United States

ENVIRONMENTAL PROTECTION AGENCY

State Implementation Plans (SIPs) Summary

Section 110

Plan Name:	TN_CAA 110(l) Noninterference Demonstration for IM Removal for Middle TN_02262020
State(s):	TN
Submitted By:	James P Johnston, TN
Submitted:	February 27, 2020, 3:00 PM (EST)

Plan Submission Information

Enter a brief title of the plan or plan elements you are submitting. TN_CAA 110(l) Noninterference Demonstration for IM Removal for Middle TN_02262020

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Clean Air Act Section 110(l) Noninterference Demonstration

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Uploaded Documentation

FILE NAME	FILE TYPE	FILE DESCRIPTION
IM_Removal_Final_110(l)_Middle_TN_2-26-2020.pdf	pdf	CAA 110(l) Noninterference Demonstration and Public Participation Documents

STATE OF TENNESSEE
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February 26, 2020

Mary S. Walker
Regional Administrator
U.S. EPA, Region 4 Office
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303

Re: Final Submittal of Middle Tennessee's Noninterference Demonstration for Removal of the Vehicle Inspection and Maintenance (I/M) Program

Dear Administrator Walker:

I am pleased to submit the enclosed final version of the Clean Air Act §110(l) Noninterference Demonstration for removal of the vehicle Inspection and Maintenance (I/M) program for Middle Tennessee. Public Chapter No. 953, signed into law on May 15, 2018, called for the elimination of the I/M program 120 days after final EPA approval of the Noninterference Demonstration.

On February 26, 2020, the Tennessee Air Pollution Control Board approved the Noninterference Demonstration referenced above. This letter and attached documents detail the Noninterference Demonstration. Also included is the TDEC-APC's public notice for the Public Hearing, which was held on November 19, 2019. The public notice was posted to the TDEC-APC's website on October 18, 2019. On October 18, 2019, the TDEC-APC sent the pre-hearing submittal to the United States Environmental Protection Agency (USEPA), surrounding states, locals, and tribes. An additional public notice was posted to the TDEC-APC's website on January 16, 2020, for an additional 30-day comment period. There are two response to comments documents; one for the first comment period and one for the second comment period.

We have worked closely with your staff throughout the development of this Noninterference Demonstration and greatly appreciate their time, effort and consideration. If you have any questions or require additional information on this Noninterference Demonstration, please feel free to contact me at (615) 532-0554.

Sincerely,

Michelle W. Owenby
Division Director
Air Pollution Control

Attached Documents

Attachment	Description
Attachment 1	Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in Middle Tennessee Area
Attachment 2	Public Hearing Documents
Attachment 3	Comments Received (1st Public Notice)
Attachment 4	Response to Comments (1st Public Notice)
Attachment 5	2nd Public Notice
Attachment 6	Comments Received (2nd Public Notice)
Attachment 7	Response to Comments (2nd Public Notice)
Attachment 8	Board Order 20-003

Attachment 1

Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in the Middle Tennessee Area

Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in the Middle Tennessee Area

Prepared by:

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February 26, 2020

Table of Contents

1.0 Proposal……. 1
2.0 Background..... 1
3.0 Emission Inventory……...……..…. 3
3.1 Overview of Emission Inventory ……..3
3.2 Onroad Mobile Source Emissions ……...……..……4
3.2.1 Overview of Onroad Emissions ……..……..…… 4
3.2.2 Onroad Emissions Inventory Development ……..……4
3.2.3 Onroad Emissions in 2022 & Estimated Impact of IM Program…….……. 5
3.3 Nonroad Mobile Source Emissions……...…… 8
3.3.1 Nine Major categories of nonroad mobile source emissions ……....…….. 8
3.3.2 Marine, Aircraft, and Rail (MAR) sources ……...……9
3.3.3 Total for Nonroad Mobile Source Emissions……...…….…… 9
3.4 Point Emissions ……..….. 10
3.5 Nonpoint Emissions …….…. 10
3.6 Total Projected Emissions……... 12
4.0 Sensitivity of Ozone to NOx and VOC Emissions……..……....…….……... 13
5.0 Court Settlements Effecting Region ……..…….. 14
5.1 TVA settlement ……..……15
5.2 VW settlement ……..…….. 16
6.0 Ambient Air Quality Monitoring……..……16
6.1 Ozone ……. 17
6.2 Particulate Matter ……18
6.3 Nitrogen Dioxide …… 20
6.4 Carbon Monoxide ……..…… 20
7.0 Conclusion…… 22
7.1 Overview ……..…. 22
7.2 Ozone NAAQS…… 22
7.3 $PM_{2.5}$ NAAQS ……..……. 22
7.4 SO_2 NAAQS ……..…… 22
7.5 NO_2 NAAQS……..…… 22
7.6 CO NAAQS ……...…… 23
7.7 Pb NAAQS……..…..…. 23
7.8 Final Conclusion …….…… 23

List of Appendices

Appendix A: Tennessee Law, Public Chapter No. 953
Appendix B: Request for Removal and Redline of Tennessee Air Pollution Control Regulation 1200-03-29 and Davidson County Regulation No. 8 from the Tennessee SIP
Appendix C: Onroad Mobile Source Emissions Inventory
Appendix D: Methodology for Developing Input Datasets for the MOVES Model
Appendix E: Interagency Consultation
Appendix F: Nonroad Mobile Source Emissions Inventory; Nine Categories
Appendix G: Nonroad Mobile Source Emissions Inventory; Marine, Aircraft, and Rail
Appendix H: Point Source Emissions Inventory for Davidson County
Appendix I: Point Source Emissions Inventory for Four Facilities
Appendix J: Nonpoint Emissions Inventory
Appendix K: Sensitivity Analysis of Ozone to NOx and VOC

List of Tables

Table 1: Annual Vehicle Miles Traveled for Middle Tennessee Area in 2022……..…. 4
Table 2: Source Type Population Projections for Middle Tennessee Area in 2022……..…. 5
Table 3: Middle Tennessee Area Onroad Emissions without the I/M Program in 2022…….6
Table 4: Middle Tennessee Area Onroad Emissions with the Current I/M Program in 2022….6
Table 5: Benefit of the I/M Program in the Middle Tennessee Area in 2022…….…….…. 7
Table 6: Middle Tennessee Area Nonroad Mobile Source Emissions (9 categories) of CO, NOx, and VOC (in tons per year) for baseline year (2014 NEI) ……...…..8
Table 7: Middle Tennessee Area Nonroad Mobile Source Emissions (9 categories) of CO, NOx, and VOC (in tons per year) for projected future year (2022) ……...…….…. 8
Table 8: Middle Tennessee Area Nonroad Mobile Source Emissions (MAR) of CO, NOx, and VOC (in tons per year) for baseline year (2014 NEI) and projected future year (2022) …….……..…….…. 9
Table 9: Middle Tennessee Area Total Nonroad Mobile Source Emissions of CO, NOx, and VOC (in tons per year) for baseline year (2014 NEI) and projected future year (2022) …….……...…. 9
Table 10: Middle Tennessee Area Point Source Emissions for CO, NOx, and VOC (in tons per year) of baseline (2014 NEI) and projected future (2022) …….…. 10
Table 11: Middle Tennessee Area Nonpoint Emissions for CO, NOx, and VOC (in tons per year) of baseline (2014 NEI) …….…….....…. 11
Table 12: Middle Tennessee Area Nonpoint Emissions of CO, NOx, and VOC (in tons per year) for projected year 2022……..……..…..…. 11
Table 13: Middle Tennessee Area Total Projected Emissions of CO, NOx, and VOC (in tons per year) in projected year 2022 with the I/M Program……..... 12
Table 14: Middle Tennessee Area Total Projected Emissions of CO, NOx, and VOC (in tons per year) in projected year 2022 without the I/M Program……... 12
Table 15: Normalized sensitivities of NOx and VOC Emissions on 8-hour Daily Maximum Ozone Concentrations (ppb ozone/TPD) ……...….….13
Table 16: Emissions Increases Due to the I/M Program removal and Effects on Ozone Formation ……..….…. 14
Table 17: Ozone Design Values (DV in ppb) …….....…..…. 17
Table 18: $PM_{2.5}$ 24-hour Design Values (µg/m^3) for 2012-2018……...…….…. 18
Table 19: $PM_{2.5}$ Annual Design Values (µg/m^3)…….……...…. 19
Table 20: NO_2 1-hour Design Values (ppb)…….……..……...…. 20
Table 21: NO_2 Annual Mean (ppb)……...……...…. 21

List of Figures

Figure 1: Ozone Design Values (DV in ppb)……...…….…….…. 17
Figure 2: $PM_{2.5}$ 24-hour Design Values (DV in µg/m^3)……...….....…...……... 18
Figure 3: $PM_{2.5}$ Annual Design Values (DV in µg/m^3)……...…….…. 19
Figure 4: NO_2 1-hour Design Values (ppb)……...……..…….…. 20
Figure 5: NO_2 Annual Mean (ppb)……...…….…. 21

List of Acronyms and Abbreviations

AIRS	Aerometric Information Retrieval System
BMP	Beneficiary Mitigation Plan
CAA	Clean Air Act
CO	Carbon monoxide
CMAQ	Community Multi-scale Air Quality
CFR	Code of Federal Regulations
EAC	Early Action Compact
EMT	Environmental Mitigation Trust
EPA	United States Environmental Protection Agency
FR	Federal Register
HPMS	Highway Performance Monitoring System
I/M	Inspection and Maintenance
MOVES	Motor Vehicle Emissions Simulator
NEI	National Emission Inventory
NOx	Nitrogen Oxides
NO_2	Nitrogen Dioxide
NAAQS	National Ambient Air Quality Standards
O_3	Ozone
Pb	Lead
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter less than 10 microns
ppb	Parts per billion
ppm	Parts per million
SEMAP	Southeastern Modeling Analysis and Planning
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
TDEC	Tennessee Department of Environment and Conservation
TDEC-APC	Tennessee Department of Environment and Conservation, Division of Air Pollution Control
TDM	Travel Demand Model
TCA	Tennessee Code Annotated
TN	Tennessee
TPO	Transportation Planning Organization
TVA	Tennessee Valley Authority
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
VW	Volkswagen

1.0 Proposal Summary

The Tennessee Department of Environment and Conservation, Air Pollution Control Division (TDEC-APC) requests the United States Environmental Protection Agency (EPA) remove the requirement for an Inspection and Maintenance (I/M) program for the five-county Middle Tennessee area, which includes Davidson, Sumner, Wilson, Rutherford, and Williamson Counties (hereinafter referred to as the Middle Tennessee area) from Tennessee's State Implementation Plan (SIP). The SIP currently requires the Middle Tennessee area to implement an I/M program. In order to remove the requirement for an I/M program, the TDEC-APC must demonstrate noninterference through a noninterference demonstration pursuant to Clean Air Act (CAA) Section 110(l), which states the following:

> Each revision to an implementation plan submitted by a State under this chapter shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 7501 of this title), or any other applicable requirement of this chapter.

The information presented in this document will demonstrate that removing the I/M program from Tennessee's SIP will not interfere with attainment or maintenance of the ozone (O_3), fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), or lead (Pb) NAAQS.

Furthermore, this demonstration is being submitted in accordance with, and to satisfy, the requirements of the EPA guidance document entitled *Demonstrating Noninterference Under Section 110(l) of the Clean Air Act When Revising a State Implementation Plan* (dated June 8, 2005)*;* hereinafter referred to as the EPA 110(l) guidance.

2.0 Background

The CAA requires the EPA to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants (also known as "criteria air pollutants"). These pollutants are O_3, $PM_{2.5}$, SO_2, NO_2, CO, and Pb. All of the NAAQS will be evaluated in this demonstration; however, ozone will be the primary focus since the I/M program was a control strategy used to attain the ozone NAAQS. The criteria pollutants are found throughout the U.S. and at certain concentrations can be harmful to human health and the environment, and cause property damage. The State of Tennessee is required to develop a State Implementation Plan (SIP) to control air pollution within the state and maintain compliance with the NAAQS standards. In general, the SIP consists of programs, including: air quality monitoring, air quality modeling, emission inventories, emission control strategies, and documents (policies, rules, and plans) that the state uses to attain and maintain the NAAQS. Each area of the country is designated attainment or nonattainment based on whether the area is in compliance with the NAAQS (attainment) or not in compliance with the NAAQS (nonattainment). The Clean Air Act requires the EPA to

periodically review all of the NAAQS to ensure that they provide adequate health and environmental protection, and to update those standards as necessary.

Davidson County implemented an I/M program in response to the designations from the 1977 CAA. Davidson County began emissions testing of light duty vehicles in 1985. The I/M program required all light-duty motor vehicles registered in the Davidson County to be inspected annually for compliance with emissions performance and anti-tampering test criteria. More details of the current I/M program are given at the end of this section.

Ground level ozone is created by chemical reactions between NOx and VOC in the presence of sunlight. The EPA set the ozone NAAQS at 0.12 ppm (parts per million) 1-hour standard on February 8, 1979 (44 Federal Register (FR) 8202). In this document, this will be referred to as the 1979 ozone NAAQS. Although the NAAQS are cited in the federal regulations in units of ppm, the remainder of this document will use units of parts per billion (ppb) for ease of readability. In mathematical terms, 1,000 ppb is equivalent to 1 ppm. In terms of the NAAQS, 0.12 ppm is equivalent to 120 ppb. The passage of the 1990 Clean Air Act Amendments required expansion of the existing I/M program in Davidson County due to the moderate ozone nonattainment classification for the 1-Hour Ozone NAAQS. On November 6, 1991, the EPA designated the Middle Tennessee area as a moderate nonattainment area, which required the implementation of an I/M program (56 FR 56694). This meant that Rutherford, Sumner, Williamson and Wilson counties were also required to implement an I/M program in addition to Davidson County.

The TDEC-APC submitted a SIP to the EPA outlining the specifics of the I/M program for the Middle Tennessee area on July 17, 1994. The SIP was federally approved on September 26, 1995 (60 FR 38694). The I/M program started in Rutherford, Sumner, Williamson and Wilson counties on December 1, 1994. After coming back into compliance with the 1979 ozone NAAQS, the EPA redesignated the Middle Tennessee area as attainment on October 30, 1996 (61 FR 55903). This meant that the Middle Tennessee area was a maintenance area and was still required to have an I/M program.

On July 18, 1997, the EPA revised the NAAQS for ground-level ozone from a 120 ppb 1-hour standard to an 80 ppb 8-hour average standard. In this document, this will be referred to as the 1997 ozone NAAQS. Faced with a possible designation of nonattainment, the Middle Tennessee area entered into a voluntary program called an Early Action Compact (EAC) with the EPA in December 2002. The EPA offered the EAC as an option for reaching attainment earlier than would be required by the CAA's conventional nonattainment route. The EPA offered to defer the effective date of air quality nonattainment designations for these areas if they met the qualifications to participate in the EAC. Specifically, the EPA required development of a plan to bring the area's ozone design value to an attaining level by December 31, 2007. This plan had to contain a modeling demonstration that the area's projected emissions inventory in 2007 would lead to attaining the 8-hour ozone NAAQS. Through the region's efforts to proactively address ozone air quality, a demonstration was made that the area was expected to attain the new standard by December 31, 2007, and maintain it through at least 2017. The ozone NAAQS was revised in 2008 to a value of 75 ppb and again in 2015 to 70 ppb. The Middle Tennessee area

was classified as attainment for the 2008 and 2015 ozone NAAQS. Thus, the Middle Tennessee area is currently in attainment with all of the ozone NAAQS.

The full requirements of the current I/M program are found in Chapter 29 of the Tennessee Air Pollution Control Regulations (TAPCR 1200-03-29). The main requirements of this regulation are presented hereinafter. This regulation specifies an emission limit for CO and hydrocarbon (HC) for gasoline powered light-duty vehicles with a model year from 1975 to 1995. An onboard diagnostics (OBD) inspection is required for 1996 and newer gasoline powered light-duty vehicle and 2002 and newer diesel powered light-duty vehicles. The OBD is a system of vehicle component and condition monitors controlled by a central, onboard computer designed to signal the motorist when conditions exist which could lead to a vehicle's exceeding its certification standards by 1.5 times the Federal Test Procedure (FTP) standard. The FTP is a test procedure used to determine the compliance of vehicles with federal emission standards. The anti-tampering test ensures that the emission control devices (catalytic converter and fuel filler cap) are not in a tampered condition. Essentially, owners of vehicles that fail the emission performance and anti-tampering criteria must repair the vehicle so that it passes the test and can be properly registered in Tennessee. Thus, an I/M program ensures that vehicle emissions of CO, nitrogen oxides (NOx), and volatile organic compounds (VOC) are properly controlled. As a result of the proactive effort, the Middle Tennessee area met the EAC requirements by December 31, 2007, demonstrating attainment with the 8-hour NAAQS of 80 ppb. On April 2, 2008, the EPA designated the Middle Tennessee area as attainment for the ozone NAAQS (73 Federal Register 17897).

On May 15, 2018, a new law (Public Chapter No. 953) was passed in Tennessee that states that "no inspection and maintenance program shall be employed in this state on or after the effective date of this act." The law goes on to say that the requirement for the I/M program would end after the EPA approved a SIP revision showing removal of the I/M program would not interfere with attainment or maintenance of air quality standards. There is a provision in the law that allows any county with a local air pollution control program that implements its own I/M program on the effective date of the law change to continue the program if the governing body acted to do so within thirty (30) days of the effective date of the law change. Thus, the new law is the reason for the request to remove the I/M program from Tennessee's SIP. Appendix A contains the full language of the new law. The new law is codified in Tennessee Code Annotated (TCA) 68-201-119(b), (c) and (d) and 55-4-104. Concurrent with this noninterference demonstration, the TDEC-APC requests that Chapter 29 of the TAPCR and Davidson County's Regulation No. 8 be completely removed from Tennessee's SIP. Appendix B contains the proposed revisions to Chapter 29 and Regulaton No. 8.

3.0 Emission Inventory

This section is divided into six sub-sections as follows:

3.1 Overview of Emission Inventory
3.2 Onroad Mobile Source Emissions
3.3 Nonroad Mobile Source Emissions

3.4 Point Source Emissions
3.5 Nonpoint Emissions
3.6 Total emissions

3.1 Overview of Emission Inventory

If the EPA approves this noninterference demonstration for the removal of the I/M program, it would likely take place in either 2020 or 2021. Thus, emissions in the Middle Tennessee area were projected to 2022 since that would be the first anticipated full calendar year without the I/M program. The starting point for the emission projections for several sectors (nonroad, point, and nonpoint) was the 2014 National Emission Inventory (NEI), version 2. Emissions were then projected to 2022 using different techniques as stated in the subsections for each sector. The onroad emissions were projected using the Motor Vehicle Emissions Simulator (MOVES) model. Two onroad scenarios were modeled: (1) with an I/M program and (2) without an I/M program. Total emissions were then calculated by adding all the sector emissions together.

3.2 Onroad Mobile Source Emissions

This section is divided into three sub-sections as follows
3.2.1 Overview of Onroad Emissions
3.2.2 Onroad Emissions Inventory Development
3.2.3 Onroad Emissions in 2022 and the Estimated Impact of the IM Program

3.2.1 Overview of Onroad Emissions

Onroad mobile sources as an emissions source category is comprised of a large number of individual sources. Onroad mobile sources are all vehicles certified for onroad use. These include, for example, cars, motorcycles, pickup trucks, buses, delivery trucks and long-haul trucks (18 wheelers). As a group, onroad vehicles contribute significant amounts of certain air pollutants. Emissions from onroad sources are estimated through the use of locally gathered information on the vehicle population and the miles driven in each county, as well as a number of other inputs, combined with the EPA's Motor Vehicle Emissions Simulator (MOVES) model. Details on the development of the onroad emissions are contained in Appendices C, D, and E.

3.2.2 Onroad Emissions Inventory Development

The onroad mobile source emissions were developed using the most recent database for the EPA's MOVES2014a model, released in August of 2018. The emissions inventory for onroad sources was developed in conjunction with the Davidson County Metro Health Department Division of Pollution Control and the Nashville Metropolitan Planning Organization (MPO). Development of the onroad emission inventory followed the EPA's Technical Guidance on the use of MOVES for SIP emissions inventory development[1]. Onroad emissions were developed through the use of locally gathered data applied to EPA's Motor Vehicle Emissions Simulator

[1] *MOVES2014, MOVES2014a, and MOVES2014b Technical Guidance: Using MOVES to Prepare Emissions Inventories for State Implementation Plans and Transportation Conformity*. US EPA. EPA-420-B-18-039, August 2018.

(MOVES) model. Some of the locally developed data includes vehicles miles travelled (VMT) and vehicle population. Table 1 and Table 2 summarize the VMT and vehicle population in the five Middle Tennessee Counties.

Table 1: Annual Vehicle Miles Traveled for Middle Tennessee Counties in 2022

Middle Tennessee 2022 Annual Vehicle Miles Traveled						
Vehicle Type	MOVES Source Type ID	Davidson	Rutherford	Sumner	Williamson	Wilson
Motorcycle	11	57,713,968	26,292,483	12,155,938	22,386,905	12,586,664
Passenger Car	21	4,634,801,869	1,989,586,973	754,843,360	1,701,881,665	925,300,575
Passenger Truck	31	3,182,297,691	1,408,527,116	538,075,392	1,254,170,726	662,022,498
Light Commercial Truck	32	913,590,380	411,283,269	156,965,408	354,734,966	196,040,173
Intercity Bus	41	63,015	33,036	34,162	27,376	25,002
Transit Bus	42	1,077,154	66,228	-	125,553	-
School Bus	43	649,925	497,666	1,593,460	404,447	363,839
Refuse Truck	51	13,330,589	4,372,578	9,344,581	5,224,103	3,218,185
Single Unit Short-haul Truck	52	319,896,217	102,930,408	293,103,105	89,442,084	62,515,507
Single Unit Long-haul Truck	53	15,865,508	5,199,065	11,868,915	5,803,116	3,611,621
Motor Home	54	11,403,222	3,707,775	8,777,445	4,014,639	2,487,548
Combination Short-haul Truck	61	175,962,149	86,151,150	29,115,618	56,230,707	41,437,374
Combination Long-haul Truck	62	597,742,508	292,225,031	97,610,284	192,506,485	141,754,651
Total:		9,924,394,196	4,330,872,778	1,913,487,668	3,686,952,773	2,051,363,637

Table 2: Source Type Population Projections for the Middle Tennessee Area in 2022

Vehicle Type	MOVES Source Type ID	Source Type Population 2022				
		Davidson	Rutherford	Sumner	Williamson	Wilson
Motorcycle	11	11,233	7,992	5,921	5,845	4,212
Passenger Car	21	324,177	139,019	86,521	136,657	62,003
Passenger Truck	31	206,060	91,902	58,046	90,993	42,052
Light Commercial Truck	32	52,384	23,371	14,751	23,151	10,702
Intercity Bus	41	15	4	1	4	3
Transit Bus	42	403	11	-	27	-
School Bus	43	932	363	281	356	263
Refuse Truck	51	402	138	55	117	76
Single Unit Short-haul Truck	52	12,807	4,869	2,951	3,079	2,527
Single Unit Long-haul Truck	53	589	202	86	160	105
Motor Home	54	3,641	1,239	547	952	622
Combination Short-haul Truck	61	7,285	2,111	606	1,763	1,267
Combination Long-haul Truck	62	7,942	2,298	652	1,937	1,391
Total		627,870	273,519	170,418	265,041	125,223

More detailed information on how onroad emissions were estimated is contained in Appendices C, D, and E.

3.2.3 Onroad Emissions in 2022 and the Estimated Impact of the I/M Program

Table 3 illustrates the onroad emissions for CO, NOx and VOCs in the Middle Tennessee area in 2022 without an I/M Program. Table 4 illustrates the onroad emissions for CO, NOx and VOCs in Middle Tennessee area in 2022 with the current I/M Program. Table 5 illustrates the difference between the two scenarios. This difference is the expected impact of the Middle Tennessee area I/M program in 2022 as generated by the EPA's MOVES model. The difference

in the two scenarios (Table 5) for the onroad sector is a 14.4% increase in CO emissions, a 4.2% increase in NOx emissions, and a 12.4% increase in VOC emissions.

Table 3: Middle Tennessee Area Onroad Emissions without the I/M Program in 2022.

