To the Graduate Council:

I am submitting herewith a thesis written by Jeongran Yun entitled “On-road Mobile Source Emissions in Tennessee for 2002 – an Inventory and Analysis.” I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Environmental Engineering.

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ON-ROAD MOBILE SOURCE EMISSIONS IN TENNESSEE FOR 2002 – AN INVENTORY AND ANALYSIS

A Thesis

Presented for the

Master of Science

Degree

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Jeongran Yun

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ABSTRACT

Annual on-road mobile source emissions must be updated every three years according to the U.S. Environmental Protection Agency (EPA). The year 2002 is the most recent year to update the emission inventory. The EPA's computer model, MOBILE6.2, was used to develop the inventory, and the results presented in this report. Emissions of VOC, CO, NO_X, SO_2, NH_3, PM2.5, PM10, and CO_2 were estimated for each of the 95 counties in the state of Tennessee. The latest available traffic data for the year 2002 obtained from the Tennessee Department of Transportation (TDOT) were used to estimate emissions. This data included the estimates of vehicle speeds, truck mix, and vehicle miles of travel, by county and roadway type.

Monthly average values of min/max temperatures, absolute humidity, and fuel RVP were used to obtain monthly and annual emissions. Annual emissions from monthly estimates were compared to emissions estimated by using annual average inputs of temperature, absolute humidity, and fuel RVP values. Based on this comparison, findings were that it is not necessary to use monthly average values of temperature, humidity, and fuel RVP to accurately estimate annual emissions for most of pollutants except for VOC and CO. This is due to the fact that no significant differences were calculated in emissions using monthly input values compared to emissions calculated using annual average input values. There were about 10% differences in VOC and CO emissions between the two methods.

Monthly variations in VMT affect all emission estimates with the highest VMT occurring in July and the lowest in January. Humidity has the most significant effect on

monthly variations of NO_X emission factors. Temperature changes have a smaller effect on NO_X emission factors. VOC and CO emissions are not sensitive to changes in humidity values, but monthly variations in temperatures and fuel RVP values significantly affect VOC and CO emissions.

Different types of vehicles have different emission rates. Annual emissions are affected by the VMT fractions of each vehicle type. Passenger cars and light duty trucks, less than 6000 lbs of gross vehicle weight rating, accounted for over 80% of on-road mobile source emissions of VOC, CO, and NH_3 throughout the state of Tennessee. Fifty four percent of NO_X emissions from on-road mobile sources in Tennessee were from heavy-duty diesel trucks, HDV8A & 8B. The contribution of heavier trucks (HDV8A &8B) to NO_X emissions varies widely (e.g. 9.7% for Hancock County and 79.7% for Haywood County). This is due to differences in truck VMT in counties with and without interstates.

Future year projections in 2009, 2020, and 2030 without VMT growth were conducted for 6 counties in the Knoxville area. NO_X emissions were projected to decrease by 84 to 93.5% for the 6 counties between 2002 and 2030. VOC emissions were projected to decrease by 78%. The projected reductions in PM2.5 emissions were 64.8-83.5%, 91-94% in SO_2 emissions, and 66-68% in CO emissions. Similar reductions would be projected for all Tennessee counties. However, ammonia emissions were projected to increase by 3%. The new regulations affect more reductions on NO_X emissions. If catalytic converter reduces more NO_X, it produces more NH_3 emissions as byproduct. The actual change in future emissions from on-road mobile sources will depend on VMT growth rates.

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1 INTRODUCTION

The Environmental Protection Agency (EPA) requires that emission inventories for all different sources (i.e., point, non-point, on-road, non-road, and biogenic sources) be updated and submitted to the EPA every 3 years with the exception of the type A point sources, which have large emissions as stated on the 40 CFR part 51, and are reported annually.[7] The emission inventories are used for policy decision and further studies on air quality, which affects human health and welfare.

The pollutants known as precursors to ground-level ozone are hydrocarbons (HC) and nitrogen oxides (NO_X). On-road mobile source emissions are a major source of air pollution, especially for ozone (O_3) as well as CO. According to the 1999 national emissions by source, HC and NO_X emissions from on-road mobile sources accounted for 29 percent and 34 percent of the total emissions from all sources, respectively.[13] On-road mobile sources contributed to CO emissions by 57% of the total national CO emissions.[14] The 1999 Emissions Trends Report[10] states that NO_X emissions from transportation sources have increased over the last 20 years by 16 percent. While the emission controls have improved, emissions have not decreased considerably because of people's tendencies to drive more these days.

Nationally, 8-hour ozone levels have decreased over the past 20 years. However, several areas in Tennessee have seen an increase in 8-hour ozone levels.[10] Knoxville, Clarksville, and Memphis areas were designated as 8-hour ozone nonattainment areas as of April 15, 2004.

This study generated a 2002 annual emission inventory for on-road mobile sources for the 95 counties in the state of Tennessee. The pollutants that were included in the emission inventory are: volatile organic compounds (VOC), nitrogen oxides (NO_X), carbon monoxide (CO), particulate matter less than 10 microns in diameter (PM10), particulate matter less than 2.5 microns in diameter (PM2.5), ammonia (NH_3), and sulfur dioxide (SO_2). Local specific inputs (i.e., temperature, VMT fractions, average speeds), if possible, were used to run the model. This study also evaluated the sensitivity of the annual emission inventory, by either using monthly values for temperature, absolute humidity, and fuel Reid Vapor Pressure (RVP), or by using annual average values. Cooper et al.[3] found that there were small differences for Central Florida between the results when using monthly inputs or annual average inputs. They also recommended that the annual emission inventory should be calculated using annual average inputs considering that the use of the monthly average data is more complex and time consuming to perform.

However, based on sensitivity analysis studies conducted by several authors[11,12] the input parameters have a significant effect on emission rates. The range of monthly temperatures and fuel RVP values in Tennessee is different from Central Florida, therefore monthly estimation of emissions were calculated to obtain the annual emission inventory. A comparison of emissions using monthly values and annual average values was conducted. Furthermore, the contribution of different vehicle types to the emissions of each pollutant was also investigated. More analysis included in this study.

2 BACKGROUND

2.1 Emission Inventory Updates

EPA's Consolidated Emissions Reporting Rule (CERR) requires every state to submit its on-road mobile source emission inventories for criteria pollutants such as ozone, particulate matter, and carbon monoxide and their precursors (i.e., VOC) every three years. New requirements of PM2.5 and NH_3 for mobile sources were added in 2002.[7] 2002 is the latest year for updating emission inventories. The updated emission inventories will be utilized by the EPA for several purposes: modeling analyses, projection of future control strategies, tracking progress to meet requirements of Clean Air Act (CAA), calculating risk, and responding to public inquiries.[7] Emission inventories are also used by states to development plans to attain and maintain the National Ambient Air Quality Standards (NAAQS). For nonattainment areas which violate the NAAQS for at least one of the six criteria pollutants, these inventories will be important in developing and meeting State Implementation Plans (SIP) requirements to meet the NAAQS.

The EPA designated nonattainment areas for 8-hour ozone on April 15, 2004. The 8-hour ozone nonattainment areas in Tennessee are described below. The designations for the PM2.5 NAAQS will be promulgated in 2004-2005. The states, designated as nonattainment areas for either pollutant, will be required to submit new attainment demonstration SIP planning for the new NAAQS within 3-4 years.[8]

2.2 Nonattainment Areas in Tennessee

The CAA defines nonattainment areas as geographic areas, which are violating the NAAQS or are contributing to a nearby area that is violating the NAAQS, in terms of the six criteria pollutants: O_3, CO, PM, SO_2, nitrogen dioxide (NO_2), and lead (Pb).[15] EPA designated 8-hour ozone nonattainment areas on Apr. 15, 2004.[16] There are several counties in Tennessee designated as an 8-hour ozone nonattainment area, effective June 15, 2004. Some counties are not meeting the 8-hour ozone NAAQS, but they are participating in an Early Action Compact (EAC). For the EAC areas, EPA deferred the effective date to designate an 8-hour ozone nonattainment area on September 30, 2005 since the EAC areas are committed to early reduction and early implementation of control measures. The nonattainment areas are listed in Table 2-1. The maximum attainment dates required are also listed in Table 2-1.

As far as the 1-hour ozone NAAQS concerned, there are no nonattainment areas in Tennessee as of May 2004. In the past, several counties in Tennessee were classified as 1-hour ozone nonattainment areas for a while, but were redesignated to attainment areas a few years ago.[9] For example, the Nashville area, including Davidson, Rutherford, Sumner, Williamson, and Wilson counties is a former ozone nonattainment area, classified as moderate (0.138 – 0.160 ppm). It was redesignated to attainment in 1996. The Knox County, former ozone nonattainmnet area (marginal: 0.121 – 0.138 ppm), was redesignated to attainment in 1993. Shelby County is also a former ozone nonattainment area (marginal). It was redesignated to attainment in 1995. These areas, previously nonattainment areas, are called maintenance areas in terms of the 1-hour ozone standard.

Table 2-1. Nonattainment Areas in TN as of Apr. 15, 2004

Designated Area	County	Designation	Classification	Design Value in ppb* 8-hour	Design Value in ppb* 1-hour	Effective Date	Maximum Attainment Date
Chattanooga	Hamilton Co. Meigs Co.	Nonattainment	Subpart 1. Subpart 1.	88	113	6/15/2004	June 2009
Clarkesville-Hopkinsville, TN-KY	Montgomery Co.	Nonattainment	Subpart 1. Subpart 1.	85	99	6/15/2004	June 2009
Knoxville	Anderson Co. Blount Co. Cocke Co. (part) (Great Smoky Mtn Park) Jefferson Co. Knox Co. Loudon Co. Sevier Co.	Nonattainment	Subpart 1. Subpart 1. Subpart 1. Subpart 1. Subpart 1. Subpart 1. Subpart 1.	92	114	6/15/2004	June 2009
Nashville (EAC)	Davidson Co. Rutherford co. Sumner Co. Williamson Co. Wilson Co.	Nonattainment - deferred	Subpart 1. Subpart 1. Subpart 1. Subpart 1. Subpart 1.	86	107	9/30/2005	December 2007
Memphis	Shelby Co.	Nonattainment	Subpart 2/Moderate	92	126	6/15/2004	June 2010
Tri-Cities (EAC)	Hawkins Co. Sullivan Co.	Nonattainment - deferred	Subpart 1. Subpart 1.	86	110	9/30/2005	December 2007

* These values are from the EPA's 8-hour ground level ozone designations website

http://www.epa.gov/ozonedesignations/documents/tsd/ch4.pdf

The level of the 8-hour ozone NAAQS is 0.08 ppm.

The 8-hour ozone design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentrations.

The Subpart 1 category means when an area has a 1-hour design value of 120 ppb or lower.

For those 8-hour ozone nonattainment areas, states are required to submit full planning requirements of Title I, Part D of the CAA.[15] One of the requirements is to submit an accurate and current emission inventory of all sources of pollutants in that area.

2.3 Pollutants from On-road Mobile Sources

2.3.1 Carbon Monoxide

Carbon monoxide (CO) is a major air pollutant in many cities. This is a colorless, odorless gas. The main source of CO in the air is vehicle emissions. According to the 1999 national emission inventory, CO emissions from on-road mobile sources account for 51 percent of all sources.[13] Carbon monoxide forms when fuel burns incompletely. This gas is poisonous especially to persons with heart disease. It causes mortality by reducing oxygen delivery to the body's organs and tissues.

To reduce CO emissions from vehicles, catalytic converters were installed on vehicles since 1970s to convert carbon monoxide to carbon dioxide.[17] In cold weather, vehicles need more fuel to start and emission control devices tend to operate less efficiently, therefore, CO emissions increase in cold conditions.

2.3.2 Hydrocarbons

VOC is one type of hydrocarbons. Hydrocarbon (HC) emissions from on-road mobile sources account for 29 percent of all sources.[13] HC emissions are caused when fuel does not burn completely and occur through fuel evaporation during hot days. HCs are an ozone precursor. Ground-level ozone is a public health problem, as are HCs. Some HCs by themselves cause cancer. Ground-level ozone, a secondary pollutant, causes

severe irritation, lung damage, and reduced cardiovascular functioning. It also causes damage to crops and forests.

The CAA of 1990 helps reducing vehicle emissions by tightening tailpipe standards, improving control of evaporative emissions, and computerizing diagnostic systems.[17]

2.3.3 Nitrogen Oxides

Nitrogen Oxides (NO_X) emissions occur when fuel burns at high temperature and high pressure in an engine. Thirty four percent of NO_X emissions in the air are from on-road mobile sources.[13] NO_X are also precursors to ground-level ozone.

2.3.4 Particulate Matter

Particulate Matter is solid or liquid particles in the air. On-road mobile sources emit mainly fine particulate matter (PM2.5). PM emissions from on-road mobile sources account for 10 percent of all sources.[13] Since PM2.5 can reach into the deepest regions of the lungs this brings health concerns to children and the elderly. In the MOBILE 6.2 model, this particulate matter includes tire wear, break wear, sulfate portion of exhaust particulate (SO_4), elemental carbon (ECARBON), organic carbon (OCARBON), and total carbon portion of gasoline exhaust particulate (GASPM).

2.3.5 Emissions Trends

According to EPA's Emissions Trends Report, 1999[10], all of the six criteria pollutant levels have decreased over the last 20 years, nationally. A 36 percent reduction has occurred in ambient average CO concentrations over the last 10 years (1990-1999).

Ambient average NO_2 concentrations have decreased by 10 percent from 1990 to 1999, while NO_X emissions have increased by 5 percent overall. Furthermore, NO_X emissions from transportation sources have increased by 17 percent during the same time frame. Since NO_X emissions are a precursor to ozone, increasing NO_X emissions may cause an increase in ozone levels. Nationally, ambient mean ozone concentrations have been reduced by 4 percent for the 1-hour levels, and have no change in 8-hour ozone levels from 1990-1999, even though anthropogenic VOCs emissions have decreased by 14 percent.[10]

2.4 Growth of Vehicle Miles Traveled (VMT) in Tennessee

Vehicle miles traveled (VMT) is a major factor of mobile source emissions. There has been significant progress in reducing emissions per mile traveled since 1970, when the Clean Air Act first came out. Nonetheless, VMT per year in each county in Tennessee has increased. The main counties in Tennessee, such as Davidson, Hamilton, Knox, Shelby, and Sullivan Counties, have actual increases of 717,000; 300,000; 412,000; 828,000 and 133,000 miles/day annually during the period of 1990-1999, respectively.[18] Even though control systems have been improved and control strategies have been stringent, the number of cars on roads and the miles people travel have been increasing.

2.5 MOBILE6.2 Model

To estimate on-road mobile source emissions, the EPA requires state agencies to use the latest version of MOBILE emissions model. The EPA's Office of Transportation and Air Quality (OTAQ) has recently updated its emissions model, MOBILE6.2. This is

a Fortran-based computer program to estimate emission factors of highway mobile sources. This model estimates CO, HC, NO_X, SO_4 (Sulfate portion of exhaust particulate), OCARBON (organic carbon portion of diesel exhaust particulate), ECARBON (elemental carbon portion of diesel exhaust particulate), GASPM (total carbon portion of gasoline exhaust particulate), Lead (lead portion of exhaust particulate), Brake (brake wear particulate), and Tire (tire wear particulate), SO_2, NH_3, six hazardous air pollutants (HAPs), and carbon dioxide (CO_2) emission factors for on-road mobile sources. MOBILE6.1/6.2 is the expanded version of MOBILE6.0.[5]

Mobile emission factors are broken down by 28 vehicle types (LDGV, LDGT1, LDGT2, etc.), by 13 roadway types (rural interstate, rural principal arterial, etc.), and by 19 pollutant types. The 28 vehicle types are listed in Table 2-2. The 13 roadway types are rural interstate, rural principal arterial, rural minor arterial, rural major collector, rural minor collector, rural local, urban interstate, urban freeway, urban principal arterial, urban minor arterial, urban collector, urban local, and urban interstate ramp. The 19 pollutants are described above.

2.6 Sensitivity Analysis

MOBILE6.2 has its own default values for each input parameters. However, EPA requires each modeler to use local specific data to estimate more accurate on-road mobile source emissions for a specific locale. Several papers investigated the sensitivity analysis of MOBILE6.0. Giannelli et al.[11] divided the input parameters into three groups in terms of the magnitude of the effects. They studied the sensitivity, by changing the input parameters by 20 percent. If the emission rate changes occurred at least

Table 2-2. 28 MOBILE6.2 Vehicle Classifications

Number	Abbreviation	Description
1	LDGV	Light-Duty Gasoline Vehicles (Paasenger 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 5751 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 1 and 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)

20 percent on one of the three pollutants (HC, CO, or NO_X), an input parameter was categorized as “major effects” on that pollutant. It was categorized as “intermediate effects” with an emissions change (5-20%) in one of the pollutants, and “minor effects” with a less than 5 percent change in the emissions of any pollutants.

The study shows that the parameters that affect major effects on emissions were vehicle age distribution, average vehicle speeds, average daily temperatures, and fuel RVP. For all three pollutants (HC, CO, and NO_X), emissions increase with vehicle age. This reflects the MOBILE assumptions, which is that older vehicle have greater emissions than newer vehicles. Average speed values below 20 mph or above 50 mph results in NO_X and CO emission increases. Decreasing average speed values increases HC emissions. HC emissions increase at temperatures below about 20 °F or above 75 °F. Average temperatures below 50 °F have major effects on CO emissions. NO_X emissions increase at ambient temperatures below 30 °F. Fuel RVP values above 7.8 pounds per square inch (psi) cause a significant increase in CO and HC emissions. However, there is no effect on emissions with RVP values greater than 11.7 psi, according to the model.

Altitude, speed, and starts per day were intermediate effect parameters (IEP) for HC emissions. Air conditioning, altitude, mileage accumulation, and vehicle starts per day were IEP for CO emissions, whereas absolute humidity, air conditioning, altitude, mileage accumulation were IEP for NO_X emissions.

Another sensitivity analysis of MOBILE6 was conducted by Tang et al.[12] They evaluated fourteen parameters. Those parameters include: ramp vehicle miles traveled, vehicle miles traveled by facility, roadway facility speed, humidity, percentage of cloud cover, fuel RVP, temperature, fraction of vehicle miles traveled at each hour of the day,

fraction of vehicle mile traveled by speed, fraction of vehicle mile traveled by vehicle types, vehicle age distribution, vehicle starts per day, vehicle trip length distribution, and vehicle mile accumulation rate. Vehicle speeds were found to have the most significant effect on all three-pollutant emission rates. The parameter that had the least effect on all emission rates was vehicle weekday trip length.

Cooper et al.[3] observed that CO, NO_X, and VOC emission factors tend to have minimum values at certain temperature ranges: 60-80 °F for CO and NO_X and 30-50 °F for VOC. They also found that CO emissions were the highest in December through February when temperatures were colder and fuel RVP values are higher.

3 INPUT PARAMETER PREPARATION AND METHOD

MOBILE6.2 requires many different input parameters, such as calendar year, month (January, July), min/max temperatures, fuel characteristics (RVP, sulfur content, etc.), absolute humidity, registration distribution by vehicle class, etc. The emission rates are a function of average speed, temperature, registration age distribution, RVP of gasoline, absolute humidity, etc. To obtain the on-road mobile source emission inventory for the state of Tennessee, local specific data were used for more accurate inventory. However, for some input parameters, the national default values were used in the absence of local data. The methodologies of preparation for each parameter for Tennessee are described in this chapter.

3.1 Monthly Average Minimum and Maximum Temperatures

Monthly average minimum and maximum temperatures for 2002 were used for the temperature data inputs in the MOBILE6.2 model. Temperature data were obtained from the National Climatic Data Center.[4] Unedited Local Climatological Data (LCD) Daily Summary files were used for 12 months. Instead of using different temperature data for each county, Knoxville McGhee Tyson Airport station was used as the representative for East Tennessee, and Nashville International Airport station was used as the representative for Middle Tennessee. For West Tennessee, Memphis International Airport station was used. Tables 3-1, 3-2, and 3-3 show the temperature data for three representatives for each region.

Table 3-1. East Tennessee Meteorological and RVP Data

EAST TN (Knoxville-TYS)				
	Monthly Avg. Min Temp (F)	Monthly Avg. Max Temp (F)	Absolute Humidity (gr/lb)	RVP (psi)
January	31.6	51.4	28.16	15
February	30.8	51.8	22.90	13.5
March	38.9	61.8	37.83	13.5
April	51.4	73.9	55.61	13.5
May	54.1	76.4	68.97	9
June	65.4	87.7	93.12	9
July	70.2	88.0	113.31	9
August	68.0	89.8	101.34	9
September(1-15)	64.9	84.8	92.83	9
September(16-30)	64.9	84.8	92.83	11.5
October	55.6	70.2	73.05	13.5
November	37.6	55.1	36.03	13.5
December	32.1	49.2	27.70	15

Table 3-2. Middle Tennessee Meteorological and RVP Data

MIDDLE TN (Nashville-BNA)					
	Monthly Avg. Min Temp (F)	Monthly Avg. Max Temp (F)	Absolute Humidity (gr/lb)	RVP (psi) for other counties	RVP (psi) for Davidson,Rutherford, Sumner, Williamson, Wilson
January	32.0	52.3	30.38	15	15
February	29.8	51.3	22.39	13.5	13.5
March	37.9	61.0	34.53	13.5	13.5
April	50.7	73.3	57.39	13.5	13.5
May	54.9	76.5	69.86	9	9
June	66.5	87.3	101.44	9	7.8
July	71.1	89.0	115.78	9	7.8
August	69.8	90.1	105.81	9	7.8
September(1-15)	64.8	85.2	91.13	9	7.8
September(16-30)	64.8	85.2	91.13	11.5	11.5
October	54.1	68.7	64.34	13.5	13.5
November	37.3	55.5	35.39	13.5	13.5
December	32.4	48.6	29.27	15	15

Table 3-3. West Tennessee Meteorological and RVP Data

WEST TN (Memphis-MEM)					
	Monthly Avg. Min Temp (F)	Monthly Avg. Max Temp (F)	Absolute Humidity (gr/lb)	RVP (psi) for other counties	RVP (psi) for Shelby
January	36.3	55.3	30.08	15	15
February	33.9	53.0	24.55	13.5	13.5
March	40.7	60.5	37.61	13.5	13.5
April	55.9	75.7	61.57	13.5	13.5
May	59.9	79.0	73.15	9	9
June	70.9	89.2	101.16	9	7.8
July	74.4	90.9	119.24	9	7.8
August	73.6	90.5	112.74	9	7.8
September(1-15	69.0	86.3	96.35	9	7.8
September(16-3	69.0	86.3	96.35	11.5	11.5
October	56.2	69.7	65.25	13.5	13.5
November	40.4	57.6	35.90	13.5	13.5
December	36.2	52.2	31.34	15	15

3.2 Absolute Humidity

According to the Technical Guidance on the Use of MOBILE6 for Emission Inventory Preparation[1], humidity ratio (absolute humidity) for the model input should be the lowest value that occurred during the exceedance days. The technical guidance suggests that the lowest absolute humidity should be determined individually for each of the 10 days, which are used to calculate average minimum and maximum temperatures with the highest ozone concentrations. Then, the lowest of these ratios should be used as an input to MOBILE6.2. This recommendation is for ozone season. The guidance does not have specific instructions for an annual emission inventory to prepare absolute humidity. One approach is to use monthly average values. This approach was used by E.

H. Pechan & Assoc.[2] Another approach might be to use an annual average value to cover the whole year, as well as for other variables such as min/max temperatures.[3]

Absolute humidity was calculated using a spreadsheet available at the MOBILE6 website.[21] This calculator requires temperature, relative humidity, and barometric pressure. To calculate absolute humidity for each month, monthly average temperature and average barometric pressure were used. Relative humidity for each month was determined by reading the psychrometric chart using monthly average dry bulb temperature and monthly average dew point temperature. Barometric pressure information was also available in the Unedited Local Climatological Data (LCD) Daily Summary files at the National Climatic Data Center website.[4]

The absolute humidity was obtained for three places as representative of the three regions in Tennessee, as were temperature values. The humidity values are shown in Tables 3-1, 3-2, and 3-3 above.

3.3 Fuel Reid Vapor Pressure (RVP)

Volatility of gasoline can be measured by different kinds of methods. RVP is one of them. Fuel volatility has an effect on exhaust and especially non-exhaust emissions, so the RVP values are very important in estimating mobile source emissions. The required RVP values were obtained from the annual book of the American Society for Testing and Materials (ASTM).[6] Method D4814-01 describes the standard specification for automotive spark-ignition engine fuel.

Fuel RVP values for Tennessee are shown in Tables 3-1, 3-2, and 3-3. The same monthly RVP values were assigned to each county with the exception of six, which were

Davidson, Rutherford, Sumner, Williamson, Wilson, and Shelby. According to the ASTM standard, the RVP values comply with the EPA phase II vapor pressure requirements for the period, May 1 through September 15. The RVP limits for this period are either 9.0 psi or 7.8 psi. For ozone nonattainment areas, the six counties listed above, reduced vapor pressure is required by the EPA, which means that 7.8 psi is applied for those areas. The RVP values for the period, September 16 through April 30, are not covered by the EPA phase II volatility regulations. The values for this period shown in Tables 3-1, 3-2, and 3-3 are based on the ASTM standards. When two different volatility classes were listed in one month in the standard, the higher vapor pressure values were chosen for a worse case scenario to estimate higher emissions. For example, the classes (D-4 and A-3) were listed for April, the class D-4 (13.5 psi) was chosen for that month.

3.4 Fractions of Vehicle Miles Traveled (VMT) by Vehicle Type

VMT mix is required as an input to the MOBILE6.2 model. The VMT mix indicates the fraction of total highway VMT that is accumulated by each vehicle type. The model needs 16 composite vehicle classes for the VMT mix. Different vehicle types have different emission rates. For example, class8b heavy-duty diesel vehicles (gross vehicle weight rating greater than 60,000 pounds) have more than 10 times NO_X emission rate per mile of travel than the light duty diesel vehicles (i.e., passenger cars). As such, it is necessary to develop VMT fractions by vehicle types to estimate more accurate emissions.

3.4.1 VMT Fractions According to 3 TDOT Classes

The report, the 2002 Average Truck Percentage by Functional Class (Urban and Rural), provided by Tennessee Department of Transportation (TDOT), was used to develop the 2002 VMT fractions for 16 vehicle types required as an input to the MOBILE6.2 model at the county/roadway type level. This report provides the fractions of VMT in each county for single-unit truck and multi-unit truck (i.e., tractor-trailers) categories. This was determined, based on the vehicle counts of each vehicle type (i.e., cars, pickups, single unit truck and multi truck) on different roadways for both rural and urban areas. TDOT performed these counts at 141 sites throughout the state of Tennessee in 2002. [23] The summary of the results of vehicle classification counts is shown in Table 3-4. [23]

Table 3-4. TDOT Statewide Vehicle Classification Counts in 2002

Facility Type	No. Sites Sampled	Cars (%)	Motor-cycles (%)	Pickups, Panels, & Vans (%)	Buses (%)	Single Unit Trucks (%)	Tractor/ Trailer Trucks (%)	Total (%)	LDGVs Cars & Trucks (%)	HDVs (%)
RURAL										
Interstates	8	55.93	0.2	14.43	0.21	3.91	25.47	100	70.4	29.4
Principal Arterials	23	70.59	0.73	20.63	0.06	2.33	5.67	100	91.2	8
Minor Arterials	41	72.92	0.46	21.24	0.07	2.04	3.24	100	94.2	5.3
Major Collectors	11	67.06	1.69	27.05	0.01	1.97	2.18	100	94.1	4.2
Minor Collectors	4	68.56	0.97	27.8	0.05	1.92	0.71	100	96.4	2.6
Total Rural	87	64.6	0.45	18.28	0.13	2.94	13.66	100	82.9	16.6
URBAN										
Interstates	6	71.41	0.05	17.02	0.29	2.95	8.5	100	88.4	11.5
Freeways	1	78.58	0.28	14.26	0.04	2.03	4.86	100	92.8	6.9
Principal Arterials	19	78.48	0.45	16.04	0.11	2.03	2.94	100	94.5	5
Minor Arterials	26	81.63	0.38	14.3	0.12	1.77	1.86	100	95.9	3.6
Collectors	2	83.93	0.24	13.89	0.07	1.27	0.64	100	97.8	1.9
Total Urban	54	77.39	0.29	15.86	0.17	2.25	4.6	100	93.3	6.9
Total All Systems	141	72.92	0.35	16.71	0.16	2.49	7.77	100	89.6	10.3

TDOT only provided the truck fractions for single unit truck and multi truck categories in the report. The other vehicle categories, such as passenger cars, motorcycles, other 2- axle 4-tire vehicles, and buses, were grouped under “Other” category. Roadway classes in this analysis included interstates, arterials, and collectors for rural areas, and interstates, freeway/expressways, arterials, and collectors for urban areas. The 2002 rural and urban VMT fractions for the 95 counties among the two vehicle types are listed in Table 3-5.

3.4.2 Converting the 3 TDOT Classes to EPA’s 28 Vehicle Types

While TDOT provided VMT fractions of the 3 vehicle types, the EPA’s MOBILE6.2 model requires 16 vehicle categories for the VMT fraction input parameter. Therefore, to obtain VMT fractions by 16 vehicle types, the truck mix, provided by TDOT, needed to be allocated to the 16 vehicle types found in MOBILE6.2. However, it needed to be converted to 28 vehicle classes first since the MOBILE6.2 model provides the default VMT fractions for 28 vehicle types, then be consolidated to 16 vehicle types as required for input to EPA’s MOBILE6.2 model.

The two-type truck mixes provided by TDOT and the supplementary category, “Other”, were allocated among the 28 vehicle types output by MOBILE6.2. The 28 vehicle types were distributed within the 3 TDOT classes based on the national default distribution of vehicles within each of the 3 TDOT classes. The steps to do this procedure are described below.

Table 3-5. Truck Mix of the Two Categories Provided by TDOT

		RURAL						URBAN							
COUNTY		INTERSTATE		ARTERIALS		COLLECTOR		INTERSTATE		FW/EXPWY		ARTERIALS		COLLECTOR	
CODE	NAME	SUT	TT	SUT	TT	SUT	TT	SUT	TT	SUT	TT	SUT	TT	SUT	TT
1	Anderson	0.051	0.237	0.022	0.018	0.02	0.012					0.022	0.013	0.02	0.01
2	Bedford	0.06	0.22	0.037	0.058	0.022	0.011					0.031	0.041	0.024	0.011
3	Benton	0.07	0.33	0.053	0.102	0.027	0.011								
4	Bledsoe			0.044	0.03	0.023	0.01								
5	Blount	0.02	0.01	0.016	0.025	0.029	0.01	0.02	0.01	0.005	0.003	0.029	0.017	0.03	0.011
6	Bradley	0.044	0.217	0.027	0.04	0.031	0.012	0.05	0.24	0.031	0.039	0.022	0.022	0.026	0.01
7	Campbell	0.074	0.321	0.039	0.04	0.033	0.012					0.03	0.017	0.02	0.01
8	Cannon			0.026	0.022	0.027	0.01								
9	Carroll	0.06	0.3	0.039	0.054	0.03	0.02					0.026	0.036	0.021	0.011
10	Carter			0.042	0.03	0.026	0.01			0.04	0.1	0.029	0.013	0.025	0.01
11	Cheatham	0.051	0.208	0.029	0.008	0.029	0.011								
12	Chester			0.068	0.09	0.032	0.011					0.047	0.056	0.032	0.016
13	Claiborne			0.041	0.06	0.03	0.017								
14	Clay			0.04	0.04	0.02	0.01								
15	Cocke	0.03	0.311	0.031	0.014	0.026	0.01	0.03	0.304			0.028	0.011	0.025	0.01
16	Coffee	0.07	0.244	0.033	0.03	0.029	0.01	0.072	0.262			0.026	0.025	0.023	0.009
17	Crockett			0.023	0.114	0.03	0.012								
18	Cumberland	0.069	0.267	0.048	0.054	0.03	0.019	0.07	0.248			0.035	0.023	0.03	0.01
19	Davidson			0.029	0.012	0.048	0.036	0.035	0.128	0.023	0.037	0.026	0.018	0.034	0.01
20	Decatur	0.06	0.29	0.067	0.079	0.028	0.017								
21	Dekalb			0.05	0.027	0.026	0.013								
22	Dickson	0.07	0.35	0.024	0.014	0.03	0.01	0.07	0.349			0.03	0.011	0.025	0.01
23	Dyer	0.04	0.25	0.036	0.106	0.028	0.019	0.031	0.184	0.027	0.17	0.022	0.037	0.02	0.011
24	Fayette	0.06	0.331	0.037	0.04	0.027	0.013								
25	Fentress			0.031	0.05	0.03	0.014								
26	Franklin			0.031	0.036	0.028	0.013					0.029	0.023	0.021	0.01
27	Gibson			0.03	0.043	0.027	0.014					0.033	0.028	0.024	0.01
28	Giles	0.03	0.411	0.042	0.05	0.028	0.01					0.035	0.026	0.023	0.01
29	Grainger			0.029	0.063	0.029	0.011								
30	Greene	0.039	0.288	0.048	0.034	0.029	0.011					0.026	0.023	0.027	0.01
31	Grundy	0.09	0.279	0.026	0.034	0.048	0.03								
32	Hamblen	0.034	0.286	0.042	0.026	0.029	0.011	0.049	0.25			0.029	0.017	0.026	0.01
33	Hamilton	0.047	0.181	0.045	0.046	0.027	0.01	0.046	0.137	0.039	0.03	0.025	0.013	0.024	0.01
34	Hancock			0.028	0.013	0.022	0.011								
35	Hardeman			0.039	0.054	0.024	0.01					0.026	0.031	0.023	0.01
36	Hardin			0.047	0.083	0.031	0.017					0.028	0.032	0.02	0.01
37	Hawkins			0.032	0.034	0.031	0.011					0.028	0.017	0.024	0.01
38	Haywood	0.072	0.347	0.037	0.047	0.032	0.018	0.07	0.336			0.031	0.023	0.031	0.012
39	Henderson	0.06	0.317	0.061	0.066	0.048	0.023					0.032	0.038	0.026	0.012
40	Henry			0.04	0.078	0.038	0.021					0.025	0.031	0.03	0.011
41	Hickman	0.07	0.34	0.032	0.027	0.03	0.02								
42	Houston			0.026	0.024	0.033	0.013								
43	Humphreys	0.07	0.34	0.039	0.08	0.023	0.01								
44	Jackson			0.037	0.029	0.026	0.02								
45	Jefferson	0.048	0.256	0.029	0.037	0.027	0.011	0.05	0.24			0.024	0.022	0.027	0.014
46	Johnson			0.034	0.05	0.038	0.013								
47	Knox	0.045	0.146	0.029	0.021	0.025	0.013	0.037	0.102	0.01	0.02	0.019	0.021	0.026	0.014
48	Lake			0.056	0.048	0.023	0.013								

Units in fraction
FW/EXPWY stands for freeway/expressway
SUT stands for Single Unit Truck
TT stands for Tractor Trailer

Table 3-5. Continued.

		RURAL						URBAN							
COUNTY		INTERSTATE		ARTERIALS		COLLECTOR		INTERSTATE		FW/EXPWY		ARTERIALS		COLLECTOR	
CODE	NAME	SUT	TT	SUT	TT	SUT	TT	SUT	TT	SUT	TT	SUT	TT	SUT	TT
49	Lauderdale			0.059	0.067	0.032	0.02					0.04	0.027	0.018	0.009
50	Lawrence			0.04	0.054	0.037	0.013					0.033	0.023	0.02	0.01
51	Lewis			0.043	0.048	0.028	0.01								
52	Lincoln			0.049	0.076	0.031	0.016					0.035	0.042	0.02	0.01
53	Loudon	0.054	0.22	0.032	0.048	0.026	0.012	0.05	0.205			0.032	0.014	0.036	0.01
54	McMinn	0.042	0.303	0.037	0.036	0.03	0.017	0.04	0.317			0.027	0.017	0.02	0.01
55	McNairy			0.056	0.096	0.032	0.012								
56	Macon			0.03	0.03	0.026	0.014								
57	Madison	0.06	0.309	0.031	0.053	0.032	0.011	0.052	0.254			0.024	0.028	0.024	0.011
58	Marion	0.083	0.248	0.021	0.045	0.038	0.016								
59	Marshall	0.03	0.34	0.036	0.028	0.023	0.011	0.03	0.34			0.034	0.015	0.031	0.015
60	Maury	0.03	0.319	0.041	0.033	0.033	0.01	0.03	0.295	0.064	0.055	0.024	0.026	0.033	0.01
61	Meigs			0.046	0.052	0.022	0.011								
62	Monroe	0.04	0.262	0.03	0.031	0.031	0.01	0.04	0.27			0.031	0.017	0.02	0.01
63	Montgomery	0.04	0.31	0.03	0.026	0.039	0.011	0.032	0.236			0.029	0.021	0.032	0.011
64	Moore			0.03	0.058	0.036	0.013								
65	Morgan			0.029	0.032	0.03	0.011								
66	Obion			0.037	0.074	0.03	0.016					0.03	0.038	0.032	0.01
67	Overton			0.043	0.04	0.024	0.01								
68	Perry			0.04	0.07	0.03	0.039								
69	Pickett			0.042	0.06	0.026	0.009								
70	Polk			0.031	0.051	0.031	0.018								
71	Putnam	0.051	0.239	0.036	0.02	0.038	0.01	0.05	0.256	0.031	0.058	0.021	0.01	0.035	0.01
72	Rhea			0.036	0.051	0.021	0.01					0.03	0.029	0.03	0.015
73	Roane	0.061	0.23	0.03	0.019	0.026	0.01	0.058	0.213			0.032	0.01	0.023	0.01
74	Robertson	0.044	0.191	0.03	0.027	0.021	0.013	0.046	0.152			0.025	0.019	0.022	0.01
75	Rutherford	0.043	0.194	0.033	0.054	0.035	0.013	0.024	0.146	0.05	0.14	0.058	0.017	0.028	0.01
76	Scott			0.046	0.048	0.03	0.01								
77	Sequatchie			0.06	0.082	0.02	0.013								
78	Sevier			0.01	0.018	0.038	0.01	0.055	0.205			0.022	0.013	0.046	0.01
79	Shelby	0.06	0.33	0.035	0.016	0.035	0.015	0.039	0.113	0.02	0.01	0.026	0.018	0.023	0.011
80	Smith	0.052	0.264	0.039	0.02	0.024	0.016								
81	Stewart			0.039	0.058	0.036	0.012								
82	Sullivan	0.03	0.276	0.027	0.021	0.03	0.01	0.028	0.191	0.017	0.028	0.022	0.014	0.023	0.01
83	Sumner	0.05	0.16	0.019	0.025	0.027	0.011	0.045	0.15	0.03	0.01	0.033	0.017	0.022	0.011
84	Tipton			0.042	0.052	0.024	0.011					0.036	0.055	0.039	0.012
85	Trousdale			0.038	0.05	0.02	0.01								
86	Unicoi			0.04	0.092	0.036	0.018					0.046	0.031	0.036	0.011
87	Union			0.028	0.05	0.03	0.01								
88	Van Buren			0.04	0.079	0.036	0.011								
89	Warren			0.039	0.041	0.032	0.01					0.036	0.02	0.026	0.01
90	Washington	0.03	0.24	0.04	0.017	0.029	0.01	0.02	0.045	0.04	0.1	0.037	0.016	0.033	0.012
91	Wayne			0.034	0.073	0.033	0.016								
92	Weakley			0.036	0.031	0.027	0.014					0.025	0.014	0.02	0.01
93	White			0.036	0.06	0.028	0.011								
94	Williamson	0.033	0.218	0.022	0.044	0.028	0.013	0.02	0.101			0.025	0.019	0.026	0.011
95	Wilson	0.042	0.258	0.03	0.045	0.026	0.011	0.03	0.211	0.05	0.14	0.029	0.021	0.026	0.01

Units in fraction

FW/EXPWY stands for freeway/expressway

SUT stands for Single Unit Truck

TT stands for Tractor Trailer

(1) The 2002 default MOBILE6.2 VMT fractions for 28 vehicle types were obtained by running the MOBILE6.2 model for calendar year 2002. This is shown in Table 3-6.

(2) Each of the 28 MOBILE6.2 vehicle types was assigned to one of the 3 TDOT vehicle type classifications.

   a. HDGV3, HDDV3, HDGV4, HDDV4, HDGV5, HDDV5, HDGV6, HDDV6, HDGV7, HDDV7, HDGB, HDDBT, and HDDBS were assigned to the single-unit truck (SUT) category.

   b. HDGV8A, HDDV8A, HDGV8B, and HDDV8B were assigned to the tractor-trailer (TT) truck category.

   c. LDGV, LDDV, MC, LDGT1, LDGT2, LDGT3, LDGT4, LDDT12, LDDT34, HDGV2B, and HDDV2B were assigned to the “others” category

(3) The MOBILE6.2 default VMT fractions for each vehicle type were apportioned to three vehicle categories as defined by TDOT. The percentage of the VMT attributable to each EPA vehicle type within each TDOT vehicle classification was calculated and is shown in Table 3-6.

(4) The TDOT VMT fractions for each roadway type were separately multiplied by the apportioned VMT fractions for each MOBILE6.2 vehicle type included within the TDOT vehicle category.

Table 3-7 shows the results for Knox County, one of the 95 counties in Tennessee. For example, the multi truck category included the MOBILE 6.2 HDGV8A, HDGV8B,

Table 3-6. Apportioned VMT Fraction for the 28 Vehicle Types.

Vehicle category by TDOT definition	MOBILE6 vehicle category	MOBILE6 default VMT for 2002	Apportioned VMT fraction (percent)
SINGLE UNIT TRUCK	HDGV3	0.001027	3.39%
	HDGV4	0.000522	1.72%
	HDGV5	0.001164	3.84%
	HDGV6	0.002489	8.22%
	HDGV7	0.001132	3.74%
	HDDV3	0.002778	9.18%
	HDDV4	0.002438	8.05%
	HDDV5	0.001085	3.58%
	HDDV6	0.005944	19.63%
	HDDV7	0.008851	29.24%
	HDGB	0.000496	1.64%
	HDDBT	0.000926	3.06%
	HDDBS	0.001423	4.70%
	Total	0.030275	100.00%
MULTI TRUCK	HDGV8A	0.000004	0.01%
	HDGV8B	0	0.00%
	HDDV8A	0.010936	21.91%
	HDDV8B	0.038966	78.08%
	Total	0.049906	100.00%
OTHERS	LDGV	0.463793	50.42%
	LDDV	0.000781	0.08%
	MC	0.005983	0.65%
	LDGT1	0.070491	7.66%
	LDGT2	0.234672	25.51%
	LDGT3	0.071379	7.76%
	LDGT4	0.032825	3.57%
	LDDT12	0.000221	0.02%
	LDDT34	0.001451	0.16%
	HDGV2B	0.028896	3.14%
	HDDV2B	0.009326	1.01%
	Total	0.919818	100.00%
TOTAL		1.000	

Table 3-7. VMT Fractions for the Knox County

47 Knox				RURAL						URBAN							
				INTERSTATE		ARTERIALS		COLLECTOR & LOCAL		INTERSTATE & RAMP		FW/EXPWY		ARTERIALS		COLLECTOR & LOCAL	
Vehicle category by TDOT definition	MOBILE6 vehicle category	MOBILE6 default VMT for 2002	Apportioned VMT fraction (percent)	Vehicle fraction provided by TDOT	Allocated vehicle fraction	Vehicle fraction provided by TDOT	Allocated vehicle fraction	Vehicle fraction provided by TDOT	Allocated vehicle fraction	Vehicle fraction provided by TDOT	Allocated vehicle fraction	Vehicle fraction provided by TDOT	Allocated vehicle fraction	Vehicle fraction provided by TDOT	Allocated vehicle fraction	Vehicle fraction provided by TDOT	Allocated vehicle fraction
	HDGV3	0.001027	3.39%		0.00153		0.00098		0.00085		0.00126		0.00034		0.00064		0.00088
	HDGV4	0.000522	1.72%		0.00078		0.00050		0.00043		0.00064		0.00017		0.00033		0.00045
	HDGV5	0.001164	3.84%		0.00173		0.00111		0.00096		0.00142		0.00038		0.00073		0.00100
	HDGV6	0.002489	8.22%		0.00370		0.00238		0.00206		0.00304		0.00082		0.00156		0.00214
	HDGV7	0.001132	3.74%		0.00168		0.00108		0.00093		0.00138		0.00037		0.00071		0.00097
SINGLE	HDDV3	0.002778	9.18%		0.00413		0.00266		0.00229		0.00340		0.00092		0.00174		0.00239
UNIT	HDDV4	0.002438	8.05%	0.045	0.00362	0.029	0.00234	0.025	0.00201	0.037	0.00298	0.010	0.00081	0.019	0.00153	0.026	0.00209
TRUCK	HDDV5	0.001085	3.58%		0.00161		0.00104		0.00090		0.00133		0.00036		0.00068		0.00093
	HDDV6	0.005944	19.63%		0.00884		0.00569		0.00491		0.00726		0.00196		0.00373		0.00510
	HDDV7	0.008851	29.24%		0.01316		0.00848		0.00731		0.01082		0.00292		0.00555		0.00760
	HDGB	0.000496	1.64%		0.00074		0.00048		0.00041		0.00061		0.00016		0.00031		0.00043
	HDDBT	0.000926	3.06%		0.00138		0.00089		0.00076		0.00113		0.00031		0.00058		0.00080
	HDDBS	0.001423	4.70%		0.00212		0.00136		0.00118		0.00174		0.00047		0.00089		0.00122
	Total	0.030275	100.00%														
	HDGV8A	0.000004	0.01%		0.00001		0.00000		0.00000		0.00001		0.00000		0.00000		0.00000
MULTI	HDGV8B	0	0.00%	0.146	0.00000	0.021	0.00000	0.013	0.00000	0.102	0.00000	0.020	0.00000	0.021	0.00000	0.014	0.00000
TRUCK	HDDV8A	0.010936	21.91%		0.03199		0.00460		0.00285		0.02235		0.00438		0.00460		0.00307
	HDDV8B	0.038966	78.08%		0.11400		0.01640		0.01015		0.07964		0.01562		0.01640		0.01093
	Total	0.049906	100.00%														
	LDGV	0.463793	50.42%		0.40792		0.47901		0.48506		0.43414		0.48910		0.48405		0.48405
	LDDV	0.000781	0.08%		0.00069		0.00081		0.00082		0.00073		0.00082		0.00082		0.00082
	MC	0.005983	0.65%		0.00526		0.00618		0.00626		0.00560		0.00631		0.00624		0.00624
	LDGT1	0.070491	7.66%		0.06200		0.07280		0.07372		0.06598		0.07434		0.07357		0.07357
	LDGT2	0.234672	25.51%	0.809	0.20640	0.950	0.24237	0.962	0.24543	0.861	0.21967	0.970	0.24747	0.960	0.24492	0.960	0.24492
OTHERS	LDGT3	0.071379	7.76%		0.06278		0.07372		0.07465		0.06681		0.07527		0.07450		0.07450
	LDGT4	0.032825	3.57%		0.02887		0.03390		0.03433		0.03073		0.03462		0.03426		0.03426
	LDDT12	0.000221	0.02%		0.00019		0.00023		0.00023		0.00021		0.00023		0.00023		0.00023
	LDDT34	0.001451	0.16%		0.00128		0.00150		0.00152		0.00136		0.00153		0.00151		0.00151
	HDGV2B	0.028896	3.14%		0.02541		0.02984		0.03022		0.02705		0.03047		0.03016		0.03016
	HDDV2B	0.009326	1.01%		0.00820		0.00963		0.00975		0.00873		0.00983		0.00973		0.00973
	Total	0.919818	100.00%														
TOTAL		1.000		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

HDDV8A, and HDDV8B vehicle types. The default 2002 MOBILE6.2 VMT fraction for HDDV8Bs was divided by the sum of the HDGV8A, HDGV8B, HDDV8A, and HDDV8B default 2002 MOBILE6.2 VMT fractions. This yielded a value of 78.08%. This number was multiplied by the TDOT vehicle fraction for the multi truck category. Thus, the allocated vehicle fraction for HDDV8B was obtained. In the case of rural interstates in Knox County, this yielded a value of 0.114. This was done separately for each roadway type in rural and urban areas. Table 3-7 shows the result of the allocated vehicle fractions for 28 MOBILE6.2 vehicle types for Knox County.

3.4.3 Use of Developed VMT Fraction in the MOBILE6.2 Model

The VMT fraction values for 28 vehicle types were generated at the county and roadway type level. However, the MOBILE6.2 model requires VMT fractions for 16 combined vehicle types as an input. Many of the 28 individual classes are in pairs: a gasoline-fueled class and a corresponding diesel-fueled class.

The 16 vehicle classes required as an input in the MOBILE6.2 model are:

1) LDV: Light-Duty Vehicles (Passenger Cars)
2) LDT1: Light-Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3,750 lbs. LVW)
3) LDT2: Light-Duty Trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)
4) LDT3: Light-Duty Trucks 3 (6,001-8,500 lbs. GVWR, 0-3,750 lbs. LVW)
5) LDT4: Light-Duty Trucks 4 (6,001-8,500 lbs. GVWR, 3,751-5,750 lbs. LVW)
6) HDV2B: Class 2b Heavy Duty Vehicles (8,501-10,000 lbs. GVWR)
7) HDV3: Class 3 Heavy Duty Vehicles (10,001-14,000 lbs. GVWR)
8) HDV4: Class 4 Heavy Duty Vehicles (14,001-16,000 lbs. GVWR)

9) HDV5: Class 5 Heavy Duty Vehicles (16,001-19,500 lbs. GVWR)
10) HDV6: Class 6 Heavy Duty Vehicles (19,501-26,000 lbs. GVWR)
11) HDV7: Class 7 Heavy Duty Vehicles (26,001-33,000 lbs. GVWR)
12) HDV8A: Class 8a Heavy Duty Vehicles (33,001-60,000 lbs. GVWR)
13) HDV8B: Class 8b Heavy Duty Vehicles (>60,000 lbs. GVWR)
14) HDBS: School Buses
15) HDBT: Transit and Urban Buses
16) MC: Motorcycles (All)

The VMT fractions for the 28 vehicle classes were regrouped, resulting in 16 classes as follows: LDV (LDGV + LDDV), LDT1 (LDGT1), LDT2 (LDGT2 + LDDT12), LDT3 (LDGT3), LDT4 (LDGT4 + LDDT34), HDV2B (HDGV2B + HDDV2B), HDV3 (HDGV3 + HDDV3), HDV4 (HDGV4 + HDDV4), HDV5 (HDGV5 + HDDV5), HDV6 (HDGV6 + HDDV6), HDV7 (HDGV7 + HDDV7), HDV8A (HDGV8A + HDDV8A), HDV8B (HDGV8B + HDDV8B), HDBS (HDGB + HDDBS), HDBT (HDDBT), and MC (MC). The new VMT fractions for the 16 combined vehicle types were in the right input format in the MOBILE6.2 model. This procedure was applied to the 95 counties. The VMT fractions for the 95 counties are listed in Appendix A. In the MOBILE6.2 model, the 16 vehicle types were split into the 28 vehicle types internally by accounting for national diesel sales fractions and annual mileage accumulation rates.

3.5 Registration Age Distribution

Registration distribution by age is the fraction of vehicles by age in the fleet. Since inventory guidance requires the use of locality specific distributions, area specific registration distributions for the state of Tennessee were developed from the 2001 registration data obtained from the Tennessee Department of Safety, Title and Registration Division by the Department of Civil and Environmental Engineering at the University of Tennessee.[18]

The registration distributions by age were developed based on the model year 2001 reported in vehicle registration records. This was developed only for the two major vehicle categories. One is the light-duty vehicle (LDV) category, which is for passenger cars less than 8500 lbs gross vehicle weight (GVW). Another one is the light-duty truck (LDT) category, which includes LDT1 and LDT2 for less than 6000 lbs GVW, and LDT3 and LDT4 for 6001-8500 lbs GVW.

For the development of registration distributions by age, the 95 counties were grouped into six area subgroupings, based on a Metropolitan Statistical Area (MSA).

1) "Shelby +"; Shelby, Tipton, and Fayette Counties
2) "Davidson +"; Davidson, Sumner, Wilson, Williamson, and Rutherford Counties
3) "Hamilton +"; Hamilton and Marion Counties
4) "Knox +"; Knox, Anderson, Loudon, Blount, Sevier, Union, and Jefferson Counties
5) "Sullivan +"; Sullivan, Hawkins, Washington, Carter, and Unicoi Counties

6) "All Others"; All Other TN Counties

Since the fraction of vehicles in each age was calculated based on the actual vehicle counts in a certain year, it cannot be applied for future years without deriving a best-fit curve. The plots of the fractions showed a bell-shaped curve.

The developed registration distributions by age for the six area subgroups for the two vehicle classifications are shown in Table 3-8[18]. Figures 3-1[18] and 3-2[18] illustrate the curves of LDV and LDT, respectively, for the 6 areas and the national default. The developed registration distributions by age were used as an input to the MOBILE6.2 model. Since the registration distribution was completed only for the two vehicle categories, LDV and LDT (LDT 1, 2, 3, and 4), the national default values in the MOBILE6.2 model were used for the rest, eleven vehicle categories. A different approach was applied for the case of "All Others" because it is assumed that in a rural county where a major interstate flows through, the majority of vehicles on the interstate are possibly a part of the "through" traffic, not necessarily registered in that county. For a county under "All Others" category where the total interstate (interstate + freeway) DVMT (daily vehicle miles traveled) exceeded 50% of the total DVMT, the national default values were used, not the developed registration fractions.

3.6 Average Speed Values

MOBILE6.2 defines average speed as the distance traveled (in miles) divided by the time (in hours). It also factors in obstacles that may cause vehicles to stop or idle. Vehicle emissions are affected by the transient behavior of vehicles as they travel. The MOBILE6.2 model captures this effect using average speed. The Technical Guidance on

Table 3-8. Registration Age Distribution for Light Duty Trucks (LDT) and Light Duty Vehicles (LDV)

	SHELBY +		DAVIDSON +		HAMILTON +		KNOX +		SULLIVAN +		ALL OTHERS IN TN		NATIONAL DEFAULTS		
Age	**LDV**	**LDT**	**LDV**	**LDT**	**LDV**	**LDT**	**LDV**	**LDT**	**LDV**	**LDT**	**LDV**	**LDT**	**LDV**	**LDT1&2**	**LDT3&4**
1	0.0592	0.0613	0.0641	0.0607	0.0446	0.0456	0.0481	0.0577	0.0355	0.0427	0.0298	0.0369	0.053	0.0581	0.0594
2	0.0780	0.0795	0.0769	0.0794	0.0519	0.0654	0.0596	0.0678	0.0418	0.0515	0.0428	0.0479	0.0706	0.0774	0.0738
3	0.0780	0.0781	0.0780	0.0794	0.0559	0.0653	0.0618	0.0662	0.0463	0.0527	0.0481	0.0502	0.0706	0.0769	0.0688
4	0.0771	0.0760	0.0780	0.0783	0.0592	0.0647	0.0632	0.0644	0.0504	0.0535	0.0531	0.0520	0.0705	0.076	0.064
5	0.0752	0.0732	0.0767	0.0762	0.0617	0.0635	0.0639	0.0622	0.0540	0.0540	0.0575	0.0533	0.0703	0.0745	0.0597
6	0.0724	0.0698	0.0743	0.0732	0.0633	0.0619	0.0637	0.0598	0.0569	0.0540	0.0610	0.0542	0.0698	0.0723	0.0556
7	0.0688	0.0659	0.0709	0.0694	0.0639	0.0598	0.0628	0.0571	0.0590	0.0536	0.0634	0.0545	0.0689	0.0693	0.0518
8	0.0645	0.0616	0.0665	0.0649	0.0634	0.0574	0.0611	0.0543	0.0601	0.0528	0.0647	0.0543	0.0676	0.0656	0.0482
9	0.0597	0.0569	0.0615	0.0599	0.0620	0.0546	0.0588	0.0513	0.0603	0.0515	0.0647	0.0535	0.0655	0.061	0.0449
10	0.0546	0.0521	0.0560	0.0545	0.0596	0.0515	0.0558	0.0482	0.0595	0.0500	0.0635	0.0523	0.0627	0.0557	0.0419
11	0.0492	0.0473	0.0502	0.0490	0.0564	0.0482	0.0523	0.0451	0.0577	0.0481	0.0610	0.0505	0.0588	0.0498	0.039
12	0.0438	0.0424	0.0443	0.0434	0.0525	0.0447	0.0485	0.0419	0.0551	0.0459	0.0576	0.0484	0.0539	0.0436	0.0363
13	0.0385	0.0377	0.0385	0.0380	0.0480	0.0412	0.0443	0.0387	0.0517	0.0434	0.0532	0.0459	0.0458	0.0372	0.0338
14	0.0334	0.0331	0.0329	0.0328	0.0433	0.0376	0.0400	0.0356	0.0477	0.0408	0.0483	0.0431	0.0363	0.0309	0.0315
15	0.0286	0.0289	0.0277	0.0279	0.0384	0.0341	0.0357	0.0325	0.0434	0.0380	0.0429	0.0400	0.0288	0.0249	0.0294
16	0.0242	0.0249	0.0230	0.0235	0.0335	0.0307	0.0315	0.0295	0.0387	0.0351	0.0374	0.0368	0.0228	0.0195	0.0274
17	0.0202	0.0212	0.0187	0.0195	0.0287	0.0273	0.0274	0.0267	0.0340	0.0322	0.0320	0.0335	0.0181	0.0147	0.0255
18	0.0166	0.0179	0.0151	0.0159	0.0243	0.0242	0.0235	0.0240	0.0294	0.0294	0.0268	0.0303	0.0144	0.0107	0.0237
19	0.0135	0.0150	0.0119	0.0129	0.0202	0.0212	0.0200	0.0214	0.0250	0.0265	0.0220	0.0270	0.0114	0.0085	0.0221
20	0.0108	0.0124	0.0093	0.0102	0.0165	0.0185	0.0167	0.0191	0.0209	0.0238	0.0177	0.0239	0.009	0.0081	0.0206
21	0.0086	0.0102	0.0071	0.0081	0.0133	0.0159	0.0139	0.0168	0.0172	0.0211	0.0140	0.0209	0.0072	0.0078	0.0192
22	0.0067	0.0083	0.0054	0.0063	0.0105	0.0137	0.0113	0.0148	0.0139	0.0186	0.0109	0.0181	0.0057	0.0075	0.0179
23	0.0052	0.0066	0.0040	0.0048	0.0082	0.0116	0.0091	0.0129	0.0111	0.0163	0.0082	0.0156	0.0045	0.0072	0.0167
24	0.0039	0.0053	0.0029	0.0036	0.0063	0.0098	0.0073	0.0112	0.0087	0.0142	0.0061	0.0132	0.0036	0.0069	0.0156
25	0.0030	0.0042	0.0021	0.0027	0.0047	0.0082	0.0057	0.0097	0.0067	0.0122	0.0045	0.0111	0.0102	0.0359	0.0732
26	0.0022	0.0032	0.0015	0.0020	0.0035	0.0068	0.0045	0.0084	0.0051	0.0104	0.0032	0.0093			
27	0.0016	0.0025	0.0010	0.0014	0.0026	0.0056	0.0034	0.0071	0.0038	0.0089	0.0023	0.0077			
28	0.0012	0.0019	0.0007	0.0010	0.0018	0.0045	0.0026	0.0061	0.0028	0.0074	0.0016	0.0063			
29	0.0008	0.0014	0.0005	0.0007	0.0013	0.0037	0.0020	0.0051	0.0020	0.0062	0.0010	0.0051			
30	0.0006	0.0011	0.0003	0.0005	0.0009	0.0030	0.0014	0.0043	0.0014	0.0052	0.0007	0.0041			
Total	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

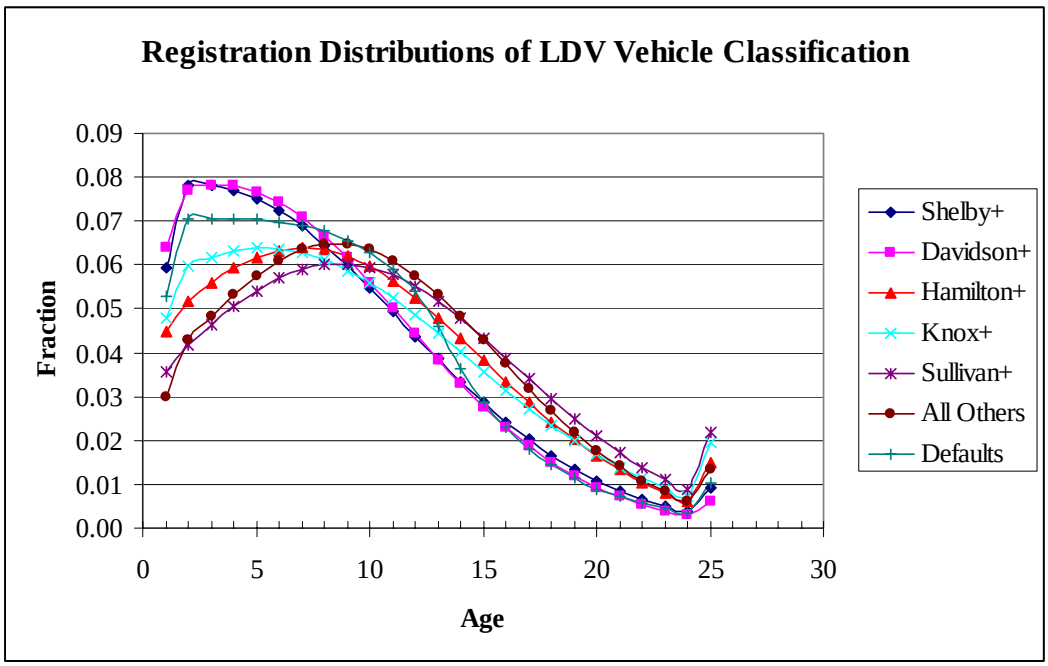

Figure 3-1. Registration Distributions of LDV Vehicle Classification in TN

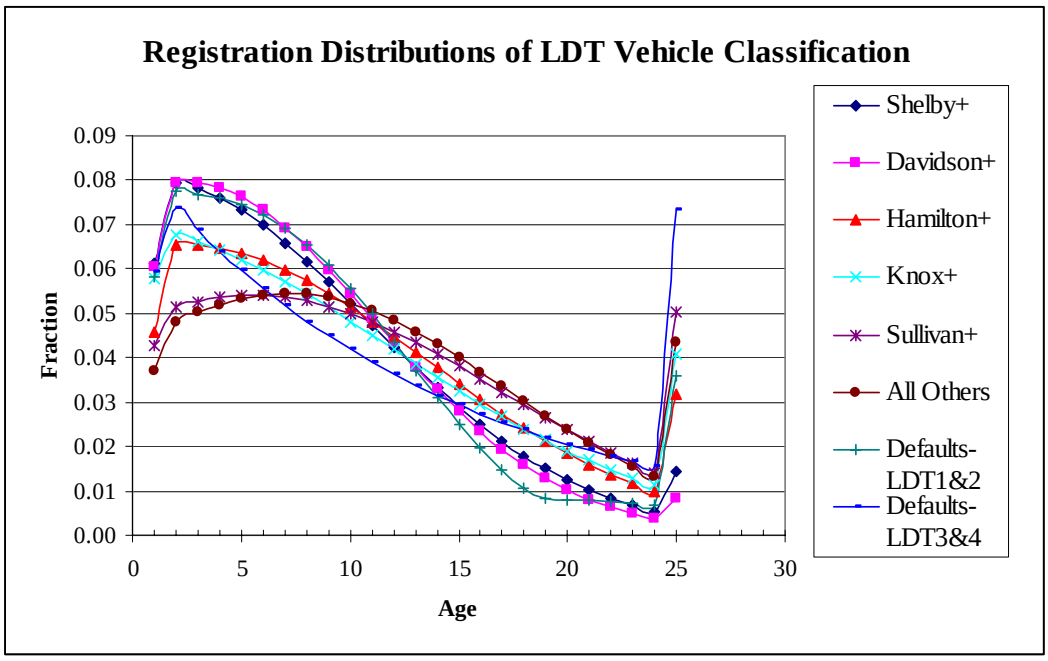

Figure 3-2. Registration Distributions of LDT Vehicle Classification in TN

the Use of MOBILE6 for Emissions Inventory Preparation suggests that the distribution of VMT by average speed be used as an input into the model. This is due to the fact that the distribution of VMT by average speed influences overall daily emissions.

