form		Includes FID HC	Includes Methane	Includes Ethane	Includes Aldehydes
Total Hydrocarbons	(THC)	Yes	Yes	Yes	Partially
Nonmethane Hydrocarbons	(NMHC)	Yes	No	Yes	Partially
Volatile Organic Compounds	(VOC)	Yes	No	No	Yes
Total Organic Gases	(TOG)	Yes	Yes	Yes	Yes
Nonmethane Organic Gases	(NMOG)	Yes	No	Yes	Yes

Table 3-4 lists all pollutants for which NMIM produces inventories. The pollutant codes are those specified by NIF3.[1] Numeric codes are Chemical Abstracts Service Registry Numbers[2] (CASRN) with the hyphens removed.

In Table 3-4, a non-blank "Ratio to" column (MB for MOBILE6, NR for NONROAD) indicates that the pollutant is calculated by NMIM, after the MOBILE6 or NONROAD model is run, by ratio to the pollutant listed in the column. A blank "Ratio to" column indicates that the pollutant is calculated inside MOBILE6 or NONROAD. The ratio depends on source type, expressed as a SCC, and fuel characteristics. The complete list of these ratios may be found in the NCD SCC table and SCCToxics table. Ratio units are g/gallon, g/mile, and g/g of PM or VOC. For on-road vehicles, naphthalene is ratioed to exhaust PM and to evaporative VOC. For nonroad, it is

[1] Details of the NIF3 may be found as links to http://www.epa.gov/ttn/chief/nif/index.html#ver3.

[2] See EPA's Substance Registry System: http://www.epa.gov/srs/ and the CAS Registry website: http://www.cas.org/EO/regsys.html.

ratioed to exhaust PM10 only. Secondary organic aerosol (SOA) is present to provide input to REMSAD (Regional Modeling System for Aerosols and Deposition[3]).

The "Six HAPs" category represents the first HAPs studied for mobile sources. They are selected individually in the NMIM RunSpec. The 27 "Add'l. HAPs" (additional HAPs) are selected as a group in the NMIM RunSpec. The 17 dioxin/furan congeners are also selected as a group. Pollutants in Table 3-4 without a category listed may be selected individually in the NMIM RunSpec. All pollutants are output separately, even if they are selected as a group.

Table 3-4. List of Pollutants for Which Inventories Are Produced by NMIM

Pollutant Code	PollutantName	Category	Ratio to MB	Ratio to NR
CO	Carbon Monoxide			
HC	Hydrocarbons (choice of five forms)			
NOX	Nitrogen Oxides			
SO2	Sulfur Dioxide			
PM10-PRI	Primary PM10 (Filterables and Condensibles)			
PM25-PRI	Primary PM2.5 (Filterables and Condensibles)			PM10*
NH3	Ammonia			Gal*
75070	Acetaldehyde	Six HAPS		VOC
107028	Acrolein	Six HAPS		VOC
71432	Benzene	Six HAPS		VOC
106990	1,3-Butadiene	Six HAPS		VOC
50000	Formaldehyde	Six HAPS		VOC
1634044	MTBE	Six HAPS		VOC
100414	Ethyl Benzene	Add'l. HAPS	VOC	VOC
100425	Styrene	Add'l. HAPS	VOC	VOC
108883	Toluene	Add'l. HAPS	VOC	VOC
110543	Hexane	Add'l. HAPS	VOC	VOC
120127	Anthracene	Add'l. HAPS	PM10	PM10
123386	Propionaldehyde	Add'l. HAPS	VOC	VOC
129000	Pyrene	Add'l. HAPS	PM10	PM10
1330207	Xylene	Add'l. HAPS	VOC	VOC
16065831	Chromium (Cr3+)	Add'l. HAPS	Mile	Gal
18540299	Chromium (Cr6+)	Add'l. HAPS	Mile	Gal
191242	Benzo(g,h,i)perylene	Add'l. HAPS	PM10	PM10
193395	Indeno(1,2,3,c,d)pyrene	Add'l. HAPS	PM10	PM10
205992	Benzo(b)fluoranthene	Add'l. HAPS	PM10	PM10
206440	Fluoranthene	Add'l. HAPS	PM10	PM10
207089	Benzo(k)fluoranthene	Add'l. HAPS	PM10	PM10
208968	Acenaphthylene	Add'l. HAPS	PM10	PM10
218019	Chrysene	Add'l. HAPS	PM10	PM10
50328	Benzo(a)pyrene	Add'l. HAPS	PM10	PM10

[3] Information on REMSAD may be found at http://remsad.saintl.com/overview.htm.

Table 3-4 (continued)

Pollutant Code	PollutantName	Category	Ratio to MB	Ratio to NR
53703	Dibenzo(a,h)anthracene	Add'l. HAPS	PM10	PM10
540841	2,2,4-Trimethylpentane	Add'l. HAPS	VOC	VOC
56553	Benz(a)anthracene	Add'l. HAPS	PM10	PM10
7439965	Manganese	Add'l. HAPS	Mile	Gal
7440020	Nickel	Add'l. HAPS	Mile	Gal
83329	Acenaphthene	Add'l. HAPS	PM10	PM10
85018	Phenanthrene	Add'l. HAPS	PM10	PM10
86737	Fluorene	Add'l. HAPS	PM10	PM10
91203	Naphthalene	Add'l. HAPS	PMVOC	PM10
1746016	2,3,7,8-Tetrachlorodibenzo-p-Dioxin	Dioxin/furan	Mile	Gal
19408743	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	Dioxin/furan	Mile	Gal
3268879	Octachlorodibenzo-p-dioxin	Dioxin/furan	Mile	Gal
35822469	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	Dioxin/furan	Mile	Gal
39001020	Octachlorodibenzofuran	Dioxin/furan	Mile	Gal
39227286	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	Dioxin/furan	Mile	Gal
40321764	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	Dioxin/furan	Mile	Gal
51207319	2,3,7,8-Tetrachlorodibenzofuran	Dioxin/furan	Mile	Gal
55673897	1,2,3,4,7,8,9-Heptachlorodibenzofuran	Dioxin/furan	Mile	Gal
57117314	2,3,4,7,8-Pentachlorodibenzofuran	Dioxin/furan	Mile	Gal
57117416	1,2,3,7,8-Pentachlorodibenzofuran	Dioxin/furan	Mile	Gal
57117449	1,2,3,6,7,8-Hexachlorodibenzofuran	Dioxin/furan	Mile	Gal
57653857	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	Dioxin/furan	Mile	Gal
60851345	2,3,4,6,7,8-Hexachlorodibenzofuran	Dioxin/furan	Mile	Gal
67562394	1,2,3,4,6,7,8-Heptachlorodibenzofuran	Dioxin/furan	Mile	Gal
70648269	1,2,3,4,7,8-Hexachlorodibenzofuran	Dioxin/furan	Mile	Gal
72918219	1,2,3,7,8,9-Hexachlorodibenzofuran	Dioxin/furan	Mile	Gal
CO2	Carbon Dioxide			
SOA	Secondary Organic Aerosol		VOC*	VOC*

* Ratios for these pollutants are in the NCD SCC table. All others are in the SCCToxics table.

3.1.6 Source Categories for Which Inventories Are Produced by NMIM

NMIM's output is always in terms of SCC, which are described in the SCC table. For on-road output, NMIM also distinguishes five emission types (exhaust, evaporation, refueling, brake wear, and tire wear). For NONROAD, NMIM distinguishes three emission types (exhaust, evaporation, and refueling) and also reports the NONROAD power classes, which subdivide a given SCC by horsepower range.

The VMT in the BaseYearVMT table is by the 28 MOBILE6 vehicle classes. In NMIM output, however, these 28 vehicle classes are aggregated into the 12 vehicle classes that correspond to SCC codes. These 12 vehicle classes are shown in Table 3-5a. The NCD M6VClass table defines the correspondence between these two sets of vehicle classes, which are also shown in Table 3-5b.

Table 3-5a. The 12 Vehicle Classes That Correspond to SCCs

Class	Description	Class	Description
LDGV	Light duty gasoline vehicles	LDDT	Light duty diesel trucks
LDGT1	Light duty gasoline truck 1	2BHDDV	Class 2b heavy duty diesel vehicles
LDGT2	Light duty gasoline truck 2	LHDDV	Light heavy-duty diesel vehicles
HDGV	Heavy duty gasoline vehicles, include buses	MHDDV	Medium heavy-duty diesel vehicles
MC	Motorcycles	HHDDV	Heavy heavy-duty diesel vehicles
LDDV	Light duty diesel vehicles	BUSES	Diesel buses

Table 3-5b. The 28 MOBILE6 Vehicle Classes and the 12 Vehicle Classes Corresponding to SCCs That Are Output by NMIM

M6#	28 M6	12 SCC	Description
1	LDGV	LDGV	Light-Duty Gasoline Vehicles (Passenger Cars)
2	LDGT1	LDGT1	Light-Duty Gasoline Trucks 1 (0-6,000 lbs. GVWR, 0-3750 lbs. LVW)
3	LDGT2	LDGT1	Light-Duty Gasoline Trucks 2 (0-6,000 lbs. GVWR, 3751-5750 lbs. LVW)
4	LDGT3	LDGT2	Light-Duty Gasoline Trucks 3 (6,001-8,500 lbs. GVWR, 0-5750 lbs. ALVW)
5	LDGT4	LDGT2	Light-Duty Gasoline Trucks 4 (6,001-8,500 lbs. GVWR, 5751 lbs. and greater ALVW)
6	HDGV2B	HDGV	Class 2b Heavy-Duty Gasoline Vehicles (8501-10,000 lbs. GVWR)
7	HDGV3	HDGV	Class 3 Heavy-Duty Gasoline Vehicles (10,001-14,000 lbs. GVWR)
8	HDGV4	HDGV	Class 4 Heavy-Duty Gasoline Vehicles (14,001-16,000 lbs. GVWR)
9	HDGV5	HDGV	Class 5 Heavy-Duty Gasoline Vehicles (16,001-19,500 lbs. GVWR)
10	HDGV6	HDGV	Class 6 Heavy-Duty Gasoline Vehicles (19,501-26,000 lbs. GVWR)
11	HDGV7	HDGV	Class 7 Heavy-Duty Gasoline Vehicles (26,001-33,000 lbs. GVWR)
12	HDGV8A	HDGV	Class 8a Heavy-Duty Gasoline Vehicles (33,001-60,000 lbs. GVWR)
13	HDGV8B	HDGV	Class 8b Heavy-Duty Gasoline Vehicles (>60,000 lbs. GVWR)
14	LDDV	LDDV	Light-Duty Diesel Vehicles (Passenger Cars)
15	LDDT12	LDDT	Light-Duty Diesel Trucks 1 and 2 (0-6,000 lbs. GVWR)
16	HDDV2B	2BHDDV	Class 2b Heavy-Duty Diesel Vehicles (8501-10,000 lbs. GVWR)
17	HDDV3	LHDDV	Class 3 Heavy-Duty Diesel Vehicles (10,001-14,000 lbs. GVWR)
18	HDDV4	LHDDV	Class 4 Heavy-Duty Diesel Vehicles (14,001-16,000 lbs. GVWR)
19	HDDV5	LHDDV	Class 5 Heavy-Duty Diesel Vehicles (16,001-19,500 lbs. GVWR)
20	HDDV6	MHDDV	Class 6 Heavy-Duty Diesel Vehicles (19,501-26,000 lbs. GVWR)
21	HDDV7	MHDDV	Class 7 Heavy-Duty Diesel Vehicles (26,001-33,000 lbs. GVWR)
22	HDDV8A	HHDDV	Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs. GVWR)
23	HDDV8B	HHDDV	Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs. GVWR)
24	MC	MC	Motorcycles (Gasoline)
25	HDGB	HDGV	Gasoline Buses (School, Transit and Urban)
26	HDDBT	BUSES	Diesel Transit and Urban Buses
27	HDDBS	BUSES	Diesel School Buses
28	LDDT34	LDDT	Light-Duty Diesel Trucks 3 and 4 (6,001-8,500 lbs. GVWR)

SCC output also distinguishes 12 roadway types, listed in Table 3-6. The 12 roadway types are those used by the FHWA Highway Performance Monitoring System (HPMS).[4] These roadway types, in combination with the 12 vehicle types, result in 144 SCCs for on-road mobile sources.

[4] Information on the FHWA HPMS is available at http://www.fhwa.dot.gov/policy/ohpi/hpms/.

Table 3-6. 12 Roadway Types

Interstate: Rural	Interstate: Urban
Other Principal Arterial: Rural	Other Freeways and Expressways: Urban
Minor Arterial: Rural	Other Principal Arterial: Urban
Major Collector: Rural	Minor Arterial: Urban
Minor Collector: Rural	Collector: Urban
Local: Rural	Local: Urban

Emissions are estimated by the NONROAD Model for 214 SCCs. SCCs distinguish between equipment types, fuels (gasoline, diesel, LPG, and CNG) and between two stroke and four stroke gasoline engines. In addition, NONROAD produces horsepower categories, and NMIM retains these in its output.

Within NMIM and the NONROAD Model, the nonroad SCCs are grouped into 12 segments, listed in Table 3-7.

Table 3-7. NONROAD Model Equipment Segments

Recreational	Lawn/Garden	Logging	Oil Field
Construction	Agriculture	Airport Support	Pleasure Craft
Industrial	Commercial	Underground Mining	Railroad

Any single SCC always falls under only one of these segments, corresponding to its most typical application, although it may be used in other segments as well. For example, skid steer loaders are in the construction segment, although they are also used in agriculture. Fuels are gasoline, diesel, LPG, and CNG. NMIM users must choose a segment and fuel; individual SCCs may not be selected. Output, however, is by individual SCC.

3.2 THE NMIM COUNTY DATABASE

3.2.1 Database Structure

The NCD contains all the county-specific information needed to run MOBILE6 and NONROAD. It also contains the list of pollutants and the ratios of HAPs, dioxins/furans, and some metals to various NONROAD and MOBILE6 outputs that are used to estimate inventories of these nonstandard pollutants. This database is in MySQL, an open source database management system that is available from www.mysql.com. The tables in the database are listed in Table 3-8.

3.2.2 Onroad VMT

The NCD is populated with 2002 VMT data developed from information provided by the FHWA. These default FHWA-based VMT data were then replaced by State data where these data were supplied to EPA. VMT data in the NCD is contained in the BaseYearVMT table. To use this table, the VMT data for a given county must contain records for each of the 12 HPMS functional roadway types and the 28 MOBILE6 vehicle classes, for a total of 336 records in this table per county. The VMT data in the NMIM BaseYearVMT table is annual data in units of millions of miles.

Table 3-8. Tables in the NMIM County Database (NCD)

Table	Contents
BaseYearVMT	VMT by year, county, M6VClass, and HPMSRoadType.
County	For each county, Federal Information Processing System (FIPS) codes for the county and State, altitude, beginning and end of ozone season, Stage 2 information, Natural Gas Vehicle (NGV) fraction file name
CountyMap	The representing county for each county, one for NONROAD and one for MOBILE6.
CountyMonth	Defines the set of possible county-month combinations.
CountyMonthHour	Monthly average hourly temperature and humidity table used if “Use yearly weather data” is not selected or there is no data for the requested year in the CountyYearMonthHour table.
County NRFile	References to external NONROAD files pertaining to a county.
CountyVMTMonth Allocation	Mileage allocation factors for the 12 months of the year, by county.
CountyYear	Stage2 percent input to the NR model, plus external file references for MOBILE6 and NR.
CountyYearMonth	Gasoline, diesel, and natural gas fuel IDs for each county for each year and month.
CountyYearMonth Hour	Historical hourly temperature and relative humidity.
DataSource	Defines datasource identifiers used in other tables.
Diesel	Diesel sulfur content associated with each diesel ID.
EmissionType	Associates emission types (exhaust, evap, brake, tire) with EmissionTypeID used in other tables
FileType	Defines the set of valid external files and their 3-character extensions.
Gasoline	Detailed fuel properties associated with each gasoline ID.
Hour	Defines the hour identifiers.
HPMSRoadType	Defines the 12 HPMS road type identifiers.
M6VClass	Defines the 28 vehicle classes used in MOBILE6. These are the valid combinations of M6Vtype and fuel.
M6VType	Defines the fuel-independent vehicle types used in MOBILE6.
NaturalGas	Natural gas sulfur content associated with each natural gas ID.
PollutantCode	Associates NIF pollutant codes and pollutant names with PollutantCodeID used in other tables.
SCC	Associates with each SCCID an SCC code and description, and ratios for NH_3, PM25, and for converting between HC forms.
SCCToxics	SCC and fuel property-dependent ratios for calculating HAPs, dioxin/furans, and metals.
State	Associates State names and abbreviations with State FIPS codes used in other tables.
VMTGrowth	The annual VMT growth rate for a M6VClass by county and year.
VMTMonth Allocation	Factors for allocating annual VMT to the 12 months, by M6VType and HPMSRoadType, used if there are no county-specific values in CountyVMTMonthAllocation.

3.2.2.1 Annual

3.2.2.1.1 Data Sources Used to Develop VMT

The default 2002 VMT database was developed by EPA, using data supplied directly by FHWA and as well as publicly available data from FHWA's *Highway Statistics* series (FHWA, 2003). From *Highway Statistics 2002*, EPA uses Table VM-2 "Functional System Travel - 2002; Annual Vehicle-Miles (http://www.fhwa.dot.gov/policy/ohim/hs02/pdf/vm2.pdf). This table contains state-level summaries of miles of annual travel in each State by functional system and by rural and urban areas. Rural VMT is provided on a State level for the following six roadway types: interstate, other principal arterial, minor arterial, major collector, minor collector, and local. Urban VMT is provided on a State level for the following six roadway types: interstate, other freeways and expressways, other principal arterial, minor arterial, collector, and local. EPA also uses Table VM-1 "Annual Vehicle Distance Traveled in Miles and Related Data - 2002; by Highway Category and Vehicle Type" (http://www.fhwa.dot.gov/policy/ohim/hs02/pdf/vm1.pdf) from *Highway Statistics 2002*. This table provides annual VMT separated by rural and urban areas broken down into the following vehicle categories: passenger cars, motorcycles, buses, other 2-axle 4-tire vehicles, single-unit 2-axle 6-tire or more trucks, and combination trucks. In addition to these publicly available tables, FHWA provided EPA with its HPMS 2002 universe and sample databases (Kashuba, 2004). From these data tables, EPA extracted daily VMT by urban area (areas with a population of 50,000 or more) in each of the six urban roadway categories as listed for Table VM-2, broken down by urban area and State. This data is similar to that in Table HM-71 from *Highway Statistics 2002* with the exception that Table HM-71 does not break down multi-state urban areas into the portion in each State. EPA also calculated roadway mileage by county and each of the 12 roadway classes listed above from the HPMS 2002 data provided by FHWA.

In addition to the FHWA data, EPA uses Census data in developing the VMT database. Three data sets are used. The first contains the 2002 population estimates by county (BOC, 2004a). The second is the 2000 Census data listing the urban and rural population in each county (BOC, 2004b). The third table has the 2000 Census data showing the population breakdown for each urban area by county for each county included in that urban area.

3.2.2.1.2 How Does EPA Estimate VMT?

VMT is the activity factor EPA uses to estimate on-road vehicle emissions; therefore, the development of a VMT database is critical to the estimation process. Starting with State-level VMT totals for each year, EPA allocates VMT by county, roadway type, and vehicle type. There are four basic steps in this process: (1) allocate state-level rural VMT by roadway type to county/roadway type level; (2) allocate large urban area VMT by roadway type to the county/roadway type level; (3) allocate remaining state-level small urban VMT by roadway type to the county/roadway type level; and (4) allocate county/roadway type level VMT to each of the 28 MOBILE6 vehicle classes for each county and roadway type combination. Each of these steps is described in more detail in the following sections.

2002 Rural VMT Development

Rural Interstates

Rural interstate VMT is allocated from the State level to the county level based on rural interstate roadway mileage. To estimate county-level VMT on rural interstates, EPA calculated each county's fraction of the State's total rural interstate roadway mileage and then multiplied that fraction by the State's 2002 rural interstate VMT total from Table VM-2. Equation 1 shows this calculation.

$$VMT_{RI,C} = VMT_{RI,S} \times \frac{MIL_{RI,C}}{MIL_{RI,S}} \quad \textbf{(Eq. 1)}$$

where: $VMT_{RI,C}$ = Rural interstate VMT in county C (calculated)
$VMT_{RI,S}$ = Rural interstate VMT, State total (*Highway Statistics* Table VM-2)
$MIL_{RI,C}$ = Rural interstate mileage in county C (FHWA)
MILRI,S = Rural interstate mileage, State total (FWHA)

Rural Local Roads

For the rural local roadway type, VMT was allocated from the State to the county level using rural population to determine the allocation fractions. Thus, rural local VMT at the county level was calculated by multiplying the State's rural local VMT total by the ratio of a county's rural population to the State's rural population. The equation used for this calculation is the same as Equation 1, but with rural interstate mileage replaced by rural population. 2002 rural population was first estimated at the county level by multiplying the Census Bureau's 2002 county-level population estimates by the ratio of each county's rural population in the 2000 Census to its total rural plus urban population.

Other Rural Roadway Types

EPA allocated VMT for the remaining four rural roadway types (other principal arterials, minor arterials, major collectors, and minor collectors) from the State level to the county level using rural county population as the primary source of the VMT allocation. Additionally, VMT for a specific roadway type was distributed only to counties with nonzero roadway mileage of the specified roadway type, based on the roadway mileage file data from FHWA. Thus, rural population within a State was totaled individually for each of these four rural roadway types, including only population from counties with nonzero roadway mileage of the specified roadway type. Equation 2 shows the equation used to calculate county-level VMT on rural roadway types other than rural interstates.

$$VMT_{RX,C} = VMT_{RX,S} \times \frac{POP_{RX,C}}{POP_{RX,S}} \quad \textbf{(Eq. 2)}$$

where: $VMT_{RX,C}$ = VMT on rural roadtype X in county C (calculated)
$VMT_{RX,S}$ = VMT on rural roadtype X, State total (*Highway Statistics* Table VM-2)
$POP_{R,C}$ = Rural population in county C with nonzero mileage from rural roadway type X (0 if zero mileage from rural roadway type X in county C) (Census)
$POP_{R,S}$ = Rural population, State total of all counties with nonzero mileage from rural roadway type X (Census)

2002 Urban Area VMT Development

The procedure for developing urban area VMT at the county and road type level involves allocating the FHWA State/urban area VMT data to the county level using the Census data on urban area population by county as well as the FHWA roadway mileage data by county and road type. The FHWA urban area VMT data are in units of average daily miles. These data are first converted to millions of annual miles to be consistent with the Table VM-2 State-level data by multiplying the urban area VMT data by 365 and dividing by 1,000,000.

The Census data containing information on the population by county in each urban area is prepared only for the decennial censuses. Therefore, these data are converted from 2000 population by county in each State/urban area combination to the fraction of the total State/urban area population in each of the counties making up that State/urban area. As shown in Equation 3, EPA then calculates each county's share of a State/urban area's VMT by distributing urban area VMT from FHWA's State/urban area VMT database based on the percentage of the urban area's population in each county. As with the rural VMT allocations, VMT for a specific roadway type is distributed only to counties with nonzero roadway mileage of the specified roadway type, based on the FHWA roadway mileage data. Thus, the county-level State/urban population fractions are divided by the total State/urban area population fraction from counties with nonzero roadway mileage of the specified roadway type. For the urban local roadway category, VMT is distributed strictly by urban population, assuming that all counties with urban populations have mileage in the urban local roadway category.

$$VMT_{X,C} = VMT_{X,A} \times \frac{POP_{X,C}}{POP_{X,A}} \qquad \textbf{(Eq. 3)}$$

where: $VMT_{X,C}$ = State/urban area A's VMT on roadway type X in county C (calculated)
$VMT_{X,S}$ = Total of State/urban area A's VMT on roadway type X (FHWA)
$POP_{X,C}$ = State/urban area A's population fraction in county C with nonzero mileage from urban roadway type X (Census)
$POP_{X,A}$ = State/urban area A's total population fraction from all counties with nonzero mileage from urban roadway type X (Census)

2002 Small Urban VMT Development

The urban VMT included in Table VM-2 of *Highway Statistics 2002* accounts for VMT from both urban (population greater than 50,000) and small urban areas. Thus, small urban VMT is calculated by subtracting the urban VMT, calculated as discussed above, from the urban VMT totals in Table VM-2. First, the resultant annual VMT for urban areas was totaled by State and roadway type and was then subtracted from the total urban VMT by State and roadway type reported in Table VM-2. This calculation results in small urban VMT by State and roadway type.

To allocate the small urban VMT to the county level, EPA first estimated the county-level population in small urban areas. The Census 2000 urban area population data by county was totaled by county to determine the population in each county falling in the Census-defined urban areas. This population was then subtracted from the Census total urban population for each county in 2000. The small urban population fraction was then calculated for each county as the ratio of the county small urban county population to the total county population. These 2000 small urban population fractions by county were then multiplied by the 2002 county-level population to estimate 2002 small urban population. Finally, each county's small urban population was calculated as a fraction of the total State's small urban population to use in allocating the small urban VMT from the State to the county level.

As with the rural and urban VMT allocations, the small urban VMT for a specific roadway type was distributed only to counties with nonzero roadway mileage of the specified roadway type, based on the FHWA roadway mileage data. Thus, the county-level State/small urban population fractions are divided by the total State/small urban population fraction from counties with nonzero roadway mileage of the specified roadway type. For the small urban local roadway category, VMT is distributed strictly by small urban population, assuming that all counties with small urban populations have mileage in the urban local roadway category. Equation 4 shows the equation used to calculate county-level VMT on small urban roadway types.

$$VMT_{SX,C} = VMT_{SX,S} \times \frac{POP_{SX,C}}{POP_{SX,S}} \quad \textbf{(Eq. 4)}$$

where: $VMT_{SX,C}$ = VMT on small urban roadtype X in county C (calculated)

$VMT_{SX,S}$ = VMT on small urban roadtype X, State total (obtained by subtracting large urban VMT from total urban VMT from *Highway Statistics* Table VM-2)

$POP_{SX,C}$ = Small urban population fraction in county C with nonzero mileage from urban roadway type X (Census data) (0 if zero mileage from urban roadway type X in county C)

$POP_{SX,S}$ = State's small urban population fraction total from all counties with nonzero mileage from urban roadway type X (Census data)

3.2.2.1.3 2002 VMT Allocation by Vehicle Type

For input to the NCD, the 2002 VMT must be allocated to the 28 MOBILE6 vehicle types for each county and roadway type. This allocation was done for 2002 using the distribution of the 2002 VMT among the six HPMS vehicle types found in Table VM-1 ("Annual Vehicle Distance Traveled in Miles and Related Data - 2002 - by Highway Category and Vehicle Type") of FHWA's *Highway Statistics 2002* (http://www.fhwa.dot.gov/policy/ohim/hs02/pdf/vm1.pdf) and a mapping of these HPMS vehicle categories to the 28 MOBILE6 vehicle types, provided by OTAQ. First, the VMT totals for each of the six HPMS vehicle categories (passenger cars, motorcycles, other 2-axle 4-tire vehicles, single unit 2-axle 6-tire or more trucks, combination trucks, and buses) were calculated as a fraction of the total VMT. This calculation was performed separately for five groups of roadway classes. The resulting 2002 VMT fractions for each group of roadway classes are shown in Table 3-9. Next, EPA assigned each of the 28 MOBILE6 vehicle types to one of the 6 HPMS vehicle categories, as shown in Table 3-9. Using the default MOBILE6 VMT fractions for 2002, the MOBILE6 VMT fractions were renormalized among all MOBILE6 vehicle types mapped to a given HPMS vehicle category. Then the HPMS VMT fractions for each roadway group were separately multiplied by the renormalized MOBILE6 VMT fractions for all MOBILE6 vehicle types included within a given HPMS vehicle category.