No I/M Scenario in 2022		**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**
Vehicle Type	SourceType	------- tons/year -------		
Motorcycle	11	1,665.90	93.23	279.85
Passenger Car	21	33,473.99	1,643.96	2,201.84
Passenger Truck	31	34,874.37	2,388.51	2,017.64
Light Commercial Truck	32	5,958.15	358.53	268.97
Intercity Bus	41	0.49	1.18	0.08
Transit Bus	42	5.91	1.70	0.23
School Bus	43	33.94	6.03	1.11
Refuse Truck	51	50.67	128.98	7.96
Single Unit Short-haul Truck	52	3,799.84	1,262.13	213.99
Single Unit Long-haul Truck	53	76.51	89.14	10.52
Motor Home	54	535.11	70.48	27.18
Combination Short-haul Truck	61	537.52	1,528.05	94.75
Combination Long-haul Truck	62	1,171.85	4,215.76	249.21
	Total:	82,184.25	11,787.69	5,373.33

Table 4: Middle Tennessee Area Onroad Emissions with the Current I/M Program in 2022.

Current I/M Scenario 2022		**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**
Vehicle Type	SourceType	------- tons/year -------		
Motorcycle	11	1,665.90	93.23	279.85
Passenger Car	21	28,863.86	1,449.85	1,919.18
Passenger Truck	31	29,799.75	2,134.39	1,739.09
Light Commercial Truck	32	5,274.62	328.24	237.09
Intercity Bus	41	0.49	1.18	0.08
Transit Bus	42	5.91	1.70	0.23
School Bus	43	33.94	6.03	1.11
Refuse Truck	51	50.67	128.98	7.96
Single Unit Short-haul Truck	52	3,799.84	1,262.13	213.99
Single Unit Long-haul Truck	53	76.51	89.14	10.52
Motor Home	54	535.11	70.48	27.18
Combination Short-haul Truck	61	537.52	1,528.05	94.75
Combination Long-haul Truck	62	1,171.85	4,215.76	249.21
	Total:	71,815.97	11,309.17	4,780.23

Table 5: Benefit of the I/M Program in the Middle Tennessee Area in 2022.

Difference between I/M and no I/M Scenarios in 2022		**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**
Vehicle Type	SourceType	------- tons/year -------		
Motorcycle	11	0.00	0.00	0.00
Passenger Car	21	4,610.12	194.11	282.66
Passenger Truck	31	5,074.62	254.12	278.55
Light Commercial Truck	32	683.53	30.28	31.89
Intercity Bus	41	0.00	0.00	0.00
Transit Bus	42	0.00	0.00	0.00
School Bus	43	0.00	0.00	0.00
Refuse Truck	51	0.00	0.00	0.00
Single Unit Short-haul Truck	52	0.00	0.00	0.00
Single Unit Long-haul Truck	53	0.00	0.00	0.00
Motor Home	54	0.00	0.00	0.00
Combination Short-haul Truck	61	0.00	0.00	0.00
Combination Long-haul Truck	62	0.00	0.00	0.00
	Total:	10,368.28	478.52	593.10

3.3 Nonroad Mobile Source Emissions

There are several categories of nonroad mobile source emissions. This section is divided into the following sub-sections:

3.3.1 Nine major categories of nonroad mobile source emissions
3.3.2 Marine, Aircraft, and Rail (MAR) sources
3.3.3 Total for Nonroad Mobile Source Emissions

3.3.1 Nine Major Categories of Nonroad Mobile Source Emissions

County-level emission estimates for the 9 major categories of nonroad mobile source emissions were developed using the EPA's 2014 Version 2 NEI. The 9 major categories are listed in Tables 6 and 7. Table 6 shows the baseline emissions in 2014 and Table 7 shows the projected emissions in 2022. Appendix F contains more detailed information.

Table 6: Middle Tennessee Area Nonroad Mobile Source Emissions (9 categories) of CO, NOx, and VOC (in tons per year) for Baseline Year (2014 NEI)

9 Major Categories	**CO**	**NOx**	**VOC**
Agricultural Equipment	264	296	32
Commercial Equipment	11,791	507	481
Construction and Mining Equipment	3,802	3,244	494
Industrial Equipment	2,050	599	92
Lawn and Garden Equipment	27,880	451	1,795
Logging Equipment	16.7	1.9	2.1
Pleasure Craft	2,194	198	624
Railroad Equipment	12.3	6.4	1.3
Recreational Equipment	5,845	72	1,756
Total Emissions	53,854	5,376	5,278

Table 7: Middle Tennessee Area Nonroad Mobile Source Emissions (9 categories) of CO, NOx, and VOC (in tons per year) for Projected Future Year (2022)

9 Major Categories	**CO**	**NOx**	**VOC**
Agricultural Equipment	79	88	9
Commercial Equipment	9,956	290	353
Construction and Mining Equipment	2,648	1,606	281
Industrial Equipment	1,632	364	55
Lawn and Garden Equipment	27,274	330	1,612
Logging Equipment	9.9	0.5	1.2
Pleasure Craft	1,947	173	323
Railroad Equipment	11.7	3.7	0.8
Recreational Equipment	2,840	33	469
Total Emissions	46,398	2,887	3,104

3.3.2 Marine, Aircraft, and Rail (MAR) Sources

Base year emissions for MAR sources were obtained from the 2014 Version 2 NEI. Emissions were projected to 2022 by growing the base year 2014 emissions by the appropriate EPA growth factors over an 8 year span. For source codes with no known growth factor, a 3 percent increase was applied to the base year 2014 emissions. Appendix G contains more detailed information.

Table 8: Middle Tennessee Area Nonroad Mobile Source Emissions (MAR) of CO, NOx, and VOC (in tons per year) for Baseline Year (2014 NEI) and Projected Future Year (2022)

MAR Source Type	**2014 NEI V2**			**2022 Projection**		
	CO	**NO_X**	**VOC**	**CO**	**NO_X**	**VOC**
Rail	298	2,055	106	229	1,570	82
Marine	30	107	11	34	123	12
Airport	2,314	800	243	2,444	833	254
Total Emissions	2,642	2,963	360	2,707	2,527	347

3.3.3 Total for Nonroad Mobile Source Emissions

Table 9 shows the total emissions for the nonroad mobile sources sector, which includes the 9 major nonroad categories, as well as mobile, aircraft, and rail emissions.

Table 9: Middle Tennessee Area Total Nonroad Mobile Source Emissions of CO, NOx, and VOC (in tons per year) for Baseline Year (2014 NEI) and Projected Future Year (2022)

	2014 NEI V2			**2022 Projection**		
	CO	**NO_X**	**VOC**	**CO**	**NO_X**	**VOC**
Total Emissions	56,497	8,339	5,638	49,105	5,413	3,451

3.4 Point Source Emissions

Point source emissions for Sumner, Wilson, Rutherford, and Williamson Counties were obtained from the 2014 Version 2 NEI. For these four counties, only facilities with a Major Source Permit[2] and actual emissions of CO, NOx, or VOC greater than 100 tons per year were included. Metro Nashville/Davidson County Pollution Control Division provided emission data for all point sources in Davidson County for 2017. In the table below, these sources are grouped together as "Davidson County Facilities". Appendix H contains more detailed information about the Davidson County facilities. Except for the four facilities mentioned below, future-year emissions were developed by growing the base year 2014 or 2017 emissions by the appropriate EPA growth factors, or, for sources with no known growth factor, using engineering judgement. Appendix I contains details on how 2022 projections were developed for BFI Waste Systems, Bridgestone, Hoeganaes, and TVA Gallatin.

Table 10: Middle Tennessee Area Point Source Emissions for CO, NOx, and VOC (in tons per year) of Baseline and Projected Future (2022)

Facility	**Baseline**			**2022 Projection**		
	CO	**NO_X**	**VOC**	**CO**	**NO_X**	**VOC**
BFI Waste Systems of Tennessee, LLC	133	24	25	186	34	29
Bridgestone Americas Tire Operations, LLC	27	26	204	27	26	204
Nissan North America, Inc.	58	52	2,377	52	47	2,237
Hoeganaes Corporation	793	95	7	751	90	6
TVA Gallatin Fossil Plant	884	5,106	106	873	1,143	103
Midwestern Gas Transmission, Station 2101	41	529	20	44	572	21
Tennessee Gas Pipeline Company, LLC	101	921	60	105	976	59
Davidson County Facilities	531	1,286	1,004	657	1,567	1,208
Total Emissions	2,568	8,040	3,803	2,696	4,455	3,867

3.5 Nonpoint Emissions

For the nonpoint emission inventory, fourteen categories were determined to be contributors to the particular pollutants of interest, i.e. CO, NOx, and VOC. The development of the nonpoint emission inventory was completed by following the EPA's established methodologies that are laid out in the nonpoint tools published by the EPA and available on the NOMAD Sharepoint website. The fourteen categories are listed in Tables 11 and 12. Table 11 shows the baseline emissions in 2014, and Table 12 shows the projected emissions in 2022. Appendix J contains a description of each of the fourteen categories and the methodology used for projecting emissions to 2022.

[2] Major (or Title V) Source Permits are issued to facilities with potential emissions over 100 tons per year of an air contaminant or 10 tons/year for a single "hazardous air pollutants" (HAP) or 25 tons/year for any combination of HAP's.

Table 11: Middle Tennessee Area Nonpoint Emissions for CO, NOx, and VOC (in tons per year) of Baseline (2014 NEI)

Category	**CO**	**NOx**	**VOC**
Agricultural Livestock	0	0	37
Agricultural Pesticides	0	0	57
Asphalt Paving	0	0	226
Aviation Gasoline	0	0	101
Commercial Cooking	121	0	44
Composting	0	0	154
Gasoline Stage 1 Distribution	0	0	2,175
Human Cremation	0.03	6.79	0.02
Open Burning	31,113	963	2,141
Residential Heating	383	919	53
Industrial, Commercial, & Institutional Fuel Combustion	3,062	1,684	103
Residential Wood Combustion	3,769	66	623
Residential Charcoal Grilling	2,929	63	55
Solvents	0	0	13,948
Total Emissions	41,375	3,702	19,716

Table 12: Middle Tennessee Area Nonpoint Emissions of CO, NOx, and VOC (in tons per year) for Projected Year 2022

Category	**CO**	**NOx**	**VOC**
Agricultural Livestock	0	0	39
Agricultural Pesticides	0	0	57
Asphalt Paving	0	0	329
Aviation Gasoline	0	0	102
Commercial Cooking	138	0	51
Composting	0	0	163
Gasoline Stage 1 Distribution	0	0	2,527
Human Cremation	0.03	6.61	0.02
Open Burning	35,401	1,098	2,465
Residential Heating	382	919	53
Industrial, Commercial, & Institutional Fuel Combustion	2,153	1,336	79
Residential Wood Combustion	4,722	79	750
Residential Charcoal Grilling	3,036	65	57
Solvents	0	0	16,018
Total Emissions	45,833	3,504	22,690

3.5 Total Projected Emissions

The total projected emissions in 2022 were calculated by adding the four sectors (onroad, point, nonroad, and non-point) together. Table 13 shows the total projected emission in 2022 with the I/M program. Table 14 shows the total projected emissions in 2022 without the I/M program. Since the I/M program only effects emissions in the onroad sector, the projected emissions in the other sectors (point, nonroad, and non-point) are the same between the "with the I/M program" and the "without the I/M program" scenarios.

The difference in the two scenarios for the onroad sector is a 10,368.28 ton per year increase in CO emissions, a 478.52 ton per year increase in NOx emissions, and a 593.1 ton per year increase in VOC emissions. On a percentage basis, the difference in the two scenarios for the onroad sector is a 14.4% increase in CO emissions, a 4.2% increase in NOx emissions, and a 12.4% increase in VOC emissions. The difference in the two scenarios for all four sectors combined is a 6.1% increase in CO emissions, a 1.9% increase in NOx emissions, and a 1.7% increase in VOC emissions. These small increases in NOx and VOC emissions are not expected to significantly increase ozone concentrations. The Conclusion Section of this document further discusses the implications of these emission increases.

Table 13: Middle Tennessee Area Total Projected Emissions of CO, NOx, and VOC (in tons per year) in Projected Year 2022 with the I/M Program

Sector	**CO**	**NO_X**	**VOC**
Onroad	71,816	11,309	4,780
Point	2,696	4,455	3,867
Nonroad	49,105	5,413	3,451
Non-Point	45,833	3,504	22,690
Total Emissions	169,450	24,681	34,788

Table 14: Middle Tennessee Area Total Projected Emissions of CO, NOx, and VOC (in tons per year) in Projected Year 2022 without the I/M Program

Sector	**CO**	**NO_X**	**VOC**
Onroad	82,184	11,788	5,373
Point	2,696	4,455	3,867
Nonroad	49,105	5,413	3,451
Non-Point	45,833	3,504	22,690
Total Emissions	179,818	25,160	35,382

4.0 Sensitivity of Ozone to NOx and VOC Emissions

To quantify the potential impact of removal of the I/M program, the TDEC-APC completed a photochemical modeling sensitivity analysis. The analysis presented in this section is included as additional weight of evidence to show that the emissions increases resulting from removal of the I/M program will have an insignificant to no impact on ozone concentrations in the Middle Tennessee area. VOC's and nitrogen oxides (NOx) are both precursors to the formation of tropospheric ozone. In the Southeast United States, it has been determined that NOx emissions are the primary emissions source for the production of ground-level ozone. Thus, lowering NOx emissions is more effective in controlling ozone formation than lowering VOC emissions. Stated another way, ozone formation in the Southeast United States is NOx limited, meaning that changes in the VOC concentration result in little to no change in ozone concentration. This is due to high biogenic (naturally occurring from vegetation) VOC emissions compared to anthropogenic (human caused) VOC emissions in the Southeast United States.

As part of the Southeastern Modeling Analysis and Planning (SEMAP) project, Georgia Institute of Technology performed an analysis of the sensitivity of ozone concentrations in the Eastern U.S. to reductions in emissions of both NOx and VOCs. This analysis was based off of the 2007 and 2018 SEMAP modeling which used the Community Multi-scale Air Quality (CMAQ) model, version 5.01 with updates to the vertical mixing coefficients and land-water interface. This analysis focuses on the part of the ozone season (May 1 through September 30), which was modeled using a 12-km modeling grid that covered the Eastern U.S.

Sensitivities were modeled relative to 2018 emissions to evaluate the impact of NOx and VOC reductions on daily 8-hour maximum ozone concentrations. Each emissions sensitivity run reduced the 2018 anthropogenic NOx or VOC emissions (point, area, mobile, non-road, marine/aircraft/rail) within a specific geographic region by 30%. The TDEC-APC examined the normalized sensitivities of NOx and VOC emissions (in Table 15) on 8-hour daily maximum ozone concentrations (ppb ozone/TPD) at five ozone monitors in the Middle Tennessee area. Appendix K contains further details on the approach used to calculate the normalized sensitivities of NOx and VOC as contributors to ozone formation. The results in Table 15 show that NOx emissions reductions are more effective than VOC emissions reductions at reducing ozone concentrations.

Table 15: Normalized Sensitivities of NOx and VOC Emissions on 8-hour Daily Maximum Ozone Concentrations (ppb ozone/TPD)

Site ID	Location	Site Name	30% NOx (ppb/TPD)	30% VOC (ppb/TPD)
47-037-0026	Davidson County	Percy Priest	-0.1942	-0.00481
47-037-0011	Davidson County	Trinity Lane	-0.1835	-0.00547
47-165-0007	Sumner County	Rockland Recreation Area	-0.1491	-0.00014
47-187-0106	Williamson County	Fairview Middle School	-0.1413	-0.00028
47-189-0103	Wilson County	Cedars of Lebanon State Park	-0.1363	0.00017
		Average	-0.1609	-0.00210

Although the SEMAP study projected emissions and ozone concentrations in 2018, it is estimated that a similar response to NOx and VOC reductions would occur in 2022. In order to look at the impact of the removal of the I/M program, the site-specific normalized sensitivities are multiplied by the increase in NOx and/or VOC emissions. The site-specific normalized NOx and VOC sensitivities were applied to the expected emissions increases due to the removal of the I/M program. The emissions increases are based on 2022 values. As stated in Section 3.5, the removal of the I/M program results in an increase in NOx emissions of 478.52 tons per year and VOC emissions of 593.1 tons per year in 2022. A simple average of these totals results in an increase in NOx emissions of 1.311 tons per day and VOC emissions of 1.625 tons per day in 2022. Although these values represent an average day and the SEMAP project used an ozone season day, it is expected that the increase in emissions on an average day and an ozone season day would be similar and would not change the conclusions drawn from this sensitivity analysis.

The corresponding ozone increases at each monitor are found in Table 16 and demonstrate a very small increase in ozone concentrations. The highest increase was 0.262 ppb at the Percy Priest monitor (AIRS ID 47-037-0026). The calculated changes in ozone levels are well below the level of precision of the ambient ozone monitors (1 ppb).

Table 16: Emissions Increases Due to the I/M Program Removal and Effects on Ozone Formation

AIRS ID	2022 NO_X Emissions Increase (tons/day)	Corresponding O_3 Increase at Monitor due to NO_X Increase (ppb)	2022 VOC Emissions Increase (tons/day)	Corresponding O_3 Increase at Monitor due to VOC Increase (ppb)	Corresponding O_3 Increase at Monitor due to combined NOx and VOC increases (ppb)
47-037-0026	1.311	0.25454	1.625	0.00782	0.262
47-037-0011	1.311	0.24059	1.625	0.00888	0.249
47-165-0007	1.311	0.19545	1.625	0.00022	0.196
47-187-0106	1.311	0.18518	1.625	0.00045	0.186
47-189-0103	1.311	0.17865	1.625	-0.00028	0.178

5.0 Court Settlements

There are decreases in emission from actions taken or proposed to be taken relating to two court settlements that will potentially affect ambient air in the Middle Tennessee area. This noninterference demonstration does not rely on these settlements in any way to quantify air quality changes, but includes them to show that there have recently been large NOx decreases in the power sector, and there will be additional future NOx decreases anticipated in the onroad sector. This provides further weight of evidence to show that the emissions increases resulting

from removal of the I/M program will have insignificant to no impact on ozone concentrations in the Middle Tennessee area.

This section is divided into the following subsections:

5.1 TVA settlement
5.2 VW settlement

5.1 TVA Settlement

The largest source of NOx emissions in Tennessee is Electric Generating Units (EGU's), which are all owned by the Tennessee Valley Authority (TVA). The TVA entered into a court settlement in 2011 for previous violations of the Clean Air Act. This settlement required shut downs, new controls, and a switch from coal to natural gas at certain facilities. Some of these changes have taken place, some are on-going, and some will take place in the near future. Specifically, the following changes have been implemented:

- Shut down of the TVA Allen coal plant in Shelby County, which was replaced by a natural gas plant on the same site. The coal-fired units were retired before June, 2018
- Shut down of the TVA Johnsonville coal plant in Humphreys County. The tenth and final coal-fired unit was retired December 31, 2017
- Addition of selective catalytic reduction (SCR) controls at the TVA Gallatin coal plant in Sumner County. All SCRs were installed and operational by December, 2017

In addition to the settlement agreement, the TVA has recently started producing electricity from Watts Bar 2 nuclear plant in Rhea County, which could decrease power production from the TVA fossil fuel-fired facilities. Also, on February 14, 2019, the TVA Board of Directors approved the retirement of the TVA Bull Run coal plant in Anderson County, which would take place as early as 2023.

The calculation of the ozone NAAQS design value (which will be discussed in more detail in Section 6.1 of this document) is averaged across three consecutive years. The changes to the TVA facilities listed above that occurred in 2017 and 2018 would affect the 2019 ozone design value, which is the average of ozone values for 2017, 2018, and 2019; and these changes would also affect the 2020 ozone design value, which is the average of ozone values for 2018, 2019, and 2020. Thus, changes at TVA facilities that have already been completed will affect the ozone design values for several years after the change.

In summary, there will be benefits in the Middle Tennessee area from NOx reductions in other parts of Tennessee and neighboring states due to decreases in the transport of ozone and ozone precursors from outside the Middle Tennessee area.

5.2 VW Settlement

In 2015, Volkswagen (VW) publicly admitted that it had secretly and deliberately installed a defeat device—software designed to cheat emissions tests and deceive federal and state

regulators—in approximately 590,000 model year 2009 to 2016 motor vehicles containing 2.0 and 3.0 liter diesel engines. The United States Department of Justice (DOJ) filed a complaint against VW, alleging that the company had violated the Clean Air Act. In October 2016 and May 2017, the U.S. District Court, Northern District of California ("Court"), approved two partial settlements related to the affected 2.0 and 3.0 liter vehicles, respectively, totaling $14.9 billion ("the VW Settlement"). The VW Settlement will be implemented through the First Partial Consent Decree and Second Partial Consent Decree. Under these consent decrees, VW has agreed to: (1) dedicate $10 Billion to the recall of at least 85% of the affected 2.0 and 3.0 liter vehicles; (2) invest $2 Billion in zero-emission vehicle infrastructure and promotion ("Zero Emission Vehicle Investment Plan"); and (3) establish a $2.9 Billion Environmental Mitigation Trust (EMT) to mitigate the environmental effects of the excess nitrogen oxide (NOx) emissions from the affected vehicles.

The purpose of the EMT is to execute environmental mitigation projects that reduce emissions of NOx. In accordance with the EMT goal, the State of Tennessee's overall goal in administering its EMT allocation is to reduce NOx emissions by targeting the largest contributors of mobile NOx emissions in Tennessee: the on-road, diesel heavy duty sector (33% of mobile NOx emissions) and the on-road, non-diesel light duty sector (40% of mobile NOx emissions). As NOx emissions contribute to the formation of ozone and particulate matter, reductions in NOx emissions will assist in the State's efforts to maintain compliance with the NAAQS for Ozone and Particulate Matter less than 2.5 micrometers in diameter ($PM_{2.5}$).

The State of Tennessee released the final Beneficiary Mitigation Plan (BMP) on September 21, 2018, for implementing the State's initial allocation from the VW EMT. Project solicitations have already begun, and once implemented NOx and PM reductions will then be realized. Although onroad emission sources in the Middle Tennessee area may only receive some of the BMP allocation, there will be benefits in the Middle Tennessee area from NOx reductions in other parts of Tennessee and the Southeast United States due to decreases in the formation and transport of ozone and ozone precursors from outside the Middle Tennessee area.

6.0 Ambient Air Quality Monitoring

Ambient air quality monitoring refers to outdoor monitors that collect air samples, determine the chemical properties of the air sample, and record the data. The data is computed in several different ways to arrive at a design value. Air monitors are located across Tennessee with several monitors located in the Middle Tennessee area. This section gives the ozone and $PM_{2.5}$ data collected at these monitors. This section contains four subsections:

6.1 Ozone
6.2 $PM_{2.5}$
6.3 NO_2
6.4 CO

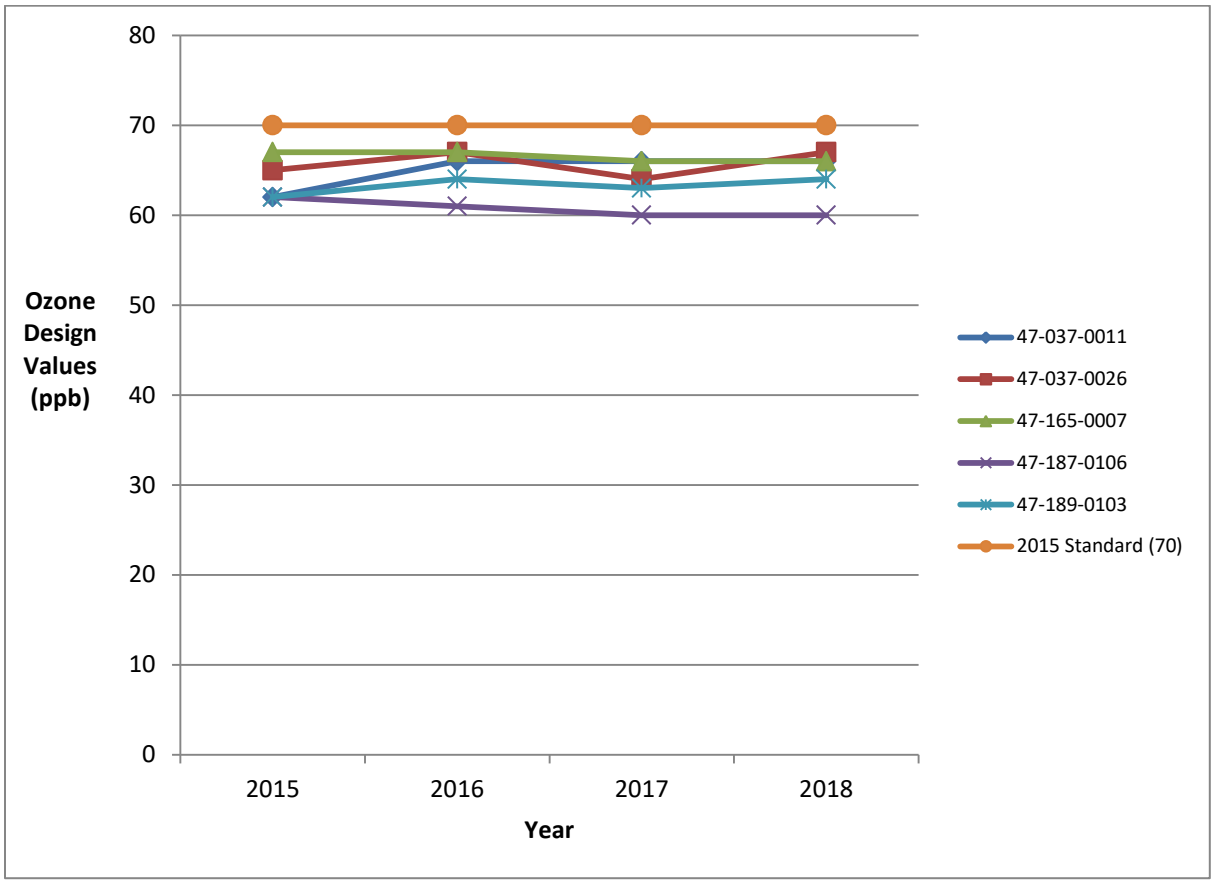
6.1 Ozone

The 2015 ozone NAAQS is 70 ppb. The ozone design value is the fourth–highest daily maximum, averaged across three consecutive years. The daily maximum has an averaging time of eight hours. In any given year, the design value for the area is determined from the monitor with the highest ozone design value in the Middle Tennessee area. Ambient air quality monitoring for ozone is being conducted at five locations in the Middle Tennessee area. The data in Table 17 shows that the five monitors have shown compliance with this standard in 2015, 2016, 2017, and 2018. For 2018, the Percy Priest monitor reflects the highest design value for the area.