3.6.1 Methodology

The average speed values as an input to the MOBILE6.2 model are required only for interstate and arterial roadway types. However, the average speed values for all 12 roadway types for both rural and urban areas were used as an input to the model. The technical guidance suggests that the model default speed values be used for local and ramp roadway types, 12.9 miles per hour (mph) and 34.6 mph, respectively. However, the value for the local roadway types does not seem reasonable for Tennessee, and no data is available on VMT on interstate ramps.

The average speeds for each roadway type that have been used in previous emission inventories for Tennessee[18] are summarized in Table 3-9[18]. These average speeds were obtained from different studies, including transportation modeling studies and floating car travel speed studies conducted in the Memphis, Nashville, and Knoxville Metropolitan Planning Areas in Tennessee. Table 3-9 shows the speed values from each study and the average speeds determined from these studies to use as an input to the model. This table also shows the speed values from federal test procedure, national acid precipitation study, and default speeds in procedures for emission inventory preparation.

TDOT measured vehicle speeds at 114 locations in 2003.[23] The tables of summary of vehicle speed measurements and distribution of vehicle speeds measured by TDOT are attached to Appendix I. The average speed measured in rural interstates was

Table 3-9. Vehicle Speeds Used in Previous Emission Inventories in Tennessee and USA

	Rural Areas - All Speeds in Miles Per Hour					
Source	**Interstates**	**Prin Arterials or Expressway**	**Min Arterials**	**Major Collectors**	**Minor Collectors**	**Local Streets**
FTP	19.6	19.6	19.6	19.6	19.6	19.6
NAPAP	55	45	45	45	45	45
Default speed in Inventory Guidance*	57.3	45.4	39.9	35.1	30.5	30.5
Knox MPO Trans Plan- 1997	**62.5**	**47.5**	**37.5**	**37.5**	**37.5**	**30**
Memphis MPO Plan - 2000	**64**	**42.9**	**41**	**39.2**	**39.2**	**24.3**
Knox Travel Speeds Study	**64.9**	**46.6**	**46.6**	**35.1**	**35.1**	
Nashville Speeds Study		**42.6**	**42.6**			
Average Last 4:	**63.8**	**44.9**	**41.9**	**37.3**	**37.3**	**27.2**
Standard Deviation	1.2	2.5	3.8	2.1	2.1	4

	Urban Areas - All Speeds in Miles Per Hour					
Source	**Interstates**	**Freeways**	**Prin Arterials**	**Minor Arterials**	**Collectors**	**Local Streets**
FTP	19.6	19.6	19.6	19.6	19.6	19.6
NAPAP	19.6	19.6	19.6	19.6	19.6	19.6
Default speed in Inventory Guidance*	46.3	43.3	18.9	19.6	19.6	19.6
Knox MPO Trans Plan - 1997	**52.5**	**42.5**	**32.5**	**32.5**	**27.5**	**25**
Memphis MPO Plan - 2000	**58**	**42.8**	**37.3**	**35.8**	**35.8**	**19**
Nashville MPO Plan - 1998	**55.9**		**34.5**	**34.5**		**18.7**
Knox Travel Speeds Study	**55.2**	**51.2**	**30.6**	**30.6**	**21.9**	
Nashville Speeds Study	**52.7**		**32.8**	**32.8**	**31.9**	
Average Last 5:	**54.9**	**45.5**	**33.5**	**33.2**	**29.3**	**20.9**
Standard Deviation	2.3	4.9	2.5	2	6	3.6

FTP = Federal Test Procedure

NAPAP = National Acid Precipitation Study

* Default Speeds in Procedure For Emission Inventory Preparation, Vol IV Mobile Sources, EPA-450/4-81-026

70.8 mph, with a standard deviation of 7 mph. The posted speed limit for rural interstates is 70 mph. The average speed measured in urban interstates was 60.7 mph, with a standard deviation of 9 mph, while the posted speed limit is 55 mph. The average speed measured in principal arterials, where posted speed limit is 55 mph, was 58.4 mph with a standard deviation of 6 mph. These measured speed values are shown in Table 3-10. The 2003 TDOT speed study was conducted only for these roadway types where posted speed limits are above 55 mph.

The average speed values used in the model were obtained for 12 roadway types for rural and urban areas. These values were obtained by comparing three different values from the different sources. The first source was the National Emission Inventory (NEI) documentation.[22] The second source was the speed values used in the previous Tennessee emission inventory.[18] The third source was from TDOT measurements in 2003. The summary of the 3 sources and the average speeds used in the model is shown in Table 3-10. The reason why the speed value for rural interstates is 65 mph is because the speed range allowed in the model does not include 70 mph. The model can handle 2.5 mph though 65 mph (maximum speed handled by MOBILE 6.2).

Since the MOBILE6.2 model simulates only four roadway types, which are freeway, arterial/collector, local, and freeway ramp, the average speeds for principal arterial, minor arterial, major collector, and minor collector roadway types were considered as the “arterial” category as far as the model run is concerned. Local roadway type was also considered as the “arterial” category since there is no way to use specific speed values for a local roadway type in the MOBILE6.2 model. The freeway category was used for both interstate and freeway/expressway roadway types for the model runs.

Table 3-10. Vehicle Speeds from 3 Different Sources and the Average Speeds Used in the Model

Roadway Type	NEI Doc. Defaults for LDVs (mph)	Tennessee Speeds from Table 3-9 (mph)	TDOT Measured in 2003 (mph)	Use in the Model (mph)
Rural Interstate	60	63.8	70.8	65
Rural Principal Arterial	45	44.9		45
Rural Minor Arterial	40	41.9		40
Rural Major Collector	35	37.3		35
Rural Minor Collector	30	37.3		30
Rural Local	30	27.2		30
Urban Interstate	45	54.9	60.7	60
Urban Freeway	45	45.5		45
Urban Principal Arterial	20	33.5		30
Urban Minor Arterial	20	33.2		30
Urban Collector	20	29.3		30
Urban Local	20	20.9		20

4 RUNNING THE MOBILE6.2 MODEL

4.1 How to Run the MOBILE6.2 Model

The MOBILE6.2 model runs were done separately for each county for rural and urban area classifications. The model run for rural areas contained scenarios for 12 months and 6 roadway types, and for urban areas 12 months and 7 roadway types. The 95 counties in Tennessee were divided by three regional areas, East Tennessee, Middle Tennessee, and West Tennessee, to use the representative temperatures and absolute humidity for each region, instead of using county-level specific values. The counties in each regional area are listed in Table 4-1. Minimum and maximum temperatures, and absolute humidity values for 12 months were dependent upon the region (East, Middle, or West TN) where the county is located. These values are shown in Table 3-1, 3-2, and 3-3.

Registration distribution data were developed for 6 areas: Nashville, Knoxville, Memphis, Chattanooga, Tri-Cities area, and the rest of areas in Tennessee. Therefore, 6 different registration distribution data were applied to 6 areas, depending on the location of the county. The registration distribution data did not change between urban and rural roadway classifications. Figure 4-1[23] presents a map showing the counties in the 6 area subgroups and the counties classified in each region; East, Middle, and West Tennessee.

For those counties whose interstate traffic accounted for more than 50% of the total DVMT, the national default registration distribution was applied. There were 8 counties with greater than 50% interstate DVMT; Cumberland and Campbell counties in the East Tennessee region, Putnam, Smith, Robertson, and Humphreys counties in the

Table 4-1. The List of Counties in Each Region.

COUNTY CODE	EAST AREA	COUNTY CODE	MIDDEL AREA	COUNTY CODE	WEST AREA
1	ANDERSON	2	BEDFORD	3	BENTON
4	BLEDSOE	8	CANNON	9	CARROLL
5	BLOUNT	11	CHEATHAM	12	CHESTER
6	BRADLEY	14	CLAY	17	CROCKETT
7	*CAMPBELL*	16	COFFEE	20	DECATUR
10	CARTER	19	DAVIDSON	23	DYER
13	CLAIBORNE	21	DE KALB	24	FAYETTE
15	COCKE	22	DICKSON	27	GIBSON
18	*CUMBERLAND*	25	FENTRESS	35	HARDEMAN
29	GRAINGER	26	FRANKLIN	36	HARDIN
30	GREENE	28	GILES	38	*HAYWOOD*
32	HAMBLEN	31	GRUNDY	39	*HENDERSON*
33	HAMILTON	41	HICKMAN	40	HENRY
34	HANCOCK	42	HOUSTON	48	LAKE
37	HAWKINS	43	*HUMPHREYS*	49	LAUDERDALE
45	JEFFERSON	44	JACKSON	55	MC NAIRY
46	JOHNSON	50	LAWRENCE	57	MADISON
47	KNOX	51	LEWIS	66	OBION
53	LOUDON	52	LINCOLN	79	SHELBY
54	MC MINN	56	MACON	84	TIPTON
58	MARION	59	MARSHALL	92	WEAKLY
61	MEIGS	60	MAURY		
62	MONROE	63	MONTGOMERY		
65	MORGAN	64	MOORE		
70	POLK	67	OVERTON		
72	RHEA	68	PERRY		
73	ROANE	69	PICKETT		
76	SCOTT	71	*PUTNAM*		
78	SEVIER	74	*ROBERTSON*		
82	SULLIVAN	75	RUTHERFORD		
86	UNICOI	77	SEQUATCHIE		
87	UNION	80	*SMITH*		
90	WASHINGTON	81	STEWART		
		83	SUMNER		
		85	TROUSDALE		
		88	VAN BUREN		
		89	WARREN		
		91	WAYNE		
		93	WHITE		
		94	WILLIAMSON		
		95	WILSON		

Underlined counties are the ones whose interstate traffic accounts for more than 50 % of the total DVMT.

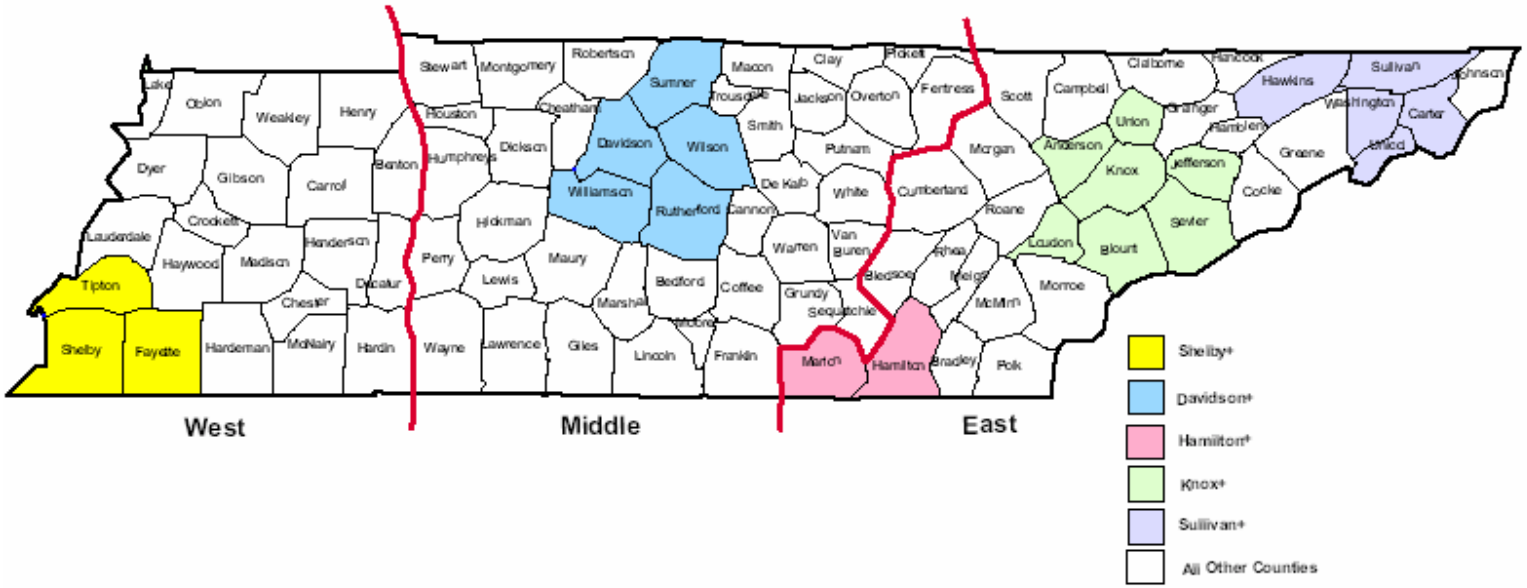

Figure 4-1. Map of the 6 Area Subgroups and the Counties Classified as East, Middle, and West Tennessee

Middle Tennessee region, and Henderson and Haywood counties in the West Tennessee region. These are shown underlined in italics in Table 4-1.

The truck mix data for each county provided by TDOT did not contain all 12 different roadway types. Interstate, arterial, and collector roadways were included in rural areas. Interstate, freeway, arterial, and collector roadways were included in urban areas. Therefore, the VMT fractions were developed only for these roadway types based on the truck mix data. For the model runs, each of the remaining roadway types was assumed to be equal to one of the roadway types that have similar characteristics. VMT fraction for arterial roadway was used for principal arterial and minor arterial roadways. VMT fraction for collector roadway was used for major collector, minor collector, and local roadways. Interstate ramps for urban areas were assumed to have the same VMT fractions as the one for interstate roadways.

Average speed data were used in the model runs. The MOBILE6.2 user's guide[5] states that the default average speed data for local and ramp roadways are required to be used. However, to have more accurate results, local-specific speed data for all roadway types were used except for ramp roadways. Local-specific speed values were used for local roadways instead of the default value, which is 12.9 mph. Local roadways were considered as arterial roadways as far as the model run is concerned since there is no way to run the model by using different speed values from the default for local roadways by considering as itself. Speed values were the same between counties, while the values were different between urban and rural areas. The speed values used in this study are shown in Table 3-10. The default speed value was used for urban ramp roadways.

The categories used for the “VMT by facility” command in the MOBILE6.2 model were freeways, arterials, locals, and ramps. To run the model, interstate and freeway roadways were considered as freeways, and principal arterial, minor arterial, major collector, minor collector, and local roadways were considered as arterials.

The model runs were done for 12 months. MOBILE6.2 input command provides only two options to calculate emission factors, which are January 1 or July 1 of the calendar year of evaluation. To evaluate the rest of months in the calendar year, January 1 was used for November through April, and July 1 was used for May through October. The emission factors were calculated for the calendar year 2002.

To calculate emission factors for particulate matter, 6 data files were required. The MOBILE6.2 model provides the default particulate emission factor data. These are PMGZML.CSV (Gasoline Vehicle Zero Mile Emission Levels), PMGDR1.CSV (Gasoline Vehicle Deterioration Rates Age 1 through X), PMGDR2.CSV (Gasoline Vehicle Deterioration Rates Age X through 25), PMDZML.CSV (Diesel Vehicle Zero Mile Emission Levels), PMDDR1.CSV (Diesel Vehicle Deterioration Rates Age 1 through X), and PMDDR2.CSV (Diesel Vehicle Deterioration Rates Age X through 25). Emission factors of PM10 and PM2.5 were obtained. The average diesel sulfur level for year 2002 was 500 parts per million (ppm). The fuel RVP values for each county for each month are shown in Tables 3-1, 3-2, and 3-3.

The command input files consist of three sections, which are the Header, Run, and Scenario sections. The Header section controls the overall input, output, and execution of the program. Parameter values that localize or customize the MOBILE6.2 runs are defined in the Run section. The Scenario section describes which factors are to be

calculated. Table 4-2 describes the header section. The same input commands and values in this table were applied to all counties. The run section is explained in Table 4-3. The values for each input command were required to follow each description. The input command, “ANTI-TAMP PROG”, was only for Nashville area, consisting of Davidson, Rutherford, Sumner, Williamson, and Wilson counties. The input command, “I/M DESC FILE”, was applied to only those 5 counties and Shelby County. The scenario section is shown in Table 4-4. This was the same for all counties. However, each run for rural areas contained 72 different scenarios, which included 6 roadway types and 12 months. Each run for urban areas contained 84 scenarios, which included 7 roadway types and 12 months.

Inspection and maintenance (I/M) programs are described in Tables B-1 through B-8 of Appendix B. It was assumed that an ongoing I/M program exists in the city of Memphis, based on the Memphis MPO Long Range Transportation Plan.[20] Based on the information in the Nashville MPO Long Range Transportation Plan,[19] ongoing I/M programs exist in Davidson, Rutherford, Sumner, Williamson, and Wilson counties. The examples of input files are shown in Appendix B. This is for Knox County in rural area only for the month of January.

4.2 How to Calculate the Emissions from the Raw Output Data

The MOBILE6.2 model generated emission factors of each pollutant in grams per vehicle miles traveled (g/mile) for 28 vehicle types and 13 roadway types. This was done separately by rural and urban classifications.

Table 4-2. Header Section (Same for All Counties)

Input Command	Value/Description
MOBILE6 INPUT FILE	Identifies input files as a regular command input file rather than a batch file Self-sufficient command*
POLLUTANTS	*HC CO NOx CO2* Calculate emission factors for all 4 pollutants
PARTICULATES	Enables the computation of particle matter (PM) and related emissions and specifies which of these pollutants are claculated and reported
NO DESC OUTPUT	Prevents reporting in descriptive output format Self-sufficient command*
DATABASE OUTPUT	Specifies MOBILE6 to report output in database format Self-sufficient command*
WITH FIELDNAMES	Specifies MOBILE6 to include a Header record of field names for the database output Self-sufficient command*
AGGREGATED OUTPUT	Database output by daily time periods aggregated to the level of the descriptive output Self-sufficient command*
RUN DATA	Marks end of Header section and beginning of Run section of a regular command input files Self-sufficient command*

* Self-Sufficient command - a command by itself, no further information required.
Italics indicate the value for an input command

Table 4-3. Run Section (for All Counties)

Input command	Value/Description
EXPRESS HC AS VOC	Directs MOBILE6 output exhaust HC as volatile organic compounds Self-sufficient command*
NO REFUELING	Exclude refueling emissions from all output values Self-sufficient command*
MIN/MAX TEMPERATURE	Minimum temperature - refer to Table 3-1,2, and 3 for each month for East, Middle, and West TN Maximum temperature - refer to Table 3-1,2, and 3 for each month for East, Middle, and West TN
ABSOLUTE HUMIDITY	Refer to Table 3-1,2, and 3 for each month for East, Middle, and West TN
REG DIST	Name of the external file that contains the registration distribution fraction *Knreg.d* (for Knox, Anderson, Blount, Jefferson, Loudon, Sevier, and Union counties) *Hareg.d* (for Hamilton and Marion counties) *Snreg.d* (for sullivan, Carter, Hawkins, Unicoi, and Washington counties) *Davreg.d* (for Davidson, Rutherford, Sumner, Williamson, and Wilson counties) *Shreg.d* (for Shelby, Tipton, and Fayette counties) *Othreg.d* (for the rest of counties except for 8 counties decribed below) *national defualt* (for Cumberland, Campbell, Putnam, Smith, Robertson, Humphreys, Henderson, and Haywood counties) Area specific registration diestribution by age for LDV, LDT1, LDT2, LDT3, and LDT4 and national default distribution for the other 11 vehicles types.
VMT BY FACILITY	Name of the external file that contains the VMT distribution fractions. *Art-only.vmt* (for principal arterials, minor arterials, major collectors, and minor collectors) *F-only.vmt* (for interstates and freeways) *R-only.vmt* (for ramps) Allocate all VMT to various roadway or facility types by vehicle class for both rural and urban.

*Self-sufficient command - a command by itself, no further information required.
Italics indicate the value for an input command

Table 4-3. Continued.

Input command	Value/Description
VMT FRACTIONS	County specific VMT fractions by each of 16 combined vehicle types for rural and urban roadway classification. Refer to Table A of Appendix A for VMT fractions for each county
FUEL RVP	Fuel reid vapor pressure for each month. Refer to Table 3-1,2,&3 for each month for East, Middle, and West TN
ANTI-TAMP PROG	*95 75 30 22222 11111111 1 11 098 12211112* (for only Davidson County) *95 75 30 22222 11111111 1 11 095 12211112* (for only Rutherford, Sumner, Williamson, and Wilson counties) 95 - Program Start Year 1995 75 - First Model Year 1975 30 - Last Model Year 2030 Next set of 14 values - Vehicle Type subject/not subject to ATP Inspection (1=NO, 2=YES) in the following order LDGV, LDGT1, LDGT2, LDGT3 LDGT4, HDGV2B, HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B, GAS BUS 1 = must be entered, entering '2' will discontinue ATP benefits. 1 =Inspection frequency - annual 098 = Compliance rate of 98 % 095 = Compliance rate of 95 % 12211112 = Inspections performed (1=NO, 2=YES) Air Pump System Disablement = NO Catalyst Removal = YES Fuel Inlet Restrictor Disablement = YES Tailpipe Lead Deposit Test = NO EGR Disablement = NO Evaporative System Disablement = NO PVC system Disablement = NO Missing Gas Cap = YES
I/M DESC FILE	Name of the external file that contains the I/M program specifications County — I/M file name Davidson — *02DIM.d* Rutherford, Sumner, Williamson, and Wilson — *02OIM.d* Shelby — *02SIM.d*

Italics indicate the value for an input command

Tabel 4-4. Scenario Section (Same for All Counties)

Input command	Value/Description
SCENARIO REC	Label individual scenario Run for 6 roadway types for rural and 7 roadway types for urban areas for 12 months
CALENDAR YEAR	*2002*
EVALUATION MONTH	Provides the option of calculating emission factors for January or July *1* - (means January - November through April) *7* - (means July - May through October)
AVERAGE SPEED	Designate a single average speed to use for each roadway for the entire day <u>Rural</u> — <u>Urban</u> *65* Non-ramp (for interstates) — *60* Non-ramp (for interstates) — *45* Non-ramp (for freeways) *45* Arterial (for principal arterials) — *30* Arterial (for principal arterials) *40* Arterial (for minor arterials) — *30* Arterial (for minor arterials) *35* Arterial (for major collectors) — *30* Arterial (for collectors) *30* Arterial (for minor collectors) *30* Arterial (for locals) — *20* Arterial (for locals)
PARTICULATE EF	Specifies the location of the data files that contain the particulate emission factors. *PMGZML.CSV PMGDR1.CSV PMGDR2.CSV* *PMDZML.CSV PMDDR1.CSV PMDDR2.CSV*
PARTICLE SIZE	Specify the maximum particulate size cutoff that is used by the model *2.5* - for PM 2.5 *10* - for PM10
DIESEL SULFUR	Provides the input of the average diesel fuel sulfur level for the scenario. *500*
END OF RUN	Indicates separate multiple runs in command input files.

Italics indicate the value for an input command

4.2.1 Counties without Inspection and Maintenance (I/M) Program

To estimate composite emissions for each pollutant (VOC, NO_X, CO, PM10, PM2.5, NH_3, SO_2, and CO_2) by month, the following steps were taken. This applied only to those counties without I/M program.

1) VMT fractions for each vehicle type, DVMT for each roadway type, and seasonal adjustment factors were applied to the emission factors, to estimate emissions by each vehicle type and each roadway type.

The equation used is:

$$EMri = EFri * DVMTri * 1.102E\text{-}6 / SAFr$$

where,

EMri = emissions by r (13 roadway types) and i (28 vehicle types), tons/day

EF = emission factors from the MOBILE6.2 runs, g/mile

DVMT = annual daily vehicle miles traveled, miles/day

1.102E-6 = conversion factor to convert grams to tons

SAF = seasonal adjustment factors for annual DVMT

2) The emissions calculated under the first step above were monthly emission rates by each vehicle type and roadway type. The composite emissions of each pollutant for each vehicle type were obtained by simply adding up the emissions for 6 roadway types for rural and 7 roadway types for urban areas.

3) The composite emissions of each pollutant were obtained by adding up the emissions for 28 vehicle types.

4) This was done separately by rural and urban classifications. Therefore, the final step was to add those two classifications.

In addition to VOC, NO_X, CO, NH_3, SO_2, and CO_2 emission calculations, the MOBILE6.2 model estimated SO_4, OCARBON, ECARBON, GASPM, Lead, Brake wear, and Tire wear. The model did not estimate emission factors of PM2.5 and PM10 by itself. All 7 particulate species were combined to get PM10 or PM2.5 emissions.

TDOT estimated annual average DVMT for 12 roadway types for each county in Tennessee based on traffic counts from the Highway Performance Monitoring System (HPMS) as required each year by the Federal Highway Administration (FHWA).[23] The annual average DVMT is shown in Table C of Appendix C. The SAF values were used to determine monthly average DVMT by dividing the annual average DVMT by the SAF factor for that month. The 2003 SAF values were obtained from TDOT. The SAF values vary by the day of the week for every month. The SAF values that were applied to the DVMT were the average of the monthly variation factors by day of week. Table 4-5 shows the SAF values for each month for rural and urban areas. Note that the SAF values for rural areas have two different sets of factors, while the SAF values are same for all roadway types in urban areas.

The model runs were done for the 13 roadway types including urban ramp roadway types. The DVMT data provided by TDOT did not have DVMT values for urban ramp roadways. Based on the information in technical guidance, it was assumed that the DVMT on urban ramp roadways accounted for 8 percent of the total DVMT of urban interstate roadways. Therefore, the DVMT for urban interstate roadways were

Table 4-5. Seasonal Adjustment Factors for Tennessee

2003	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Interstate, Rural												
Sunday	1.31	1.24	1.01	0.97	1.00	0.94	0.88	0.91	1.03	1.00	0.95	1.15
Monday	1.28	1.23	1.12	1.04	1.02	1.03	0.96	1.01	1.02	1.07	1.08	1.06
Tuesday	1.23	1.20	1.11	1.05	0.99	1.02	0.94	1.03	1.08	1.06	1.01	1.09
Wednesday	1.23	1.17	1.07	1.01	0.97	0.97	0.92	1.01	1.06	1.03	0.91	1.07
Thursday	1.23	1.11	0.99	0.94	0.92	0.93	0.88	0.93	1.01	0.99	1.02	1.02
Friday	1.21	1.04	0.85	0.80	0.83	0.85	0.78	0.82	0.87	0.88	0.91	0.93
Saturday	1.18	1.17	0.92	0.92	0.99	0.91	0.84	0.88	1.01	1.01	0.99	1.07
Average	**1.239**	**1.166**	**1.010**	**0.961**	**0.960**	**0.950**	**0.886**	**0.941**	**1.011**	**1.006**	**0.981**	**1.056**
Other, Rural												
Sunday	1.50	1.37	1.30	1.14	1.14	1.09	1.10	1.10	1.15	1.14	1.15	1.31
Monday	1.29	1.29	1.10	0.96	0.99	0.96	0.97	0.95	0.99	0.93	0.95	1.06
Tuesday	1.20	1.14	1.14	0.97	0.96	0.95	0.94	0.95	0.94	0.94	0.95	1.07
Wednesday	1.25	1.09	1.16	0.97	0.97	0.97	0.95	0.97	0.96	0.95	0.91	1.09
Thursday	1.25	1.34	1.13	0.95	0.93	0.93	0.91	0.93	0.91	0.90	1.00	1.05
Friday	1.17	1.25	1.04	0.88	0.85	0.87	0.86	0.86	0.83	0.83	0.89	1.00
Saturday	1.33	1.29	1.12	0.94	0.95	0.96	0.94	0.97	0.97	0.97	0.99	1.14
Average	**1.284**	**1.253**	**1.141**	**0.973**	**0.970**	**0.961**	**0.953**	**0.961**	**0.964**	**0.951**	**0.977**	**1.103**
Urban												
Sunday	1.54	1.39	1.33	1.32	1.35	1.26	1.24	1.24	1.28	1.29	1.31	1.33
Monday	1.04	1.00	0.94	0.96	1.00	0.93	0.98	0.93	0.93	0.94	0.93	1.01
Tuesday	1.00	0.97	0.94	0.97	0.98	0.92	0.96	0.92	0.93	0.94	0.92	0.95
Wednesday	0.99	0.97	0.93	0.95	0.97	0.92	0.94	0.91	0.92	0.93	0.91	0.93
Thursday	1.02	1.00	0.90	0.94	0.94	0.90	0.96	0.91	0.91	0.91	0.91	0.95
Friday	0.97	0.92	0.84	0.91	0.89	0.86	0.89	0.86	0.87	0.88	0.91	0.93
Saturday	1.21	1.13	1.02	1.09	1.12	1.05	1.07	1.04	1.09	1.10	1.12	1.15
Average	**1.110**	**1.054**	**0.986**	**1.020**	**1.036**	**0.977**	**1.006**	**0.973**	**0.990**	**0.999**	**1.001**	**1.036**

allocated by 92 percent of the total DVMT on the urban interstate roadway category. The DVMT on rural ramp roadways was assumed to be zero since the DVMT on the ramps was considered insignificant, compared to the one on the interstates.

After calculating the emissions for urban ramps and urban interstates, the emissions for ramps were added back to interstates. This is due to the fact that the national emission inventory format that the EPA provided as a submittal for CERR did not include a ramp category.

4.2.2 Davidson and Shelby Counties with I/M Programs

Davidson and Shelby counties have on-going I/M programs. Based on the Nashville MPO Long Range Transportation Plan[19], calculations for Davidson County were done by assuming that 76% of the vehicles were subjected to the I/M programs and 24% were not. Based on the Memphis MPO report[20], in Shelby County 53.95% of the vehicles were subjected to the I/M programs and the rest of them were not.

The equation for these counties is:

EMri = [(EFri with I/M * f1) + (EFri without I/M * f2)] * DVMTri * 1.102E-6 / SAFr

where,

EMri = emissions by r (13 roadway type) and i (28 vehicle types), tons/day

f1 = fraction of vehicles that have been subjected to I/M program

f2 = fraction of vehicles that have not been subjected to I/M program

EF = emission factor from MOBILE6.2 runs, g/mile

DVMT = annual daily vehicle miles traveled, miles/day

1.102E-6 = conversion factor to convert grams to tons

SAF = seasonal adjustment factor for annual DVMT

The rest of steps to estimate composite emissions for Davidson and Shelby counties were the same as the one for the counties without an I/M program. However, this assumption was not used for the other 4 counties in Nashville area, which are Rutherford, Sumner, Williamson, and Wilson. It was assumed that 100% of the vehicles were subjected to the I/M programs for those counties.

5 RESULTS AND DISCUSSION

5.1 2002 Emission Inventory and the Range Errors

For the purpose of 2002 on-road mobile source emission inventory submittal to the EPA, the inventory was generated for the pollutants of VOC, NO_X, CO, PM10, PM2.5, NH_3, and SO_2. Each emission was allocated to the 144 Source Classification Codes (SCC), which consisted of 12 roadway types and 12 vehicle types. However some counties did not have urban areas. For those counties, there were only 72 SCC codes. Since the MOBILE6.2 model generated output by 28 vehicle categories, these 28 vehicle categories were consolidated into 12 vehicle categories to report the emissions associated with the EPA's format.

The results appear in the version-3 format of National Emission Inventory (NEI). The NEI input format (NIF) version 3 has three tables, PE, EM, and TR tables. The PE table contains state-county FIPs codes, SCC codes, and VMT per year. It contains 75,600 records representing the 95 counties. The EM table contains state-county FIPs code, SCC codes, pollutant codes, emissions values, and the period of reported emissions. It has 100,800 records. The TR table contains the contact person's information.

The Quality Assurance check was done with the EPA's QA program. It flagged 144 emission range errors out of 75,600 records. The 144 range errors occured because of the exceedances of DVMT "warning levels". For example, Anderson County has 1,714 tons/yr of NO_X for Heavy Duty Diesel Vehicles (HDDV) Class 8A and 8B from rural interstates. But it is over the expected "range maximum" of 1350 tons/yr of NO_X. This is

due to the fact that the DVMT has over 500,000 miles/day for rural interstates. These range errors do not present real concerns. It just warns people to look carefully at what causes the range errors. In Tennessee, rural interstates and urban interstates in some counties have more DVMT than the national average. The range errors are listed in Table F of Appendix F.

The monthly emissions were calculated by applying annual average DVMT and monthly SAF to the emission factors, which were generated by the MOBILE6.2 model. The emissions of pollutants, VOC, NO_X, CO, PM10, PM2.5, NH_3, SO_2, and CO_2, were estimated in tons per day for each month. The annual emissions were obtained by multiplying the daily emissions by the number of days in each month and by adding up all the 12 months. The results for the 95 counties in Tennessee are shown in Appendix D.

The statewide emissions for each pollutant are shown in Appendix E. The annual emissions for VOC in the state of Tennessee are 132,993 tons/year. The statewide annual emissions for NO_X are 288,409 tons/year. The model estimated 1,805,639 tons of CO per year, 6,169 tons of PM10 per year, 4,728 tons of PM2.5 per year, 6,535 tons of NH_3 per year, and 8,790 tons of SO_2 per year throughout the State.

5.2 Monthly Relative Magnitude Variation of Each Pollutant Without SAF Adjustment

It is important to investigate how the monthly different values of temperature, absolute humidity, and fuel RVP affect monthly emissions and annual emissions. Knox County was chosen to investigate such effects. To see the monthly variations of emissions associated with temperature, absolute humidity, and fuel RVP, the SAF factors

were not adjusted to the annual average DVMT values. Temperature, absolute humidity, and fuel RVP vary monthly throughout the year. The monthly emissions were converted to relative magnitude.

5.2.1 Emission Variations of CO_2, SO_2, NH_3, PM2.5, and PM10 Without SAF Adjustment

Unlike the variations of emissions of VOC, NO_X, and CO, the emissions of CO_2, SO_2, NH_3, PM2.5, and PM10 do not fluctuate monthly. This means that varying monthly temperature, absolute humidity, and fuel RVP do not affect the estimation of emissions of CO_2, SO_2, NH_3, PM2.5, and PM10. The emissions for these 5 pollutants have two different values throughout the year depending on the "evaluation month", which is either July or January. MOBILE6.2 uses a slightly different vehicle age distribution for the two evaluation months. However, the difference in emissions between the two evaluation months is not significant, 0.017% for CO_2, 0.034% for SO_2, 0.24% for NH_3, 0.14% for PM2.5, and 0.58% for PM10. Therefore, either July or January can be used as the evaluation month command in the MOBILE6.2 model, to estimate annual emissions of the 5 pollutants.

5.2.2 Emission Variations of VOC, NO_X, and CO Without SAF Adjustment

For the other 3 pollutants, VOC, NO_X, and CO, the monthly variation in emissions are affected by other factors, such as temperature, humidity, and fuel RVP. Table 5-1 shows the monthly emissions of VOC, CO, and NO_X and the relative magnitude values for each pollutant excluding the effect of the SAF factors. The monthly

Table 5-1. Monthly Emissions (Excluding SAF Factors) and Relative Magnitudes for Knox County

	VOC (tons/day)	Relative Magnitude	CO (tons/day)	Relative Magnitude	NOx (tons/day)	Relative Magnitude
JAN	31.56	0.999	496.95	1.166	57.49	1.095
FEB	31.00	0.981	499.02	1.171	57.92	1.103
MAR	33.35	1.055	473.95	1.112	55.25	1.052
APR	39.26	1.242	462.70	1.086	52.45	0.999
MAY	26.52	0.839	328.42	0.771	50.20	0.956
JUNE	28.13	0.890	332.27	0.780	48.61	0.926
JULY	28.11	0.889	332.67	0.781	47.35	0.902
AUG	28.63	0.906	336.81	0.790	48.17	0.917
SEP	32.98	1.044	411.36	0.965	48.65	0.927
OCT	37.48	1.186	462.55	1.086	50.17	0.956
NOV	31.33	0.991	479.25	1.125	56.09	1.068
DEC	30.87	0.977	497.15	1.167	57.71	1.099
Average	31.60		426.09		52.50	

emission variations of each pollutant were compared to the monthly variations of RVP, min/max temperatures, and absolute humidity. The values of RVP, min/max temperatures, and absolute humidity for Knox County are shown in Table 5-2, as well as the relative magnitude values for each.

The relative magnitude variation of emissions of each pollutant and the relative magnitude variation of RVP values are illustrated in Figure 5-1. The relative magnitude variation of CO emissions follows the trend of the relative magnitude variation of the RVP values. VOC emissions increase along with the increase of the RVP values up to 13.5 psi of RVP values. The RVP values are 13.5 psi in April and October. However, even though the RVP values increase up to 15 psi, the VOC emissions decrease. Figure 5-2 illustrates the relative magnitude variations of each pollutant versus the relative

Table 5-2. Temperature, Absolute Humidity, and RVP values and Relative Magnitudes for Knox County

	Monthly Avg. Min Temp (F)	Relative Magnitude	Monthly Avg. Max Temp (F)	Relative Magnitude	Absolute Humidity (gr/lb)	Relative Magnitude	RVP (psi)	Relative Magnitude
JAN	31.6	0.63	51.4	0.73	28.16	0.45	15	1.25
FEB	30.8	0.62	51.8	0.74	22.90	0.37	13.5	1.13
MAR	38.9	0.78	61.8	0.88	37.83	0.60	13.5	1.13
APR	51.4	1.03	73.9	1.06	55.61	0.89	13.5	1.13
MAY	54.1	1.08	76.4	1.09	68.97	1.10	9	0.75
JUNE	65.4	1.31	87.7	1.25	93.12	1.49	9	0.75
JULY	70.2	1.40	88.0	1.26	113.31	1.81	9	0.75
AUG	68.0	1.36	89.8	1.28	101.34	1.62	9	0.75
SEP	64.9	1.30	84.8	1.21	92.83	1.48	10.25	0.86
OCT	55.6	1.11	70.2	1.00	73.05	1.17	13.5	1.13
NOV	37.6	0.75	55.1	0.79	36.03	0.58	13.5	1.13
DEC	32.1	0.64	49.2	0.70	27.70	0.44	15	1.25
Average	50.1		70.0		62.57		11.98	

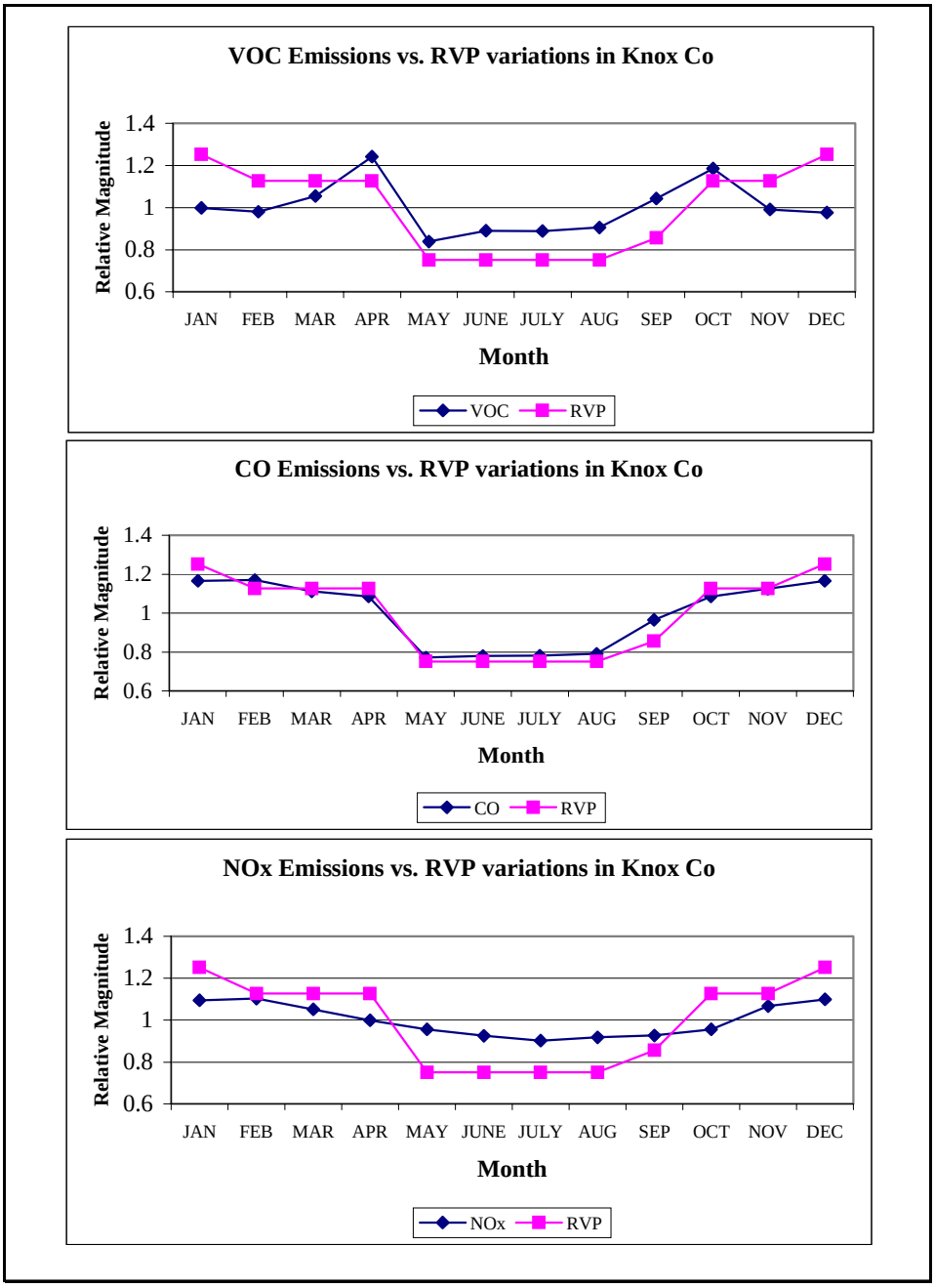

Figure 5-1. Emission Variations vs. RVP Variations in Relative Magnitude Without SAF Adjustment in Knox County, TN

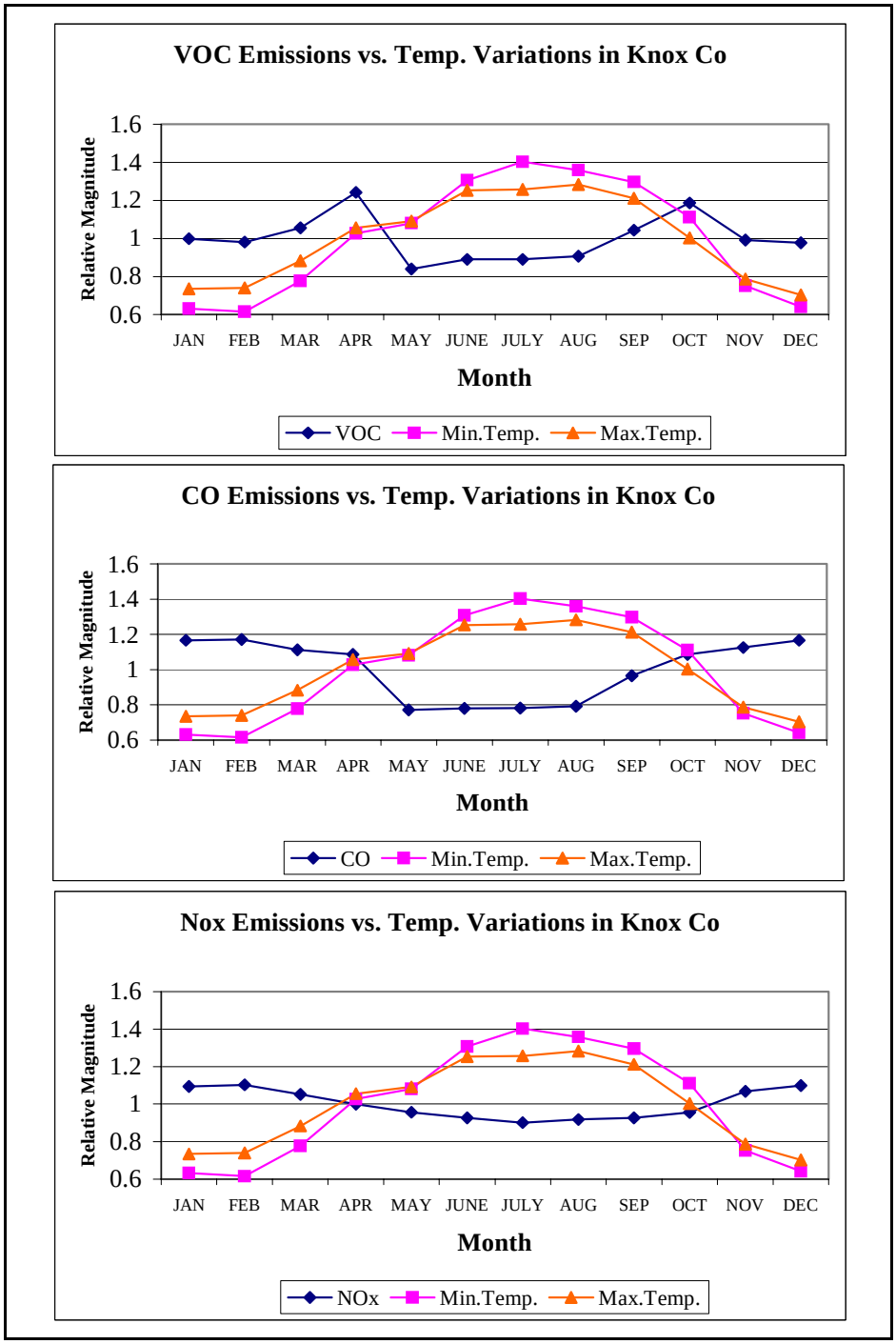

Figure 5-2. Emission Variations vs. Temperature Variations in Relative Magnitude Without SAF Adjustment in Knox County, TN

magnitude variations of min/max temperatures throughout the year. From January to April, min/max temperatures increase, as do VOC emissions.

Based on Figure 5-3, it is hard to interpret absolute humidity effects on each pollutant. However, Table 5-3 explains the effect of each factor on NO_X emissions. The effects of absolute humidity, RVP, and temperature changes on the emission factor for NO_X were taken from the sensitivity analysis conducted by Tang et al.[12] Relevant portions of the report are included in Appendix H. Table 5-3 shows that NO_X emissions (without SAF adjustment) decrease about 18% from February to July. Sixty two percent of the change in NO_X emissions is due to the change in absolute humidity. Temperature changes account for 33% of the change in NO_X emissions while RVP changes have only a 5% effect on the change in NO_X emissions.

The change of absolute humidity levels between February and July affects CO and VOC emissions insignificantly. This is shown in the graphs of Appendix H. However, RVP and min/max temperatures do significantly affect CO and VOC emissions. The RVP values are 13.5 psi for February and 9.0 psi for July. The min/max temperatures are 30.8/51.8 °F for February and 70.2/88.0 °F for July. The MOBILE6.2 model tested for 4 combinations of RVP and min/max temperatures with default values for other parameters. The 4 combinations of the two variables and the composite VOC and CO emission rates are shown in Table 5-4. At low temperatures, an RVP change from 13.5 to 9.0 psi causes only a 7.5% decrease in VOC and a 4% decrease in CO emission factors. However, at high temperatures an RVP change from 13.5 to 9.0 psi causes a decrease of VOC and CO emission factors by approximately 47%. At low RVP values, temperature changes have a small effect on VOC and CO emission factors. At

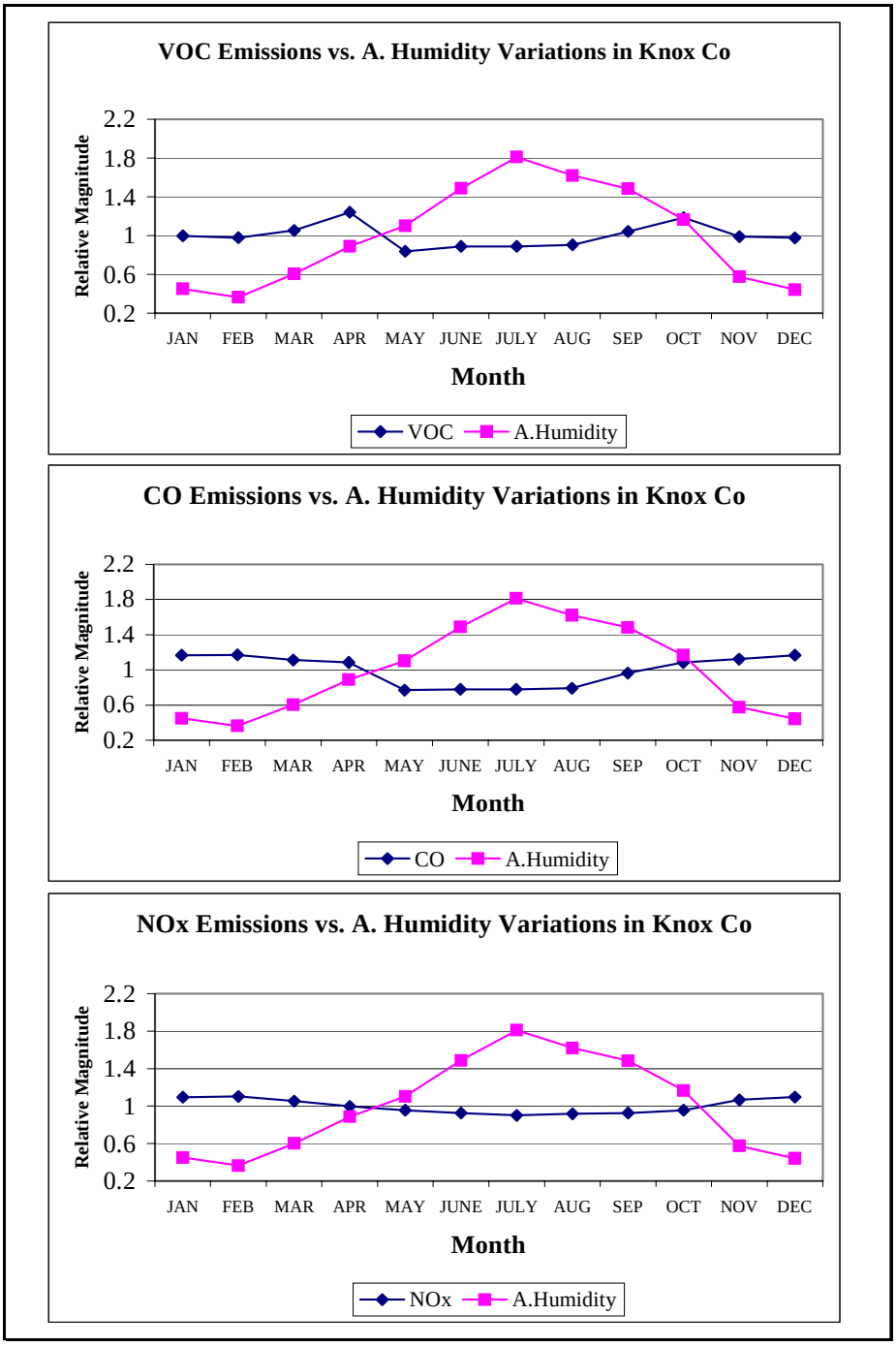

Figure 5-3. Emission Variations vs. Absolute Humidity Variations in Relative Magnitude Without SAF Adjustment in Knox County, TN

Table 5-3. NO_X Emission Factor Change Associated with the Change of Each Input Factor between February and July.

			NOx emission rate		
	FEB	JULY	FEB(g/mile)	JULY(g/mile)	decrease(%)
Abs.Humidity (gr/lb)	22.9	113.31	2.25	1.98	12.00
RVP (psi)	13.5	9.0	2.123	2.1	1.08
Temperature (F)	41.3	79.1	2.2	2.06	6.36
Emissions w/o SAF (tpd)			57.92	47.35	18.25

Table 5-4. Combinations of RVP and Min/Max Temperatures for February and July, and the Emission Factors for VOC and CO for Each Combination.

	COMBINATION			
	1	2	3	4
RVP (psi)	13.5	9	13.5	9
MIN/MAX TEMP(F)	30.8/51.8	30.8/51.8	70.2/88.0	70.2/88.0
VOC (g/mile)	1.801	1.666	3.238	1.723
CO (g/mile)	29.070	27.894	36.128	19.146

high RVP values, temperature changes have a much larger effect on VOC and CO emission factors. These values are tabulated in Table 5-5. From the comparisons, it is hard to say which factor alone is more important, RVP or temperature. The effect on emissions is due to the combined effects of humidity and temperature.

Figure 5-1 shows that VOC emissions increase along with the increase of RVP values for the period of April through October. Nonetheless, the VOC emissions increase from February to April while the RVP values are constant. Table 5-5 explains this condition. When the temperatures increase as the RVP values are constant with 13.5 psi, the VOC emissions increase. The emission variations of pollutants cannot be explained in terms of one factor such as RVP values or temperature. The emissions are affected by a combination of these factors.

Table 5-5. The Sensitivity of VOC and CO Emission Factors to Changes in RVP and Temperatures.

		VOC decrease in %	CO decrease in %
RVP change (13.5 to 9.0)	1 vs. 2 (30.8/51.8)	7.47	4.05
Temperature constant	3 vs. 4 (70.2/88.0)	46.77	47.01
Temp. change (30.8/51.8 to 70.2/88.0)	1 vs. 3 (13.5)	-79.79	-24.28
RVP constant	2 vs. 4 (9.0)	-3.43	31.36

5.3 Comparison of Monthly Relative Magnitude Variation of Each Pollutant in Knox County and Central Florida with SAF Adjustment

The monthly SAF factors were adjusted to the DVMT values to analyze for the variations in emissions. Figure 5-4 shows the VOC monthly emissions for Knox County with and without SAF adjustment. The graph presents very little difference throughout the year between the two curves. Figure 5-5 illustrates the relative magnitude of variations of VOC, CO, and NO_X emissions (including SAF factors) versus RVP variation in Knox County. Peak VOC emissions are predicted for April in Knox County. NO_X and CO emissions peak in November as shown in Figure 5-5.

The on-road mobile source emissions of VOC, NO_X, and CO in 3 counties (Orange, Seminole, and Osceola) in Central Florida were obtained from a paper by David Cooper.[3] Data from the 3 counties were used for comparison with variation of emissions in Knox County, TN. The emissions of each pollutant in Central Florida were converted to relative magnitude values for each month. Figure 5-5 shows the relative magnitude variation of each pollutant and RVP variation as well. The peak emissions occurred in February for all pollutants in Central Florida.

The peak VOC emissions occurred in April in Knox County and in February in Central Florida. This peak value for VOC emissions in Knox County occurred at an RVP value of 13.5 psi, minimum temperature of 51.4 °F, maximum temperature of 73.9 °F, and absolute humidity of 55.61 gr/lb. The peak value for VOC emissions in Central Florida occurred at RVP value of 13.0 psi, minimum temperature 49.7 °F, maximum temperature 72.7 °F, and absolute humidity of 54 gr/lb. The VOC emissions peaked in

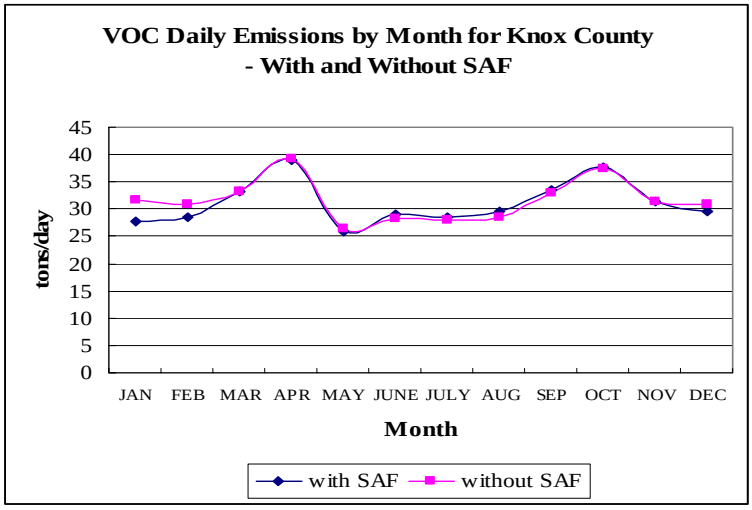

Figure 5-4. VOC Daily Emissions by Month for Knox County With and Without SAF

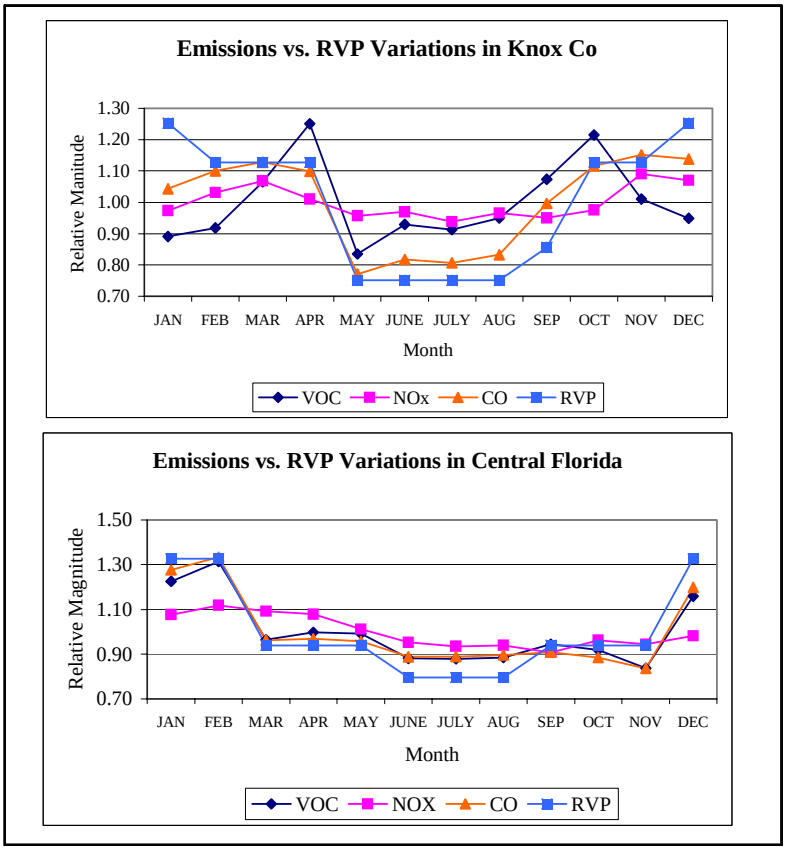

Figure 5-5. Emissions vs. RVP Variations in Relative Magnitude in Knox Co, TN and Central Florida

April in Knox County, TN, and in February in Central Florida because of the similar temperatures and RVP values.