For example, Table 3-9 shows that the HPMS Passenger Car vehicle category includes the MOBILE6 LDGV and LDDV vehicle types. Therefore, the default 2002 MOBILE6 VMT fraction for LDGVs was divided by the sum of the LDGV and LDDV default 2002 MOBILE6 VMT fractions. This number was then multiplied by the HPMS VMT fraction for Passenger Cars (0.4947 for rural interstates). This resulted in a 2002 LDGV VMT fraction on rural interstates of 0.4939. Table 3-9 lists the resulting VMT fractions for 2002 for each of the MOBILE6 vehicle types and each of the five roadway groups. Finally, each of the VMT records in the 2002 VMT database, at the State/county/roadway type level of detail was then multiplied by the fraction of VMT in each of the corresponding MOBILE6 vehicle type categories to obtain total annual VMT at the State/county/roadway type/MOBILE6 vehicle type level.

3.2.2.1.4 How Were State VMT Estimates Incorporated into the NEI?

For the final version of the 2002 NEI, a number of State and local agencies submitted 2002 VMT data that were accepted by EPA for incorporation into the NEI. VMT data were submitted for all counties in the following 32 States for 2002: Alabama, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Idaho, Illinois, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and West Virginia. Additionally, VMT data were submitted for Maricopa County, Arizona; Jefferson County, Kentucky; Bernalillo County, New Mexico; and Lancaster County, Nebraska. VMT data were also submitted for all counties in Nevada except for Washoe County.

The VMT data were submitted in several different formats. Several States submitted VMT data in the NMIM BaseYearVMT table format. Others supplied VMT at the 8 or 12 vehicle type level. Some of the submitted VMT files did not include a distribution of the VMT by roadway type, while others had distributed VMT to the roadway types but not to any vehicle types. Therefore, EPA developed procedures to expand all of the VMT data to the 28 vehicle type and 12 roadway type level of detail. The procedures followed to expand the VMT for all of these States to the 28 vehicle type level and 12 roadway type level are discussed below.

Expanding State/Local VMT to the 28 Vehicle Classes

In nearly all cases the vehicle class information available from measurements of VMT, such as those obtained from the HPMS or State departments of transportation, are not as detailed as used by NMIM. The vehicle classifications used in NMIM are the same as used in the MOBILE6 output:

MOBILE6 Vehicle Classifications

Number	***Abb reviation***	***Description***
1	LDGV	Light-Duty Gasoline Vehicles (Passenger Cars)
2	LDGT1	Light-Duty Gasoline Trucks 1 (0-6,000 lbs. GVWR, 0-3,750 lbs. LVW)
3	LDGT2	Light-Duty Gasoline Trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)
4	LDGT3	Light-Duty Gasoline Trucks 3 (6,001-8,500 lbs. GVWR, 0-5,750 lbs. ALVW)
5	LDGT4	Light-Duty Gasoline Trucks 4 (6,001-8,500 lbs. GVWR, greater than 5,751 lbs. ALVW)
6	HDGV2b	Class 2b Heavy-Duty Gasoline Vehicles (8,501-10,000 lbs. GVWR)
7	HDGV3	Class 3 Heavy-Duty Gasoline Vehicles (10,001-14,000 lbs. GVWR)
8	HDGV4	Class 4 Heavy-Duty Gasoline Vehicles (14,001-16,000 lbs. GVWR)
9	HDGV5	Class 5 Heavy-Duty Gasoline Vehicles (16,001-19,500 lbs. GVWR)
10	HDGV6	Class 6 Heavy-Duty Gasoline Vehicles (19,501-26,000 lbs. GVWR)
11	HDGV7	Class 7 Heavy-Duty Gasoline Vehicles (26,001-33,000 lbs. GVWR)
12	HDGV8a	Class 8a Heavy-Duty Gasoline Vehicles (33,001-60,000 lbs. GVWR)
13	HDGV8b	Class 8b Heavy-Duty Gasoline Vehicles (>60,000 lbs. GVWR)
14	LDDV	Light-Duty Diesel Vehicles (Passenger Cars)
15	LDDT12	Light-Duty Diesel Trucks 1and 2 (0-6,000 lbs. GVWR)
16	HDDV2b	Class 2b Heavy-Duty Diesel Vehicles (8,501-10,000 lbs. GVWR)
17	HDDV3	Class 3 Heavy-Duty Diesel Vehicles (10,001-14,000 lbs. GVWR)
18	HDDV4	Class 4 Heavy-Duty Diesel Vehicles (14,001-16,000 lbs. GVWR)
19	HDDV5	Class 5 Heavy-Duty Diesel Vehicles (16,001-19,500 lbs. GVWR)
20	HDDV6	Class 6 Heavy-Duty Diesel Vehicles (19,501-26,000 lbs. GVWR)
21	HDDV7	Class 7 Heavy-Duty Diesel Vehicles (26,001-33,000 lbs. GVWR)
22	HDDV8a	Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs. GVWR)
23	HDDV8b	Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs. GVWR)
24	MC	Motorcycles (Gasoline)
25	HDGB	Gasoline Buses (School, Transit and Urban)
26	HDDBT	Diesel Transit and Urban Buses
27	HDDBS	Diesel School Buses
28	LDDT34	Light-Duty Diesel Trucks 3 and 4 (6,001-8,500 lbs. GVWR)

EPA guidance ("Technical Guidance on the Use of MOBILE6 for Emission Inventory Preparation," January 2002, Section 4.1 (EPA, 2002a)) allows the use of the VMT distribution calculated by MOBILE6 to be used to disaggregate local VMT information into more disaggregate vehicle classifications. However, since MOBILE6 calculates the VMT distribution internally using vehicle counts, age distributions, annual mileage accumulation rates and diesel sales fractions, user supplied local information may affect the VMT distribution values calculated. The most accurate reflection of local VMT is therefore obtained by first running MOBILE6 using all local inputs (if any) for:

- Age distributions (registration fractions),
- Annual mileage accumulation rates,
- Diesel sales fractions, and
- VMT mix fractions.

Therefore, for each State or local area that submitted VMT with fewer than the 28 NMIM vehicle classes, EPA created MOBILE6 input files representing each unique set of the above inputs provided by a State or local agency. If none of these inputs were provided, the default MOBILE6 VMT distribution was used. Within each of these MOBILE6 input files, the DATABASE OUTPUT and AGGREGATED OUTPUT commands were used to generate database output aggregated across all hours, ages, emission types and roadway types. The POLLUTANTS command was set to NOX to restrict the output to a single pollutant to reduce duplication of the VMT results. The EVALUATION MONTH was set to “7" (July) to give a midyear VMT distribution. The CALENDAR YEAR was set to 2002. The resulting 28 VMT fractions in the MOBILE6 output files add up to one, or due to rounding, are very close.

The 28 MOBILE6 vehicle classes must be mapped unambiguously to the more aggregate eight MOBILE5 or 12 SCC level vehicle types. The following table shows the mapping of the MOBILE6 classes to the eight or 12 vehicle classifications.

Mapping of MOBILE6 to MOBILE5 Vehicle Classes

MOBILE5 8 Vehicle Classes	SCC-Level 12 Vehicle Classes	MOBILE6 Vehicle Class	MOBILE6 Vehicle Class Code
LDGV	LDGV (2201001)	LDGV	1
LDGT1	LDGT1 (2201020)	LDGT1	2
		LDGT2	3
LDGT2	LDGT2 (2201040)	LDGT3	4
		LDGT4	5
HDGV	HDGV (2201070)	HDGV2B	6
		HDGV3	7
		HDGV4	8
		HDGV5	9
		HDGV6	10
		HDGV7	11
		HDGV8A	12
		HDGV8B	13
		HDGB	25
MC	MC (2201080)	MC	24
LDDV	LDDV (2230001)	LDDV	14
LDDT	LDDT (2230060)	LDDT12	15
		LDDT34	28
HDDV	2BHDDV (2230071)	HDDV2B	16
	LHDDV (2230072)	HDDV3	17
		HDDV4	18
		HDDV5	19

Mapping of MOBILE6 to MOBILE5 Vehicle Classes			
MOBILE5 8 Vehicle Classes	**SCC-Level 12 Vehicle Classes**	**MOBILE6 Vehicle Class**	**MOBILE6 Vehicle Class Code**
	MHDDV (2230073)	HDDV6	20
		HDDV7	21
	HHDDV (2230074)	HDDV8A	22
		HDDV8B	23
	BUS (2230075)	HDDBT	26
		HDDBS	27

Next, the fractions of each MOBILE5 or SCC-level vehicle type represented by each MOBILE6 class is calculated. For clarity, the calculated fractions are referred to here as "factors" and the original VMT fractions as "fractions." This factor is the MOBILE6 VMT fraction divided by the sum of all MOBILE6 VMT fractions which are mapped into that MOBILE5 or SCC-level vehicle type to which the each MOBILE6 VMT fraction belongs. For example, the representing factor for LDGV, LDDV and MC are one, since there is only one MOBILE6 vehicle class (themselves) in the corresponding MOBILE5 class in which they belong. The MOBILE6 LDGT1 fraction would be divided by the sum of the MOBILE6 LDGT1 and LDGT2 fractions, which both belong to the MOBILE5 LDGT1 category to give the LDGT1 factor. Each MOBILE6 class fraction mapped to the MOBILE5 HDDV category would be divided by the sum of the MOBILE6 fractions from all ten of the classes mapped to that MOBILE5 category. When completed, there will be 28 factors. The value of the sum of the factors within each MOBILE5 category will be one, when starting with data at the 8 MOBILE5 vehicle class level.

The factors are applied to the eight VMT values corresponding to each of the eight MOBILE5 vehicle classifications or to the 12 VMT values corresponding the each of the 12 SCC-level vehicle classifications. This divides the VMT in each of the MOBILE5 or SCC-level classes to the MOBILE6 classes that make it up. When completed, the total VMT sum of all 28 vehicle classes will be the same as the total VMT sum from the original eight VMT values.

Expanding State/Local VMT by Roadway Type

As mentioned above, several State or local agencies supplied VMT data that was not allocated by roadway type. In these cases, EPA relied on the VMT data from the preliminary 2002 NEI to allocate the VMT by roadway type to develop ratios of VMT by roadway type for each county and vehicle type. These ratios were then used to allocate the VMT data developed as discussed above to the 12 roadway types.

3.2.2.2 Monthly Allocation

The table CountyVMTMonthAllocation within the NCD provides the ability to supply NMIM with monthly temporal allocation factors. If these data are supplied, the allocation factors must be specified by the 28 vehicle types, 12 roadway types, and for each month of the year. State or local data were supplied by Delaware, Maryland, Minnesota, Utah, and Washington for these monthly temporal allocation factors. In some cases, the data supplied by the State agencies was replicated by EPA to include the appropriate coverage in NMIM. For example, if a State supplied monthly temporal allocation factors with corresponding county, road type, and month codes, but no vehicle type codes, the monthly factors were replicated so that the same data would be provided for each vehicle type corresponding to the county, road type, and month provided by the State.

The table CountyVMTMonthAllocation within the NCD contains the NMIM default values for the monthly temporal allocation factors. Annual VMT data are temporally allocated to months within the NMIM code using defaults if no data are included in the NMIM CountyVMTMonthAllocation table. EPA uses seasonal 1985 National Acid Precipitation Assessment Program (NAPAP) temporal allocation factors (EPA, 1990) to apportion the VMT to the four seasons. Monthly VMT data are then obtained by using a ratio between the number of days in a month and the number of days in the corresponding season. These temporal factors are shown in Table 3-10.

Table 3-9. Allocation of VMT from HPMS Vehicle Categories to MOBILE6 Vehicle Types for 2002

	HPMS 2002 VMT Fractions					2002 VMT Fractions by MOBILE6 Vehicle Type					
HPMS Vehicle Category	**RInt**	**ROPA, RMinArt**	**RMajC, RminC, RLoc**	**UInt**	**UFwyExp, UOPA, UMinArt, UCol, ULoc**	**MOBILE6 Vehicle Type**	**RInt**	**ROPA, RMinArt**	**RMajC, RminC, RLoc**	**UInt**	**UFwyExp, UOPA, UMinArt, UCol, ULoc**
Passenger Cars	0.4947	0.5485	0.5622	0.5951	0.6111	LDGV	0.4939	0.5476	0.5613	0.5941	0.6101
						LDDV	0.0008	0.0009	0.0009	0.0010	0.0010
Motorcycles	0.0043	0.0037	0.0039	0.0041	0.0026	MC	0.0043	0.0037	0.0039	0.0041	0.0026
Other 2-Axle 4-Tire Vehicles	0.3034	0.3474	0.3592	0.3181	0.3425	LDGT1	0.0476	0.0545	0.0564	0.0499	0.0537
						LDGT2	0.1585	0.1815	0.1876	0.1662	0.1789
						LDGT3	0.0482	0.0552	0.0571	0.0505	0.0544
						LDGT4	0.0222	0.0254	0.0262	0.0232	0.0250
						LDDT12	0.0001	0.0002	0.0002	0.0002	0.0002
						LDDT34	0.0010	0.0011	0.0012	0.0010	0.0011
						HDGV2B	0.0195	0.0223	0.0231	0.0205	0.0220
						HDDV2B	0.0063	0.0072	0.0075	0.0066	0.0071
Single-Unit 2-Axle 6-Tire or More Trucks	0.0312	0.0337	0.0361	0.0223	0.0216	HDGV3	0.0012	0.0013	0.0014	0.0008	0.0008
						HDGV4	0.0006	0.0006	0.0007	0.0004	0.0004
						HDGV5	0.0013	0.0014	0.0015	0.0009	0.0009
						HDGV6	0.0028	0.0031	0.0033	0.0020	0.0020
						HDGV7	0.0013	0.0014	0.0015	0.0009	0.0009
						HDDV3	0.0032	0.0034	0.0037	0.0023	0.0022
						HDDV4	0.0028	0.0030	0.0032	0.0020	0.0019
						HDDV5	0.0012	0.0013	0.0014	0.0009	0.0009
						HDDV6	0.0068	0.0073	0.0078	0.0048	0.0047
						HDDV7	0.0101	0.0109	0.0117	0.0072	0.0070
Combination Trucks	0.1630	0.0641	0.0340	0.0585	0.0206	HDGV8A	0.0000	0.0000	0.0000	0.0000	0.0000
						HDGV8B	0.0000	0.0000	0.0000	0.0000	0.0000
						HDDV8A	0.0357	0.0141	0.0075	0.0128	0.0045
						HDDV8B	0.1273	0.0501	0.0265	0.0456	0.0161
Buses	0.0034	0.0025	0.0046	0.0020	0.0016	HDGB	0.0006	0.0004	0.0008	0.0003	0.0003
						HDDBT	0.0011	0.0008	0.0015	0.0006	0.0005
						HDDBS	0.0017	0.0013	0.0023	0.0010	0.0008
Total	1.0000	1.0000	1.0000	1.0000	1.0000	Total	1.0000	1.0000	1.0000	1.0000	1.0000

Notes: RInt = Rural Interstate, ROPA = Rural Other Principal Arterial, RMinArt = Rural Minor Arterial, RMajC = Rural Major Collector, RMinC = Rural Minor Collector, RLoc = Rural Local, UInt = Urban Interstate, UFwyExp = Urban Other Freeway and Expressway, UOPA = Urban Other Principal Arterial, UMinArt = Urban Minor Arterial, UCol = Urban Collector, ULoc = Urban Local

Table 3-10. NMIM Default VMT Seasonal and Monthly Temporal Allocation Factors

Vehicle Type	Roadway Type	Seasonal VMT Factors			
		Winter	Spring	Summer	Fall
LDV, LDT, MC	Rural	0.2160	0.2390	0.2890	0.2560
LDV, LDT, MC	Urban	0.2340	0.2550	0.2650	0.2450
HDV	All	0.2500	0.2500	0.2500	0.2500

Vehicle Type	Roadway Type	Monthly VMT Factors											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
LDV, LDT, MC	Rural	7.44	6.72	8.05	7.79	8.05	9.42	9.74	9.75	8.44	8.72	8.44	7.44
LDV, LDT, MC	Urban	8.06	7.28	8.6	8.33	8.6	8.65	8.94	8.94	8.09	8.36	8.09	8.06
HDV	All	8.62	7.78	8.42	8.15	8.42	8.15	8.42	8.42	8.24	8.52	8.24	8.62

3.2.3 Fuel Properties

NMIM contains average gasoline, diesel and natural gas fuel properties for each month of calendar year 2002. Each county may have different fuel properties from other counties in the State, as reflected in the CountyYearMonth table of the NCD. For the 2002 draft NEI, several States provided information to update fuel properties for their counties; however for the draft version of the NEI these data were not reviewed and incorporated by EPA into NMIM.

3.2.3.1 Gasoline

The same gasoline fuel properties are used for both onroad and nonroad inventories. For the preliminary NEI, gasoline fuel properties were determined by the Eastern Research Group, Inc., (ERG) under contract to EPA (ERG, 2003). The fuel properties stored in the Gasoline table include:

- Average RVP
- Average sulfur content
- Maximum sulfur content
- RVP waiver flag indicating whether a waiver has been granted to allow splash blending of alcohol-based oxygenates that allows alcohol-based oxygenated fuels to exceed the RVP requirements by up to 1 pound per square inch (psi)
- Ethanol (ETOH) percent (by volume) of ethanol blended gasolines
- Ethanol blend market share
- MTBE (percent (by volume) of ether blended gasolines
- MTBE blend market share
- ETBE (Ethyl Tertiary Butyl Ether) percent (by volume) of ether blended gasolines
- ETBE blend market share
- TAME (Tertiary Amyl Methyl Ether) percent (by volume) of ether blended gasolines
- TAME blend market share
- Aromatic content
- Olefin content
- Benzene content
- E200 (vapor percentage of gasoline at 200 degrees Fahrenheit)
- E300 (vapor percentage of gasoline at 300 degrees Fahrenheit)
- Reformulated gasoline (RFG) flag

The gasoline properties were derived from several surveys including:

- EPA's "Reformulated Gasoline Survey Data for 2000" (EPA, 2000)
- EPA's "Oxygenated Fuel Program Summary, State Winter Oxygenated Fuel Program Requirements for Attainment or Maintenance of CO NAAQS" (EPA, 2001a)
- 1999 TRW (previously NIPER) fuel survey (TRW, 1999)
- 1992 Alliance of Automobile Manufacturers of America (AAMA) survey (AAMA, 1992)

Market share for oxygenated gasolines was obtained from the EPA's *Oxygenate Type Analysis Tables* (EPA, 2001a) and the Federal Highway Administration (FHWA, 1999). If the MTBE percent volume content was less than 0.1 percent, MTBE content was assumed to be zero with a zero percent market share. Similarly, if the ethanol percent volume content was less than 0.1 percent, ethanol content was assumed to be zero with a zero percent market share. For any area which reported non-zero values for TAME or ETBE, the entire market share was assumed to be MTBE, since it was not possible to distinguish the market share between these specific oxygenates.

All gasoline properties are area-wide averages, except for oxygenates, which are allowed to have market shares. Three fuels (winter, summer, and spring/fall) were determined for each county and assigned to months by season. Months representing seasons varied by location. Spring/fall gasoline properties were derived from summer and winter fuels by interpolation. Gasolines in Puerto Rico and the Virgin Islands were assumed to be similar to gasolines in Collier County, Florida. Details of how the fuel survey data were applied to individual States and counties are described in the report, "National Mobile Inventory Model (NMIM) Base and Future Year County Database Documentation and Quality Assurance Procedures to EPA" (ERG, 2003).

3.2.3.2 Diesel and Natural Gas

For diesel fuel and natural gas, the only fuel property stored is sulfur content, in the Diesel and NaturalGas tables of the NCD, respectively.

3.2.3.2.1 Diesel Sulfur Contents for Onroad Vehicles

The preliminary 2002 NEI inventory used 500 ppm diesel sulfur content for onroad vehicles in all counties. For the final 2002 NEI, OTAQ developed diesel sulfur content values for each State based on 2000 January and July diesel fuel sulfur content data obtained for a number of survey cities from the AAMA fuel surveys done each calendar year in the January and July (AAM, 2002).

The January sulfur data were applied in the winter months (December, January, and February) and the July sulfur data were applied in the summer months (June, July, and August). For the remaining months, the average of the January and July sulfur content values were applied. Table 3-11 lists the diesel fuel survey cities and the 2000 winter and summer diesel sulfur values obtained for these cities, along with the spring and fall sulfur values calculated from the winter and summer data.

The method for mapping fuel values follows the basic procedure that EPA developed for allocating RVP that is described in previous Trends/NEI report (EPA, 2004a). The method is based on assigning a single set of monthly fuel sulfur data to each State, either from a single survey city which represents the State or from the weighted average of nearby cities. The same set of fuel values for the State is then assigned to every county in the State in the NCD.

Table 3-12 shows the weighting from each of the survey cities in a given State. Note that the diesel fuel survey includes fewer cities than the Alliance gasoline surveys. Thus, there are several surrogate city assignments from the original RVP work that have no matching surveyed city in the diesel sulfur data. In these cases, the average values from all of the surveyed cities were used. These values are shown in Table 3-11 in the row labeled "Average US."

For example, Table 3-12 shows that two of the survey cities would be mapped to Alabama--city 2 (Atlanta) gets a weight of 3 and city 16 (Average U.S.) gets a weight of 1. Therefore, Alabama's diesel sulfur would be calculated by the following equation:

*((3 * Atlanta diesel sulfur content) + (1 * Average US diesel sulfur content))/(3+1)*

The weight numbers were originally determined based on a list that OTAQ derived which mapped Alliance survey cities to each non-attainment area in the country, as well as some additional metropolitan areas. The weight for a given survey city was determined by adding up the number of areas in the State that had that survey city mapped to it.

3.2.3.2.2 Diesel Sulfur Contents for Nonroad Vehicles

For nonroad engines in the preliminary 2002 NEI inventory , a diesel sulfur content of 2700 ppm was modeled in all counties, except for California. In California, 120 ppm diesel sulfur content was assumed for nonroad engines in all counties. The 2002 preliminary nonroad inventory was based on an assumption that the diesel fuel used by all nonroad sources in a county would be the same in terms of sulfur content. The version of NMIM used for the final 2002 NEI reflects a difference in the sulfur content of diesel fuel used by recreational marine engines compared to the sulfur content of diesel fuel used by other nonroad engines in the county. Diesel sulfur values by category and by State are listed in Table 3-13. These values are based on the regulatory impact analyses performed for the Clean Air Diesel Rule (EPA, 2004c).

3.2.3.2.3 Natural Gas Sulfur Content

The sulfur content of natural gas was assumed to be 30 ppm in both the preliminary and draft versions of the 2002 NEI inventories.

3.2.4 Environmental Data

Environmental data are the parameters that affect emissions which are a property of the environment in which the source is operated. The environmental parameters used in the modeling of mobile sources are ambient temperature, humidity and altitude.

3.2.4.1 Temperature and Humidity

MOBILE6 allows daily temperatures to be supplied as either minimum and maximum temperatures (as in MOBILE5) or as hourly average temperatures. However, since MOBILE6 calculates emissions separately for each hour of the day, user supplied minimum and maximum temperatures are used to internally derive hourly temperatures, using a default diurnal temperature profile, for use by MOBILE6. MOBILE6 also allows the entry of hourly relative humidity levels. The NO_x emission results from MOBILE6 are sensitive to humidity levels, and

Table 3-11. Survey Cities and 2000 Diesel Sulfur Values

Survey City Index	Survey City	2000 Diesel Fuel Sulfur Content (ppm)		
		Winter	Summer	Fall and Spring
1	Albuquerque, NM	330	300	315
2	Atlanta, GA	340	400	370
4	Billings, MT	330	300	315
5	Boston, MA	340	400	370
6	Chicago, IL	350	400	375
7	Cleveland, OH	320	300	310
9	Denver, CO	360	400	380
10	Detroit, MI	350	400	375
11	Kansas City, MO	370	400	385
13	Los Angeles, CA	120	100	110
14	Miami, FL	360	400	380
15	Minneapolis/St. Paul	290	300	295
17	New York City, NY	340	300	320
18	Philadelphia, PA	280	300	290
21	San Antonio, TX	400	300	350
23	Seattle, WA	300	300	300
24	St. Louis, MO	320	300	310
All others	Average US	324	329	326

Table 3-12. City Mapping and Weights for Diesel Sulfur

State Abbreviation	State FIPS	City Index	Weight
AL	1	2	3
AL	1	16	1
AK	2	26	2
AZ	4	19	1
AR	5	24	1
CA	6	13	5
CO	8	9	5
CT	9	5	2
CT	9	17	1
DE	10	18	2
DC	11	25	1
FL	12	14	3
GA	13	2	2
HI	15	27	1
ID	16	4	1
ID	16	23	1
IL	17	6	1
IL	17	24	1
IL	17	24	1

Table 3-12 (continued)

State Abbreviation	State FIPS	City Index	Weight
IN	18	6	1
IN	18	7	7
IA	19	15	1
KS	20	11	1
KY	21	2	1
KY	21	6	1
KY	21	7	6
KY	21	24	1
KY	21	28	1
LA	22	16	3
ME	23	5	6
ME	23	28	1
MD	24	18	2
MD	24	25	2
MA	25	5	5
MI	26	10	4
MN	27	15	2
MS	28	24	1
MO	29	11	1
MO	29	24	1
MT	30	4	2
NE	31	11	1
NE	31	15	1
NV	32	12	1
NV	32	22	1
NH	33	5	3
NJ	34	17	1
NJ	34	18	2
NJ	34	28	1
NM	35	1	1
NY	36	17	2
NY	36	28	7
NC	37	2	5
ND	38	15	1
OH	39	7	10
OH	39	10	1
OH	39	28	1
OK	40	11	1
OK	40	24	1
OR	41	22	2
OR	41	23	2
PA	42	7	2
PA	42	18	2
PA	42	28	8

Table 3-12 (continued)

State Abbreviation	State FIPS	City Index	Weight
RI	44	5	1
SC	45	2	5
SD	46	15	1
TN	47	2	4
TN	47	24	1
TX	48	1	1
TX	48	16	2
TX	48	16	2
TX	48	21	1
UT	49	9	2
VT	50	15	1
VA	51	2	2
VA	51	25	3
WA	53	23	4
WV	54	7	4
WV	54	28	3
WI	55	6	4
WI	55	15	7
WY	56	4	1
WY	56	9	1
PR	72	14	1
VI	78	14	1

Table 3-13. Nonroad Diesel Sulfur Levels by Category and by State

State	Land-Based Diesel Equipment Fuel Sulfur Level, ppm	Recreational Marine Diesel Equipment Fuel Sulfur Level, ppm
Alaska	2570	2570
California	120	120
Hawaii	2381	2421
All Other States	2457	2765

hourly humidity levels are the most accurate way to represent daily humidity. Therefore, NMIM requires that each county have both hourly average temperatures and hourly relative humidity values for each month of the year.

Temperature and relative humidity are linked, since the value of relative humidity is in units of percent, which depends on the temperature. The NCD contains a full set of default hourly average temperatures and hourly relative humidity values for each county for each month. These temperature and humidity values were derived from raw measurement data obtained from the National Climatic Data Center (NCDC). The NCDC data were obtained from stations of all classifications, including First-Order (National Weather Service), Second-Order (both Automated Surface Observing System (ASOS) and Automated Weather Observing System (AWOS)), and cooperative (local).