Table 17: Ozone Design Values (DV in ppb)

AIRS ID	Site Name	2015	2016	2017	2018
47-037-0011	Trinity Lane	62	66	66	66
47-037-0026	Percy Priest	65	67	64	67
47-165-0007	Rockland Recreation Area	67	67	66	66
47-187-0106	Fairview Middle School	62	61	60	60
47-189-0103	Cedars of Lebanon State Park	62	64	63	64

Figure 1: Ozone Design Values (in ppb) for 2015-2018



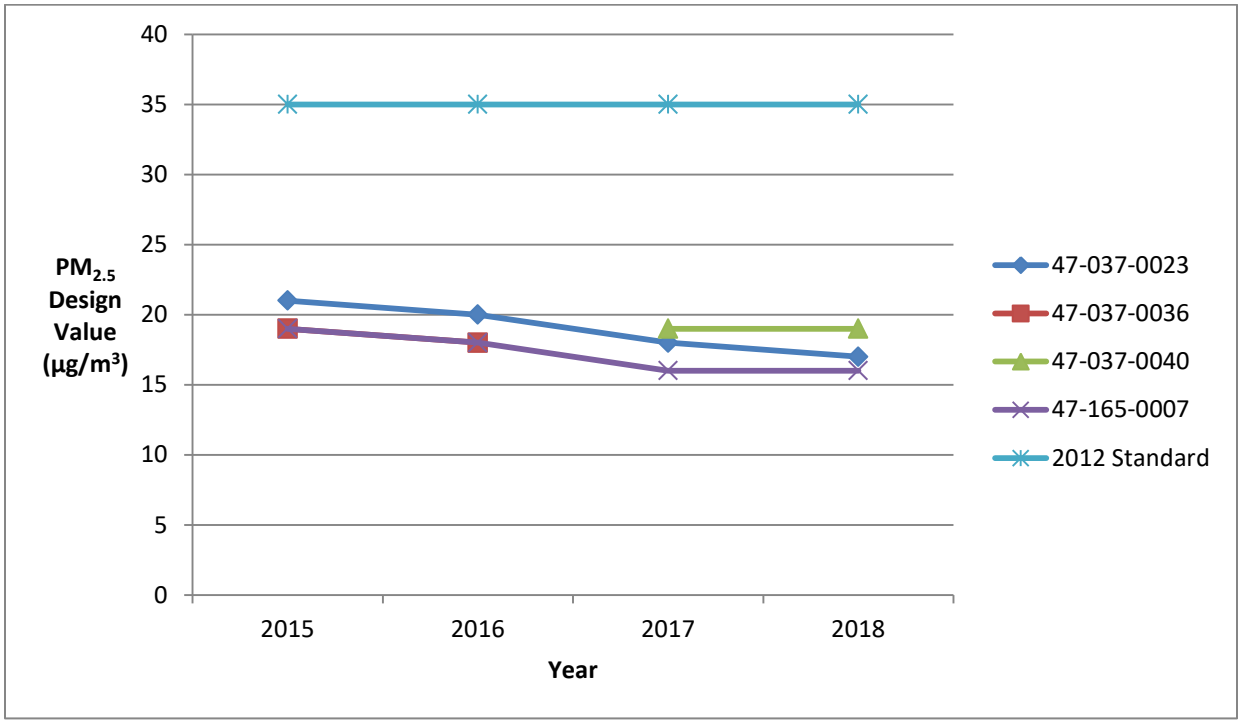
6.2 Particulate Matter

Ambient air quality monitoring for fine particulate matter ($PM_{2.5}$) has been conducted at three locations in the Middle Tennessee area. The 2012 $PM_{2.5}$ 24-hour NAAQS is 35 µg/m^3. The 2012 $PM_{2.5}$ annual NAAQS is 12.0 µg/m^3. The $PM_{2.5}$ 24-hour NAAQS design value is the 98th percentile value, averaged across three consecutive years. The $PM_{2.5}$ annual NAAQS design value is the annual mean averaged across three consecutive years. The details of calculating the $PM_{2.5}$ 24-hour and annual design values are found in Appendix N of 40 CFR 50. The data in Tables 18 and 19 shows that the four monitors show compliance with the $PM_{2.5}$ standards during the time period 2015-2018[3].

Table 18: $PM_{2.5}$ 24-hour Design Values (µg/m^3) for 2015-2018

AIRS ID	2015	2016	2017	2018
47-037-0023	21	20	18	17
47-037-0036	19	18		
47-037-0040			19	19
47-165-0007	19	18	16	16
2012 Standard	35	35	35	35

Figure 2: $PM_{2.5}$ 24-hour Design Values (in µg/m^3) for 2015-2018

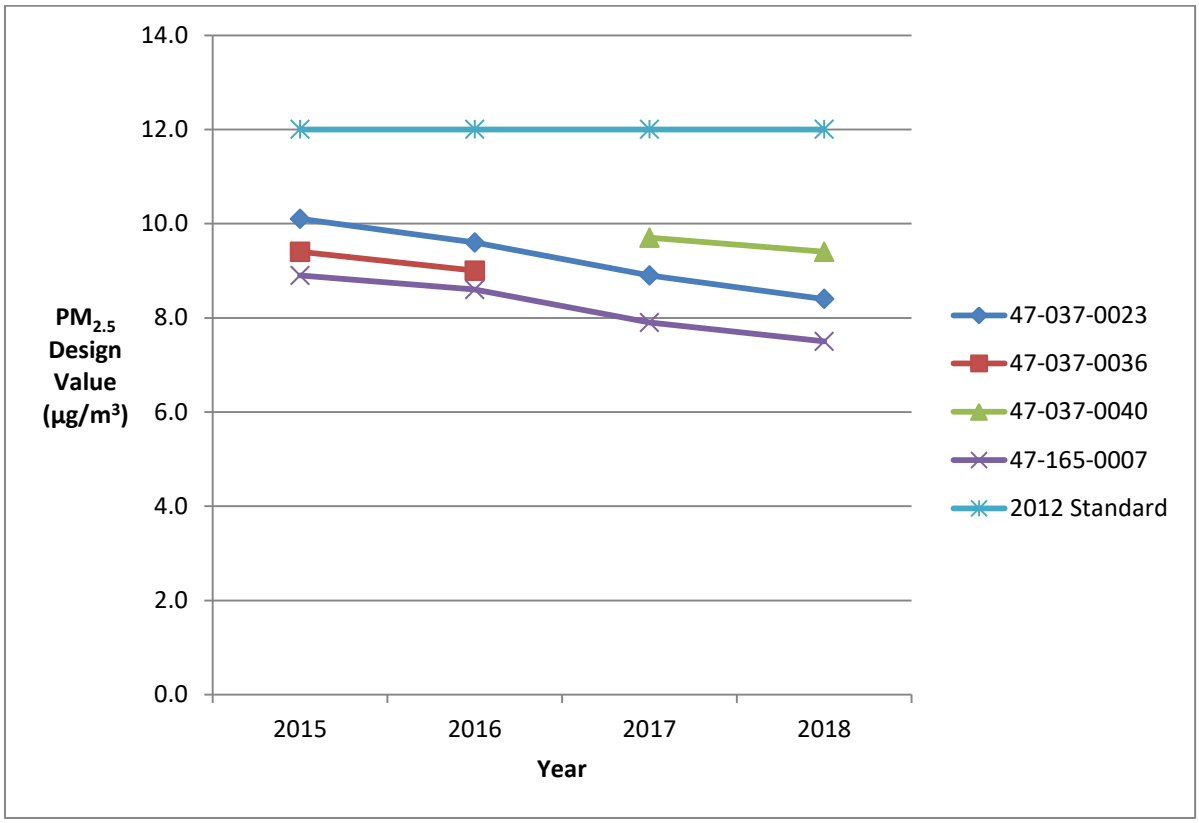


[3] Due to issues with the laboratory analysis of samples, there is no valid design value data for 2012-2014. Site 47-037-0036 stopped operation at the end of 2016. Site 47-037-0040 started operation in 2017; thus, the design value in 2017 represents only 2017 data and the design value for 2018 represents the average of 2017 and 2018 data.

Table 19: $PM_{2.5}$ Annual Design Values ($\mu g/m^3$) for 2015-2018

AIRS ID	2015	2016	2017	2018
47-037-0023	10.1	9.6	8.9	8.4
47-037-0036	9.4	9.0		
47-037-0040			9.7	9.4
47-165-0007	8.9	8.6	7.9	7.5
2012 Standard	12.0	12.0	12.0	12.0

Figure 3: $PM_{2.5}$ Annual Design Values ($\mu g/m^3$) for 2015-2018



6.3 Nitrogen Dioxide

Ambient air quality monitoring for nitrogen dioxide (NO_2) has been conducted at two locations in Davidson County. The NO_2 1-hour NAAQS is 100 ppb. The NO_2 1-hour NAAQS design value is the 98th percentile of 1-hour daily maximum concentrations averaged across three consecutive years. The NO_2 annual NAAQS is 53 ppb. It is simply the annual mean. The details of calculating the NO_2 1-hour and annual design values are found in Appendix S of 40 CFR 50. The data in Tables 20 and 21 shows that the two monitors show compliance with the NO_2 standards during the time period 2016-2018

Table 20: NO_2 1-hour Design Values (ppb) for 2016-2018

AIRS ID	2016	2017	2018
47-037-0011	39	39	36
47-037-0040	53	53	51
Standard	100	100	100

Figure 4: NO_2 1-hour Design Values (ppb) for 2016-2018

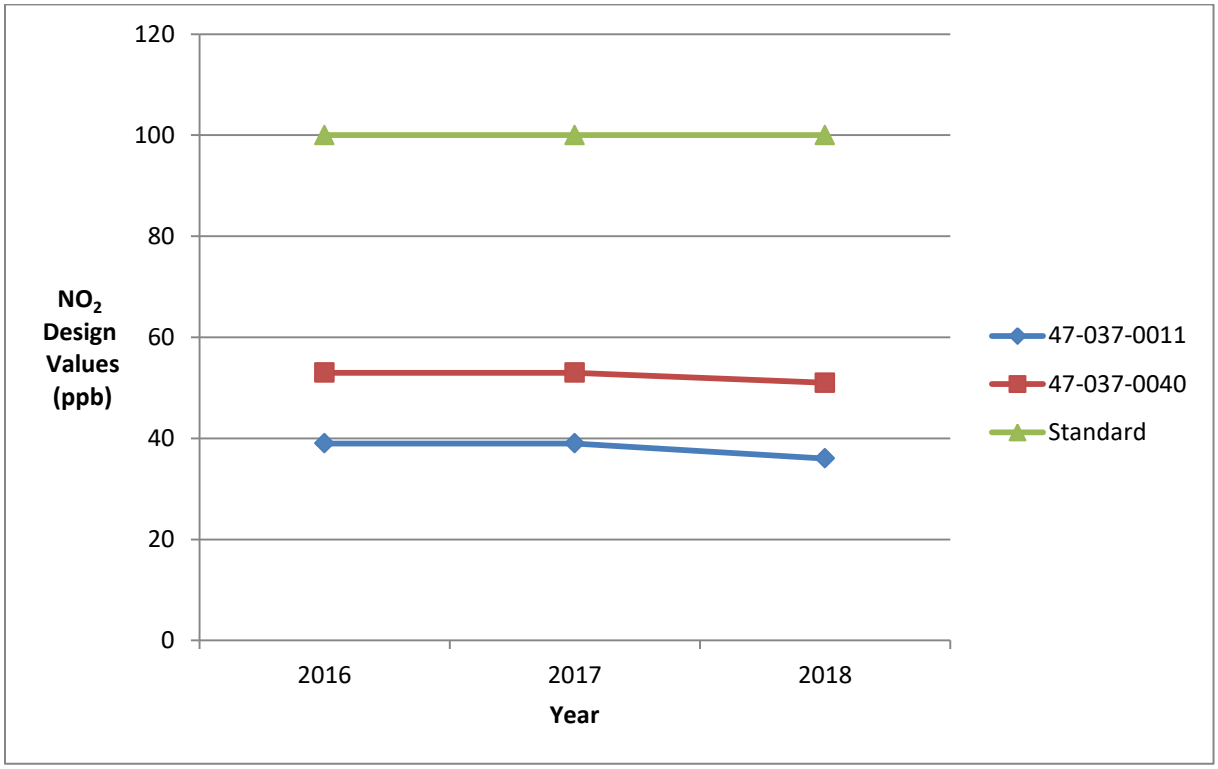
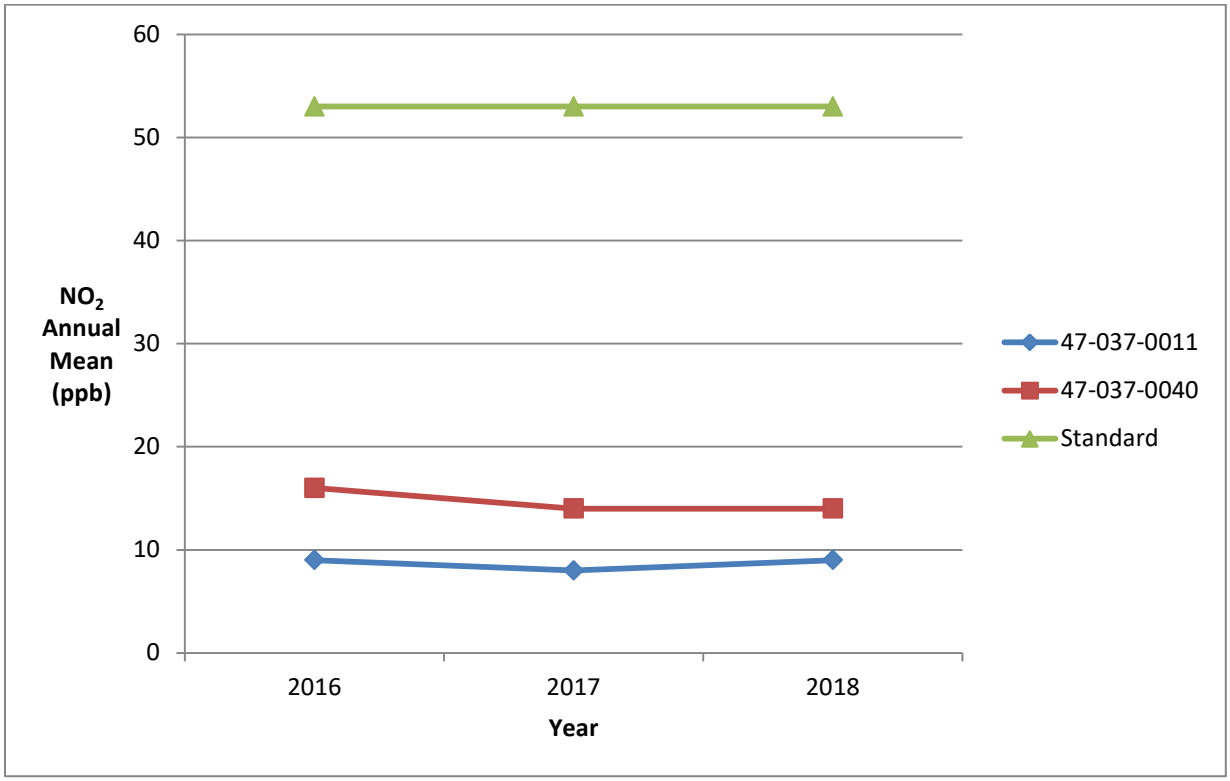


Table 21: NO_2 Annual Mean (ppb) for 2016-2018

AIRS ID	2016	2017	2018
47-037-0011	9	8	9
47-037-0040	16	14	14
Standard	53	53	53

Figure 5: NO_2 Annual Mean (ppb) for 2016-2018



6.4 Carbon Monoxide

Ambient air quality monitoring for carbon monoxide (CO) has been conducted at one location in the Middle Tennessee area. The site is located in Davidson County with an AIRS ID 47-037-0040. The CO 1-hour NAAQS is 35 ppm, and the 8-hour NAAQS is 9 ppm. These values are not to be exceeded more than once per year. Ambient CO levels are well below the two standards. The maximum 1-hour value was 1.8 ppm in 2016, 1.9 ppm in 2017, and 1.9 ppm in 2018. These values show compliance with both standards.

7.0 Conclusion

This section is divided into eight sub-sections as follows:

7.1 Overview
7.2 Ozone NAAQS
7.3 $PM_{2.5}$ NAAQS
7.4 SO_2 NAAQS
7.5 NO_2 NAAQS
7.6 CO NAAQS
7.7 Pb NAAQS
7.8 Final Conclusion

7.1 Overview

The I/M program started in Davidson County in 1985, and it started in Sumner, Wilson, Rutherford, and Williamson Counties in 1994. In May 2018, a new law in Tennessee was passed that called for the end of the I/M program after the EPA approved a SIP revision. As such, the TDEC-APC is submitting this noninterference demonstration, which is required by the CAA, in order to revise the SIP to remove the I/M program in the Middle Tennessee area.

TDEC-APC developed an emission inventory that projected emissions of CO, NOx, and VOC to a future year of 2022, which is anticipated to be the first full year after the I/M program ends. Onroad mobile source emissions were projected for the two scenarios (1) with an I/M program and (2) without an I/M program. Since the I/M program was implemented to help attain the ozone standard, the NOx and VOC emissions were the most important pollutants to examine; especially, NOx emissions since the Southeast is NOx limited.

As stated previously in this document, the EPA sets NAAQS for six "criteria air pollutants", which are O_3, $PM_{2.5}$, SO_2, NO_2, CO, and Pb. This section of the document will discuss the effect on the NAAQS of removing the I/M program, which would cause an increase in emissions of CO, NOx and VOC. Specifically, in the onroad sector there would be a 14.4% increase in CO emissions, a 4.2% increase in NOx emissions, and a 12.4% increase in VOC emissions. For all four sectors (onroad, nonroad, point, and non-point) combined, there would be a 6.1% increase in CO emissions, a 1.9% increase in NOx emissions, and a 1.7% increase in VOC emissions.

The results of a sensitivity analysis based on previously conducted photochemical modeling show that the emissions increases of NOx and VOC resulting from removal of the I/M program would only increase the ozone design value by approximately 0.26 ppb at the highest design value monitor.

A court settlement with the TVA has driven NOx emission down across Tennessee over the past several years and ensures that these emissions will stay at historically low levels. Additionally, a court settlement with VW will bring additional NOx emission decreases across the state.

7.2 Ozone NAAQS

Ground level ozone is created by chemical reactions between NOx and VOC in the presence of sunlight. The removal of the I/M program would cause an increase in both NOx and VOC emissions. Ambient air monitoring shows that the ozone design value for the Middle Tennessee area in 2018 is 67 ppb, which is below the NAAQS of 70 ppb. In section 4.0 of this document, the results of a sensitivity analysis showed only a very small increase (0.26 ppb) in the ozone value in any given year. If the increase in ozone (0.26 ppb) from the sensitivity analysis was added to the current ozone design value (67 ppb) then the result (67.26 ppb) would be less than the current NAAQS of 70 ppb. The small increases in NOx (by 1.9%) and VOC (by 1.7%) emissions are expected to only cause a very small increase in the ozone design value. Therefore, removing the I/M program will not interfere with continued attainment or maintenance of the NAAQS for ozone.

7.3 $PM_{2.5}$ NAAQS

Particulate matter (PM) is found in many sizes and shapes and can be made up of hundreds of different chemicals. For example, $PM_{2.5}$ is formed in the atmosphere as directly emitted NOx reacts with other compounds to form $PM_{2.5}$. NOx compounds that are considered $PM_{2.5}$ only comprise a fraction of the total $PM_{2.5}$. Ambient air monitoring shows that $PM_{2.5}$ 24-hour design value for the Middle Tennessee area in 2018 is 17 $\mu g/m^3$, which is below the 24-hour NAAQS of 35 $\mu g/m^3$. Also, the annual design value in 2018 is 8.4 $\mu g/m^3$, which is below the annual NAAQS of 12.0 $\mu g/m^3$. The small increase in NOx (by 1.9%) emissions is expected to only cause a small increase in the $PM_{2.5}$ design value. Therefore, removing the I/M program will not interfere with attainment or maintenance of the NAAQS for $PM_{2.5}$.

7.4 SO_2 NAAQS

The removal of the I/M program would not cause an increase in emissions of SO_2. Therefore, removing the I/M program will not interfere with attainment or maintenance of the NAAQS for SO_2.

7.5 NO_2 NAAQS

The removal of the I/M program would cause an increase in NOx. NO_2 is one of a group of highly reactive gases known as NOx. Ambient air monitoring shows that the 1-hour design value and annual mean are well below the NAAQS in 2018. Therefore, removing the I/M program will not interfere with attainment or maintenance of the NAAQS for NO_2.

7.6 CO NAAQS

The removal of the I/M program would cause an increase in emissions of CO (by 6.1%). Ambient air monitoring shows that the CO values are well below the 1-hour and 8-hour NAAQS in 2018. Therefore, removing the I/M program will not interfere with attainment or maintenance of the NAAQS for CO.

7.7 Pb NAAQS

Effective January 1, 1996, the CAA banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in onroad vehicles. Since there is no lead in fuels for onroad vehicles, the removal of the I/M program would not cause an increase in emissions of Pb. Therefore, removing the I/M program will not interfere with attainment or maintenance of the NAAQS for Pb.

7.8 Final Conclusion

Currently, there are no nonattainment areas in the Middle Tennessee area for O_3, $PM_{2.5}$, SO_2, NO_2, CO, or Pb. Monitoring data shows that the Middle Tennessee area is meeting the 2015 ozone standard of 70 ppb, the 2012 $PM_{2.5}$ 24-hour standard of 35 $\mu g/m^3$, the 2012 $PM_{2.5}$ annual standard of 12.0 $\mu g/m^3$, the NO_2 1-hour standard of 100 ppb, the NO_2 annual mean standard of 53 ppb, the CO 1-hour standard of 35 ppm, and the CO 8-hour standards of 9 ppm.

The information presented in this document demonstrates that removing the I/M program will not interfere with continued attainment or maintenance of the NAAQS for O_3, $PM_{2.5}$ SO_2, NO_2, CO, or Pb. The TDEC-APC requests from the EPA the removal of the I/M program requirement in the SIP for the Middle Tennessee area.