For both Knox County and Central Florida, note that CO emissions are higher in December through February with lower temperature and higher RVP value. NO_X emissions are also high in winter and low in summer.

5.4 The Sensitivity of the Annual Emission Inventory Results by Using Annual Average or Monthly Values of Temperature, Absolute Humidity, and Fuel RVP.

The annual on-road mobile source inventory was developed for the state of Tennessee. The monthly values of temperature, absolute humidity, and fuel RVP were used to develop the annual emission inventory. The annual emissions of each pollutant were also estimated for Knox County by using the annual average values of all inputs. The annual average values of each variable in Knox County were 50 °F for the minimum temperature, 70 °F for the maximum temperature, 62.57 gr/lb for the absolute humidity, and 11.85 psi for the RVP value.

Table 5-6 shows the emissions obtained by using monthly inputs for the 4 variables and annual average values of the variables in Knox County. The emissions using annual average values were also calculated in two ways, with the two different evaluation months (January and July). The SAF factors were applied to the annual average DVMT for the monthly emissions, while the SAF factors were not needed to calculate emissions using annual average values of the variables.

Table 5-6. Comparison of Emissions Using Monthly Average Inputs vs. Annual Average Inputs of 4 Variables in Knox County

	JAN	**FEB**	**MAR**	**APR**	**MAY**	**JUNE**	**JULY**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**Avg.**	(1)	Diff(%)*	(2)	Diff(%)**
VOC	27.71	28.57	33.13	38.90	25.98	28.91	28.40	29.55	33.40	37.78	31.44	29.52	31.11	34.25	9.18	33.77	7.88
CO	435.73	459.56	471.15	458.88	322.07	341.62	337.15	347.76	416.19	465.94	480.96	475.36	417.70	462.19	9.63	463.60	9.90
NOX	50.25	53.27	55.15	52.19	49.44	50.07	48.47	49.86	49.06	50.39	56.32	55.24	51.64	52.25	1.17	51.25	-0.76
SO2	1.50	1.58	1.70	1.70	1.68	1.76	1.74	1.77	1.73	1.72	1.72	1.64	1.69	1.72	1.67	1.71	1.64
NH3	1.23	1.29	1.39	1.39	1.38	1.44	1.42	1.45	1.42	1.41	1.41	1.34	1.38	1.40	1.60	1.41	1.84
PM2.5	0.75	0.79	0.86	0.85	0.82	0.86	0.85	0.86	0.84	0.83	0.86	0.82	0.83	0.86	3.13	0.83	0.08
PM10	1.00	1.05	1.14	1.14	1.10	1.15	1.14	1.15	1.13	1.12	1.15	1.10	1.11	1.15	2.88	1.12	0.38
CO2	7051	7409	8007	7989	7902	8280	8172	8316	8142	8106	8080	7698	7929	8064	1.67	8066	1.69

(1) and (2): run with the annual average of min/max temperature, absolute humidity, RVP values

(1): using the evaluation of month as January

(2): using the evaluation of month as July

Diff(%)*: difference between the value of (1) and Avg.

Diff(%)**: difference between the value of (2) and Avg.

The differences between the average emissions for all 12 months and the emissions obtained with annual average values were not significant for NO_X, SO_2, NH_3, PM2.5, PM10, and CO_2. These differences were all less than 2% except for PM2.5 and PM10 with differences of 3.13% for PM2.5 and 2.88% for PM10. The differences in VOC and CO emissions were about 10%.

The results in Knox County are different from the ones in Central Florida. In Central Florida, there were no significant differences between the two emissions using monthly average inputs or annual average inputs of the variables.[3] The difference for VOC was 0.4%, and 0.7% for NO_X emissions. The biggest difference occurred in CO emissions. Nonetheless the difference was relatively small, 2.6%. The difference of annual average fuel RVP between the two areas might cause these different results. The range of fuel RVP in Knox County in Tennessee is 9-15 psi with an average of 11.98 psi, while in Central Florida the range is 7.8-13.0 psi with an average of 9.8 psi.

5.5 The Contribution to the Emissions by the 6 Vehicle Types

Different vehicle types have different emission rates. Each vehicle type contributes a different percentage of emissions. The MOBILE6.2 model generated emission rates for the 28 vehicle types. The 28 vehicle types were consolidated into 6 vehicle types, according to similar characteristics and similar vehicle size. The 6 vehicle types are (1) LDV (2) LDT1 &2 (3) LDT3&4 and HDV2B, (4) HDV3, 4, 5, 6, &7 and Buses (5) HDV8A & 8B, and (6) MC. Each county has its own VMT fractions for each vehicle type and for different roadway types. Therefore, each county has different emission contributions for each pollutant.

Figure 5-6 shows the percentage of contribution to the emission by the 6 vehicle types for Knox County. The first 2 vehicle types, (1) LDV and (2) LDT1&2 account for 80% of VOC emissions, 82% of CO emissions, and 84% of NH_3 emissions. In contrast, the vehicle type (HDV8A & 8B) by itself contributes over 40% to NO_X, PM2.5, and PM10 emissions. The SO_2 emissions from (1) LDV and (2) LDT1&2 account for 50%. Fifty eight percent of the CO_2 emissions are allocated to vehicle types (1) and (2).

As far as the statewide emissions are concerned, the percentage of emissions allocated to each vehicle type is also displayed in Figure 5-7. From the figure, note that vehicle types (1) and (2) account for over 80% of VOC, CO, and NH_3 emissions, almost the same as for Knox County. Fifty four percent of NO_X emissions in Tennessee come from HDV8A & 8B, vehicle type (5). This is 10% higher than for Knox County. The contribution of each vehicle type to SO_2, PM2.5, PM10, and CO_2 is slightly different than from Knox County. The percentage of emissions allocated to each vehicle type for the 95 counties is listed in Table G of Appendix G.

The percentage of emission contributions by the 6 vehicle types was analyzed for the 95 counties. The mean percentage for each vehicle type for each pollutant was obtained, as were the ranges. Table 5-7 shows the values of the means, the ranges, and the standard deviations. The contribution of each vehicle type to VOC, CO, and NH_3 is very similar for all of the 95 counties. However, for NO_X, SO_2, PM2.5, PM10, and CO_2 the contributions vary, especially the heavier trucks (HDV8A &8B), which contribute different percentages to emissions in different counties throughout the State. This is caused by the different VMT fractions of heavy trucks in different counties. Counties

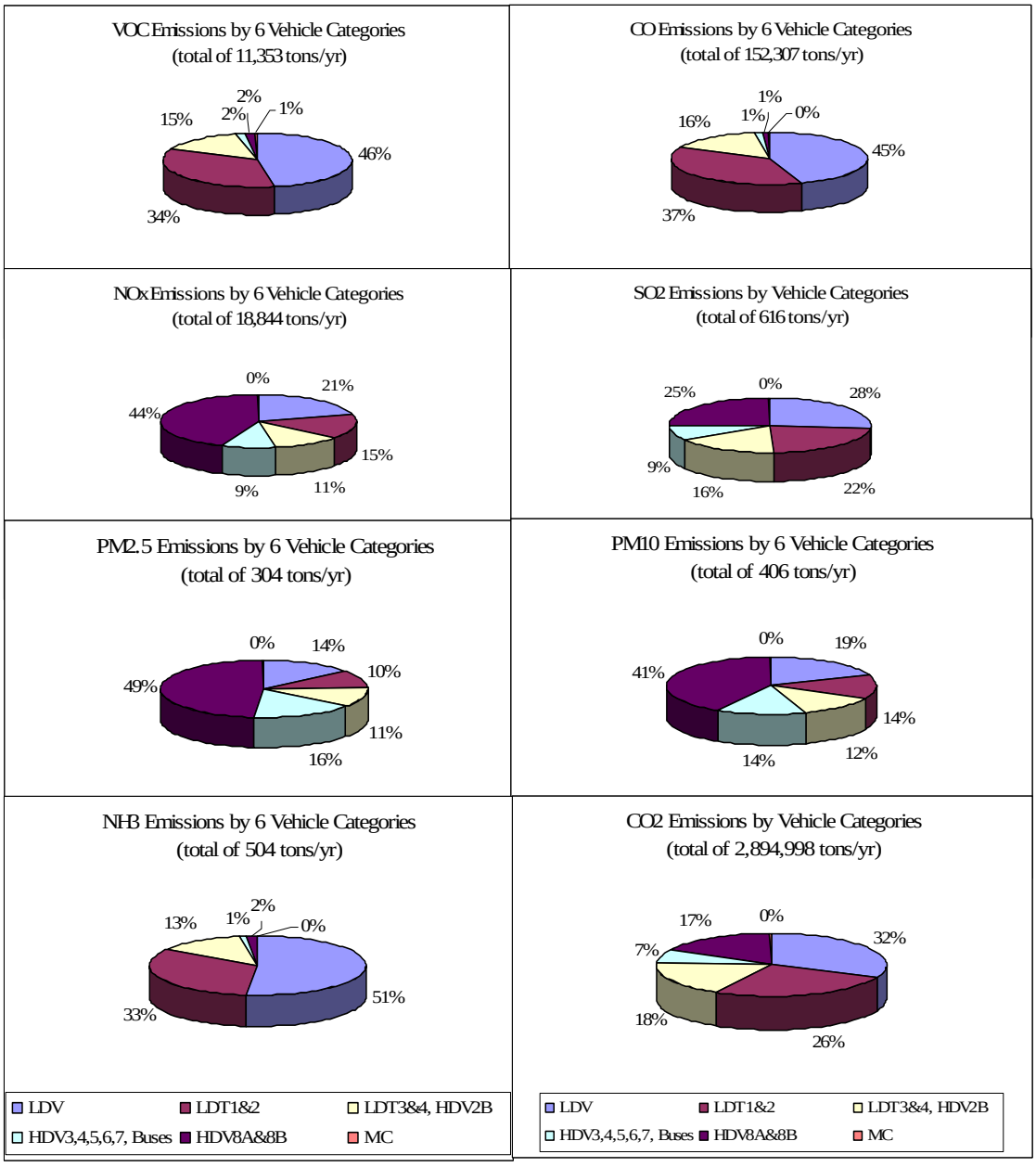

Figure 5-6. Emission Contributions by 6 Vehicle Types for Each Pollutant in Knox Co.

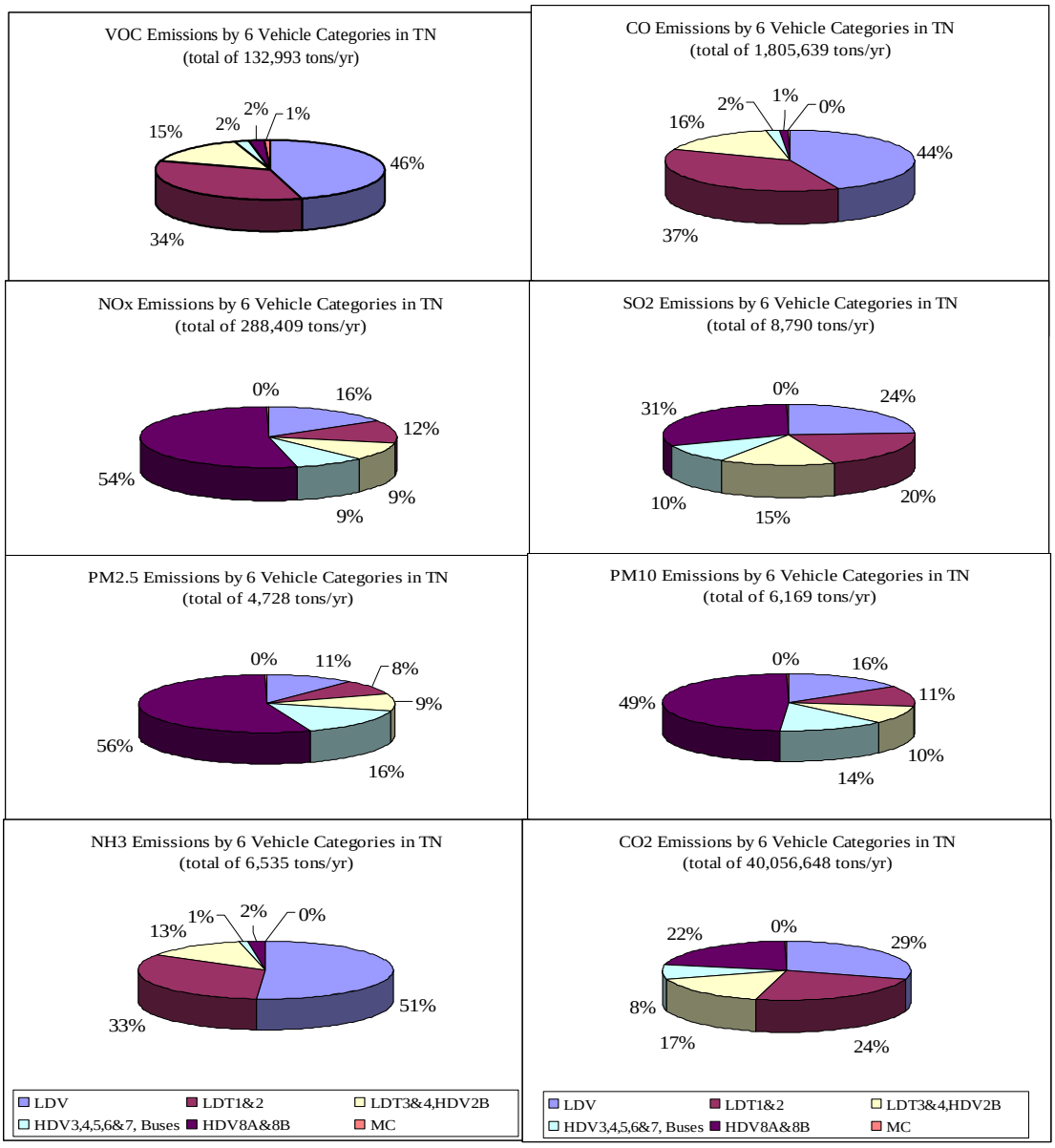

Figure 5-7. Emission Contributions by 6 Vehicle Types for Each Pollutant in Tennessee

Table 5-7. The Mean of Percentage of Contribution to Each Pollutant by the 6 Vehicle Types from the 95 Counties.

	LDV			LDT1&2			LDT3&4, HDV2B			HDV3,4,5,6,7 & Buses			HDV8A &8B			MC		
	mean (%)	range (%)	standard deviation	mean (%)	range (%)	standard deviation	mean (%)	range (%)	standard deviation	mean (%)	range (%)	standard deviation	mean (%)	range (%)	standard deviation	mean (%)	range (%)	standard deviation
VOC	44.76	40.7-47.7	1.47	35.04	28.4-37.1	2.27	15.29	13.4-18.8	0.99	1.96	1.2-3.8	0.6	2.32	0.4-8.8	1.88	0.63	0.5-1	0.117
CO	43.01	41.1-45.2	0.91	38.03	33.2-39.5	1.59	16	14.6-18.2	0.67	1.59	0.9-3.6	0.61	1.09	0.2-4.3	0.93	0.27	0.2-0.4	7.45
NOX	21.05	5-34.9	8.67	16	3.9-26.7	6.57	11.7	3.4-18.9	4.53	9.67	4.8-14.5	1.98	41.32	9.7-79.7	21.15	0.26	0.1-0.4	0.1
SO2	25.17	12.2-34.2	5.65	20.9	10.1-28.4	4.68	15.29	7.4-20.7	3.42	10.77	6.8-15.7	1.68	27.7	6.8-59.8	14.22	0.17	0.1-0.2	4.79
NH3	51.36	47.5-52.8	1.2	32.38	30.7-33.4	0.64	12.61	11.6-13.1	0.32	1.31	0.8-2.5	0.37	2.26	0.4-7.8	1.77	0.1	0.1-0.1	0
PM2.5	12.73	3.9-22.7	4.72	9.93	2.9-17.9	3.71	10.92	3.5-19.5	3.99	18.15	8.9-28.3	4.44	48.04	17.4-77.7	16.28	0.22	0.1-0.4	8.74
PM10	17.61	6.1-28.8	5.78	12.82	4.3-21.2	4.24	11.41	4.2-18.7	3.7	15.54	8.2-23.3	3.3	42.33	13.6-73.9	16.34	0.29	0.1-0.5	9.64
CO2	29.96	17.4-37.2	5.03	24.6	14.5-30.5	4.08	17.09	9.9-21.2	2.88	8.14	5.7-11.9	1.3	20.03	4.3-48.9	11.75	0.17	0.1-0.2	4.53

with high percentage of VMT by heavy trucks have much higher emissions of NO_X and PM.

Emissions of PM2.5 consist of SO_4, OCARBON, ECARBON, GASPM, Lead, Brake wear, and Tire wear particulates. The model does not produce lead portion of exhaust particulate. Therefore lead was omitted from this analysis. PM2.5 emissions were broken down into 6 particulate species in interstate roadways in Knox County. Figure 5-8 indicates that light duty gasoline vehicle (LDGV) produces no ECARBON and OCARBON. This is due to the fact that ECARBON and OCARBON are elemental and organic carbon portions of diesel exhaust particulates. It is noticed that ECARBON accounts for 68% of PM2.5 emissions from an HDDV8B vehicle category and OCARBON accounts for 22% in interstate in Knox County based on Figure 5-9. Overall, ECARBON and OCARBON account for 90% of PM2.5 emissions from an HDDV8B vehicle category in interstate roadways in Knox County.

5.6 Future Year Projections for 6 Counties in the Knoxville Area, Ozone Nonattainment Area

The Knoxville area was designated by USEPA as an ozone nonattainment area on June 15, 2004. Emission projections were done for 6 counties in this area, which are Anderson, Blount, Jefferson, Knox, Loudon, Sevier counties. All pollutants were projected for the years 2009, 2020, and 2030 without VMT growth. The year 2009 is the maximum year that the nonattainment area is required to meet the NAAQS. The same input data were used for the future years except for the diesel sulfur content (112 ppm for 2009 and 15 ppm for 2020 and 2030).

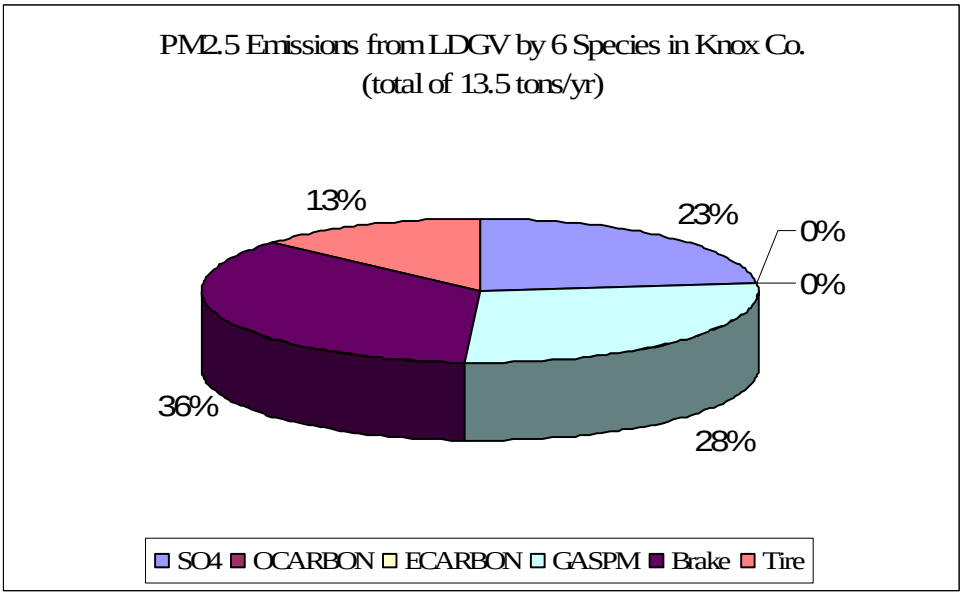

Figure 5-8. PM2.5 Emissions from LDGV by 6 Particulate Species in Knox Co.

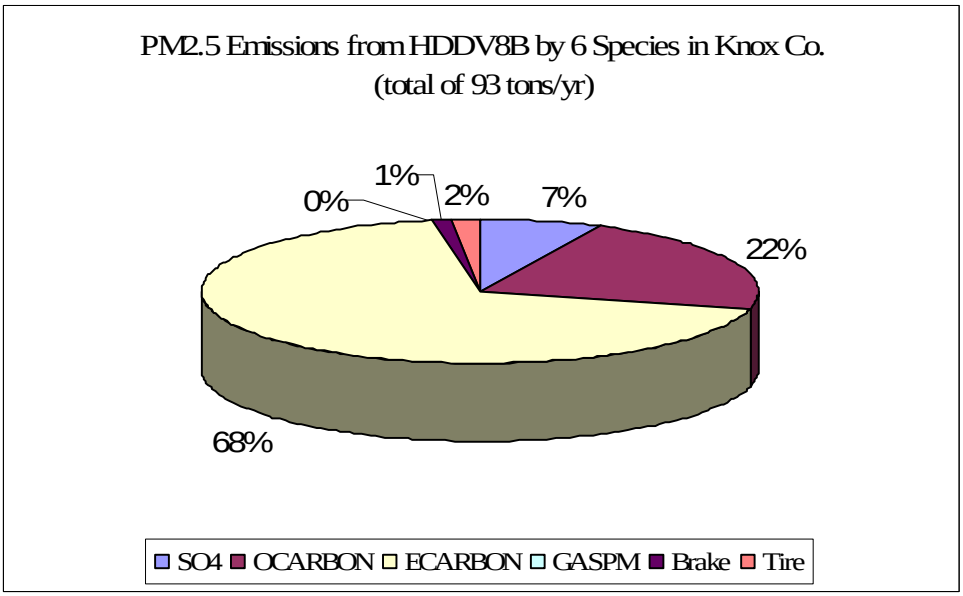

Figure 5-9. PM2.5 Emissions from HDDV8B by 6 Particulate Species in Knox Co.

The VOC and NO_X emissions for 2002 and future year projections are shown in Figure 5-10 for the 6 counties. The relative changes in emission levels for VOC emissions were found to be similar for all 6 counties. About 78% reductions in VOC emissions were projected by 2030 for the 6 counties even though the magnitude of the emission levels varied. For NO_X emissions, however, the projected reductions by 2030 varied for the 6 counties. Anderson County has a 90.4% projected reduction, and Blount County has a 84% projected reduction. There are 93.5%, 89%, 93%, and 87.7% projected reductions for Jefferson, Knox, Loudon, and Sevier County, respectively. Based on the projected reductions in both VOC and NO_X emissions, the new regulations obviously affect more reductions on NO_X emissions than VOC emissions.

PM2.5 emissions show projected reductions of 64.8-83.5% for the 6 counties as shown in Figure 5-11. There are 48.4-73% projected reductions in PM10 emissions by 2030 for the 6 counties. The 6 counties have projected 91-94% reductions in SO_2 emissions. Figures 5-12 and 5-13 show that there are 66-68% projected reductions in CO emissions for the 6 counties. Interestingly, the projected NH_3 emissions by 2030 show no decrease. Instead, there is an increase by approximately 3% for all 6 counties. Future regulations seem stricter in NO_X emissions. Catalytic converter reduces NO_X emissions, and NH_3 emissions are produced as byproduct. More NO_X emissions reduced, more NH_3 emissions produced.

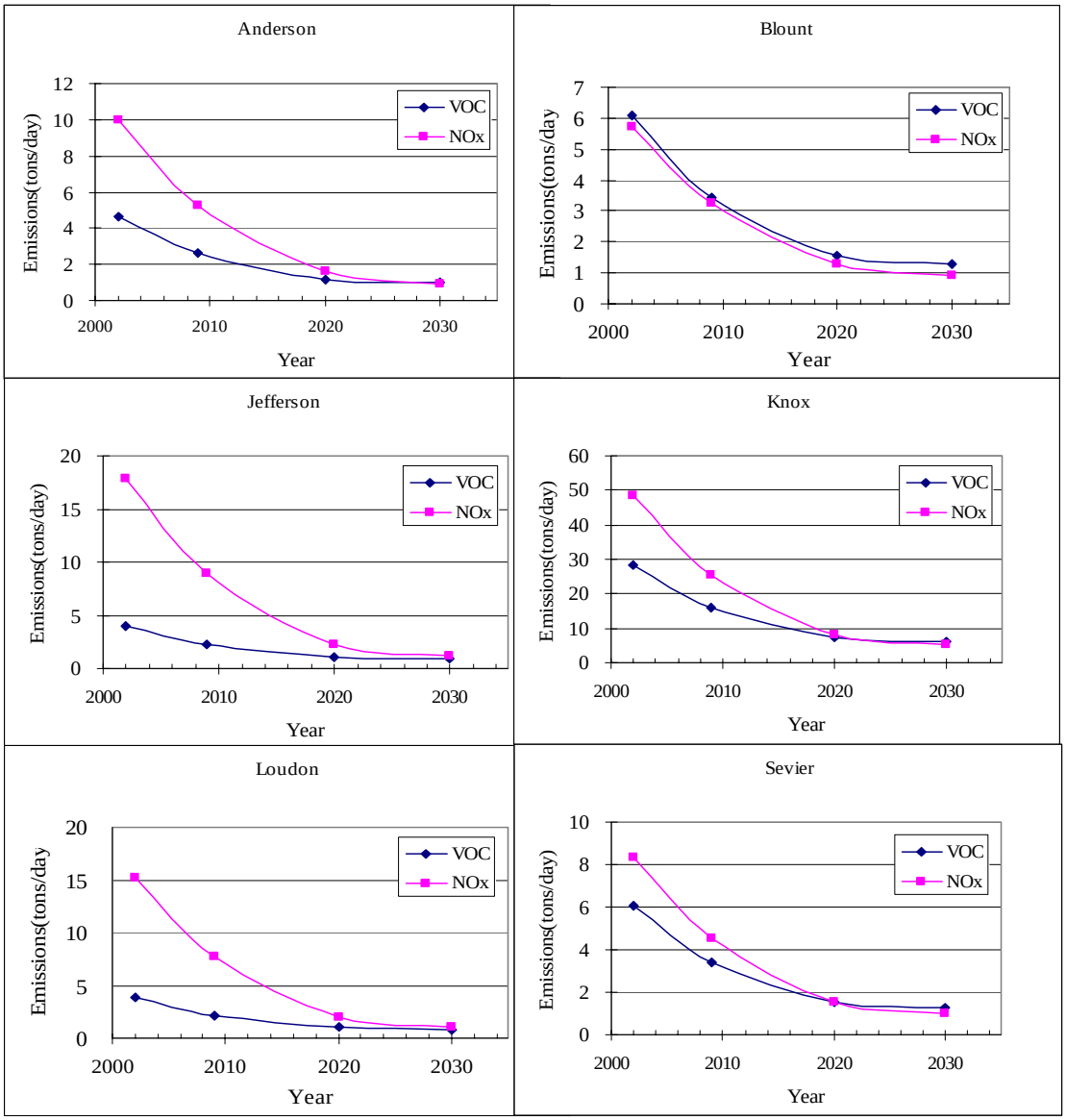

Figure 5-10. VOC and NO_X Projected Emissions in 6 Counties Without VMT Growth

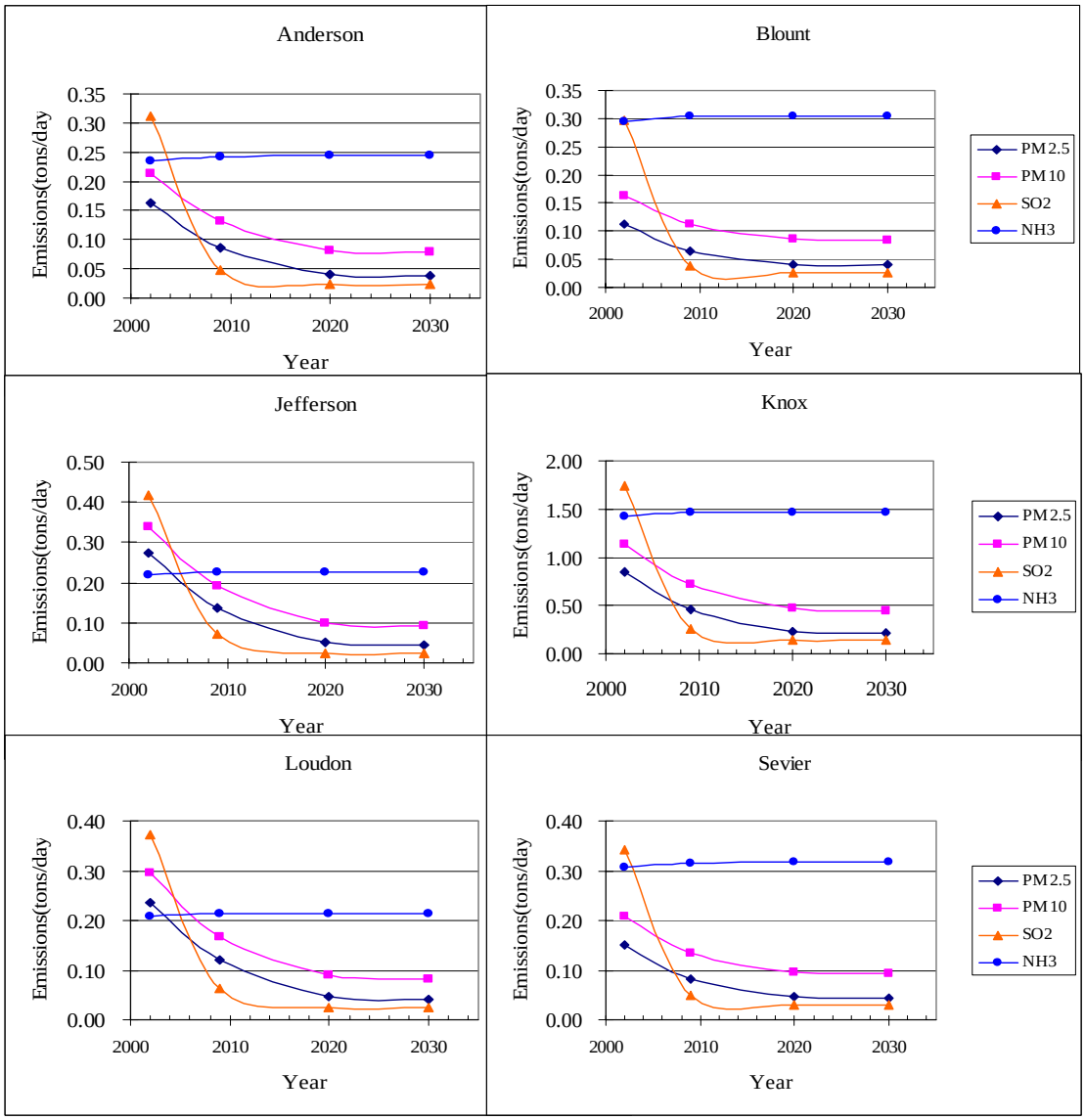

Figure 5-11. PM2.5, PM10, SO_2, and NH_3 Projected Emissions in 6 Counties Without VMT Growth

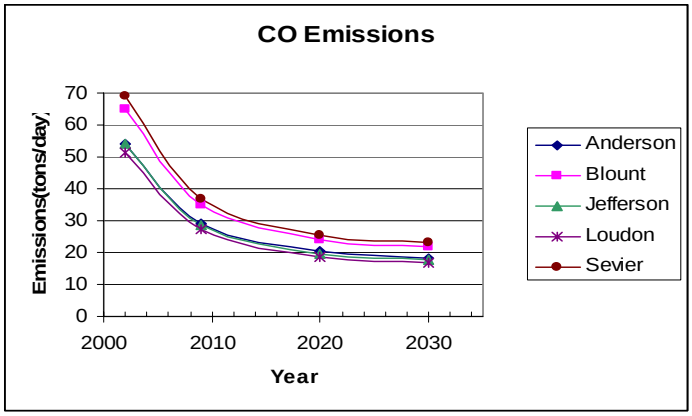

Figure 5-12. CO Projected Emissions in 5 Counties Without VMT Growth

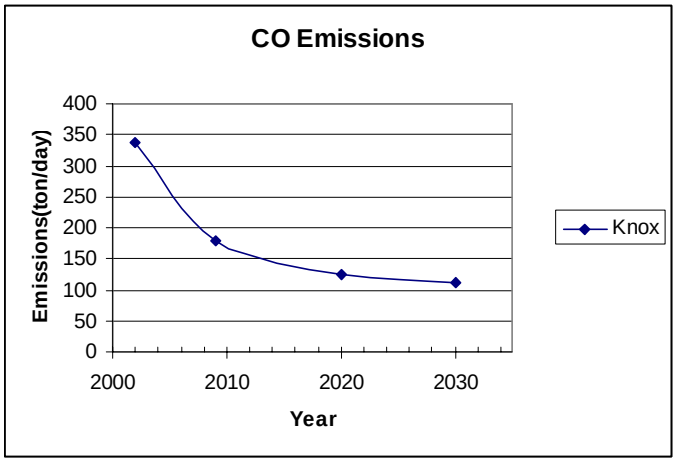

Figure 5-13. CO Projected Emissions in Knox County Without VMT Growth

6 CONCLUSIONS

This study generated an on-road mobile source emission inventory for the state of Tennessee for the year 2002 using the MOBILE6.2 model and the latest available traffic data from TDOT. This report contains the results of the inventory and an analysis of the factors affecting the emissions. Monthly variations of each pollutant without SAF factors were investigated as well as a comparison of the monthly variation with SAF factors in Knox County, Tennessee and Central Florida. The annual emissions obtained with annual average values of temperature, absolute humidity, and fuel RVP were compared to the ones obtained with monthly values of the variables. This study also investigated the contribution of the 6 vehicle types to the emissions. Furthermore, future projections were conducted for 6 counties in the Knoxville area, which were designated as an 8-hour ozone nonattainment area.

The statewide annual emissions in 2002 for each pollutant are 132,993, 288,409, 1,805,639, 6,169, 4,728, 6,535, and 8,790 tons/year of VOC, NO_X, CO, PM10, PM2.5, NH_3, and SO_2, respectively. The inventory was transferred to the EPA's NIF version 3 ACCESS database. The PE table contains 75,600 records, and the EM table contains 100,800 records. The EPA's QA program checked for range errors. Only 144 range errors occurred out of 75,600 records, which were warning messages due to high DVMT on some roadways.

Monthly emissions were found to vary due to SAF factors, temperatures, fuel RVP values, and absolute humidity. Emission factors of VOC and CO are dependent on temperature and RVP values. Even though the VOC emissions increase with higher

temperature, the effect of lower RVP values in summer months is so strong that VOC emissions in summer are lower than in April and October. Furthermore, VOC emissions increase along with the increase of the RVP values up to 13.5 psi. Over 13.5 psi of RVP values, VOC emissions decrease as temperatures decrease. CO emissions tend to follow the trend of the RVP variation. However, CO emission variation is explained not only by RVP variation but also by temperature change. NO_X emissions do not show a wide variation compared to VOC and CO emissions associated with the variation of temperatures and RVP. It was found that humidity and temperatures are the most important factors affecting NO_X emissions. Lower temperatures and humidity during winter season increases NO_X emissions by 18% compared to summer conditions.

Generally, CO and NO_X emissions are lower in summer and higher in winter. For the pollutants of SO_2, NH_3, PM2.5, PM10, and CO_2, the choice of the evaluation of month, January or July, has an insignificant effect on emissions, as do different values of temperature and RVP. Annual emissions of the 5 pollutants can be generated without any particular temperature, RVP, and humidity values.

From the comparison of the emissions based on the monthly inputs versus the annual average inputs of temperature, absolute humidity, and fuel RVP, it is recommended that the annual emission inventory for the on-road mobile sources are created by using the monthly input data for VOC and CO emissions. The reason is that a 10% difference was seen in the comparison. However, for the rest of the pollutants, NO_X, SO_2, NH_3, PM2.5, PM10, and CO_2, the annual average inputs for temperature, absolute humidity, and fuel RVP with the evaluation of month (July) can be used to estimate the annual emissions, because no significant differences are shown in monthly values. This is

a different result from the one for central Florida.[3] In Central Florida, there were only small differences in all pollutants. These different results between the two areas might be due to different range of RVP values with different annual RVP values.

To see the contribution of each vehicle type to emissions, the statewide emissions of each pollutant were divided into the 6 vehicle types (1) LDV, (2) LDT1&2, (3) LDT3&4, and HDV2B, (4) HDV3, 4, 5, 6, & 7, and Buses (5) HDV8A & 8B, and (6) MC. Passenger cars and light duty trucks, less than 6000 lbs of gross vehicle weight rating, accounted for over 80% of emissions for VOC, CO, and NH_3. Fifty four percent of NO_X emissions in Tennessee were from heavier trucks, HDV8A & 8B. This vehicle type contributed to 56% of PM2.5 emissions and 49% of PM10 emissions. The emissions of SO_2 do not have specific source of vehicle types which contributes dominant percentage in SO_2 emissions. However, the percentage of emissions from motorcycles was negligible.

Even though different VMT fractions of each vehicle type for each roadway type, the contribution of the 6 vehicle types to the emissions of VOC, CO, and NH_3 was not much different among the 95 counties. However, the other pollutants tend to be affected by the VMT fractions. Especially heavier trucks (HDV8A & 8B) had a wide range of contributions to NO_X, SO_2, PM2.5, PM10, and CO_2 emissions based on the different VMT fractions in each county. For example, only 9.7% of NO_X emissions came from HDV8A & 8B in Hancock County, and 79.7% in Haywood County. ECARBON by itself account for 68% of PM2.5 emissions from an HDDV8B vehicle category in interstate roadways in Knox County. ECARBON is elemental carbon portion of diesel exhaust particulate.

Future year projections in 2009, 2020, and 2030 were conducted for 6 counties in the Knoxville area, which were designated as an ozone nonattainment area. Without VMT growth, projected NO_X emissions show a reduction of 84 to 93.5% for all 6 counties by 2030. About 78% reductions in VOC emissions were projected by 2030 for all 6 counties. Although the magnitude of the emission levels varied, the relative changes in emission levels for VOC emissions were similar for all 6 counties. The projected reductions for the 6 counties were 64.8 – 83.5% in PM2.5 emissions, 48.4 – 73% in PM10 emissions, 91 – 94% in SO_2 emissions, and 66 – 68% in CO emissions. Generally, the emissions were projected to decrease continuously except for NH_3 emissions. NH_3 emissions were projected to increase by about 3% by 2003 for the 6 counties. The future regulations seem to be stricter for NO_X emissions than for other emissions. It causes to produce more NH_3 emissions. The projected reductions shown in SO_2 emissions may be affected by the reduction of diesel sulfur content in the future. The real projections will be a little different due to VMT growth.

REFERENCES

REFERENCES

1. *Technical Guidance on the Use of MOBILE6 for Emission Inventory Preparation*, U.S. EPA Office of Transportation and Air Quality, Jan 2002. Also found at http://www.epa.gov/otaq/models/mobile6/m6techgd.pdf, accessed Feb 20, 2004.
2. *Documentation for the 1999 National Emissions Inventory version 2.0 for Criteria Air Pollutants and draft version 3.0 for HAPS – On-road Sources*, prepared for OAQPS, U.S. EPA, E.H. Pechan & Assoc., Springfield, VA, Oct. 2002.
3. Cooper, C. D. and Arbrandt, M. *Mobile Source Emission Inventories – Monthly or Annual Average Inputs to MOBILE6*, Proceedings of the Air & Waste Management Association's 97th Annual Conference and Exhibition, Indianapolis, IN, 2004
4. The National Climatic Data Center. Found at http://www.ncdc.noaa.gov/oa/climate/stationlocator.html, accessed Mar 15, 2004.
5. *User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model*, OTAQ, U.S. EPA, EPA420-R-02-028, Oct 2002.
6. *Annual Book of American Society for Testing and Materials (ASTM) Standards*, Vol 05.02, D 4814, p 1114-1120, ASTM International, West Conshohocken, PA, 2002
7. *EPA 40 CFR Part 51. Consolidated Emissions Reporting Rule; Final Rule*, Federal Register, Vol. 67, No. 111. June 10, 2002.
8. *2002 Base Year Emission Inventory SIP Planning: 8-hr Ozone, PM2.5 and Regional Haze Programs*, Research Triangle Park, NC. U.S. EPA, Nov. 18, 2002.

9. The Green Book, U.S. EPA. Also Found at http://www.epa.gov/oar/oaqps/greenbk, accessed May 12, 2004
10. *National Air Quality and Emissions Trends Report, 1999*. EPA 454/R-01-004, OAQPS, Research Triangle Park, NC. U.S. EPA, Mar. 2001,
11. Giannelli, R.A., Gilmore, J.H., Landman, L., Srivastava, S., Beardsley, M., Brzezinski, D., Dolce, G., Koupal, J., Pedelty, J., and Shyu, G. *Sensitivity Analysis of MOBILE6.0*, EPA420-R-02-035, OTAQ, U.S. EPA, Dec 2002.
12. Tang, T., Roberts, M., and Ho, C., *Sensitivity Analysis of MOBILE6 Motor Vehicle Emission Factor Model*, FHWA-RC-Atlanta-03-0007. US DOT, FHWA, Atlanta, 2002
13. EPA OTAQ inventory website http://www.epa.gov/otaq/invntory/overview/pollutants/index.htm, accessed on Apr, 20, 2004
14. *National Air Pollutant Emission Trends: 1990-1998*, EPA 454/R-00-002. U.S. EPA Office of Air Quality Planning Standards. Mar 2000.
15. *Clean Air Act (CAA), Title I, Part D: Plan Requirements for Nonattainment Areas*, U.S. EPA, 1990. Also Found at http://www.epa.gov/oar/caa/contents.html#id, accessed May 13, 2004.
16. *EPA 40 CFR Parts 50, 51, and 81: 8-Hour Ozone National Ambient Air Quality Standards; Final Rule*, Federal Register Vol. 69. No. 84. 23858, April 30, 2004. Also found at http://www.epa.gov/ttn/naaqs/ozone/eac/fr_69(84)_23858.pdf, accessed May 12, 2004.

17. *Automobiles and Carbon Monoxide*, EPA 400-F-92-005, U.S EPA Office of Mobile Sources, Jan 1993.
18. Davis, W. T., Miller, T. L., Reed, G. D., Tang, A. M. Y., Doraiswamy, P., and Sanhueza, P., *Effects of Growth in VMT and New Mobile Source Emission Standards on* NO_X *and VOC Emissions in Tennessee*, Dept. of Civil and Environmental Engineering in the University of Tennessee, Mar. 14, 2002.
19. *Nashville Long Range 2025 Transportation Plan Conformity*, Hagler Bailly Inc. Gallop Corporation, Bucher, Willis & Ratcliff, Inc, and IDE Assiciates, Oct, 1999.
20. *Memphis Metropolitan Area Long Range Transportation Plan*, Parsons Brinckerhoff Quade & Douglas, Inc. Dec 1998.
21. MOBILE6 website, http://www.epa.gov/otaq/m6.htm
22. *Documentation for the Onroad National Emissions Inventory (NEI) for Base Years 1970-2002*, prepared for OAQPS, U.S. EPA, E.H. Pecan & Assoc., Springfiled, VA, Jan. 2004
23. *Tennessee Traffic Data for Estimating Air Pollution Emissions in 2002*, prepared for the Tennessee Department of Transportation Requested by Steve Allen, Manager 2 Mapping and Statistics Office, The University of Tennessee, Department of Civil and Environmental Engineering, May 20, 2004.

APPENDICES

Appendix A

VMT Fractions by 16 Vehicle Types and 7 Roadway Types for the 95 Counties

Table A. The VMT Fractions by 16 Vehicle Categories for 7 Roadway Types for Each County.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Anderson	Rural	Interstate	0.3596	0.0546	0.1818	0.0553	0.0265	0.0296	0.0064	0.0050	0.0038	0.0142	0.0168	0.0520	0.1850	0.0032	0.0016	0.0046	1.0000
		Arterials	0.4848	0.0736	0.2451	0.0745	0.0358	0.0399	0.0028	0.0022	0.0016	0.0061	0.0073	0.0039	0.0141	0.0014	0.0007	0.0062	1.0000
		Collector & Local	0.4888	0.0742	0.2472	0.0751	0.0361	0.0402	0.0025	0.0020	0.0015	0.0056	0.0066	0.0026	0.0094	0.0013	0.0006	0.0063	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4873	0.0740	0.2463	0.0749	0.0360	0.0401	0.0028	0.0022	0.0016	0.0061	0.0073	0.0028	0.0102	0.0014	0.0007	0.0063	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
Bedford	Rural	Interstate	0.3636	0.0552	0.1839	0.0559	0.0268	0.0299	0.0075	0.0059	0.0045	0.0167	0.0198	0.0482	0.1718	0.0038	0.0018	0.0047	1.0000
		Arterials	0.4572	0.0694	0.2311	0.0702	0.0337	0.0376	0.0047	0.0036	0.0027	0.0103	0.0122	0.0127	0.0453	0.0023	0.0011	0.0059	1.0000
		Collector & Local	0.4884	0.0741	0.2469	0.0750	0.0360	0.0402	0.0028	0.0022	0.0016	0.0061	0.0073	0.0024	0.0086	0.0014	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4688	0.0711	0.2370	0.0720	0.0346	0.0386	0.0039	0.0030	0.0023	0.0086	0.0102	0.0090	0.0320	0.0020	0.0009	0.0060	1.0000
		Collector & Local	0.4874	0.0740	0.2464	0.0749	0.0360	0.0401	0.0030	0.0023	0.0018	0.0067	0.0079	0.0024	0.0086	0.0015	0.0007	0.0063	1.0000
Benton	Rural	Interstate	0.3031	0.0460	0.1532	0.0466	0.0224	0.0249	0.0088	0.0068	0.0052	0.0195	0.0231	0.0723	0.2577	0.0044	0.0021	0.0039	1.0000
		Arterials	0.4267	0.0648	0.2157	0.0656	0.0315	0.0351	0.0067	0.0052	0.0039	0.0148	0.0175	0.0224	0.0796	0.0034	0.0016	0.0055	1.0000
		Collector & Local	0.4859	0.0737	0.2457	0.0747	0.0358	0.0400	0.0034	0.0026	0.0020	0.0075	0.0089	0.0024	0.0086	0.0017	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Bledsoe	Rural	Interstate																	
		Arterials	0.4676	0.0710	0.2365	0.0719	0.0345	0.0385	0.0055	0.0043	0.0033	0.0123	0.0145	0.0066	0.0234	0.0028	0.0013	0.0060	1.0000
		Collector & Local	0.4885	0.0741	0.2469	0.0750	0.0360	0.0402	0.0029	0.0022	0.0017	0.0064	0.0076	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Blount	Rural	Interstate	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
		Arterials	0.4843	0.0735	0.2449	0.0744	0.0357	0.0399	0.0020	0.0016	0.0012	0.0045	0.0053	0.0055	0.0195	0.0010	0.0005	0.0062	1.0000
		Collector & Local	0.4854	0.0736	0.2454	0.0746	0.0358	0.0399	0.0036	0.0028	0.0022	0.0081	0.0096	0.0022	0.0078	0.0018	0.0009	0.0063	1.0000
	Urban	Interstate & Ramp	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
		Fw/Expwy	0.5010	0.0760	0.2533	0.0770	0.0370	0.0412	0.0006	0.0005	0.0004	0.0014	0.0016	0.0007	0.0023	0.0003	0.0002	0.0065	1.0000
		Arterials	0.4819	0.0731	0.2437	0.0740	0.0355	0.0396	0.0036	0.0028	0.0022	0.0081	0.0096	0.0037	0.0133	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4844	0.0735	0.2449	0.0744	0.0357	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0024	0.0086	0.0019	0.0009	0.0062	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Bradley	Rural	Interstate	0.3733	0.0566	0.1888	0.0573	0.0275	0.0307	0.0055	0.0043	0.0033	0.0123	0.0145	0.0476	0.1694	0.0028	0.0013	0.0048	1.0000
		Arterials	0.4712	0.0715	0.2383	0.0724	0.0348	0.0388	0.0034	0.0026	0.0020	0.0075	0.0089	0.0088	0.0312	0.0017	0.0008	0.0061	1.0000
		Collector & Local	0.4834	0.0733	0.2444	0.0743	0.0357	0.0398	0.0039	0.0030	0.0023	0.0086	0.0102	0.0026	0.0094	0.0020	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp	0.3586	0.0544	0.1813	0.0551	0.0265	0.0295	0.0063	0.0049	0.0037	0.0139	0.0165	0.0526	0.1874	0.0032	0.0015	0.0046	1.0000
		Fw/Expwy	0.4698	0.0713	0.2375	0.0722	0.0347	0.0386	0.0039	0.0030	0.0023	0.0086	0.0102	0.0085	0.0305	0.0020	0.0009	0.0060	1.0000
		Arterials	0.4828	0.0733	0.2441	0.0742	0.0356	0.0397	0.0028	0.0022	0.0016	0.0061	0.0073	0.0048	0.0172	0.0014	0.0007	0.0062	1.0000
		Collector & Local	0.4869	0.0739	0.2462	0.0748	0.0359	0.0401	0.0033	0.0025	0.0019	0.0072	0.0086	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000
Campbell	Rural	Interstate	0.3057	0.0464	0.1545	0.0469	0.0225	0.0251	0.0093	0.0072	0.0055	0.0206	0.0244	0.0704	0.2506	0.0047	0.0023	0.0039	1.0000
		Arterials	0.4651	0.0706	0.2351	0.0715	0.0343	0.0383	0.0049	0.0038	0.0029	0.0109	0.0129	0.0088	0.0312	0.0025	0.0012	0.0060	1.0000
		Collector & Local	0.4823	0.0732	0.2439	0.0741	0.0356	0.0397	0.0041	0.0032	0.0025	0.0092	0.0109	0.0026	0.0094	0.0021	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4813	0.0730	0.2434	0.0740	0.0355	0.0396	0.0038	0.0029	0.0022	0.0084	0.0099	0.0037	0.0133	0.0019	0.0009	0.0062	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
Cannon	Rural	Interstate																	
		Arterials	0.4808	0.0730	0.2431	0.0739	0.0355	0.0396	0.0033	0.0025	0.0019	0.0072	0.0086	0.0048	0.0172	0.0016	0.0008	0.0062	1.0000
		Collector & Local	0.4865	0.0738	0.2459	0.0747	0.0359	0.0400	0.0034	0.0026	0.0020	0.0075	0.0089	0.0022	0.0078	0.0017	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Carroll	Rural	Interstate	0.3233	0.0490	0.1634	0.0497	0.0238	0.0266	0.0075	0.0059	0.0045	0.0167	0.0198	0.0658	0.2342	0.0038	0.0018	0.0042	1.0000
		Arterials	0.4580	0.0695	0.2316	0.0704	0.0338	0.0377	0.0049	0.0038	0.0029	0.0109	0.0129	0.0118	0.0422	0.0025	0.0012	0.0059	1.0000
		Collector & Local	0.4798	0.0728	0.2426	0.0737	0.0354	0.0395	0.0038	0.0029	0.0022	0.0084	0.0099	0.0044	0.0156	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4738	0.0719	0.2395	0.0728	0.0350	0.0390	0.0033	0.0025	0.0019	0.0072	0.0086	0.0079	0.0281	0.0016	0.0008	0.0061	1.0000
		Collector & Local	0.4890	0.0742	0.2472	0.0751	0.0361	0.0402	0.0026	0.0021	0.0016	0.0058	0.0069	0.0024	0.0086	0.0013	0.0006	0.0063	1.0000
Carter	Rural	Interstate																	
		Arterials	0.4687	0.0711	0.2370	0.0720	0.0346	0.0386	0.0053	0.0041	0.0031	0.0117	0.0138	0.0066	0.0234	0.0027	0.0013	0.0060	1.0000
		Collector & Local	0.4869	0.0739	0.2462	0.0748	0.0359	0.0401	0.0033	0.0025	0.0019	0.0072	0.0086	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy	0.4345	0.0659	0.2197	0.0667	0.0320	0.0357	0.0050	0.0039	0.0030	0.0111	0.0132	0.0219	0.0781	0.0025	0.0012	0.0056	1.0000
		Arterials	0.4840	0.0734	0.2446	0.0743	0.0357	0.0398	0.0036	0.0028	0.0022	0.0081	0.0096	0.0028	0.0102	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4873	0.0740	0.2464	0.0749	0.0360	0.0401	0.0031	0.0024	0.0019	0.0070	0.0082	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Cheatham	Rural	Interstate	0.3743	0.0568	0.1892	0.0575	0.0276	0.0308	0.0064	0.0050	0.0038	0.0142	0.0168	0.0456	0.1624	0.0032	0.0016	0.0048	1.0000
		Arterials	0.4864	0.0738	0.2459	0.0747	0.0359	0.0400	0.0036	0.0028	0.0022	0.0081	0.0096	0.0018	0.0062	0.0018	0.0009	0.0063	1.0000
		Collector & Local	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0036	0.0028	0.0022	0.0081	0.0096	0.0024	0.0086	0.0018	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Chester	Rural	Interstate																	
		Arterials	0.4254	0.0645	0.2150	0.0653	0.0314	0.0350	0.0085	0.0066	0.0051	0.0189	0.0224	0.0197	0.0703	0.0043	0.0021	0.0055	1.0000
		Collector & Local	0.4833	0.0733	0.2444	0.0743	0.0357	0.0398	0.0040	0.0031	0.0024	0.0089	0.0106	0.0024	0.0086	0.0020	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4531	0.0687	0.2291	0.0696	0.0334	0.0373	0.0059	0.0046	0.0035	0.0131	0.0155	0.0123	0.0437	0.0030	0.0014	0.0058	1.0000
		Collector & Local	0.4807	0.0730	0.2431	0.0739	0.0355	0.0396	0.0040	0.0031	0.0024	0.0089	0.0106	0.0035	0.0125	0.0020	0.0010	0.0062	1.0000
Claiborne	Rural	Interstate																	
		Arterials	0.4540	0.0689	0.2296	0.0698	0.0335	0.0374	0.0052	0.0040	0.0030	0.0114	0.0135	0.0132	0.0468	0.0026	0.0013	0.0058	1.0000
		Collector & Local	0.4813	0.0730	0.2434	0.0740	0.0355	0.0396	0.0038	0.0029	0.0022	0.0084	0.0099	0.0037	0.0133	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Clay	Rural	Interstate																	
		Arterials	0.4648	0.0705	0.2349	0.0714	0.0343	0.0382	0.0050	0.0039	0.0030	0.0111	0.0132	0.0088	0.0312	0.0025	0.0012	0.0060	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Cocke	Rural	Interstate	0.3328	0.0505	0.1683	0.0511	0.0246	0.0274	0.0038	0.0029	0.0022	0.0084	0.0099	0.0682	0.2428	0.0019	0.0009	0.0043	1.0000
		Arterials	0.4824	0.0732	0.2439	0.0741	0.0356	0.0397	0.0039	0.0030	0.0023	0.0086	0.0102	0.0031	0.0109	0.0020	0.0009	0.0062	1.0000
		Collector & Local	0.4869	0.0739	0.2462	0.0748	0.0359	0.0401	0.0033	0.0025	0.0019	0.0072	0.0086	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp	0.3364	0.0510	0.1701	0.0517	0.0248	0.0277	0.0038	0.0029	0.0022	0.0084	0.0099	0.0666	0.2374	0.0019	0.0009	0.0043	1.0000
		Fw/Expwy																	
		Arterials	0.4854	0.0736	0.2454	0.0746	0.0358	0.0399	0.0035	0.0027	0.0021	0.0078	0.0092	0.0024	0.0086	0.0018	0.0009	0.0063	1.0000
		Collector & Local	0.4873	0.0740	0.2464	0.0749	0.0360	0.0401	0.0031	0.0024	0.0019	0.0070	0.0082	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Coffee	Rural	Interstate	0.3465	0.0526	0.1752	0.0532	0.0256	0.0285	0.0088	0.0068	0.0052	0.0195	0.0231	0.0535	0.1905	0.0044	0.0021	0.0045	1.0000
		Arterials	0.4733	0.0718	0.2393	0.0727	0.0349	0.0389	0.0041	0.0032	0.0025	0.0092	0.0109	0.0066	0.0234	0.0021	0.0010	0.0061	1.0000
		Collector & Local	0.4854	0.0736	0.2454	0.0746	0.0358	0.0399	0.0036	0.0028	0.0022	0.0081	0.0096	0.0022	0.0078	0.0018	0.0009	0.0063	1.0000
	Urban	Interstate & Ramp Fw/Expwy	0.3365	0.0510	0.1701	0.0517	0.0248	0.0277	0.0090	0.0070	0.0053	0.0201	0.0237	0.0574	0.2046	0.0046	0.0022	0.0043	1.0000
		Arterials	0.4794	0.0727	0.2424	0.0736	0.0354	0.0394	0.0033	0.0025	0.0019	0.0072	0.0086	0.0055	0.0195	0.0016	0.0008	0.0062	1.0000
		Collector & Local	0.4889	0.0742	0.2472	0.0751	0.0361	0.0402	0.0029	0.0022	0.0017	0.0064	0.0076	0.0020	0.0070	0.0015	0.0007	0.0063	1.0000
Crockett	Rural	Interstate																	
		Arterials	0.4358	0.0661	0.2204	0.0670	0.0322	0.0359	0.0029	0.0022	0.0017	0.0064	0.0076	0.0250	0.0890	0.0015	0.0007	0.0056	1.0000
		Collector & Local	0.4840	0.0734	0.2446	0.0743	0.0357	0.0398	0.0038	0.0029	0.0022	0.0084	0.0099	0.0026	0.0094	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Cumberlan	Rural	Interstate	0.3354	0.0509	0.1696	0.0515	0.0247	0.0276	0.0087	0.0067	0.0051	0.0192	0.0228	0.0585	0.2085	0.0044	0.0021	0.0043	1.0000
		Arterials	0.4536	0.0688	0.2293	0.0697	0.0335	0.0373	0.0060	0.0047	0.0036	0.0134	0.0158	0.0118	0.0422	0.0030	0.0015	0.0058	1.0000
		Collector & Local	0.4803	0.0729	0.2429	0.0738	0.0354	0.0395	0.0038	0.0029	0.0022	0.0084	0.0099	0.0042	0.0148	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy	0.3446	0.0523	0.1742	0.0529	0.0254	0.0283	0.0088	0.0068	0.0052	0.0195	0.0231	0.0544	0.1936	0.0044	0.0021	0.0044	1.0000
		Arterials	0.4759	0.0722	0.2406	0.0731	0.0351	0.0391	0.0044	0.0034	0.0026	0.0097	0.0115	0.0050	0.0180	0.0022	0.0011	0.0061	1.0000
		Collector & Local	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0022	0.0078	0.0019	0.0009	0.0062	1.0000
Davidson	Rural	Interstate																	
		Arterials	0.4844	0.0735	0.2449	0.0744	0.0357	0.0399	0.0036	0.0028	0.0022	0.0081	0.0096	0.0026	0.0094	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4626	0.0702	0.2339	0.0711	0.0341	0.0381	0.0060	0.0047	0.0036	0.0134	0.0158	0.0079	0.0281	0.0030	0.0015	0.0060	1.0000
	Urban	Interstate & Ramp	0.4228	0.0641	0.2138	0.0650	0.0312	0.0348	0.0044	0.0034	0.0026	0.0097	0.0115	0.0281	0.0999	0.0022	0.0011	0.0054	1.0000
		Fw/Expwy	0.4749	0.0720	0.2400	0.0729	0.0350	0.0391	0.0029	0.0022	0.0017	0.0064	0.0076	0.0081	0.0289	0.0015	0.0007	0.0061	1.0000
		Arterials	0.4829	0.0733	0.2442	0.0742	0.0356	0.0397	0.0033	0.0025	0.0019	0.0072	0.0086	0.0039	0.0141	0.0016	0.0008	0.0062	1.0000
		Collector & Local	0.4829	0.0733	0.2441	0.0742	0.0356	0.0397	0.0043	0.0033	0.0025	0.0095	0.0112	0.0022	0.0078	0.0022	0.0010	0.0062	1.0000
Decatur	Rural	Interstate	0.3284	0.0498	0.1660	0.0504	0.0242	0.0270	0.0075	0.0059	0.0045	0.0167	0.0198	0.0636	0.2264	0.0038	0.0018	0.0042	1.0000
		Arterials	0.4313	0.0654	0.2181	0.0663	0.0318	0.0355	0.0084	0.0066	0.0050	0.0187	0.0221	0.0173	0.0617	0.0042	0.0020	0.0056	1.0000
		Collector & Local	0.4823	0.0732	0.2439	0.0741	0.0356	0.0397	0.0035	0.0027	0.0021	0.0078	0.0092	0.0037	0.0133	0.0018	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials																	
		Collector & Local																	