Population centroids (latitude and longitude) for each county were obtained from the 2000 U.S. Census. Population, rather than geographic, centroids were used to provide a reasonable estimate of where the county's vehicle miles traveled and nonroad activity would be concentrated. From each county's centroid, EPA calculated the distance and direction to each weather station. The distance was computed using the standard great circle navigation method and the constant course direction was computed using the standard rhumb line method. A rhumb line is a line on a sphere that cuts all meridians at the same angle; for example, the path taken by a ship or plane that maintains a constant compass direction. For each of the eight compass directions (octant), the stations were sorted by distance. The station closest to the centroid for each octant was chosen for further processing. If the closest station was more than 200 miles away, that octant was ignored. (Such situations occurred near the oceans and the along the Canadian and Mexican borders.) The temperatures from these eight (or fewer) stations were then averaged together using inverse-distance weighting to produce an average county temperature for each hour of the day.

Relative humidity is a calculated value that depends on both temperature and dew point. Average hourly dew points were computed employing the same octal search, inverse-distance weighting scheme as used for temperature. The relative humidity was then computed from the resulting hourly temperature and dew point pairs.

The daily temperature and dew point averages for each hour were then used to calculate adjusted monthly averages for each hour. Because minimum and maximum temperatures occur at different hours each day, the minimum of the hourly averages will be higher than the average of the daily minima, and the daily maximum of the hourly averages will be lower than the average of the daily maxima.

To avoid this narrowing of the daily temperature range, the monthly average of hourly temperatures was assumed to capture the daily temporal pattern and was mathematically stretched so that the low temperature equaled the monthly average of the daily minima and the high temperature equals the monthly average of the daily maxima, producing a set of monthly average hourly temperatures consistent with the maximum and minimum values. Not all stations record hourly temperature values, so the subset of the stations which do record hourly temperatures was used to determine the initial average temperatures in each hour for each month. The same procedure was applied to the dewpoint values. An adjusted monthly average hourly relative humidity was then calculated from the adjusted monthly average hourly temperatures and dewpoints.

The stretching algorithm used to produce the adjusted hourly temperatures and dewpoints using the maximum, minimum and hourly values is shown here:

$$T = MinT + (t-mint)* [(MaxT-MinT)/(maxt-mint)]$$

$$D = MinD + (d-mind)* [(MaxD-MinD)/(maxd-mind)]$$

where:			
	T	=	The adjusted monthly average temperature for an hour in a month.
	t	=	The average temperature for an hour in the month calculated from the hourly point measurements taken at a fixed time each hour at some stations.
	MaxT	=	The monthly average daily maximum temperature using all daily maximum (peak) temperature reading from all stations.
	MinT	=	The monthly average daily minimum temperature using all daily minimum (peak) temperature reading from all stations.
	maxt	=	The maximum monthly average hourly temperature calculated from the maximum hourly point measurements taken at a fixed time each hour at some stations.
	mint	=	The minimum monthly average hourly temperature calculated from the minimum hourly point measurements taken at a fixed time each hour at some stations.
	D	=	The adjusted monthly average dewpoint for an hour in a month.
	d	=	The average dewpoint for an hour in the month.
	MaxD	=	The monthly average daily maximum dewpoint.
	MinD	=	The monthly average daily minimum dewpoint.
	maxd	=	The maximum monthly average hourly dewpoint.
	mind	=	The minimum monthly average hourly dewpoint.

The determination of the default NMIM temperature and relative humidity values is discussed in more detail in the report, "Derivation of By-Month, By-County, By-Hour Temperature and Relative Humidity with Monthly Data," by Air Improvement Resources, Inc. (AIR, 2004).

EPA is confident that in most cases the default temperature and humidity values calculated from the NCDC data will be the best values to use in the inventory calculations for each county. However, EPA recognizes that there are circumstances under which these generic methods may not provide the best estimate of temperature and humidity values for a county. These circumstances include:

- The use of more local temperature and humidity measurements that are not provided to the NCDC.

- Physical characteristics of the county (such as sea shores, valleys and sudden changes in altitude) which make the centroid interpolation methodology used by EPA inappropriate.

In these cases, temperature and humidity values determined by S/L/T agencies may provide better estimates of temperatures and humidity values.

3.2.4.2 Altitude and Barometric Pressure

MOBILE6 can calculate separate emission rates for high- and low-altitude regions. Low-altitude emission factors are based on conditions representative of approximately 500 feet above mean sea level. High-altitude factors are based on conditions representative of approximately 5,500 feet above mean sea level. When high-altitude region emission factors are requested, MOBILE6 also includes vehicles that were built to meet specific high-altitude emission standards. The NCD contains an indication for each county as to whether the county should be modeled as a high altitude area. The NCD assumes that all counties in Colorado, Nevada, New Mexico and Utah (except Washington County) are high altitude areas.

When relative humidity inputs are used in MOBILE6, the user supplied relative humidity values are converted to absolute humidity for use in adjustment equations. This conversion requires values of temperature and barometric pressure. The barometric pressure is provided as a single value in inches of mercury, with valid values between 13.0 and 33.0 inches of mercury. The NCD has a barometric pressure value for each county.

The average barometric pressure value for each county was calculated for calendar year 2002 using the same octal-search, inverse-distance-squared scheme used to estimate the temperature values (see Section 3.2.4.1). All available NCDC stations were used, which included 1st and 2nd Order, AWOS, and ASOS stations. All barometric values averaged were station (actual) pressures, NOT sea level adjusted pressures. In mountainous terrain, the station pressure can vary considerably over relatively short distances due to elevation variations. Therefore, the values supplied should be used with caution in those areas.

3.2.5 Nonroad-Specific Parameters

Temperature and fuel parameters are shared by the onroad and nonroad inventory estimates and are addressed in sections 3.2.3 and 3.2.4. However, the NCD also contains fields that may be populated with the file names of external data files containing State or county data specific to nonroad. If alternate data files are not provided, NMIM uses the default NONROAD model data files. The NONROAD external data files include:

- Activity rates (including annual hours of use and load factor)
- Temporal (monthly and daily) allocations
- Source populations.
- Growth indexes
- Geographic allocations by equipment category

Many of the nonroad specific parameters are contained in the NONROAD model itself as defaults. These values may change with different versions. The preliminary 2002 NEI results used the draft 2002a version of the NONROAD model. The final 2002 NEI used the 2004n version of NONROAD. Default values were used for all nonroad specific parameters in the preliminary results. Default values were also used for nonroad specific parameters in the draft results, except where changes were submitted by S/L/T agencies. Table 3-14 details the changes provided by S/L/T agencies for use in NMIM for the final 2002 NEI.

Table 3-14. Nonroad Specific Parameters Provided by State

State	Description	File Type
Colorado	Oil production equipment allocations.	oil
Delaware	Airport equipment allocations.	air
Delaware	Golf equipment allocations.	gc
Delaware	Household allocations.	hou
Delaware	Logging equipment allocations.	log
Delaware	Source populations.	pop
Delaware	Recreational vehicle park allocations.	rvp
Illinois	Nonroad activity	act
Illinois	Growth rates.	grw
Illinois	Source populations.	pop
Illinois	Seasonal allocations.	sea
Illinois	Inboard watercraft allocations.	wib
Illinois	Outboard watercraft allocations.	wob
Indiana	Nonroad activity	act
Indiana	Growth rates.	grw
Indiana	Source populations.	pop
Indiana	Seasonal allocations.	sea
Indiana	Inboard watercraft allocations.	wib
Indiana	Outboard watercraft allocations.	wob
Iowa	Nonroad activity	act
Iowa	Source populations.	pop
Iowa	Seasonal allocations.	sea
Iowa	Inboard watercraft allocations.	wib
Iowa	Outboard watercraft allocations.	wob
Michigan	Nonroad activity	act
Michigan	Growth rates.	grw
Michigan	Source populations.	pop
Michigan	Seasonal allocations.	sea
Michigan	Inboard watercraft allocations.	wib
Michigan	Outboard watercraft allocations.	wob
Minnesota	Nonroad activity	act
Minnesota	Growth rates.	grw
Minnesota	Seasonal allocations.	sea
Minnesota	Snowmobile allocations.	snm
Minnesota	Inboard watercraft allocations.	wib
Minnesota	Outboard watercraft allocations.	wob
Ohio	Nonroad activity	act
Ohio	Growth rates.	grw
Ohio	Source populations.	pop
Ohio	Seasonal allocations.	sea
Ohio	Inboard watercraft allocations.	wib
Ohio	Outboard watercraft allocations.	wob
Rhode Island	Source populations.	pop
Washington	Inboard watercraft allocations.	wib
Washington	Outboard watercraft allocations.	wob
Wisconsin	Nonroad activity	act
Wisconsin	Growth rates.	grw
Wisconsin	Source populations.	pop
Wisconsin	Seasonal allocations.	sea
Wisconsin	Inboard watercraft allocations.	wib
Wisconsin	Outboard watercraft allocations.	wob

3.2.6 Onroad Local Emission Control Programs

The following sections discuss several different onroad control programs that are modeled in MOBILE6/NMIM. These include inspection and maintenance, anti-tampering, low emitting vehicle, and refueling emission control (i.e., Stage II) programs.

3.2.6.1 Inspection and Maintenance Programs

MOBILE6 and NMIM account for local periodic inspection programs to identify and repair vehicles in need of emission related repairs, typically known as inspection and maintenance (I/M) programs. State and local agencies may supply an improved description of their I/M program. See Section 6.0 of the report, "Technical Guidance on the Use of MOBILE6.2 for Emission Inventory Preparation" for a discussion of I/M programs (EPA, 2004d).

MOBILE6 allows the description of the I/M program to be stored in an external ASCII text file, rather than included in the input command file, using the I/M DESC FILE command. I/M programs may require additional external data files which contain emission cutpoints used for IM240 tailpipe emission inspections. NMIM uses these files in the same format as used by MOBILE6. For the 2002 final NEI, the I/M program data submitted by State or local agencies to reflect improvements to I/M programs are discussed in section 2.3.4 of this document..

3.2.6.2 Anti-Tampering Programs

Anti-tampering programs may be implemented by States or local areas, which involve periodic inspections to visually identify and repair vehicles with disabled emission control systems. Where they exist, MOBILE6 and the NCD account for these local programs. Section 6.12 of the report, "Technical Guidance on the Use of MOBILE6.2 for Emission Inventory Preparation" also discusses anti-tampering programs (EPA, 2004d).

Anti-tampering program information is provided to MOBILE6 using the ANTI-TAMP PROG command. NMIM uses this information in the same format as used by MOBILE6, however, it is stored in an external ASCII text file, rather than included in the input command file. The external ASCII file may also contain comment records that comply with MOBILE6 rules. One or more counties in the following States were modeled with an anti-tampering program in the 2002 final NEI: Arizona, Delaware, District of Columbia, Kentucky, Maryland, Massachusetts, New Jersey, New York, Oregon, Tennessee, Texas, Utah, and Virginia.

3.2.6.3 Low Emitting Vehicle Programs

MOBILE6 already accounts for the federal national LEV program as part of the federal motor vehicle emission compliance program. Some States have implemented an accelerated phase in for LEV vehicles, and these local programs are accounted for in the NCD. State and local agencies may supply an accelerated phase in for LEV vehicles or information to reflect improvements to their programs. Section 7.4.1 of the report, "Technical Guidance on the Use of MOBILE6.2 for Emission Inventory Preparation" addresses phase in for LEV vehicles (EPA, 2004d).

The phase in for LEV vehicles is provided to MOBILE6 using an external ASCII text file using the 94+ LDG IMP command. NMIM uses this file in the same format as used by MOBILE6. For the final 2002 NEI, no State or local agencies submitted additional information to reflect an alternate phase in for LEV vehicles.

3.2.6.4 Refueling Emission Control Programs

Stage II Gasoline Distribution encompasses the refueling of a vehicle at a gasoline service station. According to the Clean Air Act, Section 182, areas with ozone nonattainment classifications greater than Moderate were required to install vapor recovery systems at these service stations. If installed and inspected annually, a minimum of 86 percent reduction percentage can be applied to estimated emissions using uncontrolled emission factors. The default emissions percentage is from the Control Techniques Guidance for Stage II Vapor Recovery (EPA, 1991).

A list of counties with this regulation imposed were identified for the 1999 NEI via a literature search, and is found in Table E-2 of Appendix E of the “Documentation for the Final 1999 Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants (Version 3)” (EPA, 2003c). This list was used as the basis for the list of counties used for the 2002 NEI. A copy of the list was sent to each of the ten EPA Regional offices for verification. The changes suggested by the EPA Regions are listed below.

1. Add all Vermont counties.
2. Remove Shelby County (TN).
3. Remove Kent and Queen Anne’s Counties (MD).
4. Add Berks County (PA).
5. Remove all Colorado counties.
6. Remove all Utah counties.
7. Remove Maricopa County (AZ).
8. Remove Amador, Calaveras, Colusa, Del Norte, Humboldt, Lake, Lassen, Mariposa, Mendocino, Modoc, Siskiyou, Tehama and Trinity Counties (CA).
9. Remove Thurston County (WA).
10. Add Kitsap, King and Snohomish Counties (WA).
11. Add Clackamas, Multnomah and Washington Counties (OR).

While compiling the list of applicable counties for the 1999 NEI, 14 States listed vapor recovery emission reduction percentages in their State regulations greater than the default value. New York provided a 90 percent reduction for ten counties, while the remaining 13 States provided a 95 percent reduction for 153 counties. The remaining 116 counties that have Stage II controls either listed 86 percent as their reduction percentage or did not provide a reduction percentage (in which case the 86 percent reduction was used as a default). New Jersey provided revisions to the 86 percent reduction effectiveness for the 2002 final NEI of 62 percent and 77 percent, respectively. All of the counties added for the 2002 NEI assume 86 percent effectiveness, unless other counties in that State already exist and have effectiveness values greater than 86 percent. In these cases, the added counties take on the effectiveness of the other counties in the State. For purposes of MOBILE6 modeling of Stage II controls, all counties were assumed to be completely phased in by calendar year 2002 and that the effectiveness for Stage II was the same for gasoline fueled light duty and heavy duty vehicles.

Table A-1 of Appendix A lists the resulting 274 counties with their assumed effectiveness (refueling vapor loss emission reduction) values as used in the 2002 final NEI.

3.2.7 Onroad Fleet and Activity

Fleet and activity data refer to those parameters in the model which describe the type of vehicles assumed in the fleet and their use by vehicle owners which impacts the calculation of emissions from these sources. References to MOBILE6 in this section apply to NMIM as well, since MOBILE6 is the underlying model in NMIM for onroad sources. Most of the onroad fleet and activity information used in the NEI inventory are in the format specified by MOBILE6.

There are default values for all of the fleet and activity parameters in the MOBILE6 model based on national averages and no input of these parameters is required to run the model. However, alternate values which are more representative of the local fleet and local fleet activity may be provided. More information about the scope and format of these alternate values are contained in the document, “User’s Guide to MOBILE6.1 and MOBILE6.2, Mobile Source Emission Factor Model” (EPA, 2003b). Guidance on how to obtain these values is contained in the report “Technical Guidance on the Use of MOBILE6.2 for Emission Inventory Preparation” (EPA, 2004d).

3.2.7.1 Age Distribution

A typical vehicle fleet includes a mix of vehicles of different ages. MOBILE6 covers a 25-year range of vehicle ages, with vehicles 25 years and older grouped together. If no alternate data are supplied, MOBILE6 will use a set of default values for these distributions. The technical report, “Fleet Characterization Data for MOBILE6" (EPA, 2001b), describes how these default values were derived.

MOBILE6 allows the user to specify the fraction of vehicles in each of 25 vehicle ages for each of the 16 vehicle classes (combined gasoline and diesel) in the model. This requires that an external data file be provided containing the alternate values.

The NMIM model runs for the NEI all used the default MOBILE6 registration distribution, except where alternate distributions were provided by S/L/T agencies. Age distributions were provided for at least some counties in Arizona, Delaware, District of Columbia, Illinois, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, New Jersey, New York, Ohio, Oregon, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin.

Table A-2 of Appendix A indicates which counties used default distributions and which counties used S/L/T supplied distributions.

To determine whether the default MOBILE6 registration distribution would be appropriate to apply in Puerto Rico and the Virgin Islands, data available from Puerto Rico listing new vehicle sales and the total number of vehicle registrations, both by model year, was examined and compared to national trends in the United States. Table A-3 in Appendix A has the 25-year trend of vehicle sales and registrations in Puerto Rico.

Based on comparisons made between this list and the national trend, and without more specific data, it was determined that the default MOBILE6 registration distribution would sufficiently represent Puerto Rico and the Virgin Islands.

3.2.7.2 Diesel Sales Fractions

Within any vehicle class, diesel and gasoline vehicles have distinctly different emission rates. Diesel fractions allow the model to separate gasoline and diesel vehicles within a vehicle class. MOBILE6 includes default diesel sales fractions for 14 of the 16 composite vehicle classes - all except urban/transit buses, which are assumed to be all diesel-fueled, and motorcycles, which are assumed to be all gasoline-fueled. MOBILE6 projects future diesel fractions as constant beginning with the 1996 model year. Users can enter alternative diesel fractions for these 14 vehicle classes for each of 25 vehicle ages in any calendar year. The derivation of the default diesel sales fractions is found in the report "Fleet Characterization Data for MOBILE6" (EPA, 2001b).

The final 2002 NEI inventories used the default MOBILE6 assumptions regarding diesel sales fractions by model year and vehicle type, except for the changes submitted by S/L/T agencies. Diesel sales fractions were provided for at least some counties in Arizona, Iowa, Maryland, Minnesota, New Jersey, New York, Texas and Virginia. Table A-4 presents the counties for which alternate diesel sales fractions were provided.

3.2.7.3 Average Speeds

MOBILE6 uses VMT distribution over preselected average speed ranges. MOBILE6 calculates these distributions for each of the 24 hours of the day and for freeways and arterials (producing 48 separate distributions, each containing 14 fractions). The data in this array only specify the average speeds on the roadway types at a particular time of day. The data do not affect either the hourly VMT distribution or the VMT distributions by facility type.

NMIM does not use the default average speed distributions found in MOBILE6. Instead a separate single average speed is used, depending on the vehicle class and roadway type. Every combination of vehicle class grouping and roadway type does not have an independent average speed estimate.

There are four MOBILE6 roadway types: freeways, arterials, locals, and freeway ramps. The 12 roadway types shown in Table A-5 were assigned to one of these MOBILE6 roadway types based on EPA guidance. The MOBILE6 freeway roadway type was assigned to rural interstates, urban interstates, and urban other freeways and expressways. Each roadway assigned to the MOBILE6 freeway roadway type also assume that the average speed includes the effects of freeway ramps and that ramps account for 8 percent of travel on these roadways. The MOBILE6 arterial roadway type was assigned to rural other principal arterials, rural minor arterials, rural major collectors, rural minor collectors, rural locals, urban other principal arterials, urban minor arterials, and urban collectors. Urban local roadways are modeled using the "Local" roadway category of MOBILE6, with an average speed of 12.9 mph. The average speed of this roadway type cannot be varied, since the emission factors modeled on the MOBILE6 local roadway type do not vary by average speed. The groupings of vehicle class groups and roadway types is explained in more detail in Section 3.1 above.

The default average speeds represent the average speeds that had been modeled nationally in prior years of the Trends analysis. Table A-5 shows the default average speed used for each of the 12 roadway types for each of the vehicle class groupings for the final 2002 NEI.

The final 2002 NEI used the same set of average speeds for each roadway type and vehicle class grouping, except for the changes submitted by S/L/T agencies. Average speed information was provided for at least some counties in Delaware, District of Columbia, Iowa, Maryland, New Jersey, New Mexico, Rhode Island, Utah, and Virginia. Table A-6 presents the counties for which alternate average speed distributions were provided.

3.2.7.4 Annual Mileage Accumulation Rates

The annual mileage accumulation rate represents the total annual travel accumulated per vehicle of a given age and individual vehicle class. Vehicles accumulate mileage at different rates depending on the type and age of the vehicle. Trucks tend to be driven more miles per year than cars. Older vehicles tend to be driven fewer miles per year than newer ones. Annual mileage accumulation affects the rate at which vehicle emission controls deteriorate and affect the relative emissions contributions of newer and older vehicles to fleet emissions. Vehicles with higher total mileage accumulation will tend to have higher emission rates, however, older vehicles tend to travel fewer miles each year. Annual mileage accumulation rates are also used in MOBILE6 to determine the daily vehicle miles traveled per vehicle. This estimate is used to convert daily emissions in grams per day from engine starts, hot soaks, diurnal losses, resting losses and refueling to units of grams per mile of vehicle travel.

The derivation of the default annual mileage accumulation rates is found in the report, “Fleet Characterization Data for MOBILE6" (EPA, 2001b).

The final 2002 NEI inventories used the default MOBILE6 assumptions regarding annual mileage accumulation rates by model year and vehicle class, except for the changes submitted by S/L/T agencies. Only the State of New York provided alternate annual mileage accumulation rates for use in NMIM.

3.2.7.5 Trips Per Day

The nearly uncontrolled exhaust emissions that occur immediately after a cold engine start can account for a significant fraction of the emissions that occur during a vehicle trip. There will be at least one engine start for each vehicle trip, so this parameter is also called starts per day. Only light duty vehicles (passenger cars), light duty trucks and motorcycles account for engine starts separately in MOBILE6. The emission rates for heavy duty vehicles and buses include the effects of engine starts and the number of engine starts and the soak time distribution cannot be changed by the user for these vehicle classes.

The derivation of the default values for the number of vehicle trips per day is found in the report “Soak Length Activity Factors for Start Emissions” (EPA, 2002b). Although MOBILE6 allows the number of trips per day to vary by vehicle age, all default values are the same for all vehicle ages.

The final 2002 NEI inventories used the default MOBILE6 assumptions regarding vehicle trips per day rates by vehicle class. No changes for light duty vehicles, light duty trucks or motorcycles were submitted by S/L/T agencies.

3.2.7.6 Trip Length Distribution

Fuel evaporation occurs during trips due to the heating of the fuel system, especially including the fuel tank. These emissions are affected by the length of time the vehicle has been in operation. Longer trips mean more evaporative running loss emissions due to increased fuel system temperatures. Only gasoline fueled vehicles (not including motorcycles) are affected by the distribution of trip lengths in MOBILE6. Diesel vehicles and natural gas vehicles are assumed to have negligible evaporative running loss emissions.

The derivation of the default values for the trip length distributions is found in the report "Trip Length Activity Factors for Running Loss and Exhaust Running Emissions" (EPA, 2001c). The same distribution of vehicle trip lengths is used for all vehicle classes for all hours of the day, for both weekdays and weekend days.

The final 2002 NEI inventories used the default weekday MOBILE6 assumptions regarding the trip length distributions, except for the changes submitted by S/L/T agencies. Trip length data were provided for at least some counties in District of Columbia, Maryland, Texas, and Virginia. Table A-7 lists the counties for which alternate trip length distributions were provided.

3.2.7.7 Hourly Distribution of Engine Starts

MOBILE6 distributes the daily number of engine starts across the hours of the day. The same distribution is used for all vehicle classes, although there are different distributions for weekdays and weekend days. Only light duty vehicles (passenger cars), light duty trucks and motorcycles account for engine starts separately. The emission rates for heavy duty vehicles and buses include engine starts and these emission rates are not affected by changes in the distribution of engine starts across the hours of the day.

The derivation of the default values for the distribution of engine starts across the hours of the day is found in the report "Soak Length Activity Factors for Start Emissions" (EPA, 2002b).

The final 2002 NEI inventories used the default weekday MOBILE6 assumptions regarding the distribution of engine starts across the hours of the day, except for the changes submitted by S/L/T agencies. Only the State of New York provided an alternate hourly distribution of engine starts.

3.2.7.8 Hourly Distribution of Vehicle Miles Traveled

MOBILE6 distributes the estimate for daily vehicle miles traveled across the hours of the day. There are separate distributions for the freeway, arterial/collector and local roadway classifications. The same distribution is used for all vehicle classes, although there are different distributions for weekdays and weekend days.

The derivation of the default values for the distribution of vehicle miles traveled across the hours of the day is found in the report "Development of Methodology for Estimating VMT Weighting by Facility Type" (EPA, 2001d).

The final 2002 NEI inventories used the default weekday MOBILE6 assumptions regarding the distribution of vehicle miles traveled across the hours of the day, except for the changes submitted by S/L/T agencies. Hourly distributions for daily vehicle miles traveled were provided for at least some counties in Illinois, New York, Texas, and Utah. Table A-8 lists the counties which provided alternate distributions for vehicle miles traveled across the hours of the day.

3.2.7.9 Soak Time Distribution

Soak time is defined as the time between when the engine is turned off to the next time it is restarted. The soak time can have a significant effect on the emissions associated with an engine start. MOBILE6 contains default values for the distribution of the soak times before an engine start by hour of the day. The same soak time distributions are applied to all vehicle classes and all vehicle ages. Only light duty vehicles (passenger cars), light duty trucks and motorcycles account for engine starts separately. The emission rates for heavy duty vehicles and buses include engine starts and changing the soak time distribution does not affect their emissions.

The derivation of the default values for the distribution of vehicle miles traveled across the hours of the day is found in the report "Soak Length Activity Factors for Start Emissions" (EPA, 2002b).

The final 2002 NEI inventories used the default MOBILE6 assumptions regarding soak times by hour of the day. No changes for light duty vehicles, light duty trucks or motorcycles were submitted by S/L/T agencies.

3.2.7.10 Diurnal Activity Distribution

While the engine is shut down (key off) and during times of day when the ambient temperature is rising, fuel vapors will be driven off the vehicle from the increasing temperature of the fuel in the tank and other locations on the vehicle. The ability of the vehicle emission control components to adsorb these vapors depends on how long the vehicle has been subjected to diurnal emission generation. The resulting hydrocarbon losses are referred to as diurnal emissions. If the vehicle is restarted, the active emission control systems begin again and the full diurnal effect is interrupted, resulting in fewer diurnal emissions. MOBILE6 contains default values for the distribution of the diurnal soak time by hour of the day.

Only gasoline fueled vehicles are affected by the diurnal soak activity. Diesel vehicles and natural gas vehicles are assumed to have negligible diurnal evaporative emissions. The same distribution of diurnal soak times is used for all vehicle classes.

The derivation of the default values for the distribution of diurnal soak activity across the hours of the day is found in the report, "Soak Length Activity Factors for Diurnal Emissions" (EPA, 2001e).

The final 2002 NEI inventories used the default MOBILE6 assumptions regarding the distribution of evaporative diurnal activity. No changes were submitted by S/L/T agencies.

3.2.7.11 Hot Soak Distribution

Immediately after an engine is shut down (key off), while the engine is still hot, fuel vapors in the intake manifold and other locations in the fuel system are driven off the vehicle by the heat of the engine. These hydrocarbon losses are referred to as hot soak emissions. If the vehicle is restarted, the active emission control systems begin again and the full hot soak effect is interrupted, resulting in fewer hot soak emissions. MOBILE6 contains default values for the distribution of the hot soak time after an engine shut down by hour of the day. The actual number of hot soaks that occur is a function of the number of engine starts per day that occur. Changing the number of engine starts per day will automatically change the number of hot soaks in a day. The number of engine starts (trips) per day is discussed in Section 3.2.7.5 above.