Appendix A

Tennessee Law, Public Chapter No. 953

State of Tennessee

PUBLIC CHAPTER NO. 953

HOUSE BILL NO. 1782

By Representatives Carter, Madam Speaker Harwell, McCormick, Gravitt, Hazlewood, Favors, Lamberth, Dawn White, Sparks, Terry, Rudd, Lynn, Boyd, Howell, Faison, Williams, Mark White, Tillis

Substituted for: Senate Bill No. 2656

By Senators Watson, Gardenhire, Ketron, Haile, Pody, Johnson, Kelsey, Stevens

AN ACT to amend Tennessee Code Annotated, Title 55 and Title 68, relative to motor vehicle inspection requirements.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF TENNESSEE:

SECTION 1. Tennessee Code Annotated, Section 68-201-119, is amended by designating the current language as subsection (a) and by adding the following language as a new subsection (b):

(b)

(1) Notwithstanding subsection (a) or any other law to the contrary, no inspection and maintenance program shall be employed in this state on or after the effective date of this act, except in accordance with Section 2.

(2) If at any time under the federal Clean Air Act, compiled in 42 U.S.C. § 7401 et seq., an inspection and maintenance program is mandated instead of available as a voluntary state implementation plan measure in any county of this state, then subdivision (b)(1) shall not apply in that county.

SECTION 2. An inspection and maintenance program may be employed in a county that, on the effective date of this act, has a local air pollution control program and implements its own inspection and maintenance program, if the county authorizes the continuation of its own inspection and maintenance program by action of its governing body; provided, that in order to authorize the continuation of the inspection and maintenance program, the governing body must authorize the continuation within thirty (30) days of the effective date of this act, and the presiding officer of the county governing body must furnish a certified copy of the approved resolution to the technical secretary of the air pollution control board within sixty (60) days of the effective date of this act.

SECTION 3. The Tennessee air pollution control board is authorized to promulgate rules to effectuate the purposes of this act. All such rules shall be promulgated in accordance with the Uniform Administrative Procedures Act, compiled in Tennessee Code Annotated, Title 4, Chapter 5.

SECTION 4. Any new contract between the department or a local government and a contractor providing inspection services, any new contract between a local government and the department relative to the inspection and maintenance program, and any renewals of such contracts occurring after the effective date of this act, shall include a provision stating that the contract must conform to any changes in state law. Any existing contracts as described in this section shall be amended to include a provision stating that the contract must conform to any changes in state law.

SECTION 5. Tennessee Code Annotated, Section 55-4-104, is amended by adding the following as a new subsection:

( ) Any county that ceases to have an inspection and maintenance program pursuant to Section 1(b)(1) of this act may, by action of its governing body, increase the amount of any clerk's fee imposed on any initial registration, or at the time of renewal, by

an amount up to four dollars ($4.00). Of any increase up to four dollars ($4.00), the clerk shall retain one dollar ($1.00) and remit, as directed by the county governing body, the balance of any funds to the county general fund.

SECTION 6 Any fee increase promulgated by the air pollution control board in order to offset any revenue lost as the result of the implementation of this act shall not be imposed on major sources of air pollutants under Title V of the Clean Air Act (42 U.S.C. § 7401 et seq.) except to the extent that such fees are used to pay for indirect and direct costs related to the Title V program as provided in Title 68, Chapter 203 and 42 U.S.C. § 7661a, and indirect and direct costs specified in 40 CFR § 70.9.

SECTION 7. If any provision of this act or its application to any person or circumstance is held invalid, then the invalidity shall not affect other provisions or applications of the act that can be given effect without the invalid provision or application, and to that end the provisions of this act shall be severable.

SECTION 8.

(a) Section 1 shall take effect one hundred twenty (120) calendar days following the date on which the United States environmental protection agency (EPA) approves a revised state implementation plan consistent with this act, the public welfare requiring it; provided, however, that if on such date, a contract exists between the department and a contractor providing inspection services, then Section 1 shall take effect upon the date of the contract's termination or expiration, the public welfare requiring it. For all other purposes, this act shall take effect upon becoming a law, the public welfare requiring it.

(b)

(1) The commissioner of environment and conservation shall certify in writing to the executive secretary of the Tennessee code commission the date of the approval by the EPA described in Section 6(a) and provide the executive secretary of the commission with a copy of such approval.

(2) If a contract exists on the date one hundred twenty (120) calendar days following the date of approval of the revised state implementation plan, then the commissioner shall also certify in writing the date of the department's contract termination or expiration, and provide the executive secretary of the commission with a copy of the signed document.

HOUSE BILL NO. 1782

PASSED: April 24, 2018

BETH HARWELL, SPEAKER
HOUSE OF REPRESENTATIVES

RANDY MCNALLY
SPEAKER OF THE SENATE

APPROVED this 15th day of May 2018

BILL HASLAM, GOVERNOR

Appendix B

Request for Removal and Redline of

Tennessee Air Pollution Control Regulation 1200-03-29

and Davidson County Regulation No. 8

from the Tennessee SIP

MEMORANDUM

DATE: July 18, 2019

SUBJECT: Request for Removal of *Chapter 1200-3-29 – Light- Duty Motor Vehicle Inspection and Maintenance* from the State of Tennessee State Implementation Plan

This document is Appendix B of the report entitled *Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance program in the Middle Tennessee Area*. The 110(l) presents the technical support for elimination of the vehicle inspection program. This Appendix is the request for removal of the attached *Chapter 1200-3-29 (Light Duty Motor Vehicle Inspection and Maintenance)* from the Tennessee State Implementation Plan based on the findings of the 110(l) demonstration.

The attached redline/strikeout of Chapter 1200-3-29 was downloaded from the Federal Environmental Protection Agency web-site https://www.epa.gov/sips-tn/epa-approved-statutes-and-regulations-tennessee-sip on July 10, 2019. To the best of our knowledge this document accurately presents Chapter 1200-3-29 of the applicable State Implementation Plan for the State of Tennessee under section 110 of the Clean Air Act, 42 U.S.C. 7401, and 40 CFR part 51.

The Tennessee Department of Environment & Conservation Division of Air Pollution Control requests that Chapter 1200-3-29 be removed in its entirety from the Tennessee State Implementation Plan.

~~Chapter 1200-3-29~~
~~Light-Duty Motor Vehicle Inspection and Maintenance~~

~~1200-3-29-.01 Purpose~~

~~The purpose of this Chapter is to reduce the air pollution produced by the operation of light-duty motor vehicles.~~

~~Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq. Administrative History: Original rule filed February 14, 1994; effective April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994.~~

	~~Date Submitted to EPA~~	~~Date Approved by EPA~~	~~Federal Register~~
~~Original Reg~~	~~JUL 8, 1994~~	~~JUL 28, 1995~~	~~60 FR 38694~~

~~1200-3-29-.02 Definitions~~

~~As used in this Chapter, all terms not defined herein shall have the meaning given them in Chapter 1200-3-2:~~

~~(1) Air Pollution is any particulate matter or any gas or vapor other than water or any combination thereof including any physical, chemical, biological, radioactive substance or matter which is emitted into or otherwise enters the ambient air.~~

~~(2) Antique motor vehicle is any motor vehicle over twenty-five years old which is owned solely as a collectors' item and is used for participation in club activities, exhibits, tours, parades and similar uses, but in no event for general transportation.~~

~~(3) Carbon dioxide is a compound consisting of the chemical formula (CO_2).~~

~~(4) Carbon monoxide is a compound consisting of the chemical formula (CO).~~

~~(5) Catalytic converter is a pollution control device containing a catalyst for converting automobile exhaust into mostly harmless products.~~

~~(6) Centralized Network means that motor vehicle inspections are conducted by the State and/or a single contractor in an area.~~

~~(7) Certificate of Compliance is a certification issued by a Department vehicle inspector or a fleet vehicle inspector that the motor vehicle identified on the certificate complies with the emission performance and anti-tampering criteria appropriate to the vehicle as specified in this regulation.~~

~~(8) Check Engine Light: for the definition see Malfunction Indicator Light (MIL).~~

~~(9) Contractor is a person (as defined in 1200-3-2) with whom the Department has a contract that provides for the operation of one or more Official Inspection Stations.~~

~~(10) Department means the Tennessee Department of Environment and Conservation, Division of Air Pollution Control.~~

~~(11) Department Vehicle Inspector is any person employed by the Tennessee Division of Air Pollution Control and/or contractor who is designated by the Technical Secretary as qualified to perform vehicle emissions performance and anti-tampering inspections.~~

~~(12) Diagnostic Trouble Codes (DTCs) is an alphanumeric code which is set in a~~

~~vehicle's onboard computer when a monitor detects a condition likely to lead to (or has already produced) a component or system failure or otherwise contribute to exceeding emissions standards by 1.5 times the certification FTP standard.~~

~~(13) Diesel powered motor vehicle is a motor vehicle powered by a compression-ignition internal combustion engine.~~

~~(14) Electric powered motor vehicle is a motor vehicle which uses a propulsive unit powered exclusively by electricity.~~

~~(15) Exhaust emissions are substances emitted into the atmosphere from any opening downstream from the exhaust ports of a motor vehicle engine.~~

~~(16) Exhaust gas analyzer is a device for sensing the amount of air pollutants, including carbon monoxide and hydrocarbons, in the exhaust emissions of a motor vehicle. For the purpose of this regulation, this shall mean analyzing devices of the nondispersive infrared type or any other analyzing devices that provide equal or greater accuracy as approved by the Technical Secretary.~~

~~(17) Factory-Installed Motor Vehicle Pollutant Control System is a motor vehicle pollution control system installed by the vehicle or engine manufacturer to comply with the United States government motor vehicles emission control laws and regulations.~~

~~(18) Federal Test Procedure (FTP) is the test procedure used to determine the compliance of vehicles with federal emission standards.~~

~~(19) Fleet means 50 or more light-duty motor vehicles owned by the same person or business entity which are in-use, registered in any county that has been designated by the Board to have a motor vehicle inspection and maintenance program in order to attain and maintain compliance with national ambient air quality standards within any area of Tennessee or an adjoining state and not owned or held primarily for the purpose of resale.~~

~~(20) Fleet Inspection Location is any motor vehicle inspection facility operated by a fleet operator holding a valid fleet inspection permit.~~

~~(21) Fleet Inspection Permit is a certificate issued by the Technical Secretary authorizing a fleet operator to conduct motor vehicle inspections in accordance with this regulation and other requirements as determined by the Department.~~

(22) Fleet Operator is the person owning a group of motor vehicles which constitute a fleet as defined in this regulation.

(23) Fleet Vehicle Inspector is any person retained by a fleet operator holding a valid fleet inspection permit and who is certified by the Technical Secretary as qualified to perform vehicle emissions performance and anti-tampering inspections.

(24) Fuel inlet restrictor is the leaded fuel nozzle restrictor installed on motor vehicles which was designed for the use of unleaded gasoline only.

(25) Gasoline powered motor vehicle is any motor vehicle powered by spark-ignition internal combustion engine.

(26) Gross Vehicle Weight Rating (GVWR) is a term defining the gross vehicle weight as determined from the combined manufacturer vehicle and maximum load rating.

(27) Heavy-duty motor vehicle is any motor vehicle having a combined manufacturer vehicle and maximum load rating (GVWR) to be carried thereon in excess of 10,500 pounds (4,773 kilograms).

(28) Hydrocarbon is any organic compound consisting predominantly of carbon andhydrogen.

(29) Idle speed means the unloaded engine speed of a motor vehicle when the accelerator pedal is fully released. In a vehicle equipped with an automatic transmission, this is with the drive selector in neutral or park. In a vehicle equipped with a manual transmission, this is with the gear selector in neutral and the clutch fully engaged. In all vehicles, the engine operated accessories shall be turned off.

(30) Internal combustion engine is any engine in which the combustion of gaseous, liquid or pulverized solid fuel takes place within one or more cylinders, or any engine with one or more combustion chambers.

(31) Light-duty motor vehicle is any motor vehicle having a combined manufacturer vehicle and maximum load rating (GVWR) to be carried thereon of 10,500 pounds (4,773 kilograms) or less.

(32) Malfunction Indicator Light (MIL) is known as the Check Engine light. The Malfunction Indicator Light is illuminated on the dashboard when conditions exist likely to result in emissions exceeding FTP standards by 1.5 time or

~~worse. Alternatives include "Service Engine Soon," as well as an unlabeled icon of an engine.~~

~~(33) Manufacturers Idle-speed Specification is the engine idle speed specified for a particular motor vehicle as printed on the engine compartment emissions system data plate or in the owners manual.~~

~~(34) Model Year means the annual production period of new motor vehicles or new motor vehicle engines designated by the calendar year in which such production ends. If the manufacturer does not designate a production period, the year with respect to such vehicle or engines shall mean the twelve (12) month period beginning January of the year in which production thereof begins. The model year for a motor vehicle constructed by other than the original manufacturer shall be assigned by the Technical Secretary.~~

~~(35) Motor vehicle is any self-propelled vehicle used for transporting persons or commodities on public roads.~~

~~(36) Motor Vehicle Regulatory License is the annual motor vehicle license required as a condition for legal operation of certain classes of motor vehicles.~~

~~(37) Motorcycle is any motor vehicle having a seat or saddle for the use of the rider and designed totravel on not more than three wheels in contact with the ground, and having a curb weight of 2000 pounds (907 kilograms) or less.~~

~~(38) New motor vehicle is any motor vehicle that has never been previously titled or registered in this or any other jurisdiction and whose ownership document remains as a manufacturer's certificate of origin.~~

~~(39) Official Inspection Station means a facility operated by the Department and/or contractor to conduct test only vehicle inspections pursuant to this regulation, in a Centralized Network.~~

~~(40) Onboard Diagnostics (OBD) is a system of vehicle component and condition monitors controlled by a central, onboard computer designed to signal the motorist when conditions exist which could lead to a vehicle's exceeding its certification standards by 1.5 times the FTP standard.~~

~~(41) OBD Data Link Connector (DLC) serves as an interface between a vehicle's OBD computer and the OBD scanner and is usually located under the dashboard on the driver's side. Connecting an OBD scanner to the DLC allows inspectors and vehicle repair technicians to read the readiness status of vehicle's onboard monitors as well as any diagnostic trouble codes.~~

(42) Pollution Control Device is the equipment designed by the manufacturer for installation on a motor vehicle for the purpose of reducing pollutants emitted from the vehicle, or a system or engine modification on a motor vehicle which causes a reduction of pollutants emitted from the motor vehicle.

(43) Readiness codes are status flags stored by a vehicle's onboard computer which is different from the DTC in that it does not indicate a vehicle fault, but rather whether or not a given monitor has been run (i.e. whether or not the component or system in question has been checked to determine if it is functioning properly).

(44) RPM is a term describing the engine crankshaft revolutions per minute.

(45) Tampering means to remove, render inoperative, cause to be removed, or make less operative any emission control device, unless such removal or act to render inoperative or less operative is for the purpose of motor vehicle disposal or salvage operation.

(46) Technical Secretary is the Technical Secretary of the Air Pollution Control Board of the State of Tennessee or his designated representative.

(47) Vehicle Exhaust System means all devices, equipment and systems which transport exhaust emissions from the exhaust ports of the motor vehicle engine to the atmosphere.

(48) Wheel Tax is the annual commercial vehicle tax required as a condition for the legal operation of certain classes of motor vehicles.

(49) Opacity is the degree to which emissions reduce the transmission of light and obscure the view of an object in the background.

Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq. Administrative History: Original rule filed February 14, 1994; April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994. Amendment filed July 8, 2001; effective October 1, 2001. Amendment filed September 19, 2001; effective December 3, 2001.

	Date Submitted to EPA	**Date Approved by EPA**	**Federal Register**
Original Reg	DEC 29, 2004	AUG 26, 2005	70 FR 50199

~~1200-3-29-.03 Motor Vehicle Inspection Requirements~~

~~(1) All of the light-duty motor vehicles registered in any county that has been designated by the Board to have a motor vehicle inspection and maintenance program or directly with the motor vehicle division of the Tennessee Department of Revenue pursuant to T.C.A. § 55-4-207 and used within or assigned to a user within that county, except those exempted by Rule 1200-3-29-.04, are required to be inspected annually for compliance with emissions performance and anti-tampering test criteria in Rules 1200-3-29-.05 and 1200-3-29-.06. Owners of vehicles so inspected are required to obtain a Certificate of Compliance. A Certificate of Compliance shall be valid for 90 days following the date of issuance, except for those registered pursuant to T.C.A. § 55-4-207, which shall be valid for one year.~~

~~(2) Any light-duty vehicle which is owned or operated by an agency of the federal government and which is operated on a federal installation located in any county that has been designated by the Board to have a motor vehicle inspection and maintenance program is required to be inspected annually for compliance with emissions performance and anti- tampering criteria in Rules 1200-3- 29-.05 and 1200-3-29-.06. This requirement shall not apply to a vehicle which is on the facility for less than a total of 60 days during the calendar year.~~

~~(3) A Certificate of Compliance shall be issued only by the Department and/or contractor vehicle inspector or a licensed fleet vehicle inspector and only after the vehicle demonstrates compliance with the test criteria established in Rules 1200-3-29-.05 and 1200-3-29-.06.~~

~~(4) All light-duty motor vehicles required to obtain a Certificate of Compliance except those vehicles contained in a fleet which has a valid fleet inspection permit and those vehicles registered in any county that has been designated by the Board to have a motor vehicle inspection and maintenance program but not subject to either the Wheel Tax or the Motor Vehicle Regulatory License requirements shall obtain a valid Certificate of Compliance within 90 days prior to the required date for payment of the wheel tax or the motor vehicle regulatory license fee as appropriate to the class of motor vehicle.~~

~~.~~

~~(5) All light-duty motor vehicles required to obtain a Certificate of Compliance that are contained in a fleet having a valid fleet inspection permit, operated on a Federal installation registered in any county that has been designated by the Board to have a motor vehicle inspection and maintenance program or vehicles registered in any county that has been designated by the Board to have a motor vehicle inspection and maintenance program in order to attain and maintain compliance with national ambient air quality standards~~

within any area of Tennessee or an adjoining state but exempt from the Wheel Tax and Motor Vehicle Regulatory License requirements shall obtain a valid Certificate of Compliance within 90 days prior to a compliance date for that particular motor vehicle. The Technical Secretary shall establish a schedule of compliance dates for such vehicles. A copy of the Certificate of Compliance for each fleet vehicle shall be submitted to the Technical Secretary within 90 days of the compliance date. A list of all subject vehicles shall be submitted to the Technical Secretary or his designee on an annual basis as directed by the division. Additionally, notification of any changes to the list of subject vehicles shall be made to the division within 30 days of such changes.

(6)(5) The Certificate of Compliance must be presented to the County Clerks' office prior to the issuance of the Wheel Tax or the Vehicle Regulatory License.

(7)(6) The requirements contained in this Chapter shall become effective July 1, 1994. The provisions concerning OBD testing shall become effective July 1, 2002.

Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq. Administrative History: Original rule filed February 14, 1994; April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994. Amendment filed October 12, 1998; effective December 26, 1998. Amendment filed July 8, 2001; effective October 1, 2001.

	Date Submitted to EPA	**Date Approved by EPA**	**Federal Register**
Original Reg	DEC 29, 2004	AUG 26, 2005	70 FR 50199

~~1200-3-29-.04 Exemption from Motor Vehicle Inspection Requirements~~

~~(1) The following classes of motor vehicles are exempt from the requirements established in Rule 1200-3-29-.03 of this Chapter:~~

~~(a) antique motor vehicles~~

~~(b) electric powered light-duty vehicles~~

~~(c) light-duty motor vehicles with a designated model year prior to 1975~~

~~(d) motorcycles~~

~~(e) heavy-duty motor vehicles~~

~~(f) new motor vehicles being registered for the first time or one year from initial registration~~

~~(g) tactical military vehicles~~

~~Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq. Administrative History: Original rule filed February 14, 1994; April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994.~~
~~Amendment filed September 19, 2001; effective December 3, 2001.~~

	~~Date Submitted to EPA~~	**~~Date Approved by EPA~~**	**~~Federal Register~~**
~~Original Reg~~	~~DEC 29, 2004~~	~~AUG 26, 2005~~	~~70 FR 50199~~

~~1200-3-29-.05 Motor Vehicle Emission~~

~~Performance Test Criteria~~

~~(1) Vehicles shall not be allowed to complete emission performance testing if one or more of the following conditions exist when the vehicle is presented for testing:~~

~~(a) For 1975 through 1995 model gasoline powered motor vehicles, if the vehicle exhaust system leaks in such a way as to dilute the exhaust emissions being sampled by the exhaust gas analyzer, the sum of carbon monoxide and carbon dioxide concentrations recorded for idle speed reading from an exhaust outlet must not be less than 6%.~~

~~(b) For 1975 through 2001 model diesel powered motor vehicles, if the vehicle's exhaust system leaks in such a way as to dilute the exhaust emissions being sampled.~~

~~(c) The visible emissions from the motor vehicle are such that it would interfere with operation of the testing equipment.~~

~~(2) Gasoline powered motor vehicle models 1975 through 1995 which have idle speed emission values that exceed the test standards specified in Table I shall fail the emission performance test.~~

~~TABLE I~~
~~MAXIMUM IDLE SPEED EMISSIONS ALLOWABLE~~
~~DURING IDLE SPEED EMISSIONS TEST~~

~~Vehicle Model Year~~	~~CO (%)~~ ~~Light-Duty Vehicles Less Than or Equal To 6000 lbs GVWR~~		~~HC (PPM)~~ ~~Light-Duty Vehicles Greater Than 6000 lbs GVWR~~	~~Light-Duty Vehicles Less Than or Equal To 6000 lbs GVWR~~
~~1975~~	~~5.0~~	~~6.5~~	~~500~~	~~750~~
~~1976~~	~~5.0~~	~~6.5~~	~~500~~	~~750~~
~~1977~~	~~5.0~~	~~6.5~~	~~500~~	~~750~~
~~1978~~	~~4.0~~	~~6.0~~	~~400~~	~~600~~
~~1979~~	~~4.0~~	~~6.0~~	~~400~~	~~600~~

~~1980~~	~~3.0~~	~~4.5~~	~~300~~	~~400~~
~~1981 - 1995~~	~~1.2~~	~~4.0~~	~~220~~	~~400~~

~~(3) Light-duty diesel powered motor vehicle models 1975 through 2001 shall be subject to the curb idle test as follows:~~

~~(a) A diesel vehicle shall not emit visible emissions in excess of ten (10) percent opacity for ten (10) or more consecutive seconds, as measured at idle engine speed.~~

~~(4) All 1996 and newer gasoline powered motor vehicles and all 2002 and newer diesel powered motor vehicles shall be subject to an OBD inspection. An OBD check shall consist of two parts : a visual check of the MIL and an electronic examination of the OBD computer. The vehicle is required to pass a MIL command on test and a bulb check test. After the vehicle has passed the MIL command on test and the bulb check test, it must not have any DTCs set and all of the required readiness codes must be set in order to pass an OBD inspection.~~

~~(5) When a motor vehicle is equipped with other than the original engine or when a motor vehicle has been constructed, modified, customized or altered in such a way so that the model year cannot be clearly determined, the vehicle shall be classified for purposes of the emission performance test bythe model year of the chassis.~~

~~Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq.~~
~~Administrative History: Original rule filed February 14, 1994; April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994.~~
~~Amendment filed September 19, 2001; effective December 3,2001.~~

	~~**Date Submitted to EPA**~~	~~**Date Approved by EPA**~~	~~**Federal Register**~~
~~Original Reg~~	~~DEC 29, 2004~~	~~AUG 26, 2005~~	~~70 FR 50199~~

~~1200-3-29-.06 Motor Vehicle Anti-Tampering Criteria~~

~~(1) Each gasoline powered motor vehicle subject to an emission performance test is also subject to a visual anti-tampering inspection under this rule and shall comply with the following minimum anti-tampering requirements:~~

~~(a) At a minimum, the emissions control devices subject to an inspection are the catalytic converter, and fuel filler cap. If emission control devices are found in a tampered condition, such devices shall be repaired or replaced prior to any retesting or reinspection as provided for in Rule 1200-3-29-.10.~~

~~(b) Nothing in this Rule shall be construed as to relieve a motor vehicle owner from complying with the provisions of Rule 1200-3-29-.05.~~

~~(2) Each gasoline powered motor vehicle subject to an OBD inspection is also subject to an anti- tampering test, and shall comply with a DLC check, and a fuel cap pressure test.~~

~~(3) Each diesel powered motor vehicle subject to an emission performance test is also subject to an anti-tampering test and shall comply at a minimum with a catalytic converter check, if applicable, and a fuel capcheck.~~

~~(4) Each diesel powered motor vehicle subject to an OBD inspection is also subject to an anti- tampering test, and shall comply with a DLC check and a fuel capcheck.~~

~~Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq. Administrative istory: Original rule filed February 14, 1994; April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994.~~
~~Amendment filed September 19, 2001; effective December 3, 2001.~~