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
		Arterials	0.4662	0.0707	0.2357	0.0716	0.0344	0.0384	0.0063	0.0049	0.0037	0.0139	0.0165	0.0059	0.0211	0.0032	0.0015	0.0060	1.0000
		Collector & Local	0.4855	0.0736	0.2454	0.0746	0.0358	0.0399	0.0033	0.0025	0.0019	0.0072	0.0086	0.0028	0.0102	0.0016	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Dickson	Rural	Interstate	0.2930	0.0444	0.1482	0.0450	0.0216	0.0241	0.0088	0.0068	0.0052	0.0195	0.0231	0.0767	0.2733	0.0044	0.0021	0.0038	1.0000
		Arterials	0.4859	0.0737	0.2457	0.0747	0.0358	0.0400	0.0030	0.0023	0.0018	0.0067	0.0079	0.0031	0.0109	0.0015	0.0007	0.0063	1.0000
		Collector & Local	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0022	0.0078	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp	0.2935	0.0445	0.1484	0.0451	0.0217	0.0241	0.0088	0.0068	0.0052	0.0195	0.0231	0.0765	0.2725	0.0044	0.0021	0.0038	1.0000
		Fw/Expwy																	
		Arterials	0.4844	0.0735	0.2449	0.0744	0.0357	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0024	0.0086	0.0019	0.0009	0.0062	1.0000
		Collector & Local	0.4873	0.0740	0.2464	0.0749	0.0360	0.0401	0.0031	0.0024	0.0019	0.0070	0.0082	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000
Dyer	Rural	Interstate	0.3587	0.0544	0.1813	0.0551	0.0265	0.0295	0.0050	0.0039	0.0030	0.0111	0.0132	0.0548	0.1952	0.0025	0.0012	0.0046	1.0000
		Arterials	0.4333	0.0658	0.2190	0.0666	0.0320	0.0357	0.0045	0.0035	0.0027	0.0100	0.0119	0.0232	0.0828	0.0023	0.0011	0.0056	1.0000
		Collector & Local	0.4813	0.0730	0.2434	0.0740	0.0355	0.0396	0.0035	0.0027	0.0021	0.0078	0.0092	0.0042	0.0148	0.0018	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp	0.3965	0.0602	0.2005	0.0609	0.0293	0.0326	0.0039	0.0030	0.0023	0.0086	0.0102	0.0403	0.1437	0.0020	0.0009	0.0051	1.0000
		Fw/Expwy	0.4057	0.0615	0.2051	0.0623	0.0299	0.0334	0.0034	0.0026	0.0020	0.0075	0.0089	0.0373	0.1327	0.0017	0.0008	0.0052	1.0000
		Arterials	0.4752	0.0721	0.2403	0.0730	0.0351	0.0391	0.0028	0.0022	0.0016	0.0061	0.0073	0.0081	0.0289	0.0014	0.0007	0.0061	1.0000
		Collector & Local	0.4893	0.0743	0.2474	0.0752	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0024	0.0086	0.0013	0.0006	0.0063	1.0000
Fayette	Rural	Interstate	0.3075	0.0467	0.1555	0.0473	0.0227	0.0253	0.0075	0.0059	0.0045	0.0167	0.0198	0.0726	0.2584	0.0038	0.0018	0.0040	1.0000
		Arterials	0.4663	0.0707	0.2357	0.0716	0.0344	0.0384	0.0047	0.0036	0.0027	0.0103	0.0122	0.0088	0.0312	0.0023	0.0011	0.0060	1.0000
		Collector & Local	0.4849	0.0736	0.2452	0.0745	0.0358	0.0399	0.0034	0.0026	0.0020	0.0075	0.0089	0.0028	0.0102	0.0017	0.0008	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Fentress	Rural	Interstate																	
		Arterials	0.4643	0.0704	0.2347	0.0713	0.0342	0.0382	0.0039	0.0030	0.0023	0.0086	0.0102	0.0110	0.0390	0.0020	0.0009	0.0060	1.0000
		Collector & Local	0.4829	0.0733	0.2441	0.0742	0.0356	0.0397	0.0038	0.0029	0.0022	0.0084	0.0099	0.0031	0.0109	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Franklin	Rural	Interstate																	
		Arterials	0.4712	0.0715	0.2383	0.0724	0.0348	0.0388	0.0039	0.0030	0.0023	0.0086	0.0102	0.0079	0.0281	0.0020	0.0009	0.0061	1.0000
		Collector & Local	0.4844	0.0735	0.2449	0.0744	0.0357	0.0399	0.0035	0.0027	0.0021	0.0078	0.0092	0.0028	0.0102	0.0018	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4787	0.0727	0.2421	0.0736	0.0353	0.0394	0.0036	0.0028	0.0022	0.0081	0.0096	0.0050	0.0180	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4894	0.0743	0.2475	0.0752	0.0361	0.0403	0.0026	0.0021	0.0016	0.0058	0.0069	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
Gibson	Rural	Interstate																	
		Arterials	0.4683	0.0710	0.2368	0.0719	0.0345	0.0385	0.0038	0.0029	0.0022	0.0084	0.0099	0.0094	0.0336	0.0019	0.0009	0.0060	1.0000
		Collector & Local	0.4845	0.0735	0.2449	0.0744	0.0357	0.0399	0.0034	0.0026	0.0020	0.0075	0.0089	0.0031	0.0109	0.0017	0.0008	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4742	0.0720	0.2398	0.0729	0.0350	0.0390	0.0041	0.0032	0.0025	0.0092	0.0109	0.0061	0.0219	0.0021	0.0010	0.0061	1.0000
		Collector & Local	0.4880	0.0740	0.2467	0.0750	0.0360	0.0401	0.0030	0.0023	0.0018	0.0067	0.0079	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
Giles	Rural	Interstate	0.2824	0.0428	0.1428	0.0434	0.0208	0.0232	0.0038	0.0029	0.0022	0.0084	0.0099	0.0901	0.3209	0.0019	0.0009	0.0036	1.0000
		Arterials	0.4586	0.0696	0.2319	0.0705	0.0338	0.0377	0.0053	0.0041	0.0031	0.0117	0.0138	0.0110	0.0390	0.0027	0.0013	0.0059	1.0000
		Collector & Local	0.4858	0.0737	0.2457	0.0747	0.0358	0.0400	0.0035	0.0027	0.0021	0.0078	0.0092	0.0022	0.0078	0.0018	0.0009	0.0063	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4743	0.0720	0.2398	0.0729	0.0350	0.0390	0.0044	0.0034	0.0026	0.0097	0.0115	0.0057	0.0203	0.0022	0.0011	0.0061	1.0000
		Collector & Local	0.4885	0.0741	0.2469	0.0750	0.0360	0.0402	0.0029	0.0022	0.0017	0.0064	0.0076	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
Grainger	Rural	Interstate																	
		Arterials	0.4586	0.0696	0.2319	0.0705	0.0338	0.0377	0.0036	0.0028	0.0022	0.0081	0.0096	0.0138	0.0492	0.0018	0.0009	0.0059	1.0000
		Collector & Local	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0036	0.0028	0.0022	0.0081	0.0096	0.0024	0.0086	0.0018	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Greene	Rural	Interstate	0.3398	0.0516	0.1718	0.0522	0.0251	0.0280	0.0049	0.0038	0.0029	0.0109	0.0129	0.0631	0.2249	0.0025	0.0012	0.0044	1.0000
		Arterials	0.4637	0.0704	0.2344	0.0712	0.0342	0.0381	0.0060	0.0047	0.0036	0.0134	0.0158	0.0075	0.0265	0.0030	0.0015	0.0060	1.0000
		Collector & Local	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0036	0.0028	0.0022	0.0081	0.0096	0.0024	0.0086	0.0018	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4804	0.0729	0.2429	0.0738	0.0354	0.0395	0.0033	0.0025	0.0019	0.0072	0.0086	0.0050	0.0180	0.0016	0.0008	0.0062	1.0000
		Collector & Local	0.4865	0.0738	0.2459	0.0747	0.0359	0.0400	0.0034	0.0026	0.0020	0.0075	0.0089	0.0022	0.0078	0.0017	0.0008	0.0063	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Grundy	Rural	Interstate	0.3186	0.0484	0.1611	0.0490	0.0235	0.0262	0.0113	0.0088	0.0067	0.0251	0.0297	0.0612	0.2178	0.0057	0.0028	0.0041	1.0000
		Arterials	0.4749	0.0720	0.2401	0.0729	0.0350	0.0391	0.0033	0.0025	0.0019	0.0072	0.0086	0.0075	0.0265	0.0016	0.0008	0.0061	1.0000
		Collector & Local	0.4656	0.0707	0.2355	0.0715	0.0344	0.0383	0.0060	0.0047	0.0036	0.0134	0.0158	0.0066	0.0234	0.0030	0.0015	0.0060	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Hamblen	Rural	Interstate	0.3434	0.0521	0.1737	0.0528	0.0253	0.0283	0.0043	0.0033	0.0025	0.0095	0.0112	0.0627	0.2233	0.0022	0.0010	0.0044	1.0000
		Arterials	0.4708	0.0714	0.2380	0.0723	0.0347	0.0387	0.0053	0.0041	0.0031	0.0117	0.0138	0.0057	0.0203	0.0027	0.0013	0.0061	1.0000
		Collector & Local	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0036	0.0028	0.0022	0.0081	0.0096	0.0024	0.0086	0.0018	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp	0.3541	0.0537	0.1790	0.0544	0.0261	0.0291	0.0062	0.0048	0.0036	0.0136	0.0162	0.0548	0.1952	0.0031	0.0015	0.0046	1.0000
		Fw/Expwy																	
		Arterials	0.4819	0.0731	0.2437	0.0740	0.0355	0.0396	0.0036	0.0028	0.0022	0.0081	0.0096	0.0037	0.0133	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4869	0.0739	0.2462	0.0748	0.0359	0.0401	0.0033	0.0025	0.0019	0.0072	0.0086	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000
Hamilton	Rural	Interstate	0.3899	0.0592	0.1971	0.0599	0.0288	0.0321	0.0059	0.0046	0.0035	0.0131	0.0155	0.0397	0.1413	0.0030	0.0014	0.0050	1.0000
		Arterials	0.4591	0.0697	0.2321	0.0705	0.0339	0.0378	0.0057	0.0044	0.0033	0.0125	0.0148	0.0101	0.0359	0.0029	0.0014	0.0059	1.0000
		Collector & Local	0.4865	0.0738	0.2459	0.0747	0.0359	0.0400	0.0034	0.0026	0.0020	0.0075	0.0089	0.0022	0.0078	0.0017	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp	0.4127	0.0626	0.2087	0.0634	0.0304	0.0339	0.0058	0.0045	0.0034	0.0128	0.0152	0.0300	0.1070	0.0029	0.0014	0.0053	1.0000
		Fw/Expwy	0.4702	0.0713	0.2377	0.0722	0.0347	0.0387	0.0049	0.0038	0.0029	0.0109	0.0129	0.0066	0.0234	0.0025	0.0012	0.0061	1.0000
		Arterials	0.4858	0.0737	0.2457	0.0747	0.0358	0.0400	0.0031	0.0024	0.0019	0.0070	0.0082	0.0028	0.0102	0.0016	0.0008	0.0063	1.0000
		Collector & Local	0.4880	0.0740	0.2467	0.0750	0.0360	0.0401	0.0030	0.0023	0.0018	0.0067	0.0079	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
Hancock	Rural	Interstate																	
		Arterials	0.4844	0.0735	0.2449	0.0744	0.0357	0.0399	0.0035	0.0027	0.0021	0.0078	0.0092	0.0028	0.0102	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4884	0.0741	0.2469	0.0750	0.0360	0.0402	0.0028	0.0022	0.0016	0.0061	0.0073	0.0024	0.0086	0.0014	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Hardeman	Rural	Interstate																	
		Arterials	0.4580	0.0695	0.2316	0.0704	0.0338	0.0377	0.0049	0.0038	0.0029	0.0109	0.0129	0.0118	0.0422	0.0025	0.0012	0.0059	1.0000
		Collector & Local	0.4880	0.0740	0.2467	0.0750	0.0360	0.0401	0.0030	0.0023	0.0018	0.0067	0.0079	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4764	0.0723	0.2408	0.0732	0.0351	0.0392	0.0033	0.0025	0.0019	0.0072	0.0086	0.0068	0.0242	0.0016	0.0008	0.0061	1.0000
		Collector & Local	0.4885	0.0741	0.2469	0.0750	0.0360	0.0402	0.0029	0.0022	0.0017	0.0064	0.0076	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Hardin	Rural	Interstate																	
		Arterials	0.4393	0.0667	0.2222	0.0675	0.0324	0.0362	0.0059	0.0046	0.0035	0.0131	0.0155	0.0182	0.0648	0.0030	0.0014	0.0057	1.0000
		Collector & Local	0.4808	0.0730	0.2431	0.0739	0.0355	0.0396	0.0039	0.0030	0.0023	0.0086	0.0102	0.0037	0.0133	0.0020	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4749	0.0720	0.2400	0.0729	0.0350	0.0391	0.0035	0.0027	0.0021	0.0078	0.0092	0.0070	0.0250	0.0018	0.0009	0.0061	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
Hawkins	Rural	Interstate																	
		Arterials	0.4717	0.0716	0.2385	0.0725	0.0348	0.0388	0.0040	0.0031	0.0024	0.0089	0.0106	0.0075	0.0265	0.0020	0.0010	0.0061	1.0000
		Collector & Local	0.4840	0.0734	0.2447	0.0743	0.0357	0.0398	0.0039	0.0030	0.0023	0.0086	0.0102	0.0024	0.0086	0.0020	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4823	0.0732	0.2439	0.0741	0.0356	0.0397	0.0035	0.0027	0.0021	0.0078	0.0092	0.0037	0.0133	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4880	0.0740	0.2467	0.0750	0.0360	0.0401	0.0030	0.0023	0.0018	0.0067	0.0079	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
Haywood	Rural	Interstate	0.2935	0.0445	0.1484	0.0451	0.0217	0.0241	0.0090	0.0070	0.0053	0.0201	0.0237	0.0761	0.2709	0.0046	0.0022	0.0038	1.0000
		Arterials	0.4627	0.0702	0.2339	0.0711	0.0341	0.0381	0.0047	0.0036	0.0027	0.0103	0.0122	0.0103	0.0367	0.0023	0.0011	0.0060	1.0000
		Collector & Local	0.4798	0.0728	0.2426	0.0737	0.0354	0.0395	0.0040	0.0031	0.0024	0.0089	0.0106	0.0039	0.0141	0.0020	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp Fw/Expwy	0.3001	0.0455	0.1517	0.0461	0.0221	0.0247	0.0088	0.0068	0.0052	0.0195	0.0231	0.0737	0.2623	0.0044	0.0021	0.0039	1.0000
		Arterials	0.4778	0.0725	0.2416	0.0734	0.0353	0.0393	0.0039	0.0030	0.0023	0.0086	0.0102	0.0050	0.0180	0.0020	0.0009	0.0062	1.0000
		Collector & Local	0.4834	0.0733	0.2444	0.0743	0.0357	0.0398	0.0039	0.0030	0.0023	0.0086	0.0102	0.0026	0.0094	0.0020	0.0009	0.0062	1.0000
Henderson	Rural	Interstate	0.3147	0.0477	0.1591	0.0483	0.0232	0.0259	0.0075	0.0059	0.0045	0.0167	0.0198	0.0695	0.2475	0.0038	0.0018	0.0041	1.0000
		Arterials	0.4409	0.0669	0.2229	0.0677	0.0325	0.0363	0.0077	0.0060	0.0045	0.0170	0.0201	0.0145	0.0515	0.0039	0.0019	0.0057	1.0000
		Collector & Local	0.4693	0.0712	0.2372	0.0721	0.0346	0.0386	0.0060	0.0047	0.0036	0.0134	0.0158	0.0050	0.0180	0.0030	0.0015	0.0060	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4697	0.0713	0.2375	0.0722	0.0347	0.0386	0.0040	0.0031	0.0024	0.0089	0.0106	0.0083	0.0297	0.0020	0.0010	0.0060	1.0000
		Collector & Local	0.4859	0.0737	0.2457	0.0747	0.0358	0.0400	0.0033	0.0025	0.0019	0.0072	0.0086	0.0026	0.0094	0.0016	0.0008	0.0063	1.0000
Henry	Rural	Interstate																	
		Arterials	0.4456	0.0676	0.2252	0.0684	0.0329	0.0367	0.0050	0.0039	0.0030	0.0111	0.0132	0.0171	0.0609	0.0025	0.0012	0.0057	1.0000
		Collector & Local	0.4753	0.0721	0.2403	0.0730	0.0351	0.0391	0.0048	0.0037	0.0028	0.0106	0.0125	0.0046	0.0164	0.0024	0.0012	0.0061	1.0000
	Urban	Interstate & Ramp Fw/Expwy																	
		Arterials	0.4768	0.0723	0.2411	0.0733	0.0352	0.0392	0.0031	0.0024	0.0019	0.0070	0.0082	0.0068	0.0242	0.0016	0.0008	0.0061	1.0000
		Collector & Local	0.4844	0.0735	0.2449	0.0744	0.0357	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0024	0.0086	0.0019	0.0009	0.0062	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Hickman	Rural	Interstate	0.2981	0.0452	0.1507	0.0458	0.0220	0.0245	0.0088	0.0068	0.0052	0.0195	0.0231	0.0745	0.2655	0.0044	0.0021	0.0038	1.0000
		Arterials	0.4753	0.0721	0.2403	0.0730	0.0351	0.0391	0.0040	0.0031	0.0024	0.0089	0.0106	0.0059	0.0211	0.0020	0.0010	0.0061	1.0000
		Collector & Local	0.4798	0.0728	0.2426	0.0737	0.0354	0.0395	0.0038	0.0029	0.0022	0.0084	0.0099	0.0044	0.0156	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Houston	Rural	Interstate																	
		Arterials	0.4799	0.0728	0.2426	0.0737	0.0354	0.0395	0.0033	0.0025	0.0019	0.0072	0.0086	0.0053	0.0187	0.0016	0.0008	0.0062	1.0000
		Collector & Local	0.4819	0.0731	0.2437	0.0740	0.0355	0.0396	0.0041	0.0032	0.0025	0.0092	0.0109	0.0028	0.0102	0.0021	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Humphrey	Rural	Interstate	0.2981	0.0452	0.1507	0.0458	0.0220	0.0245	0.0088	0.0068	0.0052	0.0195	0.0231	0.0745	0.2655	0.0044	0.0021	0.0038	1.0000
		Arterials	0.4449	0.0675	0.2250	0.0684	0.0328	0.0366	0.0049	0.0038	0.0029	0.0109	0.0129	0.0175	0.0625	0.0025	0.0012	0.0057	1.0000
		Collector & Local	0.4885	0.0741	0.2469	0.0750	0.0360	0.0402	0.0029	0.0022	0.0017	0.0064	0.0076	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Jackson	Rural	Interstate																	
		Arterials	0.4718	0.0716	0.2385	0.0725	0.0348	0.0388	0.0047	0.0036	0.0027	0.0103	0.0122	0.0064	0.0226	0.0023	0.0011	0.0061	1.0000
		Collector & Local	0.4819	0.0731	0.2438	0.0740	0.0355	0.0396	0.0033	0.0025	0.0019	0.0072	0.0086	0.0044	0.0156	0.0016	0.0008	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Jefferson	Rural	Interstate	0.3516	0.0533	0.1778	0.0540	0.0259	0.0289	0.0060	0.0047	0.0036	0.0134	0.0158	0.0561	0.1999	0.0030	0.0015	0.0045	1.0000
		Arterials	0.4717	0.0716	0.2385	0.0725	0.0348	0.0388	0.0036	0.0028	0.0022	0.0081	0.0096	0.0081	0.0289	0.0018	0.0009	0.0061	1.0000
		Collector & Local	0.4859	0.0737	0.2457	0.0747	0.0358	0.0400	0.0034	0.0026	0.0020	0.0075	0.0089	0.0024	0.0086	0.0017	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp	0.3586	0.0544	0.1813	0.0551	0.0265	0.0295	0.0063	0.0049	0.0037	0.0139	0.0165	0.0526	0.1874	0.0032	0.0015	0.0046	1.0000
		Fw/Expwy																	
		Arterials	0.4819	0.0731	0.2437	0.0741	0.0355	0.0396	0.0030	0.0023	0.0018	0.0067	0.0079	0.0048	0.0172	0.0015	0.0007	0.0062	1.0000
		Collector & Local	0.4845	0.0735	0.2449	0.0744	0.0357	0.0399	0.0034	0.0026	0.0020	0.0075	0.0089	0.0031	0.0109	0.0017	0.0008	0.0062	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Johnson	Rural	Interstate																	
		Arterials	0.4626	0.0702	0.2339	0.0711	0.0341	0.0381	0.0043	0.0033	0.0025	0.0095	0.0112	0.0110	0.0390	0.0022	0.0010	0.0060	1.0000
		Collector & Local	0.4794	0.0727	0.2423	0.0736	0.0354	0.0394	0.0048	0.0037	0.0028	0.0106	0.0125	0.0028	0.0102	0.0024	0.0012	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Knox	Rural	Interstate	0.4086	0.0620	0.2066	0.0628	0.0301	0.0336	0.0057	0.0044	0.0033	0.0125	0.0148	0.0320	0.1140	0.0029	0.0014	0.0053	1.0000
		Arterials	0.4798	0.0728	0.2426	0.0737	0.0354	0.0395	0.0036	0.0028	0.0022	0.0081	0.0096	0.0046	0.0164	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4858	0.0737	0.2457	0.0747	0.0358	0.0400	0.0031	0.0024	0.0019	0.0070	0.0082	0.0028	0.0102	0.0016	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp	0.4349	0.0660	0.2199	0.0668	0.0321	0.0358	0.0047	0.0036	0.0027	0.0103	0.0122	0.0224	0.0796	0.0023	0.0011	0.0056	1.0000
		Fw/Expwy	0.4900	0.0743	0.2477	0.0753	0.0361	0.0403	0.0013	0.0010	0.0007	0.0028	0.0033	0.0044	0.0156	0.0006	0.0003	0.0063	1.0000
		Arterials	0.4848	0.0736	0.2451	0.0745	0.0358	0.0399	0.0024	0.0019	0.0014	0.0053	0.0063	0.0046	0.0164	0.0012	0.0006	0.0062	1.0000
		Collector & Local	0.4849	0.0736	0.2452	0.0745	0.0358	0.0399	0.0033	0.0025	0.0019	0.0072	0.0086	0.0031	0.0109	0.0016	0.0008	0.0062	1.0000
Lake	Rural	Interstate																	
		Arterials	0.4526	0.0687	0.2288	0.0695	0.0334	0.0372	0.0070	0.0055	0.0042	0.0156	0.0185	0.0105	0.0375	0.0035	0.0017	0.0058	1.0000
		Collector & Local	0.4868	0.0739	0.2462	0.0748	0.0359	0.0401	0.0029	0.0022	0.0017	0.0064	0.0076	0.0028	0.0102	0.0015	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Lauderdale	Rural	Interstate																	
		Arterials	0.4414	0.0670	0.2232	0.0678	0.0326	0.0363	0.0074	0.0058	0.0044	0.0164	0.0195	0.0147	0.0523	0.0037	0.0018	0.0057	1.0000
		Collector & Local	0.4787	0.0727	0.2421	0.0736	0.0353	0.0394	0.0040	0.0031	0.0024	0.0089	0.0106	0.0044	0.0156	0.0020	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4712	0.0715	0.2383	0.0724	0.0348	0.0388	0.0050	0.0039	0.0030	0.0111	0.0132	0.0059	0.0211	0.0025	0.0012	0.0061	1.0000
		Collector & Local	0.4914	0.0746	0.2485	0.0755	0.0363	0.0404	0.0023	0.0018	0.0013	0.0050	0.0059	0.0020	0.0070	0.0011	0.0006	0.0063	1.0000
Lawrence	Rural	Interstate																	
		Arterials	0.4577	0.0694	0.2314	0.0703	0.0338	0.0376	0.0050	0.0039	0.0030	0.0111	0.0132	0.0118	0.0422	0.0025	0.0012	0.0059	1.0000
		Collector & Local	0.4799	0.0728	0.2426	0.0737	0.0354	0.0395	0.0047	0.0036	0.0027	0.0103	0.0122	0.0028	0.0102	0.0023	0.0011	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4768	0.0723	0.2411	0.0733	0.0352	0.0392	0.0041	0.0032	0.0025	0.0092	0.0109	0.0050	0.0180	0.0021	0.0010	0.0061	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Lewis	Rural	Interstate																	
		Arterials	0.4591	0.0697	0.2321	0.0705	0.0339	0.0378	0.0054	0.0042	0.0032	0.0120	0.0142	0.0105	0.0375	0.0027	0.0013	0.0059	1.0000
		Collector & Local	0.4858	0.0737	0.2457	0.0747	0.0358	0.0400	0.0035	0.0027	0.0021	0.0078	0.0092	0.0022	0.0078	0.0018	0.0009	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Lincoln	Rural	Interstate																	
		Arterials	0.4419	0.0671	0.2234	0.0679	0.0326	0.0364	0.0062	0.0048	0.0036	0.0136	0.0162	0.0167	0.0593	0.0031	0.0015	0.0057	1.0000
		Collector & Local	0.4814	0.0730	0.2434	0.0740	0.0355	0.0396	0.0039	0.0030	0.0023	0.0086	0.0102	0.0035	0.0125	0.0020	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4663	0.0707	0.2357	0.0716	0.0344	0.0384	0.0044	0.0034	0.0026	0.0097	0.0115	0.0092	0.0328	0.0022	0.0011	0.0060	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
Loudon	Rural	Interstate	0.3667	0.0556	0.1854	0.0563	0.0271	0.0302	0.0068	0.0053	0.0040	0.0150	0.0178	0.0482	0.1718	0.0034	0.0017	0.0047	1.0000
		Arterials	0.4647	0.0705	0.2349	0.0714	0.0343	0.0382	0.0040	0.0031	0.0024	0.0089	0.0106	0.0105	0.0375	0.0020	0.0010	0.0060	1.0000
		Collector & Local	0.4859	0.0737	0.2457	0.0747	0.0358	0.0400	0.0033	0.0025	0.0019	0.0072	0.0086	0.0026	0.0094	0.0016	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp	0.3763	0.0571	0.1902	0.0578	0.0278	0.0310	0.0063	0.0049	0.0037	0.0139	0.0165	0.0449	0.1601	0.0032	0.0015	0.0048	1.0000
		Fw/Expwy																	
		Arterials	0.4819	0.0731	0.2437	0.0740	0.0355	0.0396	0.0040	0.0031	0.0024	0.0089	0.0106	0.0031	0.0109	0.0020	0.0010	0.0062	1.0000
		Collector & Local	0.4819	0.0731	0.2437	0.0740	0.0355	0.0396	0.0045	0.0035	0.0027	0.0100	0.0119	0.0022	0.0078	0.0023	0.0011	0.0062	1.0000
McMinn	Rural	Interstate	0.3308	0.0502	0.1673	0.0508	0.0244	0.0272	0.0053	0.0041	0.0031	0.0117	0.0138	0.0664	0.2366	0.0027	0.0013	0.0043	1.0000
		Arterials	0.4683	0.0711	0.2368	0.0719	0.0345	0.0385	0.0047	0.0036	0.0027	0.0103	0.0122	0.0079	0.0281	0.0023	0.0011	0.0060	1.0000
		Collector & Local	0.4813	0.0730	0.2434	0.0740	0.0355	0.0396	0.0038	0.0029	0.0022	0.0084	0.0099	0.0037	0.0133	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp	0.3248	0.0493	0.1642	0.0499	0.0240	0.0267	0.0050	0.0039	0.0030	0.0111	0.0132	0.0695	0.2475	0.0025	0.0012	0.0042	1.0000
		Fw/Expwy																	
		Arterials	0.4829	0.0733	0.2442	0.0742	0.0356	0.0397	0.0034	0.0026	0.0020	0.0075	0.0089	0.0037	0.0133	0.0017	0.0008	0.0062	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
McNairy	Rural	Interstate																	
		Arterials	0.4283	0.0650	0.2166	0.0658	0.0316	0.0352	0.0070	0.0055	0.0042	0.0156	0.0185	0.0210	0.0750	0.0035	0.0017	0.0055	1.0000
		Collector & Local	0.4829	0.0733	0.2441	0.0742	0.0356	0.0397	0.0040	0.0031	0.0024	0.0089	0.0106	0.0026	0.0094	0.0020	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Macon	Rural	Interstate																	
		Arterials	0.4749	0.0720	0.2400	0.0729	0.0350	0.0391	0.0038	0.0029	0.0022	0.0084	0.0099	0.0066	0.0234	0.0019	0.0009	0.0061	1.0000
		Collector & Local	0.4849	0.0736	0.2452	0.0745	0.0358	0.0399	0.0033	0.0025	0.0019	0.0072	0.0086	0.0031	0.0109	0.0016	0.0008	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Madison	Rural	Interstate	0.3187	0.0484	0.1611	0.0490	0.0235	0.0262	0.0075	0.0059	0.0045	0.0167	0.0198	0.0677	0.2413	0.0038	0.0018	0.0041	1.0000
		Arterials	0.4627	0.0702	0.2339	0.0711	0.0341	0.0381	0.0039	0.0030	0.0023	0.0086	0.0102	0.0116	0.0414	0.0020	0.0009	0.0060	1.0000
		Collector & Local	0.4833	0.0733	0.2444	0.0743	0.0357	0.0398	0.0040	0.0031	0.0024	0.0089	0.0106	0.0024	0.0086	0.0020	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp	0.3505	0.0532	0.1772	0.0539	0.0259	0.0288	0.0065	0.0051	0.0039	0.0145	0.0171	0.0557	0.1983	0.0033	0.0016	0.0045	1.0000
		Fw/Expwy																	
		Arterials	0.4788	0.0727	0.2421	0.0736	0.0353	0.0394	0.0030	0.0023	0.0018	0.0067	0.0079	0.0061	0.0219	0.0015	0.0007	0.0062	1.0000
		Collector & Local	0.4874	0.0740	0.2464	0.0749	0.0360	0.0401	0.0030	0.0023	0.0018	0.0067	0.0079	0.0024	0.0086	0.0015	0.0007	0.0063	1.0000
Marion	Rural	Interstate	0.3379	0.0513	0.1708	0.0519	0.0249	0.0278	0.0104	0.0081	0.0062	0.0231	0.0274	0.0544	0.1936	0.0053	0.0025	0.0044	1.0000
		Arterials	0.4718	0.0716	0.2385	0.0725	0.0348	0.0388	0.0026	0.0021	0.0016	0.0058	0.0069	0.0099	0.0351	0.0013	0.0006	0.0061	1.0000
		Collector & Local	0.4777	0.0725	0.2416	0.0734	0.0353	0.0393	0.0048	0.0037	0.0028	0.0106	0.0125	0.0035	0.0125	0.0024	0.0012	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Marshall	Rural	Interstate	0.3181	0.0483	0.1609	0.0489	0.0235	0.0262	0.0038	0.0029	0.0022	0.0084	0.0099	0.0745	0.2655	0.0019	0.0009	0.0041	1.0000
		Arterials	0.4728	0.0717	0.2390	0.0726	0.0349	0.0389	0.0045	0.0035	0.0027	0.0100	0.0119	0.0061	0.0219	0.0023	0.0011	0.0061	1.0000
		Collector & Local	0.4879	0.0740	0.2467	0.0750	0.0360	0.0401	0.0029	0.0022	0.0017	0.0064	0.0076	0.0024	0.0086	0.0015	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp	0.3181	0.0483	0.1609	0.0489	0.0235	0.0262	0.0038	0.0029	0.0022	0.0084	0.0099	0.0745	0.2655	0.0019	0.0009	0.0041	1.0000
		Fw/Expwy																	
		Arterials	0.4803	0.0729	0.2429	0.0738	0.0354	0.0395	0.0043	0.0033	0.0025	0.0095	0.0112	0.0033	0.0117	0.0022	0.0010	0.0062	1.0000
		Collector & Local	0.4819	0.0731	0.2437	0.0741	0.0355	0.0396	0.0039	0.0030	0.0023	0.0086	0.0102	0.0033	0.0117	0.0020	0.0009	0.0062	1.0000
Maury	Rural	Interstate	0.3288	0.0499	0.1662	0.0505	0.0243	0.0271	0.0038	0.0029	0.0022	0.0084	0.0099	0.0699	0.2491	0.0019	0.0009	0.0042	1.0000
		Arterials	0.4676	0.0710	0.2365	0.0719	0.0345	0.0385	0.0052	0.0040	0.0030	0.0114	0.0135	0.0072	0.0258	0.0026	0.0013	0.0060	1.0000
		Collector & Local	0.4833	0.0733	0.2444	0.0743	0.0357	0.0398	0.0041	0.0032	0.0025	0.0092	0.0109	0.0022	0.0078	0.0021	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp	0.3409	0.0517	0.1724	0.0524	0.0252	0.0280	0.0038	0.0029	0.0022	0.0084	0.0099	0.0647	0.2303	0.0019	0.0009	0.0044	1.0000
		Fw/Expwy	0.4449	0.0675	0.2250	0.0684	0.0328	0.0366	0.0080	0.0063	0.0048	0.0178	0.0211	0.0121	0.0429	0.0041	0.0020	0.0057	1.0000
		Arterials	0.4799	0.0728	0.2426	0.0737	0.0354	0.0395	0.0030	0.0023	0.0018	0.0067	0.0079	0.0057	0.0203	0.0015	0.0007	0.0062	1.0000
		Collector & Local	0.4833	0.0733	0.2444	0.0743	0.0357	0.0398	0.0041	0.0032	0.0025	0.0092	0.0109	0.0022	0.0078	0.0021	0.0010	0.0062	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Meigs	Rural	Interstate																	
		Arterials	0.4556	0.0691	0.2303	0.0700	0.0336	0.0375	0.0058	0.0045	0.0034	0.0128	0.0152	0.0114	0.0406	0.0029	0.0014	0.0059	1.0000
		Collector & Local	0.4884	0.0741	0.2469	0.0750	0.0360	0.0402	0.0028	0.0022	0.0016	0.0061	0.0073	0.0024	0.0086	0.0014	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Monroe	Rural	Interstate	0.3526	0.0535	0.1783	0.0542	0.0260	0.0290	0.0050	0.0039	0.0030	0.0111	0.0132	0.0574	0.2046	0.0025	0.0012	0.0045	1.0000
		Arterials	0.4742	0.0720	0.2398	0.0729	0.0350	0.0390	0.0038	0.0029	0.0022	0.0084	0.0099	0.0068	0.0242	0.0019	0.0009	0.0061	1.0000
		Collector & Local	0.4845	0.0735	0.2449	0.0744	0.0357	0.0399	0.0039	0.0030	0.0023	0.0086	0.0102	0.0022	0.0078	0.0020	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp	0.3486	0.0529	0.1762	0.0535	0.0257	0.0287	0.0050	0.0039	0.0030	0.0111	0.0132	0.0592	0.2108	0.0025	0.0012	0.0045	1.0000
		Fw/Expwy																	
		Arterials	0.4808	0.0730	0.2431	0.0739	0.0355	0.0396	0.0039	0.0030	0.0023	0.0086	0.0102	0.0037	0.0133	0.0020	0.0009	0.0062	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
Montgomery	Rural	Interstate	0.3284	0.0498	0.1661	0.0504	0.0242	0.0270	0.0050	0.0039	0.0030	0.0111	0.0132	0.0680	0.2420	0.0025	0.0012	0.0042	1.0000
		Arterials	0.4768	0.0723	0.2411	0.0733	0.0352	0.0392	0.0038	0.0029	0.0022	0.0084	0.0099	0.0057	0.0203	0.0019	0.0009	0.0061	1.0000
		Collector & Local	0.4797	0.0728	0.2426	0.0737	0.0354	0.0395	0.0049	0.0038	0.0029	0.0109	0.0129	0.0024	0.0086	0.0025	0.0012	0.0062	1.0000
	Urban	Interstate & Ramp	0.3697	0.0561	0.1869	0.0568	0.0273	0.0304	0.0040	0.0031	0.0024	0.0089	0.0106	0.0517	0.1843	0.0020	0.0010	0.0048	1.0000
		Fw/Expwy																	
		Arterials	0.4798	0.0728	0.2426	0.0737	0.0354	0.0395	0.0036	0.0028	0.0022	0.0081	0.0096	0.0046	0.0164	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4833	0.0733	0.2444	0.0743	0.0357	0.0398	0.0040	0.0031	0.0024	0.0089	0.0106	0.0024	0.0086	0.0020	0.0010	0.0062	1.0000
Moore	Rural	Interstate																	
		Arterials	0.4606	0.0699	0.2329	0.0708	0.0340	0.0379	0.0038	0.0029	0.0022	0.0084	0.0099	0.0127	0.0453	0.0019	0.0009	0.0059	1.0000
		Collector & Local	0.4803	0.0729	0.2429	0.0738	0.0354	0.0395	0.0045	0.0035	0.0027	0.0100	0.0119	0.0028	0.0102	0.0023	0.0011	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Morgan	Rural	Interstate																	
		Arterials	0.4742	0.0720	0.2398	0.0729	0.0350	0.0390	0.0036	0.0028	0.0022	0.0081	0.0096	0.0070	0.0250	0.0018	0.0009	0.0061	1.0000
		Collector & Local	0.4844	0.0735	0.2449	0.0744	0.0357	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0024	0.0086	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Obion	Rural	Interstate																	
		Arterials	0.4491	0.0681	0.2271	0.0690	0.0331	0.0369	0.0047	0.0036	0.0027	0.0103	0.0122	0.0162	0.0578	0.0023	0.0011	0.0058	1.0000
		Collector & Local	0.4819	0.0731	0.2437	0.0740	0.0355	0.0396	0.0038	0.0029	0.0022	0.0084	0.0099	0.0035	0.0125	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4708	0.0714	0.2380	0.0723	0.0347	0.0387	0.0038	0.0029	0.0022	0.0084	0.0099	0.0083	0.0297	0.0019	0.0009	0.0061	1.0000
		Collector & Local	0.4840	0.0734	0.2446	0.0743	0.0357	0.0398	0.0040	0.0031	0.0024	0.0089	0.0106	0.0022	0.0078	0.0020	0.0010	0.0062	1.0000
Overton	Rural	Interstate																	
		Arterials	0.4631	0.0703	0.2341	0.0712	0.0342	0.0381	0.0054	0.0042	0.0032	0.0120	0.0142	0.0088	0.0312	0.0027	0.0013	0.0060	1.0000
		Collector & Local	0.4880	0.0740	0.2467	0.0750	0.0360	0.0401	0.0030	0.0023	0.0018	0.0067	0.0079	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Perry	Rural	Interstate																	
		Arterials	0.4495	0.0682	0.2273	0.0691	0.0332	0.0370	0.0050	0.0039	0.0030	0.0111	0.0132	0.0153	0.0547	0.0025	0.0012	0.0058	1.0000
		Collector & Local	0.4703	0.0713	0.2377	0.0722	0.0347	0.0387	0.0038	0.0029	0.0022	0.0084	0.0099	0.0085	0.0305	0.0019	0.0009	0.0061	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Pickett	Rural	Interstate																	
		Arterials	0.4536	0.0688	0.2293	0.0697	0.0335	0.0373	0.0053	0.0041	0.0031	0.0117	0.0138	0.0132	0.0468	0.0027	0.0013	0.0058	1.0000
		Collector & Local	0.4874	0.0740	0.2464	0.0749	0.0360	0.0401	0.0033	0.0025	0.0019	0.0072	0.0086	0.0020	0.0070	0.0016	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Polk	Rural	Interstate																	
		Arterials	0.4638	0.0704	0.2344	0.0712	0.0342	0.0381	0.0039	0.0030	0.0023	0.0086	0.0102	0.0112	0.0398	0.0020	0.0009	0.0060	1.0000
		Collector & Local	0.4804	0.0729	0.2429	0.0738	0.0354	0.0395	0.0039	0.0030	0.0023	0.0086	0.0102	0.0039	0.0141	0.0020	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Putnam	Rural	Interstate	0.3586	0.0544	0.1813	0.0551	0.0265	0.0295	0.0064	0.0050	0.0038	0.0142	0.0168	0.0524	0.1866	0.0032	0.0016	0.0046	1.0000
		Arterials	0.4768	0.0723	0.2411	0.0733	0.0352	0.0392	0.0045	0.0035	0.0027	0.0100	0.0119	0.0044	0.0156	0.0023	0.0011	0.0061	1.0000
		Collector & Local	0.4807	0.0730	0.2431	0.0739	0.0355	0.0396	0.0048	0.0037	0.0028	0.0106	0.0125	0.0022	0.0078	0.0024	0.0012	0.0062	1.0000
	Urban	Interstate & Ramp	0.3505	0.0532	0.1772	0.0539	0.0259	0.0288	0.0063	0.0049	0.0037	0.0139	0.0165	0.0561	0.1999	0.0032	0.0015	0.0045	1.0000
		Fw/Expwy	0.4602	0.0698	0.2327	0.0707	0.0339	0.0379	0.0039	0.0030	0.0023	0.0086	0.0102	0.0127	0.0453	0.0020	0.0009	0.0059	1.0000
		Arterials	0.4894	0.0743	0.2475	0.0752	0.0361	0.0403	0.0026	0.0021	0.0016	0.0058	0.0069	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
		Collector & Local	0.4824	0.0732	0.2439	0.0741	0.0356	0.0397	0.0044	0.0034	0.0026	0.0097	0.0115	0.0022	0.0078	0.0022	0.0011	0.0062	1.0000
Rhea	Rural	Interstate																	
		Arterials	0.4612	0.0700	0.2332	0.0708	0.0340	0.0379	0.0045	0.0035	0.0027	0.0100	0.0119	0.0112	0.0398	0.0023	0.0011	0.0059	1.0000
		Collector & Local	0.4894	0.0743	0.2475	0.0752	0.0361	0.0403	0.0026	0.0021	0.0016	0.0058	0.0069	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4753	0.0721	0.2403	0.0730	0.0351	0.0391	0.0038	0.0029	0.0022	0.0084	0.0099	0.0064	0.0226	0.0019	0.0009	0.0061	1.0000
		Collector & Local	0.4823	0.0732	0.2439	0.0741	0.0356	0.0397	0.0038	0.0029	0.0022	0.0084	0.0099	0.0033	0.0117	0.0019	0.0009	0.0062	1.0000
Roane	Rural	Interstate	0.3580	0.0543	0.1811	0.0550	0.0264	0.0295	0.0077	0.0060	0.0045	0.0170	0.0201	0.0504	0.1796	0.0039	0.0019	0.0046	1.0000
		Arterials	0.4803	0.0729	0.2429	0.0738	0.0354	0.0395	0.0038	0.0029	0.0022	0.0084	0.0099	0.0042	0.0148	0.0019	0.0009	0.0062	1.0000
		Collector & Local	0.4869	0.0739	0.2462	0.0748	0.0359	0.0401	0.0033	0.0025	0.0019	0.0072	0.0086	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp	0.3681	0.0559	0.1861	0.0566	0.0272	0.0303	0.0073	0.0057	0.0043	0.0162	0.0191	0.0467	0.1663	0.0037	0.0018	0.0047	1.0000
		Fw/Expwy																	
		Arterials	0.4840	0.0734	0.2446	0.0743	0.0357	0.0398	0.0040	0.0031	0.0024	0.0089	0.0106	0.0022	0.0078	0.0020	0.0010	0.0062	1.0000
		Collector & Local	0.4885	0.0741	0.2469	0.0750	0.0360	0.0402	0.0029	0.0022	0.0017	0.0064	0.0076	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
Robertson	Rural	Interstate	0.3863	0.0586	0.1954	0.0594	0.0285	0.0318	0.0055	0.0043	0.0033	0.0123	0.0145	0.0419	0.1491	0.0028	0.0013	0.0050	1.0000
		Arterials	0.4763	0.0723	0.2408	0.0732	0.0351	0.0392	0.0038	0.0029	0.0022	0.0084	0.0099	0.0059	0.0211	0.0019	0.0009	0.0061	1.0000
		Collector & Local	0.4880	0.0740	0.2467	0.0750	0.0360	0.0401	0.0026	0.0021	0.0016	0.0058	0.0069	0.0028	0.0102	0.0013	0.0006	0.0063	1.0000
	Urban	Interstate & Ramp	0.4051	0.0615	0.2048	0.0622	0.0299	0.0333	0.0058	0.0045	0.0034	0.0128	0.0152	0.0333	0.1187	0.0029	0.0014	0.0052	1.0000
		Fw/Expwy																	
		Arterials	0.4829	0.0733	0.2441	0.0742	0.0356	0.0397	0.0031	0.0024	0.0019	0.0070	0.0082	0.0042	0.0148	0.0016	0.0008	0.0062	1.0000
		Collector & Local	0.4888	0.0742	0.2472	0.0751	0.0361	0.0402	0.0028	0.0022	0.0016	0.0061	0.0073	0.0022	0.0078	0.0014	0.0007	0.0063	1.0000
Rutherford	Rural	Interstate	0.3854	0.0585	0.1948	0.0592	0.0284	0.0317	0.0054	0.0042	0.0032	0.0120	0.0142	0.0425	0.1515	0.0027	0.0013	0.0050	1.0000
		Arterials	0.4612	0.0700	0.2332	0.0708	0.0340	0.0379	0.0041	0.0032	0.0025	0.0092	0.0109	0.0118	0.0422	0.0021	0.0010	0.0059	1.0000
		Collector & Local	0.4808	0.0730	0.2431	0.0739	0.0355	0.0396	0.0044	0.0034	0.0026	0.0097	0.0115	0.0028	0.0102	0.0022	0.0011	0.0062	1.0000
	Urban	Interstate & Ramp	0.4193	0.0636	0.2120	0.0644	0.0309	0.0345	0.0030	0.0023	0.0018	0.0067	0.0079	0.0320	0.1140	0.0015	0.0007	0.0054	1.0000
		Fw/Expwy	0.4090	0.0621	0.2068	0.0629	0.0302	0.0337	0.0063	0.0049	0.0037	0.0139	0.0165	0.0307	0.1093	0.0032	0.0015	0.0053	1.0000
		Arterials	0.4671	0.0709	0.2362	0.0718	0.0345	0.0384	0.0073	0.0057	0.0043	0.0162	0.0191	0.0037	0.0133	0.0037	0.0018	0.0060	1.0000
		Collector & Local	0.4858	0.0737	0.2457	0.0747	0.0358	0.0400	0.0035	0.0027	0.0021	0.0078	0.0092	0.0022	0.0078	0.0018	0.0009	0.0063	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Scott	Rural	Interstate																	
		Arterials	0.4576	0.0694	0.2314	0.0703	0.0338	0.0376	0.0058	0.0045	0.0034	0.0128	0.0152	0.0105	0.0375	0.0029	0.0014	0.0059	1.0000
		Collector & Local	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0022	0.0078	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Sequatchie	Rural	Interstate																	
		Arterials	0.4333	0.0658	0.2190	0.0666	0.0320	0.0357	0.0075	0.0059	0.0045	0.0167	0.0198	0.0180	0.0640	0.0038	0.0018	0.0056	1.0000
		Collector & Local	0.4884	0.0741	0.2469	0.0750	0.0360	0.0402	0.0025	0.0020	0.0015	0.0056	0.0066	0.0028	0.0102	0.0013	0.0006	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Sevier	Rural	Interstate																	
		Arterials	0.4910	0.0745	0.2482	0.0754	0.0362	0.0404	0.0013	0.0010	0.0007	0.0028	0.0033	0.0039	0.0141	0.0006	0.0003	0.0063	1.0000
		Collector & Local	0.4807	0.0730	0.2431	0.0739	0.0355	0.0396	0.0048	0.0037	0.0028	0.0106	0.0125	0.0022	0.0078	0.0024	0.0012	0.0062	1.0000
	Urban	Interstate & Ramp	0.3738	0.0567	0.1890	0.0574	0.0276	0.0307	0.0069	0.0054	0.0041	0.0153	0.0181	0.0449	0.1601	0.0035	0.0017	0.0048	1.0000
		Fw/Expwy																	
		Arterials	0.4873	0.0740	0.2463	0.0749	0.0360	0.0401	0.0028	0.0022	0.0016	0.0061	0.0073	0.0028	0.0102	0.0014	0.0007	0.0063	1.0000
		Collector & Local	0.4768	0.0723	0.2411	0.0733	0.0352	0.0392	0.0058	0.0045	0.0034	0.0128	0.0152	0.0022	0.0078	0.0029	0.0014	0.0061	1.0000
Shelby	Rural	Interstate	0.3082	0.0467	0.1558	0.0473	0.0227	0.0253	0.0075	0.0059	0.0045	0.0167	0.0198	0.0723	0.2577	0.0038	0.0018	0.0040	1.0000
		Arterials	0.4794	0.0727	0.2424	0.0736	0.0354	0.0394	0.0044	0.0034	0.0026	0.0097	0.0115	0.0035	0.0125	0.0022	0.0011	0.0062	1.0000
		Collector & Local	0.4799	0.0728	0.2426	0.0737	0.0354	0.0395	0.0044	0.0034	0.0026	0.0097	0.0115	0.0033	0.0117	0.0022	0.0011	0.0062	1.0000
	Urban	Interstate & Ramp	0.4282	0.0650	0.2166	0.0658	0.0316	0.0352	0.0049	0.0038	0.0029	0.0109	0.0129	0.0248	0.0882	0.0025	0.0012	0.0055	1.0000
		Fw/Expwy	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
		Arterials	0.4829	0.0733	0.2442	0.0742	0.0356	0.0397	0.0033	0.0025	0.0019	0.0072	0.0086	0.0039	0.0141	0.0016	0.0008	0.0062	1.0000
		Collector & Local	0.4879	0.0740	0.2467	0.0750	0.0360	0.0401	0.0029	0.0022	0.0017	0.0064	0.0076	0.0024	0.0086	0.0015	0.0007	0.0063	1.0000
Smith	Rural	Interstate	0.3455	0.0524	0.1747	0.0531	0.0255	0.0284	0.0065	0.0051	0.0039	0.0145	0.0171	0.0579	0.2061	0.0033	0.0016	0.0044	1.0000
		Arterials	0.4752	0.0721	0.2403	0.0730	0.0351	0.0391	0.0049	0.0038	0.0029	0.0109	0.0129	0.0044	0.0156	0.0025	0.0012	0.0061	1.0000
		Collector & Local	0.4849	0.0736	0.2452	0.0745	0.0358	0.0399	0.0030	0.0023	0.0018	0.0067	0.0079	0.0035	0.0125	0.0015	0.0007	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Stewart	Rural	Interstate																	
		Arterials	0.4560	0.0692	0.2306	0.0701	0.0336	0.0375	0.0049	0.0038	0.0029	0.0109	0.0129	0.0127	0.0453	0.0025	0.0012	0.0059	1.0000
		Collector & Local	0.4807	0.0730	0.2431	0.0739	0.0355	0.0396	0.0045	0.0035	0.0027	0.0100	0.0119	0.0026	0.0094	0.0023	0.0011	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Sullivan	Rural	Interstate	0.3505	0.0532	0.1772	0.0539	0.0259	0.0288	0.0038	0.0029	0.0022	0.0084	0.0099	0.0605	0.2155	0.0019	0.0009	0.0045	1.0000
		Arterials	0.4808	0.0730	0.2431	0.0739	0.0355	0.0396	0.0034	0.0026	0.0020	0.0075	0.0089	0.0046	0.0164	0.0017	0.0008	0.0062	1.0000
		Collector & Local	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0022	0.0078	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp	0.3944	0.0599	0.1994	0.0606	0.0291	0.0325	0.0035	0.0027	0.0021	0.0078	0.0092	0.0419	0.1491	0.0018	0.0009	0.0051	1.0000
		Fw/Expwy	0.4823	0.0732	0.2439	0.0741	0.0356	0.0397	0.0021	0.0017	0.0013	0.0047	0.0056	0.0061	0.0219	0.0011	0.0005	0.0062	1.0000
		Arterials	0.4868	0.0739	0.2461	0.0748	0.0359	0.0401	0.0028	0.0022	0.0016	0.0061	0.0073	0.0031	0.0109	0.0014	0.0007	0.0063	1.0000
		Collector & Local	0.4885	0.0741	0.2469	0.0750	0.0360	0.0402	0.0029	0.0022	0.0017	0.0064	0.0076	0.0022	0.0078	0.0015	0.0007	0.0063	1.0000
Sumner	Rural	Interstate	0.3991	0.0605	0.2018	0.0613	0.0294	0.0328	0.0063	0.0049	0.0037	0.0139	0.0165	0.0351	0.1249	0.0032	0.0015	0.0051	1.0000
		Arterials	0.4828	0.0733	0.2441	0.0742	0.0356	0.0397	0.0024	0.0019	0.0014	0.0053	0.0063	0.0055	0.0195	0.0012	0.0006	0.0062	1.0000
		Collector & Local	0.4859	0.0737	0.2457	0.0747	0.0358	0.0400	0.0034	0.0026	0.0020	0.0075	0.0089	0.0024	0.0086	0.0017	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp	0.4065	0.0617	0.2056	0.0625	0.0300	0.0335	0.0057	0.0044	0.0033	0.0125	0.0148	0.0329	0.1171	0.0029	0.0014	0.0052	1.0000
		Fw/Expwy	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0022	0.0078	0.0019	0.0009	0.0062	1.0000
		Arterials	0.4798	0.0728	0.2426	0.0737	0.0354	0.0395	0.0041	0.0032	0.0025	0.0092	0.0109	0.0037	0.0133	0.0021	0.0010	0.0062	1.0000
		Collector & Local	0.4884	0.0741	0.2469	0.0750	0.0360	0.0402	0.0028	0.0022	0.0016	0.0061	0.0073	0.0024	0.0086	0.0014	0.0007	0.0063	1.0000
Tipton	Rural	Interstate																	
		Arterials	0.4576	0.0694	0.2314	0.0703	0.0338	0.0376	0.0053	0.0041	0.0031	0.0117	0.0138	0.0114	0.0406	0.0027	0.0013	0.0059	1.0000
		Collector & Local	0.4874	0.0740	0.2464	0.0749	0.0360	0.0401	0.0030	0.0023	0.0018	0.0067	0.0079	0.0024	0.0086	0.0015	0.0007	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4591	0.0697	0.2321	0.0705	0.0339	0.0378	0.0045	0.0035	0.0027	0.0100	0.0119	0.0121	0.0429	0.0023	0.0011	0.0059	1.0000
		Collector & Local	0.4793	0.0727	0.2423	0.0736	0.0354	0.0394	0.0049	0.0038	0.0029	0.0109	0.0129	0.0026	0.0094	0.0025	0.0012	0.0062	1.0000
Trousdale	Rural	Interstate																	
		Arterials	0.4606	0.0699	0.2329	0.0708	0.0340	0.0379	0.0048	0.0037	0.0028	0.0106	0.0125	0.0110	0.0390	0.0024	0.0012	0.0059	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Unicoi	Rural	Interstate																	
		Arterials	0.4385	0.0665	0.2217	0.0674	0.0323	0.0361	0.0050	0.0039	0.0030	0.0111	0.0132	0.0202	0.0718	0.0025	0.0012	0.0056	1.0000
		Collector & Local	0.4777	0.0725	0.2416	0.0734	0.0353	0.0393	0.0045	0.0035	0.0027	0.0100	0.0119	0.0039	0.0141	0.0023	0.0011	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4662	0.0707	0.2357	0.0716	0.0344	0.0384	0.0058	0.0045	0.0034	0.0128	0.0152	0.0068	0.0242	0.0029	0.0014	0.0060	1.0000
		Collector & Local	0.4813	0.0730	0.2434	0.0740	0.0355	0.0396	0.0045	0.0035	0.0027	0.0100	0.0119	0.0024	0.0086	0.0023	0.0011	0.0062	1.0000
Union	Rural	Interstate																	
		Arterials	0.4656	0.0707	0.2355	0.0715	0.0344	0.0383	0.0035	0.0027	0.0021	0.0078	0.0092	0.0110	0.0390	0.0018	0.0009	0.0060	1.0000
		Collector & Local	0.4848	0.0736	0.2452	0.0745	0.0358	0.0399	0.0038	0.0029	0.0022	0.0084	0.0099	0.0022	0.0078	0.0019	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Van Buren	Rural	Interstate																	
		Arterials	0.4451	0.0675	0.2250	0.0684	0.0328	0.0366	0.0050	0.0039	0.0030	0.0111	0.0132	0.0173	0.0617	0.0025	0.0012	0.0057	1.0000
		Collector & Local	0.4813	0.0730	0.2434	0.0740	0.0355	0.0396	0.0045	0.0035	0.0027	0.0100	0.0119	0.0024	0.0086	0.0023	0.0011	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Warren	Rural	Interstate																	
		Arterials	0.4646	0.0705	0.2349	0.0714	0.0343	0.0382	0.0049	0.0038	0.0029	0.0109	0.0129	0.0090	0.0320	0.0025	0.0012	0.0060	1.0000
		Collector & Local	0.4839	0.0734	0.2447	0.0743	0.0357	0.0398	0.0040	0.0031	0.0024	0.0089	0.0106	0.0022	0.0078	0.0020	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4768	0.0723	0.2411	0.0733	0.0352	0.0392	0.0045	0.0035	0.0027	0.0100	0.0119	0.0044	0.0156	0.0023	0.0011	0.0061	1.0000
		Collector & Local	0.4869	0.0739	0.2462	0.0748	0.0359	0.0401	0.0033	0.0025	0.0019	0.0072	0.0086	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000
Washington	Rural	Interstate	0.3688	0.0559	0.1865	0.0566	0.0272	0.0303	0.0038	0.0029	0.0022	0.0084	0.0099	0.0526	0.1874	0.0019	0.0009	0.0047	1.0000
		Arterials	0.4764	0.0723	0.2408	0.0732	0.0351	0.0392	0.0050	0.0039	0.0030	0.0111	0.0132	0.0037	0.0133	0.0025	0.0012	0.0061	1.0000
		Collector & Local	0.4854	0.0736	0.2454	0.0746	0.0358	0.0399	0.0036	0.0028	0.0022	0.0081	0.0096	0.0022	0.0078	0.0018	0.0009	0.0063	1.0000
	Urban	Interstate & Ramp	0.4721	0.0717	0.2387	0.0726	0.0348	0.0389	0.0025	0.0020	0.0015	0.0056	0.0066	0.0099	0.0351	0.0013	0.0006	0.0061	1.0000
		Fw/Expwy	0.4345	0.0659	0.2197	0.0667	0.0320	0.0357	0.0050	0.0039	0.0030	0.0111	0.0132	0.0219	0.0781	0.0025	0.0012	0.0056	1.0000
		Arterials	0.4783	0.0726	0.2418	0.0735	0.0353	0.0394	0.0047	0.0036	0.0027	0.0103	0.0122	0.0035	0.0125	0.0023	0.0011	0.0062	1.0000
		Collector & Local	0.4823	0.0732	0.2439	0.0741	0.0356	0.0397	0.0041	0.0032	0.0025	0.0092	0.0109	0.0026	0.0094	0.0021	0.0010	0.0062	1.0000

Table A. Continued.