Only gasoline fueled vehicles are affected by the hot soak activity. Diesel vehicles and natural gasoline vehicles are assumed to have negligible hot soak evaporative emissions. The same distribution of hot soak times is used for all vehicle classes.

The derivation of the default values for the distribution of the hot soak time by hour of the day is found in the report, “Soak Length Activity Factors for Hot Soak Emissions” (EPA, 2001f).

The final 2002 NEI inventories used the default MOBILE6 assumptions regarding the distribution of hot soak times. No changes were submitted by S/L/T agencies.

3.2.8 NMIM Toxic Emission Factors

The hazardous air pollutants for which inventories are produced by NMIM are listed in Table 3-4 above. The “six HAPs” are produced internally by MOBILE6. In all other cases, as indicated in the “Pollutants” section above, HAP inventories were generated by ratios to various MOBILE6 and NONROAD outputs.

HAPs are estimated using data sources and methods developed for the 1999 NEI for HAPs, version 3 (EPA, 2003d; EPA, 2004a), with some modifications, described below. NMIM does not estimate HAP emissions for CNG engines.

HAPs are estimated in NMIM using one of three approaches:

1. Gaseous HAPs – Apply toxic to VOC ratios to VOC estimates.

2. Poly-Aromatic Hydrocarbons (PAHs) – Apply toxic to PM10 ratios to PM10 estimates.

3. Metals, Dioxins and Furans – For NONROAD, multiply HAP gram per gallon emission factors by county level fuel consumption estimates. For MOBILE6, multiply HAP gram per mile emission factors by county level VMT estimates.

The NCD SCCToxics table provides a complete listing of toxic ratios and emission factors for all SCCs and fuel combinations. The above approaches are described in more detail in the following sections.

3.2.8.1 Gaseous HAPs

NMIM uses the toxic to VOC ratios described in the documentation for the 1999 NEI for HAPs, version 3, and summarized in Volume 1, Appendix D, Table 1 (EPA, 2003d). Separate ratios are used for evaporative and exhaust emissions for each of the following four categories of gasoline blends:

1. Baseline Gasoline. All cases that do not fall into categories 2-4 below. Ratios are in variables “ExhBaseGas” and “EvapBaseGas” in the SCCToxics table.

2. WO (Winter Oxygenate) Gasoline/ETBE - used where the fuel contains ethanol which is greater than or equal to 5 percent by volume or ETBE greater than or equal to 5 percent by volume. Ratios are in variables “ExhEthGas” and “EvapEthGas” in the SCCToxics table.

3. WO Gasoline/ethanol or MTBE/TAME - used where the fuel contains MTBE which is greater than or equal to 12 percent by volume or TAME greater than or equal to 13 percent by volume. Ratios are in variables “ExhMTBEGas” and “EvapMTBEGas” in the SCCToxics table.

4. RFG/MTBE/TAME - Used where the fuel is RFG and where the fuel contains oxygenate greater than 5 percent by volume and where the fuel contains MTBE which is less than 12 percent by volume or TAME less than 13 percent by volume. Ratios are in variables “ExhRFGGas” and “EvapRFGGas” in the SCCToxics table.

It should be noted that NMIM uses a different set of criteria to determine which toxic to VOC ratios to use than that used in the 1999 NEI final version 3 for HAPs. In the 1999 NEI inventory, ratios for different fuel types were weighted according to whether the county participated in the Federal or California Reformulated Gasoline Program or a winter oxygenated fuel program, and the percentage of the year the county participated in these programs. For example, if a county participated in the Federal Reformulated Gasoline Program for 4 months, the RFG/MTBE/TAME fraction would be weighted by a factor of 0.33, and the baseline fraction by 0.67 to develop a composite annual fraction, which would then be applied to VOC. This approach does not adequately account for reformulated and oxygenated gasoline use outside counties participating in the program, or use outside the fuel program season. One result is an underestimate of the nonroad MTBE inventory. Thus, when comparing the unofficial NMIM 1999 estimates with those of the 1999 NEI, NMIM estimates for 1999 result in substantially higher nationwide MTBE than those in the 1999 NEI for HAPs.

In some cases, HAP profiles for specific nonroad equipment and engine type combinations are available. However, for many equipment/engine type combinations, no speciation data are available. In such instances, default values for 2-stroke gasoline engines, 4-stroke gasoline engines, and diesel engines are used. These default values represent an average fraction for various equipment types within an engine category.

3.2.8.2 PAHs

All PAHs emitted in exhaust are estimated as fractions of PM10, although the data used to calculate mass ratios includes both gas and particle phase PAH emissions. The data used to develop the PAH fractions are described in the documentation for the 1999 NEI for HAPs. Evaporative naphthalene emissions from on-road vehicles is estimated as a fraction of VOC. NMIM does not currently estimate evaporative naphthalene emissions for nonroad equipment.

3.2.8.3 Metals, Dioxins, and Furans

For metals, dioxins, and furans, NMIM estimates on-road emissions using g/mile emission factors developed for the 1999 NEI for HAPs, version 3.

The approach used by NMIM to estimate nonroad county-level metal emissions differs in a number of respects from the approach used in the 1999 NEI for HAPs, version 3. In the 1999 NEI, nationwide metal emissions for gasoline engines were obtained by applying a mass per gallon emission factor by nationwide gasoline consumption from the NONROAD model. For diesel engines, a mass per brake-horsepower emission factor was multiplied by nationwide energy output. The resultant nationwide emission estimates were then spatially allocated to counties relative to the county proportion of PM10 emissions compared to the national PM10 emissions, as obtained from the NONROAD model.

In contrast, NMIM multiplies mass per gallon emission factors for gasoline engines by county level fuel consumption to obtain a county level inventory estimate. For diesel engines, mass per brake horsepower emission factors were converted to mass per gallon emission factors using the following equation:

*grams per gallon = (micrograms per brake-horsepower hour (ì g/bhphr) * average fuel density (lb/gallon))/fuel consumption per brake-horsepower hour (lb fuel/bhphr)*1,000,000*

where:

average fuel density	= 7.01 lb/gal
fuel consumption per brake horsepower hour	= 0.408 lb for engines less than 100 hp
	= 0.367 lb for engines greater than 100 hp

The fuel consumption per brake horsepower hour estimates are from the NONROAD model (EPA, 2002c). The gram per gallon metal emission factors for gasoline and diesel engines are contained in the NCD SCCToxics table.

Mass per gallon emission factors for dioxins and furans from nonroad engines were calculated by multiplying the on-road vehicle emission factors in grams per mile by fleet average fuel economy estimates. The assumed fuel economy for gasoline vehicles was 21.5 miles per gallon; for diesel vehicles it was 7 miles per gallon. Resulting gram per gallon emission factors are contained in the NCD SCCToxics table.

3.2.8.4 Revisions to NMIM Toxic Emission Factors

EPA also made some revisions to the NMIM toxic emission factors used for the preliminary 2002 NEI. There is no physical reason why evaporating gasoline would differ by SCC classification. However, factors for toxic compounds from evaporating gasoline for onroad and nonroad sources often came from different sources. The following changes were made for the final 2002 NEI to make the estimates for toxic compounds from evaporating gasoline consistent across SCCs.

- There were two different factors for 2,2,4-Trimethylpentane from evaporative gasoline. The factor used for LDV was applied to all SCCs.

- There were no factors for onroad Benzene in the table. The nonroad factors were applied to onroad as well, although MOBILE6 actually generates the benzene emissions and does not use the table.

- There were no factors for Naphthalene from evaporative gasoline for nonroad. The factor for onroad was applied to all nonroad SCCs.

- There were two different factors for Ethyl Benzene, Hexane, Toluene, and Xylene from evaporative gasoline. The factor for onroad for these pollutants was applied to all nonroad SCCs as well.

The SCCToxics table also had several small errors in the factors used to generate toxic emission rates from HC results. These were corrected to produce the values listed in Table 3-15.

Table 3-15. Updates to the SCCToxics Factors Evaporative Emissions (All SCCs)

Pollutant Code	Toxic Compound	Base Gasoline	Gasoline with Ethanol	Gasoline with MTBE	Reformulated Gasoline
540841	2,2,4-Trimethylpentane	0.0157667	0.0157667	0.0157667	0.0157667
71432	Benzene	0.0220	0.01254	0.01584	0.01584
100414	Ethyl Benzene	0.0077	0.0045	0.0063	0.0063
110543	Hexane	0.0234	0.0096	0.0087	0.0087
91203	Naphthalene	0.0004	0.0004	0.0004	0.0004
108883	Toluene	0.0413	0.0195	0.0276	0.0276
1330207	Xylene	0.0223	0.0119	0.0188	0.0188

3.2.9 Quality Assurance (QA) Procedures

The NCD was compiled using default data augmented with State data provided for the June 2004 CERR submittal in Access format. These data were reviewed and many of the data elements were checked using a quality assurance program developed specifically for the NCD.

This quality assurance program includes a table in Microsoft Access (called tblQADefinitions) listing the data elements to be checked from the following NCD tables: BaseYearVMT, County, CountyMonthHour, CountyNRFile, CountyVMTMonthAllocation, CountyYear, CountyYearMonth, Diesel, Gasoline, NaturalGas, State, and DataSource. For each of these tables, the QA program lists the data fields that need to be reviewed. The QA program does several different types of checks, depending on the type of field being evaluated. The tblQADefinitions table indicates whether individual field entries can be null, the minimum and maximum string length of certain fields, the minimum and maximum allowable value of certain fields, and checks on certain file naming conventions for some of the fields that include file names. This table also lists the name of additional tables that contain the entire set of allowable values for a given field.

As an example, for the BaseYearVMT table, the tblQADefinitions table indicates that the values in the field Vclass must be able to be matched to the values for this field within another external table called m6class which provides the allowable set of vehicle class codes. Similarly, the RoadType, FIPSCountyID, FIPSStateID, and DataSource fields in the BaseYearVMT table are also referred to individual external tables containing the allowable set of codes for these variables. The QA table also lists the allowable minimum and maximum length of each of these variables. The field RoadType, for example, has both a minimum and maximum length of 2. Therefore, any inputs to this field that do not have a length of 2 will produce error messages. As another example, this QA table lists the maximum value of LDVStage2Percent (in table County) as 100 and the minimum value as 0, while the field OzoneSeasonStartMonth in this same table has a maximum allowable value of 12 and a minimum of 1.

4.0 2002 ONROAD NEI DEVELOPMENT

4.1 HOW WAS NMIM RUN TO GENERATE A DEFAULT ONROAD NEI?

For the 2002 onroad NEI Version 2, NMIM was run for all counties. The NCD used is designated as NCD20050714, which includes the data provided by the States after they reviewed the draft 2002 NEI (posted in February 2005). State-specific files that correspond to the updated NCD are posted at EPA's web site at: http://www.epa.gov/ttn/chief/net/2002inventory.html#nmim. The version of the NMIM software was NMIM20050429. The MOBILE model version was MOBILE6.2.03.

In cases where S/L/T agencies provided NIF data, including the PE table where VMT data are stored, the NIF VMT data were converted to the NMIM BaseYearVMT table format. The NCD was then updated with these VMT data before it was run. In this manner, onroad emissions from all pollutants would be calculated using the same activity data, even if the S/L/T provided emissions only for some of the pollutants. The conversion from the NIF to NMIM VMT formats was performed in the manner discussed in Section 3.2.2 of this document for VMT provided at the 12 vehicle type level of detail and then expanded to the 28 vehicle type level of detail.

4.2 HOW WERE NMIM EMISSIONS AND STATE DATA USED?

EPA accepted criteria and HAP annual emissions data from S/L/T agencies to replace the default EPA estimates generated by NMIM. These were accepted for the draft version of the NEI even in cases where the S/L/T agency had provided inputs to use for the default NMIM runs, since State emissions data were determined to take precedence. However, when S/L/T agencies provided NMIM inputs for the NEI Version 2, the NMIM-based emissions, incorporating the S/L/T-supplied NMIM inputs, were included in the2002 NEI rather than the emissions data submitted for the draft NEI. Emissions that were provided only for a single season or day were not used. However, in the cases where emissions and VMT data were provided for all months or seasons, the data were processed as needed to obtain annual emissions and VMT estimates.

Table 4-1 shows a summary by State that lists whether any emissions data were provided by S/L/Ts that were included in the2002 NEI Version 2, what pollutants the submission covered, and what data from the default NEI were used to gap-fill missing pollutants. The specific augmentation procedures are described in Section 4.3. For a more detailed listing of the emissions data received and the corrections and additions EPA made to the data submissions, please see Appendix B.

Table 4-1. Summary of Onroad S/L/T Emission Submittals and Data Allocation Procedures

FIPS Code	State or State/County Name	S/L/T Provided Emissions?	Number of SCCs	Pollutants Submitted	Use NMIM Results as Default Onroad Inventory	Allocation Procedures Applied		
						Vehicle Type	Road Type	Emission Process Type
01000	Alabama	Y	348	CAPs	for HAPs	Y		
02000	Alaska	N			Y			
04013	Arizona- Maricopa	Y*			Y			
04019	Arizona - Pima	Y	8	VOC, CO, NO_x, SO_2, PM10-PRI	for PM25-PRI, NH_3, HAPs	YY		Y
04000	Arizona	N			Y			
05000	Arkansas	Y	8	CAPs	for HAPs	Y	Y	Y
06000	California	Y	CAPs: 31 HAPs: 27	CAPs and 32 HAPs	for some HAPs	Y	Y	Y
08000	Colorado	Y*			Y			
09000	Connecticut	Y	8	VOC, CO, NO_x	for SO_2, PM10-PRI, PM2.5-PRI, NH_3, HAPs	YY		Y
10000	Delaware	Y	492	CAPs and 50 HAPs	for some HAPs			
11000	District of Columbia	N			Y			
12103	Florida - Pinellas	Y	8	CAPs	for HAPs	Y	Y	Y
12000	Florida	N			Y			
13xxx	Georgia -25-county Atlanta area	Y	96	CAPs	for HAPs	Y		Y
13000	Georgia	Y	348	CAPs	for HAPs	Y		
15000	Hawaii	N			Y			
16000	Idaho	Y	48	VOC, CO, NO_x, SO_2, PM10-PRI, NH_3, 6 HAPs	for PM25-PRI, some HAPs	Y		Y
17000	Illinois	Y	8	CAPs	for HAPs	Y	Y	Y
18000	Indiana	N			Y			
19000	Iowa	Y*			Y			
20000	Kansas	N			Y			
21111	Kentucky - Jefferson	Y	CAPs: 492 HAPs: 144	CAPs and 33 HAPs	for some HAPs			HAPs
21000	Kentucky	N			Y			
22000	Louisiana	N			Y			
23000	Maine - Penobscot Tribe	Y**	3	VOC, CO, NO_x, SO_2, PM10-PRI, 6 HAPs	for PM25-PRI, NH_3, some HAPs			
23000	Maine	Y	492	CAPs	for HAPs			
24000	Maryland	N			Y			
25000	Massachusetts	Y	492	CAPs	for HAPs			
26xxx	Michigan - 7 SEMCOG counties	Y	88	VOC, CO, NO_x	for SO_2, PM10-PRI, PM25-PRI, NH_3, HAPs	Y		Y
26000	Michigan	N			Y			
27000	Minnesota	Y*			Y			
28000	Mississippi	Y	348	CAPs	for HAPs	Y		
29000	Missouri	Y	8	VOC, CO, NO_x, SO_2, PM10-PRI, PM25-PRI	for HAPs, NH_3	Y	Y	Y
30000	Montana	N			Y			
31109	Nebraska - Lancaster	Y	8	CAPs	for HAPs	Y	Y	Y
31000	Nebraska	N			Y			

Table 4-1 (continued)

FIPS Code	State or State/County Name	S/L/T Provided Emissions?	Number of SCCs	Pollutants Submitted	Use NMIM Results as Default Onroad Inventory	Allocation Procedures Applied		
						Vehicle Type	Road Type	Emission Process Type
32003	Nevada- Clark	Y	492	CAPs	for HAPs			
32031	Nevada- Washoe	N			Y			
32000	Nevada	Y	456	CAPs	for HAPs			
33000	New Hampshire	N			Y			
34000	New Jersey	N			Y			
35000	New Mexico	N			Y			
36000	New York	Y	492	CAPs	for HAPs			
37000	North Carolina	Y	348	CAPs	for HAPs	Y		
38000	North Dakota	N			Y			
39000	Ohio	N			Y			
40000	Oklahoma	N			Y			
41000	Oregon	N			Y			
42000	Pennsylvania	Y	350	CAPs	for HAPs			VOC exhaust and evap only
72000	Puerto Rico	N			Y			
44000	Rhode Island	N			Y			
45000	South Carolina	N			Y			
46000	South Dakota	N			Y			
47037	Tennessee - Davidson	Y	8	VOC, CO, NO_x, SO_2, PM10-PRI	for HAPs, PM25-PRI, NH_3	YY		Y
47065	Tennessee- Hamilton	N			Y			
47093	Tennessee- Knox	Y	144	CAPs	for HAPs			Y
47157	Tennessee- Shelby	N			Y			
47000	Tennessee	Y	144	CAPs	for HAPs			Y
48000	Texas	Y***	576	CAPs	for HAPs			VOC exhaust and evap only
49000	Utah	Y	96	CAPs, 6 HAPs	for some HAPs	Y		Y
50000	Vermont	Y	88	VOC, CO, NO_x, SO_2, PM10-PRI, NH_3, 7 HAPs	for some HAPs	Y		Y
51000	Virginia	N			Y			
78000	Virgin Islands	N			Y			
53000	Washington	Y	492	CAPs, 50 HAPs	for some HAPs			
54000	West Virginia	Y	348	CAPs	for HAPs	Y		
55000	Wisconsin	N			Y			
56000	Wyoming	N			Y			

Notes: *These S/L/T agencies provided emissions data for the draft NEI, but then supplied NMIM input data for the NEI Version 2 that superceded the draft emissions data.

**Emissions data for the Penobscot Tribe in Maine were added to the NEI Version 2 as is for the 3 SCCs submitted. No emission allocation procedures were applied to the Penobscot data.

***Emissions from the 12-county Dallas, Texas area were those from the final NMIM run, including NMIM inputs supplied by Texas. CAP emissions for the remainder of the State were taken from the Texas emission submittal for the draft NEI.

4.3 WHAT AUGMENTATION PROCEDURES WERE USED FOR STATE DATA?

4.3.1 Missing Pollutants

Of the S/L/T onroad emission submittals, most included all or some of the criteria pollutants, but not HAPs. Several of the submittals included some, but not all of the HAPs generated by NMIM. In cases where any of the pollutants that were included in the NMIM-generated onroad emission inventory were not included in a S/L/T submittal, then the NMIM-generated emissions from that pollutant were used. Because VMT and any other MOBILE/NMIM inputs submitted by the S/L/T agencies were included in the NMIM runs, there is at least some consistency between the emissions for the pollutants calculated using NMIM and the emissions for the pollutants supplied by the S/L/Ts.

Due to the significant uncertainty of the arsenic and mercury emission factors for onroad vehicles, emissions for these pollutants were not included in the 2002 NEI Version 2. Thus, mercury and arsenic emissions were removed from any S/L/T emission inventory that included these emissions (EPA, 2005b). For Version 3, mercury and arsenic were added. See section 2.4.3 for details.

Pollutants provided by the S/L/T agencies that were not in the list of pollutants generated by NMIM were not retained in the 2002 onroad NEI Version 2.

4.3.2 SCC Allocations

For the 2002 NEI Version 2, EPA accepted the use of 492 unique onroad SCCs. The first seven digits define the vehicle, with 12 possible codes. The eighth and ninth digits define the roadway class, with 12 unique codes, and the final digit of the SCC defines the emission process. Table 4-2 shows the allowable values for each of these three portions of the onroad SCCs. Note that for diesel vehicle and trucks, the MOBILE model does not calculate any evaporative emissions. Therefore, SCCs for diesel vehicles that end in “V” are not included in the allowable SCC list. Also, only the particulates have brake and tire wear emissions so the endings “B” and “T” are used only for PM10-PRI and PM25-PRI. Similarly, evaporative emissions occur only with VOC, so the “V” is only used when the pollutant code is VOC. When S/L/T emission submissions did not include the necessary level of detail, EPA developed procedures to allocate the emissions to this set of SCCs. These allocation procedures are discussed below. Note that in some cases, more than one of the allocations described below were applied.

4.3.2.1 Vehicle Type Allocations

Previous versions of the SCC list included only eight vehicle types. In this case, the five heavy duty diesel vehicle types were replaced by a single vehicle type with an SCC starting with “2230070". This code was included in many of the S/L/T submittals, but was not an allowable code for the 2002 NEI. Therefore, EPA distributed the emissions submitted by the S/L/T agencies that were coded with an SCC starting with “2230070" among the five heavy duty diesel vehicle categories shown in Table 4-2 (SCCs starting with “2230071", “2230072", “2230073", “2230074", and “2230075"). These allocations were performed based on the output of the

NMIM runs. For each affected State, county, and pollutant combination, the corresponding emissions from the NMIM outputs were totaled using the first six and last three digits of the SCC to obtain the heavy duty diesel emission total (equivalent to an SCC code of "2230070"). The ratio of the emissions from each of the five individual SCCs to the "2230070" total from the NMIM runs was then calculated and this ratio was multiplied by the State/county/pollutant emissions from the S/L/T submittal to obtain five new emission records, representing each of the five heavy duty diesel vehicles.

There were also several submittals that did not include any vehicle type information in the SCCs (e.g., the third through seventh digits of the SCCs were filled in with "00000" or "XXXXX". The same ratio method, based on emissions calculated by NMIM, was used to allocate these emissions among the 12 vehicle categories. However, in this case, the NMIM emissions were totaled using only the last three digits of the SCC. For each record in the S/L/T submittal, 12 new records replaced it with the appropriate vehicle type code included in the SCC.

4.3.2.2 Road Type Allocations

Some of the S/L/T submittals used the code "00" for the roadway type portion of the SCC code (the eighth and ninth digits). To allocate these emissions by road type, a similar procedure was followed as discussed above for the heavy duty diesel allocations. Again, the allocations to road type were made based on ratios obtained from the NMIM-generated emission inventory. For each affected State, county, and pollutant combination, the corresponding emissions from the NMIM outputs were totaled using the first seven and last one digit of the SCC to obtain the vehicle/emission process emission total. The ratio of the emissions from each of the 12 individual SCCs that included the roadway type code to the vehicle/emission process emission total from the NMIM runs was then calculated and this ratio was multiplied by the State/county/pollutant emissions from the S/L/T submittal to obtain 12 new emission records, representing each of the 12 roadway types.

4.3.2.3 Exhaust/Evaporative/Tire/Brake Allocations

There were a number of cases where the S/L/T submittals included a "0" in the last digit of the onroad SCC, indicating the total of all emission processes. However, for VOC and some of the HAPs, the breakdown between exhaust and evaporative emissions is needed. In addition, the PM10-PRI and PM25-PRI emissions need to be broken down by exhaust, brake wear, and tire wear. For all pollutants other than VOC, the HAPs with an evaporative component, PM10-PRI, and PM25-PRI, EPA replaced the final digit of the SCC with "X" to indicate exhaust emissions. The allocation between exhaust and evaporative emissions for VOC and the HAPs as well as the allocation to exhaust, brake wear, and tire wear for PM10-PRI and PM25-PRI were both calculated separately using a ratio method based on the NMIM-generated emissions output. For these State/county/pollutant combinations, emissions from the NMIM-generated inventory were totaled for the first nine digits of the SCC. Ratios between these totals and the corresponding State/county/pollutant/10-digit SCC emissions were calculated and then multiplied by the State-provided emission values to create two new emission records for VOC and the HAPs and three new emission records for PM10-PRI and PM25-PRI at the 10-digit SCC level of detail.

4.3.2.4 Ammonia Allocations

Several States in the central United States provided only ammonia emissions for onroad vehicles. These were emissions prepared by the Central Regional Air Planning Association (CENRAP). In these cases, the ammonia emissions were coded only as a county level total either for all vehicles combined or as a gasoline total and a diesel total. Again, EPA employed a ratio method to allocate these emissions to the 144 ammonia SCCs for each county. Ammonia emissions from the NMIM output were totaled by county or by county/fuel type for these States and then the ratios from each of the 144 SCCs to the total were calculated. The resulting ratios were multiplied by the county-level or county/fuel type-level ammonia emissions supplied by the States to yield a 144 SCC emission data set for each county in these States.

4.3.3 Estimating Annual Emissions

Most S/L/Ts provided estimates that represented annual 2002 emissions. Where seasonal or monthly emission estimates supplied by S/L/Ts could be summed together to generate an annual inventory, this calculation was performed. Seasonal, monthly, or daily emission estimates provided by S/L/Ts were not retained in the NEI Version 2.

4.4 QA PROCEDURES

4.4.1 Models

NMIM has been tested to ensure that the MOBILE6 input files it generates are correct, that it reads the NCD properly, and that its output files properly read and process the MOBILE6 output files. MOBILE6.2.03 has been peer reviewed and publically released.

4.4.2 NMIM County Database

The NCD has been undergoing review ever since it was developed. The database was assembled by Eastern Research Group under contract to OTAQ and included significant QA effort, as documented in “National Mobile Inventory Model (NMIM) Base and Future Year County Database Documentation and Quality Assurance Procedures” (EPA, 2003e). The NCD was subsequently quality checked by Pechan under contract to OTAQ, as documented in “Comparison of NMIM County Database to NEI Modeling, Final Report” (EPA, 2003f). States most recently reviewed the data in the NCD posted for NEI 2002 v1 and provided corrections, which, except for fuels, have been incorporated into the database. For more information on the NCD, see Section 3.2.

4.4.3 Completeness Checks

EPA checked that data for all county-month combinations were generated by the NMIM run. Since the NMIM MOBILE6 runs are always executed in county-month combinations, the presence in the output data of all county-month combinations indicates that all MOBILE6 runs completed and that NMIM processed them.

4.4.4 Comparison of the Draft 2002 NEI with Preliminary 2002 NEI

Comparison of the draft with the preliminary NEI was performed with the expectation that most changes would be small and that the direction and magnitude of the larger changes would be consistent with the changes in the NCD and/or methodology. The VMT nationally was 0.7 percent higher, with only Nevada and North Carolina showing decreases greater than five percent and only New York and Florida showing increases greater than five percent. The source of VMT changes between the two inventories was State submitted data. For national pollutant totals, only MTBE and SO_2 showed decreases greater than five percent, and only NO_x and dibenzo(a,h)anthracene showed increases of greater than five percent. MTBE decreased because of more accurate gasoline fuels data. SO_2 decreased because of more accurate diesel sulfur data. NO_x increased because of including relative humidity in the NCD, whereas the MOBILE6 default (75 grains per pound of dry air) was used previously. Actual humidities tend to be lower than this default, producing higher NO_x emissions. The dibenzo(a,h)anthracene increase was an artifact that resulted from extremely low emissions and limited precision in the preliminary NEI database.

4.5 NOTES

Local data collection efforts by States are uneven.

For the Pima County, Arizona submittal, the emissions of CO, NO_x, PM10-PRI, SO_2, VOC were reported as daily emissions (Emission Type =27), not total seasonal emissions, but with start and end dates covering three seasons making up the entire year. Therefore, emissions for these pollutants are reported incorrectly in the 2002 NEI Version 2. Emissions should have first been calculated as total emissions for each season before summing to obtain annual emissions. However, preliminary checks on this indicate that the magnitude of the starting emissions are not truly daily lbs, either.