	~~**Date Submitted to EPA**~~	~~**Date Approved by EPA**~~	~~**Federal Register**~~
~~Original Reg~~	~~DEC 29, 2004~~	~~AUG 26, 2005~~	~~70 FR 50199~~

~~1200-3-29-.07 Motor Vehicle Emissions Performance Test Methods~~

~~(1) For gasoline powered motor vehicles, the motor vehicle emissions performance test shall consist of the sampling of exhaust emissions at idle speed and measurement of CO_2 dilution, CO concentration and HC concentration.~~

~~(2) For gasoline powered motor vehicles, sampling of exhaust emissions shall consist of measurement of CO_2 dilution, CO concentration and HC concentration during idle operation using an approved exhaust gas analyzer. Measurements taken during the initial idle phase may be succeeded by measurements taken during a second idle phase which has followed an engine conditioning phase consisting of engine operation at approximately 2500 RPM for approximately 20 seconds. The lowest emission readings from either of these idle speed test phases shall be used to determine pass or failure of the emissions performance test.~~

~~(3) For diesel powered motor vehicles, the motor vehicle emissions performance test shall consist of the Curb Idle test procedures for diesel vehicles:~~

~~(a) Diesel powered vehicles shall be inspected with an opacity meter that is a full flow, direct reading, continuous reading light extinction type using a collimated light source and photo-electric cell, accurate to within plus or minus five (5) percent.~~

~~(b) Separate measurements shall be made on each exhaust outlet on diesel vehicles equipped with multiple exhaust outlets. The reading taken from the outlet giving the highest reading shall be used for comparison with the standard for the vehicle being tested.~~

~~(4) For gasoline powered motor vehicles with a model year of 1996 and newer and for diesel powered motor vehicles with a model year of 2002 and newer, an onboard diagnostic test shall be performed. All vehicles that have a readily accessible OBD system shall be tested. The results of the test shall be used to determine pass or failure of the vehicle.~~

~~Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq. Administrative History: Original rule filed February 14, 1994; April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994. Amendment filed September 19, 2001; effective December 3, 2001.~~

	~~**Date Submitted to EPA**~~	~~**Date Approved by EPA**~~	~~**Federal Register**~~
~~Original Reg~~	~~DEC 29, 2004~~	~~AUG 26, 2005~~	~~70 FR 50199~~

~~1200-3-29-.08 Motor Vehicle Anti-Tampering Test Methods~~

~~(1) For vehicles 1975 to 1995, the motor vehicle anti-tampering test shall be verified by the Department vehicle inspector and consist of the following elements:~~

~~(a) The vehicle shall be checked by the vehicle inspector to see that the appropriate fuel cap is securely in place. If the appropriate fuel cap is not in place, it shall result in the failure of the anti-tampering test.~~

~~(b) The vehicle shall be checked visually (with a mirror or otherwise) to see if the catalytic converter is the correct type for the certified vehicle configuration and is properly connected. If the catalytic converter has been tampered with, removed or is the incorrect configuration, it shall result in the failure of the anti-tampering test.~~

~~(2) Each gasoline powered motor vehicle with a model year of 1996 and newer is subject to an anti- tampering test, and shall comply with the DLC and a fuel cap pressure test. The anti-tampering test shall consist of the following elements:~~

~~(a) Vehicle shall be visually checked to see if the appropriate fuel cap is securely in place.~~

~~(b) If the fuel cap is present, it shall be removed and a fuel cap pressure test shall be performed to assure the cap is working properly. (F.T.P. 26-21 Pass/Fail Standard). If the fuel cap fails the pressure test, it shall result in a failure of the anti-tampering test.~~

~~(c) If the DLC has been tampered with or is missing, it must be repaired or replaced prior to any retesting or reinspection. If the vehicle is incompatible with the OBD test equipment or if the DLC is readily unavailable, then the vehicle is required to pass the idle speed emission values as specified in Paragraph 1200-3-29-.05.~~

~~(3) Each diesel powered motor vehicle with a model year of 2002 and newer is subject to an anti- tampering test, and shall comply at a minimum with a DLC check and a fuel cap pressure test. The anti-tampering test shall consist of the following elements:~~

~~(a) Vehicle shall be visually checked to see if the appropriate fuel cap is securely in place.~~

(b) If the DLC has been tampered with or is missing, it must be repaired or replaced prior to any retesting or reinspection. If the vehicle is incompatible with the OBD test equipment or if the DLC is readily unavailable, then the vehicle is subject to the Curb Idle test as specified in Paragraph 1200-3-29-.05.

(4) Pass/fail determination. A pass or fail determination shall be made for each of the test elements in Paragraph 1200-3-29-.08(1), (2), or (3). If a vehicle fails any of the anti-tampering elements in Paragraph 1200-3-29-.08(1), (2), or (3), it shall result in the failure of the motor vehicle inspection test and a Certificate of Compliance shall not be issued until the repairs have been made to the vehicle.

Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq. Administrative History: Original rule filed February 14, 1994; April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994.
Amendment filed September 19, 2001; effective December 3, 2001.

	Date Submitted to EPA	**Date Approved by EPA**	**Federal Register**
Original Reg	DEC 29, 2004	AUG 26, 2005	70 FR 50199

~~1200-3-29-.09 Motor Vehicle Inspection Program~~

~~(1) The motor vehicle inspection program shall be operated by the Tennessee Department of Environment and Conservation, Division of Air Pollution Control, the State approved local government and/or the State approved contractor.~~

~~(2) All motor vehicle inspections shall be conducted at official or mobile inspection stations operated by the Department, local government and/or contractor except those fleet inspections provided for in Paragraph 1200-3-29-.09(3) of this regulation.~~

~~(3) In lieu of the requirement in Paragraph 1200-3-29-.09(2) of this regulation, vehicles owned or operated by a fleet operator to whom a fleet inspection permit has been issued may be inspected by a licensed fleet vehicle inspector at a site other than an official inspection station.~~

~~(4) A light-duty fleet vehicle operator may make application to the Technical Secretary for a fleet inspection permit. Minimum requirements for issuance of a permit shall be:~~

~~(a) Possession of an approved analyzer, tools and testing equipment determined by the Technical Secretary to be adequate for conducting the required emissions inspections;~~

~~(b) Demonstration of knowledge of methods and procedures for conducting the required emissions performance and anti-tampering inspections according to criteria developed by the Technical Secretary;~~

~~(c) Provisions of appropriate facility for vehicle testing and appropriate secure storage facility for storage of Certificates of Compliance and records of inspections;~~

~~(d) Agreement to supply inspection and Certificate of Compliance issuance information as requested by the Technical Secretary and to allow access to testing facility, testing equipment, testing personnel, testing data, Certificate of Compliance inventory and fleet vehicles as requested by the Technical Secretary;~~

~~(e) Retention of licensed fleet vehicle inspector to conduct fleet vehicle inspections.~~

~~(5) A fleet inspection permit shall be valid for one year from the date of issuance~~

~~and may be renewed through application to the Technical Secretary within 30 days prior to the date of expiration. A fleet inspection permit is not transferable and may be denied, suspended or revoked by the Technical Secretary for failure to comply with this regulation and other requirements as determined by the Department.~~

~~(6) A person employed or retained by a fleet operator holding a valid fleet inspection permit may make application to the Technical Secretary for a fleet vehicle inspector's license. Minimum requirements for issuance of this license shall be:~~

~~(a) Successful completion of a vehicle inspector training course prepared and offered by the Department;~~

~~(b) Successful completion of the mechanics training course approved by the Technical Secretary;~~

~~(c) Agreement to participate in additional training activities from time to time as specified by the Technical Secretary;~~

~~(d) Provision of written evidence that applicant is employed or retained by the fleetoperator.~~

~~(7) A fleet inspector's license shall be valid for one year from the date of issuance and may be renewed through application to the Technical Secretary within thirty (30) days prior to the date of expiration. A fleet vehicle inspector's license is not transferable and may be denied, suspended or revoked by the Technical Secretary for failure to comply with this regulation and other requirements as determined by the Department.~~

~~(8) All vehicles issued a Certificate of Compliance under the provision of Paragraph 1200-3-29-.09(3) of this regulation shall be subject to retesting at either the fleet inspection location or an officialinspection station as deemed necessary by the Technical Secretary in order to maintain compliance with the intent of this regulation.~~

~~Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq. Administrative History: Original rule filed February 14, 1994; April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994.~~

	~~Date Submitted to EPA~~	**~~Date Approved by EPA~~**	**~~Federal Register~~**
~~Original Reg~~	~~DEC 29, 2004~~	~~AUG 26, 2005~~	~~70 FR 50199~~

~~1200-3-29-.10 Motor Vehicle Inspection Fee~~

~~(1) There shall be a fee set by the Tennessee Air Pollution Control Board for the Inspection & Maintenance program. The fee shall be for each emission test and payable at the time of inspection by the operator of the vehicle subject to the testing.~~

~~(2) There shall be a fee of five dollars ($5.00) for each Certificate of Compliance generated by licensed fleet inspectors for issuance to motor vehicles which comply with the testing provisions of this regulation.~~

~~(3) Each vehicle which fails its initial inspection is entitled to one (1) reinspection at no charge if the vehicle is accompanied by the entire initial inspection report.~~

~~(4) Motor vehicle owners or operator shall be given in writing the results of all inspection procedures carried out at any official inspection station.~~

~~(5) There shall be a fee of One Hundred Dollars ($100.00) for each annual Fleet Inspection Permit issued to fleet vehicle operators.~~

~~(6) There shall be a fee of One Hundred Dollars ($100.00) for each initial annual Fleet Vehicle Inspector's License issued to a fleet vehicle inspector; there shall be a fee of Twenty-Five Dollars ($25.00) for each annual renewal of a Fleet Vehicle Inspector's License.~~

~~Authority: T.C.A. §§ 68-201-105 and 4-5-201 et. seq. Administrative History: Original rule filed February 14, 1994; April 30, 1994. Stay of effective date filed April 15, 1994; effective June 14, 1994.~~
~~Amendment filed July 8, 2001; effective October 1, 2001; Amendment filed September 19, 2001;~~
~~effective December 3, 2001.~~

	~~Date Submitted to EPA~~	**~~Date Approved by EPA~~**	**~~Federal Register~~**
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~~1200-3-29-.12 Area of Applicability~~

~~(1) Chapter 1200-3-29 shall apply in the following areas of Tennessee as designated by the Tennessee Air Pollution Control Board:~~

~~(a) Davidson County~~

~~(b. Hamilton County~~

~~(c) Rutherford County~~

~~(d) Sumner County~~

~~(e) Williamson County~~

~~(f) Wilson County~~

~~(2) For the counties specified in paragraph 1200-3-29-.12(1), the requirements contained in this Chapter shall become effective as follows:~~

~~(a) For EPA-designated nonattainment counties classified as Basic, the effective date is April 1, 2006.~~

~~(b) For EPA-designated nonattainment counties with an EPA approved Early Action Compact classified as Basic, the effective date is April 1, 2005.~~

~~(c) For EPA-designated nonattainment areas classified as Marginal, the effective date is July 1, 2005.~~

~~(d) For EPA-designated nonattainment areas classified as Moderate, the effective date is April 1, 2007.~~

~~(e) For counties that would like to volunteer to implement a vehicle inspection and maintenance program, the startup date will be determined by the County and the Tennessee Air Pollution Control Board.~~

~~Authority: T. C.A. Section §§ 68-201-105, 55-4-130 and 4-5-201 et. seq.~~

~~Administrative History: Original rule filed_____2004 ; effective date_____ 2004.~~

	~~**Date Submitted to EPA**~~	~~**Date Approved by EPA**~~	~~**Federal Register**~~
~~Original Reg~~	~~DEC 29, 2004~~	~~AUG 26, 2005~~	~~70 FR 50199~~

Metro Public Health Dept
Nashville / Davidson County
Protecting, Improving, and **Sustaining** Health

David Briley, Mayor

Wendy J. Long, MD, MPH
Director of Health

Board of Health
Carol Etherington, MSN, RN, Chair
A. Alex Jahangir, MD, MMHC, Vice Chair
Thomas W. Campbell, MD
Tené Hamilton Franklin, MS
David A. Frederick, MS
Margreete G. Johnston, MD, MPH

July 29, 2019

Michelle W. Owenby, Director
Air Pollution Control Division
Department of Environment and Conservation
Tennessee Tower, 15th Floor
312 Rosa L. Parks Ave.
Nashville, TN 37243

Dear Ms. Owenby:

As you know, Tennessee Public Chapter 953 requires the discontinuation of vehicle inspection and maintenance programs once their requirement has been removed from the State Implementation Plan (SIP). Davidson County has taken advantage of the exemption provided in the rule and will be maintaining a local inspection program, at least through the life of the existing contract. However, there is no need for this ongoing program to be federally mandated through the SIP. Therefore, I am requesting that Regulation No. 8, "Inspection and Maintenance of Light-Duty Motor Vehicles" be removed from Davidson County's portion of the SIP. Enclosed, please find an underline/strikeout version of the regulation to reflect the proposed changes to the SIP.

If there are any questions concerning this matter, please feel free to contact me at (615) 340-5653.

Sincerely,

John Finke, P.E.
Director
Metro Public Health Department
Pollution Control Division

~~METROPOLITAN PUBLIC HEALTH DEPARTMENT~~
~~DIVISION OF POLLUTION CONTROL~~

~~REGULATION NO. 8~~

~~Inspection and Maintenance of~~
~~Light-Duty Motor Vehicles~~

~~As provided for in the Code of Laws of the Metropolitan Government of Nashville and Davidson County, Tennessee, Chapter 10.56, "Air Pollution Control", Section 10.56.090 and Section 10.56.240.~~

~~Adopted May 13, 1981~~
~~As Amended February 15, 1984~~
~~As Amended November 9, 1993~~
~~As Amended July 10, 2001~~
~~As Amended July 31, 2001~~
~~As Amended December 14, 2004~~
~~As Amended June 8, 2007~~
~~By the Metropolitan Board of Health~~
~~of Nashville and Davidson County, Tennessee~~

~~TABLE OF CONTENTS~~

		~~PAGE~~
~~Section 8-1~~	~~Definitions~~	~~1~~
~~Section 8-2~~	~~Motor Vehicle Inspection Requirements~~	~~5~~
~~Section 8-3~~	~~Exemption From Motor Vehicle Inspection Equipment~~	~~5~~
~~Section 8-4~~	~~Motor Vehicle Emission Performance Test Criteria~~	~~6~~
~~Section 8-5~~	~~Motor Vehicle Anti-Tampering Test Criteria~~	~~7~~
~~Section 8-6~~	~~Motor Vehicle Emissions Performance Test Methods~~	~~7~~
~~Section 8-7~~	~~Motor Vehicle Anti-Tampering Test Methods~~	~~8~~
~~Section 8-8~~	~~Motor Vehicle Inspection Program~~	~~9~~
~~Section 8-9~~	~~Motor Vehicle Inspection Fee~~	~~11~~
~~Section 8-10~~	~~Severability~~	~~11~~

~~RESOLUTION NO. RS2007-2013~~

~~A resolution approving an amendment to Regulation No. 8 of the Metropolitan Board of Health to reduce the fee charged for emissions inspections of light-duty motor vehicles and approving a contract amendment between the Metropolitan Government and SysTech International, LLC, for the provision of services relating to automobile emission testing.~~

~~WHEREAS, Section 10.56.240 of the Metropolitan Code authorizes the Metropolitan Board of Health to adopt and promulgate regulations for a program of inspection and maintenance (I&M) of internal-combustion engines and requires that any such regulation be approved by resolution of the Metropolitan Council; and,~~

~~WHEREAS, the Board of Health adopted and promulgated its Regulation No. 8 that established the I&M program; and,~~

~~WHEREAS, Regulation No. 8 and subsequent amendments thereto have been approved by resolutions of the Metropolitan Council; and,~~

~~WHEREAS, Section 8-9 (a) of Regulation No. 8 currently sets the fee charged for emissions inspections of light-duty motor vehicles at $10.00 per inspection; and,~~

~~WHEREAS, at the request of the Metropolitan Council, the Board of Health has reviewed the fee charged for inspections and has determined that Regulation No. 8 should be amended to reflect a reduced fee of $9.00 per inspection; and,~~

~~WHEREAS, the Metropolitan Government previously entered into a contract with SysTech International, LLC, for the provision of services relating to automobile emission testing; and~~

~~WHEREAS, both parties wish enter into an Amendment to the contract, as evidenced by the signatures on the contract attached hereto as Exhibit 1 and incorporated herein; and~~

~~WHEREAS, it is in the best interest of the citizens of The Metropolitan Government of Nashville and Davidson County that this amendment to Regulation No. 8 and to the contract Amendment with SysTech International, LLC, be approved.~~

~~NOW, THEREFORE, BE IT ENACTED BY THE COUNCIL OF THE METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY:~~

~~SECTION 1. That Section 8-9 (a) of Regulation No. 8 of the Metropolitan Board of Health, attached hereto an incorporated herein, be amended to reduce the fee for emissions inspections from $10.00 per inspection to $9.00 per inspection.~~
~~SECTION 2. That the contract Amendment by and between the Metropolitan Government and SysTech International, LLC, attached as Exhibit 1 to this resolution is hereby approved and the Mayor, or his designee, is authorized to execute it on behalf of the Metropolitan Government.~~

~~SECTION 3. This resolution shall take effect from and after its adoption, the welfare of The Metropolitan Government of Nashville and Davidson County requiring it.~~

~~Sponsored by: Ryman, Brenda Gilmore, Billy Walls~~

~~Attachment(s) on file in the Metropolitan Clerk's Office~~

~~RESOLUTION NO. RS2005-694~~

~~A resolution approving amendments to Regulation No. 8 of the Metropolitan Board of Health regarding inspection and maintenance of light-duty motor vehicles.~~

~~Whereas, Tennessee Code Annotated 68-201-115 provides that local pollution control programs must have air pollution control regulations that are at least as stringent as those regulations promulgated by the Tennessee Air Pollution Control Board; and~~

~~Whereas, the Metropolitan Health Department was designated as the local promulgator and enforcer of air pollution control regulations for Davidson County by the federal Environmental Protection Agency ("EPA") in accordance with the Clean Air Act of 1968; and~~

~~Whereas, pursuant to that designation, the Metropolitan Health Department acting by and through the Metropolitan Board of Health was bound to promulgate regulations as stringent as those promulgated by the EPA; and~~

~~Whereas, the Tennessee Department of Environment and Conservation was designated by the EPA and the Clean Air Act as the state-wide enforcer and promulgator of air pollution control regulations, with the exception of those areas designated as local enforcement areas, such as Davidson County, as long as those local enforcement areas promulgated regulations as stringent as those promulgated by the state and by the EPA; and~~

~~Whereas, the EPA will defer the designation of localities as "non-attainment areas" provided eligible localities enter into an Early Attainment Compact "EAC"; and~~

~~Whereas, EAC's will allow designated localities to avoid the sanctions and controls that could imposed upon areas designated as "non-attainment areas" provided the conditions of the EAC are met; and~~

~~Whereas, the Tennessee Air Pollution Control Board promulgates and enforces air pollution control regulations for the State of Tennessee, and has entered into the Tennessee Early Action Compact ("EAC") for clean air; and~~

~~Whereas, a condition of the EAC adopted by the Tennessee Air Pollution Control Board is an 8-hour ozone standard that lowers the amount of allowable ozone in the air; and~~

~~Whereas, the Tennessee Air Pollution Control Board has chosen to make more types of vehicles subject to the vehicle inspection program to satisfy the requirements of the new standard; and~~

~~Whereas, the Tennessee Air Pollution Control Board recently amended Regulation 1200-3-29 to require that diesel light duty vehicles and light duty vehicles weighing not more than 10,500 pounds be subject to emissions testing; and~~

~~Whereas, Davidson, Hamilton, Rutherford, Sumner, Williamson, and Wilson counties were specifically included in the area of applicability for Regulation 1200-3-29; and~~

~~Whereas, Regulation 1200-3-29 became effective for Hamilton, Rutherford, Sumner, Williamson and Wilson counties on December 14, 2004; and~~

~~Whereas, Section 10.56.240 of the Metropolitan Code authorizes the Metropolitan Board of Health to adopt and promulgate regulations for a program of inspection and maintenance (I&M) of internal combustion engines and requires that any such regulation be approved by resolution of the Metropolitan Council; and,~~

~~Whereas, the Board of Health adopted and promulgated its Regulation No. 8 that established the I&M program; and,~~

~~Whereas, Regulation No. 8 and subsequent amendments thereto have been approved by resolutions of the Metropolitan Council; and,~~

~~Whereas, in order to comply with the new state regulation, the Board of Health, on December 14, 2004, adopted amendments to Regulation No. 8 that redefined "Heavy-duty Motor Vehicle" to mean motor vehicles with a GVWR in excess of 10,500 pounds; and "Light-duty Motor Vehicle" to mean motor vehicles with an GVWR of not more than 10,500 pounds; and, further adopted amendments that removed the exemption of diesel powered light-duty motor vehicles, thereby making such vehicles subject to the provisions of Regulation No. 8; and,~~

~~Whereas, it is in the best interest of The Metropolitan Government of Nashville and Davidson County for the Metropolitan Council to approve the amendments to Regulation No. 8.~~

~~Now, therefore, be it resolved by the Council of The Metropolitan Government of Nashville and Davidson County:~~

~~Section 1. That the amendments to Regulation No. 8 of the Metropolitan Board of Health, amending Sections 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, and 8-7 thereof, to redefine "Heavy-duty Motor Vehicle" to mean motor vehicles with a GVWR in excess of 10,500 pounds; and "Light-duty Motor Vehicle" to mean motor vehicles with an GVWR of not more than 10,500 pounds; and, to remove the exemption of diesel powered light-duty motor vehicles, thereby making such vehicles subject to the provisions of Regulation No. 8 , a copy of which amended Regulation No. 8 is attached hereto and made a part of this Resolution, be and the same are hereby approved.~~

~~Section 2. That this Resolution shall take effect from and after its adoption, the welfare of The Metropolitan Government of Nashville and Davidson County requiring it.~~

~~Sponsored by: Erik Cole~~

RESOLUTION NO. RS2001-716

A RESOLUTION APPROVING AMENDMENTS TO REGULATION NO. 8 OF THE METROPOLITAN BOARD OF HEALTH REGARDING INSPECTION AND MAINTENANCE OF LIGHT-DUTY MOTOR VEHICLES.

WHEREAS, Section 10.56.240 of the Metropolitan Code authorizes the Metropolitan Board of Health to adopt and promulgate regulations for a program of inspection and maintenance (I & M) of internal combustion engines and requires that any such regulation be approved by regulation of the Metropolitan Council; and,

WHEREAS, the Board of health adopted and promulgated its Regulation No. 8 that established the I&M program, including inspection fees; and,

WHEREAS, the inspection fees of Six Dollars ($6.00) for individually-owned light-duty vehicles and Three Dollars ($3.00) per vehicle for fleet-owned light-duty vehicles have remained unchanged since the inception of the I&M program in January 1985; and,

WHEREAS, on July 10,2001 and July 31, 2001, the Board of Health adopted two amendments to Regulation No.8, the first of which added a new testing procedure required by federal law called the Onboard Diagnostics Test (OBD), and the second which increased the inspection fees to Ten Dollars ($10.00) for individually-owned light-duty vehicles and Five Dollars ($5.00) for fleet-owned light-duty vehicles; and,

WHEREAS, the State of Tennessee has already adopted OBD requirements and identical inspection fee increases to be applied in Sumner, Wilson, Rutherford, and Williamson Counties where the State operates I&M programs; and,

WHEREAS, it is in the best interest of The Metropolitan Government of Nashville and Davidson County for the Metropolitan Council to approve the amendments to Regulation No. 8.

Now, therefore, be it resolved by the Council of The Metropolitan Government of Nashville and Davidson County:

SECTION 1. That the amendments to Regulation No. 8 of the Metropolitan Board of Health, amending Sections 8-1, 8-4, 8-5, 8-6, 8-7, and 8-9 thereof, to add Onboard Diagnostic Testing and to increase the inspection fees to Ten Dollars ($10.00) for individually-owned light-duty vehicles and Five Dollars ($5.00) for fleet-owned vehicles, a copy of which amended Regulation No. 8 is attached hereto and made a part of this Resolution, be and the same are hereby approved.

SECTION 2. That this Resolution shall take effect from and after its adoption, the welfare of The Metropolitan Government of Nashville and Davidson County requiring it.