County		Roadway	LDV	LDT1	LDT2	LDT3	LDT4	HDV2B	HDV3	HDV4	HDV5	HDV6	HDV7	HDV8A	HDV8B	HDBS	HDBT	MC	TOTAL
Wayne	Rural	Interstate																	
		Arterials	0.4511	0.0684	0.2280	0.0693	0.0333	0.0371	0.0043	0.0033	0.0025	0.0095	0.0112	0.0160	0.0570	0.0022	0.0010	0.0058	1.0000
		Collector & Local	0.4803	0.0729	0.2429	0.0738	0.0354	0.0395	0.0041	0.0032	0.0025	0.0092	0.0109	0.0035	0.0125	0.0021	0.0010	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Weakley	Rural	Interstate																	
		Arterials	0.4711	0.0715	0.2383	0.0724	0.0348	0.0388	0.0045	0.0035	0.0027	0.0100	0.0119	0.0068	0.0242	0.0023	0.0011	0.0061	1.0000
		Collector & Local	0.4845	0.0735	0.2449	0.0744	0.0357	0.0399	0.0034	0.0026	0.0020	0.0075	0.0089	0.0031	0.0109	0.0017	0.0008	0.0062	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials	0.4854	0.0736	0.2454	0.0746	0.0358	0.0399	0.0031	0.0024	0.0019	0.0070	0.0082	0.0031	0.0109	0.0016	0.0008	0.0063	1.0000
		Collector & Local	0.4899	0.0743	0.2477	0.0753	0.0361	0.0403	0.0025	0.0020	0.0015	0.0056	0.0066	0.0022	0.0078	0.0013	0.0006	0.0063	1.0000
White	Rural	Interstate																	
		Arterials	0.4565	0.0693	0.2308	0.0702	0.0337	0.0376	0.0045	0.0035	0.0027	0.0100	0.0119	0.0132	0.0468	0.0023	0.0011	0.0059	1.0000
		Collector & Local	0.4854	0.0736	0.2454	0.0746	0.0358	0.0399	0.0035	0.0027	0.0021	0.0078	0.0092	0.0024	0.0086	0.0018	0.0009	0.0063	1.0000
	Urban	Interstate & Ramp																	
		Fw/Expwy																	
		Arterials																	
		Collector & Local																	
Williamson	Rural	Interstate	0.3783	0.0574	0.1913	0.0581	0.0279	0.0311	0.0041	0.0032	0.0025	0.0092	0.0109	0.0478	0.1702	0.0021	0.0010	0.0049	1.0000
		Arterials	0.4716	0.0716	0.2385	0.0725	0.0348	0.0388	0.0028	0.0022	0.0016	0.0061	0.0073	0.0096	0.0344	0.0014	0.0007	0.0061	1.0000
		Collector & Local	0.4844	0.0735	0.2449	0.0744	0.0357	0.0399	0.0035	0.0027	0.0021	0.0078	0.0092	0.0028	0.0102	0.0018	0.0009	0.0062	1.0000
	Urban	Interstate & Ramp	0.4439	0.0674	0.2244	0.0682	0.0328	0.0365	0.0025	0.0020	0.0015	0.0056	0.0066	0.0221	0.0789	0.0013	0.0006	0.0057	1.0000
		Fw/Expwy																	
		Arterials	0.4829	0.0733	0.2441	0.0742	0.0356	0.0397	0.0031	0.0024	0.0019	0.0070	0.0082	0.0042	0.0148	0.0016	0.0008	0.0062	1.0000
		Collector & Local	0.4865	0.0738	0.2459	0.0747	0.0359	0.0400	0.0033	0.0025	0.0019	0.0072	0.0086	0.0024	0.0086	0.0016	0.0008	0.0063	1.0000
Wilson	Rural	Interstate	0.3535	0.0536	0.1788	0.0543	0.0261	0.0291	0.0053	0.0041	0.0031	0.0117	0.0138	0.0566	0.2014	0.0027	0.0013	0.0046	1.0000
		Arterials	0.4672	0.0709	0.2362	0.0718	0.0345	0.0384	0.0038	0.0029	0.0022	0.0084	0.0099	0.0099	0.0351	0.0019	0.0009	0.0060	1.0000
		Collector & Local	0.4865	0.0738	0.2459	0.0747	0.0359	0.0400	0.0033	0.0025	0.0019	0.0072	0.0086	0.0024	0.0086	0.0016	0.0008	0.0063	1.0000
	Urban	Interstate & Ramp	0.3834	0.0582	0.1938	0.0589	0.0283	0.0315	0.0038	0.0029	0.0022	0.0084	0.0099	0.0463	0.1647	0.0019	0.0009	0.0049	1.0000
		Fw/Expwy	0.4090	0.0621	0.2068	0.0629	0.0302	0.0337	0.0063	0.0049	0.0037	0.0139	0.0165	0.0307	0.1093	0.0032	0.0015	0.0053	1.0000
		Arterials	0.4798	0.0728	0.2426	0.0737	0.0354	0.0395	0.0036	0.0028	0.0022	0.0081	0.0096	0.0046	0.0164	0.0018	0.0009	0.0062	1.0000
		Collector & Local	0.4869	0.0739	0.2462	0.0748	0.0359	0.0401	0.0033	0.0025	0.0019	0.0072	0.0086	0.0022	0.0078	0.0016	0.0008	0.0063	1.0000

Appendix B

I/M Programs for Davidson and 4 Surrounding Counties, and Shelby County and

Example of Input Files for Knox County in Rural Area for January

Table B-1. I/M Program “1” Parameters for Davidson and 4 Surrounding Counties.

Input command	Value/Description*
I/M PROGRAM	*1 1985 2030 1 T/O IDLE* (for Davidson county) *1 1995 2030 1 T/O IDLE* (for 4 other counties) 1 = 1st I/M program 1985 or 1995 = program start year 2030 = program end year 2030 1 = Inspection frequency - annual T/O = program type - test only IDLE = test type - Idle test
I/M MODEL YEARS	*1 1975 1995* 1975 = first model year 1975 1995 = last model year 1995 for analysis years 2002 through 2010, 2015, 2020, 2025, and 2030.
I/M VEHICLES	*1 22222 11111111 1* Vehicle types subject/not subject to inspection (1=NO, 2=YES) in the following order: LDGV, LDGT1, LDGT2, LDGT3, LDGT4 HDGV2B, HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B GAS BUS
I/M STRINGENCY	*1 30.0* 30.0 = Stringency level 30 %
I/M COMPLIANCE	*1 98.0* (for Davidson County) *1 95.0* (for 4 other counties) 98.0 and 95.0 = Compliance rate
I/M WAIVER RATES	*1 0.0 0.0* (for Davidson County) *1 5.0 5.0* (for 4 other counties) 0.0 or 5.0 = Waiver rate for pre-1981 model year vehicle 0.0 or 5.0 = Waiver rate for 1981 and later model year vehicle
I/M EXEMPTION AGE	*1 25* 25 = vehicles 25 years and older exempt from I/M
I/M GRACE PERIOD	*1 1* 1 = 1 year grace period when I/M testing not required

Italics indicate the input parameter.
*The first value of "1" in all records refers to the 1st I/M program type.

Table B-2. I/M Program "2" Parameters for Davidson and 4 Surrounding Counties

Input command	Value/Description*
I/M PROGRAM	*2 2002 2030 1 T/O OBD I/M* 2 = 2nd I/M program 2002 = program start year 2030 = program end year 1 = inspection frequency - annual T/O = program type - test only OBD I/M = test type - OBD type I/M
I/M MODEL YEARS	*2 1996 2030* 1996 = first model year 1996 2030 = last model year 2030
I/M VEHICLES	*2 22222 11111111 1* Vehicle types subject/not subject to inspection (1=NO, 2=YES) in the following order: LDGV, LDGT1, LDGT2, LDGT3, LDGT4 HDGV2B, HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B GAS BUS
I/M STRINGENCY	*2 30.0* 30.0 = Stringency level 30 %
I/M COMPLIANCE	*2 98.0* (for Davidson County) *2 95.0* (for 4 other counties) 98.0 and 95.0 = Compliance rate
I/M WAIVER RATES	*2 0.0 0.0* (for Davidson County) *2 5.0 5.0* (for 4 other counties) 0.0 or 5.0 = Waiver rate for pre-1981 model year vehicle 0.0 or 5.0 = Waiver rate for 1981 and later year vehicle

Italics indicate the input parameter.
* The first value of "2" in all records refers to the 2nd I/M program type.
I/M program 2 applies to analysis years 2002 and later.

Table B-3. I/M Program “3” Parameters for Davidson and 4 Surrounding Counties.

Input command	Value/Description*
I/M PROGRAM	*3 2002 2030 1 T/O EVAP OBD & GC* 3 = 3rd I/M program 2002 = program start year 2002 2030 = program end year 2030 1 = inspection frequency - annual T/O = program type - test only EVAP OBD & GC = evaporative OBD and gas cap I/M program
I/M MODEL YEARS	*3 1996 2030* 1996 = first model year 1996 2030 = last model year 2030
I/M VEHICLES	*3 22222 11111111 1* Vehicle types subject/not subject to inspection (1=NO, 2=YES) in the following order: LDGV, LDGT1, LDGT2, LDGT3, LDGT4 HDGV2B, HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B GAS BUS
I/M STRINGENCY	*3 30.0* 30.0 = Stringency level 30 %
I/M COMPLIANCE	*3 98.0* (for Davidson County) *3 95.0* (for 4 other counties) 98.0 and 95.0 = Compliance rate
I/M WAIVER RATES	*3 0.0 0.0* *3 5.0 5.0* 0.0 or 5.0 = Waiver rate for pre-1981 model year vehicle 0.0 or 5.0 = Waiver rate for 1981 and later year vehicle

Italics indicate the input parameter.
* The first value of "3" in all records refers to the 3rd I/M program type.
I/M program 3 applies to analysis years 2002 and later.

Table B-4. I/M Program “1” Program for Shelby County

Input command	Value/Description*
I/M PROGRAM	*1 1984 2030 1 T/O IDLE* 1 = 1st I/M program 1984 = program start year 1984 2030 = program end year 2030 1 = inspection frequency - annual T/O = program type - test only IDLE = test type - Idle test
I/M MODEL YEARS	*1 1974 1995* 1974 = first model year 1974 1995 = last model year 1995 for analysis years 2002 through 2010, 2015, 2020, 2025 and 2030.
I/M VEHICLES	*1 22222 22222222 1* Vehicle types subject/not subject to inspection (1=NO, 2=YES) in the following order: LDGV, LDGT1, LDGT2, LDGT3, LDGT4 HDGV2B, HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B GAS BUS
I/M STRINGENCY	*1 17.0* 17.0 = Stringency level 17 %
I/M COMPLIANCE	*1 84.0* 84.0 = Compliance rate of 84% for analysis years 1999 through 2010, and for 2015
I/M WAIVER RATES	*1 1.0 1.0* 1.0 = waiver rate for pre-1981 model year vehicle 1.0 = waiver rate for 1981 and later model year vehicle
I/M EXEMPTION AGE	*1 25* 25 = vehicles 25 years and older exempt from I/M
I/M GRACE PERIOD	*1 1* 1 = 1 year grace period when I/M testing not required

Italics indicate the input parameter.
*The first value of "1" in all records refers to the 1st I/M program type.

Table B-5. I/M Program “2” Parameters for Shelby County

Input command	Value/Description*
I/M PROGRAM	*2 2002 2030 1 T/O OBD I/M* 2 = 2nd I/M program 2002 = program start year 2030 = program end year 1 = inspection frequency - annual T/O = program type - test only OBD I/M = test type - OBD type I/M
I/M MODEL YEARS	*2 1996 2030* 1996 = first model year 1996 2030 = last model year 2030
I/M VEHICLES	*2 22222 22222222 1* Vehicle types subject/not subject to inspection (1=NO, 2=YES) in the following order: LDGV, LDGT1, LDGT2, LDGT3, LDGT4 HDGV2B, HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B GAS BUS
I/M STRINGENCY	*2 17.0* 17.0 = Stringency level 17 %
I/M COMPLIANCE	*2 84.0* 84.0 = Compliance rate of 84% for analysis years 1999 through 2010, and for 2015
I/M WAIVER RATES	*2 1.0 1.0* 1.0 = waiver rate for pre-1981 model year vehicle 1.0 = waiver rate for 1981 and later model year vehicle

Italics indicate the input parameter.
* The first value of "2" in all records refers to the 2nd I/M program type.
I/M program 2 applies to analysis years 2002 and later.

Table B-6. I/M Program “3” Parameters for Shelby County

Input command	Value/Description*
I/M PROGRAM	*3 2002 2030 1 T/O EVAP OBD & GC* 3 = 3rd I/M program 2002 = program start year 2002 2030 = program end year 2030 1 = inspection frequency - annual T/O = program type - test only EVAP OBD & GC = evaporative OBD and gas cap I/M program
I/M MODEL YEARS	*3 1996 2006* 1996 = first model year 1996 2006 = last model year 2006
I/M VEHICLES	*3 22222 11111111 1* Vehicle types subject/not subject to inspection (1=NO, 2=YES) in the following order: LDGV, LDGT1, LDGT2, LDGT3, LDGT4 HDGV2B, HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B GAS BUS
I/M STRINGENCY	*3 17.0* 17.0 = Stringency level 17 %
I/M COMPLIANCE	*3 84.0* 84.0 = Compliance rate of 84% for analysis years 1999 through 2010, and for 2015
I/M WAIVER RATES	*3 1.0 1.0* 1.0 = waiver rate for pre-1981 model year vehicle 1.0 = waiver rate for 1981 and later model year vehicle

Italics indicate the input parameter.
* The first value of "3" in all records refers to the 3rd I/M program type.
I/M program 3 applies to analysis years 2002 and later.

Table B-7. I/M Program “4” Parameters for Shelby County

Input command	Value/Description*
I/M PROGRAM	*4 2002 2030 1 T/O GC* 4 = 4th I/M program 2002 = program start year 2002 2030 = program end year 2030 1 = inspection frequency - annual T/O = program type - test only GC = gas cap evaporative I/M program
I/M MODEL YEARS	*4 1996 2006* 1996 = first model year 1996 2006 = last model year 2006
I/M VEHICLES	*4 11111 22222222 1* Vehicle types subject/not subject to inspection (1=NO, 2=YES) in the following order: LDGV, LDGT1, LDGT2, LDGT3, LDGT4 HDGV2B, HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B GAS BUS
I/M STRINGENCY	*4 17.0* 17.0 = Stringency level 17 %
I/M COMPLIANCE	*4 84.0* 84.0 = Compliance rate of 84% for analysis years 1999 through 2010, and for 2015
I/M WAIVER RATES	*4 1.0 1.0* 1.0 = waiver rate for pre-1981 model year vehicle 1.0 = waiver rate for 1981 and later model year vehicle

Italics indicate the input parameter.
* The first value of "4" in all records refers to the 4th I/M program type.
I/M program 4 applies to analysis years 2002 and later.

Table B-8. I/M Program “5” Parameters for Shelby County

Input command	Value/Description*
I/M PROGRAM	*5 2002 2030 1 T/O EVAP OBD & GC* 5 = 5th I/M program 2002 = program start year 2002 2030 = program end year 2030 1 = inspection frequency - annual T/O = program type - test only EVAP OBD & GC = evaporative OBD and gas cap I/M program
I/M MODEL YEARS	*5 2007 2030* 2007 = first model year 2007 2030 = last model year 2030
I/M VEHICLES	*5 22222 22222222 1* Vehicle types subject/not subject to inspection (1=NO, 2=YES) in the following order: LDGV, LDGT1, LDGT2, LDGT3, LDGT4 HDGV2B, HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B GAS BUS
I/M STRINGENCY	*5 17.0* 17.0 = Stringency level 17 %
I/M COMPLIANCE	*5 84.0* 84.0 = Compliance rate of 84% for analysis years 1999 through 2010, and for 2015
I/M WAIVER RATES	*5 1.0 1.0* 1.0 = waiver rate for pre-1981 model year vehicle 1.0 = waiver rate for 1981 and later model year vehicle

Italics indicate the input parameter.
* The first value of "5" in all records refers to the 5th I/M program type.
I/M program 5 applies to analysis years 2002 and later.

Example of Input Files for Knox County in Rural Area for January

```
MOBILE6 INPUT FILE  :
POLLUTANTS            : HC CO NOX CO2
PARTICULATES          :
NO DESC OUTPUT        :
DATABASE OUTPUT       :
WITH FIELDNAMES       :
AGGREGATED OUTPUT     :

RUN DATA
EXPRESS HC AS VOC     :
NO REFUELING          :
MIN/MAX TEMPERATURE: 31.6 51.4
ABSOLUTE HUMIDITY     : 28.16
REG DIST              : Knreg.d
VMT BY FACILITY       : Art-only.vmt
VMT FRACTIONS         :
    0.4798    0.0728    0.2426    0.0737    0.0354    0.0395    0.0036    0.0028
    0.0022    0.0081    0.0096    0.0046    0.0164    0.0018    0.0009    0.0062

FUEL RVP              : 15.0
SCENARIO REC          : Scenario Title Text - PM2.5 Rural Principal Arterial 2002 JAN
CALENDAR YEAR         : 2002
EVALUATION MONTH      : 1
AVERAGE SPEED         : 45 Arterial
PARTICULATE EF        : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE         : 2.5
DIESEL SULFUR         : 500

SCENARIO REC          : Scenario Title Text - PM10 Rural Principal Arterial 2002 JAN
CALENDAR YEAR         : 2002
EVALUATION MONTH      : 1
AVERAGE SPEED         : 45 Arterial
PARTICULATE EF        : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE         : 10
DIESEL SULFUR         : 500

END OF RUN

EXPRESS HC AS VOC     :
NO REFUELING          :
MIN/MAX TEMPERATURE: 31.6 51.4
ABSOLUTE HUMIDITY     : 28.16
REG DIST              : Knreg.d
VMT BY FACILITY       : Art-only.vmt
VMT FRACTIONS         :
    0.4798    0.0728    0.2426    0.0737    0.0354    0.0395    0.0036    0.0028
    0.0022    0.0081    0.0096    0.0046    0.0164    0.0018    0.0009    0.0062

FUEL RVP              : 15.0
SCENARIO REC          : Scenario Title Text - PM2.5 Rural Minor Arterial 2002 JAN
CALENDAR YEAR         : 2002
EVALUATION MONTH      : 1
AVERAGE SPEED         : 40 Arterial
PARTICULATE EF        : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE         : 2.5
DIESEL SULFUR         : 500

SCENARIO REC          : Scenario Title Text - PM10 Rural Minor Arterial 2002 JAN
CALENDAR YEAR         : 2002
EVALUATION MONTH      : 1
AVERAGE SPEED         : 40 Arterial
PARTICULATE EF        : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE         : 10
DIESEL SULFUR         : 500

END OF RUN
```

```
EXPRESS HC AS VOC  :
NO REFUELING       :
MIN/MAX TEMPERATURE: 31.6 51.4
ABSOLUTE HUMIDITY  : 28.16
REG DIST           : Knreg.d

VMT BY FACILITY    : F-only.vmt
VMT FRACTIONS      :
    0.4086      0.062      0.2066      0.0628      0.0301      0.0336      0.0057      0.0044
    0.0033     0.0125      0.0148       0.032       0.114      0.0029      0.0014      0.0053

FUEL RVP           : 15.0

SCENARIO REC       : Scenario Title Text - PM2.5 Rural Interstate 2002 JAN
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 1
AVERAGE SPEED      : 65 Non-Ramp
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 500

SCENARIO REC       : Scenario Title Text - PM10 Rural Interstate 2002 JAN
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 1
AVERAGE SPEED      : 65 Non-Ramp
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 500

END OF RUN

EXPRESS HC AS VOC  :
NO REFUELING       :
MIN/MAX TEMPERATURE: 31.6 51.4
ABSOLUTE HUMIDITY  : 28.16
REG DIST           : Knreg.d

VMT BY FACILITY    : Art-only.vmt
VMT FRACTIONS      :
    0.4858      0.0737      0.2457      0.0747      0.0358        0.04      0.0031      0.0024
    0.0019       0.007      0.0082      0.0028      0.0102      0.0016      0.0008      0.0063

FUEL RVP           : 15.0

SCENARIO REC       : Scenario Title Text - PM2.5 Rural Major Collector 2002 JAN
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35 Arterial
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 500

SCENARIO REC       : Scenario Title Text - PM10 Rural Major Collector 2002 JAN
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35 Arterial
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 500

END OF RUN
```

```
EXPRESS HC AS VOC  :
NO REFUELING       :
MIN/MAX TEMPERATURE: 31.6 51.4
ABSOLUTE HUMIDITY  : 28.16
REG DIST           : Knreg.d

VMT BY FACILITY    : Art-only.vmt
VMT FRACTIONS      :
    0.4858      0.0737      0.2457      0.0747      0.0358          0.04      0.0031      0.0024
    0.0019       0.007      0.0082      0.0028      0.0102        0.0016      0.0008      0.0063

FUEL RVP           : 15.0

SCENARIO REC       : Scenario Title Text - PM2.5 Rural Minor Collector 2002 JAN
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 1
AVERAGE SPEED      : 30 Arterial
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 500

SCENARIO REC       : Scenario Title Text - PM10 Rural Minor Collector 2002 JAN
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 1
AVERAGE SPEED      : 30 Arterial
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 500

END OF RUN

EXPRESS HC AS VOC  :
NO REFUELING       :
MIN/MAX TEMPERATURE: 31.6 51.4
ABSOLUTE HUMIDITY  : 28.16
REG DIST           : Knreg.d
VMT BY FACILITY    : L-only.vmt
VMT FRACTIONS      :
    0.4858      0.0737      0.2457      0.0747      0.0358          0.04      0.0031      0.0024
    0.0019       0.007      0.0082      0.0028      0.0102        0.0016      0.0008      0.0063

FUEL RVP           : 15.0

SCENARIO REC       : Scenario Title Text - PM2.5 Rural Local 2002 JAN
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 1
AVERAGE SPEED      : 30 Arterial
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 500

SCENARIO REC       : Scenario Title Text - PM10 Rural Local 2002 JAN
CALENDAR YEAR      : 2002
EVALUATION MONTH   : 1
AVERAGE SPEED      : 30 Arterial
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 500

END OF RUN
```

Appendix C

2002 Annual Average Daily Vehicle Miles of Travel for Tennessee by County

Table C. 2002 Annual Average Daily Vehicle Miles of Travel for Tennessee by County

Co #	County	Interstate		Freeways	Principal Arterial		Minor Arterial		Major Collector	Collector	Minor Collector	Local		County
		Rural	Urban	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Rural	Urban	Total
1	ANDERSON	525,822	26,278		122,889	614,952	79,043	246,243	284,305	67,220	114,445	112,278	130,138	2,323,613
2	BEDFORD	17,779			209,637	179,653	169,810	77,338	105,220	28,606	92,413	88,110	57,959	1,026,525
3	BENTON	272,035			147,371		73,605		102,406		66,724	45,937		708,078
4	BLEDSOE				121,073		43,599		22,475		58,144	43,663		288,954
5	BLOUNT	16,965	60,689	8,717	337,151	859,241	79,640	292,995	153,432	261,935	215,963	298,848	278,625	2,864,201
6	BRADLEY	740,500	124,654	52,925	308,743	261,983	190,488	264,300	163,114	108,975	149,531	191,443	219,907	2,776,563
7	CAMPBELL	1,047,193			155,559	139,849	38,853	11,947	152,913	11,988	132,650	112,549	17,351	1,820,852
8	CANNON				119,722		77,871		35,224		49,455	41,192		323,464
9	CARROLL	19,919			258,849	36,492	208,736	19,506	133,436	6,253	74,823	70,487	13,411	841,912
10	CARTER			47,686	62,391	346,068	124,687	162,687	154,936	48,186	67,899	71,919	75,855	1,162,314
11	CHEATHAM	526,443					317,607		170,990		101,440	103,822		1,220,302
12	CHESTER				117,135		133,625		64,139		64,152	49,555		428,606
13	CLAIBORNE				422,839		164,349		39,582		105,838	72,636		805,244
14	CLAY				77,177		39,997		13,995		25,442	25,910		182,521
15	COCKE	524,461	35,648			102,630	313,221	34,481	63,757	8,015	90,065	102,291	16,681	1,291,250
16	COFFEE	929,371	92,904		192,858	239,295	46,288	213,246	149,110	54,774	136,274	104,258	86,922	2,245,300
17	CROCKETT				228,192		43,656		114,750		56,752	40,741		484,091
18	CUMBERLAND	1,101,900	75,157		140,622	158,702	95,883	111,735	301,380	27,688	87,927	93,964	55,392	2,250,350
19	DAVIDSON		8,159,804	1,448,684		3,633,579	66,995	3,438,109	55,773	1,026,819	14,348	28,364	2,656,997	20,529,472
20	DECATUR	171,123			152,712		75,528		42,309		39,928	36,179		517,779
21	DE KALB						293,592		59,645		47,275	72,654		473,166
22	DICKSON	540,436	12,529			232,098	434,878	76,354	113,223	31,466	83,672	93,827	52,266	1,670,749
23	DYER	146,393	9,945	25,279	314,445	142,794	52,714	109,980	162,245	52,853	109,980	82,043	80,132	1,288,803
24	FAYETTE	510,929			367,629		297,581		142,753		93,205	75,458		1,487,555
25	FENTRESS				136,769		93,908		38,526		95,656	122,965		487,824
26	FRANKLIN				275,759	81,014	106,428	67,736	145,524	21,085	108,850	125,422	37,597	969,415
27	GIBSON				292,405	187,241	187,573	57,155	208,320	15,824	178,341	135,677	28,028	1,290,564
28	GILES	392,037			136,684	23,105	241,687	59,665	98,264	8,902	120,205	100,696	18,075	1,199,320
29	GRAINGER				249,639		181,235		75,874		70,514	72,238		649,500
30	GREENE	900,916			285,838	347,699	236,084	77,437	165,559	46,704	229,371	221,493	78,581	2,589,682
31	GRUNDY	227,273			288		137,351		77,951		14,148	33,586		490,597
32	HAMBLEN	284,696			6,927	544,157	208,705	177,818	74,152	82,797	123,492	107,813	157,148	1,767,705
33	HAMILTON	116,769	2,516,974	1,253,803	220,514	1,789,711	130,096	2,381,303	49,957	460,260	66,354	132,762	822,652	9,941,155

Table C. Continued.

Co #	County	Interstate		Freeways	Principal Arterial		Minor Arterial		Major Collector	Collector	Minor Collector	Local		County
		Rural	Urban	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Rural	Urban	Total
34	HANCOCK						60,409		18,333		21,037	19,122		118,901
35	HARDEMAN				106,308	91,414	314,253	16,308	30,269	6,525	103,633	69,289		737,999
36	HARDIN				155,126	66,869	232,244	25,657	72,883	8,504	70,741	71,306	14,712	718,042
37	HAWKINS				330,002	236,136	154,926	45,862	104,397	28,539	131,600	139,928	21,505	1,192,895
38	HAYWOOD	771,318				60,325	161,883	53,089	93,824	13,316	47,652	40,657	30,758	1,272,822
39	HENDERSON	804,778			15,080	149,371	320,795	19,190	96,004	18,533	54,210	60,966	44,282	1,583,209
40	HENRY				325,239	152,326	33,323	37,350	154,476	12,893	78,097	97,235	27,899	918,838
41	HICKMAN	498,584					324,224		67,344		65,585	70,214		1,025,951
42	HOUSTON						78,138		39,094		18,006	22,449		157,687
43	HUMPHREYS	491,373					286,348		20,351		105,573	63,223		966,868
44	JACKSON						157,003		38,483		41,205	38,690		275,381
45	JEFFERSON	1,215,888				108,705	439,245	19,417	196,121	12,681	109,929	111,982	28,567	2,242,535
46	JOHNSON				4,723		204,461		109,281		39,729	48,442		406,636
47	KNOX	1,177,765	4,179,002	16,440	207,628	2,326,877	484,472	1,292,383	433,625	672,734	377,102	447,889	2,597,464	14,213,381
48	LAKE						67,521		14,887		16,670	10,698		109,776
49	LAUDERDALE				226,557	105,801	19,923	57,609	127,612	7,327	58,196	59,864	11,463	674,352
50	LAWRENCE				378,468	121,899	20,363	71,284	127,916	21,769	124,032	154,448	37,432	1,057,611
51	LEWIS						162,967		11,881		20,922	20,372		216,142
52	LINCOLN				296,111	147,462	56,716	19,218	147,342	9,844	106,607	105,984	17,229	906,513
53	LOUDON	1,122,429	20,530		160,160	136,800	173,610	25,324	165,348	17,283	144,456	103,005	23,048	2,091,993
54	MC MINN	940,342	77,032		130,042	164,022	314,924	86,660	166,891	19,351	129,954	138,711	43,179	2,211,108
55	MC NAIRY				422,616		116,238		116,012		112,700	84,499		852,065
56	MACON				178,771		42,894		81,374		67,441	59,095		429,575
57	MADISON	699,533	231,244		327,941	586,308	188,037	572,875	111,513	158,064	228,879	131,086	316,671	3,552,151
58	MARION	1,152,028			215,311		85,731		255,351		65,439	73,502		1,847,362
59	MARSHALL	272,377	5,071			81,552	281,515	84,129	77,671	24,227	40,900	58,464	37,392	963,298
60	MAURY	425,182	17,193	79,006	221,766	510,985	462,774	159,762	160,169	79,003	190,753	132,656	132,560	2,571,809
61	MEIGS				8,650		180,805		34,643		28,974	34,154		287,226
62	MONROE	277,400	10,089		200,616	70,838	280,223	11,401	108,741	21,868	166,689	192,051	24,144	1,364,060
63	MONTGOMERY	251,146	398,776		96,625	949,915	283,437	665,953	88,670	132,521	118,142	124,299	327,983	3,437,467
64	MOORE				100,778				22,383		32,582	26,815		182,558
65	MORGAN				115,081		148,074		46,719		70,411	53,905		434,190
66	OBION				370,624	144,708	122,491	48,649	126,893	31,696	110,772	84,708	37,973	1,078,514

Table C. Continued.

Co #	County	Interstate		Freeways	Principal Arterial		Minor Arterial		Major Collector	Collector	Minor Collector	Local		County
		Rural	Urban	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Rural	Urban	Total
67	OVERTON				266,820		113,223		62,557		69,196	82,791		594,587
68	PERRY						164,173		21,094		26,991	30,347		242,605
69	PICKETT				72,250		1,582		18,086		17,409	22,910		132,237
70	POLK				327,751		34,011		27,697		56,104	88,166		533,729
71	PUTNAM	1,211,279	142,408	116,351	84,252	180,696	144,820	221,782	160,457	53,846	124,501	133,320	98,413	2,672,125
72	REA				276,436	91,310	134,099	34,294	33,768	24,021	78,945	74,773	31,803	779,449
73	ROANE	786,692	87,120		162,240	320,243	87,927	57,191	169,506	18,430	119,592	105,427	30,142	1,944,510
74	ROBERTSON	1,287,720			4,376	168,127	396,996	42,565	187,717	28,352	107,366	125,603	44,322	2,393,144
75	RUTHERFORD	1,313,222	556,580	2,005	656,219	935,261	162,800	749,532	362,750	264,829	339,898	291,642	784,714	6,419,452
76	SCOTT				223,200		97,835		69,721		53,269	66,741		510,766
77	SEQUATCHIE				237,783		3,437		47,654		32,934	42,655		364,463
78	SEVIER	231,229	77,748		459,868	567,534	456,656	54,512	231,834	43,946	250,505	488,918	82,904	2,945,654
79	SHELBY	231,431	5,474,416	937,515	494,939	6,071,835	300,367	5,988,818	43,838	1,412,053	345,238	189,259	2,317,508	23,807,217
80	SMITH	637,918					275,824		46,202		53,959	43,131		1,057,034
81	STEWART				195,983		47,607		51,103		31,539	47,423		373,655
82	SULLIVAN	211,296	731,589	178,105	187,830	1,154,560	123,439	828,351	177,157	217,707	134,226	187,691	462,935	4,594,886
83	SUMNER	242,560	132,835	243,613	162,738	917,789	270,035	290,935	270,879	316,065	116,394	121,511	310,436	3,395,790
84	TIPTON				324,953	148,850	118,652	30,232	126,743	18,274	154,790	143,573	30,638	1,096,705
85	TROUSDALE				53,525		95,147		24,047		20,363	19,328		212,410
86	UNICOI				269,093		12,308	36,141	83,327	13,073	55,498	41,124	20,532	531,096
87	UNION						181,242		93,609		44,088	59,242		378,181
88	VAN BUREN				90,927		32,251		22,985		25,382	18,276		189,821
89	WARREN				284,584	141,860	113,983	86,118	107,072	11,937	82,449	91,282	22,471	941,756
90	WASHINGTON	122,159	581,944	20,072	11,301	443,311	169,165	656,037	118,913	120,516	140,481	133,770	243,434	2,761,103
91	WAYNE				93,000		128,156		60,620		78,377	71,521		431,674
92	WEAKLY				312,445	51,665	31,778	70,629	192,142	10,980	76,531	79,755	26,747	852,672
93	WHITE				232,161		143,040		82,551		105,628	82,246		645,626
94	WILLIAMSON	648,817	911,805		232,209	428,725	727,827	447,750	216,608	179,286	268,615	266,273	201,531	4,529,446
95	WILSON	555,404	711,971	5,740	186,394	382,846	500,573	228,977	174,584	175,684	181,587	139,051	96,251	3,339,062

Appendix D

Monthly Emissions and Annual Emissions for the 95 Counties in Tennessee

Table D-a-1. 2002 VOC Emissions (tons/day) – East Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
1	ANDERSON	4.27	4.38	5.15	6.31	4.24	4.65	4.65	4.75	5.35	6.09	5.05	4.65	4.96	1811.21
4	BLEDSOE	0.55	0.55	0.65	0.91	0.62	0.66	0.67	0.68	0.78	0.90	0.72	0.63	0.69	253.08
5	BLOUNT	5.72	5.87	6.84	8.37	5.58	6.16	6.07	6.30	7.20	8.17	6.70	6.17	6.60	2407.40
6	BRADLEY	5.42	5.56	6.56	8.17	5.57	6.08	6.11	6.21	6.98	7.99	6.52	5.96	6.43	2346.64
7	CAMPBELL	2.27	2.33	2.80	3.55	2.45	2.64	2.73	2.70	2.95	3.36	2.83	2.56	2.76	1009.44
10	CARTER	2.25	2.30	2.70	3.37	2.26	2.49	2.46	2.54	2.91	3.31	2.69	2.45	2.64	965.25
13	CLAIBORNE	1.48	1.49	1.76	2.43	1.67	1.78	1.79	1.81	2.08	2.41	1.93	1.69	1.86	679.26
15	COCKE	2.27	2.32	2.76	3.54	2.44	2.62	2.68	2.68	2.99	3.43	2.82	2.55	2.76	1006.56
18	CUMBERLAND	2.96	3.04	3.64	4.57	3.14	3.39	3.50	3.49	3.84	4.39	3.67	3.32	3.58	1306.86
29	GRAINGER	1.21	1.22	1.44	1.99	1.36	1.46	1.47	1.48	1.70	1.97	1.58	1.38	1.52	555.42
30	GREENE	4.75	4.86	5.77	7.36	5.05	5.46	5.54	5.57	6.24	7.16	5.85	5.30	5.74	2096.69
32	HAMBLEN	3.73	3.84	4.50	5.50	3.72	4.10	4.07	4.19	4.76	5.41	4.38	4.04	4.35	1589.11
33	HAMILTON	19.17	19.78	22.91	26.54	17.67	19.79	19.28	20.23	23.01	26.09	21.34	20.18	21.33	7786.15
34	HANCOCK	0.23	0.23	0.28	0.38	0.26	0.28	0.28	0.28	0.33	0.38	0.30	0.26	0.29	106.78
37	HAWKINS	2.55	2.59	3.03	3.95	2.69	2.92	2.91	2.97	3.40	3.89	3.16	2.83	3.07	1122.23
45	JEFFERSON	3.42	3.50	4.19	5.35	3.66	3.93	4.06	4.01	4.41	5.06	4.28	3.88	4.15	1513.68
46	JOHNSON	0.77	0.78	0.92	1.28	0.87	0.93	0.94	0.95	1.09	1.26	1.01	0.88	0.97	355.25
47	KNOX	27.71	28.57	33.13	38.90	25.98	28.91	28.40	29.55	33.40	37.78	31.44	29.52	31.11	11353.43
53	LOUDON	3.24	3.33	3.98	5.05	3.45	3.70	3.82	3.78	4.16	4.77	4.04	3.67	3.92	1429.60
54	MC MINN	3.83	3.93	4.67	5.95	4.10	4.42	4.51	4.51	5.01	5.76	4.74	4.30	4.64	1695.64
58	MARION	2.59	2.66	3.21	4.15	2.86	3.05	3.18	3.12	3.41	3.93	3.29	2.97	3.20	1169.35
61	MEIGS	0.54	0.54	0.64	0.89	0.61	0.65	0.66	0.66	0.76	0.88	0.70	0.61	0.68	248.23
62	MONROE	2.55	2.59	3.07	4.08	2.79	3.00	3.04	3.06	3.47	4.00	3.23	2.87	3.15	1148.51
65	MORGAN	0.83	0.83	0.98	1.37	0.93	1.00	1.01	1.02	1.17	1.35	1.08	0.94	1.04	380.61
70	POLK	0.99	1.00	1.18	1.63	1.12	1.19	1.20	1.22	1.39	1.62	1.29	1.13	1.25	455.75
72	RHEA	1.55	1.57	1.85	2.44	1.66	1.80	1.80	1.83	2.10	2.42	1.94	1.73	1.89	690.47
73	ROANE	3.54	3.63	4.32	5.41	3.71	4.02	4.09	4.10	4.57	5.24	4.31	3.94	4.24	1548.41
76	SCOTT	0.95	0.96	1.13	1.57	1.07	1.15	1.16	1.17	1.34	1.56	1.24	1.09	1.20	437.94
78	SEVIER	5.34	5.43	6.38	8.27	5.55	6.03	6.03	6.15	7.01	8.04	6.59	5.92	6.40	2335.14
82	SULLIVAN	8.52	8.77	10.21	12.18	8.17	9.09	8.94	9.29	10.55	11.93	9.78	9.10	9.71	3544.26
86	UNICOI	1.06	1.07	1.26	1.68	1.15	1.24	1.24	1.26	1.44	1.65	1.35	1.19	1.30	474.90
87	UNION	0.65	0.66	0.77	1.07	0.72	0.77	0.78	0.79	0.91	1.05	0.85	0.74	0.81	296.90
90	WASHINGTON	6.34	6.53	7.55	8.96	6.04	6.71	6.59	6.86	7.77	8.79	7.24	6.77	7.18	2619.80
	TOTAL	133.26	136.71	160.23	197.17	133.19	146.09	145.65	149.19	168.46	192.03	157.95	145.22	155.43	56739.95

Table D-a-2. 2002 VOC Emissions (tons/day) – Middle Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
2	BEDFORD	2.11	2.14	2.48	3.21	2.20	2.38	2.41	2.45	2.81	3.12	2.57	2.30	2.51	918.19
8	CANNON	0.62	0.62	0.73	1.01	0.70	0.74	0.76	0.76	0.88	0.99	0.81	0.70	0.78	283.29
11	CHEATHAM	2.14	2.17	2.58	3.42	2.36	2.52	2.63	2.58	2.89	3.25	2.72	2.41	2.64	963.26
14	CLAY	0.35	0.35	0.41	0.56	0.39	0.41	0.42	0.42	0.49	0.55	0.45	0.39	0.43	157.52
16	COFFEE	4.12	4.22	4.95	6.15	4.24	4.60	4.73	4.72	5.27	5.85	4.94	4.51	4.86	1773.63
19	DAVIDSON	27.57	28.09	32.77	38.42	24.58	25.62	25.14	26.17	31.94	36.35	30.25	28.34	29.60	10801.48
21	DE KALB	0.91	0.91	1.06	1.48	1.02	1.08	1.11	1.11	1.28	1.44	1.17	1.02	1.13	413.30
22	DICKSON	3.07	3.12	3.66	4.66	3.22	3.47	3.56	3.57	4.02	4.47	3.74	3.37	3.66	1336.64
25	FENTRESS	0.94	0.94	1.10	1.53	1.06	1.13	1.15	1.15	1.33	1.49	1.22	1.06	1.18	429.40
26	FRANKLIN	1.97	1.98	2.31	3.07	2.10	2.26	2.29	2.32	2.68	2.99	2.45	2.17	2.38	869.83
28	GILES	2.08	2.11	2.48	3.26	2.27	2.42	2.50	2.49	2.80	3.13	2.61	2.32	2.54	927.21
31	GRUNDY	0.81	0.82	0.97	1.28	0.89	0.95	0.99	0.98	1.09	1.22	1.02	0.91	0.99	363.26
41	HICKMAN	1.66	1.68	1.99	2.63	1.84	1.95	2.04	2.00	2.23	2.49	2.10	1.87	2.04	744.76
42	HOUSTON	0.31	0.31	0.36	0.50	0.34	0.37	0.37	0.37	0.43	0.49	0.40	0.34	0.38	139.54
43	HUMPHREYS	1.18	1.20	1.43	1.88	1.31	1.40	1.46	1.43	1.58	1.76	1.50	1.34	1.46	531.75
44	JACKSON	0.53	0.53	0.62	0.87	0.59	0.63	0.65	0.65	0.75	0.84	0.69	0.60	0.66	242.04
50	LAWRENCE	2.14	2.16	2.51	3.31	2.27	2.45	2.48	2.51	2.89	3.23	2.65	2.35	2.58	941.63
51	LEWIS	0.41	0.41	0.48	0.66	0.46	0.49	0.50	0.50	0.57	0.64	0.53	0.46	0.51	185.15
52	LINCOLN	1.80	1.81	2.11	2.80	1.92	2.07	2.10	2.12	2.44	2.72	2.23	1.98	2.17	793.50
56	MACON	0.83	0.83	0.97	1.34	0.92	0.98	1.00	1.01	1.16	1.31	1.07	0.93	1.03	375.54
59	MARSHALL	1.80	1.83	2.15	2.75	1.89	2.04	2.09	2.10	2.37	2.64	2.20	1.98	2.15	786.66
60	MAURY	5.13	5.22	6.08	7.66	5.25	5.71	5.79	5.87	6.67	7.40	6.15	5.57	6.04	2205.74
63	MONTGOMERY	7.42	7.60	8.76	10.47	7.13	7.88	7.86	8.11	9.24	10.16	8.45	7.84	8.41	3069.61
64	MOORE	0.35	0.35	0.40	0.56	0.39	0.41	0.42	0.42	0.49	0.55	0.45	0.39	0.43	156.93
67	OVERTON	1.12	1.12	1.32	1.83	1.26	1.34	1.37	1.37	1.58	1.78	1.45	1.26	1.40	511.09
68	PERRY	0.45	0.45	0.53	0.74	0.51	0.54	0.55	0.55	0.64	0.72	0.59	0.51	0.56	206.02
69	PICKETT	0.25	0.25	0.29	0.40	0.28	0.30	0.30	0.30	0.35	0.39	0.32	0.28	0.31	113.40
71	PUTNAM	3.71	3.79	4.48	5.53	3.79	4.11	4.25	4.23	4.69	5.19	4.44	4.05	4.35	1589.84
74	ROBERTSON	3.23	3.30	3.94	5.00	3.43	3.69	3.86	3.79	4.19	4.66	4.00	3.60	3.89	1420.85
75	RUTHERFORD	7.97	8.08	9.62	12.07	7.76	7.92	8.00	8.09	9.83	11.25	9.36	8.49	9.04	3298.28
77	SEQUATCHIE	0.66	0.66	0.78	1.08	0.74	0.79	0.81	0.81	0.93	1.05	0.86	0.75	0.83	301.74
80	SMITH	1.31	1.34	1.60	2.07	1.44	1.53	1.62	1.57	1.72	1.92	1.66	1.48	1.60	585.97
81	STEWART	0.70	0.70	0.81	1.13	0.78	0.83	0.85	0.85	0.98	1.10	0.90	0.78	0.87	316.21
83	SUMNER	4.42	4.47	5.30	6.61	4.20	4.30	4.29	4.39	5.41	6.21	5.11	4.65	4.95	1806.03

Table D-a-2. Continued.

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
85	TROUSDALE	0.40	0.40	0.47	0.65	0.45	0.48	0.49	0.49	0.56	0.63	0.52	0.45	0.50	181.69
88	VAN BUREN	0.35	0.35	0.41	0.57	0.39	0.42	0.43	0.43	0.49	0.55	0.45	0.39	0.44	159.46
89	WARREN	1.92	1.93	2.25	2.94	2.01	2.18	2.20	2.23	2.57	2.87	2.35	2.10	2.30	838.31
91	WAYNE	0.82	0.82	0.96	1.33	0.92	0.98	1.00	1.00	1.16	1.30	1.06	0.92	1.02	373.49
93	WHITE	1.22	1.22	1.43	1.98	1.37	1.46	1.49	1.49	1.72	1.93	1.58	1.37	1.52	555.67
94	WILLIAMSON	5.46	5.51	6.54	8.33	5.35	5.45	5.50	5.56	6.76	7.79	6.46	5.84	6.21	2267.83
95	WILSON	3.91	3.95	4.68	5.94	3.84	3.92	3.95	4.00	4.83	5.55	4.62	4.18	4.45	1623.00
	TOTAL	108.15	109.71	128.78	161.68	107.82	114.20	115.41	116.99	136.69	153.95	128.07	116.25	124.81	45558.73

Table D-a-3. 2002 VOC Emissions (tons/day) – West Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
3	BENTON	1.19	1.17	1.39	1.92	1.30	1.39	1.46	1.42	1.60	1.80	1.53	1.34	1.46	533.09
9	CARROLL	1.65	1.61	1.89	2.65	1.77	1.91	1.96	1.94	2.25	2.54	2.10	1.84	2.01	733.53
12	CHESTER	0.81	0.79	0.93	1.33	0.89	0.96	0.98	0.97	1.13	1.28	1.05	0.91	1.00	366.24
17	CROCKETT	0.91	0.89	1.05	1.50	1.00	1.08	1.11	1.09	1.27	1.44	1.19	1.03	1.13	412.67
20	DECATUR	0.89	0.87	1.03	1.43	0.97	1.04	1.08	1.05	1.19	1.35	1.14	1.00	1.09	396.79
23	DYER	2.62	2.59	3.02	4.00	2.66	2.91	2.97	2.96	3.41	3.81	3.19	2.85	3.08	1125.54
24	FAYETTE	1.83	1.79	2.14	2.98	1.96	2.11	2.20	2.14	2.44	2.77	2.35	2.06	2.23	814.97
27	GIBSON	2.68	2.63	3.08	4.22	2.80	3.05	3.11	3.09	3.60	4.04	3.35	2.95	3.22	1174.57
35	HARDEMAN	1.48	1.45	1.70	2.37	1.57	1.71	1.74	1.73	2.01	2.27	1.88	1.64	1.80	655.98
36	HARDIN	1.43	1.40	1.63	2.27	1.51	1.64	1.67	1.66	1.93	2.17	1.80	1.58	1.72	629.45
38	HAYWOOD	1.61	1.60	1.92	2.48	1.68	1.82	1.92	1.86	2.05	2.27	1.99	1.79	1.92	699.42
39	HENDERSON	2.09	2.08	2.47	3.23	2.17	2.36	2.47	2.40	2.67	2.97	2.58	2.32	2.48	907.30
40	HENRY	1.88	1.85	2.16	2.94	1.95	2.13	2.16	2.16	2.51	2.81	2.33	2.06	2.25	819.94
48	LAKE	0.21	0.21	0.24	0.35	0.23	0.25	0.26	0.26	0.30	0.34	0.28	0.24	0.26	96.49
49	LAUDERDALE	1.38	1.36	1.59	2.15	1.43	1.56	1.59	1.58	1.84	2.06	1.71	1.52	1.65	601.48
55	MC NAIRY	1.59	1.55	1.82	2.61	1.75	1.88	1.93	1.90	2.21	2.50	2.07	1.79	1.97	718.64
57	MADISON	7.36	7.33	8.54	10.78	7.15	7.92	8.03	8.05	9.22	10.23	8.63	7.89	8.43	3076.58
66	OBION	2.20	2.16	2.53	3.44	2.29	2.49	2.54	2.53	2.94	3.30	2.74	2.42	2.63	960.79
79	SHELBY	37.29	37.01	42.99	52.40	32.90	34.16	33.76	34.65	42.84	49.05	41.41	38.61	39.76	14507.32
84	TIPTON	1.58	1.54	1.82	2.53	1.63	1.77	1.81	1.80	2.12	2.39	1.98	1.74	1.89	691.14
92	WEAKLY	1.76	1.72	2.01	2.78	1.84	2.00	2.04	2.03	2.37	2.66	2.20	1.94	2.11	771.98
	TOTAL	74.46	73.63	85.96	110.38	71.46	76.15	76.79	77.28	91.90	104.06	87.49	79.51	84.09	30693.92

Table D-b-1. 2002 NO_X Emissions (tons/day) - East Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
1	ANDERSON	9.02	9.56	10.31	10.33	9.88	9.83	10.01	9.83	9.44	9.72	10.82	10.33	9.92	3622.19
4	BLEDSOE	0.66	0.68	0.70	0.76	0.73	0.70	0.67	0.69	0.69	0.74	0.83	0.77	0.72	261.96
5	BLOUNT	6.42	6.78	6.79	6.48	6.13	6.05	5.70	5.97	6.00	6.30	7.29	7.13	6.42	2341.95
6	BRADLEY	12.32	13.05	14.10	14.23	13.65	13.61	13.84	13.60	13.09	13.46	14.86	14.13	13.66	4987.33
7	CAMPBELL	14.27	15.15	17.13	17.84	17.20	17.23	18.23	17.33	16.28	16.54	17.88	16.71	16.82	6140.94
10	CARTER	2.68	2.82	2.84	2.75	2.61	2.58	2.44	2.55	2.56	2.68	3.07	2.99	2.71	990.37
13	CLAIBORNE	2.14	2.22	2.30	2.52	2.43	2.35	2.29	2.32	2.34	2.48	2.73	2.51	2.39	870.79
15	COCKE	7.97	8.45	9.39	9.70	9.33	9.31	9.71	9.34	8.86	9.05	9.88	9.28	9.19	3355.39
18	CUMBERLAND	14.59	15.48	17.31	17.89	17.23	17.26	17.53	16.76	15.83	16.12	17.52	16.98	16.71	6100.37
29	GRAINGER	1.66	1.72	1.78	1.95	1.87	1.81	1.76	1.79	1.81	1.91	2.12	1.95	1.84	673.12
30	GREENE	13.81	14.63	16.15	16.66	16.03	15.95	16.56	15.97	15.21	15.59	17.09	16.07	15.81	5772.40
32	HAMBLEN	6.60	7.00	7.46	7.41	7.09	7.06	7.11	7.04	6.81	7.02	7.84	7.52	7.16	2614.44
33	HAMILTON	34.22	36.29	37.07	34.30	32.44	33.13	31.47	32.96	32.69	33.51	37.39	37.05	34.38	12541.72
34	HANCOCK	0.25	0.26	0.26	0.28	0.27	0.25	0.24	0.25	0.25	0.27	0.31	0.29	0.27	96.89
37	HAWKINS	2.84	2.97	3.01	3.08	2.94	2.85	2.72	2.80	2.83	3.01	3.43	3.25	2.98	1086.85
45	JEFFERSON	14.37	15.25	17.10	17.76	17.09	17.04	17.92	17.10	16.14	16.48	17.97	16.84	16.76	6118.46
46	JOHNSON	0.97	1.01	1.03	1.12	1.08	1.04	1.01	1.03	1.04	1.10	1.23	1.14	1.07	389.49
47	KNOX	50.25	53.27	55.15	52.19	49.44	50.07	48.47	49.86	49.06	50.39	56.32	55.24	51.64	18843.83
53	LOUDON	12.38	13.14	14.67	15.18	14.61	14.55	15.24	14.59	13.80	14.11	15.43	14.48	14.35	5238.81
54	MC MINN	14.35	15.21	16.91	17.46	16.80	16.79	17.50	16.84	15.98	16.31	17.75	16.68	16.55	6042.14
58	MARION	13.23	14.04	15.83	16.50	15.93	15.89	16.78	15.96	15.02	15.31	16.62	15.53	15.56	5680.34
61	MEIGS	0.71	0.74	0.76	0.83	0.80	0.77	0.75	0.76	0.77	0.82	0.91	0.83	0.79	287.54
62	MONROE	5.34	5.63	6.09	6.35	6.11	6.02	6.14	6.01	5.81	6.01	6.65	6.23	6.03	2202.28
65	MORGAN	0.98	1.02	1.04	1.13	1.09	1.04	1.00	1.02	1.04	1.11	1.25	1.15	1.07	391.52
70	POLK	1.35	1.39	1.44	1.57	1.51	1.46	1.41	1.44	1.45	1.54	1.71	1.58	1.49	542.78
72	RHEA	1.97	2.05	2.09	2.18	2.09	2.04	1.96	2.01	2.03	2.14	2.40	2.26	2.10	767.03
73	ROANE	10.56	11.20	12.35	12.59	12.11	12.08	12.51	12.10	11.52	11.79	12.94	12.23	12.00	4380.86
76	SCOTT	1.26	1.31	1.35	1.47	1.42	1.36	1.32	1.34	1.36	1.44	1.60	1.48	1.39	508.35
78	SEVIER	8.11	8.53	8.90	9.04	8.62	8.47	8.34	8.41	8.29	8.67	9.77	9.28	8.70	3176.07
82	SULLIVAN	15.75	16.68	17.27	16.44	15.59	15.80	15.29	15.73	15.50	15.90	17.72	17.33	16.25	5929.42
86	UNICOI	1.53	1.59	1.64	1.77	1.70	1.65	1.61	1.64	1.65	1.73	1.92	1.77	1.68	614.61
87	UNION	0.84	0.87	0.89	0.97	0.93	0.89	0.86	0.88	0.89	0.94	1.06	0.98	0.91	333.92
90	WASHINGTON	8.40	8.91	9.10	8.58	8.13	8.12	7.79	8.05	7.97	8.29	9.44	9.28	8.50	3102.64
	TOTAL	291.81	308.87	330.22	329.31	314.90	315.03	316.22	313.96	303.99	312.48	345.76	331.25	317.82	116006.77

Table D-b-2. 2002 NO_X Emissions (tons/day) – Middle Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
2	BEDFORD	2.73	2.89	2.98	3.01	2.88	2.79	2.72	2.78	2.81	3.00	3.30	3.13	2.92	1065.21
8	CANNON	0.70	0.73	0.75	0.80	0.77	0.72	0.70	0.71	0.73	0.80	0.89	0.82	0.76	277.47
11	CHEATHAM	5.99	6.37	7.07	7.32	7.06	6.93	7.26	6.96	6.66	6.91	7.53	7.05	6.93	2528.68
14	CLAY	0.43	0.45	0.46	0.50	0.48	0.45	0.45	0.45	0.46	0.50	0.55	0.51	0.47	173.21
16	COFFEE	13.03	13.89	15.36	15.58	14.98	14.91	15.53	14.99	14.30	14.71	15.97	15.09	14.86	5426.03
19	DAVIDSON	72.45	77.28	79.69	73.30	68.66	70.39	67.47	70.54	70.36	72.07	79.08	78.16	73.29	26737.87
21	DE KALB	1.07	1.12	1.16	1.24	1.19	1.13	1.10	1.12	1.15	1.24	1.37	1.26	1.18	430.62
22	DICKSON	9.64	10.26	11.39	11.68	11.24	11.16	11.67	11.22	10.70	11.01	11.95	11.23	11.09	4050.83
25	FENTRESS	1.15	1.20	1.24	1.33	1.28	1.21	1.19	1.21	1.24	1.34	1.47	1.35	1.27	462.65
26	FRANKLIN	2.25	2.37	2.43	2.49	2.38	2.27	2.21	2.26	2.31	2.50	2.77	2.60	2.40	876.67
28	GILES	7.58	8.04	8.98	9.36	9.02	8.95	9.38	8.99	8.57	8.81	9.52	8.88	8.84	3228.30
31	GRUNDY	3.17	3.36	3.77	3.94	3.80	3.76	3.96	3.79	3.60	3.70	3.99	3.72	3.71	1356.00
41	HICKMAN	7.54	8.01	9.03	9.42	9.08	9.03	9.54	9.08	8.60	8.81	9.50	8.86	8.87	3240.65
42	HOUSTON	0.34	0.36	0.37	0.39	0.38	0.35	0.35	0.35	0.36	0.39	0.43	0.40	0.37	135.88
43	HUMPHREYS	7.33	7.79	8.80	9.23	8.90	8.88	9.39	8.94	8.45	8.62	9.26	8.61	8.68	3170.89
44	JACKSON	0.62	0.65	0.67	0.72	0.69	0.65	0.64	0.65	0.67	0.72	0.80	0.73	0.69	250.22
50	LAWRENCE	2.61	2.75	2.82	2.90	2.78	2.67	2.60	2.65	2.71	2.91	3.21	3.01	2.80	1022.18
51	LEWIS	0.54	0.56	0.58	0.63	0.61	0.58	0.57	0.57	0.59	0.63	0.69	0.63	0.60	217.80
52	LINCOLN	2.40	2.53	2.61	2.72	2.61	2.52	2.46	2.51	2.55	2.72	2.97	2.78	2.62	954.48
56	MACON	0.96	1.01	1.03	1.10	1.06	1.00	0.98	0.99	1.02	1.11	1.22	1.13	1.05	383.29
59	MARSHALL	4.99	5.31	5.85	6.00	5.77	5.71	5.94	5.74	5.50	5.68	6.18	5.81	5.71	2083.41
60	MAURY	10.36	11.03	11.89	11.98	11.49	11.33	11.56	11.36	11.06	11.51	12.59	11.93	11.51	4200.89
63	MONTGOMERY	13.23	14.12	14.80	14.14	13.45	13.47	13.29	13.50	13.32	13.82	15.16	14.72	13.92	5078.85
64	MOORE	0.45	0.47	0.49	0.53	0.51	0.48	0.48	0.48	0.49	0.53	0.58	0.53	0.50	183.33
67	OVERTON	1.41	1.48	1.53	1.64	1.58	1.49	1.47	1.49	1.52	1.65	1.80	1.66	1.56	569.12
68	PERRY	0.66	0.69	0.72	0.79	0.76	0.73	0.72	0.73	0.74	0.79	0.85	0.78	0.75	273.10
69	PICKETT	0.33	0.34	0.36	0.39	0.37	0.35	0.35	0.35	0.36	0.39	0.42	0.39	0.37	133.44
71	PUTNAM	15.53	16.54	18.39	18.70	17.97	17.95	18.74	18.06	17.18	17.59	19.05	17.97	17.81	6501.31
74	ROBERTSON	12.41	13.23	14.79	15.20	14.63	14.49	15.25	14.58	13.84	14.25	15.49	14.55	14.39	5255.74
75	RUTHERFORD	23.32	24.84	26.75	26.56	25.20	25.16	25.56	25.27	24.54	25.28	27.81	26.54	25.57	9332.96
77	SEQUATCHIE	1.04	1.08	1.13	1.24	1.19	1.15	1.13	1.14	1.16	1.24	1.33	1.22	1.17	427.54
80	SMITH	7.30	7.77	8.79	9.14	8.81	8.77	9.29	8.83	8.33	8.52	9.20	8.59	8.61	3144.67
81	STEWART	0.96	1.00	1.04	1.12	1.08	1.03	1.02	1.03	1.05	1.13	1.23	1.12	1.07	389.35
83	SUMNER	8.48	9.06	9.41	9.00	8.45	8.38	8.25	8.39	8.33	8.70	9.78	9.49	8.81	3214.53

Table D-b-2. Continued

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
85	TROUSDALE	0.52	0.55	0.57	0.61	0.59	0.56	0.55	0.55	0.57	0.61	0.67	0.61	0.58	211.49
88	VAN BUREN	0.52	0.54	0.57	0.62	0.59	0.57	0.56	0.57	0.58	0.62	0.67	0.61	0.58	213.04
89	WARREN	2.27	2.40	2.45	2.49	2.39	2.29	2.22	2.27	2.32	2.50	2.76	2.61	2.41	880.85
91	WAYNE	1.10	1.15	1.19	1.30	1.25	1.19	1.17	1.18	1.21	1.30	1.41	1.29	1.23	448.38
93	WHITE	1.60	1.68	1.74	1.88	1.81	1.72	1.69	1.71	1.75	1.88	2.06	1.89	1.78	650.96
94	WILLIAMSON	15.75	16.75	17.90	17.76	16.81	16.77	16.89	16.82	16.46	17.01	18.71	17.85	17.12	6249.90
95	WILSON	15.19	16.12	17.37	17.27	16.39	16.54	16.68	16.60	16.17	16.54	17.95	17.12	16.66	6081.88
	TOTAL	279.92	297.77	318.92	316.04	300.92	300.45	302.97	301.39	294.33	304.02	332.19	317.20	305.51	111513.67