Table 4-2. SCCs Included in Onroad Inventory

SCC Digits	Applicable Portion of SCC Code	Portion that SCC Describes	Description
1 - 7	2201001	Vehicle type	Light-duty gasoline vehicles (passenger cars)
1 - 7	2201020	Vehicle type	Light-duty gasoline trucks 1 (0-6,000 pounds (lbs) gross vehicle weight rating [GVWR])
1 - 7	2201040	Vehicle type	Light-duty gasoline trucks 2 (6,001-8,500 lbs GVWR)
1 - 7	2201070	Vehicle type	Heavy-duty gasoline vehicles (> 8,500 lbs GVWR)
1 - 7	2201080	Vehicle type	Motorcycles (gasoline)
1 - 7	2230001	Vehicle type	Light-duty diesel vehicles (passenger cars)
1 - 7	2230060	Vehicle type	Light-duty diesel trucks (0-8,500 lbs GVWR)
1 - 7	2230071	Vehicle type	Class 2b heavy-duty diesel vehicles (8,501-10,000 lbs GVWR)
1 - 7	2230072	Vehicle type	Class 3, 4, and 5 heavy-duty diesel vehicles (10,001-19,500 lbs GVWR)
1 - 7	2230073	Vehicle type	Class 6 and 7 heavy-duty diesel vehicles (19,501-33,000 lbs GVWR)
1 - 7	2230074	Vehicle type	Class 8 heavy-duty diesel vehicles (> 33,000 lbs GVWR)
1 - 7	2230075	Vehicle type	Diesel buses
8 - 9	11	Roadway type	Rural interstates
8 - 9	13	Roadway type	Rural other principal arterials
8 - 9	15	Roadway type	Rural minor arterials
8 - 9	17	Roadway type	Rural major collectors
8 - 9	19	Roadway type	Rural minor collectors
8 - 9	21	Roadway type	Rural locals
8 - 9	23	Roadway type	Urban interstates
8 - 9	25	Roadway type	Urban other freeways and expressways
8 - 9	27	Roadway type	Urban other principal arterials
8 - 9	29	Roadway type	Urban minor arterials
8 - 9	31	Roadway type	Urban collectors
8 - 9	33	Roadway type	Urban locals
10	X	Emission process	Exhaust
10	V	Emission process	Evaporative
10	B	Emission process	Brake wear
10	T	Emission process	Tire wear

5.0 2002 NONROAD NEI DEVELOPMENT

5.1 HOW WAS NMIM RUN TO GENERATE A DEFAULT NONROAD NEI?

For the 2002 nonroad NEI Version 2, NMIM was run for all counties. The NCD used is designated as NCD20050714, which includes the data provided by the States after reviewing the draft 2002 NEI (posted in February 2005). The specific State-submitted data related to nonroad activity parameters used for the NONROAD/NMIM runs is described in detail in Chapter 3, Section 3.2.5. The version of the NMIM software was NMIM20050429. The NONROAD Model version was NR04N, which is functionally the same as the publically released Draft NONROAD2004. It contains a change to handle two separate nonroad diesel sulfur levels, one for nonroad's pleasure craft segment and one for all other equipment.

5.2 HOW WERE NMIM EMISSIONS AND S/L/T DATA USED?

EPA accepted criteria and HAP annual emissions data from S/L/T agencies to replace the default EPA estimates. These were accepted even in cases where the S/L/T agencies had provided inputs to use for the default NMIM runs, since these S/L/T emissions data were determined to take precedence. Emissions that were provided only for a single season or day were not used.

Table 5-1 shows a summary by State that lists whether any emissions data were provided by S/L/T agencies, what pollutants the submission covered, and what data from the default NEI were used to gap-fill missing pollutants. The specific augmentation procedures are described in Section 5.3. For a more detailed listing of the emissions data received and the corrections and additions EPA made to the data submissions, including additional comments/submissions for the Version 2 NEI, please see Appendix C.

5.3 WHAT AUGMENTATION PROCEDURES WERE USED FOR STATE DATA?

5.3.1 Missing Pollutants

Many S/L/T agencies provided the complete suite of pollutants generated from NONROAD, including VOC, NO_x, CO, PM10-PRI, PM25-PRI, and SO_2. However, several States did not provide estimates for NH_3 or HAPs. Because NMIM generates estimates for these pollutants, EPA augmented the State-supplied inventories when any of these pollutants were missing. This procedure was performed by matching on the existing State-supplied county/SCC combinations so as not to add additional records that reflect a different county/SCC distribution than the State intended. It should be noted that zero emission numeric value records that existed in EPA's default NMIM data set were added to the draft NEI. These zero value records may be removed for the final NEI for space considerations.

Table 5-1. Summary of NONROAD Model S/L Submittals and Data Augmentation Procedures

FIPS Code	State or State/County Name	State Provided Emissions?	Number of SCCs	Pollutants	Use NMIM Results as Default NONROAD Model Inventory	CAPs to Augment	HA Ps to Augment
01000	Alabama	Y	196	CAPs only		None	All HAPs
02000	Alaska	N			Y		
04013	Arizona- Maricopa	Y	216	CAPs only		None	All HAPs
04000	Arizona	N			Y		
05000	Arkansas	Y	193	CAPs only		None	All HAPs
06000	California	Y	30	CAPs only, no NH_3		NH_3	All HAPs
08000	Colorado*	Y	214	CAPs only	Y	None	All HAPs
09000	Connecticut	N			Y		
10000	Delaware	Y	214	CAPs and HAPs		None	None
11000	District of Columbia	N			Y		
12000	Florida	N			Y		
13000	Georgia	Y	200	CAPs only		None	All HAPs
15000	Hawaii	N			Y		
16000	Idaho	Y	199	CAPs only, no SO_2 or NH_3		SO_2 and NH_3	All HAPs
17000	Illinois*	Y	214	CAPs only	Y	None	All HAPs
18000	Indiana	N			Y		
19000	Iowa*	Y	90	NH_3 only	Y		
20000	Kansas	Y	106	NH_3 only	Y		
21000	Kentucky	N			Y		
21111	Kentucky - Jefferson Cty	Y	185	CAPs only		None	All HAPs
22000	Louisiana	Y	91	NH_3 only	Y		
23000	Maine	Y	214	CAPs only		None	All HAPs
24000	Maryland	Y	207	CAPs only		None	All HAPs
25000	Massachusetts	N			Y		
26000	Michigan*	Y	214	CAPs only	Y		
27000	Minnesota	Y	128	NH_3 only	Y		
28000	Mississippi	Y	192	CAPs only		None	All HAPs
29000	Missouri	Y	121	NH_3 only	Y		
30000	Montana	N			Y		
31000	Nebraska	Y	1	CAPs only, no NH_3	Y		
32000	Nevada	Y	185	CO, NOX, PM-PRI		VOC, SO_2, NH_3	
32003	Nevada- Clark	Y	183	CAPs only, no NH_3		NH_3	All HAPs
32031	Nevada- Washoe	N			Y		
33000	New Hampshire	Y	6	CAPs and HAPs			Some HAPs
34000	New Jersey	Y	216	CAPs only		None	All HAPs
35000	New Mexico	N			Y		
36000	New York	Y	214	CAPs only		None	All HAPs
37000	North Carolina	Y	201	CAPs only		None	All HAPs

Table 5-1 (continued)

FIPS Code	State or State/County Name	State Provided Emissions?	Number of SCCs	Pollutants	Use NMIM Results as Default NONROAD Model Inventory	CAPs to Augment	HA Ps to Augment
38000	North Dakota	N			Y		
39000	Ohio*	N			Y		
40000	Oklahoma	N			Y		
41000	Oregon	Y	38	CAPs and HAPs, no NH_3		NH_3	Some HAPs
42000	Pennsylvania	Y	214	CAPs only		None	All HAPs
72000	Puerto Rico	N			Y		
44000	Rhode Island	N			Y		
45000	South Carolina	N			Y		
46000	South Dakota	N			Y		
47000	Tennessee	Y	201	CAPs only, no NH_3		NH_3	All HAPs
47037	Tennessee - Davidson Cty (Nashville)	Y	192	CAPs only, no NH_3		NH_3	All HAPs
47065	Tennessee- Hamilton	N			Y		
47093	Tennessee- Knox	N			Y		
47157	Tennessee- Shelby	N			Y		
48000	Texas	Y	219	CAPs only		None	All HAPs
49000	Utah*	Y	214	CAPs no NH_3	Y	NH_3	All HAPs
50000	Vermont	N			Y		
51000	Virginia	Y	214	VOC, NOX, CO (summer day emissions)	Y		
78000	Virgin Islands	N			Y		
53000	Washington	Y	214	CAPs and HAPs		None	Some HAPs
53033	Washington- King	N			Y		
53035	Washington- Kitsap	N			Y		
53053	Washington- Pierce	N			Y		
53061	Washington- Snohomish	N			Y		
54000	West Virginia	Y	193	CAPs only, PM-PRI only		None	All HAPs
55000	Wisconsin*	N			Y		
56000	Wyoming	N			Y		

*States with an asterisk provided emissions for the draft NEI or Version 2 NEI, but requested that their inventories be based on EPA's NMIM results for the NEI Version 2.

NOTE: For a summary of Tribal data incorporated, see Appendix C.

Several S/L/Ts provided PM10-PRI but not PM25-PRI. Instead of using the above procedure where the missing pollutants were augmented from the NMIM results, EPA estimated the PM25-PRI based on their PM10-PRI estimates. This would remove the possibility that PM25 estimates inconsistent with PM10 estimates would be larger than PM10 estimates. EPA used the particle-sized distributions available from NONROAD that vary based on fuel/engine type as follows:

Engine Type	PM2.5/PM10 Particle Size Multiplier
2-stroke/4-stroke gasoline	0.92
LPG/CNG	1.0
Diesel	0.97

Due to the significant uncertainty of the arsenic and mercury emission factors for nonroad vehicles, emissions for these pollutants were not included in the Version 2 2002 NEI. Thus, mercury and arsenic emissions were removed from any S/L/T emission inventory that included these emissions (EPA, 2005b). For Version 3, mercury and arsenic were added. See section 2.4.3 for details.

5.3.2 SCC Detail

The NONROAD model/NMIM provides emission estimates at the 10-digit SCC level of detail (representing specific applications within broader nonroad categories). Some States provided emission estimates that represented a more aggregate emission estimate [e.g., SCCs corresponding to 7-digit or 4-digit level of detail, which are generally category or engine level estimates]. To place these emission estimates on a consistent basis with the rest of the inventory, EPA estimated the distribution of emissions at the 10-digit level. This was performed by calculating the ratio of the 10-digit SCC emission estimate to the 7-digit or 4-digit emission estimates reported for these States in the default inventory. This ratio was them multiplied by the appropriate State-supplied emission estimates. This was done for all States that supplied these more aggregate data, except for California. Because California uses their own model (OFFROAD), EPA is not able to easily match all SCCs and allocate the California estimates using NONROAD model default estimates.

5.3.3 Estimating Annual Emissions

Most S/L/T agencies provided estimates that represented annual 2002 emissions. Where seasonal emission estimates supplied could be summed together to generate an annual inventory, this calculation was performed. Seasonal, monthly, or daily emission estimates provided by S/L/T agencies were not retained in the draft NEI.

5.4 QA PROCEDURES

5.4.1 Models

NMIM has been tested to ensure that the NONROAD option (“opt”) files it generates are correct, that it reads the NCD properly, and that it properly reads and processes the NONROAD output files. Draft NONROAD2004 has been peer reviewed and publically released.

5.4.2 NMIM County Database

The NCD has been undergoing review ever since it was developed. The database was assembled by Eastern Research Group under contract to OTAQ and included significant QA effort, as documented in “National Mobile Inventory Model (NMIM) Base and Future Year County Database Documentation and Quality Assurance Procedures” (EPA, 2003e). The database was subsequently quality checked by Pechan under contract to OTAQ, as documented in “Comparison of NMIM County Database to NEI Modeling, Final Report” (EPA, 2003f). S/L/T agencies most recently reviewed the data in the NCD posted for NEI 2002 v1 and provided corrections, which, except for fuels, have been incorporated into the database. For more information on the NCD, see Section 3.2.

5.4.3 Completeness Checks

EPA checked that all county-month combinations were generated. Since the NMIM NONROAD runs are always executed in county-month combinations, the presence in the output data of all county-month combinations indicates that all NONROAD runs were completed and that NMIM processed them.

5.4.4 Comparison with Preliminary 2002 NEI

Comparison of EPA’s default 2002 draft NEI with the preliminary NEI was performed with the expectation that most changes would be small and that the direction and magnitude of the larger changes would be consistent with the changes in the NCD and/or methodology. The major differences are due to changes in the NONROAD Model between the preliminary 2002 NEI and the 2002 draft NEI, and the emissions differences are consistent with the changes in the model. Diesel recreational marine populations and horsepower increased significantly, explaining large increases in PM, VOC and the HAPs (which are calculated as ratios to PM and VOC) for those SCCs. Gasoline recreational equipment PM increased due to increased emission factors for ATVs and motorcycles. Drops in SO_2 and NH_3 are explained by large decreases in BSFC for the same two recreational equipment categories.

5.4.5 Quality Assurance of NIF3.0 Format

Upon receipt of State data, EPA ran the QA Checker Program on the NIF3.0 files. Errors identified by the program including invalid NIF3.0 codes and referential integrity were corrected and confirmed as necessary with the appropriate S/L/T contact.

During the data augmentation with the default NMIM data, Pechan prepared record counts of pollutant codes by FIPS and SCC, to ensure that augmentation procedures were performed correctly. Pechan also prepared crosstab comparisons of the State data before and after data augmentation to check that data not being augmented was not changed during the process. Pechan then ran EPA’s QA Checker to identify and resolve any additional errors in the final State-specific databases.

5.5 NOTES

In developing the 2002 nonroad NEI Version 2, several procedures were followed that are noted below due to the limitations inherent in these procedures.

- Missing pollutant emissions data were added to S/L/T submissions that may represent estimates on a different activity basis than the S/L/T-supplied estimates. This may especially be the case for HAP estimates added to inventories that only included criteria emissions.

- SCCs that were provided in the S/L/T submissions that were not included in EPA's inventory were kept in the final State-specific databases. As such these could not be augmented with missing data for most pollutants, except for PM25-PRI.

- Emissions for Clifton Forge City, Virginia (FIPS code 51560) are reported by EPA's NMIM/NONROAD. This county FIPS is no longer valid, and the results for this county were combined with emissions reported in Allegheny County, Virginia (FIPS code 51005).

- In 2001, the State of Colorado created Broomfield County (FIPS code 08014) from areas within four counties (Adams, Boulder, Jefferson, and Weld) that contained the City of Broomfield. The portion of the population in the City of Broomfield that was part of each of these counties was obtained and used to estimate the 2002 Broomfield County emissions from the 2002 NMIM/NONROAD results (since NONROAD does not reflect Broomfield county).

6.0 2002 MOBILE STAGE II REFUELING NEI

This section describes how Stage II emission estimates related to onroad mobile and nonroad mobile refueling were estimated, and how they were reported in the 2002 NEI. No updates were made to the Stage II emissions reported in the draft NEI for the final 2002 NEI.

6.1 HOW WERE STAGE II ONROAD REFUELING EMISSIONS DEVELOPED?

The EPA developed onroad Stage II refueling emission estimates for VOC, benzene, and MTBE based on the results of the draft NEI 2002 NMIM runs. These estimates were not updated for Version 3. NMIM/MOBILE6 calculates Stage II emissions using a base uncontrolled displacement emission factor of 5.46 grams/gallon HC, and a base uncontrolled spillage EF is 0.31 grams/gallon HC. These emission factors are then adjusted for temperature and RVP, and are converted from HC to VOC within MOBILE6. For a description of the counties with Stage II control programs, as well as the assumed control efficiency for the program, see section 3.2.6.4.

For several other HAPs, EPA applied national HAP speciation profiles to the VOC emission estimates from NMIM. These HAPs are listed in Table 6-1, along with their emission factors (MACTEC, 2004).

Table 6-1. Stage II HAP Speciation Profiles Applied to VOC Emissions

Pollutant	Emission Factor
2,2,4-Trimethylpentane	0.827% of VOC
Cumene	0.01% of VOC
Ethyl Benzene	0.138% of VOC
Hexane	1.589% of VOC
Naphthalene	0.046% of VOC
Toluene	1.290% of VOC
Xylenes	0.530% of VOC

6.2 HOW WERE STAGE II NONROAD REFUELING EMISSIONS DEVELOPED?

NMIM/NONROAD accounts for refueling emissions from nonroad equipment under two separate components, vapor displacement and spillage. The procedures that NONROAD uses to estimate refueling emissions are documented in the EPA report, “Refueling Emissions for Nonroad Engine Modeling” (EPA, 2004e). For both spillage and vapor displacement, NONROAD incorporates emission factor values in terms of grams of emissions per gallon of fuel consumed. Fuel consumption is then used to calculate total emissions based on the g/gal emissions factors. Nonroad equipment may be fueled from a gasoline pump or a portable container. Stage II nonroad emissions are associated with nonroad equipment being filled directly at the gasoline pumps. Because the different refueling modes result in different emissions, NONROAD includes assumptions concerning which equipment will be refueled predominantly using a gasoline pump and which will be refueled predominantly from a portable container. In general, gasoline-powered equipment with larger horsepower engines are fueled at the pump while equipment with smaller horsepower engines are fueled with a container. Both Stage II and portable fuel container components may be included in the SCC-level vapor displacement and spillage emissions output of NMIM (depending on the SCC). As such, Stage II emissions were not subtracted out of the NONROAD model emission estimates and unlike Stage II onroad emissions, were not reported as part of the area source inventory.

6.3 REPORTING OF MOBILE STAGE II REFUELING

Nonroad Stage II emissions were included in all relevant nonroad gasoline SCCs that have engines assumed to be refueled at a gasoline pump. Onroad Stage II emissions are reported under the SCC 22501060100 (Petroleum and Petroleum Product Storage, Gasoline Service Stations, Stage 2: Total) in the non-point source inventory. It should be noted that Stage II vehicle refueling emissions may also be reported in the point source inventory under the following SCCs:

Point Source SCCs	Description
40600401	Filling Vehicle Gas Tanks - Stage II, Vapor Loss w/o Controls
40600402	Filling Vehicle Gas Tanks - Stage II, Liquid Spill Loss w/o Controls
40600403	Filling Vehicle Gas Tanks - Stage II, Vapor Loss w/o Controls
40600499	Filling Vehicle Gas Tanks - Stage II, Not Classified **
40600601	Consumer (Corporate) Fleet Refueling - Stage II, Vapor Loss w/o Controls
40600602	Consumer (Corporate) Fleet Refueling - Stage II, Liquid Spill Loss w/o Controls
40600603	Consumer (Corporate) Fleet Refueling - Stage II, Vapor Loss w/ Controls

6.4 QA PROCEDURES

Spot checks were performed of the onroad Stage II HAP emission estimates developed using the speciation profiles listed in Table 6-1. In addition, onroad Stage II emissions are currently undergoing S/L/T review, facilitated by emission summaries that compare the newly-developed Stage II emissions to the draft NEI emission estimates. These comparisons are likely to result in changes and/or corrections to the final NEI estimates for this category. Nonroad Stage II emissions would have been subject to the same QA procedures as NONROAD model exhaust and evaporative emission estimates (described in Section 5.4).

7.0 REFERENCES

AAM, 2002: North American Gasoline and Diesel Fuel Survey. Alliance of Automobile Manufacturers, Washington, DC. 2002.

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APPENDIX A.LOCAL DATA FOR NMIM COUNTY DATABASE

Table A-1. Counties With Stage II Control Programs 2002

FIPS State Code	State Name	FIPS County Code	County Name	Effect.%
6	CALIFORNIA	1	Alameda County	95
6	CALIFORNIA	3	Alpine County	95
6	CALIFORNIA	7	Butte County	95
6	CALIFORNIA	13	Contra Costa County	95
6	CALIFORNIA	17	El Dorado County	95
6	CALIFORNIA	19	Fresno County	95
6	CALIFORNIA	21	Glenn County	95
6	CALIFORNIA	25	Imperial County	95
6	CALIFORNIA	27	Inyo County	95
6	CALIFORNIA	29	Kern County	95
6	CALIFORNIA	31	Kings County	95
6	CALIFORNIA	37	Los Angeles County	95
6	CALIFORNIA	39	Madera County	95
6	CALIFORNIA	41	Marin County	95
6	CALIFORNIA	47	Merced County	95
6	CALIFORNIA	51	Mono County	95
6	CALIFORNIA	53	Monterey County	95
6	CALIFORNIA	55	Napa County	95
6	CALIFORNIA	57	Nevada County	95
6	CALIFORNIA	59	Orange County	95
6	CALIFORNIA	61	Placer County	95
6	CALIFORNIA	63	Plumas County	95
6	CALIFORNIA	65	Riverside County	95
6	CALIFORNIA	67	Sacramento County	95
6	CALIFORNIA	69	San Benito County	95
6	CALIFORNIA	71	San Bernardino County	95
6	CALIFORNIA	73	San Diego County	95
6	CALIFORNIA	75	San Francisco County	95
6	CALIFORNIA	77	San Joaquin County	95
6	CALIFORNIA	79	San Luis Obispo County	95
6	CALIFORNIA	81	San Mateo County	95
6	CALIFORNIA	83	Santa Barbara County	95
6	CALIFORNIA	85	Santa Clara County	95
6	CALIFORNIA	87	Santa Cruz County	95
6	CALIFORNIA	89	Shasta County	95
6	CALIFORNIA	91	Sierra County	95
6	CALIFORNIA	95	Solano County	95
6	CALIFORNIA	97	Sonoma County	95
6	CALIFORNIA	99	Stanislaus County	95
6	CALIFORNIA	101	Sutter County	95
6	CALIFORNIA	107	Tulare County	95
6	CALIFORNIA	109	Tuolumne County	95
6	CALIFORNIA	111	Ventura County	95
6	CALIFORNIA	113	Yolo County	95
6	CALIFORNIA	115	Yuba County	95
9	CONNECTICUT	1	Fairfield County	95
9	CONNECTICUT	3	Hartford County	95
9	CONNECTICUT	5	Litchfield County	95
9	CONNECTICUT	7	Middlesex County	95
9	CONNECTICUT	9	New Haven County	95
9	CONNECTICUT	11	New London County	95
9	CONNECTICUT	13	Tolland County	95
9	CONNECTICUT	15	Windham County	95
10	DELAWARE	1	Kent County	86
10	DELAWARE	3	New Castle County	86

Table A-1. Counties With Stage II Control Programs 2002

FIPS State Code	State Name	FIPS County Code	County Name	Effect.%
10	DELAWARE	5	Sussex County	86
11	DISTRICT OF COLUMBIA	1	District of Columbia	86
12	FLORIDA	11	Broward County	95
12	FLORIDA	86	Miami-Dade County	95
12	FLORIDA	99	Palm Beach County	95
13	GEORGIA	57	Cherokee County	86
13	GEORGIA	63	Clayton County	86
13	GEORGIA	67	Cobb County	86
13	GEORGIA	77	Coweta County	86
13	GEORGIA	89	DeKalb County	86
13	GEORGIA	97	Douglas County	86
13	GEORGIA	113	Fayette County	86
13	GEORGIA	117	Forsyth County	86
13	GEORGIA	121	Fulton County	86
13	GEORGIA	135	Gwinnett County	86
13	GEORGIA	151	Henry County	86
13	GEORGIA	223	Paulding County	86
13	GEORGIA	247	Rockdale County	86
17	ILLINOIS	31	Cook County	86
17	ILLINOIS	43	DuPage County	86
17	ILLINOIS	63	Grundy County	86
17	ILLINOIS	89	Kane County	86
17	ILLINOIS	93	Kendall County	86
17	ILLINOIS	97	Lake County	86
17	ILLINOIS	111	McHenry County	86
17	ILLINOIS	197	Will County	86
18	INDIANA	19	Clark County	86
18	INDIANA	43	Floyd County	86
18	INDIANA	89	Lake County	86
18	INDIANA	127	Porter County	86
21	KENTUCKY	15	Boone County	95
21	KENTUCKY	19	Boyd County	95
21	KENTUCKY	29	Bullitt County	95
21	KENTUCKY	37	Campbell County	95
21	KENTUCKY	89	Greenup County	95
21	KENTUCKY	111	Jefferson County	95
21	KENTUCKY	117	Kenton County	95
21	KENTUCKY	185	Oldham County	95
22	LOUISIANA	5	Ascension Parish	95
22	LOUISIANA	33	East Baton Rouge Parish	95
22	LOUISIANA	47	Iberville Parish	95
22	LOUISIANA	63	Livingston Parish	95
22	LOUISIANA	77	Pointe Coupee Parish	95
22	LOUISIANA	121	West Baton Rouge Parish	95
23	MAINE	5	Cumberland County	95
23	MAINE	23	Sagadahoc County	95
23	MAINE	31	York County	95
24	MARYLAND	3	Anne Arundel County	95
24	MARYLAND	5	Baltimore County	95
24	MARYLAND	9	Calvert County	95
24	MARYLAND	13	Carroll County	95
24	MARYLAND	15	Cecil County	95
24	MARYLAND	17	Charles County	95
24	MARYLAND	21	Frederick County	95
24	MARYLAND	25	Harford County	95

Table A-1. Counties With Stage II Control Programs 2002

FIPS State Code	State Name	FIPS County Code	County Name	Effect.%
24	MARYLAND	27	Howard County	95
24	MARYLAND	31	Montgomery County	95
24	MARYLAND	33	Prince George's County	95
24	MARYLAND	510	Baltimore city	95
25	MASSACHUSETTS	1	Barnstable County	86
25	MASSACHUSETTS	3	Berkshire County	86
25	MASSACHUSETTS	5	Bristol County	86
25	MASSACHUSETTS	7	Dukes County	86
25	MASSACHUSETTS	9	Essex County	86
25	MASSACHUSETTS	11	Franklin County	86
25	MASSACHUSETTS	13	Hampden County	86
25	MASSACHUSETTS	15	Hampshire County	86
25	MASSACHUSETTS	17	Middlesex County	86
25	MASSACHUSETTS	19	Nantucket County	86
25	MASSACHUSETTS	21	Norfolk County	86
25	MASSACHUSETTS	23	Plymouth County	86
25	MASSACHUSETTS	25	Suffolk County	86
25	MASSACHUSETTS	27	Worcester County	86
29	MISSOURI	71	Franklin County	95
29	MISSOURI	99	Jefferson County	95
29	MISSOURI	183	St. Charles County	95
29	MISSOURI	189	St. Louis County	95
29	MISSOURI	510	St. Louis city	95
32	NEVADA	3	Clark County	95
32	NEVADA	31	Washoe County	95
33	NEW HAMPSHIRE	11	Hillsborough County	86
33	NEW HAMPSHIRE	13	Merrimack County	86
33	NEW HAMPSHIRE	15	Rockingham County	86
33	NEW HAMPSHIRE	17	Strafford County	86
34	NEW JERSEY	1	Atlantic County	62
34	NEW JERSEY	3	Bergen County	62
34	NEW JERSEY	5	Burlington County	62
34	NEW JERSEY	7	Camden County	62
34	NEW JERSEY	9	Cape May County	62
34	NEW JERSEY	11	Cumberland County	62
34	NEW JERSEY	13	Essex County	62
34	NEW JERSEY	15	Gloucester County	62
34	NEW JERSEY	17	Hudson County	62
34	NEW JERSEY	19	Hunterdon County	62
34	NEW JERSEY	21	Mercer County	62
34	NEW JERSEY	23	Middlesex County	62
34	NEW JERSEY	25	Monmouth County	62
34	NEW JERSEY	27	Morris County	62
34	NEW JERSEY	29	Ocean County	62
34	NEW JERSEY	31	Passaic County	62
34	NEW JERSEY	33	Salem County	62
34	NEW JERSEY	35	Somerset County	62
34	NEW JERSEY	37	Sussex County	62
34	NEW JERSEY	39	Union County	62
34	NEW JERSEY	41	Warren County	62
36	NEW YORK	5	Bronx County	90
36	NEW YORK	47	Kings County	90
36	NEW YORK	59	Nassau County	90
36	NEW YORK	61	New York County	90
36	NEW YORK	71	Orange County	90