Sponsored By: Saletta Holloway & Howard Gentry AMENDMENT NO. 1 TO RESOLUTION NO. RS2001-716

Mr. President:

I move to amend Resolution No. RS2001-716 by adding the following sentence at the end of Section 1 thereof:

The increase in the inspection fees to Ten Dollars ($10.00) and Five Dollars ($5.00) respectively as stated in Section 8-9 of regulation No. 8 shall take effect on October 2, 2001.

~~RESOLUTION NO. R94-1049~~

~~A RESOLUTION APPROVING AN AMENDMENT TO REGULATION NO. 8 OF THE METROPOLITAN BOARD OF HEALTH REGARDING INSPECTION AND MAINTENANCE OF LIGHT-DUTY MOTOR VEHICLES.~~

~~WHEREAS, Metropolitan Code, Section 10.56.240, authorizes the Metropolitan Board of Health to adopt, promulgate and enforce rules and regulations regarding an inspection and maintenance program for light-duty motor vehicles; and,~~

~~WHEREAS, in 1981 the Metropolitan Board of Health adopted its Regulation No. 8, implementing an inspection and maintenance program of light-duty motor vehicles; and,~~

~~WHEREAS, on November 9, 1993, the Metropolitan Board of Health adopted amendments to Regulation No. 8, adding a three-point anti-tampering check for pollution control equipment as mandated by regulations promulgated by the United States Environmental Protection Agency; and~~

~~WHEREAS, said amendment to Regulation No. 8 cannot take effect until it is approved by Resolution of the Metropolitan Council.~~

~~NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY:~~

~~SECTION 1. That the amendment to Regulation No. 8 of the Metropolitan Board of Health, which adds a new Section 8-7 requiring a three-point anti-tampering check of pollution control equipment to the light-duty motor vehicle testing program, a copy of which amended Regulation No. 8 is attached hereto and made a part of this Resolution, be and the same is hereby approved.~~

~~SECTION 2. That this Resolution shall take effect from and after its adoption, the welfare of the Metropolitan Government of Nashville and Davidson County requiring it.~~

~~APPROVED AS TO AVAILABILITY OF FUNDS;~~

_____

~~Acting Director, Metropolitan Finance Department~~

~~APPROVED AS TO LEGALITY OF FORM AND COMPOSITION~~

_____

~~Metropolitan Attorney~~

~~RESOLUTION NO. R84-163~~

~~A RESOLUTION EMENDING RESOLUTION NO. 83-1471 BY APPROVING CERTAIN AMENDMENTS ADOPTED BY THE METROPOLITAN BOARD OF HEALTH TO ITS REGULATION NO. 8 RELATIVE TO MANDATORY INSPECTION AND MANDATORY INSPECTION AND MAINTENANCE FOR LIGHT-DUTY MOTOR VEHICLES.~~

~~WHEREAS, the Metropolitan Council adopted Resolution No. 83-1471 on May 17, 1983, which approved those portions of Regulation No. 8 of the Metropolitan Health Department, Pollution Control Division, relative to mandatory inspection and maintenance of light-duty vehicles; and,~~

~~WHEREAS, the Metropolitan Board of Health has adopted certain amendments to Regulation No. 8 which allow for a portion of said inspection to be conducted by a private contractor.~~

~~BE IT RESOLVED BY THE COUNCIL OF THE METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY, TENNESSEE.~~

~~SECTION 1. That Resolution No. 83-1471 be amended by approval of the amendments to Regulation No. 8, Metropolitan Health Department, Pollution Control Division, as adopted by the Metropolitan Board of Health on February 15, 1984, and that said amendments be, and the same are hereby approved.~~

~~SECTION 2. That this Resolution shall take effect from and after its adoption, the welfare of the Metropolitan Government of Nashville and Davidson County requiring it.~~

~~Approved By The~~
~~Metropolitan Council of Nashville and Davidson County~~
~~February 21, 1984~~

~~RESOLUTION NO. R83-1471~~

~~A RESOLUTION APPROVING REGULATIONS ADOPTED BY THE METROPOLITAN BOARD OF HEALTH PURSUANT TO SECTION 10.56.240 OF THE METROPOLITAN CODE AND PROVIDING FOR A MANDATORY INSPECTION AND MAINTENANCE PROGRAM FOR LIGHT DUTY MOTOR VEHICLES.~~

~~WHEREAS, Metropolitan Code Section 10.56.240(d) empowers the Metropolitan Board of Health to adopt regulations requiring regularly inspection and maintenance of light-duty motor vehicles; and~~

~~WHEREAS, Metropolitan Code Section 10.56.240(d) also states that any regulation be approved by resolution of the Metropolitan Council before it may take effect as law; and~~

~~WHEREAS, the Metropolitan Board of Health at its regular meeting on May 13, 1981, adopted regulations requiring mandatory yearly inspection and maintenance of light-duty motor vehicles, empowered by internal combustion engines, to promote automobile safety as well as air pollution control; and~~

~~WHEREAS, the Metropolitan Government is faced with the likely prospect of federally-imposed sanctions mandated by the Congress in the Clean Air Act of 1978, including the prohibitions and the loss of a substantial amount of federal funds, should this Government not initiate a program requiring inspection and maintenance for light-duty motor vehicles;~~

~~THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY:~~

~~SECTION 1. That the regulations adopted by the Metropolitan Board of Health under authority of Section 10.56.240(d) of the Metropolitan Code, requiring inspection and maintenance of light-duty motor vehicles, which regulations are attached hereto and made a part of this Resolution are hereby approved, with the exception of Sections 8-5 and 8-7 thereof, by the Metropolitan Council pursuant to Metropolitan Code Section 10.56.240(d).~~

~~SECTION 2. This resolution and the regulations herein approved shall take effect as to fleet operations as defined in all other vehicles covered in said regulations on July 1, 1984, the welfare of the Metropolitan Government of Nashville and Davidson County requiring it.~~

~~Approved by the~~
~~Metropolitan Council of Nashville and Davidson County~~
~~May 17, 1983~~

~~Regulation of Emissions From Light-duty Motor Vehicles~~
~~through Mandatory Vehicle Inspection and Maintenance Program~~

~~This Regulation is adopted for the purpose of preventing, abating and controlling air pollution caused by excessive air contaminants discharged into the air from the operation of light-duty motor vehicles. This Regulation is promulgated as provided for in Section 10.56.240, "Internal Combustion Engines", and Section 10.56.090, "Board-Powers and Duties," Chapter 10.56, of the Metropolitan Code of Laws.~~

~~SECTION 8-1: Definitions~~

~~All terms not defined herein shall have the meaning given in Chapter 10.56, "Air Pollution Control," Section 10.56.010, "Definitions," of the Metropolitan Code of Laws.~~

(a) ~~"**Air Pollutant**" - means any particulate matter or any gas or vapor other than water or any combination thereof including any physical, chemical, biological, radioactive substance or matter which is emitted into or otherwise enters the ambient air.~~

(b) ~~"**Antique Motor Vehicle**" - means any motor vehicle over twenty-five (25) years old which is owned solely as a collectors' item and is used for participation in club activities, exhibits, tours, parades and similar uses, but in no event for general transportation.~~

(c) ~~"**Carbon Dioxide**" - means a compound consisting of the chemical formula (CO_2).~~

(d) ~~"**Carbon Monoxide**" - means a compound consisting of the chemical formula (CO).~~

(e) ~~"**Catalytic Converter**" - means a pollution control device containing a catalyst for converting automobile exhaust into mostly harmless products.~~

(f) ~~"**Certificate of Compliance**" - means a certification issued by a Department vehicle inspector or a fleet vehicle inspector that the motor vehicle identified on the certificate complies with the emission performance and anti-tampering criteria appropriate to the vehicle as specified in this Regulation.~~

(g) ~~**"Check Engine Light"** - for the definition see Malfunction Indicator Light (MIL).~~

(h) ~~"**Contractor**" - means a person, business, firm, partnership, or corporation with whom the Department has a contract which provides for the operation of one or more official inspection stations.~~

(i) ~~"**Department**" - means the Department of Health of the Metropolitan Government, including the Metropolitan Board of Health, agents, employees, and divisions.~~

(j) ~~"**Department Vehicle Inspector**" - means any person employed by the Department and/or contractor who is certified by the Director as qualified to perform vehicle emissions performance and anti-tampering inspections.~~

(k) ~~**"Diagnostic Trouble Codes (DTC's)"** – is an alphanumeric code which is set in a vehicle's onboard computer when a monitor detects a condition likely to lead to (or has already produced) a component or system failure or otherwise contribute to exceeding emissions standards by 1.5 times the certification FTP standard.~~

(l) ~~"**Diesel Powered Motor Vehicle**" - means a motor vehicle powered by a compression-ignition internal combustion engine.~~

(m) ~~"**Director**" - means the chief administrative officer of the Metropolitan Board of Health or his designated representative.~~

(n) ~~"**Electric Powered Motor Vehicle**" - means a motor vehicle which uses a propulsive unit powered exclusively by electricity.~~

(o) ~~"**Emission**" - means the act of releasing or discharging air pollutants into the ambient air from any source.~~

(p) ~~"**Exhaust Emissions**" - means substances emitted into the atmosphere from any opening downstream from the exhaust ports of a motor vehicle engine.~~

(q) ~~"**Exhaust Gas Analyzer**" - means a device for sensing the amount of air pollutants, including carbon monoxide and hydrocarbons, in the exhaust emissions of a motor vehicle. For the purposes of this Regulation, this shall mean analyzing devices of the non-dispersive infrared type or any other analyzing device that provide equal or greater accuracy as approved by the Director.~~

(r) ~~"**Factory-installed Motor Vehicle Pollutant Control System**" - means a motor vehicle pollution control system installed by the vehicle or engine manufacturer to comply with United States government motor vehicle emission control laws and regulations.~~

(s) ~~**"Federal Test Procedure (FTP)"** - is the test procedure used to determine the compliance of vehicles with federal emission standards.~~

(t) ~~"**Fleet**" - means fifty (50) or more light duty motor vehicles owned by the same person or business entity which are in use, registered in Davidson County, and not owned or held primarily for the purpose of resale.~~

(u) ~~"**Fleet Inspection Location**" - means any motor vehicle inspection facility operated by a fleet operator holding a valid fleet inspection permit.~~

(v) ~~"**Fleet Inspection Permit**" - means a certificate issued by the Director authorizing a fleet operator to conduct motor vehicle inspection sin accordance with this Regulation and other requirements as determined by the Department.~~

(w) ~~"**Fleet Operator**" - means the person owning a group of motor vehicles which constitute a fleet as defined in this regulation.~~

(x) ~~"**Fleet Vehicle Inspector**" - means any person retained by a fleet operator holding a valid fleet inspection permit and who is certified by the Director as qualified to perform vehicle emissions performance and anti-tampering inspections.~~

(y) ~~"**Gasoline Inlet Restrictor**" - means the leaded fuel nozzle restrictor installed on motor vehicles which was designed for the use of unleaded gasoline only.~~

(z) ~~"**Gasoline Powered Motor Vehicle**" - means any motor vehicle powered by a spark-ignition internal combustion engine.~~

(aa) ~~"**GVWR**" - means the gross vehicle weight as determined from combined manufacturer vehicle and maximum load rating.~~

(bb) ~~"**Heavy-duty Motor Vehicle**" - means any motor vehicle having a combined manufacturer vehicle and maximum loading rate (GVWR) to be carried thereon in excess of 10,500 pounds (4773 kilograms or more).~~

(cc) ~~"**Hydrocarbon**" - means a class of chemical compounds consisting of hydrogen and carbon.~~

(dd) ~~"**Idle Speed**" - means the unloaded engine speed of a motor vehicle when the accelerator pedal is fully released. In a vehicle equipped with an automatic transmission the drive selector shall be in neutral or park. In a vehicle equipped with a manual transmission, the gear selector shall be in neutral and the clutch fully engaged. In all vehicles, engine operated accessories shall be turned off.~~

(ee) ~~"**Internal Combustion Engine**" - means any engine in which the combustion of gaseous, liquid or pulverized solid fuel takes place within one or more cylinders.~~

(ff) ~~"**Light-duty Motor Vehicles**" - means any motor vehicle having a combined manufacturer vehicle and maximum load rating to be carried thereon (GVWR) of not more than 10,500 pounds (4773 kilograms).~~

(gg) ~~**"Malfunction Indicator Light (MIL)"** – is known as the Check Engine light. The Malfunction Indicator Light is illuminated on the dashboard when conditions exist likely to result in emission exceeding FTP standards by 1.5 times or worse. Alternatives include "Service Engine Soon", as well as an unlabeled icon of an engine.~~

(hh) ~~"**Manufacturers Idle-speed Specifications**" - means the engine idle speed specified for a particular motor vehicle as printed on the engine compartment emissions system data plate or in the owners manual.~~

(ii) ~~"**Metropolitan Motor Vehicle Regulatory License**" - means the annual motor vehicle license required by Section 5.32.140 of the Metropolitan Code as a condition for legal operation of certain classes of motor vehicles.~~

(jj) ~~"**Metropolitan Wheel Tax**" - means the annual commercial vehicle tax required by Section 5.32.020 of the Metropolitan Code as a condition for legal operation of certain classes of motor vehicles.~~

(kk) ~~"**Model Year**" - means annual production period of new motor vehicles or new motor vehicle engine designated by the calendar year in which such production ends. If the manufacturer does not designate a production period, the year with respect to such vehicles or engines shall mean the twelve (12) month period beginning January of the year in which production thereof begins. The model year of a motor vehicle constructed by other than the original manufacturer shall be assigned by the Director.~~

(ll) ~~"**Motor Vehicle**" - means any self-propelled vehicle used for transporting persons or commodities on public roads.~~

(mm) ~~"**Motorcycle**" - means any motor vehicle having a seat or saddle for the use of the rider and designed to travel on not more than three wheels in contact with the ground and having a curb weight of 2000 pounds (907 kilograms) or less.~~

(nn) ~~"**New Motor Vehicle**" - means any motor vehicle that has never been previously titled or registered in this or any other jurisdiction and whose ownership document remains as a manufacturer's certificate or origin.~~

(oo) ~~"**Official Inspection Station**" - means a facility operated by the Department and/or contractor to conduct motor vehicle inspections pursuant to this Regulation.~~

(pp) ~~**"Onboard Diagnostics (OBD)"** – is a system of vehicle component and condition monitors controlled by a central, onboard computer designed to signal the motorist when conditions exist which could lead to a vehicle's exceeding its certification standards by 1.5 times the FTP standard.~~

(qq) ~~**"OBD Data Link Connector (DLC)"** – is the interface which is usually located under the dashboard on the driver's side between a vehicle's OBD computer and the OBD scanner. Connecting an OBD scanner to the DLC allows inspectors and vehicle repair technicians to read the readiness status of the vehicle's various onboard monitors as well as any diagnostic trouble codes.~~

(rr) ~~"**Opacity**" - means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background.~~

(ss) ~~"**Person**" - means any individual natural person, trustee, court-appointed representative, syndicate, association, partnership, firm, club, company, corporation, business trust, institution, agency, government corporation, municipal corporation, city, county, municipality, district or other political subdivision, department, bureau, agency or other entity recognized by law as the subject of rights and duties, and any officer, agent, or employee thereof. The masculine, feminine, singular, or plural is included in any circumstances.~~

(tt) ~~"**Pollution Control Device**" - means equipment designed by the manufacturer for installation on a motor vehicle for the purpose of reducing pollutants emitted from the vehicle, or a system or engine modification on a motor vehicle which causes a reduction of pollutants emitted from the vehicle.~~

(uu) ~~**"Readiness Codes"** – are status flags stored by a vehicle's onboard computer which is different from the DTC in that it does not indicate a vehicle fault, but rather whether or not a given monitor has been run (i.e., whether or not the component or system in question has been checked to determine if it is functioning properly).~~

(vv) ~~"**PPM**" - means parts per million by volume.~~

(ww) ~~"**RPM**" - means engine crankshaft revolutions per minute.~~

(xx) ~~"**Tampering**" - means to remove, render inoperative, cause to be removed, or make less operative any emission control device, unless such removal or act to render inoperative or less operative is for the purpose of motor vehicle disposal or salvage operation.~~

(yy) ~~"**Vehicle Exhaust System**" - means all devices, equipment and systems which transport exhaust emissions from the exhaust ports of the motor vehicle engine to the atmosphere.~~

~~SECTION 8-2: Motor Vehicle Inspection Requirements~~

~~(a) All light-duty motor vehicles either registered in Davidson County, or directly with the motor vehicle division of the Tennessee Department of Revenue pursuant to T.C.A. 55-4-207 and used within or assigned to user within Davidson County, except those exempted in Section 8-3 of this Regulation, are required to be inspected annually for compliance with the emissions performance and anti-tampering criteria provisions of Sections 8-4 and 8-5 of this Regulation. Owners of vehicles so inspected are required to obtain a Certificate of Compliance. A Certificate of Compliance shall be valid for 90 days following the date of issuance, except for those registered pursuant to T.C.A. 55-4-207, which shall be valid for one year.~~

~~(b) A Certificate of Compliance shall be issued only by a Department and/or contractor vehicle inspector and only after the vehicle demonstrates compliance with the test criteria established in Sections 8-4 and 8-5 of this Regulation.~~

~~(c) All light-duty motor vehicles required to obtain a Certificate of Compliance except those vehicles contained in a fleet which has a valid fleet inspection permit and those vehicles registered in Davidson County but not subject to either the Metropolitan Wheel Tax or the Metropolitan Motor Vehicle Regulatory License requirements shall obtain a valid Certificate of Compliance within ninety (90) days prior to the required date for payment of the wheel tax or the motor vehicle regulatory license fee as appropriate to the class of motor vehicles.~~

~~(d) All light-duty motor vehicles required to obtain a Certificate of Compliance and which are either contained in a fleet having a valid fleet inspection permit or are vehicles registered in Davidson County but exempted from the Metropolitan Wheel Tax and Metropolitan Motor Vehicle Regulatory License requirements shall obtain a valid Certificate of Compliance within ninety (90) days prior to a compliance date for that particular motor vehicle. A schedule of compliance dates for such vehicles shall be established by the Director.~~

~~(e) The Certificate of Compliance must be presented prior to the issuance of the Metropolitan Wheel Tax or the Metropolitan Vehicle Regulatory License.~~

~~SECTION 8-3: Exemption From Motor Vehicle Inspection Equipment~~

~~(a) The following classes of motor vehicles are exempted from the requirement established in Section 8-2 of this Regulation.~~

~~(1) New motor vehicles being registered for the first time;~~

~~(2) Heavy duty motor vehicles;~~

~~(3) Motorcycles;~~

~~(4) Antique motor vehicles;~~

~~(5) Electric-powered light-duty motor vehicles; and~~

~~(6) Gasoline-powered light-duty motor vehicles with a designated model year prior to 1975.~~

~~(b) When a motor vehicle is equipped with other than the original engine, the vehicle shall be classified for purposes of the emission performance test by the model year of the chassis.~~

~~SECTION 8-4: Motor Vehicle Emission Performance Test Criteria~~

~~(a) Vehicles shall not be allowed to complete emission performance testing if one or more of the following conditions exist when the vehicle is presented for testing:~~

~~(1) For 1975 to 1995 model vehicles if the vehicle exhaust system leaks in such a way as to dilute the exhaust emissions being sampled by the exhaust gas analyzer; the sum of carbon monoxide and carbon dioxide concentrations recorded for the idle speed reading from an exhaust outlet must not be less than six (6) percent; and~~

~~(2) The visible emission from the gasoline-powered vehicles is such that it would interfere with operation of the emission test equipment.~~

~~(b) Vehicle models 1975 to 1995 with idle speed emission values, which exceed the test standards specified in Table 1, shall fail the emission performance test.~~

~~TABLE 1~~ ~~MAXIMUM IDLE SPEED EMISSIONS ALLOWABLE~~ ~~DURING IDLE SPEED EMISSIONS TEST~~				
	~~CO %~~		~~HC (PPM)~~	
~~Vehicle Model Year~~	~~Light-Duty Vehicles Less Than Or Equal To 6000 Lbs. GVWR~~	~~Light-Duty Vehicles Greater Than 6000 Lbs. GVWR~~	~~Light-Duty Vehicles Less Than Or Equal To 6000 Lbs. GVWR~~	~~Light-Duty Vehicles Greater Than 6000 Lbs. GVWR~~
~~1975~~	~~5.0~~	~~6.5~~	~~500~~	~~750~~
~~1976~~	~~5.0~~	~~6.5~~	~~500~~	~~750~~
~~1977~~	~~5.0~~	~~6.5~~	~~500~~	~~750~~
~~1978~~	~~4.0~~	~~6.0~~	~~400~~	~~600~~
~~1979~~	~~4.0~~	~~6.0~~	~~400~~	~~600~~
~~1980~~	~~3.0~~	~~4.5~~	~~300~~	~~400~~
~~1981 And Newer~~	~~1.2~~	~~4.0~~	~~220~~	~~400~~

~~(3) Light-duty diesel-powered motor vehicle models 1975 through 2001 shall be subject to the Curb Idle test as follows:~~

~~(i) A diesel vehicle shall not emit visible emission in excess of ten (10) percent opacity for ten (10) or more consecutive seconds, as measured at idle engine speed.~~

~~(4) All 1996 and newer gasoline-powered motor vehicles and all 2002 and newer diesel-powered motor vehicles shall be subject to an OBD inspection. An OBD check shall consist of two parts. A visual check of the MIL and an electronic examination of the OBD computer. The vehicle is required to pass a MIL command on test and a bulb check test. After the vehicle has passed the MIL command on test and the bulb check test, it must not have any DTC set and all of the required readiness codes must be set in order to pass an OBD inspection.~~

~~SECTION 8-5: Motor Vehicle Anti-Tampering Test Criteria~~

~~(a) Each gasoline-powered motor vehicle subject to an emission performance test under this Regulation is also subject to visual anti-tampering inspection and shall comply with the following minimum anti-tampering requirements:~~

~~(1) At a minimum, the emission control devices subject to an inspection are the catalytic converter, and fuel filler cap. If emission control devices are found in a tampered condition, such devices shall be replaced prior to any retesting or reinspection as provided for in Section 8-9(c).~~

~~(2) Each gasoline-powered motor vehicle subject to an OBD inspection is also subject to an anti-tampering test, and shall comply with a DLC check and a fuel cap pressure test.~~

~~(3) Each diesel-powered motor vehicle subject to an emission performance test is also subject to an anti-tampering test and shall comply at a minimum with a catalytic converter check, if applicable, and a fuel cap check.~~

~~(4) Each diesel-powered motor vehicle subject to an OBD inspection is also subject to an anti-tampering test, and shall comply with a DLC check and fuel cap check.~~

~~SECTION 8-6: Motor Vehicle Emissions Performance Test Methods~~

~~(a) For gasoline-powered motor vehicles, the motor vehicle emissions performance test shall consist of the sampling of exhaust emissions at idle speed and measurement of CO_2 dilution, CO concentration and HC concentration.~~

~~(b) For gasoline-powered motor vehicles, sampling of exhaust emissions shall consist of measurement of CO_2 dilution, CO concentration and HC concentration during idle operation using an approved exhaust gas analyzer. Measurements taken during the initial idle phase may be succeeded by measurements taken during a second idle phase which has followed an engine conditioning phase consisting of engine operation at approximately 2500 RPM for approximately 20 seconds. The lowest emission readings~~

~~from either of these idle speed test phases shall be used to determine pass or failure of the emissions performance test.~~

~~(c) For diesel-powered motor vehicles, the motor vehicle emission performance test shall consist of the Curb Idle test procedures for diesel vehicles as follows:~~

~~(1) Diesel-powered vehicles shall be inspected with an opacity meter that is a full-flow, direct reading, continuous reading light extinction type using a collimated light source and photo-electric cell, accurate to within plus or minus five (5) percent.~~

~~(2) Separate measurements shall be made on each exhaust outlet on diesel vehicles equipped with multiple exhaust outlets. The reading taken from the outlet giving the highest reading shall be used for comparison with the standard for the vehicle being tested.~~

~~(d) For gasoline-powered motor vehicles with a model year of 1996 and newer and for diesel-powered motor vehicles with a model year of 2002 and newer, an Onboard Diagnostic test shall be performed. All vehicles that have a readily accessible OBD system shall be tested. The results of the test shall be used to determine pass or failure of the vehicle.~~

~~SECTION 8-7: Motor Vehicle Anti-Tampering Test Methods~~

~~(a) For 1975 to 1995, the motor vehicle anti-tampering test shall consist of the following:~~

~~(1) The vehicle will be visually checked to see that the appropriate fuel cap is securely in place. If the appropriate fuel cap is not in place, it will result in the failure of the anti-tampering test.~~