Table D-b-3. 2002 NO_X Emissions (tons/day) – West Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
3	BENTON	4.57	4.84	5.42	5.69	5.50	5.47	5.73	5.48	5.23	5.38	5.78	5.36	5.37	1961.34
9	CARROLL	2.28	2.39	2.52	2.65	2.56	2.49	2.45	2.45	2.48	2.66	2.89	2.65	2.54	927.05
12	CHESTER	1.19	1.24	1.31	1.43	1.38	1.34	1.32	1.32	1.35	1.44	1.54	1.40	1.35	494.27
17	CROCKETT	1.37	1.43	1.50	1.63	1.58	1.53	1.51	1.51	1.54	1.64	1.76	1.60	1.55	565.57
20	DECATUR	2.88	3.05	3.39	3.57	3.45	3.42	3.56	3.42	3.29	3.40	3.66	3.38	3.37	1231.93
23	DYER	4.65	4.92	5.26	5.36	5.15	5.10	5.11	5.06	5.01	5.25	5.69	5.33	5.16	1882.09
24	FAYETTE	8.25	8.75	9.81	10.29	9.93	9.89	10.38	9.91	9.45	9.71	10.44	9.68	9.71	3544.46
27	GIBSON	3.01	3.18	3.27	3.33	3.21	3.11	3.00	3.04	3.13	3.38	3.72	3.46	3.24	1181.19
35	HARDEMAN	1.82	1.91	1.99	2.07	1.99	1.93	1.88	1.90	1.94	2.09	2.28	2.11	1.99	727.79
36	HARDIN	1.96	2.05	2.14	2.26	2.18	2.12	2.07	2.09	2.13	2.28	2.46	2.26	2.17	790.93
38	HAYWOOD	10.96	11.66	13.24	13.74	13.26	13.30	14.11	13.37	12.58	12.80	13.75	12.83	12.97	4734.93
39	HENDERSON	11.39	12.11	13.67	14.19	13.69	13.71	14.45	13.76	13.02	13.29	14.28	13.32	13.41	4895.44
40	HENRY	2.41	2.54	2.63	2.72	2.62	2.56	2.48	2.51	2.57	2.74	2.99	2.77	2.63	959.28
48	LAKE	0.26	0.28	0.29	0.31	0.30	0.29	0.28	0.28	0.29	0.31	0.34	0.31	0.30	107.79
49	LAUDERDALE	1.75	1.84	1.90	1.95	1.88	1.84	1.78	1.80	1.84	1.97	2.15	2.00	1.89	690.33
55	MC NAIRY	2.46	2.56	2.70	2.95	2.85	2.77	2.73	2.73	2.78	2.97	3.17	2.88	2.79	1020.02
57	MADISON	16.82	17.90	19.42	19.27	18.49	18.56	18.86	18.50	17.95	18.55	20.14	19.12	18.63	6801.19
66	OBION	2.84	2.98	3.10	3.20	3.08	3.00	2.92	2.95	3.02	3.23	3.51	3.26	3.09	1127.42
79	SHELBY	69.25	74.00	76.27	69.73	65.73	67.10	64.17	66.44	66.63	69.11	76.34	75.03	69.98	25531.87
84	TIPTON	2.42	2.54	2.64	2.73	2.62	2.57	2.50	2.53	2.58	2.74	2.99	2.77	2.64	962.35
92	WEAKLY	1.92	2.02	2.08	2.12	2.04	1.97	1.91	1.93	1.99	2.16	2.38	2.21	2.06	751.43
	TOTAL	154.47	164.19	174.54	171.19	163.47	164.07	163.20	162.96	160.78	167.09	182.25	173.70	166.83	60888.68

Table D-c-1. 2002 CO Emissions (tons/day) – East Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
1	ANDERSON	65.54	68.89	71.46	72.47	51.36	53.50	53.89	54.42	64.65	72.96	75.72	73.42	64.85	23653
4	BLEDSOE	8.37	8.61	8.95	10.20	7.30	7.38	7.43	7.46	9.13	10.51	10.59	9.75	8.81	3214
5	BLOUNT	83.68	87.66	89.39	89.70	63.32	65.92	64.91	66.86	80.75	91.67	95.04	92.53	80.95	29520
6	BRADLEY	84.20	88.42	92.49	95.53	68.04	70.37	71.26	71.51	85.21	96.63	98.90	95.10	84.80	30932
7	CAMPBELL	40.54	42.67	45.83	48.85	35.24	36.77	38.56	37.61	43.50	48.28	49.45	46.93	42.85	15634
10	CARTER	33.43	34.95	35.68	36.34	25.83	26.79	26.43	27.16	32.82	37.31	38.46	37.19	32.70	11925
13	CLAIBORNE	22.85	23.52	24.47	27.91	20.00	20.26	20.42	20.50	25.05	28.77	28.93	26.62	24.11	8796
15	COCKE	36.35	38.10	40.40	43.08	30.86	31.71	32.64	32.25	38.14	43.23	44.17	41.86	37.73	13764
18	CUMBERLAND	52.72	55.50	59.19	62.39	44.77	46.84	49.18	48.34	56.34	62.60	64.09	60.54	55.21	20141
29	GRAINGER	18.50	19.04	19.80	22.56	16.16	16.35	16.47	16.53	20.22	23.26	23.42	21.56	19.49	7110
30	GREENE	74.48	78.06	82.31	87.02	62.28	64.02	65.49	65.07	77.21	87.64	89.64	85.27	76.54	27921
32	HAMBLEN	54.46	57.24	59.05	59.29	42.15	43.65	43.47	44.28	53.12	60.45	62.23	60.56	53.33	19449
33	HAMILTON	301.74	318.76	324.50	309.82	216.47	230.23	224.57	234.09	283.28	318.08	326.31	325.46	284.44	103707
34	HANCOCK	3.45	3.55	3.69	4.19	3.00	3.02	3.04	3.05	3.74	4.32	4.37	4.02	3.62	1321
37	HAWKINS	36.95	38.35	39.44	42.28	30.25	30.97	30.85	31.35	37.91	43.36	44.47	42.02	37.35	13623
45	JEFFERSON	58.02	61.00	65.40	69.89	50.01	51.80	54.19	52.91	61.47	68.87	71.09	67.35	61.00	22255
46	JOHNSON	11.50	11.84	12.29	13.96	10.02	10.11	10.17	10.21	12.48	14.39	14.55	13.40	12.08	4406
47	KNOX	435.73	459.56	471.15	458.88	322.07	341.62	337.15	347.76	416.19	465.94	480.96	475.36	417.70	152307
53	LOUDON	55.44	58.34	62.51	66.44	47.47	49.27	51.52	50.34	58.47	65.44	67.57	64.19	58.08	21191
54	MC MINN	61.80	64.87	68.85	72.97	52.31	53.87	55.50	54.82	64.63	73.10	74.74	71.03	64.04	23362
58	MARION	46.22	48.63	52.67	56.97	40.85	42.25	44.56	43.17	50.11	56.12	57.36	54.05	49.41	18029
61	MEIGS	8.10	8.33	8.66	9.84	7.06	7.13	7.18	7.21	8.81	10.15	10.25	9.44	8.51	3106
62	MONROE	39.45	41.02	43.04	47.12	33.73	34.38	34.98	34.87	41.93	47.93	48.70	45.61	41.06	14980
65	MORGAN	12.56	12.93	13.44	15.29	10.95	11.06	11.14	11.19	13.69	15.77	15.90	14.64	13.21	4821
70	POLK	15.37	15.82	16.46	18.78	13.44	13.61	13.72	13.77	16.85	19.36	19.46	17.91	16.21	5915
72	RHEA	23.16	24.01	24.79	26.92	19.21	19.61	19.57	19.84	24.20	27.75	28.13	26.44	23.64	8622
73	ROANE	57.24	60.20	63.69	66.43	47.48	49.09	50.40	49.98	58.92	66.57	68.20	65.30	58.63	21386
76	SCOTT	14.59	15.02	15.62	17.80	12.76	12.91	13.00	13.06	15.96	18.35	18.48	17.01	15.38	5610
78	SEVIER	81.76	85.09	87.99	93.87	66.67	68.67	68.95	69.69	83.99	95.48	98.16	93.02	82.78	30194
82	SULLIVAN	132.35	139.31	142.32	139.44	98.52	103.89	102.28	105.61	126.90	142.62	146.96	144.78	127.08	46339
86	UNICOI	15.61	16.14	16.69	18.45	13.25	13.51	13.54	13.67	16.54	18.91	19.28	17.98	16.13	5884
87	UNION	9.87	10.16	10.53	11.94	8.53	8.65	8.72	8.76	10.66	12.22	12.48	11.51	10.34	3771
90	WASHINGTON	93.73	98.65	100.71	98.39	69.67	73.27	71.93	74.41	89.11	100.53	103.94	102.46	89.73	32721
	TOTAL	2089.77	2194.24	2273.44	2314.99	1641.06	1712.47	1717.11	1741.78	2081.97	2348.55	2412.00	2334.31	2071.81	755608

Table D-c-2. 2002 CO Emissions (tons/day) - Middle Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
2	BEDFORD	30.61	32.17	33.08	34.95	24.75	25.41	25.54	25.80	31.50	35.88	36.66	34.74	30.92	11278
8	CANNON	9.44	9.81	10.18	11.54	8.20	8.32	8.46	8.44	10.37	11.87	12.00	11.03	9.97	3638
11	CHEATHAM	35.02	36.96	39.43	42.96	30.63	31.40	32.95	32.07	37.98	42.81	43.87	41.01	37.26	13592
14	CLAY	5.25	5.46	5.67	6.43	4.57	4.64	4.72	4.70	5.78	6.60	6.67	6.13	5.55	2025
16	COFFEE	65.33	69.46	73.30	75.42	53.62	55.71	57.71	56.93	67.16	75.23	77.58	74.43	66.82	24374
19	DAVIDSON	488.74	521.63	529.46	500.84	334.97	349.66	343.89	355.42	449.64	499.16	525.71	525.69	452.07	164778
21	DE KALB	13.45	13.98	14.50	16.41	11.69	11.83	12.03	12.00	14.72	16.87	17.09	15.72	14.19	5177
22	DICKSON	46.99	49.70	52.11	54.67	38.95	40.17	41.33	40.95	48.80	55.03	56.55	53.76	48.25	17600
25	FENTRESS	13.91	14.46	15.00	16.98	12.09	12.23	12.43	12.40	15.23	17.46	17.68	16.26	14.68	5355
26	FRANKLIN	28.82	30.17	31.09	33.71	23.89	24.40	24.61	24.76	30.34	34.65	35.27	33.05	29.56	10784
28	GILES	32.13	33.83	35.65	38.61	27.59	28.27	29.24	28.80	34.40	38.88	39.77	37.27	33.70	12294
31	GRUNDY	13.15	13.88	14.83	16.15	11.58	11.89	12.49	12.15	14.31	16.07	16.48	15.40	14.03	5119
41	HICKMAN	26.87	28.36	30.31	33.02	23.69	24.32	25.54	24.84	29.24	32.85	33.67	31.47	28.68	10464
42	HOUSTON	4.52	4.70	4.87	5.51	3.92	3.96	4.03	4.02	4.94	5.66	5.74	5.28	4.76	1738
43	HUMPHREYS	20.79	21.96	23.54	25.65	18.44	19.20	20.31	19.69	22.95	25.34	26.02	24.35	22.35	8155
44	JACKSON	7.84	8.16	8.46	9.56	6.81	6.89	7.00	6.98	8.57	9.83	9.97	9.17	8.27	3017
50	LAWRENCE	31.23	32.71	33.70	36.35	25.78	26.37	26.58	26.77	32.75	37.37	38.05	35.73	31.95	11654
51	LEWIS	6.07	6.32	6.55	7.42	5.29	5.36	5.45	5.44	6.66	7.63	7.72	7.10	6.42	2341
52	LINCOLN	26.22	27.44	28.29	30.67	21.78	22.26	22.45	22.59	27.63	31.52	32.09	30.07	26.92	9818
56	MACON	12.44	12.94	13.42	15.21	10.82	10.96	11.15	11.12	13.66	15.63	15.82	14.54	13.14	4795
59	MARSHALL	27.49	29.05	30.41	32.00	22.75	23.44	24.06	23.88	28.58	32.29	33.14	31.46	28.21	10291
60	MAURY	76.32	80.67	83.54	86.39	61.19	63.24	64.10	64.36	77.60	87.81	90.16	86.28	76.80	28012
63	MONTGOMERY	107.58	114.38	116.89	114.19	80.35	84.17	83.68	85.67	103.55	116.73	120.45	118.26	103.82	37857
64	MOORE	5.22	5.42	5.63	6.39	4.55	4.61	4.69	4.68	5.74	6.56	6.63	6.10	5.52	2013
67	OVERTON	17.07	17.75	18.43	20.90	14.87	15.09	15.36	15.32	18.79	21.48	21.71	19.95	18.06	6588
68	PERRY	6.68	6.95	7.20	8.16	5.82	5.89	5.99	5.97	7.32	8.38	8.49	7.81	7.05	2574
69	PICKETT	3.77	3.92	4.07	4.62	3.29	3.33	3.39	3.38	4.15	4.74	4.80	4.41	3.99	1455
71	PUTNAM	65.38	69.62	73.73	75.92	53.90	56.88	59.45	58.38	68.29	75.13	77.56	74.51	67.40	24584
74	ROBERTSON	58.85	62.57	67.01	70.92	50.41	52.86	56.00	54.30	63.29	69.74	71.91	68.21	62.17	22681
75	RUTHERFORD	138.57	147.23	152.41	153.72	103.81	105.94	107.84	107.74	134.17	150.05	159.90	155.18	134.71	49118
77	SEQUATCHIE	10.14	10.54	10.95	12.44	8.86	9.01	9.18	9.15	11.20	12.78	12.90	11.85	10.75	3922
80	SMITH	24.26	25.74	27.78	30.00	21.47	22.46	23.96	23.08	26.74	29.40	30.24	28.43	26.13	9533
81	STEWART	10.61	11.03	11.46	13.00	9.26	9.40	9.57	9.54	11.70	13.36	13.49	12.40	11.24	4099
83	SUMNER	74.57	79.19	80.82	80.01	53.65	54.60	54.62	55.37	69.98	78.91	84.40	82.57	70.72	25783

Table D-c-2. Continued.

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
85	TROUSDALE	6.04	6.28	6.52	7.39	5.26	5.33	5.43	5.41	6.64	7.59	7.68	7.06	6.38	2329
88	VAN BUREN	5.31	5.52	5.73	6.51	4.63	4.70	4.79	4.78	5.85	6.68	6.75	6.20	5.62	2051
89	WARREN	28.07	29.44	30.29	32.44	22.99	23.56	23.71	23.92	29.25	33.34	33.99	32.02	28.58	10426
91	WAYNE	12.10	12.59	13.05	14.78	10.53	10.65	10.84	10.81	13.26	15.19	15.39	14.15	12.78	4661
93	WHITE	18.32	19.05	19.77	22.41	15.95	16.17	16.45	16.41	20.13	23.03	23.30	21.41	19.37	7065
94	WILLIAMSON	98.71	104.58	108.01	110.38	74.34	76.05	77.17	77.35	96.98	108.24	114.64	110.65	96.43	35159
95	WILSON	70.19	74.39	76.98	78.69	53.23	54.51	55.44	55.47	69.18	77.04	81.61	78.75	68.79	25082
	TOTAL	1784.03	1890.00	1954.13	1993.29	1380.16	1425.11	1443.66	1450.82	1779.03	1994.82	2073.55	1999.84	1764.04	643280

Table D-c-3. 2002 CO Emissions (tons/day) – West Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
3	BENTON	18.11	19.07	20.56	22.96	16.01	16.85	17.79	17.16	20.57	22.85	23.01	21.19	19.68	7180
9	CARROLL	23.45	24.50	25.78	29.06	20.08	21.03	21.63	21.33	26.37	29.68	29.66	27.18	24.98	9112
12	CHESTER	11.41	11.88	12.52	14.38	9.98	10.41	10.72	10.55	13.05	14.72	14.68	13.33	12.30	4488
17	CROCKETT	13.07	13.61	14.35	16.51	11.43	11.92	12.28	12.09	14.98	16.89	16.82	15.28	14.10	5145
20	DECATUR	13.56	14.26	15.35	17.22	11.98	12.61	13.29	12.84	15.46	17.18	17.26	15.86	14.74	5378
23	DYER	36.82	38.84	40.82	43.46	29.93	31.70	32.50	32.21	39.40	44.10	44.47	41.79	38.00	13861
24	FAYETTE	31.07	32.65	35.21	39.94	27.31	29.07	30.77	29.69	36.08	39.61	39.57	36.33	33.94	12384
27	GIBSON	37.08	38.87	40.67	44.61	30.73	32.28	32.96	32.73	40.52	45.68	45.85	42.48	38.71	14119
35	HARDEMAN	20.74	21.70	22.75	25.32	17.48	18.32	18.76	18.57	22.99	25.92	25.96	23.91	21.87	7977
36	HARDIN	19.86	20.78	21.79	24.20	16.73	17.55	17.96	17.79	22.00	24.77	24.81	22.86	20.92	7633
38	HAYWOOD	26.98	28.71	31.24	33.55	23.50	25.31	27.11	25.94	30.24	32.62	33.20	31.21	29.13	10629
39	HENDERSON	34.60	36.74	39.75	42.81	29.85	32.12	34.19	32.89	38.69	41.89	42.55	39.94	37.17	13560
40	HENRY	26.08	27.36	28.61	31.22	21.52	22.66	23.12	22.99	28.40	31.96	32.07	29.79	27.15	9903
48	LAKE	2.99	3.11	3.28	3.76	2.61	2.71	2.79	2.75	3.41	3.85	3.85	3.49	3.22	1174
49	LAUDERDALE	19.15	20.10	21.01	22.83	15.75	16.60	16.92	16.83	20.78	23.37	23.47	21.84	19.89	7254
55	MC NAIRY	22.79	23.72	25.01	28.80	19.97	20.85	21.48	21.14	26.16	29.45	29.33	26.62	24.61	8978
57	MADISON	103.69	110.20	115.65	117.79	80.95	86.67	88.60	88.20	106.92	118.86	120.69	115.73	104.50	38110
66	OBION	30.66	32.15	33.63	36.78	25.35	26.69	27.24	27.07	33.47	37.65	37.76	35.04	31.96	11657
79	SHELBY	578.23	617.22	635.84	615.41	404.34	426.04	424.29	433.71	556.17	615.75	634.24	624.66	547.16	199460
84	TIPTON	24.32	25.46	26.70	29.70	20.06	21.25	21.79	21.60	27.08	30.25	30.19	27.89	25.52	9310
92	WEAKLY	24.65	25.81	27.04	29.91	20.60	21.63	22.13	21.94	27.17	30.61	30.66	28.32	25.87	9438
	TOTAL	1119.31	1186.76	1237.55	1270.23	856.16	904.26	918.31	920.04	1149.90	1277.67	1300.10	1244.73	1115.42	406751

Table D-d-1. 2002 PM10 Emissions (tons/day) – East Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
1	ANDERSON	0.17	0.18	0.20	0.21	0.20	0.21	0.21	0.21	0.20	0.20	0.21	0.19	0.20	72.80
4	BLEDSOE	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	6.51
5	BLOUNT	0.14	0.15	0.16	0.16	0.16	0.17	0.16	0.17	0.16	0.16	0.17	0.16	0.16	58.32
6	BRADLEY	0.23	0.24	0.27	0.28	0.28	0.28	0.29	0.28	0.27	0.27	0.28	0.26	0.27	99.15
7	CAMPBELL	0.25	0.27	0.31	0.33	0.32	0.32	0.34	0.32	0.30	0.30	0.32	0.30	0.31	111.84
10	CARTER	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	24.90
13	CLAIBORNE	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	22.90
15	COCKE	0.14	0.15	0.17	0.18	0.17	0.17	0.18	0.18	0.17	0.17	0.18	0.16	0.17	61.23
18	CUMBERLAND	0.27	0.28	0.32	0.34	0.33	0.33	0.34	0.33	0.31	0.31	0.32	0.31	0.32	115.73
29	GRAINGER	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	17.38
30	GREENE	0.25	0.26	0.30	0.32	0.31	0.31	0.33	0.32	0.30	0.30	0.31	0.29	0.30	109.83
32	HAMBLEN	0.13	0.13	0.15	0.15	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.14	0.15	53.77
33	HAMILTON	0.71	0.74	0.80	0.78	0.75	0.79	0.77	0.79	0.78	0.77	0.79	0.76	0.77	280.81
34	HANCOCK	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	2.31
37	HAWKINS	0.06	0.06	0.07	0.08	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	26.56
45	JEFFERSON	0.25	0.27	0.31	0.33	0.32	0.32	0.34	0.32	0.31	0.31	0.32	0.30	0.31	112.40
46	JOHNSON	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.09
47	KNOX	1.00	1.05	1.14	1.14	1.10	1.15	1.14	1.15	1.13	1.12	1.15	1.10	1.11	406.48
53	LOUDON	0.22	0.23	0.27	0.28	0.28	0.28	0.30	0.28	0.27	0.27	0.28	0.26	0.27	97.90
54	MC MINN	0.26	0.27	0.31	0.33	0.31	0.32	0.34	0.32	0.31	0.31	0.32	0.30	0.31	111.96
58	MARION	0.24	0.25	0.29	0.30	0.29	0.30	0.32	0.30	0.28	0.28	0.30	0.28	0.29	104.25
61	MEIGS	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	7.55
62	MONROE	0.10	0.11	0.12	0.13	0.13	0.13	0.13	0.13	0.12	0.13	0.13	0.12	0.12	44.74
65	MORGAN	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	9.70
70	POLK	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	13.84
72	RHEA	0.04	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	19.45
73	ROANE	0.19	0.20	0.23	0.24	0.23	0.24	0.25	0.24	0.22	0.23	0.24	0.22	0.23	82.42
76	SCOTT	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	13.12
78	SEVIER	0.17	0.17	0.19	0.21	0.20	0.20	0.21	0.21	0.20	0.20	0.21	0.19	0.20	71.45
82	SULLIVAN	0.32	0.34	0.36	0.36	0.35	0.37	0.36	0.37	0.36	0.36	0.37	0.35	0.36	130.05
86	UNICOI	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	16.25
87	UNION	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	8.78
90	WASHINGTON	0.17	0.17	0.19	0.19	0.18	0.19	0.19	0.19	0.19	0.19	0.19	0.18	0.19	68.06
	TOTAL	5.65	5.94	6.57	6.84	6.62	6.81	6.93	6.84	6.61	6.62	6.82	6.38	6.55	2392.51

Table D-d-2. 2002 PM10 Emissions (tons/day) – Middle Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
2	BEDFORD	0.06	0.06	0.07	0.08	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	26.60
8	CANNON	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	6.68
11	CHEATHAM	0.11	0.11	0.13	0.14	0.13	0.14	0.14	0.14	0.13	0.13	0.14	0.12	0.13	47.32
14	CLAY	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.36
16	COFFEE	0.24	0.25	0.28	0.30	0.29	0.29	0.30	0.29	0.28	0.28	0.29	0.27	0.28	102.45
19	DAVIDSON	1.57	1.65	1.77	1.71	1.64	1.74	1.69	1.75	1.72	1.70	1.74	1.68	1.70	619.89
21	DE KALB	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	11.01
22	DICKSON	0.17	0.18	0.21	0.22	0.21	0.22	0.23	0.22	0.21	0.21	0.22	0.20	0.21	75.49
25	FENTRESS	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	11.70
26	FRANKLIN	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	21.63
28	GILES	0.14	0.14	0.16	0.18	0.17	0.17	0.18	0.17	0.17	0.17	0.17	0.16	0.17	60.76
31	GRUNDY	0.06	0.06	0.07	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.07	25.66
41	HICKMAN	0.13	0.14	0.16	0.17	0.17	0.17	0.18	0.17	0.16	0.16	0.17	0.16	0.16	59.05
42	HOUSTON	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	3.35
43	HUMPHREYS	0.13	0.14	0.16	0.17	0.17	0.17	0.18	0.17	0.16	0.16	0.17	0.16	0.16	59.71
44	JACKSON	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	6.32
50	LAWRENCE	0.06	0.06	0.07	0.08	0.07	0.07	0.08	0.08	0.07	0.08	0.08	0.07	0.07	26.00
51	LEWIS	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	5.74
52	LINCOLN	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	25.09
56	MACON	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	9.39
59	MARSHALL	0.09	0.10	0.11	0.12	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.11	39.84
60	MAURY	0.20	0.21	0.24	0.25	0.24	0.25	0.25	0.25	0.24	0.24	0.25	0.23	0.24	86.89
63	MONTGOMERY	0.27	0.28	0.30	0.31	0.30	0.31	0.31	0.31	0.30	0.30	0.31	0.29	0.30	108.96
64	MOORE	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.68
67	OVERTON	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	14.41
68	PERRY	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	7.44
69	PICKETT	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	3.42
71	PUTNAM	0.29	0.30	0.34	0.36	0.34	0.35	0.37	0.35	0.34	0.34	0.35	0.33	0.34	123.38
74	ROBERTSON	0.23	0.24	0.27	0.29	0.28	0.28	0.30	0.29	0.27	0.27	0.28	0.26	0.27	99.43
75	RUTHERFORD	0.49	0.52	0.57	0.60	0.58	0.59	0.60	0.60	0.58	0.58	0.60	0.56	0.57	208.93
77	SEQUATCHIE	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	11.50
80	SMITH	0.13	0.14	0.16	0.17	0.16	0.16	0.17	0.17	0.16	0.16	0.16	0.15	0.16	57.44
81	STEWART	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.13
83	SUMNER	0.19	0.20	0.22	0.23	0.22	0.23	0.23	0.23	0.22	0.22	0.23	0.21	0.22	80.01

Table D-d-2. Continued.

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
85	TROUSDALE	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	5.45
88	VAN BUREN	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	5.67
89	WARREN	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	22.22
91	WAYNE	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	11.77
93	WHITE	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	16.77
94	WILLIAMSON	0.33	0.34	0.38	0.40	0.38	0.40	0.40	0.40	0.39	0.39	0.40	0.37	0.38	138.86
95	WILSON	0.31	0.33	0.36	0.37	0.36	0.37	0.37	0.37	0.36	0.36	0.37	0.35	0.36	130.02
	TOTAL	5.69	5.97	6.58	6.83	6.61	6.81	6.90	6.85	6.63	6.64	6.83	6.39	6.56	2395.43

Table D-d-3. 2002 PM10 Emissions (tons/day) – West Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
3	BENTON	0.09	0.09	0.10	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.10	0.11	38.42
9	CARROLL	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	23.39
12	CHESTER	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	13.74
17	CROCKETT	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	15.16
20	DECATUR	0.06	0.06	0.07	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.07	25.32
23	DYER	0.10	0.10	0.12	0.13	0.12	0.12	0.13	0.12	0.12	0.12	0.13	0.11	0.12	43.43
24	FAYETTE	0.16	0.16	0.19	0.20	0.20	0.20	0.21	0.20	0.19	0.19	0.20	0.18	0.19	69.74
27	GIBSON	0.07	0.07	0.08	0.09	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	29.86
35	HARDEMAN	0.04	0.04	0.05	0.06	0.05	0.05	0.06	0.05	0.05	0.06	0.06	0.05	0.05	19.03
36	HARDIN	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	21.42
38	HAYWOOD	0.19	0.21	0.24	0.25	0.24	0.24	0.26	0.25	0.23	0.23	0.25	0.23	0.23	85.76
39	HENDERSON	0.21	0.22	0.25	0.27	0.26	0.27	0.28	0.27	0.25	0.25	0.27	0.25	0.26	93.14
40	HENRY	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	25.32
48	LAKE	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	2.88
49	LAUDERDALE	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18.32
55	MC NAIRY	0.06	0.06	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.08	28.09
57	MADISON	0.33	0.34	0.38	0.39	0.38	0.39	0.40	0.39	0.38	0.38	0.39	0.37	0.38	137.80
66	OBION	0.07	0.07	0.08	0.09	0.08	0.09	0.09	0.09	0.08	0.09	0.09	0.08	0.08	29.67
79	SHELBY	1.54	1.62	1.74	1.70	1.64	1.73	1.69	1.74	1.71	1.70	1.73	1.66	1.68	614.72
84	TIPTON	0.06	0.06	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	27.09
92	WEAKLY	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18.64
	TOTAL	3.29	3.45	3.78	3.93	3.80	3.93	3.95	3.94	3.84	3.85	3.94	3.68	3.78	1380.94

Table D-e-1. 2002 PM2.5 Emissions (tons/day) – East Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
1	ANDERSON	0.13	0.14	0.15	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.15	0.15	55.29
4	BLEDSOE	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.63
5	BLOUNT	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	40.24
6	BRADLEY	0.18	0.19	0.21	0.22	0.21	0.22	0.23	0.22	0.21	0.21	0.22	0.20	0.21	76.92
7	CAMPBELL	0.21	0.22	0.25	0.27	0.26	0.26	0.28	0.26	0.25	0.25	0.26	0.24	0.25	92.08
10	CARTER	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	17.39
13	CLAIBORNE	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	17.14
15	COCKE	0.11	0.12	0.14	0.14	0.14	0.14	0.15	0.14	0.13	0.13	0.14	0.13	0.13	49.21
18	CUMBERLAND	0.22	0.23	0.26	0.28	0.27	0.27	0.28	0.26	0.25	0.25	0.26	0.25	0.26	93.77
29	GRAINGER	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	12.85
30	GREENE	0.20	0.21	0.24	0.25	0.25	0.25	0.26	0.25	0.24	0.24	0.25	0.23	0.24	87.19
32	HAMBLEN	0.10	0.10	0.11	0.12	0.11	0.12	0.12	0.12	0.11	0.11	0.12	0.11	0.11	40.65
33	HAMILTON	0.53	0.55	0.59	0.58	0.56	0.59	0.57	0.59	0.58	0.58	0.59	0.57	0.57	209.39
34	HANCOCK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.58
37	HAWKINS	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18.78
45	JEFFERSON	0.21	0.22	0.25	0.27	0.26	0.26	0.27	0.26	0.25	0.25	0.26	0.24	0.25	90.87
46	JOHNSON	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	7.34
47	KNOX	0.75	0.79	0.86	0.85	0.82	0.86	0.85	0.86	0.84	0.83	0.86	0.82	0.83	303.65
53	LOUDON	0.18	0.19	0.22	0.23	0.22	0.22	0.24	0.23	0.21	0.21	0.23	0.21	0.22	78.60
54	MC MINN	0.21	0.22	0.25	0.26	0.25	0.26	0.27	0.26	0.25	0.25	0.26	0.24	0.25	90.62
58	MARION	0.19	0.20	0.23	0.25	0.24	0.24	0.26	0.25	0.23	0.23	0.25	0.23	0.23	85.32
61	MEIGS	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	5.56
62	MONROE	0.08	0.08	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	34.28
65	MORGAN	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	6.88
70	POLK	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.16
72	RHEA	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	14.16
73	ROANE	0.15	0.16	0.18	0.19	0.18	0.19	0.20	0.19	0.18	0.18	0.19	0.17	0.18	65.44
76	SCOTT	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	9.62
78	SEVIER	0.12	0.12	0.14	0.15	0.14	0.15	0.15	0.15	0.14	0.15	0.15	0.14	0.14	51.61
82	SULLIVAN	0.24	0.25	0.27	0.27	0.26	0.27	0.27	0.27	0.27	0.27	0.27	0.26	0.27	96.77
86	UNICOI	0.03	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	12.31
87	UNION	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	6.28
90	WASHINGTON	0.12	0.13	0.14	0.14	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.13	49.25
	TOTAL	4.34	4.56	5.06	5.27	5.08	5.22	5.32	5.24	5.05	5.06	5.24	4.91	5.03	1835.79

Table D-e-2. 2002 PM2.5 Emissions (tons/day) – Middle Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
2	BEDFORD	0.05	0.05	0.05	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	19.52
8	CANNON	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.63
11	CHEATHAM	0.08	0.09	0.10	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.11	0.10	0.10	37.15
14	CLAY	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	3.14
16	COFFEE	0.19	0.20	0.23	0.24	0.23	0.23	0.24	0.24	0.22	0.22	0.23	0.22	0.22	82.05
19	DAVIDSON	1.19	1.25	1.34	1.30	1.24	1.31	1.27	1.32	1.29	1.28	1.32	1.28	1.28	468.17
21	DE KALB	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	7.90
22	DICKSON	0.14	0.15	0.17	0.18	0.17	0.17	0.18	0.17	0.16	0.17	0.17	0.16	0.17	60.39
25	FENTRESS	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	8.44
26	FRANKLIN	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	15.33
28	GILES	0.11	0.12	0.13	0.14	0.14	0.14	0.15	0.14	0.13	0.14	0.14	0.13	0.13	49.19
31	GRUNDY	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	20.86
41	HICKMAN	0.11	0.12	0.13	0.14	0.14	0.14	0.15	0.14	0.13	0.13	0.14	0.13	0.13	48.39
42	HOUSTON	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	2.35
43	HUMPHREYS	0.11	0.12	0.13	0.14	0.14	0.14	0.15	0.14	0.13	0.13	0.14	0.13	0.13	49.18
44	JACKSON	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.51
50	LAWRENCE	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18.87
51	LEWIS	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.24
52	LINCOLN	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18.67
56	MACON	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	6.62
59	MARSHALL	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	31.53
60	MAURY	0.16	0.16	0.18	0.19	0.19	0.19	0.20	0.19	0.18	0.19	0.19	0.18	0.18	66.87
63	MONTGOMERY	0.20	0.21	0.23	0.23	0.22	0.23	0.23	0.24	0.23	0.23	0.24	0.22	0.23	82.96
64	MOORE	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	3.43
67	OVERTON	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.43
68	PERRY	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	5.64
69	PICKETT	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	2.51
71	PUTNAM	0.23	0.24	0.27	0.29	0.28	0.28	0.29	0.28	0.27	0.27	0.28	0.26	0.27	98.78
74	ROBERTSON	0.18	0.19	0.22	0.23	0.22	0.22	0.24	0.23	0.21	0.21	0.23	0.21	0.22	78.59
75	RUTHERFORD	0.38	0.40	0.44	0.46	0.44	0.45	0.46	0.46	0.44	0.44	0.46	0.43	0.44	159.99
77	SEQUATCHIE	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	8.77
80	SMITH	0.11	0.11	0.13	0.14	0.13	0.13	0.14	0.13	0.13	0.13	0.13	0.12	0.13	46.76
81	STEWART	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	7.51
83	SUMNER	0.14	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	57.44

Table D-e-2. Continued.

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
85	TROUSDALE	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	3.99
88	VAN BUREN	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.28
89	WARREN	0.04	0.04	0.04	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	15.97
91	WAYNE	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	8.73
93	WHITE	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	12.32
94	WILLIAMSON	0.25	0.26	0.29	0.30	0.29	0.30	0.30	0.30	0.29	0.29	0.30	0.28	0.29	105.15
95	WILSON	0.24	0.26	0.28	0.29	0.28	0.29	0.29	0.29	0.28	0.28	0.29	0.27	0.28	102.15
	TOTAL	4.38	4.60	5.08	5.27	5.07	5.23	5.31	5.26	5.09	5.09	5.27	4.93	5.05	1843.43

Table D-e-3. 2002 PM2.5 Emissions (tons/day) – West Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
3	BENTON	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	31.33
9	CARROLL	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	17.42
12	CHESTER	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.51
17	CROCKETT	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	11.54
20	DECATUR	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	20.45
23	DYER	0.08	0.08	0.09	0.10	0.09	0.10	0.10	0.10	0.09	0.09	0.10	0.09	0.09	33.41
24	FAYETTE	0.13	0.13	0.15	0.16	0.16	0.16	0.17	0.16	0.15	0.15	0.16	0.15	0.15	56.02
27	GIBSON	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	21.35
35	HARDEMAN	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	13.95
36	HARDIN	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	16.17
38	HAYWOOD	0.16	0.17	0.20	0.21	0.20	0.20	0.22	0.20	0.19	0.19	0.20	0.19	0.19	71.11
39	HENDERSON	0.17	0.18	0.21	0.22	0.21	0.22	0.23	0.22	0.21	0.21	0.22	0.20	0.21	76.41
40	HENRY	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18.82
48	LAKE	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	2.12
49	LAUDERDALE	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	13.59
55	MC NAIRY	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	21.58
57	MADISON	0.26	0.27	0.30	0.31	0.30	0.31	0.31	0.31	0.30	0.30	0.31	0.29	0.30	108.17
66	OBION	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	22.04
79	SHELBY	1.13	1.19	1.28	1.25	1.20	1.26	1.23	1.27	1.25	1.24	1.27	1.22	1.23	449.68
84	TIPTON	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	19.67
92	WEAKLY	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	13.14
	TOTAL	2.50	2.62	2.88	2.99	2.88	2.98	3.00	2.99	2.91	2.91	3.00	2.80	2.87	1048.48

Table D-f-1. 2002 NH_3 Emissions (tons/day) – East Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
1	ANDERSON	0.19	0.20	0.22	0.23	0.23	0.24	0.24	0.24	0.23	0.23	0.23	0.21	0.22	81.47
4	BLEDSOE	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.26
5	BLOUNT	0.25	0.26	0.28	0.29	0.29	0.30	0.30	0.30	0.30	0.30	0.29	0.27	0.29	104.20
6	BRADLEY	0.22	0.23	0.25	0.27	0.27	0.28	0.28	0.28	0.27	0.27	0.27	0.25	0.26	95.16
7	CAMPBELL	0.13	0.13	0.15	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.16	0.15	0.16	57.01
10	CARTER	0.10	0.10	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.12	42.11
13	CLAIBORNE	0.06	0.06	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.08	27.95
15	COCKE	0.10	0.10	0.11	0.12	0.12	0.12	0.13	0.12	0.12	0.12	0.12	0.11	0.12	42.36
18	CUMBERLAND	0.17	0.17	0.19	0.21	0.21	0.21	0.22	0.21	0.21	0.21	0.21	0.19	0.20	73.43
29	GRAINGER	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	22.74
30	GREENE	0.20	0.20	0.23	0.25	0.25	0.25	0.26	0.25	0.25	0.25	0.24	0.22	0.24	86.41
32	HAMBLEN	0.15	0.15	0.17	0.17	0.17	0.18	0.18	0.18	0.18	0.18	0.17	0.16	0.17	61.81
33	HAMILTON	0.88	0.92	0.99	0.97	0.95	1.01	0.98	1.01	1.00	0.99	0.98	0.94	0.97	353.61
34	HANCOCK	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.28
37	HAWKINS	0.10	0.10	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.12	42.45
45	JEFFERSON	0.16	0.17	0.19	0.21	0.21	0.21	0.22	0.21	0.21	0.21	0.21	0.19	0.20	73.11
46	JOHNSON	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	14.31
47	KNOX	1.23	1.29	1.39	1.39	1.38	1.44	1.42	1.45	1.42	1.41	1.41	1.34	1.38	503.93
53	LOUDON	0.15	0.16	0.18	0.20	0.20	0.20	0.21	0.20	0.19	0.20	0.20	0.18	0.19	69.04
54	MC MINN	0.16	0.17	0.19	0.20	0.20	0.21	0.21	0.21	0.20	0.20	0.20	0.19	0.20	71.54
58	MARION	0.13	0.14	0.15	0.17	0.17	0.17	0.18	0.17	0.16	0.17	0.17	0.15	0.16	58.48
61	MEIGS	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.05
62	MONROE	0.10	0.11	0.12	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.12	0.13	46.98
65	MORGAN	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	15.44
70	POLK	0.04	0.04	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.06	0.05	0.05	0.05	18.73
72	RHEA	0.06	0.06	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.08	27.55
73	ROANE	0.15	0.16	0.17	0.18	0.18	0.19	0.19	0.19	0.18	0.18	0.18	0.17	0.18	64.89
76	SCOTT	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	17.90
78	SEVIER	0.24	0.25	0.27	0.30	0.30	0.31	0.31	0.31	0.30	0.31	0.30	0.27	0.29	105.28
82	SULLIVAN	0.40	0.42	0.45	0.45	0.45	0.47	0.46	0.47	0.46	0.46	0.46	0.43	0.45	163.76
86	UNICOI	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18.25
87	UNION	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	13.48
90	WASHINGTON	0.24	0.25	0.27	0.27	0.27	0.28	0.28	0.28	0.28	0.28	0.27	0.26	0.27	98.20
	TOTAL	5.88	6.14	6.70	6.99	6.96	7.20	7.20	7.23	7.08	7.09	7.02	6.55	6.84	2496.16

Table D-f-2. 2002 NH_3 Emissions (tons/day) – Middle Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
2	BEDFORD	0.08	0.09	0.09	0.10	0.10	0.11	0.10	0.11	0.10	0.11	0.10	0.09	0.10	36.24
8	CANNON	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	11.58
11	CHEATHAM	0.09	0.09	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	41.20
14	CLAY	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	6.45
16	COFFEE	0.17	0.18	0.20	0.21	0.21	0.21	0.22	0.22	0.21	0.21	0.21	0.19	0.20	73.98
19	DAVIDSON	1.84	1.94	2.07	2.01	1.98	2.10	2.04	2.10	2.07	2.05	2.04	1.97	2.02	736.36
21	DE KALB	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	16.72
22	DICKSON	0.13	0.13	0.14	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.14	0.15	55.05
25	FENTRESS	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	17.25
26	FRANKLIN	0.08	0.08	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	34.60
28	GILES	0.09	0.09	0.10	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.10	0.11	38.68
31	GRUNDY	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	15.62
41	HICKMAN	0.07	0.07	0.08	0.09	0.09	0.09	0.10	0.09	0.09	0.09	0.09	0.08	0.09	32.10
42	HOUSTON	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	5.63
43	HUMPHREYS	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	30.16
44	JACKSON	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	9.77
50	LAWRENCE	0.08	0.09	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10	37.38
51	LEWIS	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	7.55
52	LINCOLN	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	31.65
56	MACON	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.05	0.04	0.04	0.04	15.31
59	MARSHALL	0.07	0.08	0.08	0.09	0.09	0.09	0.10	0.09	0.09	0.09	0.09	0.08	0.09	32.27
60	MAURY	0.21	0.21	0.23	0.25	0.25	0.26	0.26	0.26	0.25	0.25	0.25	0.23	0.24	88.54
63	MONTGOMERY	0.29	0.30	0.33	0.33	0.33	0.34	0.34	0.34	0.34	0.34	0.33	0.32	0.33	119.67
64	MOORE	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	6.41
67	OVERTON	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	20.96
68	PERRY	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	8.35
69	PICKETT	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.64
71	PUTNAM	0.21	0.22	0.24	0.25	0.25	0.26	0.26	0.26	0.25	0.25	0.25	0.23	0.24	89.41
74	ROBERTSON	0.18	0.19	0.22	0.23	0.23	0.24	0.25	0.24	0.23	0.23	0.23	0.21	0.22	81.59
75	RUTHERFORD	0.54	0.56	0.61	0.64	0.63	0.65	0.66	0.66	0.64	0.64	0.64	0.60	0.62	227.14
77	SEQUATCHIE	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	12.47
80	SMITH	0.08	0.08	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	34.16
81	STEWART	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	13.03
83	SUMNER	0.30	0.31	0.34	0.35	0.34	0.36	0.35	0.36	0.35	0.35	0.35	0.33	0.34	124.39

Table D-f-2. Continued.

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
85	TROUSDALE	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	7.46
88	VAN BUREN	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	6.55
89	WARREN	0.08	0.08	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	33.43
91	WAYNE	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	15.07
93	WHITE	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	22.64
94	WILLIAMSON	0.38	0.40	0.43	0.45	0.45	0.47	0.47	0.47	0.46	0.46	0.46	0.42	0.44	161.72
95	WILSON	0.27	0.28	0.31	0.32	0.32	0.33	0.33	0.33	0.33	0.33	0.33	0.30	0.32	115.44
	TOTAL	5.85	6.12	6.66	6.94	6.90	7.14	7.12	7.17	7.03	7.04	6.97	6.51	6.79	2478.63

Table D-f-3. 2002 NH_3 Emissions (tons/day) – West Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
3	BENTON	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	22.38
9	CARROLL	0.07	0.07	0.07	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	29.37
12	CHESTER	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	14.62
17	CROCKETT	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	16.68
20	DECATUR	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	16.67
23	DYER	0.10	0.11	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12	44.33
24	FAYETTE	0.11	0.11	0.13	0.14	0.14	0.14	0.15	0.14	0.14	0.14	0.14	0.13	0.14	49.35
27	GIBSON	0.10	0.11	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.13	45.94
35	HARDEMAN	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	25.96
36	HARDIN	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.07	24.85
38	HAYWOOD	0.09	0.09	0.10	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.10	0.11	38.91
39	HENDERSON	0.11	0.12	0.13	0.14	0.14	0.15	0.15	0.15	0.14	0.14	0.14	0.13	0.14	50.08
40	HENRY	0.07	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	32.14
48	LAKE	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	3.84
49	LAUDERDALE	0.05	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	23.58
55	MC NAIRY	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.09	0.08	0.09	0.08	0.07	0.08	29.00
57	MADISON	0.28	0.30	0.32	0.34	0.33	0.35	0.35	0.35	0.34	0.34	0.34	0.32	0.33	120.33
66	OBION	0.09	0.09	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10	37.75
79	SHELBY	2.14	2.25	2.42	2.36	2.33	2.46	2.40	2.48	2.43	2.42	2.40	2.31	2.37	864.39
84	TIPTON	0.09	0.09	0.10	0.11	0.11	0.12	0.12	0.12	0.11	0.12	0.11	0.10	0.11	39.47
92	WEAKLY	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	30.46
	TOTAL	3.72	3.89	4.21	4.35	4.32	4.49	4.44	4.50	4.43	4.43	4.38	4.11	4.27	1560.09

Table D-g-1. 2002 SO_2 Emissions (tons/day) – East Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
1	ANDERSON	0.25	0.26	0.29	0.30	0.30	0.31	0.31	0.31	0.30	0.30	0.30	0.28	0.29	105.92
4	BLEDSOE	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.99
5	BLOUNT	0.25	0.26	0.28	0.29	0.29	0.30	0.30	0.30	0.30	0.30	0.29	0.28	0.29	104.52
6	BRADLEY	0.31	0.33	0.37	0.39	0.38	0.39	0.40	0.40	0.38	0.38	0.38	0.36	0.37	136.06
7	CAMPBELL	0.29	0.30	0.35	0.37	0.37	0.37	0.39	0.38	0.36	0.36	0.36	0.34	0.35	128.64
10	CARTER	0.10	0.11	0.12	0.12	0.12	0.12	0.12	0.13	0.12	0.12	0.12	0.11	0.12	43.40
13	CLAIBORNE	0.08	0.08	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	34.57
15	COCKE	0.17	0.18	0.20	0.22	0.22	0.22	0.23	0.22	0.21	0.21	0.21	0.20	0.21	75.69
18	CUMBERLAND	0.32	0.34	0.38	0.40	0.40	0.41	0.42	0.40	0.38	0.39	0.39	0.37	0.38	140.46
29	GRAINGER	0.06	0.06	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	26.95
30	GREENE	0.32	0.33	0.38	0.40	0.40	0.41	0.43	0.41	0.39	0.40	0.40	0.37	0.39	141.23
32	HAMBLEN	0.18	0.19	0.21	0.22	0.22	0.23	0.23	0.23	0.22	0.22	0.22	0.21	0.22	78.87
33	HAMILTON	1.06	1.12	1.20	1.17	1.16	1.22	1.19	1.23	1.20	1.20	1.19	1.15	1.17	428.37
34	HANCOCK	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.21
37	HAWKINS	0.10	0.11	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12	45.10
45	JEFFERSON	0.31	0.32	0.37	0.39	0.39	0.40	0.42	0.40	0.38	0.38	0.39	0.36	0.38	137.16
46	JOHNSON	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	16.24
47	KNOX	1.50	1.58	1.70	1.70	1.68	1.76	1.74	1.77	1.73	1.72	1.72	1.64	1.69	615.85
53	LOUDON	0.27	0.29	0.33	0.35	0.35	0.35	0.37	0.36	0.34	0.34	0.35	0.32	0.33	122.33
54	MC MINN	0.31	0.32	0.36	0.39	0.39	0.39	0.41	0.40	0.38	0.38	0.38	0.35	0.37	135.59
58	MARION	0.27	0.29	0.33	0.35	0.35	0.36	0.38	0.36	0.34	0.34	0.35	0.32	0.34	122.92
61	MEIGS	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	11.82
62	MONROE	0.14	0.15	0.16	0.18	0.18	0.18	0.19	0.19	0.18	0.18	0.18	0.16	0.17	63.49
65	MORGAN	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	16.44
70	POLK	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	21.78
72	RHEA	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	31.21
73	ROANE	0.24	0.25	0.29	0.30	0.30	0.31	0.32	0.31	0.30	0.30	0.30	0.28	0.29	106.22
76	SCOTT	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	20.78
78	SEVIER	0.27	0.28	0.30	0.33	0.33	0.34	0.34	0.34	0.33	0.34	0.33	0.30	0.32	116.94
82	SULLIVAN	0.48	0.51	0.55	0.55	0.54	0.57	0.56	0.57	0.56	0.55	0.55	0.53	0.54	197.76
86	UNICOI	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	23.74
87	UNION	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	14.67
90	WASHINGTON	0.27	0.28	0.30	0.30	0.30	0.32	0.31	0.32	0.31	0.31	0.31	0.29	0.30	110.13
	TOTAL	7.93	8.32	9.15	9.54	9.48	9.78	9.88	9.81	9.53	9.54	9.53	8.91	9.28	3390.07

Table D-g-2. 2002 SO_2 Emissions (tons/day) – Middle Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
2	BEDFORD	0.10	0.10	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	41.93
8	CANNON	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	11.79
11	CHEATHAM	0.14	0.15	0.17	0.18	0.18	0.18	0.19	0.18	0.18	0.18	0.18	0.16	0.17	62.98
14	CLAY	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	7.14
16	COFFEE	0.29	0.31	0.35	0.37	0.36	0.37	0.39	0.37	0.36	0.36	0.36	0.34	0.35	128.70
19	DAVIDSON	2.31	2.43	2.60	2.52	2.48	2.62	2.55	2.63	2.59	2.57	2.56	2.48	2.53	922.78
21	DE KALB	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18.32
22	DICKSON	0.21	0.23	0.25	0.27	0.27	0.28	0.29	0.28	0.26	0.27	0.27	0.25	0.26	95.00
25	FENTRESS	0.04	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	19.11
26	FRANKLIN	0.08	0.09	0.09	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.10	0.09	0.10	36.69
28	GILES	0.16	0.17	0.19	0.21	0.21	0.21	0.22	0.21	0.21	0.21	0.21	0.19	0.20	73.46
31	GRUNDY	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	30.86
41	HICKMAN	0.15	0.16	0.18	0.20	0.20	0.20	0.21	0.20	0.19	0.19	0.19	0.18	0.19	68.86
42	HOUSTON	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	5.83
43	HUMPHREYS	0.15	0.16	0.18	0.20	0.20	0.20	0.21	0.20	0.19	0.19	0.19	0.18	0.19	68.50
44	JACKSON	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.57
50	LAWRENCE	0.10	0.10	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.12	42.07
51	LEWIS	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	8.95
52	LINCOLN	0.09	0.09	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.11	38.37
56	MACON	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	16.09
59	MARSHALL	0.12	0.12	0.14	0.15	0.15	0.15	0.15	0.15	0.14	0.15	0.15	0.13	0.14	51.65
60	MAURY	0.28	0.29	0.32	0.35	0.34	0.35	0.36	0.35	0.34	0.35	0.34	0.32	0.33	121.89
63	MONTGOMERY	0.38	0.40	0.43	0.44	0.43	0.45	0.45	0.45	0.44	0.44	0.44	0.42	0.43	157.01
64	MOORE	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	7.41
67	OVERTON	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	23.47
68	PERRY	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	10.86
69	PICKETT	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	5.39
71	PUTNAM	0.35	0.37	0.42	0.44	0.44	0.45	0.47	0.45	0.43	0.43	0.44	0.41	0.42	155.09
74	ROBERTSON	0.29	0.31	0.35	0.37	0.37	0.38	0.40	0.38	0.36	0.36	0.37	0.34	0.36	129.78
75	RUTHERFORD	0.71	0.74	0.82	0.85	0.84	0.87	0.88	0.87	0.85	0.85	0.85	0.79	0.82	301.17
77	SEQUATCHIE	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	16.60
80	SMITH	0.15	0.16	0.18	0.20	0.20	0.20	0.21	0.20	0.19	0.19	0.19	0.18	0.19	68.48
81	STEWART	0.03	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	15.64
83	SUMNER	0.32	0.34	0.36	0.37	0.37	0.38	0.38	0.39	0.38	0.38	0.38	0.35	0.37	134.02

Table D-g-2. Continued.

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
85	TROUSDALE	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	8.63
88	VAN BUREN	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	8.37
89	WARREN	0.08	0.09	0.09	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	36.70
91	WAYNE	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18.09
93	WHITE	0.06	0.06	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	26.38
94	WILLIAMSON	0.48	0.50	0.55	0.58	0.57	0.59	0.60	0.59	0.58	0.58	0.58	0.54	0.56	205.04
95	WILSON	0.41	0.43	0.47	0.49	0.48	0.50	0.50	0.50	0.49	0.49	0.49	0.46	0.48	173.97
	TOTAL	7.95	8.33	9.14	9.50	9.44	9.74	9.82	9.79	9.53	9.54	9.52	8.90	9.27	3383.64

Table D-g-3. 2002 SO_2 Emissions (tons/day) – West Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
3	BENTON	0.10	0.11	0.12	0.13	0.13	0.13	0.14	0.13	0.13	0.13	0.13	0.12	0.12	45.58
9	CARROLL	0.08	0.08	0.09	0.10	0.10	0.10	0.11	0.10	0.10	0.10	0.10	0.09	0.10	35.69
12	CHESTER	0.04	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	19.72
17	CROCKETT	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	21.88
20	DECATUR	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	31.07
23	DYER	0.14	0.14	0.16	0.17	0.17	0.18	0.18	0.18	0.17	0.17	0.17	0.16	0.17	60.90
24	FAYETTE	0.19	0.20	0.23	0.25	0.25	0.25	0.27	0.26	0.25	0.25	0.25	0.23	0.24	87.23
27	GIBSON	0.11	0.12	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.13	0.14	49.73
35	HARDEMAN	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	30.06
36	HARDIN	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	31.66
38	HAYWOOD	0.22	0.23	0.26	0.28	0.28	0.28	0.29	0.28	0.26	0.27	0.27	0.25	0.26	96.15
39	HENDERSON	0.24	0.26	0.29	0.31	0.31	0.31	0.33	0.32	0.30	0.30	0.31	0.28	0.30	108.44
40	HENRY	0.09	0.09	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.11	38.79
48	LAKE	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.52
49	LAUDERDALE	0.06	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.08	28.31
55	MC NAIRY	0.09	0.09	0.10	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.10	0.11	39.81
57	MADISON	0.43	0.45	0.50	0.51	0.51	0.53	0.54	0.53	0.51	0.51	0.51	0.48	0.50	183.07
66	OBION	0.10	0.11	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12	45.47
79	SHELBY	2.44	2.56	2.75	2.69	2.65	2.80	2.73	2.81	2.76	2.74	2.73	2.63	2.69	982.45
84	TIPTON	0.10	0.10	0.11	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.11	0.12	44.15
92	WEAKLY	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	31.97
	TOTAL	4.77	5.00	5.45	5.64	5.60	5.80	5.80	5.83	5.70	5.70	5.67	5.31	5.52	2016.66

Table D-h-1. 2002 CO_2 Emissions (tons/day) – East Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
1	ANDERSON	1136	1192	1315	1372	1366	1406	1427	1413	1370	1373	1372	1280	1335	487566
4	BLEDSOE	118	121	133	156	157	158	160	158	158	160	156	138	148	53987
5	BLOUNT	1259	1314	1418	1472	1461	1519	1498	1523	1504	1504	1486	1390	1446	527842
6	BRADLEY	1400	1467	1624	1714	1707	1751	1785	1760	1705	1710	1710	1587	1660	606224
7	CAMPBELL	1144	1206	1370	1465	1465	1484	1561	1494	1418	1427	1444	1332	1401	511624
10	CARTER	515	537	580	606	601	624	616	626	619	619	611	570	594	216830
13	CLAIBORNE	354	363	399	468	469	473	477	473	472	478	466	413	442	161453
15	COCKE	712	747	840	904	904	918	954	923	885	891	895	823	866	316486
18	CUMBERLAND	1322	1390	1567	1667	1665	1694	1739	1677	1600	1609	1623	1525	1590	580631
29	GRAINGER	280	287	315	369	370	374	377	374	373	378	368	326	349	127553
30	GREENE	1369	1434	1605	1727	1725	1755	1814	1764	1699	1709	1713	1576	1657	605390
32	HAMBLEN	857	898	985	1022	1015	1049	1056	1054	1026	1027	1024	959	998	364325
33	HAMILTON	5012	5270	5651	5527	5450	5755	5614	5779	5679	5639	5618	5402	5533	2019922
34	HANCOCK	47	48	53	62	62	63	63	63	62	63	62	55	58	21334
37	HAWKINS	506	523	570	633	632	646	645	646	642	647	634	575	608	222101
45	JEFFERSON	1268	1333	1511	1629	1630	1650	1731	1661	1581	1593	1606	1476	1556	568271
46	JOHNSON	171	176	193	226	227	229	231	229	228	231	225	200	214	78133
47	KNOX	7051	7409	8007	7989	7902	8280	8172	8316	8142	8106	8080	7698	7929	2894998
53	LOUDON	1152	1212	1371	1473	1473	1494	1563	1503	1433	1442	1454	1338	1409	514632
54	MC MINN	1262	1325	1489	1595	1593	1620	1683	1629	1561	1571	1579	1456	1530	558959
58	MARION	1101	1158	1320	1427	1429	1443	1523	1453	1378	1389	1404	1289	1359	496567
61	MEIGS	123	126	139	163	163	165	166	165	164	166	162	144	154	56172
62	MONROE	642	668	742	827	827	838	859	841	821	828	821	744	788	287862
65	MORGAN	177	182	200	234	235	237	239	237	236	239	233	207	221	80865
70	POLK	228	233	256	301	302	304	307	304	303	307	299	265	284	103815
72	RHEA	340	351	383	429	428	437	437	437	435	438	429	388	411	150154
73	ROANE	1038	1091	1222	1294	1291	1318	1362	1326	1272	1277	1284	1190	1247	455535
76	SCOTT	218	223	245	287	288	291	293	291	290	294	286	254	272	99228
78	SEVIER	1298	1347	1476	1616	1613	1650	1660	1653	1629	1640	1616	1476	1556	568311
82	SULLIVAN	2271	2384	2572	2576	2547	2669	2628	2679	2629	2619	2606	2479	2555	932798
86	UNICOI	243	250	274	314	314	318	320	319	317	320	313	280	299	109043
87	UNION	158	161	177	208	209	210	212	210	210	213	207	183	197	71818
90	WASHINGTON	1289	1352	1459	1472	1457	1523	1502	1529	1502	1497	1488	1411	1457	531878
	TOTAL	36063	37781	41460	43223	42975	44346	44675	44509	43342	43407	43273	40425	42123	15382309

Table D-h-2. 2002 CO_2 Emissions (tons/day) – Middle Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
2	BEDFORD	460	477	519	568	567	581	580	582	576	580	570	520	548	200207
8	CANNON	129	133	146	171	171	173	174	173	172	175	170	151	161	58958
11	CHEATHAM	608	636	718	792	794	801	836	805	774	781	782	711	753	275198
14	CLAY	76	78	86	100	101	102	102	102	101	103	100	89	95	34656
16	COFFEE	1244	1309	1464	1540	1536	1570	1622	1579	1513	1519	1529	1421	1487	543141
19	DAVIDSON	10796	11364	12157	11765	11587	12277	11931	12330	12118	12016	11981	11577	11825	4316620
21	DE KALB	196	201	220	259	259	262	264	262	261	264	258	228	245	89318
22	DICKSON	910	955	1068	1144	1142	1163	1202	1169	1125	1131	1135	1046	1099	401480
25	FENTRESS	203	208	229	268	269	272	274	272	271	274	267	237	254	92673
26	FRANKLIN	409	422	460	517	517	526	527	527	524	528	517	467	495	180788
28	GILES	675	706	793	868	869	880	913	884	852	859	859	784	828	302581
31	GRUNDY	279	293	331	363	364	367	385	369	354	357	358	327	346	126250
41	HICKMAN	611	641	727	794	795	803	843	808	771	777	782	715	756	276015
42	HOUSTON	64	65	72	84	84	85	86	85	85	86	84	74	79	28978
43	HUMPHREYS	602	632	717	782	783	791	830	796	759	766	771	704	744	271900
44	JACKSON	113	116	128	150	150	151	153	151	151	153	149	132	142	51696
50	LAWRENCE	460	475	518	580	579	591	591	591	588	593	580	525	556	203046
51	LEWIS	93	95	105	123	123	124	125	124	124	126	122	108	116	42429
52	LINCOLN	408	421	459	516	516	525	526	526	523	528	516	466	494	180474
56	MACON	174	179	196	230	231	233	235	233	232	235	229	203	218	79523
59	MARSHALL	505	528	589	634	633	645	664	648	626	630	630	579	609	222591
60	MAURY	1268	1325	1459	1555	1549	1589	1610	1595	1555	1562	1553	1436	1505	549531
63	MONTGOMERY	1735	1821	1973	1993	1973	2060	2040	2068	2025	2019	2012	1906	1969	718782
64	MOORE	78	80	87	103	103	104	105	104	103	105	102	90	97	35397
67	OVERTON	249	255	280	329	330	332	335	332	332	336	327	290	311	113471
68	PERRY	109	112	123	144	145	146	147	146	146	148	144	127	137	49867
69	PICKETT	56	58	63	74	75	75	76	75	75	76	74	66	70	25707
71	PUTNAM	1505	1585	1776	1862	1857	1898	1965	1910	1826	1833	1848	1720	1799	656865
74	ROBERTSON	1261	1326	1500	1609	1609	1632	1707	1642	1566	1576	1589	1465	1540	562628
75	RUTHERFORD	3254	3412	3745	3883	3860	3987	4019	4005	3895	3898	3891	3642	3791	1384295
77	SEQUATCHIE	166	170	187	220	220	222	224	222	221	224	219	194	207	75780
80	SMITH	619	652	742	804	805	813	857	818	777	783	791	725	765	279574
81	STEWART	162	166	182	214	214	216	218	216	216	218	213	189	202	73792
83	SUMNER	1584	1659	1798	1841	1825	1900	1884	1907	1871	1869	1856	1747	1812	661498

Table D-h-2. Continued.