Table A-1. Counties With Stage II Control Programs 2002

FIPS State Code	State Name	FIPS County Code	County Name	Effect.%
36	NEW YORK	81	Queens County	90
36	NEW YORK	85	Richmond County	90
36	NEW YORK	87	Rockland County	90
36	NEW YORK	103	Suffolk County	90
36	NEW YORK	119	Westchester County	90
39	OHIO	7	Ashtabula County	77
39	OHIO	17	Butler County	77
39	OHIO	23	Clark County	77
39	OHIO	25	Clermont County	77
39	OHIO	35	Cuyahoga County	77
39	OHIO	55	Geauga County	77
39	OHIO	57	Greene County	77
39	OHIO	61	Hamilton County	77
39	OHIO	85	Lake County	77
39	OHIO	93	Lorain County	77
39	OHIO	103	Medina County	77
39	OHIO	109	Miami County	77
39	OHIO	113	Montgomery County	77
39	OHIO	133	Portage County	77
39	OHIO	153	Summit County	77
39	OHIO	165	Warren County	77
41	OREGON	5	Clackamus County	86
41	OREGON	51	Multnomah County	86
41	OREGON	67	Washington County	86
42	PENNSYLVANIA	3	Allegheny County	95
42	PENNSYLVANIA	5	Armstrong County	95
42	PENNSYLVANIA	7	Beaver County	95
42	PENNSYLVANIA	11	Berks County	95
42	PENNSYLVANIA	17	Bucks County	95
42	PENNSYLVANIA	19	Butler County	95
42	PENNSYLVANIA	29	Chester County	95
42	PENNSYLVANIA	45	Delaware County	95
42	PENNSYLVANIA	51	Fayette County	95
42	PENNSYLVANIA	91	Montgomery County	95
42	PENNSYLVANIA	101	Philadelphia County	95
42	PENNSYLVANIA	125	Washington County	95
42	PENNSYLVANIA	129	Westmoreland County	95
44	RHODE ISLAND	1	Bristol County	86
44	RHODE ISLAND	3	Kent County	86
44	RHODE ISLAND	5	Newport County	86
44	RHODE ISLAND	7	Providence County	86
44	RHODE ISLAND	9	Washington County	86
47	TENNESSEE	37	Davidson County	86
47	TENNESSEE	149	Rutherford County	86
47	TENNESSEE	165	Sumner County	86
47	TENNESSEE	187	Williamson County	86
47	TENNESSEE	189	Wilson County	86
48	TEXAS	39	Brazoria County	95
48	TEXAS	71	Chambers County	95
48	TEXAS	85	Collin County	95
48	TEXAS	113	Dallas County	95
48	TEXAS	121	Denton County	95
48	TEXAS	141	El Paso County	95
48	TEXAS	157	Fort Bend County	95
48	TEXAS	167	Galveston County	95

Table A-1. Counties With Stage II Control Programs 2002

FIPS State Code	State Name	FIPS County Code	County Name	Effect.%
48	TEXAS	199	Hardin County	95
48	TEXAS	201	Harris County	95
48	TEXAS	245	Jefferson County	95
48	TEXAS	291	Liberty County	95
48	TEXAS	339	Montgomery County	95
48	TEXAS	361	Orange County	95
48	TEXAS	439	Tarrant County	95
48	TEXAS	473	Waller County	95
50	VERMONT	1	Addison County	86
50	VERMONT	3	Bennington County	86
50	VERMONT	5	Caledonia County	86
50	VERMONT	7	Chittenden County	86
50	VERMONT	9	Essex County	86
50	VERMONT	11	Franklin County	86
50	VERMONT	13	Grand Isle County	86
50	VERMONT	15	Lamoille County	86
50	VERMONT	17	Orange County	86
50	VERMONT	19	Orleans County	86
50	VERMONT	21	Rutland County	86
50	VERMONT	23	Washington County	86
50	VERMONT	25	Windham County	86
50	VERMONT	27	Windsor County	86
51	VIRGINIA	13	Arlington County	95
51	VIRGINIA	36	Charles City County	95
51	VIRGINIA	41	Chesterfield County	95
51	VIRGINIA	59	Fairfax County	95
51	VIRGINIA	85	Hanover County	95
51	VIRGINIA	87	Henrico County	95
51	VIRGINIA	107	Loudoun County	95
51	VIRGINIA	153	Prince William County	95
51	VIRGINIA	179	Stafford County	95
51	VIRGINIA	510	Alexandria city	95
51	VIRGINIA	570	Colonial Heights city	95
51	VIRGINIA	600	Fairfax city	95
51	VIRGINIA	610	Falls Church city	95
51	VIRGINIA	670	Hopewell city	95
51	VIRGINIA	683	Manassas city	95
51	VIRGINIA	685	Manassas Park city	95
51	VIRGINIA	760	Richmond city	95
53	WASHINGTON	11	Clark County	86
53	WASHINGTON	15	Cowlitz County	86
53	WASHINGTON	33	King County	86
53	WASHINGTON	35	Kitsap County	86
53	WASHINGTON	53	Pierce County	86
53	WASHINGTON	61	Snohomish County	86
55	WISCONSIN	59	Kenosha County	86
55	WISCONSIN	61	Kewaunee County	86
55	WISCONSIN	71	Manitowoc County	86
55	WISCONSIN	79	Milwaukee County	86
55	WISCONSIN	89	Ozaukee County	86
55	WISCONSIN	101	Racine County	86
55	WISCONSIN	117	Sheboygan County	86
55	WISCONSIN	131	Washington County	86
55	WISCONSIN	133	Waukesha County	86

Table A-2. Registration Distributions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Registration Distribution File Name
1	AL	Default
2	AK	Default
4	AZ	0401302
4	AZ	0401902
4	AZ	Default
5	AR	Default
6	CA	Default
8	CO	Default
9	CT	Default
10	DE	1000102
10	DE	1000302
10	DE	1000502
11	DC	1100102
12	FL	Default
13	GA	Default
15	HI	Default
16	ID	Default
17	IL	1703102
17	IL	1711902
17	IL	Default
18	IN	Default
19	IA	1900102
19	IA	1900302
19	IA	1900502
19	IA	1900702
19	IA	1900902
19	IA	1901102
19	IA	1901302
19	IA	1901502
19	IA	1901702
19	IA	1901902
19	IA	1902102
19	IA	1902302
19	IA	1902502
19	IA	1902702
19	IA	1902902
19	IA	1903102
19	IA	1903302
19	IA	1903502
19	IA	1903702
19	IA	1903902
19	IA	1904102
19	IA	1904302
19	IA	1904502
19	IA	1904702
19	IA	1904902
19	IA	1905102
19	IA	1905302
19	IA	1905502
19	IA	1905702
19	IA	1905902
19	IA	1906102
19	IA	1906302
19	IA	1906502
19	IA	1906702
19	IA	1906902
19	IA	1907102
19	IA	1907302
19	IA	1907502
19	IA	1907702
19	IA	1907902

Table A-2. Registration Distributions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Registration Distribution File Name
19	IA	1908102
19	IA	1908302
19	IA	1908502
19	IA	1908702
19	IA	1908902
19	IA	1909102
19	IA	1909302
19	IA	1909502
19	IA	1909702
19	IA	1909902
19	IA	1910102
19	IA	1910302
19	IA	1910502
19	IA	1910702
19	IA	1910902
19	IA	1911102
19	IA	1911302
19	IA	1911502
19	IA	1911702
19	IA	1911902
19	IA	1912102
19	IA	1912302
19	IA	1912502
19	IA	1912702
19	IA	1912902
19	IA	1913102
19	IA	1913302
19	IA	1913502
19	IA	1913702
19	IA	1913902
19	IA	1914102
19	IA	1914302
19	IA	1914502
19	IA	1914702
19	IA	1914902
19	IA	1915102
19	IA	1915302
19	IA	1915502
19	IA	1915702
19	IA	1915902
19	IA	1916102
19	IA	1916302
19	IA	1916502
19	IA	1916702
19	IA	1916902
19	IA	1917102
19	IA	1917302
19	IA	1917502
19	IA	1917702
19	IA	1917902
19	IA	1918102
19	IA	1918302
19	IA	1918502
19	IA	1918702
19	IA	1918902
19	IA	1919102
19	IA	1919302
19	IA	1919502
19	IA	1919702
20	KS	Default
21	KY	2111102

Table A-2. Registration Distributions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Registration Distribution File Name
21	KY	Default
22	LA	Default
23	ME	Default
24	MD	2400102
24	MD	2400302
24	MD	2400902
24	MD	2401502
24	MD	2401702
24	MD	2402102
24	MD	2403102
24	MD	2403302
24	MD	2403502
24	MD	2404302
25	MA	2500002
26	MI	Default
27	MN	2700102
27	MN	2700302
27	MN	2700502
27	MN	2700702
27	MN	2700902
27	MN	2701102
27	MN	2701302
27	MN	2701502
27	MN	2701702
27	MN	2701902
27	MN	2702102
27	MN	2702302
27	MN	2702502
27	MN	2702702
27	MN	2702902
27	MN	2703102
27	MN	2703302
27	MN	2703502
27	MN	2703702
27	MN	2703902
27	MN	2704102
27	MN	2704302
27	MN	2704502
27	MN	2704702
27	MN	2704902
27	MN	2705102
27	MN	2705302
27	MN	2705502
27	MN	2705702
27	MN	2705902
27	MN	2706102
27	MN	2706302
27	MN	2706502
27	MN	2706702
27	MN	2706902
27	MN	2707102
27	MN	2707302
27	MN	2707502
27	MN	2707702
27	MN	2707902
27	MN	2708102
27	MN	2708302
27	MN	2708502
27	MN	2708702
27	MN	2708902
27	MN	2709102

Table A-2. Registration Distributions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Registration Distribution File Name
27	MN	2709302
27	MN	2709502
27	MN	2709702
27	MN	2709902
27	MN	2710102
27	MN	2710302
27	MN	2710502
27	MN	2710702
27	MN	2710902
27	MN	2711102
27	MN	2711302
27	MN	2711502
27	MN	2711702
27	MN	2711902
27	MN	2712102
27	MN	2712302
27	MN	2712502
27	MN	2712702
27	MN	2712902
27	MN	2713102
27	MN	2713302
27	MN	2713502
27	MN	2713702
27	MN	2713902
27	MN	2714102
27	MN	2714302
27	MN	2714502
27	MN	2714702
27	MN	2714902
27	MN	2715102
27	MN	2715302
27	MN	2715502
27	MN	2715702
27	MN	2715902
27	MN	2716102
27	MN	2716302
27	MN	2716502
27	MN	2716702
27	MN	2716902
27	MN	2717102
27	MN	2717302
28	MS	Default
29	MO	Default
30	MT	Default
31	NE	Default
32	NV	Default
33	NH	Default
34	NJ	3400102
35	NM	Default
36	NY	3600102
36	NY	3600502
37	NC	Default
38	ND	Default
39	OH	3900102
39	OH	3900302
39	OH	3900502
39	OH	3900702
39	OH	3900902
39	OH	3901102
39	OH	3901302
39	OH	3901502

Table A-2. Registration Distributions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Registration Distribution File Name
39	OH	3901702
39	OH	3901902
39	OH	3902102
39	OH	3902302
39	OH	3902502
39	OH	3902702
39	OH	3902902
39	OH	3903102
39	OH	3903302
39	OH	3903502
39	OH	3903702
39	OH	3903902
39	OH	3904102
39	OH	3904302
39	OH	3904502
39	OH	3904702
39	OH	3904902
39	OH	3905102
39	OH	3905302
39	OH	3905502
39	OH	3905702
39	OH	3905902
39	OH	3906102
39	OH	3906302
39	OH	3906502
39	OH	3906702
39	OH	3906902
39	OH	3907102
39	OH	3907302
39	OH	3907502
39	OH	3907702
39	OH	3907902
39	OH	3908102
39	OH	3908302
39	OH	3908502
39	OH	3908702
39	OH	3908902
39	OH	3909102
39	OH	3909302
39	OH	3909502
39	OH	3909702
39	OH	3909902
39	OH	3910102
39	OH	3910302
39	OH	3910502
39	OH	3910702
39	OH	3910902
39	OH	3911102
39	OH	3911302
39	OH	3911502
39	OH	3911702
39	OH	3911902
39	OH	3912102
39	OH	3912302
39	OH	3912502
39	OH	3912702
39	OH	3912902
39	OH	3913102
39	OH	3913302
39	OH	3913502
39	OH	3913702

Table A-2. Registration Distributions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Registration Distribution File Name
39	OH	3913902
39	OH	3914102
39	OH	3914302
39	OH	3914502
39	OH	3914702
39	OH	3914902
39	OH	3915102
39	OH	3915302
39	OH	3915502
39	OH	3915702
39	OH	3915902
39	OH	3916102
39	OH	3916302
39	OH	3916502
39	OH	3916702
39	OH	3916902
39	OH	3917102
39	OH	3917302
39	OH	3917502
40	OK	Default
41	OR	4100102
41	OR	4100302
41	OR	4100502
41	OR	4100702
41	OR	4100902
41	OR	4101102
41	OR	4101302
41	OR	4101502
41	OR	4101702
41	OR	4101902
41	OR	4102102
41	OR	4102302
41	OR	4102502
41	OR	4102702
41	OR	4102902
41	OR	4103102
41	OR	4103302
41	OR	4103502
41	OR	4103702
41	OR	4103902
41	OR	4104102
41	OR	4104302
41	OR	4104502
41	OR	4104702
41	OR	4104902
41	OR	4105102
41	OR	4105302
41	OR	4105502
41	OR	4105702
41	OR	4105902
41	OR	4106102
41	OR	4106302
41	OR	4106502
41	OR	4106702
41	OR	4106902
41	OR	4107102
42	PA	Default
44	RI	4400002
45	SC	Default
46	SD	Default
47	TN	4700302

Table A-2. Registration Distributions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Registration Distribution File Name
47	TN	4703702
47	TN	4706502
47	TN	4709302
47	TN	4715702
47	TN	4716302
47	TN	Default
48	TX	4800102
48	TX	4800302
48	TX	4800502
48	TX	4800702
48	TX	4800902
48	TX	4801102
48	TX	4801302
48	TX	4801502
48	TX	4801702
48	TX	4802102
48	TX	4802702
48	TX	4802902
48	TX	4803102
48	TX	4803302
48	TX	4803702
48	TX	4803902
48	TX	4804102
48	TX	4804302
48	TX	4804502
48	TX	4804702
48	TX	4804902
48	TX	4805502
48	TX	4807102
48	TX	4808102
48	TX	4808502
48	TX	4809102
48	TX	4811302
48	TX	4811902
48	TX	4812102
48	TX	4812702
48	TX	4813902
48	TX	4814102
48	TX	4814302
48	TX	4815702
48	TX	4816702
48	TX	4818302
48	TX	4818702
48	TX	4819902
48	TX	4820102
48	TX	4820302
48	TX	4820902
48	TX	4821302
48	TX	4822102
48	TX	4823102
48	TX	4824102
48	TX	4824502
48	TX	4825102
48	TX	4825702
48	TX	4829102
48	TX	4833902
48	TX	4836102
48	TX	4836702
48	TX	4839702
48	TX	4840102
48	TX	4842302

Table A-2. Registration Distributions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Registration Distribution File Name
48	TX	4843902
48	TX	4845302
48	TX	4845902
48	TX	4847302
48	TX	4849102
48	TX	4849302
49	UT	4900102
49	UT	4900302
49	UT	4900502
49	UT	4900702
49	UT	4900902
49	UT	4901102
49	UT	4901302
49	UT	4901502
49	UT	4901702
49	UT	4901902
49	UT	4902102
49	UT	4902302
49	UT	4902502
49	UT	4902702
49	UT	4902902
49	UT	4903102
49	UT	4903302
49	UT	4903502
49	UT	4903702
49	UT	4903902
49	UT	4904102
49	UT	4904302
49	UT	4904502
49	UT	4904702
49	UT	4904902
49	UT	4905102
49	UT	4905302
49	UT	4905502
49	UT	4905702
50	VT	5000002
51	VA	5101302
51	VA	5102302
51	VA	5103302
51	VA	5103602
51	VA	5104102
51	VA	5105902
51	VA	5106902
51	VA	5107302
51	VA	5108502
51	VA	5108702
51	VA	5109302
51	VA	5109502
51	VA	5110702
51	VA	5114902
51	VA	5115302
51	VA	5116102
51	VA	5117702
51	VA	5117902
51	VA	5119902
51	VA	5151002
51	VA	5155002
51	VA	5157002
51	VA	5163002
51	VA	5165002
51	VA	5167002

Table A-2. Registration Distributions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Registration Distribution File Name
51	VA	5170002
51	VA	5171002
51	VA	5173002
51	VA	5173502
51	VA	5174002
51	VA	5176002
51	VA	5177002
51	VA	5177502
51	VA	5180002
51	VA	5181002
51	VA	5183002
51	VA	5184002
51	VA	Default
53	WA	5300002
54	WV	Default
55	WI	5500002
56	WY	Default
72	PR	Default
78	VI	Default

All external file names use the file name extension REG. All file names have the form aabbbcc.reg, where aa is the FIPS State, bbb is the FIPS county and cc is the last two digits of the calendar year. Default means that the MOBILE6 default registration distributions were used.

Table A-3. 25 Year Trend of Vehicle Registrations And New Sales in Puerto Rico

Year	New Vehicle Sales	Total Vehicle Registrations
1973	138,108	681,596
1974	66,738	738,485
1975	73,388	773,742
1976	83,505	814,373
1977	110,393	830,373
1978	101,254	980,200
1979	103,859	1,035,200
1980	88,000	1,120,312
1981	98,193	1,201,774
1982	66,158	1,228,405
1983	60,987	1,259,111
1984	92,974	1,245,000
1985	116,431	1,353,670
1986	141,219	1,451,281
1987	118,048	1,560,308
1988	131,958	1,551,415
1989	148,459	1,567,319
1990	125,577	1,582,081
1991	116,386	1,516,102
1992	113,682	1,650,709
1993	141,550	1,740,371
1994	146,951	1,872,361
1995	160,394	2,014,207
1996	147,605	2,166,697
1997	180,027	2,272,643

Highway Statistics 2002. Federal Highway Administration, U.S. Department of Transportation, Washington, DC, 2002.

Table A-4. Diesel Sales Fractions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Diesel Sales Fraction File Name
1	AL	Default
2	AK	Default
4	AZ	0401302
4	AZ	Default
5	AR	Default
6	CA	Default
8	CO	Default
9	CT	Default
10	DE	Default
11	DC	Default
12	FL	Default
13	GA	Default
15	HI	Default
16	ID	Default
17	IL	Default
18	IN	Default
19	IA	1900002
20	KS	Default
21	KY	Default
22	LA	Default
23	ME	Default
24	MD	2400302
24	MD	2400902
24	MD	2401502
24	MD	2401702
24	MD	2402102
24	MD	2403102
24	MD	2403302
24	MD	2403502
24	MD	2404302
24	MD	Default
25	MA	Default
26	MI	Default
27	MN	2700102
27	MN	2700302
27	MN	2700502
27	MN	2700702
27	MN	2700902
27	MN	2701102
27	MN	2701302
27	MN	2701502
27	MN	2701702
27	MN	2701902
27	MN	2702102
27	MN	2702302
27	MN	2702502
27	MN	2702702
27	MN	2702902
27	MN	2703102
27	MN	2703302
27	MN	2703502
27	MN	2703702

Table A-4. Diesel Sales Fractions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Diesel Sales Fraction File Name
27	MN	2703902
27	MN	2704102
27	MN	2704302
27	MN	2704502
27	MN	2704702
27	MN	2704902
27	MN	2705102
27	MN	2705302
27	MN	2705502
27	MN	2705702
27	MN	2705902
27	MN	2706102
27	MN	2706302
27	MN	2706502
27	MN	2706702
27	MN	2706902
27	MN	2707102
27	MN	2707302
27	MN	2707502
27	MN	2707702
27	MN	2707902
27	MN	2708102
27	MN	2708302
27	MN	2708502
27	MN	2708702
27	MN	2708902
27	MN	2709102
27	MN	2709302
27	MN	2709502
27	MN	2709702
27	MN	2709902
27	MN	2710102
27	MN	2710302
27	MN	2710502
27	MN	2710702
27	MN	2710902
27	MN	2711102
27	MN	2711302
27	MN	2711502
27	MN	2711702
27	MN	2711902
27	MN	2712102
27	MN	2712302
27	MN	2712502
27	MN	2712702
27	MN	2712902
27	MN	2713102
27	MN	2713302
27	MN	2713502
27	MN	2713702

Table A-4. Diesel Sales Fractions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Diesel Sales Fraction File Name
27	MN	2713902
27	MN	2714102
27	MN	2714302
27	MN	2714502
27	MN	2714702
27	MN	2714902
27	MN	2715102
27	MN	2715302
27	MN	2715502
27	MN	2715702
27	MN	2715902
27	MN	2716102
27	MN	2716302
27	MN	2716502
27	MN	2716702
27	MN	2716902
27	MN	2717102
27	MN	2717302
28	MS	Default
29	MO	Default
30	MT	Default
31	NE	Default
32	NV	Default
33	NH	Default
34	NJ	3400102
35	NM	Default
36	NY	3600102
36	NY	3600502
37	NC	Default
38	ND	Default
39	OH	Default
40	OK	Default
41	OR	Default
42	PA	Default
44	RI	Default
45	SC	Default
46	SD	Default
47	TN	Default
48	TX	4800102
48	TX	4802102
48	TX	4802902
48	TX	4803902
48	TX	4808502
48	TX	4811302
48	TX	4813902
48	TX	4814102
48	TX	4818302
48	TX	4819902
49	UT	Default
50	VT	Default
51	VA	5101302
51	VA	5105902
51	VA	5110702

Table A-4. Diesel Sales Fractions Provided by State, Local, and Tribal Agencies

State FIPS	State Abbreviation	Diesel Sales Fraction File Name
51	VA	5115302
51	VA	5117902
51	VA	5151002
51	VA	Default
53	WA	Default
54	WV	Default
55	WI	Default
56	WY	Default
72	PR	Default
78	VI	Default

All external file names use the file name extension DSL. All file names have the form aabbbcc.dsl, where aa is the FIPS State, bbb is the FIPS county and cc is the last two digits of the calendar year. Default means that the MOBILE6 default diesel sales fractions were used.

Table A-5. Average Speeds by Road Type and Vehicle Type (mph)

	Rural	Rural	Rural	Rural	Rural	Rural
	Interstate	Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local
LDV	60	45	40	35	30	30
LDT	55	45	40	35	30	30
HDV	40	35	30	25	25	25
	Urban	**Urban**	**Urban**	**Urban**	**Urban**	**Urban**
	Interstate	**Other Freeways & Expressways**	**Principal Arterial**	**Minor Arterial**	**Collector**	**Local**
LDV	45	45	20	20	20	20
LDT	45	45	20	20	20	20
HDV	35	35	15	15	15	15

LDV : Passenger cars.
LDT : Trucks less than 8,500 lbs. Gross Vehicle Weight Rating (GVWR).
HDV : Trucks greater than 8,500 lbs. GVWR.