~~(2) The vehicle will be visually checked to see if the catalytic converter is the correct type for the certified vehicle configuration and is properly installed. If the catalytic converter has been tampered with, removed, or is the incorrect configuration, it will result in the failure of the anti-tampering test.~~

~~(b) Each gasoline-powered motor vehicle with a model year of 1996 and newer is subject to an anti-tampering test, and shall comply with the DLC and a fuel cap pressure test. The anti-tampering test shall consist of the following elements:~~

~~(1) Vehicle shall be visually checked to see if the appropriate fuel cap is securely in place.~~

~~(2) If the fuel cap is present, it shall be removed and a fuel cap pressure test shall be performed to assure the cap is working properly. (Federal Test Procedures 26-21 Pass/Fail Standard). If the fuel cap fails the pressure test, it shall result in a failure of the anti-tampering test.~~

~~(3) If the DLC has been tampered with or is missing, it must be repaired or replaced prior to any retesting or reinspection. If the vehicle is incompatible with OBD test equipment or is readily unavailable, then the vehicle is required to pass the idle speed emission values specified in Section 8-4(b).~~

~~(c) Each diesel-powered motor vehicle with a model year of 2002 and newer is subject to an anti-tampering test, and shall comply at a minimum with a DLC check and a fuel cap check. The anti-tampering test shall consist of the following elements:~~

~~(1) Vehicle shall be visually checked to see if the appropriate fuel cap is securely in place.~~

~~(2) If the DLC has been tampered with or is missing, it must be repaired or replaced prior to any retesting or reinspection. If the vehicle is incompatible with the OBD test equipment or if the DLC is readily unavailable, then the vehicle is subject to the Curb Idle test as specified in Section 8-6 (c-1-2).~~

~~(d) A pass/fail determination will be made for each of the test elements in Paragraph (a), (b), or (c). If a vehicle fails any of the elements in paragraph (a), (b), or (c), it will result in the failure of the motor vehicle inspection and a Certificate of Compliance will not be issued until the repairs have been made to the vehicle.~~

~~SECTION 8-8: Motor Vehicle Inspection Program~~

~~(a) The motor vehicle inspection program shall be operated by the Metropolitan Public Health Department or contractor.~~

~~(b) All vehicle inspections shall be conducted at official inspection stations operated by the Department and/or contractor except those fleet inspections provided for in Section 8-8(c) of this Regulation.~~

~~(c) In lieu of the requirement in Section 8-8(b) of this Regulation, vehicles owned or operated by a fleet operator to whom a fleet inspection permit has been issued may be inspected by a licensed fleet vehicle inspector at a site other than an official inspection station.~~

~~(d) A light-duty fleet vehicle operator may make application to the Director for a fleet vehicle inspection permit. Minimum requirements for issuance of a permit shall be:~~

~~(1) Possession of an approved exhaust gas analyzer, tools and equipment determined by the Director to be adequate for conducting the required emissions inspection;~~

~~(2) Demonstration of knowledge of methods and procedures for conducting required emissions performance and anti-tampering inspections according to criteria developed by the Director;~~

~~(3) Provision of appropriate facility for vehicle testing and appropriate secure storage facility for storage of Certificates of Compliance and records of inspections;~~

~~(4) Agreement to supply inspection and Certificate of Compliance issuance information as requested by the Director and to allow access to testing facility, testing equipment, testing personnel, testing data, Certificate of Compliance inventory and fleet vehicles as requested by the Director; and~~

~~(5) Retention of licensed fleet vehicle inspector to conduct fleet vehicle inspections.~~

~~(e) A fleet inspection permit shall be valid for one year from date of issuance and may be renewed through application to the Director within thirty (30) days prior to the date of expiration. A fleet inspection permit is not transferable and may be denied, suspended or revoked by the director for failure to comply with this Regulation and other requirements as determined by the Department.~~

~~(f) A person employed or retained by a fleet operator holding a valid fleet inspection permit may make application to the Director for a fleet vehicle inspector's license. Minimum requirements for issuance of this license shall be:~~

~~(1) Successful completion of a vehicle inspector training course prepared and offered by the Department;~~

~~(2) Successful completion of mechanics training course approved by the Director;~~

~~(3) Agreement to participate in additional training activities from time to time as specified by the Director; and~~

~~(4) Provision of written evidence that applicant is employed or retained by the fleet operator.~~

~~(g) A fleet inspector's license shall be valid for one year from date of issuance and may be renewed through application to the Director within thirty (30) days prior to the date of expiration. A fleet vehicle inspector's license is not transferable and may be denied, suspended or revoked by the Director for failure to comply with this Regulation and other requirements as determined by the Department.~~

~~(h) All vehicles issued Certificate of Compliance under the provisions of Section 8-8(c) of this Regulation shall be subject to retesting at either the fleet inspection location or an official inspection station as deemed necessary by the Director in order to maintain compliance with the intent of this Regulation.~~

~~SECTION 8-9: Motor Vehicle Inspection Fee~~

~~(a) There shall be a fee of $9.00 dollars for each emission test payable at the time of inspection unless the vehicle qualifies for an inspection without charge as specified in Paragraph (c).~~

~~(b) There shall be a fee of $5.00 dollars for each Certificate of Compliance supplied to licensed fleet inspectors for issuance to motor vehicles which comply with the testing provisions of this Regulation.~~

~~(c) Each vehicle which fails its initial inspection is entitled to one reinspection at no charge if the vehicle is accompanied by the entire initial inspection report.~~

~~(d) Motor vehicle owners or operators shall be given in writing the results of all inspection procedures carried out at any official inspection station.~~

~~(e) There shall be a fee of fifty ($50.00) dollars for each initial annual Fleet Vehicle Inspector's License issued to a fleet vehicle inspector; there shall be a fee of fifteen ($15.00) dollars for each annual renewal of a Fleet Vehicle Inspector's License.~~

~~SECTION 8-10: Severability~~

~~The provisions of any Part, Section, Subsection, Paragraph, phrase or clause of this Regulation that shall be adjudged invalid or unconstitutional by any court of competent jurisdiction, the judgment shall not affect, compare, or invalidate the remainder of this Regulation, but should be confined in its operation to the Part, Section, Subsection, Paragraph, phrase or clause of this Regulation that shall not be directly involved in the controversy in which such judgment shall have been redeemed.~~

Appendix C

Onroad Mobile

Source Emissions

Appendix C Onroad Mobile Source Emissions

1.0 INTRODUCTION

This appendix documents the process used in the development of the onroad mobile sources emissions inventory. The development of the onroad emissions inventory was conducted in conjunction with the Davidson County Division of Pollution Control, with assistance from the Nashville Metropolitan Planning Organization.

Onroad mobile sources emit a large variety of emissions, including carbon monoxide (CO), oxides of nitrogen (NO_x), volatile organic compounds (VOCs) and a number of other pollutants. These are the pollutants considered in this analysis. The year determined to be the most appropriate year for scenario comparison is 2022. The emissions comparisons are conducted for an annual emissions inventory. To estimate emissions, as much locally developed data was used as possible to provide input to EPA's most current version of the MOVES model.

2.0 METHODOLOGY

The onroad mobile source emissions for the Motor Vehicle Inspection and Maintenance (I/M) areas were estimated using the latest version of EPA's MOVES emission factor model. The version of the model used is the MOVES2014b version with the 20180517 database. The input parameters for the model runs were developed, reviewed and agreed to through a collaborative process including the state air agency, local air agencies, MPOs, contractors and consultants as well as other interested stakeholders.

Future VMT and other vehicle activity estimates were provided by the Nashville Metropolitan Planning Organization (MPO) based on travel demand modeling performed for Middle Tennessee (Mid TN). A summary of the modeling inputs used and the results of the emission estimates are described in this document. Onroad emissions for 2022 were developed jointly by the State of Tennessee and the Davidson County Pollution Control Division.

In December 2009, the EPA released a new model for onroad mobile sources. MOVES (MOtor Vehicle Emissions Simulator) is a computer program designed by the EPA to estimate air pollution emissions from onroad mobile sources. MOVES2010 replaces the EPA's previous emissions model for onroad mobile sources, MOBILE6.2. In October of 2015, EPA released MOVES2014, with the most recent version of MOVES2014b released in August of 2018. MOVES can be used to estimate exhaust and evaporative emissions as well as brake and tire wear emissions from all types of onroad vehicles.

MOVES can either export emissions factors or emissions inventories. If emissions factors are exported, the output will need to be post-processed. These emissions factors will need to be multiplied by vehicle population and vehicle miles traveled. Alternatively, if the VMT and vehicle population, are input into MOVES, MOVES can conduct the post-processing internally and output total emissions for a selected period of time. For simplicity and consistency, the onroad emissions inventories developed in this document were developed using MOVES' emissions inventory output option.

The objective of the following section is to describe the input files and the emissions estimation procedures. This document also includes tables summarizing the estimated emissions for the various scenarios. Onroad mobile source emissions are estimated by the methodologies suggested in the Environmental Protection Agency's (EPA) Technical Guidance[1] ("Technical Guidance").

2.1 MOVES RUNSPEC Parameters

In setting up a MOVES run, a number of parameters need to be established to define the timespan, geographic bounds, vehicle and road types, pollutants and output options for the run. Which options are selected can have an impact on the overall result. The specifics for the 'runspec' (sic) or, the specifications for a particular MOVES run saved in an ".mrs" file, are outlined below.

- Scale: County level scale – Inventory mode
- Time Span: year (2022), by hour, for all months, all days, all hours
- Geographic bounds: County level for each of the Mid TN Counties
- Vehicles/Equipment: Gasoline, CNG, ethanol (E85) and diesel fuels, all valid vehicle combinations
- Road type: All
- Pollutants and Processes: NO_x, CO and VOC and all other required supporting prerequisite pollutants
- Output options:
    - General:
        - Units: grams, joules, miles
        - Activity: Distance Traveled, Population
    - Output Emissions Detail:
        - Always: Time: Hour, Location: County

[1] *MOVES2014, MOVES2014a, and MOVES2014b Technical Guidance: Using MOVES to Prepare Emissions Inventories for State Implementation Plans and Transportation Conformity*, US EPA, EPA-420-B-18-039, August 2018.

- All Vehicle/Equipment Categories: Model year, Fuel Type
- On road: Road Type, Source Use Type

Once the runspec is developed for each county and year combination, the input data can be imported through the County Data Manager. A separate run needs to be executed for each county and scenario.

3.0 MOVES INPUT DATA

Due to the size and the complexity of the MOVES input and output files, the MOVES input files and output files will be provided electronically. Some of the smaller datasets, or parts of datasets, for illustration, are included in this document. MOVES requires a large amount of locally developed data in order to complete a MOVES run. Some of the inputs required include vehicle population, vehicle miles traveled (VMT), speeds, meteorology, day, month and hour fractions, and distribution of the VMT on different road types (road type distribution). Some of this data was developed by the Tennessee Department of Transportation (TDOT). Details on how some of these data elements were developed by TDOT are contained in the document titled: *Methodology for Developing Input Datasets for the MOVES Model*, contained in Appendix D of this document. The development of other MOVES inputs is described in the sections below.

3.1 Meteorology

Local temperature and humidity data are required inputs for MOVES. Ambient temperature is a key factor in estimating emission rates for onroad vehicles with substantial effects on most pollutant processes. Relative humidity is also important for estimating NO_x emissions from motor vehicles. MOVES requires a temperature (in degrees Fahrenheit) and relative humidity (in percent) by hour. MOVES requires a 24-hour temperature and humidity profile to model a full day of emissions on an hourly basis. The MOVES Technical Guidance provides guidance on the selection of temperature profiles for use in Transportation Conformity determinations and State Implementation Plans (SIPs).

Available data for Tennessee was obtained from the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC) at: http://www.ncdc.noaa.gov/oa/ncdc.html. Data was captured for all weather stations in Tennessee that collected hourly temperature and relative humidity data. Observations were collected only for those observations that were 'on the hour'. After the data was compiled and formatted, the data was reviewed to determine data completeness. The data was then compiled for the nearest location – the Nashville International Airport in Davidson County.

The data used was averaged by month from years 2015, 2016 and 2017. January's meteorological data for Mid TN is illustrated in Table 1 below.

Table 1. Sample Temperature and Humidity Data.

monthID	zoneID	hourID	temperature	relHumidity
1	470370	1	38	72
1	470370	2	38	73
1	470370	3	37	74
1	470370	4	37	75
1	470370	5	37	76
1	470370	6	36	76
1	470370	7	35	77
1	470370	8	37	76
1	470370	9	39	71
1	470370	10	41	68
1	470370	11	43	62
1	470370	12	45	59
1	470370	13	46	58
1	470370	14	48	55
1	470370	15	48	54
1	470370	16	47	55
1	470370	17	45	58
1	470370	18	43	61
1	470370	19	42	64
1	470370	20	41	66
1	470370	21	40	68
1	470370	22	40	70
1	470370	23	39	71
1	470370	24	38	72

3.2 Source Type Population

Source type (i.e., vehicle type) population is used by MOVES to calculate start and evaporative emissions. In MOVES, start and resting evaporative emissions are related to the population of vehicles in an area. Since vehicle type population directly determines start and evaporative emission, users must develop local data for this input. MOVES classifies vehicles based on the way vehicles are classified in the Federal Highway Administration's HPMS (Highway Performance Monitoring System) system rather than on the way they are classified in the EPA's emissions regulations.

MOVES categorizes vehicles into 13 source types, which are subsets of 6 HPMS vehicle types, as shown in the crosswalk in Table 2. The EPA believes that states should be able to develop population data for many of these source type categories from state motor vehicle registration data (e.g., motorcycles, passenger cars, passenger

trucks and light commercial trucks) and from local transit agencies, school districts, bus companies, and refuse haulers (intercity, transit, school buses and refuse trucks).

Table 2. Source Type Definitions and Crosswalk to HPMS Vehicle Type ID.

MOVES Source Type ID	HPMS Vehicle Type ID	Source Type Name	Definition
11	10	Motorcycle	Vehicles with less than four wheels.
21	20	Passenger Car	Four wheel, two axle vehicles whose primary function is passenger transport.
31	30	Passenger Truck	Four wheel, two axle trucks whose primary functional design is for cargo, but are used primarily for passenger transport.
32	30	Light Commercial Truck	Four wheel, two axle trucks used primarily for cargo transport.
41	40	Intercity Bus	Passenger vehicles with a capacity of 15 or more persons primarily used for transport between cities.
42	40	Transit Bus	Passenger vehicles with a capacity of 15 or more persons primarily used for transport within cities.
43	40	School Bus	Passenger vehicles with a capacity of 15 or more persons used primarily for transport of students for school.
51	50	Refuse Truck	Trucks primarily used to haul refuse to a central location.
52	50	Single Unit Short-haul Truck	Single unit trucks with more than four tires with a range of operation of up to 200 miles.
53	50	Single Unit Long-haul Truck	Single unit trucks with more than four tires with a range of operation of over 200 miles.
54	50	Motor Home	Trucks whose primary functional design is to provide sleeping quarters.
61	60	Combination Short-haul Truck	Combination tractor/trailer trucks with more than four tires with a range of operation of up to 200 miles.
62	60	Combination Long-haul Truck	Combination tractor/trailer trucks with more than four tires with a range of operation of over 200 miles.

TDOT developed source type populations for the Mid TN Counties for 2014. See the *Methodology for Developing Input Datasets for the MOVES Model* in Appendix D for a detailed description of how source type population was developed at the county level.

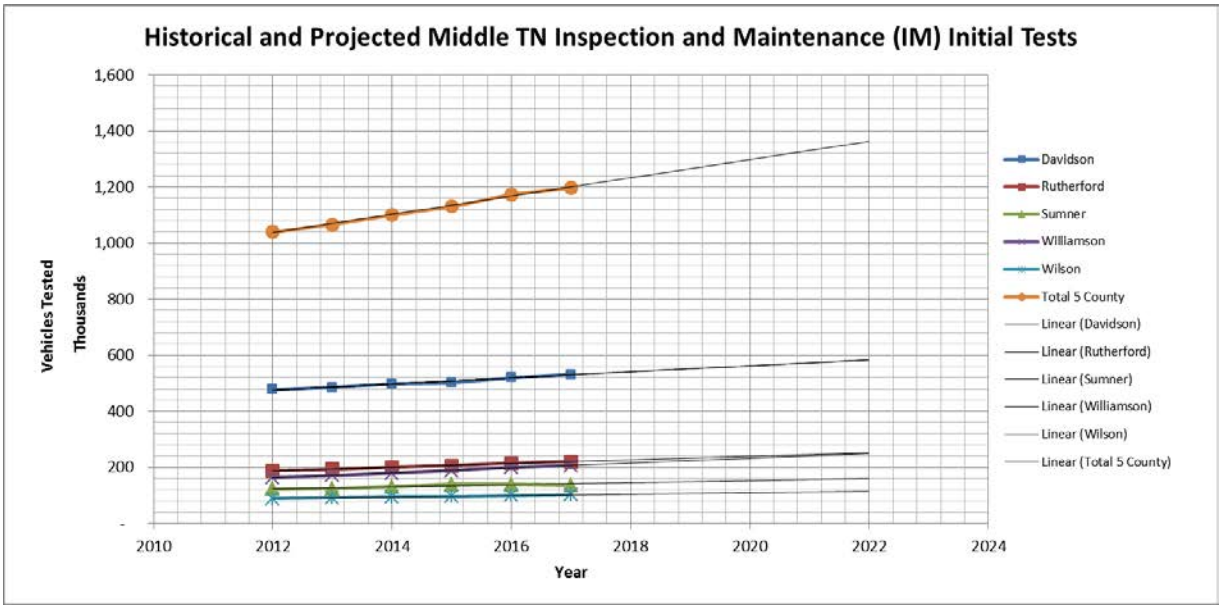
After examining the source type populations for passenger cars, passenger trucks and light commercial trucks (source types 21, 31 and 32), and comparing those to historical

vehicle inspection and maintenance data, it was determined that the vehicle population for these source types was underestimated. Historical vehicle population subject to Inspection and Maintenance (I/M) was plotted and used to project vehicle population for the applicable source types for calendar year 2022. See Table 3 and Figure 1 for historical values and projections of the number of vehicles with initial I/M tests in the Mid TN Counties.

Table 3. Historical and Projected Mid TN Inspection and Maintenance (I/M) Initial Tests.

Historical (2012-2017) and Projected (2018-2022) Mid TN Inspection and Maintenance (I/M) Initial Tests						
Year	**Davidson**	**Rutherford**	**Sumner**	**Williamson**	**Wilson**	**Total 5 County**
2012	477,479	188,029	122,720	163,346	88,707	1,040,281
2013	485,005	192,966	125,198	171,183	90,839	1,065,191
2014	497,525	199,192	130,888	179,113	94,214	1,100,932
2015	501,508	205,674	139,618	188,320	95,390	1,130,510
2016	520,383	214,881	139,519	199,481	99,731	1,173,995
2017	530,622	220,891	137,364	206,292	101,515	1,196,684
2018	539,670	227,259	145,042	215,506	104,255	1,231,733
2019	550,408	234,017	148,611	224,329	106,881	1,264,247
2020	561,146	240,776	152,180	233,153	109,506	1,296,762
2021	571,884	247,534	155,749	241,977	112,132	1,329,276
2022	582,622	254,292	159,318	250,801	114,757	1,361,790

Figure 1. Historical and Projected Mid TN Inspection and Maintenance (I/M) Initial Tests.



From this information, the number of vehicles in 2022 for source type categories 21, 31 and 32 for all five Mid TN Counties was projected at 1,361,790. These vehicles were apportioned into the three MOVES source types (21, 31 and 32) in the same proportion as the existing data.

Source type population projections for the remaining source types to 2022 for Mid TN were based on growth in household vehicle ownership and commercial truck trip growth derived from the Nashville Area MPO's Travel Demand Model (TDM). The TDM has a vehicle ownership sub-model that allocates vehicle ownership based on population. The vehicle ownership sub-model is used by the TDM to determine vehicle mode choice and vehicle activity. As people population increases, the TDM adjusts the vehicle ownership in accordance with population growth. The change in passenger vehicle population is used to grow motorcycle (source types 11) populations derived from vehicle registration data for 2014.

Source type population for the remaining source types was derived from the growth in commercial truck trips in the TDM and applied to source types 52, 53, 54, 61 and 62. Growth in buses and refuse trucks (source types 41, 42, 43 and 51) was grown based on the growth in commercial truck trips as well. Table 4 illustrates the source type population developed for 2022.

Table 4. Source Type Population Projections for Mid TN in 2022.

Vehicle Type	MOVES Source Type ID	Source Type Population 2022				
		Davidson	Rutherford	Sumner	Williamson	Wilson
Motorcycle	11	11,233	7,992	5,921	5,845	4,212
Passenger Car	21	324,177	139,019	86,521	136,657	62,003
Passenger Truck	31	206,060	91,902	58,046	90,993	42,052
Light Commercial Truck	32	52,384	23,371	14,751	23,151	10,702
Intercity Bus	41	15	4	1	4	3
Transit Bus	42	403	11	-	27	-
School Bus	43	932	363	281	356	263
Refuse Truck	51	402	138	55	117	76
Single Unit Short-haul Truck	52	12,807	4,869	2,951	3,079	2,527
Single Unit Long-haul Truck	53	589	202	86	160	105
Motor Home	54	3,641	1,239	547	952	622
Combination Short-haul Truck	61	7,285	2,111	606	1,763	1,267
Combination Long-haul Truck	62	7,942	2,298	652	1,937	1,391
Total		627,870	273,519	170,418	265,041	125,223

3.3 Age Distribution

The age distribution of the vehicle fleet can vary significantly from area to area. Fleets with a higher percentage of older vehicles will typically have higher emissions for two reasons: older vehicles have typically been driven more miles and have experienced more deterioration in the emission control system and older vehicles generally do not meet newer, more stringent emissions standards.

For SIP and conformity purposes, the EPA recommends and encourages states to develop local age distribution data. The MOVES model categorizes the vehicle fleet

into a 31 year range of vehicle ages, with vehicles 30 years and older grouped together. MOVES requires the user to specify the fraction of vehicles in each of 30 vehicle ages for each of the 13 vehicle (or source) types.

Local age distributions, sometimes with considerable work, can be estimated from local vehicle registration data. The vehicle age distribution comes from annual registration data for Tennessee as prepared by TDOT. For this analysis, the age distribution was generated based on 2014 vehicle registration data.

EPA has published a tool to project age distribution from a base year (must be 2011 or later) out to a future year. When applying this tool to a sample of age distributions developed for Tennessee, the age distribution created appears to reflect a distribution closer to the national age distribution, and not so much a consistent aging of the local fleet. There does not appear to be a consistent effect on age distribution - depending on the form of the local age distribution for the base year, the future age distribution might make the fleet younger or older, on average. Application of the age distribution projection tool appears to diminish some of the 'localness' of the vehicle fleet. If a part of the fleet is relatively new, for example, school buses - applying the tool ages the fleet to more closely resemble the national age distribution. In this case, Tennessee has legislation limiting the age of school buses in use. Applying the tool distributes the school bus fleet ages outside of the legislated age range. For these reasons, the age distribution data was held constant between 2014, the year for which actual local age distribution data is available, and 2022. For additional information, see the report in Appendix D titled: *Methodology for Developing Input Datasets for the MOVES Model*.

3.4 Vehicle Type Vehicle Miles Traveled (VMT)

MOVES defines roadways into five different functional types (see Table 5). Most travel demand models use a different roadway classification system than MOVES. The Vehicle Miles Traveled (VMT) from the TDM are aggregated into the respective MOVES road types based on the mapping shown in Table 6.

Table 5. MOVES Road Types.

MOVES Road Types		Description
1	Off-Network	All locations where the predominant activity is vehicle starts, parking and idling (parking lots, truck stops, rest areas, freight or bus terminals)
2	Rural Restricted Access	Rural highways that can only be accessed by an on-ramp
3	Rural Unrestricted Access	All other rural roads (arterials, collectors, and local streets)
4	Urban Restricted Access	Urban highways or freeways that can only be accessed by an on-ramp
5	Urban Unrestricted Access	All other urban roads (arterials, collectors, and local streets)

Table 6. Federal Highway Administration Highway Functional System and MOVES Road Type ID.