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
85	TROUSDALE	90	93	102	119	120	121	122	121	120	122	119	105	113	41200
88	VAN BUREN	85	87	96	112	112	113	114	113	113	115	112	99	106	38690
89	WARREN	407	421	458	509	508	519	519	520	516	520	510	463	489	178712
91	WAYNE	187	192	211	247	248	250	252	250	249	253	246	218	234	85302
93	WHITE	276	283	310	364	365	368	372	368	367	372	362	321	344	125683
94	WILLIAMSON	2236	2338	2559	2682	2667	2752	2765	2763	2700	2706	2690	2505	2614	954442
95	WILSON	1802	1887	2067	2153	2140	2210	2223	2219	2164	2167	2159	2017	2101	767148
	TOTAL	36147	37854	41420	43067	42792	44231	44417	44412	43339	43383	43205	40389	42055	15356886

Table D-h-3. 2002 CO_2 Emissions (tons/day) – West Tennessee

Code	County	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
3	BENTON	409	427	481	533	534	539	561	541	521	526	526	478	506	184958
9	CARROLL	372	383	421	483	483	490	494	490	487	492	481	431	459	167643
12	CHESTER	197	202	221	260	260	263	265	263	262	266	259	229	246	89685
17	CROCKETT	220	225	247	290	291	293	296	293	292	296	289	256	274	100061
20	DECATUR	285	296	333	372	372	376	390	377	365	369	367	332	353	128913
23	DYER	629	654	718	780	778	796	803	798	784	789	780	715	752	274622
24	FAYETTE	813	848	955	1061	1062	1073	1115	1077	1040	1050	1048	950	1008	368085
27	GIBSON	550	568	619	695	694	708	708	708	704	710	695	628	666	243160
35	HARDEMAN	322	331	362	412	412	419	420	419	417	421	412	370	393	143537
36	HARDIN	328	338	369	420	420	427	429	427	425	430	420	377	401	146454
38	HAYWOOD	841	887	1009	1073	1072	1087	1145	1095	1036	1043	1057	977	1027	375034
39	HENDERSON	977	1028	1162	1244	1244	1262	1320	1270	1211	1219	1229	1133	1192	435215
40	HENRY	414	428	466	522	521	531	532	532	529	533	522	472	500	182658
48	LAKE	47	48	53	62	62	63	63	63	63	64	62	55	59	21469
49	LAUDERDALE	304	314	342	381	380	389	388	389	386	390	382	346	366	133673
55	MC NAIRY	395	405	444	521	523	527	532	527	526	533	519	460	493	179933
57	MADISON	1881	1974	2171	2248	2234	2306	2331	2317	2249	2251	2251	2108	2194	801009
66	OBION	486	501	546	612	611	623	623	624	620	625	612	554	586	214174
79	SHELBY	11798	12407	13303	13005	12826	13546	13213	13603	13366	13271	13220	12714	13023	4754049
84	TIPTON	486	501	547	615	614	626	627	627	623	628	615	555	589	214979
92	WEAKLY	356	367	401	453	453	461	462	461	459	463	453	408	433	158141
	TOTAL	22109	23134	25170	26040	25847	26804	26716	26903	26365	26368	26198	24547	25517	9317453

Appendix E

Statewide Emissions for Each Pollutant

Table E. 2002 Statewide Emissions

a. 2002 VOC Emissions (tons/day)

Region	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
East	133.26	136.71	160.23	197.17	133.19	146.09	145.65	149.19	168.46	192.03	157.95	145.22	155.43	56739.95
Middle	108.15	109.71	128.78	161.68	107.82	114.20	115.41	116.99	136.69	153.95	128.07	116.25	124.81	45558.73
West	74.46	73.63	85.96	110.38	71.46	76.15	76.79	77.28	91.90	104.06	87.49	79.51	84.09	30693.92
TOTAL	315.86	320.05	374.97	469.23	312.48	336.43	337.85	343.45	397.05	450.04	373.51	340.98	364.33	132992.60

b. 2002 NO_X Emission (tons/day)

Region	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
East	291.81	308.87	330.22	329.31	314.90	315.03	316.22	313.96	303.99	312.48	345.76	331.25	317.82	116006.77
Middle	279.92	297.77	318.92	316.04	300.92	300.45	302.97	301.39	294.33	304.02	332.19	317.20	305.51	111513.67
West	154.47	164.19	174.54	171.19	163.47	164.07	163.20	162.96	160.78	167.09	182.25	173.70	166.83	60888.68
TOTAL	726.20	770.83	823.69	816.54	779.29	779.55	782.39	778.31	759.10	783.59	860.20	822.15	790.15	288409.12

c. 2002 CO Emissions (tons/day)

Region	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
East	2089.77	2194.24	2273.44	2314.99	1641.06	1712.47	1717.11	1741.78	2081.97	2348.55	2412.00	2334.31	2071.81	755608.32
Middle	1784.03	1890.00	1954.13	1993.29	1380.16	1425.11	1443.66	1450.82	1779.03	1994.82	2073.55	1999.84	1764.04	643280.39
West	1119.31	1186.76	1237.55	1270.23	856.16	904.26	918.31	920.04	1149.90	1277.67	1300.10	1244.73	1115.42	406750.60
TOTAL	4993.11	5270.99	5465.12	5578.50	3877.38	4041.85	4079.08	4112.64	5010.90	5621.03	5785.65	5578.89	4951.26	1805639.31

Table E. Continued.

d. 2002 PM10 Emissions (tons/day)

Region	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
East	5.65	5.94	6.57	6.84	6.62	6.81	6.93	6.84	6.61	6.62	6.82	6.38	6.55	2392.51
Middle	5.69	5.97	6.58	6.83	6.61	6.81	6.90	6.85	6.63	6.64	6.83	6.39	6.56	2395.43
West	3.29	3.45	3.78	3.93	3.80	3.93	3.95	3.94	3.84	3.85	3.94	3.68	3.78	1380.94
TOTAL	14.63	15.36	16.93	17.59	17.03	17.55	17.78	17.63	17.08	17.11	17.58	16.45	16.89	6168.89

e. 2002 PM2.5 Emissions (tons/day)

Region	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
East	4.34	4.56	5.06	5.27	5.08	5.22	5.32	5.24	5.05	5.06	5.24	4.91	5.03	1835.79
Middle	4.38	4.60	5.08	5.27	5.07	5.23	5.31	5.26	5.09	5.09	5.27	4.93	5.05	1843.43
West	2.50	2.62	2.88	2.99	2.88	2.98	3.00	2.99	2.91	2.91	3.00	2.80	2.87	1048.48
TOTAL	11.22	11.79	13.02	13.53	13.03	13.42	13.63	13.48	13.04	13.06	13.50	12.64	12.95	4727.70

f. 2002 NH_3 Emissions (tons/day)

Region	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
East	5.88	6.14	6.70	6.99	6.96	7.20	7.20	7.23	7.08	7.09	7.02	6.55	6.84	2496.16
Middle	5.85	6.12	6.66	6.94	6.90	7.14	7.12	7.17	7.03	7.04	6.97	6.51	6.79	2478.63
West	3.72	3.89	4.21	4.35	4.32	4.49	4.44	4.50	4.43	4.43	4.38	4.11	4.27	1560.09
TOTAL	15.45	16.15	17.57	18.27	18.18	18.83	18.77	18.90	18.54	18.55	18.38	17.18	17.90	6534.88

Table E. Continued.

g. 2002 SO_2 Emissions (tons/day)

Region	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
East	7.93	8.32	9.15	9.54	9.48	9.78	9.88	9.81	9.53	9.54	9.53	8.91	9.28	3390.07
Middle	7.95	8.33	9.14	9.50	9.44	9.74	9.82	9.79	9.53	9.54	9.52	8.90	9.27	3383.64
West	4.77	5.00	5.45	5.64	5.60	5.80	5.80	5.83	5.70	5.70	5.67	5.31	5.52	2016.66
TOTAL	20.65	21.64	23.74	24.68	24.52	25.32	25.50	25.42	24.75	24.78	24.72	23.12	24.07	8790.37

h. 2002 CO_2 Emissions (tons/day)

Region	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Average	tons/yr
East	36063	37781	41460	43223	42975	44346	44675	44509	43342	43407	43273	40425	42123	15382309
Middle	36147	37854	41420	43067	42792	44231	44417	44412	43339	43383	43205	40389	42055	15356886
West	22109	23134	25170	26040	25847	26804	26716	26903	26365	26368	26198	24547	25517	9317453
TOTAL	94319	98768	108050	112330	111614	115381	115808	115825	113046	113158	112676	105361	109695	40056648

Appendix F

Range Errors from Quality Assurance Check with the EPA's QA Program

Table F. Range Errors from Quality Assurance Check with the EPA's QA Program (tons/year)

StateCountyFIPS	County	Emission Process Description	PollutantCode	Errors
47001	ANDERSON		NOX	**** CONTENT CHECKS **** Emission Rate (1714.16) > Range Maximum (1350)
47011	BRADLEY		NOX	**** CONTENT CHECKS **** Emission Rate (2210.305) > Range Maximum (1350)
47011	BRADLEY		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (31.531) > Range Maximum (30)
47013	CAMPBELL		NOX	**** CONTENT CHECKS **** Emission Rate (4623.829) > Range Maximum (1350)
47013	CAMPBELL		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (75.712) > Range Maximum (50)
47013	CAMPBELL		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (65.961) > Range Maximum (30)
47013	CAMPBELL		SO2	**** CONTENT CHECKS **** Emission Rate (68.675) > Range Maximum (50)
47021	CHEATHAM	Rural Interstate -Heavy Duty Diesel	NOX	**** CONTENT CHECKS **** Emission Rate (1506.226) > Range Maximum (1350)
47029	COCKE	Vehicles (HDDV) Class 8A &	NOX	**** CONTENT CHECKS **** Emission Rate (2243.596) > Range Maximum (1350)
47029	COCKE	8B	PM25-PRI	**** CONTENT CHECKS **** Emission Rate (32.006) > Range Maximum (30)
47031	COFFEE		NOX	**** CONTENT CHECKS **** Emission Rate (3119.264) > Range Maximum (1350)
47031	COFFEE		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (51.076) > Range Maximum (50)
47031	COFFEE		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (44.498) > Range Maximum (30)
47035	CUMBERLAND		NOX	**** CONTENT CHECKS **** Emission Rate (4047.028) > Range Maximum (1350)
47035	CUMBERLAND		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (66.267) > Range Maximum (50)
47035	CUMBERLAND		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (57.732) > Range Maximum (30)
47035	CUMBERLAND		SO2	**** CONTENT CHECKS **** Emission Rate (60.107) > Range Maximum (50)
47037	DAVIDSON		CO	**** CONTENT CHECKS **** Emission Rate (31464.072) > Range Maximum (10250)
47037	DAVIDSON		NH3	**** CONTENT CHECKS **** Emission Rate (137.86) > Range Maximum (50)
47037	DAVIDSON	Urban Interstate -Light Duty Gasoline	NOX	**** CONTENT CHECKS **** Emission Rate (1704.993) > Range Maximum (1350)
47037	DAVIDSON	Vehicles (LDGV)	SO2	**** CONTENT CHECKS **** Emission Rate (86.65) > Range Maximum (50)
47037	DAVIDSON		VOC	**** CONTENT CHECKS **** Emission Rate (1677.105) > Range Maximum (1100)
47037	DAVIDSON	Urban Principal Arterial -Light Duty	CO	**** CONTENT CHECKS **** Emission Rate (12165.851) > Range Maximum (10250)
47037	DAVIDSON	Gasoline Vehicles (LDGV)	NH3	**** CONTENT CHECKS **** Emission Rate (70.116) > Range Maximum (50)
47037	DAVIDSON	Urban Minor Arterial -Light Duty	CO	**** CONTENT CHECKS **** Emission Rate (11511.383) > Range Maximum (10250)
47037	DAVIDSON	Gasoline Vehicles (LDGV)	NH3	**** CONTENT CHECKS **** Emission Rate (66.344) > Range Maximum (50)
47037	DAVIDSON	Urban Local -Light Duty Gasoline Vehicles (LDGV)	NH3	**** CONTENT CHECKS **** Emission Rate (51.271) > Range Maximum (50)
47037	DAVIDSON		CO	**** CONTENT CHECKS **** Emission Rate (25271.803) > Range Maximum (10250)
47037	DAVIDSON	Urban Interstate -Light Duty Gasoline	NH3	**** CONTENT CHECKS **** Emission Rate (89.189) > Range Maximum (50)
47037	DAVIDSON	Trucks 1 & 2 (M6) = LDGT1 (M5)	SO2	**** CONTENT CHECKS **** Emission Rate (72.274) > Range Maximum (50)
47037	DAVIDSON		VOC	**** CONTENT CHECKS **** Emission Rate (1144.552) > Range Maximum (1100)
47037	DAVIDSON		NOX	**** CONTENT CHECKS **** Emission Rate (11765.339) > Range Maximum (1350)
47037	DAVIDSON	Urban Interstate -Heavy Duty Diesel	PM10-PRI	**** CONTENT CHECKS **** Emission Rate (233.291) > Range Maximum (50)
47037	DAVIDSON	Vehicles (HDDV) Class 8A & 8B	PM25-PRI	**** CONTENT CHECKS **** Emission Rate (203.252) > Range Maximum (30)
47037	DAVIDSON		SO2	**** CONTENT CHECKS **** Emission Rate (211.475) > Range Maximum (50)
47043	DICKSON	Rural Interstate -Heavy Duty Diesel	NOX	**** CONTENT CHECKS **** Emission Rate (2601.912) > Range Maximum (1350)
47043	DICKSON	Vehicles (HDDV) Class 8A & 8B	PM25-PRI	**** CONTENT CHECKS **** Emission Rate (37.117) > Range Maximum (30)

Table F. Continued.

StateCountyFIPS	County	Emission Process Description	PollutantCode	Errors
47047	FAYETTE	Rural Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (2326.253) > Range Maximum (1350)
47047	FAYETTE		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (33.185) > Range Maximum (30)
47055	GILES		NOX	**** CONTENT CHECKS **** Emission Rate (2216.382) > Range Maximum (1350)
47055	GILES		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (31.618) > Range Maximum (30)
47059	GREENE		NOX	**** CONTENT CHECKS **** Emission Rate (3569.111) > Range Maximum (1350)
47059	GREENE		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (58.441) > Range Maximum (50)
47059	GREENE		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (50.915) > Range Maximum (30)
47059	GREENE		SO2	**** CONTENT CHECKS **** Emission Rate (53.009) > Range Maximum (50)
47065	HAMILTON	Urban Interstate -Light Duty Gasoline Vehicles (LDGV)	CO	**** CONTENT CHECKS **** Emission Rate (12322.815) > Range Maximum (10250)
47065	HAMILTON	Urban Minor Arterial -Light Duty Gasoline Vehicles (LDGV)	CO	**** CONTENT CHECKS **** Emission Rate (10861.548) > Range Maximum (10250)
47065	HAMILTON	Urban Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (3884.608) > Range Maximum (1350)
47065	HAMILTON		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (77.024) > Range Maximum (50)
47065	HAMILTON		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (67.107) > Range Maximum (30)
47065	HAMILTON		SO2	**** CONTENT CHECKS **** Emission Rate (69.82) > Range Maximum (50)
47075	HAYWOOD	Rural Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (3681.573) > Range Maximum (1350)
47075	HAYWOOD		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (60.284) > Range Maximum (50)
47075	HAYWOOD		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (52.52) > Range Maximum (30)
47075	HAYWOOD		SO2	**** CONTENT CHECKS **** Emission Rate (54.681) > Range Maximum (50)
47077	HENDERSON		NOX	**** CONTENT CHECKS **** Emission Rate (3509.215) > Range Maximum (1350)
47077	HENDERSON		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (57.461) > Range Maximum (50)
47077	HENDERSON		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (50.061) > Range Maximum (30)
47077	HENDERSON		SO2	**** CONTENT CHECKS **** Emission Rate (52.12) > Range Maximum (50)
47081	HICKMAN		NOX	**** CONTENT CHECKS **** Emission Rate (2331.843) > Range Maximum (1350)
47081	HICKMAN		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (33.265) > Range Maximum (30)
47085	HUMPHREYS		NOX	**** CONTENT CHECKS **** Emission Rate (2298.118) > Range Maximum (1350)
47085	HUMPHREYS		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (32.784) > Range Maximum (30)
47089	JEFFERSON		NOX	**** CONTENT CHECKS **** Emission Rate (4281.679) > Range Maximum (1350)
47089	JEFFERSON		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (70.109) > Range Maximum (50)
47089	JEFFERSON		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (61.08) > Range Maximum (30)
47089	JEFFERSON		SO2	**** CONTENT CHECKS **** Emission Rate (63.593) > Range Maximum (50)
47093	KNOX	Urban Interstate -Light Duty Gasoline Vehicles (LDGV)	CO	**** CONTENT CHECKS **** Emission Rate (21476.479) > Range Maximum (10250)
47093	KNOX		NH3	**** CONTENT CHECKS **** Emission Rate (71.806) > Range Maximum (50)
47093	KNOX		VOC	**** CONTENT CHECKS **** Emission Rate (1297.847) > Range Maximum (1100)
47093	KNOX	Urban Principal Arterial -Light Duty Gasoline Vehicles (LDGV)	CO	**** CONTENT CHECKS **** Emission Rate (10573.287) > Range Maximum (10250)
47093	KNOX	Urban Local -Light Duty Gasoline Vehicles (LDGV)	CO	**** CONTENT CHECKS **** Emission Rate (12488.395) > Range Maximum (10250)
47093	KNOX		VOC	**** CONTENT CHECKS **** Emission Rate (1225.609) > Range Maximum (1100)
47093	KNOX	Urban Interstate -Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5)	CO	**** CONTENT CHECKS **** Emission Rate (17454.711) > Range Maximum (10250)

Table F. Continued.

StateCountyFIPS	County	Emission Process Description	PollutantCode	Errors
47093	KNOX	Urban Local -Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5)	CO	**** CONTENT CHECKS **** Emission Rate (10458.937) > Range Maximum (10250)
47093	KNOX	Rural Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (2365.318) > Range Maximum (1350)
47093	KNOX		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (33.742) > Range Maximum (30)
47093	KNOX	Urban Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (4801.563) > Range Maximum (1350)
47093	KNOX		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (95.209) > Range Maximum (50)
47093	KNOX		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (82.95) > Range Maximum (30)
47093	KNOX		SO2	**** CONTENT CHECKS **** Emission Rate (86.306) > Range Maximum (50)
47105	LOUDON		NOX	**** CONTENT CHECKS **** Emission Rate (3396.765) > Range Maximum (1350)
47105	LOUDON		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (55.619) > Range Maximum (50)
47105	LOUDON		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (48.456) > Range Maximum (30)
47105	LOUDON		SO2	**** CONTENT CHECKS **** Emission Rate (50.45) > Range Maximum (50)
47107	MC MINN		NOX	**** CONTENT CHECKS **** Emission Rate (3919.306) > Range Maximum (1350)
47107	MC MINN		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (64.176) > Range Maximum (50)
47107	MC MINN		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (55.911) > Range Maximum (30)
47107	MC MINN		SO2	**** CONTENT CHECKS **** Emission Rate (58.211) > Range Maximum (50)
47113	MADISON		NOX	**** CONTENT CHECKS **** Emission Rate (2973.379) > Range Maximum (1350)
47113	MADISON		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (42.416) > Range Maximum (30)
47115	MARION		NOX	**** CONTENT CHECKS **** Emission Rate (3929.905) > Range Maximum (1350)
47115	MARION		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (64.35) > Range Maximum (50)
47115	MARION		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (56.062) > Range Maximum (30)
47115	MARION	Rural Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	SO2	**** CONTENT CHECKS **** Emission Rate (58.369) > Range Maximum (50)
47119	MAURY		NOX	**** CONTENT CHECKS **** Emission Rate (1865.723) > Range Maximum (1350)
47141	PUTNAM		NOX	**** CONTENT CHECKS **** Emission Rate (3982.139) > Range Maximum (1350)
47141	PUTNAM		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (65.205) > Range Maximum (50)
47141	PUTNAM		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (56.807) > Range Maximum (30)
47141	PUTNAM		SO2	**** CONTENT CHECKS **** Emission Rate (59.144) > Range Maximum (50)
47145	ROANE		NOX	**** CONTENT CHECKS **** Emission Rate (2488.936) > Range Maximum (1350)
47145	ROANE		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (35.506) > Range Maximum (30)
47147	ROBERTSON		NOX	**** CONTENT CHECKS **** Emission Rate (3383.149) > Range Maximum (1350)
47147	ROBERTSON		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (55.397) > Range Maximum (50)
47147	ROBERTSON		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (48.263) > Range Maximum (30)
47147	ROBERTSON		SO2	**** CONTENT CHECKS **** Emission Rate (50.249) > Range Maximum (50)
47149	RUTHERFORD		NOX	**** CONTENT CHECKS **** Emission Rate (3504.491) > Range Maximum (1350)
47149	RUTHERFORD		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (57.383) > Range Maximum (50)
47149	RUTHERFORD		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (49.993) > Range Maximum (30)
47149	RUTHERFORD		SO2	**** CONTENT CHECKS **** Emission Rate (52.049) > Range Maximum (50)

Table F. Continued.

StateCountyFIPS	County	Emission Process Description	PollutantCode	Errors
47157	SHELBY	Urban Interstate -Light Duty Gasoline Vehicles (LDGV)	CO	**** CONTENT CHECKS **** Emission Rate (22886.427) > Range Maximum (10250)
47157	SHELBY		NH3	**** CONTENT CHECKS **** Emission Rate (93.424) > Range Maximum (50)
47157	SHELBY		SO2	**** CONTENT CHECKS **** Emission Rate (58.916) > Range Maximum (50)
47157	SHELBY		VOC	**** CONTENT CHECKS **** Emission Rate (1272.499) > Range Maximum (1100)
47157	SHELBY	Urban Principal Arterial -Light Duty Gasoline Vehicles (LDGV)	CO	**** CONTENT CHECKS **** Emission Rate (21845.492) > Range Maximum (10250)
47157	SHELBY		NH3	**** CONTENT CHECKS **** Emission Rate (116.856) > Range Maximum (50)
47157	SHELBY		NOX	**** CONTENT CHECKS **** Emission Rate (1376.565) > Range Maximum (1350)
47157	SHELBY		SO2	**** CONTENT CHECKS **** Emission Rate (73.461) > Range Maximum (50)
47157	SHELBY		VOC	**** CONTENT CHECKS **** Emission Rate (1831.874) > Range Maximum (1100)
47157	SHELBY	Urban Minor Arterial -Light Duty Gasoline Vehicles (LDGV)	CO	**** CONTENT CHECKS **** Emission Rate (21546.81) > Range Maximum (10250)
47157	SHELBY		NH3	**** CONTENT CHECKS **** Emission Rate (115.258) > Range Maximum (50)
47157	SHELBY		NOX	**** CONTENT CHECKS **** Emission Rate (1357.744) > Range Maximum (1350)
47157	SHELBY		SO2	**** CONTENT CHECKS **** Emission Rate (72.457) > Range Maximum (50)
47157	SHELBY		VOC	**** CONTENT CHECKS **** Emission Rate (1806.828) > Range Maximum (1100)
47157	SHELBY	Urban Interstate -Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5)	CO	**** CONTENT CHECKS **** Emission Rate (18551.835) > Range Maximum (10250)
47157	SHELBY		NH3	**** CONTENT CHECKS **** Emission Rate (60.289) > Range Maximum (50)
47157	SHELBY	Urban Principal Arterial -Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5)	CO	**** CONTENT CHECKS **** Emission Rate (18304.366) > Range Maximum (10250)
47157	SHELBY		NH3	**** CONTENT CHECKS **** Emission Rate (75.392) > Range Maximum (50)
47157	SHELBY		SO2	**** CONTENT CHECKS **** Emission Rate (61.357) > Range Maximum (50)
47157	SHELBY		VOC	**** CONTENT CHECKS **** Emission Rate (1294.904) > Range Maximum (1100)
47157	SHELBY	Urban Minor Arterial -Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5)	CO	**** CONTENT CHECKS **** Emission Rate (18054.1) > Range Maximum (10250)
47157	SHELBY		NH3	**** CONTENT CHECKS **** Emission Rate (74.362) > Range Maximum (50)
47157	SHELBY		SO2	**** CONTENT CHECKS **** Emission Rate (60.518) > Range Maximum (50)
47157	SHELBY		VOC	**** CONTENT CHECKS **** Emission Rate (1277.2) > Range Maximum (1100)
47157	SHELBY	Urban Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (6968.419) > Range Maximum (1350)
47157	SHELBY		PM10-PRI	**** CONTENT CHECKS **** Emission Rate (138.174) > Range Maximum (50)
47157	SHELBY		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (120.382) > Range Maximum (30)
47157	SHELBY		SO2	**** CONTENT CHECKS **** Emission Rate (125.253) > Range Maximum (50)
47159	SMITH	Rural Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (2316.534) > Range Maximum (1350)
47159	SMITH		PM25-PRI	**** CONTENT CHECKS **** Emission Rate (33.047) > Range Maximum (30)
47163	SULLIVAN	Urban Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (1574.073) > Range Maximum (1350)
47187	WILLIAMSON	Rural Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (1945.591) > Range Maximum (1350)
47189	WILSON		NOX	**** CONTENT CHECKS **** Emission Rate (1971.037) > Range Maximum (1350)
47189	WILSON	Urban Interstate -Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	NOX	**** CONTENT CHECKS **** Emission Rate (1692.254) > Range Maximum (1350)

Appendix G

Contribution of Emissions by the 6 Vehicle Types

Table G-1. Contribution of VOC Emissions in Percentage by the 6 Vehicle Types in TN

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6&7, Buses	HDV8A &8B	MC	TOTAL
EAST TN	1	ANDERSON	1811.21	47.0	34.0	14.8	1.5	2.0	0.7	100
	4	BLEDSOE	253.08	45.0	36.9	15.3	1.6	0.6	0.6	100
	5	BLOUNT	2407.40	47.7	34.4	15.0	1.6	0.6	0.6	100
	6	BRADLEY	2346.64	44.3	36.2	15.1	1.6	2.3	0.6	100
	7	CAMPBELL	1009.44	41.1	29.0	17.8	3.7	7.6	0.8	100
	10	CARTER	965.25	46.3	33.7	17.0	1.7	0.6	0.6	100
	13	CLAIBORNE	679.26	44.5	36.6	15.1	1.8	1.5	0.5	100
	15	COCKE	1006.56	43.5	35.7	14.7	1.5	4.0	0.6	100
	18	CUMBERLAND	1306.86	42.1	29.8	18.3	3.3	5.7	0.8	100
	29	GRAINGER	555.42	44.8	36.7	15.2	1.4	1.4	0.6	100
	30	GREENE	2096.69	43.8	35.8	14.9	1.8	3.2	0.6	100
	32	HAMBLEN	1589.11	44.6	36.3	15.3	1.6	1.6	0.6	100
	33	HAMILTON	7786.15	47.7	33.7	14.6	1.8	1.5	0.7	100
	34	HANCOCK	106.78	45.4	37.1	15.4	1.2	0.4	0.6	100
	37	HAWKINS	1122.23	47.3	35.3	14.8	1.4	0.6	0.5	100
	45	JEFFERSON	1513.68	45.4	33.0	14.0	2.1	4.9	0.7	100
	46	JOHNSON	355.25	44.8	36.6	15.2	1.8	1.0	0.6	100
	47	KNOX	11353.43	47.2	34.1	14.8	1.6	1.6	0.7	100
	53	LOUDON	1429.60	45.6	33.1	14.1	2.3	4.2	0.7	100
	54	MC MINN	1695.64	43.2	35.4	14.6	1.8	4.4	0.6	100
	58	MARION	1169.35	44.9	31.8	13.4	3.5	5.7	0.7	100
	61	MEIGS	248.23	44.7	36.6	15.2	1.8	1.2	0.6	100
	62	MONROE	1148.51	44.5	36.4	15.1	1.6	1.9	0.6	100
	65	MORGAN	380.61	45.1	36.9	15.3	1.4	0.7	0.6	100
	70	POLK	455.75	44.8	36.8	15.2	1.5	1.2	0.6	100
	72	RHEA	690.47	44.9	36.7	15.3	1.5	1.1	0.6	100
	73	ROANE	1548.41	43.7	35.8	14.8	2.1	3.0	0.6	100
	76	SCOTT	437.94	44.7	36.7	15.2	1.9	1.0	0.6	100
	78	SEVIER	2335.14	47.5	34.4	14.9	1.6	1.0	0.6	100
	82	SULLIVAN	3544.26	45.6	32.9	17.6	1.5	1.7	0.7	100
	86	UNICOI	474.90	46.6	34.9	14.5	1.8	1.6	0.5	100
	87	UNION	296.90	47.5	34.4	14.8	1.6	1.0	0.6	100
	90	WASHINGTON	2619.80	47.1	35.1	14.8	1.6	0.9	0.6	100
MIDDLE TN	2	BEDFORD	918.19	44.8	36.6	15.3	1.5	1.2	0.6	100
	8	CANNON	283.29	45.2	37.1	15.4	1.2	0.5	0.6	100
	11	CHEATHAM	963.26	44.0	36.1	14.8	1.8	2.6	0.6	100
	14	CLAY	157.52	44.9	36.9	15.3	1.5	0.9	0.6	100
	16	COFFEE	1773.63	43.4	35.6	14.7	2.2	3.5	0.6	100
	19	DAVIDSON	10801.48	46.8	31.9	15.0	2.6	2.8	0.9	100
	21	DE KALB	413.30	44.8	36.7	15.2	1.9	0.7	0.6	100
	22	DICKSON	1336.64	43.5	35.7	14.8	2.0	3.4	0.6	100
	25	FENTRESS	429.40	44.9	36.8	15.3	1.5	0.9	0.6	100
	26	FRANKLIN	869.83	45.0	36.9	15.4	1.4	0.7	0.6	100
	28	GILES	927.21	43.2	35.4	14.6	1.7	4.5	0.6	100
	31	GRUNDY	363.26	42.6	35.0	14.4	3.0	4.4	0.6	100
	41	HICKMAN	744.76	42.4	34.9	14.3	2.5	5.4	0.6	100
	42	HOUSTON	139.54	45.1	36.9	15.3	1.4	0.6	0.6	100
	43	HUMPHREYS	531.75	41.0	29.1	17.8	3.3	8.0	0.8	100
	44	JACKSON	242.04	45.0	36.8	15.3	1.5	0.8	0.6	100
	50	LAWRENCE	941.63	44.8	36.6	15.3	1.8	0.9	0.6	100

Table G-1. Continued.

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6&7, Buses	HDV8A &8B	MC	TOTAL
	51	LEWIS	185.15	44.6	36.6	15.2	1.9	1.2	0.6	100
	52	LINCOLN	793.50	44.5	36.5	15.2	1.9	1.4	0.6	100
	56	MACON	375.54	45.1	37.0	15.3	1.3	0.7	0.6	100
	59	MARSHALL	786.66	43.9	35.9	14.9	1.6	3.1	0.6	100
	60	MAURY	2205.74	44.3	36.3	15.1	1.7	2.1	0.6	100
	63	MONTGOMERY	3069.61	44.4	36.3	15.2	1.7	1.8	0.6	100
	64	MOORE	156.93	44.8	36.8	15.2	1.6	1.1	0.6	100
	67	OVERTON	511.09	44.8	36.8	15.2	1.7	0.9	0.6	100
	68	PERRY	206.02	44.3	36.3	15.1	1.8	1.9	0.5	100
	69	PICKETT	113.40	44.8	36.8	15.2	1.6	1.1	0.6	100
	71	PUTNAM	1589.84	42.8	30.3	18.6	2.7	4.8	0.8	100
	74	ROBERTSON	1420.85	43.3	30.7	18.8	2.2	4.2	0.8	100
	75	RUTHERFORD	3298.28	46.3	31.3	14.8	3.5	3.1	1.0	100
	77	SEQUATCHIE	301.74	44.2	36.4	15.0	2.1	1.7	0.5	100
	80	SMITH	585.97	41.9	29.7	18.1	2.9	6.6	0.8	100
	81	STEWART	316.21	44.6	36.7	15.1	1.8	1.2	0.6	100
	83	SUMNER	1806.03	47.5	32.2	15.3	2.5	1.5	1.0	100
	85	TROUSDALE	181.69	44.8	36.8	15.2	1.5	1.1	0.6	100
	88	VAN BUREN	159.46	44.4	36.5	15.1	1.9	1.6	0.5	100
	89	WARREN	838.31	44.9	36.7	15.3	1.8	0.8	0.6	100
	91	WAYNE	373.49	44.6	36.6	15.2	1.7	1.4	0.6	100
	93	WHITE	555.67	44.8	36.7	15.2	1.6	1.2	0.6	100
	94	WILLIAMSON	2267.83	47.0	31.8	14.9	2.1	3.2	1.0	100
	95	WILSON	1623.00	46.0	31.1	14.5	2.5	4.9	1.0	100
WEST TN	3	BENTON	533.09	42.9	34.8	14.4	2.6	4.8	0.6	100
	9	CARROLL	733.53	44.9	36.4	15.1	1.7	1.4	0.6	100
	12	CHESTER	366.24	44.4	35.9	14.9	2.6	1.7	0.5	100
	17	CROCKETT	412.67	44.8	36.3	15.1	1.3	2.0	0.5	100
	20	DECATUR	396.79	43.2	35.1	14.4	2.8	4.0	0.6	100
	23	DYER	1125.54	44.6	36.0	15.1	1.5	2.2	0.6	100
	24	FAYETTE	814.97	45.3	31.5	14.0	2.9	5.4	0.8	100
	27	GIBSON	1174.57	45.3	36.6	15.3	1.5	0.8	0.5	100
	35	HARDEMAN	655.98	45.1	36.4	15.2	1.6	1.2	0.5	100
	36	HARDIN	629.45	44.7	36.1	15.1	1.9	1.7	0.5	100
	38	HAYWOOD	699.42	40.7	28.4	17.5	3.8	8.8	0.8	100
	39	HENDERSON	907.30	41.6	29.0	17.9	3.7	7.1	0.8	100
	40	HENRY	819.94	44.9	36.3	15.2	1.8	1.4	0.5	100
	48	LAKE	96.49	44.9	36.3	15.1	2.1	1.1	0.5	100
	49	LAUDERDALE	601.48	44.8	36.2	15.1	2.1	1.2	0.5	100
	55	MC NAIRY	718.64	44.4	36.0	14.9	2.3	1.9	0.5	100
	57	MADISON	3076.58	44.3	35.7	15.0	1.7	2.6	0.6	100
	66	OBION	960.79	44.9	36.3	15.2	1.7	1.4	0.5	100
	79	SHELBY	14507.32	46.9	33.2	15.2	2.1	1.7	0.8	100
	84	TIPTON	691.14	47.3	33.0	14.9	2.4	1.6	0.8	100
	92	WEAKLY	771.98	45.4	36.7	15.3	1.4	0.6	0.6	100
		TOTAL	132993	45.6	34.1	15.2	2.0	2.4	0.7	100

Table G-2. Contribution of CO Emissions in Percentage by the 6 Vehicle Types in TN

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
EAST TN	1	ANDERSON	23653	44.5	37.2	15.6	1.4	1.0	0.3	100
	4	BLEDSOE	3214	43.0	39.3	16.0	1.2	0.3	0.2	100
	5	BLOUNT	29520	44.8	37.6	15.8	1.2	0.2	0.3	100
	6	BRADLEY	30932	42.6	38.6	16.0	1.4	1.2	0.3	100
	7	CAMPBELL	15634	41.4	33.6	17.5	3.5	3.6	0.4	100
	10	CARTER	11925	43.7	37.0	17.4	1.3	0.3	0.3	100
	13	CLAIBORNE	8796	42.9	39.1	15.9	1.3	0.6	0.2	100
	15	COCKE	13764	42.3	38.2	15.7	1.3	2.1	0.3	100
	18	CUMBERLAND	20141	42.0	34.1	17.9	3.0	2.6	0.4	100
	29	GRAINGER	7110	43.0	39.3	16.0	1.0	0.5	0.2	100
	30	GREENE	27921	42.3	38.3	15.8	1.6	1.7	0.3	100
	32	HAMBLEN	19449	42.5	38.9	16.2	1.3	0.9	0.3	100
	33	HAMILTON	103707	45.2	37.1	15.4	1.4	0.7	0.3	100
	34	HANCOCK	1321	43.0	39.5	16.2	0.9	0.2	0.2	100
	37	HAWKINS	13623	44.4	38.3	15.8	1.1	0.3	0.2	100
	45	JEFFERSON	22255	43.9	36.3	15.1	2.0	2.4	0.3	100
	46	JOHNSON	4406	42.8	39.3	16.0	1.3	0.4	0.2	100
	47	KNOX	152307	44.8	37.2	15.6	1.4	0.8	0.3	100
	53	LOUDON	21191	44.0	36.3	15.1	2.2	2.1	0.4	100
	54	MC MINN	23362	42.1	38.0	15.6	1.7	2.3	0.3	100
	58	MARION	18029	43.5	35.4	14.6	3.4	2.7	0.4	100
	61	MEIGS	3106	42.8	39.2	16.0	1.3	0.5	0.2	100
	62	MONROE	14980	42.7	38.8	15.9	1.3	1.0	0.3	100
	65	MORGAN	4821	43.0	39.4	16.0	1.0	0.3	0.2	100
	70	POLK	5915	43.1	39.3	15.9	1.1	0.5	0.2	100
	72	RHEA	8622	42.9	39.3	16.1	1.1	0.4	0.2	100
	73	ROANE	21386	42.3	38.1	15.7	2.0	1.6	0.3	100
	76	SCOTT	5610	42.9	39.2	15.9	1.4	0.4	0.2	100
	78	SEVIER	30194	44.8	37.5	15.6	1.3	0.5	0.3	100
	82	SULLIVAN	46339	43.6	36.4	17.7	1.1	0.8	0.3	100
	86	UNICOI	5884	44.1	38.0	15.6	1.4	0.7	0.2	100
	87	UNION	3771	44.9	37.7	15.6	1.2	0.4	0.3	100
	90	WASHINGTON	32721	44.3	38.0	15.8	1.3	0.4	0.3	100
MIDDLE TN	2	BEDFORD	11278	42.7	39.2	16.1	1.2	0.5	0.3	100
	8	CANNON	3638	43.2	39.5	16.1	0.9	0.2	0.2	100
	11	CHEATHAM	13592	42.5	38.4	15.7	1.7	1.4	0.3	100
	14	CLAY	2025	43.0	39.3	16.0	1.1	0.3	0.2	100
	16	COFFEE	24374	42.0	37.9	15.7	2.2	1.8	0.3	100
	19	DAVIDSON	164778	44.8	36.5	15.3	1.9	1.1	0.4	100
	21	DE KALB	5177	42.8	39.3	16.0	1.4	0.3	0.2	100
	22	DICKSON	17600	42.0	38.2	15.7	2.0	1.9	0.3	100
	25	FENTRESS	5355	42.9	39.3	16.1	1.1	0.4	0.2	100
	26	FRANKLIN	10784	42.9	39.3	16.1	1.1	0.3	0.2	100
	28	GILES	12294	42.0	38.2	15.7	1.5	2.4	0.3	100
	31	GRUNDY	5119	41.6	37.5	15.4	3.0	2.2	0.3	100
	41	HICKMAN	10464	41.6	37.5	15.4	2.5	2.8	0.3	100
	42	HOUSTON	1738	42.9	39.4	16.1	1.1	0.2	0.2	100
	43	HUMPHREYS	8155	41.5	33.8	17.6	3.1	3.7	0.4	100
	44	JACKSON	3017	42.9	39.4	16.1	1.1	0.3	0.2	100

Table G-2. Continued.

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
	50	LAWRENCE	11654	42.8	39.2	16.1	1.4	0.4	0.2	100
	51	LEWIS	2341	42.8	39.2	15.9	1.4	0.5	0.2	100
	52	LINCOLN	9818	42.6	39.1	16.0	1.4	0.6	0.2	100
	56	MACON	4795	43.1	39.4	16.0	1.0	0.3	0.2	100
	59	MARSHALL	10291	42.3	38.5	15.9	1.3	1.7	0.3	100
	60	MAURY	28012	42.5	38.8	16.0	1.4	1.1	0.3	100
	63	MONTGOMERY	37857	42.5	38.8	16.1	1.4	0.9	0.3	100
	64	MOORE	2013.24	42.9	39.2	16.0	1.2	0.4	0.2	100
	67	OVERTON	6588	43.0	39.3	16.0	1.2	0.3	0.2	100
	68	PERRY	2574	42.6	39.1	15.9	1.3	0.8	0.2	100
	69	PICKETT	1455	42.9	39.2	16.0	1.2	0.4	0.2	100
	71	PUTNAM	24584	42.5	34.5	18.1	2.3	2.2	0.4	100
	74	ROBERTSON	22681	42.8	34.8	18.2	1.9	1.9	0.4	100
	75	RUTHERFORD	49118	44.2	36.2	15.3	2.6	1.4	0.4	100
	77	SEQUATCHIE	3922	42.7	39.0	15.8	1.6	0.7	0.2	100
	80	SMITH	9533	42.2	34.2	17.7	2.5	3.0	0.4	100
	81	STEWART	4099	42.9	39.2	15.9	1.3	0.5	0.2	100
	83	SUMNER	25783	44.8	36.8	15.5	1.8	0.6	0.4	100
	85	TROUSDALE	2329	43.0	39.3	16.0	1.1	0.5	0.2	100
	88	VAN BUREN	2051	42.8	39.1	15.9	1.4	0.7	0.2	100
	89	WARREN	10426	42.8	39.2	16.1	1.3	0.3	0.2	100
	91	WAYNE	4661	42.8	39.2	16.0	1.2	0.6	0.2	100
	93	WHITE	7065	42.9	39.2	16.0	1.1	0.5	0.2	100
	94	WILLIAMSON	35159	44.8	36.6	15.3	1.5	1.3	0.4	100
	95	WILSON	25082	44.3	36.2	15.1	1.9	2.1	0.4	100
WEST TN	3	BENTON	7180	41.8	37.6	15.4	2.4	2.5	0.3	100
	9	CARROLL	9112	42.9	39.0	16.0	1.3	0.6	0.2	100
	12	CHESTER	4488	42.5	38.7	15.9	1.9	0.7	0.2	100
	17	CROCKETT	5145	43.0	39.1	16.0	1.0	0.8	0.2	100
	20	DECATUR	5378	42.1	37.8	15.5	2.4	2.0	0.3	100
	23	DYER	13861	42.7	38.8	16.0	1.2	1.0	0.3	100
	24	FAYETTE	12384	44.2	35.8	14.7	2.4	2.5	0.3	100
	27	GIBSON	14119	42.9	39.2	16.1	1.1	0.4	0.3	100
	35	HARDEMAN	7977	42.9	39.1	16.1	1.2	0.5	0.2	100
	36	HARDIN	7633	42.7	38.9	16.0	1.4	0.7	0.2	100
	38	HAYWOOD	10629	41.1	33.2	17.4	3.6	4.3	0.4	100
	39	HENDERSON	13560	41.7	33.7	17.7	3.1	3.4	0.4	100
	40	HENRY	9903	42.8	39.0	16.1	1.4	0.6	0.2	100
	48	LAKE	1174	42.8	39.0	16.0	1.5	0.4	0.2	100
	49	LAUDERDALE	7254	42.7	39.0	16.0	1.6	0.5	0.2	100
	55	MC NAIRY	8978	42.7	38.8	15.8	1.7	0.8	0.2	100
	57	MADISON	38110	42.3	38.4	16.0	1.6	1.4	0.3	100
	66	OBION	11657	42.8	39.0	16.1	1.3	0.6	0.2	100
	79	SHELBY	199460	44.6	37.2	15.5	1.6	0.8	0.4	100
	84	TIPTON	9310	45.2	37.0	15.3	1.6	0.6	0.3	100
	92	WEAKLY	9438	43.0	39.2	16.1	1.1	0.3	0.2	100
		TOTAL	1805639	43.7	37.4	15.8	1.7	1.1	0.3	100

Table G-3. Contribution of NO_X Emissions in Percentage by the 6 Vehicle Types in TN

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
EAST TN	1	ANDERSON	3622.19	16.8	12.4	9.4	7.7	53.5	0.2	100
	4	BLEDSOE	261.96	30.9	23.7	16.9	12.2	15.9	0.4	100
	5	BLOUNT	2341.95	33.7	24.7	18.3	10.4	12.6	0.4	100
	6	BRADLEY	4987.33	15.2	11.6	8.4	7.6	57.0	0.2	100
	7	CAMPBELL	6140.94	5.8	4.5	3.9	8.7	77.0	0.1	100
	10	CARTER	990.37	31.6	23.6	17.8	11.1	15.4	0.4	100
	13	CLAIBORNE	870.79	25.1	19.2	13.8	11.2	30.4	0.3	100
	15	COCKE	3355.39	9.8	7.5	5.5	4.8	72.2	0.1	100
	18	CUMBERLAND	6100.37	7.7	6.0	5.1	9.5	71.6	0.1	100
	29	GRAINGER	673.12	26.5	20.3	14.5	8.8	29.6	0.3	100
	30	GREENE	5772.40	11.7	9.0	6.6	6.7	65.9	0.1	100
	32	HAMBLEN	2614.44	18.9	14.4	10.2	7.5	48.8	0.2	100
	33	HAMILTON	12541.72	21.6	15.8	11.8	9.9	40.6	0.3	100
	34	HANCOCK	96.89	34.9	26.7	18.9	9.5	9.7	0.4	100
	37	HAWKINS	1086.85	32.8	23.6	16.8	10.4	16.0	0.4	100
	45	JEFFERSON	6118.46	8.7	6.4	5.1	7.0	72.6	0.1	100
	46	JOHNSON	389.49	28.7	21.9	15.6	11.5	22.0	0.3	100
	47	KNOX	18843.83	20.6	15.2	11.5	9.0	43.5	0.3	100
	53	LOUDON	5238.81	9.7	7.2	5.7	8.5	68.8	0.1	100
	54	MC MINN	6042.14	9.2	7.0	5.2	6.0	72.5	0.1	100
	58	MARION	5680.34	7.5	5.5	4.4	11.0	71.5	0.1	100
	61	MEIGS	287.54	27.2	20.8	14.9	11.7	25.0	0.3	100
	62	MONROE	2202.28	16.8	12.9	9.3	7.6	53.3	0.2	100
	65	MORGAN	391.52	31.1	23.8	17.0	10.2	17.6	0.4	100
	70	POLK	542.78	27.2	20.8	14.9	9.7	27.1	0.3	100
	72	RHEA	767.03	28.5	21.8	15.4	10.0	24.1	0.3	100
	73	ROANE	4380.86	11.6	8.9	6.6	9.2	63.6	0.2	100
	76	SCOTT	508.35	27.6	21.1	15.1	12.8	23.1	0.3	100
	78	SEVIER	3176.07	24.8	18.2	13.7	9.3	33.6	0.3	100
	82	SULLIVAN	5929.42	20.0	15.1	11.8	6.8	46.0	0.3	100
	86	UNICOI	614.61	24.6	17.7	12.7	10.6	34.1	0.3	100
	87	UNION	333.92	29.6	21.8	16.4	10.1	21.7	0.4	100
	90	WASHINGTON	3102.64	27.2	19.5	14.0	9.7	29.3	0.3	100
MIDDLE TN	2	BEDFORD	1065.21	27.0	20.6	14.5	9.5	28.1	0.3	100
	8	CANNON	277.47	33.0	25.3	18.1	9.6	13.6	0.4	100
	11	CHEATHAM	2528.68	12.8	9.8	7.3	8.6	61.3	0.2	100
	14	CLAY	173.21	29.3	22.4	16.1	11.0	20.8	0.3	100
	16	COFFEE	5426.03	10.7	8.2	6.0	9.5	65.5	0.1	100
	19	DAVIDSON	26737.87	16.8	13.0	10.7	9.2	50.1	0.3	100
	21	DE KALB	430.62	30.4	23.2	16.6	13.8	15.6	0.4	100
	22	DICKSON	4050.83	10.5	8.0	5.8	7.9	67.6	0.1	100
	25	FENTRESS	462.65	29.4	22.4	15.9	10.0	22.0	0.3	100
	26	FRANKLIN	876.67	31.3	24.0	17.0	10.0	17.4	0.4	100
	28	GILES	3228.30	9.2	7.0	5.1	4.9	73.7	0.1	100
	31	GRUNDY	1356.00	8.8	6.7	5.0	11.0	68.4	0.1	100
	41	HICKMAN	3240.65	7.5	5.7	4.3	7.8	74.6	0.1	100
	42	HOUSTON	135.88	32.5	24.9	17.7	10.5	14.0	0.4	100
	43	HUMPHREYS	3170.89	5.9	4.6	4.0	7.8	77.6	0.1	100
	44	JACKSON	250.22	30.6	23.4	16.6	10.9	18.1	0.4	100
	50	LAWRENCE	1022.18	28.9	22.1	15.7	11.8	21.2	0.3	100

Table G-3. Continued.

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
	51	LEWIS	217.80	27.0	20.7	14.8	12.1	25.2	0.3	100
	52	LINCOLN	954.48	26.0	19.9	14.1	11.5	28.2	0.3	100
	56	MACON	383.29	31.6	24.1	17.3	9.9	16.8	0.4	100
	59	MARSHALL	2083.41	12.1	9.2	6.7	5.6	66.3	0.2	100
	60	MAURY	4200.89	16.6	12.7	9.1	7.2	54.2	0.2	100
	63	MONTGOMERY	5078.85	18.8	14.4	10.2	7.6	48.8	0.2	100
	64	MOORE	183.33	27.5	21.1	15.1	10.3	25.8	0.3	100
	67	OVERTON	569.12	29.0	22.2	15.9	12.0	20.6	0.3	100
	68	PERRY	273.10	23.7	18.1	12.9	10.0	35.0	0.3	100
	69	PICKETT	133.44	27.3	20.9	15.0	11.1	25.5	0.3	100
	71	PUTNAM	6501.31	8.9	7.0	5.9	8.1	70.0	0.1	100
	74	ROBERTSON	5255.74	10.1	7.9	6.8	7.9	67.0	0.2	100
	75	RUTHERFORD	9332.96	14.5	11.1	9.3	10.5	54.4	0.2	100
	77	SEQUATCHIE	427.54	22.7	17.4	12.5	12.8	34.4	0.3	100
	80	SMITH	3144.67	6.9	5.4	4.7	7.6	75.3	0.1	100
	81	STEWART	389.35	26.2	20.1	14.4	11.6	27.4	0.3	100
	83	SUMNER	3214.53	23.1	17.6	14.5	11.2	33.4	0.4	100
	85	TROUSDALE	211.49	27.6	21.1	15.1	10.3	25.5	0.3	100
	88	VAN BUREN	213.04	24.0	18.3	13.1	10.9	33.4	0.3	100
	89	WARREN	880.85	30.0	23.0	16.3	12.0	18.4	0.3	100
	91	WAYNE	448.38	26.2	20.1	14.3	10.0	29.1	0.3	100
	93	WHITE	650.96	27.3	20.9	14.9	10.2	26.4	0.3	100
	94	WILLIAMSON	6249.90	15.4	11.8	10.0	7.1	55.5	0.3	100
	95	WILSON	6081.88	11.2	8.5	7.2	6.9	66.0	0.2	100
WEST TN	3	BENTON	1961.34	8.5	6.5	4.8	8.5	71.6	0.1	100
	9	CARROLL	927.05	24.4	18.6	13.4	10.4	32.8	0.3	100
	12	CHESTER	494.27	22.5	17.1	12.3	14.5	33.3	0.3	100
	17	CROCKETT	565.57	22.6	17.2	12.4	7.0	40.5	0.3	100
	20	DECATUR	1231.93	10.2	7.8	5.8	9.7	66.4	0.1	100
	23	DYER	1882.09	18.3	13.9	10.0	7.3	50.3	0.2	100
	24	FAYETTE	3544.46	8.4	6.6	5.4	8.0	71.5	0.1	100
	27	GIBSON	1181.19	30.3	23.1	16.4	9.9	20.0	0.3	100
	35	HARDEMAN	727.79	27.6	21.0	15.0	10.4	25.7	0.3	100
	36	HARDIN	790.93	24.2	18.4	13.2	11.0	33.0	0.3	100
	38	HAYWOOD	4734.93	5.0	3.9	3.4	7.9	79.7	0.1	100
	39	HENDERSON	4895.44	6.3	4.9	4.2	8.1	76.3	0.1	100
	40	HENRY	959.28	26.0	19.8	14.1	10.7	29.1	0.3	100
	48	LAKE	107.79	27.3	20.8	14.9	13.6	23.1	0.3	100
	49	LAUDERDALE	690.33	26.4	20.1	14.3	13.4	25.5	0.3	100
	55	MC NAIRY	1020.02	21.7	16.5	11.9	12.6	37.1	0.3	100
	57	MADISON	6801.19	13.8	10.5	7.6	7.6	60.4	0.2	100
	66	OBION	1127.42	26.0	19.8	14.1	10.0	29.8	0.3	100
	79	SHELBY	25531.87	21.1	16.5	13.1	10.0	39.0	0.3	100
	84	TIPTON	962.35	25.2	19.9	15.6	12.1	26.7	0.4	100
	92	WEAKLY	751.43	31.7	24.1	17.3	10.7	15.8	0.4	100
		TOTAL	288409	16.0	12.2	9.4	8.8	53.5	0.2	100

Table G-4. Contribution of SO_2 Emissions in Percentage by the 6 Vehicle Types in TN

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
EAST TN	1	ANDERSON	105.92	25.3	21.0	15.4	8.6	29.6	0.2	100
	4	BLEDSOE	10.99	31.2	25.9	18.9	12.5	11.2	0.2	100
	5	BLOUNT	104.52	33.3	27.7	20.2	10.2	8.4	0.2	100
	6	BRADLEY	136.06	22.9	19.0	13.9	9.1	34.9	0.1	100
	7	CAMPBELL	128.64	13.5	11.3	8.2	11.1	55.8	0.1	100
	10	CARTER	43.40	32.3	26.9	19.7	11.1	9.8	0.2	100
	13	CLAIBORNE	34.57	26.8	22.2	16.3	12.1	22.5	0.2	100
	15	COCKE	75.69	18.0	14.9	10.9	6.8	49.2	0.1	100
	18	CUMBERLAND	140.46	16.3	13.6	9.9	11.6	48.5	0.1	100
	29	GRAINGER	26.95	28.1	23.3	17.0	9.5	21.9	0.2	100
	30	GREENE	141.23	19.8	16.4	12.0	9.0	42.6	0.1	100
	32	HAMBLEN	78.87	25.9	21.5	15.7	9.6	27.1	0.2	100
	33	HAMILTON	428.37	27.1	22.5	16.5	10.6	23.1	0.2	100
	34	HANCOCK	4.21	34.2	28.4	20.7	9.7	6.8	0.2	100
	37	HAWKINS	45.10	31.8	26.3	19.2	11.0	11.5	0.2	100
	45	JEFFERSON	137.16	16.9	14.1	10.3	8.7	49.9	0.1	100
	46	JOHNSON	16.24	29.4	24.4	17.8	12.2	16.0	0.2	100
	47	KNOX	615.85	27.0	22.5	16.4	9.2	24.7	0.2	100
	53	LOUDON	122.33	18.0	15.0	10.9	10.2	45.8	0.1	100
	54	MC MINN	135.59	16.8	14.0	10.2	8.1	50.8	0.1	100
	58	MARION	122.92	14.8	12.3	9.0	13.2	50.7	0.1	100
	61	MEIGS	11.82	28.3	23.5	17.1	12.5	18.5	0.2	100
	62	MONROE	63.49	24.4	20.2	14.8	9.4	31.0	0.1	100
	65	MORGAN	16.44	31.5	26.1	19.1	10.6	12.5	0.2	100
	70	POLK	21.78	28.6	23.8	17.4	10.3	19.7	0.2	100
	72	RHEA	31.21	29.4	24.5	17.9	10.6	17.5	0.2	100
	73	ROANE	106.22	19.8	16.4	12.0	10.9	40.8	0.1	100
	76	SCOTT	20.78	28.6	23.8	17.4	13.4	16.6	0.2	100
	78	SEVIER	116.94	29.9	24.9	18.2	9.7	17.1	0.2	100
	82	SULLIVAN	197.76	27.2	22.7	16.6	7.9	25.5	0.2	100
	86	UNICOI	23.74	25.6	21.2	15.5	11.8	25.8	0.2	100
	87	UNION	14.67	30.6	25.4	18.6	10.2	15.0	0.2	100
	90	WASHINGTON	110.13	30.0	24.8	18.2	10.9	15.9	0.2	100
MIDDLE TN	2	BEDFORD	41.93	28.8	23.9	17.5	10.2	19.4	0.2	100
	8	CANNON	11.79	33.0	27.4	20.0	9.8	9.5	0.2	100
	11	CHEATHAM	62.98	21.3	17.7	12.9	10.3	37.6	0.1	100
	14	CLAY	7.14	30.2	25.0	18.3	11.4	14.9	0.2	100
	16	COFFEE	128.70	18.5	15.3	11.2	11.4	43.5	0.1	100
	19	DAVIDSON	922.78	25.6	21.4	15.6	9.5	27.8	0.2	100
	21	DE KALB	18.32	30.5	25.3	18.5	14.4	11.2	0.2	100
	22	DICKSON	95.00	18.6	15.5	11.3	10.0	44.4	0.1	100
	25	FENTRESS	19.11	30.1	25.0	18.3	10.6	15.8	0.2	100
	26	FRANKLIN	36.69	31.6	26.2	19.2	10.4	12.4	0.2	100
	28	GILES	73.46	16.8	13.9	10.2	7.5	51.5	0.1	100
	31	GRUNDY	30.86	16.0	13.3	9.7	13.5	47.5	0.1	100
	41	HICKMAN	68.86	14.6	12.1	8.9	10.3	54.0	0.1	100
	42	HOUSTON	5.83	32.4	26.9	19.7	10.9	10.0	0.2	100
	43	HUMPHREYS	68.50	13.4	11.2	8.2	10.1	57.1	0.1	100
	44	JACKSON	10.57	30.9	25.7	18.7	11.4	13.1	0.2	100
	50	LAWRENCE	42.07	29.6	24.6	18.0	12.5	15.2	0.2	100

Table G-4. Continued.