Table A-6. Average Speed Distributions Provided by State, Local, and Tribal Agencies

State FIPS	County FIPS	State Abbreviation	County Name	Average Speed Distribution Base File Name
10	1	DE	Kent County	1000102
10	3	DE	New Castle County	1000302
10	5	DE	Sussex County	1000502
11	1	DC	District of Columbia	1100102
19	1	IA	Adair County	1900102
19	3	IA	Adams County	1900302
19	5	IA	Allamakee County	1900502
19	7	IA	Appanoose County	1900702
19	9	IA	Audubon County	1900902
19	11	IA	Benton County	1901102
19	13	IA	Black Hawk County	1901302
19	15	IA	Boone County	1901502
19	17	IA	Bremer County	1901702
19	19	IA	Buchanan County	1901902
19	21	IA	Buena Vista County	1902102
19	23	IA	Butler County	1902302
19	25	IA	Calhoun County	1902502
19	27	IA	Carroll County	1902702
19	29	IA	Cass County	1902902
19	31	IA	Cedar County	1903102
19	33	IA	Cerro Gordo County	1903302
19	35	IA	Cherokee County	1903502
19	37	IA	Chickasaw County	1903702
19	39	IA	Clarke County	1903902
19	41	IA	Clay County	1904102
19	43	IA	Clayton County	1904302
19	45	IA	Clinton County	1904502
19	47	IA	Crawford County	1904702
19	49	IA	Dallas County	1904902
19	51	IA	Davis County	1905102
19	53	IA	Decatur County	1905302
19	55	IA	Delaware County	1905502
19	57	IA	Des Moines County	1905702
19	59	IA	Dickinson County	1905902
19	61	IA	Dubuque County	1906102
19	63	IA	Emmet County	1906302
19	65	IA	Fayette County	1906502
19	67	IA	Floyd County	1906702
19	69	IA	Franklin County	1906902
19	71	IA	Fremont County	1907102
19	73	IA	Greene County	1907302
19	75	IA	Grundy County	1907502
19	77	IA	Guthrie County	1907702
19	79	IA	Hamilton County	1907902
19	81	IA	Hancock County	1908102
19	83	IA	Hardin County	1908302
19	85	IA	Harrison County	1908502
19	87	IA	Henry County	1908702

Table A-6. Average Speed Distributions Provided by State, Local, and Tribal Agencies

State FIPS	County FIPS	State Abbreviation	County Name	Average Speed Distribution Base File Name
19	89	IA	Howard County	1908902
19	91	IA	Humboldt County	1909102
19	93	IA	Ida County	1909302
19	95	IA	Iowa County	1909502
19	97	IA	Jackson County	1909702
19	99	IA	Jasper County	1909902
19	101	IA	Jefferson County	1910102
19	103	IA	Johnson County	1910302
19	105	IA	Jones County	1910502
19	107	IA	Keokuk County	1910702
19	109	IA	Kossuth County	1910902
19	111	IA	Lee County	1911102
19	113	IA	Linn County	1911302
19	115	IA	Louisa County	1911502
19	117	IA	Lucas County	1911702
19	119	IA	Lyon County	1911902
19	121	IA	Madison County	1912102
19	123	IA	Mahaska County	1912302
19	125	IA	Marion County	1912502
19	127	IA	Marshall County	1912702
19	129	IA	Mills County	1912902
19	131	IA	Mitchell County	1913102
19	133	IA	Monona County	1913302
19	135	IA	Monroe County	1913502
19	137	IA	Montgomery County	1913702
19	139	IA	Muscatine County	1913902
19	141	IA	O'Brien County	1914102
19	143	IA	Osceola County	1914302
19	145	IA	Page County	1914502
19	147	IA	Palo Alto County	1914702
19	149	IA	Plymouth County	1914902
19	151	IA	Pocahontas County	1915102
19	153	IA	Polk County	1915302
19	155	IA	Pottawattamie County	1915502
19	157	IA	Poweshiek County	1915702
19	159	IA	Ringgold County	1915902
19	161	IA	Sac County	1916102
19	163	IA	Scott County	1916302
19	165	IA	Shelby County	1916502
19	167	IA	Sioux County	1916702
19	169	IA	Story County	1916902
19	171	IA	Tama County	1917102
19	173	IA	Taylor County	1917302
19	175	IA	Union County	1917502
19	177	IA	Van Buren County	1917702
19	179	IA	Wapello County	1917902
19	181	IA	Warren County	1918102
19	183	IA	Washington County	1918302
19	185	IA	Wayne County	1918502

Table A-6. Average Speed Distributions Provided by State, Local, and Tribal Agencies

State FIPS	County FIPS	State Abbreviation	County Name	Average Speed Distribution Base File Name
19	187	IA	Webster County	1918702
19	189	IA	Winnebago County	1918902
19	191	IA	Winneshiek County	1919102
19	193	IA	Woodbury County	1919302
19	195	IA	Worth County	1919502
19	197	IA	Wright County	1919702
24	1	MD	Allegany County	2400002
24	3	MD	Anne Arundel County	2400002
24	5	MD	Baltimore County	2400002
24	9	MD	Calvert County	2400002
24	11	MD	Caroline County	2400002
24	13	MD	Carroll County	2400002
24	15	MD	Cecil County	2400002
24	17	MD	Charles County	2400002
24	19	MD	Dorchester County	2400002
24	21	MD	Frederick County	2400002
24	23	MD	Garrett County	2400002
24	25	MD	Harford County	2400002
24	27	MD	Howard County	2400002
24	29	MD	Kent County	2400002
24	31	MD	Montgomery County	2400002
24	33	MD	Prince George’s County	2400002
24	35	MD	Queen Anne’s County	2400002
24	37	MD	St. Mary’s County	2400002
24	39	MD	Somerset County	2400002
24	41	MD	Talbot County	2400002
24	43	MD	Washington County	2400002
24	45	MD	Wicomico County	2400002
24	47	MD	Worcester County	2400002
24	510	MD	Baltimore city	2400002
34	1	NJ	Atlantic County	3400102
34	3	NJ	Bergen County	3400302
34	5	NJ	Burlington County	3400502
34	7	NJ	Camden County	3400702
34	9	NJ	Cape May County	3400902
34	11	NJ	Cumberland County	3401102
34	13	NJ	Essex County	3401302
34	15	NJ	Gloucester County	3401502
34	17	NJ	Hudson County	3401702
34	19	NJ	Hunterdon County	3401902
34	21	NJ	Mercer County	3402102
34	23	NJ	Middlesex County	3402302
34	25	NJ	Monmouth County	3402502
34	27	NJ	Morris County	3402702
34	29	NJ	Ocean County	3402902
34	31	NJ	Passaic County	3403102
34	33	NJ	Salem County	3403302

Table A-6. Average Speed Distributions Provided by State, Local, and Tribal Agencies

State FIPS	County FIPS	State Abbreviation	County Name	Average Speed Distribution Base File Name
34	35	NJ	Somerset County	3403502
34	37	NJ	Sussex County	3403702
34	39	NJ	Union County	3403902
34	41	NJ	Warren County	3404102
35	1	NM	Bernalillo County	3500102
44	1	RI	Bristol County	4400002
44	3	RI	Kent County	4400002
44	5	RI	Newport County	4400002
44	7	RI	Providence County	4400002
44	9	RI	Washington County	4400002
49	1	UT	Beaver County	4900102
49	3	UT	Box Elder County	4900102
49	5	UT	Cache County	4900102
49	7	UT	Carbon County	4900102
49	9	UT	Daggett County	4900102
49	11	UT	Davis County	4901102
49	13	UT	Duchesne County	4900102
49	15	UT	Emery County	4900102
49	17	UT	Garfield County	4900102
49	19	UT	Grand County	4900102
49	21	UT	Iron County	4900102
49	23	UT	Juab County	4900102
49	25	UT	Kane County	4900102
49	27	UT	Millard County	4900102
49	29	UT	Morgan County	4900102
49	31	UT	Piute County	4900102
49	33	UT	Rich County	4900102
49	35	UT	Salt Lake County	4903502
49	37	UT	San Juan County	4900102
49	39	UT	Sanpete County	4900102
49	41	UT	Sevier County	4900102
49	43	UT	Summit County	4900102
49	45	UT	Tooele County	4900102
49	47	UT	Uintah County	4900102
49	49	UT	Utah County	4904902
49	51	UT	Wasatch County	4900102
49	53	UT	Washington County	4900102
49	55	UT	Wayne County	4900102
49	57	UT	Weber County	4905702
51	1	VA	Accomack County	5100102
51	3	VA	Albemarle County	5100302
51	5	VA	Alleghany County	5100502
51	7	VA	Amelia County	5100702
51	9	VA	Amherst County	5100902
51	11	VA	Appomattox County	5101102

Table A-6. Average Speed Distributions Provided by State, Local, and Tribal Agencies

State FIPS	County FIPS	State Abbreviation	County Name	Average Speed Distribution Base File Name
51	13	VA	Arlington County	5101302
51	15	VA	Augusta County	5101502
51	17	VA	Bath County	5101702
51	19	VA	Bedford County	5101902
51	21	VA	Bland County	5102102
51	23	VA	Botetourt County	5102302
51	25	VA	Brunswick County	5102502
51	27	VA	Buchanan County	5102702
51	29	VA	Buckingham County	5102902
51	31	VA	Campbell County	5103102
51	33	VA	Caroline County	5103302
51	35	VA	Carroll County	5103502
51	36	VA	Charles City County	5103602
51	37	VA	Charlotte County	5103702
51	41	VA	Chesterfield County	5104102
51	43	VA	Clarke County	5104302
51	45	VA	Craig County	5104502
51	47	VA	Culpeper County	5104702
51	49	VA	Cumberland County	5104902
51	51	VA	Dickenson County	5105102
51	53	VA	Dinwiddie County	5105302
51	57	VA	Essex County	5105702
51	59	VA	Fairfax County	5105902
51	61	VA	Fauquier County	5106102
51	63	VA	Floyd County	5106302
51	65	VA	Fluvanna County	5106502
51	67	VA	Franklin County	5106702
51	69	VA	Frederick County	5106902
51	71	VA	Giles County	5107102
51	73	VA	Gloucester County	5107302
51	75	VA	Goochland County	5107502
51	77	VA	Grayson County	5107702
51	79	VA	Greene County	5107902
51	81	VA	Greensville County	5108102
51	83	VA	Halifax County	5108302
51	85	VA	Hanover County	5108502
51	87	VA	Henrico County	5108702
51	89	VA	Henry County	5108902
51	91	VA	Highland County	5109102
51	93	VA	Isle of Wight County	5109302
51	95	VA	James City County	5109502
51	97	VA	King and Queen County	5109702
51	99	VA	King George County	5109902
51	101	VA	King William County	5110102

Table A-6. Average Speed Distributions Provided by State, Local, and Tribal Agencies

State FIPS	County FIPS	State Abbreviation	County Name	Average Speed Distribution Base File Name
51	103	VA	Lancaster County	5110302
51	105	VA	Lee County	5110502
51	107	VA	Loudoun County	5110702
51	109	VA	Louisa County	5110902
51	111	VA	Lunenburg County	5111102
51	113	VA	Madison County	5111302
51	115	VA	Mathews County	5111502
51	117	VA	Mecklenburg County	5111702
51	119	VA	Middlesex County	5111902
51	121	VA	Montgomery County	5112102
51	125	VA	Nelson County	5112502
51	127	VA	New Kent County	5112702
51	131	VA	Northampton County	5113102
51	133	VA	Northumberland County	5113302
51	135	VA	Nottoway County	5113502
51	137	VA	Orange County	5113702
51	139	VA	Page County	5113902
51	141	VA	Patrick County	5114102
51	143	VA	Pittsylvania County	5114302
51	145	VA	Powhatan County	5114502
51	147	VA	Prince Edward County	5114702
51	149	VA	Prince George County	5114902
51	153	VA	Prince William County	5115302
51	155	VA	Pulaski County	5115502
51	157	VA	Rappahannock County	5115702
51	159	VA	Richmond County	5115902
51	161	VA	Roanoke County	5116102
51	163	VA	Rockbridge County	5116302
51	165	VA	Rockingham County	5116502
51	167	VA	Russell County	5116702
51	169	VA	Scott County	5116902
51	171	VA	Shenandoah County	5117102
51	173	VA	Smyth County	5117302
51	175	VA	Southampton County	5117502
51	177	VA	Spotsylvania County	5117702
51	179	VA	Stafford County	5117902
51	181	VA	Surry County	5118102
51	183	VA	Sussex County	5118302
51	185	VA	Tazewell County	5118502
51	187	VA	Warren County	5118702
51	191	VA	Washington County	5119102
51	193	VA	Westmoreland County	5119302
51	195	VA	Wise County	5119502
51	197	VA	Wythe County	5119702

Table A-6. Average Speed Distributions Provided by State, Local, and Tribal Agencies

State FIPS	County FIPS	State Abbreviation	County Name	Average Speed Distribution Base File Name
51	199	VA	York County	5119902
51	510	VA	Alexandria city	5151002
51	515	VA	Bedford city	5151502
51	520	VA	Bristol city	5152002
51	530	VA	Buena Vista city	5153002
51	540	VA	Charlottesville city	5154002
51	550	VA	Chesapeake city	5155002
51	570	VA	Colonial Heights city	5157002
51	580	VA	Covington city	5158002
51	590	VA	Danville city	5159002
51	595	VA	Emporia city	5159502
51	600	VA	Fairfax city	5160002
51	610	VA	Falls Church city	5161002
51	620	VA	Franklin city	5162002
51	630	VA	Fredericksburg city	5163002
51	640	VA	Galax city	5164002
51	650	VA	Hampton city	5165002
51	660	VA	Harrisonburg city	5166002
51	670	VA	Hopewell city	5167002
51	678	VA	Lexington city	5167802
51	680	VA	Lynchburg city	5168002
51	683	VA	Manassas city	5168302
51	685	VA	Manassas Park city	5168502
51	690	VA	Martinsville city	5169002
51	700	VA	Newport News city	5170002
51	710	VA	Norfolk city	5171002
51	720	VA	Norton city	5172002
51	730	VA	Petersburg city	5173002
51	735	VA	Poquoson city	5173502
51	740	VA	Portsmouth city	5174002
51	750	VA	Radford city	5175002
51	760	VA	Richmond city	5176002
51	770	VA	Roanoke city	5177002
51	775	VA	Salem city	5177502
51	790	VA	Staunton city	5179002
51	800	VA	Suffolk city	5180002
51	810	VA	Virginia Beach city	5181002
51	820	VA	Waynesboro city	5182002
51	830	VA	Williamsburg city	5183002
51	840	VA	Winchester city	5184002

All external file names use the base file name with extensions which identify which of the 12 HPMS roadway types that the speeds apply to. All file names have the form aabbbcc.ddd, where aa is the FIPS State, bbb is the FIPS county, cc is the last two digits of the calendar year and ddd indicates the HPMS roadway type.

Table A-7. Trip Length Distributions Provided by State, Local, and Tribal Agencies

State FIPS	County FIPS	State Abbreviation	County Name	Trip Length File Name
11	1	DC	District of Columbia	1100102
24	9	MD	Calvert County	2400002
24	17	MD	Charles County	2400002
24	21	MD	Frederick County	2400002
24	31	MD	Montgomery County	2400002
24	33	MD	Prince George’s County	2400002
48	39	TX	Brazoria County	4803902
48	71	TX	Chambers County	4803902
48	85	TX	Collin County	4808502
48	113	TX	Dallas County	4811302
48	121	TX	Denton County	4808502
48	139	TX	Ellis County	4813902
48	157	TX	FortBend County	4803902
48	167	TX	Galveston County	4803902
48	201	TX	Harris County	4803902
48	213	TX	Henderson County	4813902
48	221	TX	Hood County	4813902
48	231	TX	Hunt County	4813902
48	251	TX	Johnson County	4813902
48	257	TX	Kaufman County	4813902
48	291	TX	Liberty County	4803902
48	339	TX	Montgomery County	4803902
48	367	TX	Parker County	4813902
48	397	TX	Rockwall County	4813902
48	439	TX	Tarrant County	4811302
48	473	TX	Waller County	4803902
51	13	VA	Arlington County	5101302
51	59	VA	Fairfax County	5101302
51	107	VA	Loudoun County	5101302
51	153	VA	Prince William County	5101302
51	179	VA	Stafford County	5101302
51	510	VA	Alexandria City	5101302
51	600	VA	Fairfax City	5101302
51	610	VA	Falls Church City	5101302
51	683	VA	Manassas City	5101302
51	685	VA	Manassas Park City	5101302

All external file names use the file name extension WDT. All file names have the form aabbbcc.wdt, where aa is the FIPS State, bbb is the FIPS county and cc is the last two digits of the calendar year.

Table A-8. Vehicle Miles Traveled by Hour of the Day Distributions Provided by State, Local, and Tribal (S/L/T) Agencies

State FIPS	County FIPS	State Abbreviation	County Name	VMT by Hour File Name
17	31	IL	Cook County	1703102
17	43	IL	DuPage County	1703102
17	89	IL	Kane County	1703102
17	97	IL	Lake County	1703102
17	111	IL	McHenry County	1703102
17	119	IL	Madison County	1711902
17	133	IL	Monroe County	1711902
17	163	IL	St. Clair County	1711902
17	197	IL	Will County	1703102
36	1	NY	Albany County	3600102
36	3	NY	Allegany County	3600302
36	5	NY	Bronx County	3600502
36	7	NY	Broome County	3600702
36	9	NY	Cattaraugus County	3600302
36	11	NY	Cayuga County	3600302
36	13	NY	Chautauqua County	3600302
36	15	NY	Chemung County	3601502
36	17	NY	Chenango County	3600302
36	19	NY	Clinton County	3600302
36	21	NY	Columbia County	3600302
36	23	NY	Cortland County	3600302
36	25	NY	Delaware County	3600302
36	27	NY	Dutchess County	3602702
36	29	NY	Erie County	3602902
36	31	NY	Essex County	3600302
36	33	NY	Franklin County	3600302
36	35	NY	Fulton County	3600302
36	37	NY	Genesee County	3600302
36	39	NY	Greene County	3600302
36	41	NY	Hamilton County	3600302
36	43	NY	Herkimer County	3600302
36	45	NY	Jefferson County	3600302
36	47	NY	Kings County	3604702
36	49	NY	Lewis County	3600302
36	51	NY	Livingston County	3600302
36	53	NY	Madison County	3600302
36	55	NY	Monroe County	3605502
36	57	NY	Montgomery County	3600302
36	59	NY	Nassau County	3605902
36	61	NY	New York County	3606102
36	63	NY	Niagara County	3606302
36	65	NY	Oneida County	3606502
36	67	NY	Onondaga County	3606702
36	69	NY	Ontario County	3600302
36	71	NY	Orange County	3607102
36	73	NY	Orleans County	3600302
36	75	NY	Oswego County	3600302
36	77	NY	Otsego County	3600302
36	79	NY	Putnam County	3607902
36	81	NY	Queens County	3608102

Table A-8. Vehicle Miles Traveled by Hour of the Day Distributions Provided by State, Local, and Tribal (S/L/T) Agencies

State FIPS	County FIPS	State Abbreviation	County Name	VMT by Hour File Name
36	83	NY	Rensselaer County	3608302
36	85	NY	Richmond County	3608502
36	87	NY	Rockland County	3608702
36	89	NY	St. Lawrence County	3600302
36	91	NY	Saratoga County	3609102
36	93	NY	Schenectady County	3609302
36	95	NY	Schoharie County	3600302
36	97	NY	Schuyler County	3600302
36	99	NY	Seneca County	3600302
36	101	NY	Steuben County	3600302
36	103	NY	Suffolk County	3610302
36	105	NY	Sullivan County	3600302
36	107	NY	Tioga County	3600302
36	109	NY	Tompkins County	3610902
36	111	NY	Ulster County	3600302
36	113	NY	Warren County	3611302
36	115	NY	Washington County	3611502
36	117	NY	Wayne County	3600302
36	119	NY	Westchester County	3611902
36	121	NY	Wyoming County	3600302
36	123	NY	Yates County	3600302
48	85	TX	Collin County	4808502
48	113	TX	Dallas County	4808502
48	121	TX	Denton County	4808502
48	139	TX	Ellis County	4813902
48	213	TX	Henderson County	4813902
48	221	TX	Hood County	4813902
48	231	TX	Hunt County	4813902
48	251	TX	Johnson County	4813902
48	257	TX	Kaufman County	4813902
48	367	TX	Parker County	4813902
48	397	TX	Rockwall County	4813902
48	439	TX	Tarrant County	4808502
49	11	UT	Davis County	4901102
49	35	UT	Salt Lake County	4903502
49	49	UT	Utah County	4904902
49	57	UT	Weber County	4905702

All external file names use the file name extension VMT. All file names have the form aabbbcc.vmt, where aa is the FIPS State, bbb is the FIPS county and cc is the last two digits of the calendar year.

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APPENDIX B.ONROAD MOBILE EMISSIONS DATA SUMMARIES FOR S/L/T SUBMITTALS

ALABAMA

S/L/T Agency: Alabama Department of Environmental Management

Contact Information: Lisa Cole
lbcole@adem.state.al.us
334-270-5615

SCCs: 348

CAPs: CO, NOX, NH3, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075').
Additions
• All HAPs.

ARIZONA - MARICOPA COUNTY

S/L/T Agency: Maricopa Association of Governments

Contact Information: Roger Roy
rroy@mag.maricopa.gov
602-254-6300

SCCs: 96

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Deleted monthly emissions.
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075').
• All SCCs ended in '0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation.
Additions
• All HAPs.

ARIZONA - PIMA COUNTY

S/L/T Agency: Pima Association of Governments

Contact Information: Natalie Shepp
nshepp@pagnet.org
520-792-1093

SCCs: 8

CAPs: CO, NOX, PM10-PRI, SO2, VOC

HAPs: None

Corrections
• Summed seasonal values into annual values and in unit of 'TON' instead of 'LBS'. • Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075'). • All SCCs ended in '0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Road type portion of SCC coded with '00'. Allocated emissions to 12 road types.
Additions
• Added PM25-PRI, NH3, all HAPs.

Note: The emissions of CO, NOX, PM10-PRI, SO2, VOC were reported as daily emissions (Emission Type =27), not total seasonal emissions, but with start and end dates covering three seasons making up the entire year. Therefore, emissions for these pollutants are reported incorrectly in the draft 2002 NEI. Emissions should have first been calculated as total emissions for each season before summing to obtain annual emissions. However, preliminary checks on this indicate that the magnitude of the starting emissions are not truly daily lbs, either. These emissions will need to be reevaluated for the final 2002 NEI.

ARKANSAS

S/L/T Agency:	Arkansas Department of Environmental Quality
Contact Information:	Ron Hoofman hoofman@adeq.state.ar.us 501-682-0537
SCCs:	8
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• Deleted all winter and summer emission values. • Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with ‘2230070' to five HDDV subcategories (SCCs ‘2230071' through ‘2230075'). • All SCCs ended in ‘0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Road type portion of SCC coded with ‘00'. Allocated emissions to 12 road types.
Additions
• All HAPs.

CALIFORNIA

S/L/T Agency: California Air Resources Board

Contact Information: Andy Alexis
916-323-1085
aalexis@arb.ca.gov

SCCs: 31 CAPs, 27 HAPs (from onroad sources only)

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: 32 HAPS

Corrections
• Deleted emission records for SCCs other than onroad sources. • Deleted emission records for arsenic (7440382) and mercury (7439976), as well as for other HAPs not included in the onroad NEI. • Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075'). • Road type portion of SCC coded with '00'. Allocated emissions to 12 road types. • For CO, NH3, NOX, SO2, and VOC, replaced last digit of SCC with 'X' for SCCs ending in '0' or 'B'. For PM10-PRI and PM25-PRI, replaced last digit of SCC with 'X' for SCCs ending in '0'.
Additions
• Added remaining HAPs from NMIM.

COLORADO

S/L/T Agency: Colorado APCD

Contact Information: Dale M. Wells
303-692-3237
dale.wells@state.co.us

SCCs: 636 (includes records marked with submittal flag of 'D'; 144 SCCs from records marked with submittal flag of 'A')

CAPs: CO, NH3, NOX, PM10-PRI, SO2, VOC

HAPs: 35

Corrections
• Deleted emission records with submittal flag of 'D'. • Deleted daily emission records. • All remaining SCCs (with submittal flag of 'A') ended in '0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Deleted emission records for arsenic (7440382) and mercury (7439976).
Additions
• Added PM25-PRI and remaining HAPs from NMIM.

CONNECTICUT

S/L/T Agency: Connecticut DEP

Contact Information: Steven Potter
860-424-3384
steven.potter@po.state.ct.us

SCCs: 8

CAPs: CO, NOX, VOC

HAPs: None

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075'). • All SCCs ended in '0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation.
Additions
• Added SO2, PM10-PRI, PM25-PRI, NH3 and all HAPs from NMIM.

DELAWARE

S/L/T Agency:	Delaware Dept of Natural Resources & Environmental Control, AQMS
Contact Information:	David Fees david.fees@state.de.us 302-739-4791
SCCs:	492
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	50

Corrections
• None.
Additions
• Added emissions for manganese compounds (198) and nickel compounds (226) from NMIM.

FLORIDA - PINELLAS COUNTY

S/L/T Agency: Pinellas County Department of Environmental Management

Contact Information: Bob Soptei
727-464-4422
bsoptei@co.pinellas.fl.us

SCCs: 8

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Revised the following pollutant codes: 630080 to CO, 7446095 to SO2, 7664417 to NH3, PM10 to PM10-PRI, and PM25P to PM25-PRI. • Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with ‘2230070' to five HDDV subcategories (SCCs ‘2230071' through ‘2230075'). • All SCCs ended in ‘0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Road type portion of SCC coded with ‘00'. Allocated emissions to 12 road types. • Replaced tribal code with ‘000'.
Additions
• All HAPs.

GEORGIA–25-County Atlanta Area

S/L/T Agency: Georgia Environmental Protection Division

Contact Information: Jon Morton
404 363 7039
jon_morton@dnr.state.ga.us

SCCs: 96

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075').
• All SCCs ended in '0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation.
Additions
• All HAPs.

GEORGIA (Rest-of-State)

S/L/T Agency: Georgia Environmental Protection Division

Contact Information: Jon Morton
404 363 7039
jon_morton@dnr.state.ga.us

SCCs: 348

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075').
• Deleted all data for Pickens County (227) where last digit of SCC is not equal to '0'. Emissions for Pickens County data were included in the Atlanta area data set with SCCs ending in '0'.
Additions
• All HAPs.

IDAHO

S/L/T Agency: DEQ

Contact Information: Gary Reinbold
208-373-0253
greinbol@deq.state.id.us

SCCs: 48

CAPs: CO, NH3, NOX, SO2, PM10-PRI, VOC

HAPs: 106990, 107028, 1634044, 50000, 71432, 75070

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with ‘2230070' to five HDDV subcategories (SCCs ‘2230071' through ‘2230075').   • All SCCs ended in ‘0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation.
Additions
• PM25-PRI, 44 HAPs.

ILLINOIS

S/L/T Agency: Illinois EPA

Contact Information: David ‘Buzz’ Asselmeier
217-524-4343
buzz.asselmeier@epa.state.il.us

SCCs: 104

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Totaled monthly emissions to annual emissions.   • Deleted ozone season day emission values.   • Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with ‘2230070' to five HDDV subcategories (SCCs ‘2230071' through ‘2230075').   • All SCCs ended in ‘0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation.   • Road type portion of SCC coded with ‘00'. Allocated emissions to 12 road types.
Additions
• All HAPs.

IOWA

S/L/T Agency: Iowa DNR - Air Quality

Contact Information: Marnie Stein
515-281-8468
marnie.stein@dnr.state.ia.us

SCCs: 2

CAPs: NH3

HAPs: None

Corrections
• Updated transmittal data for all counties. The source type was updated from 'AREA' to 'ON-ROAD MOBILE'.   • Allocated emission data from two vehicle types to 12 vehicle types. NH3 emissions from SCC '2201001000' were allocated to 2201001, 2201020, 2201040, 2201070, and 2201080 vehicle types. NH3 emissions from SCC '2230001000' were allocated to 2230001, 2230060, 2230071, 2230072, 2230073, 2230074, and 2230075 vehicle types.   • Road type portion of SCC coded with '00'. Allocated emissions to 12 road types.
Additions
• Added emissions of CO, NOX, PM10-PRI, PM25-PRI, SO2, VOC, and all HAPs from NMIM.

KENTUCKY- JEFFERSON COUNTY

S/L/T Agency:	Louisville Metro APCD
Contact Information:	Gary Flispart 502-574-6000 Gary.Flispart@loukymetro.org
SCCs:	CAPs–492, HAPs–144
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	33

Corrections
• Deleted daily emissions. • All HAP SCCs ended in ‘0'. Performed exhaust/evaporative emissions allocation for HAPs.
Additions
• Remaining HAPs.

MAINE

S/L/T Agency:	Bureau of Air Quality Control, DEP
Contact Information:	David Wright 207-287-6104 david.w.wright@state.me.us
SCCs:	492
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• None.
Additions
• All HAPs.

MAINE-PENOBSCOT TRIBE

S/L/T Agency: ITEP

Contact Information: Sarah Kelly
928-523-6377
SarahKelly@nau.edu

SCCs: 3

CAPs: CO, NOX, PM10-PRI, SO2, VOC

HAPs: 106990, 107028, 1634044, 50000, 71432, 75070

Corrections
• None. Emissions and VMT data were added to NEI for only the 3 SCCs included. No allocation of emissions or VMT were performed.
Additions
• None.

MASSACHUSETTS

S/L/T Agency:	MADEP
Contact Information:	Kenneth Santlal 617-292-5776 kenneth.santlal@state.ma.us
SCCs:	492
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• None.
Additions
• All HAPs.

Note: The Massachusetts criteria pollutant emissions in the draft 2002 NEI are those prepared for the final version of the MANE-VU 2002 emission inventory.

MICHIGAN - 7 SEMCOG COUNTIES (093, 099, 115, 125, 147, 161, and 163)

S/L/T Agency:	MI DEQ - Air Quality
Contact Information:	Allan Ostrander 517-335-2717 ostranda@michigan.gov
SCCs:	8
CAPs:	CO, NOX, VOC
HAPs:	None

Corrections
• Deleted daily emissions. • Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with ‘2230070' to five HDDV subcategories (SCCs ‘2230071' through ‘2230075'). • All SCCs ended in ‘0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation.
Additions
• NH3, PM10-PRI, PM25-PRI, SO2, and all HAPs.

MINNESOTA

S/L/T Agency: Minnesota Pollution Control Agency

Contact Information: Chun Yi Wu
651-282-5855
chun.yi.wu@pca.state.mn.us

SCCs: 2

CAPs: NH3

HAPs: None

Corrections
• Updated transmittal data for all counties. The source type was updated from 'AREA' to 'ON-ROAD MOBILE'. • Allocated emission data from two vehicle types to 12 vehicle types. NH3 emissions from SCC '2201001000' were allocated to 2201001, 2201020, 2201040, 2201070, and 2201080 vehicle types. NH3 emissions from SCC '2230001000' were allocated to 2230001, 2230060, 2230071, 2230072, 2230073, 2230074, and 2230075 vehicle types. • Road type portion of SCC coded with '00'. Allocated emissions to 12 road types.
Additions
• Added emissions of CO, NOX, PM10-PRI, PM25-PRI, SO2, VOC, and all HAPs from NMIM.