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
	51	LEWIS	8.95	28.0	23.3	17.0	12.9	18.6	0.2	100
	52	LINCOLN	38.37	27.4	22.7	16.6	12.4	20.8	0.2	100
	56	MACON	16.09	31.9	26.5	19.4	10.2	11.9	0.2	100
	59	MARSHALL	51.65	20.3	16.8	12.3	8.0	42.4	0.1	100
	60	MAURY	121.89	23.9	19.8	14.5	9.6	32.0	0.1	100
	63	MONTGOMERY	157.01	25.1	20.9	15.3	9.5	29.0	0.2	100
	64	MOORE	7.41	28.8	23.9	17.5	11.0	18.6	0.2	100
	67	OVERTON	23.47	29.8	24.7	18.1	12.4	14.8	0.2	100
	68	PERRY	10.86	25.4	21.1	15.4	11.2	26.8	0.2	100
	69	PICKETT	5.39	28.6	23.8	17.4	11.7	18.4	0.2	100
	71	PUTNAM	155.09	18.2	15.2	11.1	9.8	45.6	0.1	100
	74	ROBERTSON	129.78	20.0	16.7	12.2	9.0	42.0	0.1	100
	75	RUTHERFORD	301.17	24.1	20.1	14.7	11.9	29.2	0.1	100
	77	SEQUATCHIE	16.60	24.7	20.5	15.0	13.9	25.7	0.2	100
	80	SMITH	68.48	15.5	12.9	9.5	9.6	52.5	0.1	100
	81	STEWART	15.64	27.7	23.0	16.8	12.4	20.0	0.2	100
	83	SUMNER	134.02	30.1	25.1	18.3	10.4	15.9	0.2	100
	85	TROUSDALE	8.63	28.8	23.9	17.5	10.9	18.7	0.2	100
	88	VAN BUREN	8.37	25.9	21.5	15.7	11.9	24.9	0.2	100
	89	WARREN	36.70	30.4	25.3	18.5	12.5	13.1	0.2	100
	91	WAYNE	18.09	27.7	23.0	16.8	10.9	21.5	0.2	100
	93	WHITE	26.38	28.6	23.7	17.3	10.9	19.3	0.2	100
	94	WILLIAMSON	205.04	25.3	21.1	15.4	7.6	30.3	0.2	100
	95	WILSON	173.97	21.0	17.5	12.8	8.2	40.4	0.1	100
WEST TN	3	BENTON	45.58	15.5	12.9	9.4	11.0	51.1	0.1	100
	9	CARROLL	35.69	27.3	22.7	16.6	11.3	21.9	0.2	100
	12	CHESTER	19.72	24.3	20.2	14.8	15.7	24.8	0.2	100
	17	CROCKETT	21.88	25.2	20.9	15.3	7.8	30.6	0.2	100
	20	DECATUR	31.07	17.1	14.2	10.4	12.7	45.5	0.1	100
	23	DYER	60.90	23.9	19.9	14.5	8.6	32.9	0.1	100
	24	FAYETTE	87.23	17.7	14.7	10.8	10.0	46.6	0.1	100
	27	GIBSON	49.73	30.9	25.7	18.7	10.3	14.2	0.2	100
	35	HARDEMAN	30.06	28.8	23.9	17.5	11.0	18.7	0.2	100
	36	HARDIN	31.66	25.9	21.5	15.7	12.0	24.6	0.2	100
	38	HAYWOOD	96.15	12.2	10.1	7.4	10.4	59.8	0.1	100
	39	HENDERSON	108.44	14.1	11.8	8.6	10.9	54.4	0.1	100
	40	HENRY	38.79	27.5	22.8	16.7	11.5	21.3	0.2	100
	48	LAKE	4.52	28.2	23.4	17.1	14.3	16.8	0.2	100
	49	LAUDERDALE	28.31	27.6	22.9	16.8	14.1	18.4	0.2	100
	55	MC NAIRY	39.81	23.9	19.9	14.5	13.7	27.8	0.1	100
	57	MADISON	183.07	21.4	17.8	13.0	9.3	38.3	0.1	100
	66	OBION	45.47	27.6	22.9	16.7	10.8	21.9	0.2	100
	79	SHELBY	982.45	28.6	23.8	17.4	9.7	20.3	0.2	100
	84	TIPTON	44.15	29.1	24.2	17.7	11.5	17.3	0.2	100
	92	WEAKLY	31.97	31.9	26.5	19.4	10.9	11.0	0.2	100
		TOTAL	8790.37	24.2	20.1	14.7	10.0	30.9	0.1	100

Table G-5. Contribution of NH_3 Emissions in Percentage by the 6 Vehicle Types in TN

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
EAST TN	1	ANDERSON	81.47	51.4	32.7	12.8	1.0	2.0	0.1	100
	4	BLEDSOE	10.26	52.5	32.8	12.8	1.2	0.6	0.1	100
	5	BLOUNT	104.20	52.3	33.3	13.0	0.9	0.4	0.1	100
	6	BRADLEY	95.16	51.4	32.2	12.6	1.2	2.6	0.1	100
	7	CAMPBELL	57.01	48.2	31.1	11.7	2.2	6.6	0.1	100
	10	CARTER	42.11	52.3	33.3	12.8	1.0	0.5	0.1	100
	13	CLAIBORNE	27.95	51.9	32.5	12.7	1.3	1.5	0.1	100
	15	COCKE	42.36	50.4	31.5	12.3	1.1	4.6	0.1	100
	18	CUMBERLAND	73.43	49.2	31.8	12.0	2.0	4.9	0.1	100
	29	GRAINGER	22.74	52.2	32.6	12.8	1.0	1.4	0.1	100
	30	GREENE	86.41	50.8	31.8	12.4	1.3	3.7	0.1	100
	32	HAMBLEN	61.81	51.9	32.5	12.7	1.1	1.8	0.1	100
	33	HAMILTON	353.61	51.6	32.9	12.9	1.1	1.5	0.1	100
	34	HANCOCK	4.28	52.8	33.0	12.9	0.8	0.4	0.1	100
	37	HAWKINS	42.45	52.4	33.0	12.9	1.0	0.6	0.1	100
	45	JEFFERSON	73.11	49.6	31.6	12.3	1.5	4.9	0.1	100
	46	JOHNSON	14.31	52.3	32.7	12.8	1.2	1.0	0.1	100
	47	KNOX	503.92	51.6	32.9	12.8	1.0	1.6	0.1	100
	53	LOUDON	69.04	49.9	31.8	12.4	1.6	4.3	0.1	100
	54	MC MINN	71.54	50.0	31.3	12.2	1.4	5.1	0.1	100
	58	MARION	58.48	48.7	31.0	12.1	2.5	5.6	0.1	100
	61	MEIGS	10.05	52.1	32.6	12.7	1.3	1.1	0.1	100
	62	MONROE	46.98	51.6	32.3	12.6	1.1	2.2	0.1	100
	65	MORGAN	15.44	52.5	32.9	12.8	1.0	0.7	0.1	100
	70	POLK	18.73	52.2	32.7	12.8	1.1	1.2	0.1	100
	72	RHEA	27.55	52.3	32.7	12.8	1.1	1.0	0.1	100
	73	ROANE	64.89	50.7	31.7	12.4	1.6	3.5	0.1	100
	76	SCOTT	17.90	52.1	32.6	12.8	1.4	1.0	0.1	100
	78	SEVIER	105.28	52.0	33.1	12.9	1.0	1.0	0.1	100
	82	SULLIVAN	163.76	51.7	33.1	12.6	0.8	1.6	0.1	100
	86	UNICOI	18.25	51.6	32.5	12.7	1.4	1.8	0.1	100
	87	UNION	13.48	52.0	33.1	12.9	1.0	0.9	0.1	100
	90	WASHINGTON	98.20	52.2	32.8	12.8	1.1	0.9	0.1	100
MIDDLE TN	2	BEDFORD	36.24	52.2	32.7	12.8	1.1	1.2	0.1	100
	8	CANNON	11.58	52.7	33.0	12.9	0.9	0.5	0.1	100
	11	CHEATHAM	41.20	51.1	31.9	12.5	1.4	3.0	0.1	100
	14	CLAY	6.45	52.4	32.7	12.8	1.1	0.9	0.1	100
	16	COFFEE	73.98	50.4	31.5	12.3	1.8	4.0	0.1	100
	19	DAVIDSON	736.36	51.1	33.0	12.9	1.1	1.8	0.1	100
	21	DE KALB	16.72	52.3	32.7	12.8	1.4	0.6	0.1	100
	22	DICKSON	55.05	50.4	31.6	12.3	1.5	4.0	0.1	100
	25	FENTRESS	17.25	52.4	32.8	12.8	1.0	0.9	0.1	100
	26	FRANKLIN	34.60	52.5	32.9	12.8	1.0	0.7	0.1	100
	28	GILES	38.68	50.0	31.3	12.2	1.3	5.2	0.1	100
	31	GRUNDY	15.62	49.5	31.0	12.1	2.4	4.9	0.1	100
	41	HICKMAN	32.10	49.1	30.7	12.0	2.0	6.1	0.1	100
	42	HOUSTON	5.63	52.6	32.9	12.9	1.0	0.5	0.1	100
	43	HUMPHREYS	30.16	48.2	31.1	11.7	2.0	6.8	0.1	100
	44	JACKSON	9.77	52.5	32.8	12.8	1.1	0.7	0.1	100
	50	LAWRENCE	37.38	52.3	32.7	12.8	1.3	0.9	0.1	100

Table G-5. Continued.

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
	51	LEWIS	7.55	52.1	32.6	12.7	1.4	1.2	0.1	100
	52	LINCOLN	31.65	52.0	32.5	12.7	1.3	1.3	0.1	100
	56	MACON	15.31	52.6	32.9	12.8	1.0	0.7	0.1	100
	59	MARSHALL	32.27	50.9	31.8	12.4	1.1	3.6	0.1	100
	60	MAURY	88.54	51.6	32.2	12.6	1.2	2.3	0.1	100
	63	MONTGOMERY	119.67	51.8	32.4	12.7	1.1	2.0	0.1	100
	64	MOORE	6.41	52.2	32.7	12.8	1.1	1.1	0.1	100
	67	OVERTON	20.96	52.3	32.7	12.8	1.2	0.9	0.1	100
	68	PERRY	8.35	51.8	32.4	12.7	1.3	1.8	0.1	100
	69	PICKETT	4.64	52.2	32.6	12.8	1.2	1.1	0.1	100
	71	PUTNAM	89.41	49.9	32.2	12.1	1.5	4.2	0.1	100
	74	ROBERTSON	81.59	50.3	32.5	12.2	1.3	3.5	0.1	100
	75	RUTHERFORD	227.14	50.8	32.9	12.9	1.4	2.0	0.1	100
	77	SEQUATCHIE	12.47	51.6	32.3	12.6	1.6	1.8	0.1	100
	80	SMITH	34.16	49.0	31.7	11.9	1.7	5.6	0.1	100
	81	STEWART	13.03	52.0	32.6	12.7	1.3	1.3	0.1	100
	83	SUMNER	124.39	51.6	33.4	13.1	1.0	0.9	0.1	100
	85	TROUSDALE	7.46	52.2	32.7	12.8	1.1	1.1	0.1	100
	88	VAN BUREN	6.55	51.8	32.4	12.7	1.4	1.7	0.1	100
	89	WARREN	33.43	52.4	32.8	12.8	1.2	0.8	0.1	100
	91	WAYNE	15.07	52.1	32.6	12.7	1.2	1.4	0.1	100
	93	WHITE	22.64	52.2	32.6	12.8	1.1	1.2	0.1	100
	94	WILLIAMSON	161.72	51.1	33.0	12.9	0.9	2.0	0.1	100
	95	WILSON	115.44	50.3	32.6	12.7	1.1	3.2	0.1	100
WEST TN	3	BENTON	22.38	49.4	30.9	12.1	2.0	5.5	0.1	100
	9	CARROLL	29.37	52.0	32.5	12.7	1.2	1.4	0.1	100
	12	CHESTER	14.62	51.5	32.2	12.6	1.9	1.8	0.1	100
	17	CROCKETT	16.68	51.8	32.4	12.7	0.9	2.1	0.1	100
	20	DECATUR	16.67	49.9	31.2	12.2	2.1	4.5	0.1	100
	23	DYER	44.33	51.6	32.3	12.6	1.1	2.4	0.1	100
	24	FAYETTE	49.35	49.5	32.0	12.5	1.6	4.4	0.1	100
	27	GIBSON	45.94	52.5	32.8	12.8	1.0	0.8	0.1	100
	35	HARDEMAN	25.96	52.2	32.7	12.8	1.1	1.1	0.1	100
	36	HARDIN	24.85	51.8	32.4	12.7	1.4	1.7	0.1	100
	38	HAYWOOD	38.91	47.5	30.7	11.6	2.3	7.8	0.1	100
	39	HENDERSON	50.08	48.5	31.3	11.8	2.1	6.2	0.1	100
	40	HENRY	32.14	52.1	32.5	12.7	1.2	1.4	0.1	100
	48	LAKE	3.84	52.1	32.6	12.7	1.5	1.0	0.1	100
	49	LAUDERDALE	23.58	52.0	32.5	12.7	1.5	1.2	0.1	100
	55	MC NAIRY	29.00	51.5	32.2	12.6	1.7	2.0	0.1	100
	57	MADISON	120.33	51.1	32.0	12.5	1.3	3.1	0.1	100
	66	OBION	37.75	52.1	32.6	12.7	1.2	1.4	0.1	100
	79	SHELBY	864.39	51.5	33.2	13.0	1.0	1.2	0.1	100
	84	TIPTON	39.47	51.5	33.2	13.0	1.1	1.0	0.1	100
	92	WEAKLY	30.46	52.6	32.9	12.8	1.0	0.6	0.1	100
		TOTAL	6534.87	51.2	32.6	12.7	1.2	2.2	0.1	100

Table G-6. Contribution of PM2.5 Emissions in Percentage by the 6 Vehicle Types in TN

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
EAST TN	1	ANDERSON	55.29	12.1	9.1	10.1	14.0	54.4	0.2	100.0
	4	BLEDSOE	4.63	18.4	14.5	15.8	25.3	25.6	0.3	100.0
	5	BLOUNT	40.24	21.8	16.4	18.1	22.5	20.9	0.4	100.0
	6	BRADLEY	76.92	10.2	8.0	8.7	13.7	59.3	0.2	100.0
	7	CAMPBELL	92.08	4.4	3.3	4.1	13.3	74.9	0.1	100.0
	10	CARTER	17.39	20.0	15.1	17.3	23.7	23.6	0.4	100.0
	13	CLAIBORNE	17.14	13.4	10.6	11.5	20.7	43.5	0.2	100.0
	15	COCKE	49.21	6.9	5.4	5.9	8.9	72.7	0.1	100.0
	18	CUMBERLAND	93.77	5.7	4.3	5.3	14.8	69.8	0.1	100.0
	29	GRAINGER	12.85	14.6	11.5	12.6	17.0	44.1	0.3	100.0
	30	GREENE	87.19	8.0	6.3	6.9	12.4	66.2	0.1	100.0
	32	HAMBLEN	40.65	12.7	9.9	10.8	15.8	50.6	0.2	100.0
	33	HAMILTON	209.39	13.9	10.5	11.6	18.4	45.5	0.2	100.0
	34	HANCOCK	1.58	22.7	17.9	19.5	22.0	17.4	0.4	100.0
	37	HAWKINS	18.78	19.4	14.9	16.3	22.4	26.5	0.3	100.0
	45	JEFFERSON	90.87	6.2	4.8	5.3	11.2	72.3	0.1	100.0
	46	JOHNSON	7.34	16.1	12.7	13.9	23.1	34.0	0.3	100.0
	47	KNOX	303.65	13.8	10.4	11.5	16.0	48.2	0.2	100.0
	53	LOUDON	78.60	6.9	5.2	5.9	13.4	68.5	0.1	100.0
	54	MC MINN	90.62	6.3	4.9	5.4	10.4	73.0	0.1	100.0
	58	MARION	85.32	5.2	4.0	4.4	16.2	70.2	0.1	100.0
	61	MEIGS	5.56	14.9	11.8	12.8	22.6	37.7	0.3	100.0
	62	MONROE	34.28	11.2	8.9	9.6	14.9	55.2	0.2	100.0
	65	MORGAN	6.88	18.7	14.8	16.1	21.5	28.7	0.3	100.0
	70	POLK	10.16	15.2	12.0	13.1	18.8	40.6	0.3	100.0
	72	RHEA	14.16	16.2	12.8	13.9	19.8	37.0	0.3	100.0
	73	ROANE	65.44	8.0	6.3	6.9	15.1	63.6	0.1	100.0
	76	SCOTT	9.62	15.3	12.1	13.2	24.6	34.5	0.3	100.0
	78	SEVIER	51.61	16.8	12.7	14.2	18.7	37.3	0.3	100.0
	82	SULLIVAN	96.77	13.7	10.3	12.0	13.7	50.2	0.2	100.0
	86	UNICOI	12.31	12.5	9.6	10.5	19.4	47.7	0.2	100.0
	87	UNION	6.28	17.5	13.3	14.9	20.3	33.7	0.3	100.0
	90	WASHINGTON	49.25	17.2	13.2	14.3	20.7	34.2	0.3	100.0
MIDDLE TN	2	BEDFORD	19.52	15.5	12.2	13.2	18.7	40.1	0.3	100.0
	8	CANNON	4.63	20.8	16.5	17.9	21.2	23.2	0.4	100.0
	11	CHEATHAM	37.15	8.9	7.1	7.7	14.8	61.3	0.2	100.0
	14	CLAY	3.14	17.0	13.4	14.6	22.0	32.6	0.3	100.0
	16	COFFEE	82.05	7.2	5.7	6.2	15.2	65.6	0.1	100.0
	19	DAVIDSON	468.17	12.1	9.0	10.2	15.9	52.6	0.2	100.0
	21	DE KALB	7.90	17.5	13.9	15.1	28.3	24.9	0.3	100.0
	22	DICKSON	60.39	7.3	5.8	6.3	13.4	67.1	0.1	100.0
	25	FENTRESS	8.44	17.0	13.4	14.6	20.3	34.4	0.3	100.0
	26	FRANKLIN	15.33	18.9	14.9	16.2	21.2	28.5	0.3	100.0
	28	GILES	49.19	6.2	4.9	5.4	9.5	73.8	0.1	100.0
	31	GRUNDY	20.86	5.8	4.6	5.0	17.0	67.4	0.1	100.0
	41	HICKMAN	48.39	5.1	4.1	4.4	12.5	73.8	0.1	100.0
	42	HOUSTON	2.35	20.0	15.8	17.2	22.9	23.8	0.3	100.0
	43	HUMPHREYS	49.18	4.4	3.3	4.0	11.9	76.3	0.1	100.0
	44	JACKSON	4.51	18.0	14.2	15.5	22.7	29.4	0.3	100.0
	50	LAWRENCE	18.87	16.6	13.0	14.1	23.6	32.4	0.3	100.0

Table G-6. Continued.

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
	51	LEWIS	4.24	14.6	11.6	12.6	23.2	37.7	0.3	100.0
	52	LINCOLN	18.67	14.0	11.1	12.0	21.6	41.0	0.2	100.0
	56	MACON	6.62	19.2	15.2	16.6	21.0	27.7	0.3	100.0
	59	MARSHALL	31.53	8.3	6.5	7.1	11.2	66.8	0.1	100.0
	60	MAURY	66.87	10.9	8.6	9.3	14.9	56.1	0.2	100.0
	63	MONTGOMERY	82.96	12.1	9.4	10.2	15.4	52.8	0.2	100.0
	64	MOORE	3.43	15.5	12.2	13.3	20.1	38.6	0.3	100.0
	67	OVERTON	10.43	16.6	13.1	14.3	23.8	31.9	0.3	100.0
	68	PERRY	5.64	12.1	9.6	10.4	18.2	49.4	0.2	100.0
	69	PICKETT	2.51	15.3	12.1	13.1	21.3	37.9	0.3	100.0
	71	PUTNAM	98.78	6.7	5.0	6.2	13.2	68.8	0.1	100.0
	74	ROBERTSON	78.59	7.7	5.8	7.1	12.6	66.6	0.1	100.0
	75	RUTHERFORD	159.99	10.8	8.1	9.1	19.0	52.8	0.2	100.0
	77	SEQUATCHIE	8.77	11.6	9.2	10.0	22.3	46.7	0.2	100.0
	80	SMITH	46.76	5.3	4.0	4.9	11.9	73.9	0.1	100.0
	81	STEWART	7.51	14.2	11.3	12.3	21.9	40.0	0.2	100.0
	83	SUMNER	57.44	16.8	12.5	14.1	20.6	35.6	0.3	100.0
	85	TROUSDALE	3.99	15.4	12.2	13.3	20.1	38.7	0.3	100.0
	88	VAN BUREN	4.28	12.5	9.9	10.8	19.7	46.8	0.2	100.0
	89	WARREN	15.97	17.5	13.8	14.9	24.5	29.0	0.3	100.0
	91	WAYNE	8.73	14.2	11.2	12.2	19.2	42.8	0.2	100.0
	93	WHITE	12.32	15.2	12.0	13.1	19.9	39.6	0.3	100.0
	94	WILLIAMSON	105.15	11.6	8.8	9.9	12.7	56.8	0.2	100.0
	95	WILSON	102.15	8.4	6.3	7.2	11.8	66.1	0.2	100.0
WEST TN	3	BENTON	31.33	5.6	4.4	4.8	13.7	71.5	0.1	100.0
	9	CARROLL	17.42	13.9	11.0	12.0	19.8	43.2	0.2	100.0
	12	CHESTER	10.51	11.3	9.0	9.8	25.0	44.7	0.2	100.0
	17	CROCKETT	11.54	11.8	9.4	10.2	12.7	55.7	0.2	100.0
	20	DECATUR	20.45	6.4	5.1	5.5	16.5	66.4	0.1	100.0
	23	DYER	33.41	11.0	8.6	9.3	13.4	57.6	0.2	100.0
	24	FAYETTE	56.02	6.4	4.9	5.6	13.3	69.7	0.1	100.0
	27	GIBSON	21.35	18.0	14.2	15.4	20.4	31.7	0.3	100.0
	35	HARDEMAN	13.95	15.4	12.2	13.2	20.2	38.7	0.3	100.0
	36	HARDIN	16.17	12.7	10.0	10.9	20.0	46.3	0.2	100.0
	38	HAYWOOD	71.11	3.9	2.9	3.5	12.0	77.7	0.1	100.0
	39	HENDERSON	76.41	4.7	3.5	4.3	13.2	74.1	0.1	100.0
	40	HENRY	18.82	14.2	11.1	12.1	20.2	42.1	0.2	100.0
	48	LAKE	2.12	14.9	11.8	12.8	25.9	34.3	0.3	100.0
	49	LAUDERDALE	13.59	14.4	11.3	12.3	25.0	36.8	0.3	100.0
	55	MC NAIRY	21.58	10.9	8.6	9.4	21.5	49.3	0.2	100.0
	57	MADISON	108.17	9.2	7.2	7.8	13.4	62.3	0.2	100.0
	66	OBION	22.04	14.2	11.2	12.1	18.9	43.3	0.2	100.0
	79	SHELBY	449.68	15.1	11.3	12.7	18.1	42.6	0.3	100.0
	84	TIPTON	19.67	15.5	11.7	13.2	21.9	37.4	0.3	100.0
	92	WEAKLY	13.14	19.4	15.3	16.6	22.6	25.8	0.3	100.0
		TOTAL	4727.70	11.0	8.4	9.4	15.8	55.2	0.2	100

Table G-7. Contribution of PM10 Emissions in Percentage by the 6 Vehicle Types in TN

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
EAST TN	1	ANDERSON	72.80	17.0	12.2	10.9	12.2	47.5	0.3	100.0
	4	BLEDSOE	6.51	24.4	17.9	15.8	20.6	20.9	0.4	100.0
	5	BLOUNT	58.32	27.8	19.8	17.6	17.7	16.5	0.5	100.0
	6	BRADLEY	99.15	14.6	10.7	9.5	12.1	52.8	0.2	100.0
	7	CAMPBELL	111.84	7.0	5.0	4.7	12.5	70.7	0.1	100.0
	10	CARTER	24.90	26.1	18.6	17.1	18.9	18.9	0.4	100.0
	13	CLAIBORNE	22.90	18.7	13.7	12.2	17.8	37.4	0.3	100.0
	15	COCKE	61.23	10.3	7.5	6.7	8.2	67.1	0.2	100.0
	18	CUMBERLAND	115.73	8.9	6.3	6.0	13.7	64.9	0.2	100.0
	29	GRAINGER	17.38	20.1	14.8	13.1	14.4	37.4	0.3	100.0
	30	GREENE	109.83	11.8	8.7	7.7	11.3	60.4	0.2	100.0
	32	HAMBLEN	53.77	17.8	13.0	11.4	13.7	43.9	0.3	100.0
	33	HAMILTON	280.81	19.2	13.7	12.1	15.7	38.9	0.3	100.0
	34	HANCOCK	2.31	28.8	21.2	18.7	17.2	13.6	0.5	100.0
	37	HAWKINS	26.56	25.4	18.3	16.2	18.2	21.5	0.4	100.0
	45	JEFFERSON	112.40	9.5	6.8	6.1	10.4	67.1	0.2	100.0
	46	JOHNSON	10.09	21.8	16.0	14.2	19.2	28.4	0.4	100.0
	47	KNOX	406.47	19.0	13.6	12.1	13.6	41.3	0.3	100.0
	53	LOUDON	97.90	10.3	7.4	6.6	12.4	63.1	0.2	100.0
	54	MC MINN	111.96	9.4	6.9	6.1	9.6	67.8	0.2	100.0
	58	MARION	104.25	8.0	5.7	5.1	15.1	65.9	0.1	100.0
	61	MEIGS	7.55	20.4	15.0	13.3	19.1	31.8	0.3	100.0
	62	MONROE	44.74	16.0	11.7	10.4	13.1	48.5	0.3	100.0
	65	MORGAN	9.70	24.6	18.1	16.0	17.4	23.4	0.4	100.0
	70	POLK	13.84	20.8	15.3	13.5	15.8	34.2	0.3	100.0
	72	RHEA	19.45	21.9	16.1	14.2	16.5	30.9	0.4	100.0
	73	ROANE	82.42	11.8	8.6	7.7	13.8	58.0	0.2	100.0
	76	SCOTT	13.12	20.9	15.4	13.6	20.7	29.0	0.3	100.0
	78	SEVIER	71.45	22.6	16.2	14.5	15.5	30.9	0.4	100.0
	82	SULLIVAN	130.05	19.1	13.6	12.6	11.7	42.8	0.3	100.0
	86	UNICOI	16.25	17.5	12.7	11.2	16.8	41.5	0.3	100.0
	87	UNION	8.78	23.4	16.8	15.1	16.6	27.7	0.4	100.0
	90	WASHINGTON	68.06	22.9	16.5	14.6	17.2	28.4	0.4	100.0
MIDDLE TN	2	BEDFORD	26.60	21.1	15.4	13.6	15.7	33.8	0.3	100.0
	8	CANNON	6.68	26.9	19.8	17.5	16.9	18.5	0.4	100.0
	11	CHEATHAM	47.32	13.1	9.6	8.5	13.3	55.2	0.2	100.0
	14	CLAY	4.36	22.8	16.8	14.8	18.2	27.0	0.4	100.0
	16	COFFEE	102.45	10.8	7.9	7.0	13.9	60.3	0.2	100.0
	19	DAVIDSON	619.89	17.2	12.2	10.9	13.7	45.6	0.3	100.0
	21	DE KALB	11.01	23.4	17.2	15.2	23.3	20.5	0.4	100.0
	22	DICKSON	75.49	10.9	8.0	7.1	12.3	61.6	0.2	100.0
	25	FENTRESS	11.70	22.8	16.7	14.8	16.8	28.5	0.4	100.0
	26	FRANKLIN	21.63	24.9	18.2	16.1	17.2	23.2	0.4	100.0
	28	GILES	60.76	9.4	6.9	6.1	8.8	68.6	0.2	100.0
	31	GRUNDY	25.66	8.9	6.5	5.8	15.8	62.9	0.1	100.0
	41	HICKMAN	59.05	7.8	5.8	5.1	11.7	69.4	0.1	100.0
	42	HOUSTON	3.35	26.0	19.1	16.9	18.4	19.1	0.4	100.0
	43	HUMPHREYS	59.71	6.9	4.9	4.7	11.3	72.2	0.1	100.0
	44	JACKSON	6.32	23.9	17.5	15.5	18.5	24.1	0.4	100.0
	50	LAWRENCE	26.00	22.3	16.3	14.4	19.6	27.0	0.4	100.0

Table G-7. Continued.

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
	51	LEWIS	5.74	20.1	14.8	13.1	19.6	32.0	0.3	100.0
	52	LINCOLN	25.09	19.4	14.2	12.6	18.4	35.0	0.3	100.0
	56	MACON	9.39	25.3	18.5	16.4	17.0	22.4	0.4	100.0
	59	MARSHALL	39.84	12.2	8.9	7.9	10.1	60.7	0.2	100.0
	60	MAURY	86.89	15.6	11.4	10.1	13.1	49.6	0.3	100.0
	63	MONTGOMERY	108.96	16.9	12.4	10.9	13.4	46.1	0.3	100.0
	64	MOORE	4.68	21.1	15.5	13.7	16.9	32.5	0.3	100.0
	67	OVERTON	14.41	22.4	16.5	14.6	19.7	26.5	0.4	100.0
	68	PERRY	7.44	17.1	12.6	11.1	15.8	43.0	0.3	100.0
	69	PICKETT	3.42	20.9	15.3	13.6	17.9	31.9	0.3	100.0
	71	PUTNAM	123.38	10.3	7.3	7.0	12.1	63.2	0.2	100.0
	74	ROBERTSON	99.43	11.7	8.3	8.0	11.4	60.4	0.2	100.0
	75	RUTHERFORD	208.93	15.7	11.1	9.9	16.7	46.4	0.3	100.0
	77	SEQUATCHIE	11.50	16.5	12.1	10.7	19.5	40.9	0.3	100.0
	80	SMITH	57.44	8.2	5.9	5.6	11.1	69.0	0.1	100.0
	81	STEWART	10.13	19.7	14.5	12.8	18.6	34.1	0.3	100.0
	83	SUMNER	80.01	22.8	16.2	14.4	17.0	29.3	0.4	100.0
	85	TROUSDALE	5.45	21.0	15.5	13.7	16.9	32.6	0.3	100.0
	88	VAN BUREN	5.67	17.6	12.9	11.5	17.1	40.6	0.3	100.0
	89	WARREN	22.22	23.3	17.1	15.1	20.2	23.9	0.4	100.0
	91	WAYNE	11.77	19.7	14.4	12.8	16.3	36.5	0.3	100.0
	93	WHITE	16.77	20.8	15.2	13.5	16.7	33.4	0.3	100.0
	94	WILLIAMSON	138.86	16.8	11.9	10.6	11.0	49.4	0.3	100.0
	95	WILSON	130.02	12.6	9.0	8.0	10.6	59.6	0.2	100.0
WEST TN	3	BENTON	38.42	8.5	6.2	5.5	12.7	66.9	0.1	100.0
	9	CARROLL	23.39	19.3	14.1	12.5	16.9	36.9	0.3	100.0
	12	CHESTER	13.74	16.1	11.9	10.5	21.9	39.3	0.3	100.0
	17	CROCKETT	15.16	16.8	12.3	10.9	11.0	48.7	0.3	100.0
	20	DECATUR	25.32	9.7	7.1	6.3	15.2	61.6	0.2	100.0
	23	DYER	43.43	15.6	11.4	10.1	11.8	50.8	0.3	100.0
	24	FAYETTE	69.74	9.9	7.1	6.3	12.2	64.3	0.2	100.0
	27	GIBSON	29.86	23.9	17.5	15.5	16.7	26.0	0.4	100.0
	35	HARDEMAN	19.03	21.0	15.4	13.7	16.9	32.6	0.3	100.0
	36	HARDIN	21.42	17.8	13.0	11.5	17.3	40.1	0.3	100.0
	38	HAYWOOD	85.76	6.1	4.3	4.2	11.4	73.9	0.1	100.0
	39	HENDERSON	93.14	7.4	5.3	5.0	12.4	69.8	0.1	100.0
	40	HENRY	25.32	19.6	14.3	12.7	17.2	35.9	0.3	100.0
	48	LAKE	2.88	20.4	15.0	13.3	21.9	29.0	0.3	100.0
	49	LAUDERDALE	18.32	19.8	14.5	12.8	21.2	31.3	0.3	100.0
	55	MC NAIRY	28.09	15.6	11.5	10.2	19.0	43.5	0.3	100.0
	57	MADISON	137.80	13.3	9.7	8.6	12.1	56.2	0.2	100.0
	66	OBION	29.67	19.6	14.4	12.7	16.1	36.9	0.3	100.0
	79	SHELBY	614.72	20.8	14.8	13.1	15.2	35.8	0.4	100.0
	84	TIPTON	27.09	21.4	15.3	13.6	18.2	31.1	0.4	100.0
	92	WEAKLY	18.64	25.4	18.6	16.5	18.2	20.9	0.4	100.0
		TOTAL	6168.88	15.8	11.4	10.1	13.9	48.6	0.3	100.0

Table G-8. Contribution of CO_2 Emissions in Percentage by the 6 Vehicle Types in TN

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
EAST TN	1	ANDERSON	487566	30.3	25.1	17.4	6.5	20.5	0.2	100
	4	BLEDSOE	53987	35.0	28.7	20.0	8.8	7.3	0.2	100
	5	BLOUNT	527842	36.5	30.2	20.9	7.0	5.3	0.2	100
	6	BRADLEY	606224	28.4	23.2	16.2	7.1	25.0	0.2	100
	7	CAMPBELL	511624	18.9	15.8	10.7	9.7	44.8	0.1	100
	10	CARTER	216830	35.8	29.6	20.4	7.7	6.3	0.2	100
	13	CLAIBORNE	161453	31.6	25.9	18.0	8.9	15.4	0.2	100
	15	COCKE	316486	23.7	19.4	13.5	5.7	37.6	0.1	100
	18	CUMBERLAND	580631	22.0	18.3	12.5	9.7	37.5	0.1	100
	29	GRAINGER	127553	32.7	26.8	18.6	7.0	14.8	0.2	100
	30	GREENE	605390	25.5	20.9	14.5	7.3	31.7	0.1	100
	32	HAMBLEN	364325	30.9	25.3	17.6	7.2	18.7	0.2	100
	33	HAMILTON	2019922	31.8	26.4	18.2	7.8	15.7	0.2	100
	34	HANCOCK	21334	37.2	30.5	21.2	6.6	4.3	0.2	100
	37	HAWKINS	222101	35.4	29.0	20.2	7.7	7.5	0.2	100
	45	JEFFERSON	568271	22.6	18.7	12.9	7.3	38.4	0.1	100
	46	JOHNSON	78133	33.7	27.5	19.2	8.8	10.6	0.2	100
	47	KNOX	2894998	31.8	26.3	18.2	6.8	16.8	0.2	100
	53	LOUDON	514632	23.6	19.6	13.5	8.4	34.8	0.1	100
	54	MC MINN	558959	22.5	18.4	12.8	6.8	39.3	0.1	100
	58	MARION	496567	20.2	16.7	11.6	11.3	40.1	0.1	100
	61	MEIGS	56172	32.8	26.8	18.7	9.1	12.4	0.2	100
	62	MONROE	287862	29.6	24.3	16.9	7.2	21.8	0.2	100
	65	MORGAN	80865	35.3	28.9	20.1	7.4	8.1	0.2	100
	70	POLK	103815	33.1	27.1	18.9	7.5	13.2	0.2	100
	72	RHEA	150154	33.7	27.6	19.2	7.6	11.6	0.2	100
	73	ROANE	455535	25.4	20.8	14.5	8.8	30.4	0.1	100
	76	SCOTT	99228	33.1	27.1	18.9	9.7	11.1	0.2	100
	78	SEVIER	568311	34.0	28.1	19.5	6.9	11.3	0.2	100
	82	SULLIVAN	932798	32.0	26.5	18.2	5.8	17.3	0.2	100
	86	UNICOI	109043	30.5	25.1	17.5	8.9	17.9	0.2	100
	87	UNION	71818	34.5	28.6	19.8	7.2	9.8	0.2	100
	90	WASHINGTON	531878	34.0	28.0	19.5	7.8	10.5	0.2	100
MIDDLE TN	2	BEDFORD	200207	33.2	27.2	19.0	7.4	13.0	0.2	100
	8	CANNON	58958	36.4	29.8	20.8	6.8	6.1	0.2	100
	11	CHEATHAM	275198	26.9	22.0	15.3	8.2	27.5	0.1	100
	14	CLAY	34656	34.3	28.0	19.5	8.1	9.8	0.2	100
	16	COFFEE	543141	24.1	19.7	13.7	9.3	32.9	0.1	100
	19	DAVIDSON	4316620	30.7	25.6	17.6	7.0	19.0	0.2	100
	21	DE KALB	89318	34.5	28.2	19.6	10.2	7.3	0.2	100
	22	DICKSON	401480	24.3	19.9	13.9	8.2	33.5	0.1	100
	25	FENTRESS	92673	34.3	28.0	19.5	7.5	10.4	0.2	100
	26	FRANKLIN	180788	35.4	28.9	20.2	7.3	8.0	0.2	100
	28	GILES	302581	22.5	18.4	12.8	6.3	39.9	0.1	100
	31	GRUNDY	126250	21.5	17.6	12.3	11.4	37.0	0.1	100
	41	HICKMAN	276015	20.1	16.4	11.5	8.9	43.0	0.1	100
	42	HOUSTON	28978	35.9	29.4	20.5	7.6	6.4	0.2	100
	43	HUMPHREYS	271900	18.8	15.7	10.7	8.8	45.9	0.1	100
	44	JACKSON	51696	34.8	28.5	19.9	8.1	8.5	0.2	100
	50	LAWRENCE	203046	33.8	27.7	19.3	9.0	10.0	0.2	100

Table G-8. Continued.

REGION	CODE	COUNTY	EMISSIONS (tons/yr)	LDV	LDT1&2	LDT3&4, HDV2B	HDV3,4,5,6 &7, Buses	HDV8A &8B	MC	TOTAL
	51	LEWIS	42429	32.6	26.7	18.6	9.4	12.6	0.2	100
	52	LINCOLN	180474	32.1	26.2	18.3	9.1	14.1	0.2	100
	56	MACON	79523	35.6	29.1	20.3	7.1	7.7	0.2	100
	59	MARSHALL	222591	26.0	21.2	14.8	6.4	31.4	0.1	100
	60	MAURY	549531	29.2	23.9	16.7	7.4	22.7	0.2	100
	63	MONTGOMERY	718782	30.3	24.8	17.3	7.2	20.2	0.2	100
	64	MOORE	35397	33.3	27.2	19.0	7.9	12.4	0.2	100
	67	OVERTON	113471	34.0	27.8	19.4	8.9	9.7	0.2	100
	68	PERRY	49867	30.5	24.9	17.4	8.4	18.6	0.2	100
	69	PICKETT	25707	33.1	27.1	18.9	8.5	12.3	0.2	100
	71	PUTNAM	656865	23.9	19.9	13.6	8.0	34.4	0.1	100
	74	ROBERTSON	562628	25.7	21.4	14.6	7.2	30.9	0.1	100
	75	RUTHERFORD	1384295	29.3	24.5	16.8	8.9	20.3	0.2	100
	77	SEQUATCHIE	75780	29.9	24.4	17.0	10.5	18.0	0.2	100
	80	SMITH	279574	21.1	17.6	12.0	8.1	41.1	0.1	100
	81	STEWART	73792	32.3	26.5	18.4	9.1	13.6	0.2	100
	83	SUMNER	661498	34.2	28.5	19.6	7.3	10.3	0.2	100
	85	TROUSDALE	41200	33.2	27.2	19.0	7.9	12.5	0.2	100
	88	VAN BUREN	38690	30.9	25.2	17.6	8.9	17.2	0.2	100
	89	WARREN	178712	34.5	28.2	19.6	8.9	8.6	0.2	100
	91	WAYNE	85302	32.3	26.5	18.4	8.0	14.6	0.2	100
	93	WHITE	125683	33.1	27.1	18.9	7.9	12.9	0.2	100
	94	WILLIAMSON	954442	30.5	25.4	17.5	5.7	20.8	0.2	100
	95	WILSON	767148	26.7	22.2	15.3	6.4	29.2	0.1	100
WEST TN	3	BENTON	184958	21.0	17.2	12.0	9.4	40.2	0.1	100
	9	CARROLL	167643	32.0	26.2	18.3	8.4	14.9	0.2	100
	12	CHESTER	89685	29.5	24.1	16.8	11.9	17.4	0.2	100
	17	CROCKETT	100061	30.4	24.8	17.3	5.9	21.4	0.2	100
	20	DECATUR	128913	22.7	18.6	12.9	10.6	35.0	0.1	100
	23	DYER	274622	29.3	24.0	16.7	6.6	23.3	0.2	100
	24	FAYETTE	368085	23.4	19.5	13.4	8.2	35.3	0.1	100
	27	GIBSON	243160	34.9	28.5	19.9	7.3	9.3	0.2	100
	35	HARDEMAN	143537	33.2	27.2	18.9	8.0	12.5	0.2	100
	36	HARDIN	146454	30.9	25.3	17.6	9.0	17.0	0.2	100
	38	HAYWOOD	375034	17.4	14.5	9.9	9.2	48.9	0.1	100
	39	HENDERSON	435215	19.7	16.4	11.2	9.4	43.3	0.1	100
	40	HENRY	182658	32.2	26.4	18.4	8.5	14.4	0.2	100
	48	LAKE	21469	32.7	26.8	18.6	10.4	11.3	0.2	100
	49	LAUDERDALE	133673	32.2	26.4	18.4	10.4	12.4	0.2	100
	55	MC NAIRY	179933	29.2	23.9	16.6	10.5	19.7	0.2	100
	57	MADISON	801009	27.0	22.1	15.4	7.4	28.0	0.1	100
	66	OBION	214174	32.3	26.4	18.4	7.9	14.8	0.2	100
	79	SHELBY	4754049	33.0	27.5	18.9	7.0	13.4	0.2	100
	84	TIPTON	214979	33.4	27.8	19.1	8.2	11.4	0.2	100
	92	WEAKLY	158141	35.6	29.1	20.3	7.6	7.1	0.2	100
		TOTAL	40056648	29.4	24.3	16.8	7.6	21.7	0.2	100

Appendix H

Sensitivity Analysis of MOBILE6

Sensitivity Analysis of MOBILE6

Motor Vehicle Emission Factor Model

US Department of Transportation
Federal Highway Administration

Tianjia Tang, Mike Roberts, and Cecilia Ho

INTRODUCTION

On January 29, 2002, the US Environmental Protection Agency (EPA) officially released the latest motor vehicle emission factor model - MOBILE6. This release represents significant achievements in understanding both the motor vehicle performance and driver behavior when estimating motor vehicle emissions. The model also establishes routines to compute and analyze fuel and vehicle certification standards, state programs and different highway facilities as related to vehicle emission factors. Significant efforts by the US EPA were also carried out to establish a national default database used by the computer model. Along with the MOBILE6 release, more than 48 technical papers related to MOBILE6 development were also released. Overall, the MOBILE6 model predicts higher emission rates in the near future years and lower emission rates in the out years when compared to the MOBILE5 series models.

MOBILE6 is the approved US EPA motor vehicle emission factor model for estimating volatile organic compounds (VOC), nitrogen oxides (NOx), and carbon monoxide (CO) from different vehicles. State and local air quality and transportation agencies outside of California are required to use MOBILE6 in State Implementation Plan (SIP) development, and transportation conformity determination. The official release of MOBILE6 on January 29, 2002 started the 2-year grace period before MOBILE6 is required for new conformity determinations in most areas. As the end of the grace period approaches, transportation as well as air quality agencies are gaining an understanding of the behavior of the model, especially in impacts of using localized data as compared to EPA's national default data. Understanding the behavior of the model under various conditions becomes more critical as the tasks of collecting local data is time and resources intensive. The purpose of this paper is to provide a basic evaluation of the MOBILE6 model behavior under various conditions. Through the understanding of the model's behavior, state and local agencies can prioritize costly data collecting efforts and ultimately initiate emission control strategies according to parameter sensitivity.

METHODOLOGY

The MOBILE6 model utilized in this sensitivity analysis was the official version released by the EPA on January 29, 2002. All modeling runs were conducted on a Gateway X86-based PC with a GenuineIntel 600 Mhz microprocessor under the Windows 2000 Professional operating system.

During the sensitivity analysis, input parameters other than those being tested, were based on EPA national default data. For all scenarios, the calendar year used for modeling was 2005. For both VOC and NOx emission factor modeling, the evaluation month was July. For CO emission factor modeling, the analysis month was January. Temperatures used in all NOx and VOC analyses, unless otherwise noted, were 72.0° F and 98.0° F for the daily minimum and maximum. For analysis of CO emission, the daily minimum and maximum temperatures used were 20.0° F and 60.0° F. Fuel Reid Vapor Pressure (RVP) was 8.5 psi throughout all runs except for fuel RVP testing. Emission factors obtained and cited in this analysis are composite vehicle emission factors (VOC: start + running+ evaporative; NOx and CO: start + running) unless otherwise noted.

The least significant digit of the MOBILE6 emission factor output is the thousandth digit. When the emission factor is multiplied by vehicle miles traveled, which is typically in millions, the thousandth digit of the emission factor becomes very significant. In this sensitivity analysis, when an emission factor experiences a change in the least significant digit (the thousandth digit) as a result of one unit change in the parameter being

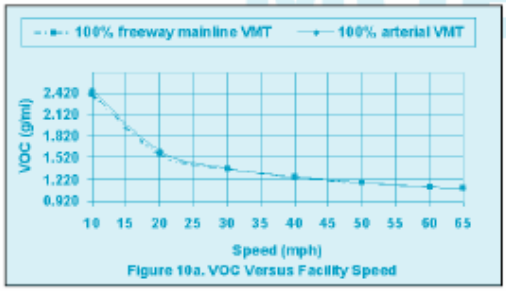

Figure 10a. VOC Versus Facility Speed

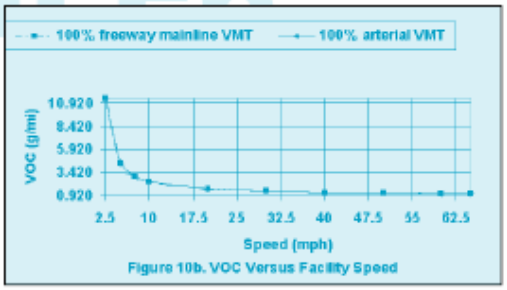

Figure 10b. VOC Versus Facility Speed

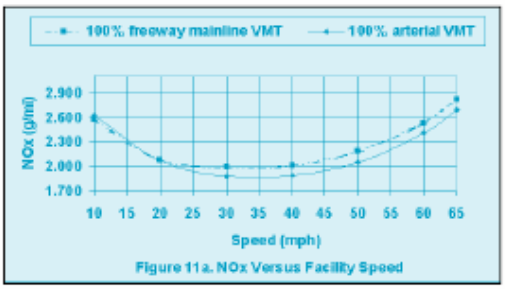

Figure 11a. NOx Versus Facility Speed

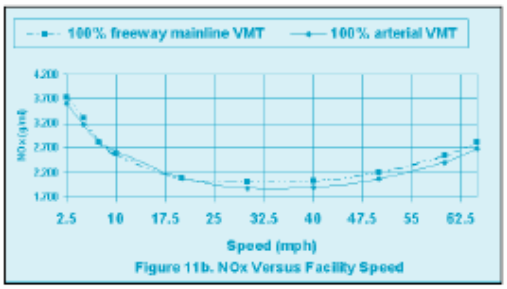

Figure 11b. NOx Versus Facility Speed

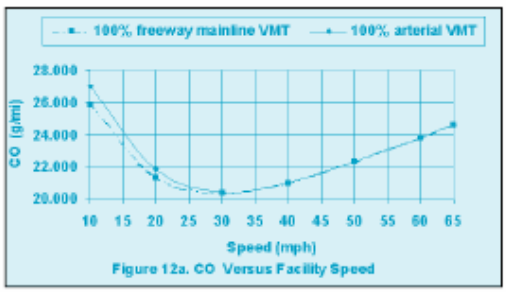

Figure 12a. CO Versus Facility Speed

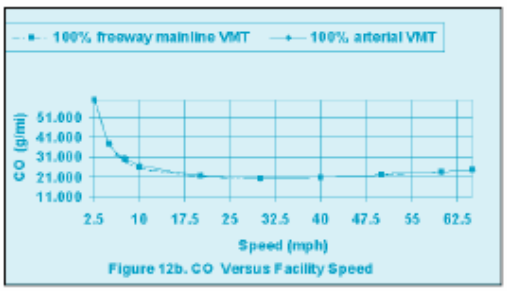

Figure 12b. CO Versus Facility Speed

NOx and CO emission rates exhibit a third order polynomial relationship with facility speeds. Between 10 mph and 35 mph, the NOx emission rate decreases as speed increases. Within the 35 mph to 65 mph range, the NOx emission rate increases as speed increases. CO emission rates decrease as speed increases in the range of 2.5 to 25 mph and increase in the range of 25 to 65 mph. Within the range of 2.5 mph to 10 mph (Figs. 10b and 12b), both CO and VOC emission rates increase dramatically as the facility speed drop to the 2.5 mph idle speed.

CO emission rates for freeway mainline and arterial facilities are identical when the facility speed exceeds 30 mph.

Humidity

The absolute humidity used in the testing ranged from 20 grains/lb to 118.0 grains/lb. At a temperature of 75.0° F, the 118.0 grains/lb represents 100% relative humidity. As indicated in Fig. 13, as humidity increases, VOC emission rates increase. However, the emission rate of VOC is not especially sensitive to changes in humidity levels. NOx emission rates are sensitive to humidity level changes. The NOx emission rate increases approximately 0.0030 g/mi per one grains/lb humidity decrease (Fig. 14). The higher the humidity level, the less NOx is produced. Humidity does not appear to have any effects on CO emissions (Fig. 15).

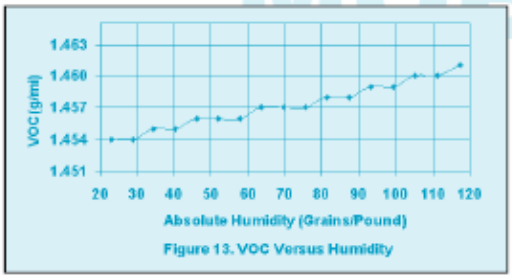

Figure 13. VOC Versus Humidity

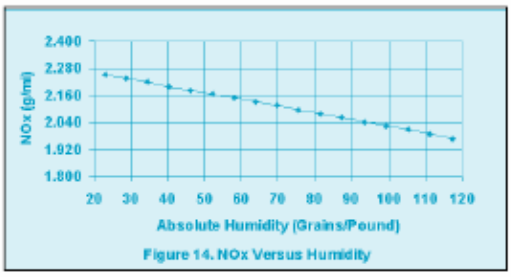

Figure 14. NOx Versus Humidity

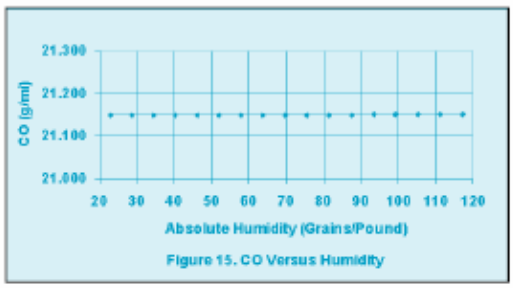

Figure 15. CO Versus Humidity

Percentage of Cloud Cover

The percentage of cloud cover evaluated is between 1% and 100%. As the cloud coverage increases, emission rates of VOC and NOx decrease (Figs. 16 and 17).

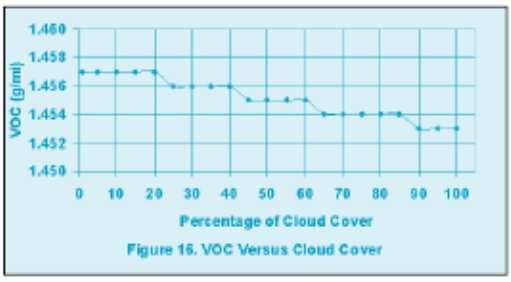

Figure 16. VOC Versus Cloud Cover

With every 10 % incremental increase in cloud cover age, the rate of NOx reduction is 0.0022 g/mi. VOC emission rates appear to be in a stepwise decrease as the cloud cover increases (Fig 16). CO emission rates are not sensitive to cloud cover (Fig. 18).

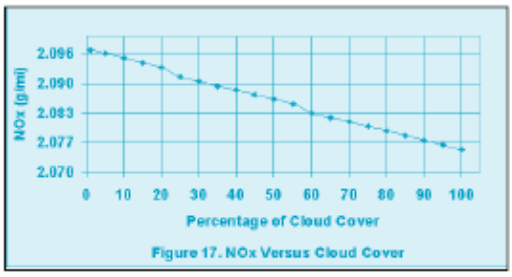

Figure 17. NOx Versus Cloud Cover

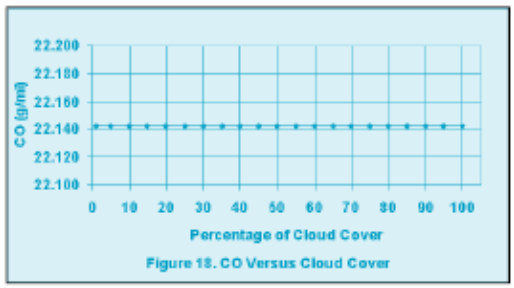

Figure 18. CO Versus Cloud Cover

Fuel Reid Vapor Pressure

Fuel Reid Vapor Pressure is one of the few parameters that a user must provide to a MOBILE6 input file. The RVP tested here ranges from 6.0 to 12.0 psi.

VOC emission rates are exceedingly sensitive to the RVP changes within the entire testing range. VOC emission rates increase 0.2543 g/mi per 1.0 psi RVP increase (Fig. 19).

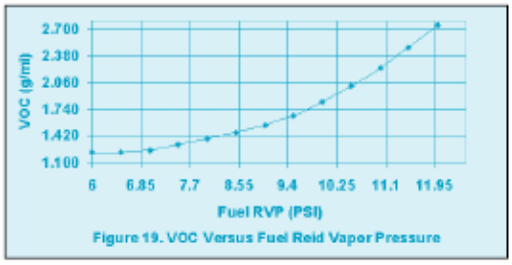

Figure 19. VOC Versus Fuel Reid Vapor Pressure

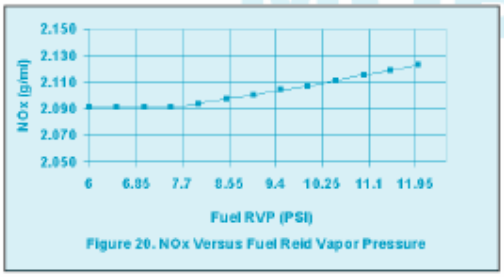

Figure 20. NOx Versus Fuel Reid Vapor Pressure

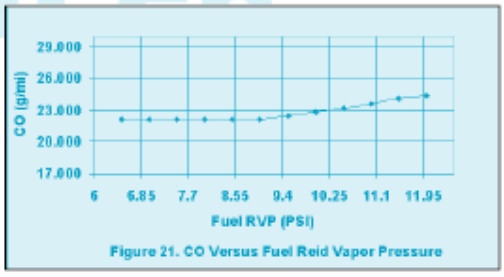

Figure 21. CO Versus Fuel Reid Vapor Pressure

As indicated in Fig. 20, NOx emission rates are not sensitive to RVP between the range of 6.0 and 7.5 psi. However, between 7.5 and 12.0 psi, NOx emission rates become very sensitive to RVP changes with an average 0.0071g/mi increase per 1.0 psi increase.

The effect of RVP on CO emission rates as depicted in Fig. 21, between 6.0 and 9.0 psi, is very limited. However, when the RVP moves into the range of 9.0 to 12.0 psi, the CO emission rate becomes sensitive to the RVP changes with an average increase of 0.7679 g/mi per 1.0 psi RVP increase.

Temperature Effects

Like the Absolute Humidity command, Min/Max Temp is another required input (Twenty-four hourly temperatures may be supplied as an alternative) that a user must supply. To evaluate temperature sensitivity, the command MIN/MAX TEMP was used by specifying the same minimum and maximum temperature for each testing scenario. The temperature tested in the analysis ranges from 7.5° F to 100.0° F.

As indicated in Figs. 22, 23, and 24, all emission factors are exceedingly sensitive to temperature changes.

VOC emission rates, as affected by temperature, exhibits a relatively complicated pattern. Within the range of 7.5° F to 40.0° F, the VOC emission rate decreases linearly at a rate of 0.0159 g/mi per one-degree temperature drop. When the temperature exceeds 40.0° F, the emission rate of VOC experiences a sudden jump (Fig. 22). Between

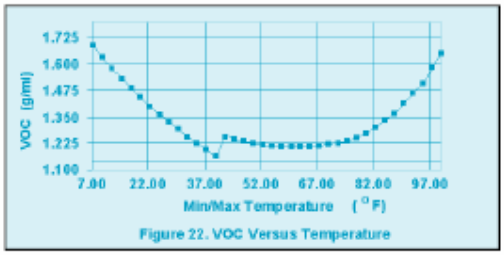

Figure 22. VOC Versus Temperature

42.5° F and 100.0° F, the emission rate, as affected by temperature changes, is best described by a third order polynomial equation. The temperature effect on NOx emissions is essentially the same as on CO emissions. The emission of NOx decreases at a rate of 0.0074 g/mi per one-degree temperature drop when the temperature is between 67.5° F and 7.5° F. When the temperature exceeds 70.5° F, the NOx emission rate increases at a rate of 0.0048 g/mi per one-degree temperature increase.

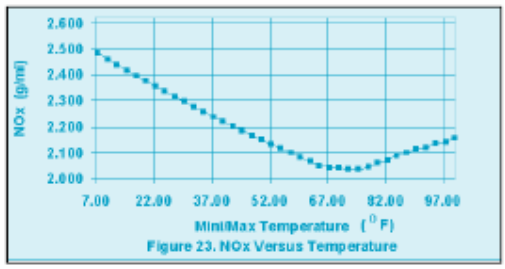

Figure 23. NOx Versus Temperature

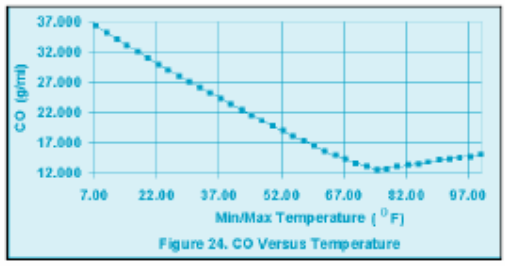

Figure 24. CO Versus Temperature

The CO emission rate decreases linearly at a rate of 0.3602 g/mi per one-degree temperature drop in the range of 72.5° F to 7.5° F; it increases at a rate of approximately 0.0956 g/mi per one-degree temperature increase within the range of 75.0° F and 100.0° F. Temperature exerts the most significant effect on CO emission.

Appendix I

TDOT Vehicle Speed Summary Tables

Table I-1. Summary of Vehicle Speed Measurements Performed by TDOT in 2003[23]

STATE OF TENNESSEE

SPEED SUMMARY REPORT

Send Quarterly Report to Office of Highway Information Management HPM-30

Send Annual Report to Office of Highway Safety HHS-32

Annual Report Quarters 1-2-3-4
Oct 2001 - Sept 2003

Quarterly Report (Annual Report) (Circle One) - Quarter of Year ANNUAL 2003 State TENNESSEE

HIGHWAY CATEGORY	NO. OF MILES	NO. OF VEHICLES OBSERVED	NO. OF LOCATIONS	NO. OF SESSIONS	PERCENT EXCEEDING							Average Speed In M.P.H.	Median Speed In M.P.H.	85 th Percentile Speed In M.P.H.
					55 MPH	60 MPH	65 MPH	70 MPH	75 MPH	80 MPH	85 MPH			
FREEWAYS POSTED AT 55 MPH.....	323	417,311	10	10	75.2%	50.3%	28.2%	14.0%	5.0%	****	****	60.7	60.1	69.7
FREEWAYS POSTED AT 70 MPH.....	709	306,184	18	18	****	****	82.4%	57.2%	22.7%	4.6%	0.8%	70.8	70.9	77.0
NON-FREEWAYS POSTED AT 55 MPH.....	7885	298,392	86	86	69.6%	36.6%	12.6%	3.3%	0.8%	****	****	58.4	58.0	64.5

**** - DATA NOT TO BE REPORTED

114 Stations were monitored during the Year
33 Stations were out of Service during the Year
6 Stations were removed from Plan
1 New Station was Added to plan
43 total Stations were in Original Plan

Table I-2. Distribution of Vehicle Speeds Measured by TDOT in 2003[23]

Send Annual Report to Office of Highway Safety HHS-32

QUARTERS,1,2,3,4 / 2003
Oct. 2002 - Sept. 2003

Quarterly Report Annual Report (Circle One) - Quarter of Year Annual 2003

NUMBER OF VEHICLES MEASURED

RECORDED SPEEDS	FREEWAYS POSTED AT 55 MPH						FREEWAYS POSTED AT 70 MPH				NON-FREEWAYS POSTED AT 55 MPH		
	RURAL INT	RURAL ART.	RURAL OTHER	URBAN INT	URBAN ART.	URBAN OTHER	RURAL INT.	RURAL ART.	RURAL OTHER	RURAL ART.	RURAL OTHER	URBAN ART.	URBAN OTHER
30 MPH AND BELOW	...	...	...	0	...	...	0	...	...	0	0	0	...
31 TO 35 MPH	...	...	...	13074	...	...	529	...	...	771	279	168	...
36 TO 40 MPH	...	...	...	1828	...	...	107	...	...	1017	561	244	...
41 TO 45 MPH	...	...	...	5075	...	...	275	...	...	3597	984	1210	...
46 TO 50 MPH	...	...	...	20401	...	...	894	...	...	13300	2913	5820	...
51 TO 55 MPH	...	...	...	63017	...	...	2952	...	...	40871	5151	13785	...
56 TO 60 MPH	...	...	...	103850	...	...	11026	...	...	68750	3937	25718	...
61 TO 65 MPH	...	...	...	92199	...	...	38202	...	...	48247	1384	22149	...
66 TO 70 MPH	...	...	...	59253	...	...	77011	...	...	18137	295	9223	...
71 TO 75 MPH	...	...	...	37928	...	...	105544	...	...	5288	56	2149	...
76 TO 80 MPH	...	...	...	15264	...	...	55561	...	...	1345	22	384	...
81 TO 85 MPH	...	...	...	3996	...	...	11777	...	...	308	11	82	...
86 AND ABOVE	...	...	...	1426	...	...	2306	...	...	189	1	46	...

INT.=INTERSTATE, ART.=NON INTERSTATE ARTERIALS, OTHER=NON ARTERIALS

417311	306184	201820	15594	80978		
		298392				

VITA

Jeongran Yun was born in Cheju island, South Korea, on February 2, 1978. She lived in Cheju Island until she graduated from Seogwipo Girls High School in February of 1996. She then moved to the mainland to enter Ajou University in March of 1996. From August of 2000 to May of 2001, she studied at the University of Tennessee, Knoxville, as an exchange student. She received a Bachelor of Science in Environmental Engineering from Ajou University in August of 2001. In January of 2002 she entered the graduate program in Environmental Engineering at the University of Tennessee, Knoxville. She is now completing her Master of Science degree and plans to enter the Ph.D program at the University of Tennessee, Knoxville, in the fall of 2004.