MISSISSIPPI

S/L/T Agency: Mississippi DEQ

Contact Information: Keith Head
601-961-5577
Keith_Head@deq.state.ms.us

SCCs: 348

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075').
Additions
• All HAPs.

MISSOURI

S/L/T Agency: Department of Natural Resources Air Pollution Control Program

Contact Information: Carlton Flowers
573-751-4817
carlton.flowers@dnr.gov

SCCs: 8

CAPs: CO, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Deleted seasonal daily emissions. • Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075'). • All SCCs ended in '0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Road type portion of SCC coded with '00'. Allocated emissions to 12 road types.
Additions
• NH3 and all HAPs.

NEBRASKA - LANCASTER COUNTY

S/L/T Agency:	Lincoln-Lancaster County Health Department
Contact Information:	Gary Bergstrom 402-441-6541 gbergstrom@ci.lincoln.ne.us
SCCs:	8
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• Deleted unpaved road emissions (SCC=2296000000). • Deleted emissions reported with pollutant code "HAPS". • Changed pollutant code from SOX to SO2. • Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075'). • All SCCs ended in '0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Road type portion of SCC coded with '00'. Allocated emissions to 12 road types. • Replaced tribal code with '000'.
Additions
• All HAPs.

NEVADA - CLARK COUNTY

S/L/T Agency: DAQM

Contact Information: Ebrahim Juma
702-455-5942
juma@co.clark.nv.us

SCCs: 494

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Deleted emission data for SCCs '2294000000' and 2296000000.
Additions
• All HAPs.

NEVADA (excluding Clark and Washoe Counties)

S/L/T Agency: NDEP

Contact Information: Sig
775-687-9392
sjaunara@ndep.state.nv.us

SCCs: 456

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• None.
Additions
• All HAPs.

NEW YORK

S/L/T Agency:	NYSDEC BAQP MSS
Contact Information:	Jeff Marshall 518-402-8396 jtmarsha@gw.dec.state.ny.us
SCCs:	588 (includes 96 invalid SCCs, corrected as described below)
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• Corrected several field names and formats in the emission table, as some of the data fields were not correctly matched to the field name and most of the field names were not NIF-compliant. • Deleted emission records with no corresponding VMT record in PE table. • Deleted emission records with SCC starting with '2230' and ending with 'V' as there are no valid SCCs for evaporative emissions from diesels. Emissions from these records totaled 0. • Replaced SCC code for records starting with an invalid SCC code of "2201700" with the corrected SCC code starting with "2201070". • Changed pollutant code from NOx to NOX, PM10-FIL to PM10-PRI and code of PM25-FIL to PM25-PRI. • Corrected VMT values in four counties (Lewis, Rockland, Wayne, and Wyoming) for one 9-digit SCC in each county based on corrected data provided by New York.
Additions
• All HAPs.

NORTH CAROLINA

S/L/T Agency:	NCDAQ
Contact Information:	Mike Abraczinskas 919-715-3743 michael.abraczinskas@ncmail.net
SCCs:	348
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with ‘2230070' to five HDDV subcategories (SCCs ‘2230071' through ‘2230075'). • Replaced affiliation type code in TR table with ‘Report Certifier’ instead of ‘02'.
Additions
• All HAPs.

PENNSYLVANIA

S/L/T Agency: PA DEP

Contact Information: Brian Trowbridge
717-783-9720
brtrowbrid@state.pa.us

SCCs: 494 (includes double-counting of SCCs for PM10-PRI and PM25-PRI)

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• All NO_x, CO, SO_2, and NH_3 SCCs ended in '0'. Replaced the tenth digit of the SCC code with "X" for all emission records of NO_x, CO, SO_2, and NH_3. • Emissions from PM10-PRI and PM25-PRI reported with SCCs ending in '0', 'X', 'B', and 'T', with emissions from SCCs ending in '0' equivalent to the sum of the emissions from SCCs ending in 'X', 'B', and 'T'. Deleted emission records with SCC code ending with '0' for pollutant codes of PM10-PRI and PM25-PRI to eliminate double-counting of these emissions. • All VOC SCCs ended in '0'. Performed exhaust/evaporative emissions allocation. • Changed pollutant code from NOx to NOX. • Changed the Organization Name field for all records in TR table from US EPA EFIG to Pennsylvania DEP.
Additions
• All HAPs.

TENNESSEE (Excluded the following counties: Davidson (037), Knox (093) and Hamilton (065), and Shelby (157))

S/L/T Agency:	TDEC APC
Contact Information:	Ron Redus 615-532-0577 ron.redus@state.tn.us
SCCs:	144
CAPs:	CO, NOX, NH3, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• All SCCs ended in ‘0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Updated tribal code to ‘000'.
Additions
• Added emissions for all CAPs and HAPs for Hamilton County and Shelby County from NMIM. • Added HAPs from NMIM for counties included in this State submittal.

TENNESSEE - KNOX COUNTY (093)

S/L/T Agency:	TDEC
Contact Information:	Ron Redus 615-532-0577 ron.redus@state.tn.us
SCCs:	144
CAPs:	CO, NOX, NH3, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Correction
• All SCCs ended in ‘0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Updated tribal code to ‘000'.
Additions
• All HAPs.

TENNESSEE - DAVIDSON COUNTY (037)

S/L/T Agency: Metro Public Health Department Nashville/Davidson Cty

Contact Information: Laura Artates
615-340-5653
laura.artates@nashville.gov

SCCs: 8

CAPs: CO, NOX, PM10-PRI, SO2, VOC

HAPs: None

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with ‘2230070' to five HDDV subcategories (SCCs ‘2230071' through ‘2230075'). • All SCCs ended in ‘0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Road type portion of SCC coded with ‘00'. Allocated emissions to 12 road types. • Deleted daily values. • Updated tribal code to ‘000'.
Additions
None.

TEXAS

S/L/T Agency: Texas Commission On Environmental Quality

Contact Information: Anusuya Iyer
512-239-1435
aiyer@tceq.state.tx.us

SCCs: 576

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Deleted daily emission records. • Changed pollutant codes from PM10-FIL to PM10-PRI and PM25-FIL to PM25-PRI. • All NO_x, CO, SO_2, and NH_3 SCCs ended in '0'. Replaced the tenth digit of the SCC code with "X" for all emission records of NO_x, CO, SO_2, and NH_3. • All VOC SCCs ended in '0'. Performed exhaust/evaporative emissions allocation. • Replaced tribal code with '000'.
Additions
• All HAPs.

UTAH

S/L/T Agency: UT Division of Air Quality

Contact Information: Carol Nielsen
801-536-4073
cnielsen@utah.gov

SCCs: 96

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: 106990, 107028, 1634044, 50000, 71432, 75070

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with '2230070' to five HDDV subcategories (SCCs '2230071' through '2230075'). • All SCCs ended in '0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. • Deleted PM10-PRI and PM25-PRI emissions. Based on supporting information provided by Utah, these emissions also included fugitive dust emissions.
Additions
• Added emissions for PM10-PRI, PM25-PRI, and remaining HAPs from NMIM.

VERMONT

S/L/T Agency:	VT Air Pollution Control Division
Contact Information:	Paul Wishinski 802-241-3862 paul.wishinski@anr.state.vt.us
SCCs:	88
CAPs:	CO, NH3, NOX, PM10-PRI, SO2, VOC
HAPs:	106990, 107028, 1634044, 50000, 71432, 7439976, 7440020, 7440382, 75070

Corrections

- Deleted emission records with submittal flag of “RD”.
- Deleted all seasonal emission records.
- Deleted emission records for arsenic (7440382) and mercury (7439976).
- Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with ‘2230070' to five HDDV subcategories (SCCs ‘2230071' through ‘2230075').
- All SCCs ended in ‘0'. Performed exhaust/evaporative/brake wear/tire wear emissions allocation. Summed monthly emission values to annual values and replaced the start date with 20020101 and the end date with 20021231.

Additions

- Added emissions for PM25-PRI based on the relationship between PM10-PRI and PM25-PRI for Vermont from the NMIM outputs and added remaining HAPs from NMIM.

Note: The Vermont criteria pollutant emissions in the draft 2002 NEI are those prepared for the final version of the MANE-VU 2002 emission inventory.

WASHINGTON

S/L/T Agency:	WA Dept. of Ecology
Contact Information:	Sally Otterson 360-407-6806 sott461@ecy.wa.gov
SCCs:	492
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	50

Corrections
• Deleted seasonal emission values.
Additions
• Added emissions for manganese compounds (198) and nickel compounds (226) from NMIM.

WEST VIRGINIA

S/L/T Agency:	WVDEP Division of Air Quality
Contact Information:	David Porter 304-926-3647 dporter@wvdep.org
SCCs:	348
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• Emissions provided for 8 vehicle types. Allocated emissions for SCC starting with ‘2230070' to five HDDV subcategories (SCCs ‘2230071' through ‘2230075').
Additions
• All HAPs.

APPENDIX C.NONROAD MODEL EMISSIONS DATA SUMMARIES FOR S/L/T SUBMITTALS

ALABAMA

S/L/T Agency: Alabama Department of Environmental Management

Contact Information: Lisa B. Cole
lbcolea@adem.state.al.us
(334) 270-5615

SCCs: 196

CAPs: CO, NOX, NH3, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
None
Additions
• CO, NOX, NH3, PM10-PRI, PM25-PRI, SO2, VOC (for some SCCs) • All HAPs

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ARIZONA - MARICOPA COUNTY

S/L/T Agency: Maricopa County

Contact Information: Bob Downing
bdowning@mail.maricopa.gov
(602) 506-6790

SCCs: 216

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
None
Additions
All HAPs

Notes:

1. Submitted 2 additional SCCs not included in NONROAD model, including 2265008010 and 2270008010; emission records for these SCCs could not be augmented with missing pollutants.

ARKANSAS

S/L/T Agency:	Arkansas Department of Environmental Quality
Contact Information:	Ron Hoofman hoofman@adeq.state.ar.us (501) 682-0537
SCCs:	193
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
Removed seasonal records
Additions
All HAPs

CALIFORNIA

S/L/T Agency:	California Air Resources Board
Contact Information:	Andy Alexis aalexis@arb.ca.gov (916) 323-1085
SCCs:	30
CAPs:	CO, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	32 HAPS

Corrections
• Changed TONS in Emission Unit Numerator to TON (EM table) • Removed records with pollutant code 1151; not a valid NIF3.0 HAP
Additions
NH3

Notes:

1. The California PE table had no data in it. The PE and EP tables from NMIM runs were used and the records were rolled up to the more aggregate SCCs provided by California.

CALIFORNIA - LAPOSTA TRIBE

S/L/T Agency: ITEP

Contact Information: Sarah Kelly
Sarah.Kelly@nau.edu
(928) 523-6377

SCCs: 3

CAPs: CO, NOX, PM10-PRI, SO2, VOC

HAPs: None

Corrections
None
Additions
Added PM25-PRI records using particle size distribution multipliers in NONROAD.

COLORADO

S/L/T Agency: Colorado APCD

Contact Information: Dale M. Wells
dale.wells@state.co.us
(303) 692-3237

SCCs: 214

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Removed summer day emissions • Revised VOC emissions for 1 record to correct for NONROAD NIF reporting error (STCTY FIPS 08079; SCC 2270002066)
Additions
• CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC (for some counties) • All HAPS

Notes:

1. Colorado had two sets of records for Adams, Boulder, Jefferson, and Weld Counties. They were differentiated by submittal flags and those with “A” submittal flags were deleted and those with “RA” submittal flags were kept.
2. EPA used default 2002 NMIM results for Colorado for final NEI.

DELAWARE

S/L/T Agency: Delaware Air Quality Management, DNREC

Contact Information: David Fees
david.fees@state.de.us
(302) 739-4791

SCCs: 214

CAPs: CO, CO2, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: 55

Corrections
• Removed CO2 records • Removed 5 HAPs not on list of valid NIF3.0 HAPs
Additions
None

Notes:
1. Started with 2002 MANE-VU CAP modeling inventory as basis.

FLORIDA - PINELLAS COUNTY

S/L/T Agency: PINELLAS COUNTY FLORIDA

Contact Information: Bob Soptei
bsoptei@pinellascounty.org
727-464-4719

SCCs: 12

CAPs: Provided comments for final NEI to delete specified CAP emission records

HAPs: Provided comments for final NEI to delete specified HAP emission records

Corrections
None
Additions
None

GEORGIA

S/L/T Agency:	Georgia Environmental Protection Division
Contact Information:	Scott Southwick scott_southwick@dnr.state.ga.us (404) 362-4569
SCCs:	200
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
None
Additions
• NH3, NOX, SO2, PM10-PRI, PM25-PRI, VOC (for some counties) • All HAPs

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IDAHO

S/L/T Agency:	DEQ
Contact Information:	Gary Reinbold greinbol@deq.state.id.us (208) 373-0253
SCCs:	199
CAPs:	CO, NOX, PM10-PRI, PM25-PRI, PM-PRI, VOC
HAPs:	None

Corrections
Deleted PM-PRI from EM and CE tables
Additions
• NH3 and SO2 • CO, NOX, PM10-PRI, PM25-PRI, VOC (for some counties) • All HAPs

Notes:

1. Idaho submitted two additional SCCs (2270002063 & 2265001020) not in the NONROAD model. As such, these SCCs could not be augmented with missing pollutant data.

ILLINOIS

S/L/T Agency: Illinois EPA

Contact Information: David 'Buzz' Asselmeier
buzz.asselmeier@epa.state.il.us
(217) 524-4343

SCCs: 214

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
Removed summer day records
Additions
• NH3 (for some counties) • All HAPs

Notes:
1. EPA used default 2002 NMIM results for Illinois for final NEI.

KENTUCKY- JEFFERSON COUNTY

S/L/T Agency: Louisville Metro APCD

Contact Information: Gary Flispart
Gary.Flispart@loukymetro.org
(502) 574-6000

SCCs: 185

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
None
Additions
• NH3, NOX, SO2, PM10-PRI, PM25-PRI, VOC (for some counties) • All HAPs

MAINE

S/L/T Agency:	Maine DEP Bureau of Air Quality
Contact Information:	David Wright David.W.Wright@maine.gov (207) 287-6104
SCCs:	214
CAPs:	CO, CO2, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• Removed CO2 records • Removed average summer day and winter weekday records
Additions
All HAPs

Notes:

1 Started with 2002 MANE-VU CAP modeling inventory as basis.

MAINE - PENOBSCOT TRIBE

S/L/T Agency:	ITEP
Contact Information:	Angelique Luedeker angelique.luedeker@nau.edu 928-523-5037
SCCs:	8
CAPs:	CO, NOX, PM-PRI, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	13

Corrections
None
Additions
None

Notes:

1. Tribal data not available from EPA NMIM data to augment missing SCCs and pollutants.

MARYLAND

S/L/T Agency: Maryland Department of the Environment

Contact Information: Roger Thunell
rthunell@mde.state.md.us
(410) 537-3273

SCCs: 207

CAPs: CO, CO2, NH3, NOX, PM-PRI, SO2, HC

HAPs: None

Corrections
• Changed PM-PRI to PM10-PRI • Converted HC to VOC using SCC-level NONROAD model conversion factors • Removed CO2 records
Additions
• CO, NH3, NOX, SO2, PM10-PRI, PM25-PRI, VOC (for some counties) • Added PM25-PRI records using particle size distribution multipliers in NONROAD • All HAPs

Notes:

1. Started with 2002 MANE-VU CAP modeling inventory as basis.
2. Maryland submitted seasonal records, representing summer, autumn, winter, and spring. These were summed together to develop annual emissions.

MICHIGAN

S/L/T Agency: Michigan DEQ Air Quality

Contact Information: Allan Ostrander
ostranda@michigan.gov
(517) 335-2717

SCCs: 214

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
None
Additions

Notes:

1.Michigan requested that EPA use the default 2002 NMIM results for their State in place of their submittal.

MISSISSIPPI

S/L/T Agency:	Mississippi DEQ
Contact Information:	Keith Head Keith_Head@deq.state.ms.us (601) 961-5577
SCCs:	192
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
None
Additions
• CO, NH3, NOX, SO2, PM10-PRI, PM25-PRI, VOC (for some counties) • All HAPs

NEBRASKA - LANCASTER COUNTY

S/L/T Agency:	Lincoln-Lancaster County Health Department
Contact Information:	Gary Bergstrom gbergstrom@ci.lincoln.ne.us (402) 441-6541
SCCs:	1
CAPs:	CO, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
None
Additions

Notes:

1.Lancaster County requested that EPA use the default 2002 NMIM results for their State in place of their submittal.

NEVADA

S/L/T Agency: NDEP

Contact Information: Brenda Harpring
bharprin@ndep.nv.gov
(775) 687-9498

SCCs: 185

CAPs: CO, NOX, PM-PRI

HAPs: None

Corrections
Changed PM-PRI to PM10-PRI
Additions
• NH3, SO2, VOC • NOX, and PM10-PRI (for some counties) • Added PM25-PRI using particle size distribution multipliers in NONROAD • All HAPs

Notes:

1. Nevada's submittal included all counties except for Clark and Washoe County. Clark County provided its own submittal, and Washoe county records were added based on EPA's default inventory.
2. Nevada submitted seasonal records, representing summer, autumn, winter, and spring. These were summed together to develop annual emissions.

NEVADA - CLARK COUNTY

S/L/T Agency: DAQM

Contact Information: Ebrahim Juma
UMA@CO.CLARK.NV.US
(702) 455-1621

SCCs: 183

CAPs: CO, CO2, HC, NOX, PM10-PRI, PM25-PRI, SOX

HAPs: None

Corrections
• Renamed SOX to SO2 • Converted HC to VOC using SCC-level NONROAD model conversion factors • Removed CO2 records
Additions
• NH3 • NOX, PM10-PRI, PM25-PRI, SO2, VOC (for some counties) • All HAPs

NEW HAMPSHIRE

S/L/T Agency:	NH Dept of Environmental Services Air Resources Division
Contact Information:	David Healy dhealy@des.state.nh.us (603) 271-0871
SCCs:	6
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	32

Corrections

- NH provided HAP emissions at an SCC-aggregated level (i.e., 4-digit SCC or engine type).
- Estimated PM25-PRI emissions for SCC 2270008000 using the assumption that 97% of PM10 is PM25 (NONROAD2004).
- Where HAPs matched EPA reported HAPs in preliminary NEI, EPA estimated 10-digit SCC emissions using county ratio of 10-digit to 4-digit SCC pollutant emissions from the 2002 preliminary NEI for NH.
- For non-matching HAPs:
  - Allocated p-xylene, m-xylene, and o-xylene (CAS 106423, 108383, 95476) based on Xylenes mixture (CAS 1330207).
  - Allocated Chromium & Compounds (CAS 136) based on Chromium III (CAS 16065831).
  - Allocated Manganese & Compounds (CAS 198) based on Manganese (7439965).
  - Allocated Nickel & Compounds (CAS 226) based on Nickel (CAS 7440020).
- Removed records for Mercury (CAS 7439976) and Arsenic & Compounds (CAS 93).
- All other reported non-matching HAP estimates were retained at the 4-digit SCC level.

Additions

- NH3
- CO, NOX, SO2, PM10-PRI, PM25-PRI, VOC (for some counties)

Notes:

1. Started with 2002 MANE-VU CAP modeling inventory as basis, which had already compiled the NR Model output from NR Model runs they performed to develop the CAP inventory in NIF3.0 format at the 10-digit SCC level..
2. Submitted 1 additional SCC not in NONROAD model (2270008000); as such, this SCC could not be augmented with missing pollutant data (except for PM25-PRI as described above).

NEW JERSEY

S/L/T Agency: NJ Department of Environmental Protection

Contact Information: John Gorgol
john.gorgol@dep.state.nj.us
(609) 292-1413

SCCs: 216

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
None
Additions
All HAPs

Notes:

1. Started with 2002 MANE-VU CAP modeling inventory as basis.
2. Submitted 2 additional SCCs not included in NONROAD model, including 2260008005 and 2268008005; emission records for these SCCs could not be augmented with missing pollutants.

NEW YORK

S/L/T Agency: NYSDEC Division of Air Resources BAQP/MSS

Contact Information: Kevin P. McGarry
kpmcgarr@gw.dec.state.ny.us
(518) 402-8396

SCCs: 214

CAPs: CO, CO2, NH3, NOX, PM, PM25, SO2, VOC

HAPs: None

Corrections
• Removed CO2 records • Changed PM to PM10-PRI and PM25 to PM25-PRI • Removed Material Code “0" from EM and PE tables • Removed SIC code “0" from EP table • Divided NH3 emissions by 1,000 to convert the emissions to the correct unit basis.
Additions
All HAPs

Notes:

1. Started with 2002 MANE-VU CAP modeling inventory as basis.

NORTH CAROLINA

S/L/T Agency: E.H. Pechan & Associates, Inc.

Contact Information: Kirstin B. Thesing
kthesing@pechan.com
(919) 493-3144

SCCs: 201

CAPs: CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Added Affiliation Type Code “Report Certifier” to TR table.
Additions
• CO, NH3, NOX, SO2, PM10-PRI, PM25-PRI, VOC (for some counties) • All HAPs

OREGON

S/L/T Agency:	ODEQ
Contact Information:	Jeffrey Stocum Stocum.jeffrey@deq.state.or.us (503) 229-5506
SCCs:	38
CAPs:	CO, NOX, SO2, PM10-PRI, PM25-PRI, VOC
HAPs:	34

Corrections

EM table

- Changed PM10 to PM10-PRI
- Changed PM25 to PM25-PRI
- Changed CAS Number 630080 to CO
- Changed SOX to SO2
- Allocated 7-digit SCC estimates for Chromium & Compounds (CAS 136) using 10-digit SCC estimates for Chromium III (CAS 16065831)
- Removed records for Mercury (CAS 7439976) and Flourine (CAS 7782414)

EM and PE Table

- Changed PER CAPITA in Throughput Unit Numerator field to EACH
- Changed HOURS of O[peration] in Throughput Unit Numerator field to HOUR
- Changed Gallons bu[rned] in Throughput Unit Numerator field to GAL

CE Table

- Deleted the CE table since there was no primary device type listed and no controlled emissions were in the table.

Additions

- NH3 and 15 HAPs
- CO, SO2, and 28 HAPs (for some counties)

Notes:

1. Oregon’s submittal was provided at the nonroad category level (i.e., the 7-digit SCC level). EPA estimated 10-digit SCC emissions using county ratio of 10-digit to 7-digit SCC pollutant emissions from the 2002 preliminary NEI for Oregon. This was done for all HAPs except flourine compounds (CAS 7782414) since flourine compounds is not a valid NIF3.0 HAP.

PENNSYLVANIA

S/L/T Agency:	PA DEP
Contact Information:	Chris Trostle dtrostle@state.pa.us (717) 787-9494
SCCs:	214
CAPs:	CO, CO2, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	None

Corrections
• Removed CO2 records • Removed average summer weekday and average winter weekday records
Additions
All HAPs

Notes:

1. Started with 2002 MANE-VU CAP modeling inventory as basis.

TENNESSEE

S/L/T Agency:	TDEC APC
Contact Information:	James R. Redus Ron.Redus@state.tn.us (615) 532-0577
SCCs:	201
CAPs:	CO, NOX, PM-PRI, SO2, VOC
HAPs:	None

Corrections
• Changed PM-PRI to PM10-PRI
Additions
• NH3 • CO, NOX, SO2, PM10-PRI, PM25-PRI, VOC (for some counties) • Added PM25-PRI records using particle size distribution multipliers in NONROAD
All HAPs

Notes:

1. Tennessee's submittal included all counties except for Davidson, Hamilton, Knox, and Shelby Counties. Davidson County provided its own submittal, and records for Hamilton, Knox, and Shelby counties were added based on EPA's default inventory.

TENNESSEE - DAVIDSON COUNTY

S/L/T Agency: Metro Public Health Department Nashville/Davidson Cty

Contact Information: Laura Artates
laura.artates@nashville.gov
(615) 340-5653

SCCs: 192

CAPs: CO, NOX, PM-PRI, SO2, VOC

HAPs: None

Corrections
• Changed PM-PRI to PM10-PRI
Additions
• NH3 • NOX, SO2, PM10-PRI, PM25-PRI, VOC (for some counties) • Added PM25-PRI records using particle size distribution multipliers in NONROAD • All HAPs

TEXAS

S/L/T Agency: TCEQ

Contact Information: Charlie Rubick
crubick@tceq.state.tx.us
(512) 239-0058

SCCs: 219

CAPs: CO, CO2, NH3, NOX, PM10-FIL, PM10-PRI, PM25-FIL, PM25-PRI, SO2, VOC

HAPs: None

Corrections
• Removed daily records • Removed CO2, PM10-FIL and PM25-FIL records • Removed records with a submittal flag of "D" • Changed "TONS" to "TON", "LBS" to "LB"
Additions
• NH3 (for some counties) • All HAPs

Notes:

1. Submitted 2 additional SCCs not in NONROAD model including 2270002063 and 2270008000; emission records for these SCCs could not be augmented with missing pollutants.
2. Submitted emissions data for 3 oil field equipment SCCs for final 2002 NEI.

UTAH

S/L/T Agency: UT Division of Air Quality

Contact Information: Carol A. Nielsen
CANielsen@Utah.gov
(801) 536-4073

SCCs: 214

CAPs: CO, NOX, PM10, SO2, VOC

HAPs: None

Corrections
• Changed PM10 to PM10-PRI • VOC actually represented HC emissions - converted emission values to VOC using SCC-specific NONROAD conversion factors
Additions
• NH3 • Added PM25-PRI records using NONROAD particle size distribution multipliers • All HAPs

Notes:

1. Records were labeled as seasonal that actually represented annual emissions; start date, end date, and emission type were corrected to reflect annual time period.
2. EPA used default 2002 NMIM results for Utah for final NEI.

VIRGINIA

S/L/T Agency:	Virginia Department of Environmental Quality
Contact Information:	Thomas C. Foster tcfoster@deq.state.va.us (804) 698-4411
SCCs:	214
CAPs:	CO, NOX, VOC
HAPs:	None

Corrections
None.
Additions

Notes:

1. Virginia only submitted daily emission estimates; as such, EPA used the default 2002 NMIM results for the annual emissions inventory for this State.

WASHINGTON

S/L/T Agency:	WA Dept. of Ecology
Contact Information:	Sally Otterson sott461@ecy.wa.gov (360) 407-6806
SCCs:	214
CAPs:	CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC
HAPs:	49

Corrections
• Removed seasonal records
Additions
• NH3 (for some counties) • 1 HAP (for some counties), Methyl Tert-Butyl Ether (CAS 1634044)

Notes:

1. Washington's inventory did not include King, Kitsap, Pierce or Snohomish counties. Records for these counties were added based on EPA's default NMIM inventory.

WEST VIRGINIA

S/L/T Agency: WVDEP Division of Air Quality

Contact Information: David Porter
dporter@wvdep.org
(304) 926-3647

SCCs: 193

CAPs: CO, NH3, NOX, PM-PRI, SO2, VOC

HAPs: None

Corrections
• Changed PM-PRI to PM10-PRI • Removed summer weekday records
Additions
• CO, NH3, NOX, PM10-PRI, PM25-PRI, SO2, VOC (for some counties) • Added PM25-PRI records by using NONROAD particle size distribution multipliers • All HAPs

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