Federal Highway Administration Highway Functional System	MOVES Road Type	MOVES Road Type ID
Rural interstate	Rural restricted access	2
Rural other principal arterial	Rural restricted access	2
Rural minor arterial	Rural unrestricted access	3
Rural major collector	Rural unrestricted access	3
Ruaral minor collector	Rural unrestricted access	3
Rural local	Rural unrestricted access	3
Urban interstate	Urban restricted access	4
Urban other freeways	Urban restricted access	4
Urban other principal arterial	Urban unrestricted access	5
urban minor arterial	Urban unrestricted access	5
Urban colector	Urban unrestricted access	5
Urban local	Urban unrestricted access	5

The Nashville MPO's TDM predicts average weekday traffic volumes for all major roadway classes. Daily VMT was obtained from the travel demand models and expanded to annual VMT for 2022. VMT for those road types (principally local roads) that were not represented in the TDM were grown from the base year HPMS VMT in proportion to a higher order road type classification (e.g. collector roads). Even though these lower order road types were not explicitly contained in the TDM, the VMT from these roads is accounted for and included in the emissions analysis. Source type annual VMT for 2022 are shown in Table 7.

Table 7. Source Type Annual Miles Traveled (VMT) for 2022.

Middle Tennessee 2022 Annual Vehicle Miles Traveled						
Vehicle Type	**MOVES Source Type ID**	**Davidson**	**Rutherford**	**Sumner**	**Williamson**	**Wilson**
Motorcycle	11	57,713,968	26,292,483	12,155,938	22,386,905	12,586,664
Passenger Car	21	4,634,801,869	1,989,586,973	754,843,360	1,701,881,665	925,300,575
Passenger Truck	31	3,182,297,691	1,408,527,116	538,075,392	1,254,170,726	662,022,498
Light Commercial Truck	32	913,590,380	411,283,269	156,965,408	354,734,966	196,040,173
Intercity Bus	41	63,015	33,036	34,162	27,376	25,002
Transit Bus	42	1,077,154	66,228	-	125,553	-
School Bus	43	649,925	497,666	1,593,460	404,447	363,839
Refuse Truck	51	13,330,589	4,372,578	9,344,581	5,224,103	3,218,185
Single Unit Short-haul Truck	52	319,896,217	102,930,408	293,103,105	89,442,084	62,515,507
Single Unit Long-haul Truck	53	15,865,508	5,199,065	11,868,915	5,803,116	3,611,621
Motor Home	54	11,403,222	3,707,775	8,777,445	4,014,639	2,487,548
Combination Short-haul Truck	61	175,962,149	86,151,150	29,115,618	56,230,707	41,437,374
Combination Long-haul Truck	62	597,742,508	292,225,031	97,610,284	192,506,485	141,754,651
Total:		9,924,394,196	4,330,872,778	1,913,487,668	3,686,952,773	2,051,363,637

EPA's MOVES model uses fractions to parse out monthly, daily, and hourly VMT. These fractions are often locally developed to represent local conditions as much as possible. The report developed by the University of Tennessee (UT) for TDOT discusses the development of month and day VMT fractions. These fractions were developed from historical 5-year average HPMS data. More information on the development of these fractions is available in Appendix D to this document.

The Nashville MPO developed hourly VMT distributions (the same distributions were assumed for all MOVES source types) from the TDM for each county and MOVES road type.

3.5 Average Speed Distribution

Average speed distribution is the speed of each source type by road type for each hour of the day. MOVES uses 16 speed bins to group source type speed fractions. These fractions represent the amount of time a source type spends traveling at that speed on a particular road type. Note, these fractions represent the time spent in these speed bins; these fractions do not reflect instantaneous speeds, but the average speed, including delays like congestion and traffic signals. Speed is a direct function of several roadway characteristics and the amount of congestion that is present.

Average speed distribution for the Mid TN area was developed by the TPO's TDM. Similar to the hourly VMT fractions, there is a need for post processing of the raw TDM outputs for average speeds on roadway links primarily for the disaggregated level of detail needed for MOVES inputs. The same speeds were assumed for all source types.

Not all of the local roads are contained in the TDM. The speeds for these facilities is assumed to be equivalent to the next higher order road type represented in the TDM.

3.6 Road Type Distribution

Road type distribution is the distribution of VMT on each roadtype by sourcetype. Travel demand models have the ability to generate distribution of VMT by roadtype. This VMT can then be summed into the MOVES road type categories. Road type distribution was provided by the Nashville MPO for the five Mid TN Counties for 2022.

3.7 Ramp Fractions

Ramp fractions are the fraction of VHT (vehicle hours traveled) spent on urban and rural restricted access ramps. This data is generated by the TDM and provided by the Nashville MPO for 2022.

3.8 Fuel Type and Technology

Fuel Type and Technology was formerly called Alternative Vehicle Fuels & Technology (AVFT). This data is now entered on the fuels tab in the County Data Manager in MOVES2014b. This input allows users to define the split between different fuel types, including gasoline, diesel, and CNG (compressed natural gas) for each vehicle type and model year.

EPA's guidance recommends the use of local data where available. Default information can be used where no local information is available. The default information for transit buses (sourceType 42) includes CNG buses as part of the fleet mix. In most areas of Tennessee there are no transit buses fueled with CNG. Therefore, at a minimum, these buses should be allocated to another fuel.

Nashville has several electric transit buses, however, since MOVES does not allow the electric transit bus combination, to be conservative, these fractions were added to the diesel bus fuelEngFraction. Table 8 illustrates a sample of the data developed into MOVES fuelEngFraction format. The last column, fuelEngFraction, contains the fraction of miles driven for each model year by fuel type (1 = gasoline, 2 = diesel, 3 = CNG).

Table 8. Example Local fuelEngFraction Developed for Mid TN Transit Buses.

sourceTypeID	modelYearID	fuelTypeID	engTechID	fuelEngFraction
42	2010	1	1	0
42	2010	2	1	1
42	2010	3	1	0
42	2011	1	1	0
42	2011	2	1	1
42	2011	3	1	0
42	2012	1	1	0
42	2012	2	1	1
42	2012	3	1	0
42	2013	1	1	0
42	2013	2	1	1
42	2013	3	1	0
42	2014	1	1	0
42	2014	2	1	1
42	2014	3	1	0
42	2015	1	1	0
42	2015	2	1	1
42	2015	3	1	0

EPA states in their Technical Guidance: “In making projections, users should assume no future changes in activity associated with alternate fuel or engine technologies unless those alternate fuels or technologies are required by regulation or law.”. This necessitates the assumption that all future-year analyses will need to have the same distribution.

3.9 Fuel Formulation and Supply

MOVES requires fuel formulation information for each county in the domain being modeled. Similarly, these formulations should also have the associated fuel supply, or the fraction of each fuel used, by month, in each county. EPA’s default data is derived and expanded from a series of samples taken at the PADD (Petroleum Administration Defense Districts) level.

EPA’s Technical Guidance suggests changing the values that reflect Reid Vapor Pressure (RVP) properties to the regulatory requirements in the area being modeled. MOVES default data generally contains lower RVP values in 2022 for Tennessee than the regulatory maximum permitted. To be conservative, and in following the Technical Guidance recommendations, fuel formulations for fuel subtypes 12 and 15 have been modified using the fuel wizard built into the MOVES2014b fuel tab in the county data manager to reflect the maximum allowable RVP for each month in Mid TN. Because some default fuel formulations were mapped to months with differing maximum RVP limits, fuel formulations were modified or added to reflect the maximum RVP for that month. In addition, since EPA anticipates (based on the fuel formulations and supply information in MOVES) that essentially all gasoline sold in Tennessee in 2022 will

contain at least nine percent ethanol, an additional 1.0 psi (pounds per square inch) waiver applies to RVP values to those fuels (subtype 12) containing ethanol that are eligible to receive the 1.0 psi waiver. Therefore, the RVP values developed are 1.0 psi above the listed regulatory maximum as allowed by the 1.0 psi waiver for subtype 12 fuels (Table 9).

Table 9. Tennessee's Regulatory RVP Limits.

Tennessee's Maximum Reid Vapor Pressure (RVP) Requirement for Gasoline	
Month	**--- psi ---**
January	15.0
February	13.5
March	13.5
April	13.5
May	9.0
June	9.0
July	9.0
August	9.0
September (1-15)	9.0
September (16-30)	11.5
October	13.5
November	13.5
December	15.0

3.10 Motor Vehicle Inspection and Maintenance (I/M)

I/M programs are an important local control measure in many nonattainment and maintenance areas. MOVES includes the ability to model the essential design elements of an I/M program.

Five Mid TN Counties have an I/M program in place: Davidson, Rutherford, Sumner, Williamson and Wilson Counties. The Nashville/Davidson County Metropolitan Health Department, Division of Pollution Control has responsibility for operation of the I/M program in Davidson County. The Tennessee Department of Environment and Conservation, Air Pollution Control Division has responsibility for the operation of the I/M program in Rutherford, Sumner, Williamson and Wilson Counties, which began on December 1, 1994. Davidson County began emissions testing in 1985. Motor vehicles subject to emissions testing include vehicles with a model year (MY) beginning in 1975, excluding those vehicles that are one year-old or less. Vehicles with a GVWR of up to 10,500 pounds are subject.

Gasoline fueled motor vehicles subject to the I/M program that are model year 1975 through 1995 receive a "tailpipe" test. The tailpipe test is administered by inserting a probe in the vehicle's tailpipe and measuring the amount of pollution emitted.

The tailpipe test measures carbon monoxide (CO) and volatile organic compound (VOC) emissions. The tailpipe emissions test cannot identify the emissions component that is malfunctioning.

Light duty gasoline fueled vehicles that are model year 1996 or newer receive an On Board Diagnostic II (OBD II, or OBD) emissions test. Most model year 1996 and newer vehicles have an onboard computer system that continually monitors the electronic sensors of the emission control system while the vehicle's engine is running. When a potential problem is detected, a dashboard warning light is illuminated to alert the driver. An OBD system may detect a problem before symptoms such as poor performance, high emissions or poor fuel economy are recognized by the driver. An OBD II emissions test provides a more comprehensive picture of a vehicle's emissions status because it evaluates emissions during everyday operating conditions, whereas a tailpipe test measures emissions only at a particular moment in time. In addition, and unlike the tailpipe test, the OBD system can help pinpoint the component of the emissions system that is malfunctioning.

MOVES uses a compliance factor input to account for I/M program compliance rates, waiver rates, and adjustments needed to account for the fraction of vehicles within a source type that are covered by an I/M program (the last adjustment is referred to as the "regulatory class coverage adjustment"). The compliance factor is entered as a number from 0 to 100 and represents the percentage of vehicles within a source type that actually receive the benefits of an I/M program.

In addition, the compliance factor is further adjusted to account for the fraction of VMT in Mid TN Counties that are attributed to those vehicles subject to an I/M inspection. Not all passenger cars, passenger trucks and light commercial trucks driving on Mid TN's roads are registered in one of the Mid TN Counties subject to emissions testing. This percentage is derived from the Mid TN MPO's TDM, which tracks the origin and destination of each vehicle trip. Those vehicles, and hence, VMT, that begin outside of the area and are not subject to an I/M test are discounted from the overall total. Several Mid TN Counties have heavily used interstates traversing the County; most of these 'pass through' vehicles are not subject to an I/M inspection. Therefore, the above described I/M compliance factor is further adjusted by applying a VMT percentage factor. This VMT percentage further reduces the I/M compliance factor to account for the fraction of VMT accumulated only by those vehicles that are actually subject to an I/M test.

The total compliance factor entered in MOVES is calculated as:

compliance factor = (percent compliance rate x (100 – percent waiver rate) x (regulatory class coverage x (VMT Percentage/100)))/100

Table 10 contains the various factors used in developing the compliance factors for the Mid TN I/M programs.

Table 10. Mid TN I/M Compliance and Waiver Rates, Regulatory Class Coverage, VMT Percentage and Compliance Factors.

County	Source Type ID	Compliance Rate (%)	Waiver Rate (%)	Regulatory Class Coverage (%)	VMT Percentage (%)	Compliance Factor
Davidson	21	98	0	100	89	87
Davidson	31	98	0	100	89	87
Davidson	32	98	0	100	91.8	90
Rutherford	21	95	5	100	83	75
Rutherford	31	95	5	100	83	75
Rutherford	32	95	5	100	99.5	90
Sumner	21	95	5	100	78	70
Sumner	31	95	5	100	78	70
Sumner	32	95	5	100	95.4	86
Williamson	21	95	5	100	82.2	74
Williamson	31	95	5	100	82.2	74
Williamson	32	95	5	100	85.9	78
Wilson	21	95	5	100	68.6	62
Wilson	31	95	5	100	68.6	62
Wilson	32	95	5	100	91.4	82

EPA's OBD II requirements were generally implemented for light duty vehicles beginning in 1996. For those vehicles that have a Gross Vehicle Weight Rate (GVWR) between 8,500 and 14,000 pounds, OBD II was implemented in a phased approach between 2004 and 2007[2]. To avoid applying OBD II benefits in MOVES to vehicles that were not equipped with OBD II, source types 31 and 32 had applied to them a regulatory class adjustment to exclude those in regulatory class 40 (those with a GVWR of 8,501-10,000 lbs.) from OBD II testing between model years (MY) 1996 and 2007. The compliance factors used for these vehicles are shown in Table 11. Currently these regulatory class 40 vehicles with a model year of 1996–2007 receive a tailpipe emissions test if they are not equipped with OBD II. MOVES does not provide for the ability to simultaneously model emissions testing with a tailpipe test, for these vehicles. For the regulatory class 30 vehicles (GVWR less than 8,501pounds) OBD II was applied beginning in 1996. Beginning with model year 2008, all vehicles are subject to an OBD II test, and are modeled as such.

[2] *On-Board Diagnostic (OBD) Regulations and Requirements: Questions and Answers*, US EPA, APA420-F-03-042, December 2003.

Table 11. Mid TN Compliance and Waiver Rates, Regulatory Class Coverage, VMT Percentage and Compliance Factors Used for Model Years 1996-2007 for Source Types 31 and 32.

County	Source Type ID	Compliance Rate (%)	Waiver Rate (%)	Regulatory Class ID	Regulatory Class Coverage (%)	VMT Percentage (%)	Compliance Factor
Davidson	31	98	0	30	98	89	85
Davidson	32	98	0	30	92	91.8	83
Rutherford	31	95	5	30	98	83	73
Rutherford	32	95	5	30	92	99.5	83
Sumner	31	95	5	30	98	78	69
Sumner	32	95	5	30	92	95.4	79
Williamson	31	95	5	30	98	82.2	73
Williamson	32	95	5	30	92	85.9	71
Wilson	31	95	5	30	98	68.6	61
Wilson	32	95	5	30	92	91.4	76

Some fields in the I/M input file, like “endModelYearID” capture specific program design features, like the last model year subject to the I/M program. This allows for certain adjustments to the I/M program be made directly to the input variables in the I/M input file.

3.11 Starts

The starts input is optional, and should only be used if local data is available. If starts are provided, starts must be provided by month, hourdayID, sourcetypeID and vehicle ageID. There is an option to input starts by day, which appears to include total starts by weekday and weekend day, only. It must include starts from all source types. This number would be a direct function of the sourcetype population. MOVES internally generates the number of starts based on the sourcetype population. Local starts information was not available, thus default starts data was used.

3.12 Hoteling

MOVES provides the option to import hoteling hours if the user has local information on total hoteling hours by hour of the day, day type, month and vehicle model year. Since data for this input was not available locally, MOVES default data was used.

4.0 EMISSIONS FROM ONROAD MOBILE SOURCES

Using the inventory approach in MOVES, emissions in tons per year were developed for the five Mid TN Counties in calendar year 2022 for two scenarios: one without an I/M program, and a second with the current I/M program. MOVES output was summarized using a pivot table in Microsoft Excel. Table 12 illustrates the onroad emissions of CO, NOx and VOCs in Mid TN in 2022 without an I/M program, with the

current program in 2022 and the difference between the two. For a more detailed breakdown of emissions of CO, NOx and VOCs by source type and road type, see the Microsoft Excel summary file. All of the input and output files, too extensive to include as tables in this appendix, are included in an associated 'zip' file available upon request.

Table 12. Mid TN Five County Onroad Emissions Without I/M, With I/M, and the Difference in Calendar Year 2022.

		Davidson			Rutherford			Sumner			Williamson			Wilson			Mid TN Total		
No I/M Scenario in 2022		**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**
Vehicle Type	SourceType	------- tons/year -------			------- tons/year -------			------- tons/year -------			------- tons/year -------			------- tons/year -------			------- tons/year -------		
Motorcycle	11	715.62	38.38	113.46	339.34	19.84	56.74	159.99	9.02	35.31	282.03	15.97	46.19	168.91	10.03	28.16	1,665.90	93.23	279.85
Passenger Car	21	16,139.40	772.58	1,015.60	6,302.37	315.16	408.13	2,912.45	159.32	245.07	5,243.17	250.41	349.54	2,876.61	146.49	183.51	33,473.99	1,643.96	2,201.84
Passenger Truck	31	16,296.89	1,102.50	922.24	6,836.58	473.32	383.09	3,222.73	235.81	233.38	5,087.72	320.14	280.42	3,430.44	256.74	198.51	34,874.37	2,388.51	2,017.64
Light Commercial Truck	32	2,840.05	167.95	124.70	1,152.05	69.88	49.80	546.79	34.75	30.65	859.21	51.11	40.06	560.04	34.84	23.76	5,958.15	358.53	268.97
Intercity Bus	41	0.22	0.43	0.03	0.08	0.20	0.01	0.06	0.21	0.01	0.07	0.18	0.01	0.06	0.15	0.01	0.49	1.18	0.08
Transit Bus	42	5.39	1.52	0.21	0.15	0.06	0.01	-	-	-	0.37	0.12	0.02	-	-	-	5.91	1.70	0.23
School Bus	43	13.96	1.26	0.37	5.56	0.82	0.17	4.99	2.62	0.29	5.42	0.74	0.16	4.02	0.59	0.12	33.94	6.03	1.11
Refuse Truck	51	21.39	51.40	3.28	6.37	14.95	0.93	11.19	32.75	1.94	7.52	19.24	1.18	4.20	10.65	0.63	50.67	128.98	7.96
Single Unit Short-haul Truck	52	1,437.80	404.29	73.15	532.03	141.02	26.54	1,071.51	480.66	72.10	428.86	135.78	24.29	329.65	100.38	17.92	3,799.84	1,262.13	213.99
Single Unit Long-haul Truck	53	32.68	36.31	4.42	9.72	10.25	1.26	17.52	23.67	2.60	10.61	12.25	1.44	5.99	6.66	0.79	76.51	89.14	10.52
Motor Home	54	238.55	28.32	12.39	71.73	8.34	3.63	111.61	19.09	5.50	72.03	9.40	3.64	41.19	5.34	2.03	535.11	70.48	27.18
Combination Short-haul Truck	61	267.52	723.98	46.43	106.30	320.16	19.23	35.76	110.55	6.63	76.74	223.16	13.62	51.20	150.19	8.84	537.52	1,528.05	94.75
Combination Long-haul Truck	62	566.02	1,999.49	119.59	234.52	868.55	49.69	68.05	273.66	13.39	151.68	580.90	30.27	151.59	493.15	36.27	1,171.85	4,215.76	249.21
	Total:	38,575.48	5,328.40	2,435.87	15,596.79	2,242.56	999.22	8,162.65	1,382.10	646.87	12,225.42	1,619.41	790.83	7,623.90	1,215.22	500.54	82,184.25	11,787.69	5,373.33
Current I/M Scenario 2022		**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**
Vehicle Type	SourceType	------- tons/year -------			------- tons/year -------			------- tons/year -------			------- tons/year -------			------- tons/year -------			------- tons/year -------		
Motorcycle	11	715.62	38.38	113.46	339.34	19.84	56.74	159.99	9.02	35.31	282.03	15.97	46.19	168.91	10.03	28.16	1,665.90	93.23	279.85
Passenger Car	21	13,652.74	671.40	872.13	5,478.87	278.46	357.60	2,568.99	143.01	216.64	4,597.91	224.44	308.14	2,565.36	132.54	164.67	28,863.86	1,449.85	1,919.18
Passenger Truck	31	13,636.91	974.40	782.37	5,885.41	423.04	331.72	2,811.23	213.25	203.57	4,437.65	288.88	245.25	3,028.55	234.81	176.18	29,799.75	2,134.39	1,739.09
Light Commercial Truck	32	2,494.73	153.41	109.29	1,016.16	63.56	43.68	485.98	31.81	26.90	779.10	47.60	36.20	498.64	31.86	21.01	5,274.62	328.24	237.09
Intercity Bus	41	0.22	0.43	0.03	0.08	0.20	0.01	0.06	0.21	0.01	0.07	0.18	0.01	0.06	0.15	0.01	0.49	1.18	0.08
Transit Bus	42	5.39	1.52	0.21	0.15	0.06	0.01	-	-	-	0.37	0.12	0.02	-	-	-	5.91	1.70	0.23
School Bus	43	13.96	1.26	0.37	5.56	0.82	0.17	4.99	2.62	0.29	5.42	0.74	0.16	4.02	0.59	0.12	33.94	6.03	1.11
Refuse Truck	51	21.39	51.40	3.28	6.37	14.95	0.93	11.19	32.75	1.94	7.52	19.24	1.18	4.20	10.65	0.63	50.67	128.98	7.96
Single Unit Short-haul Truck	52	1,437.80	404.29	73.15	532.03	141.02	26.54	1,071.51	480.66	72.10	428.86	135.78	24.29	329.65	100.38	17.92	3,799.84	1,262.13	213.99
Single Unit Long-haul Truck	53	32.68	36.31	4.42	9.72	10.25	1.26	17.52	23.67	2.60	10.61	12.25	1.44	5.99	6.66	0.79	76.51	89.14	10.52
Motor Home	54	238.55	28.32	12.39	71.73	8.34	3.63	111.61	19.09	5.50	72.03	9.40	3.64	41.19	5.34	2.03	535.11	70.48	27.18
Combination Short-haul Truck	61	267.52	723.98	46.43	106.30	320.16	19.23	35.76	110.55	6.63	76.74	223.16	13.62	51.20	150.19	8.84	537.52	1,528.05	94.75
Combination Long-haul Truck	62	566.02	1,999.49	119.59	234.52	868.55	49.69	68.05	273.66	13.39	151.68	580.90	30.27	151.59	493.15	36.27	1,171.85	4,215.76	249.21
	Total:	33,083.52	5,084.59	2,137.12	13,686.24	2,149.26	891.20	7,346.88	1,340.29	584.88	10,849.97	1,558.67	710.41	6,849.35	1,176.36	456.63	71,815.97	11,309.17	4,780.23
Difference between I/M and no I/M Scenarios in 2022		**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**	**Carbon Monoxide (CO)**	**Oxides of Nitrogen (NOx)**	**Volatile Organic Compounds (VOC)**
Vehicle Type	SourceType	------- tons/year -------			------- tons/year -------			------- tons/year -------			------- tons/year -------			------- tons/year -------			------- tons/year -------		
Motorcycle	11	(0.00)	-	0.00	0.00	-	-	(0.00)	-	-	-	-	0.00	-	(0.00)	-	(0.00)	(0.00)	0.00
Passenger Car	21	2,486.65	101.18	143.47	823.49	36.70	50.53	343.46	16.31	28.43	645.27	25.97	41.39	311.25	13.95	18.84	4,610.12	194.11	282.66
Passenger Truck	31	2,659.99	128.09	139.87	951.17	50.28	51.37	411.50	22.56	29.81	650.07	31.26	35.17	401.89	21.93	22.32	5,074.62	254.12	278.55
Light Commercial Truck	32	345.32	14.54	15.41	135.89	6.32	6.12	60.81	2.94	3.75	80.11	3.51	3.86	61.41	2.98	2.75	683.53	30.28	31.89
Intercity Bus	41	0.00	0.00	-	0.00	-	0.00	-	(0.00)	(0.00)	-	(0.00)	(0.00)	0.00	-	-	0.00	(0.00)	(0.00)
Transit Bus	42	-	-	-	-	0.00	0.00	-	-	-	-	0.00	0.00	-	-	-	-	0.00	0.00
School Bus	43	-	(0.00)	(0.00)	-	(0.00)	-	0.00	(0.00)	(0.00)	-	-	-	-	0.00	(0.00)	0.00	(0.00)	(0.00)
Refuse Truck	51	(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)
Single Unit Short-haul Truck	52	-	(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)	(0.00)
Single Unit Long-haul Truck	53	-	-	-	-	(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)
Motor Home	54	(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	0.00
Combination Short-haul Truck	61	-	(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)	(0.00)	0.00
Combination Long-haul Truck	62	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
	Total:	5,491.96	243.81	298.74	1,910.55	93.30	108.03	815.77	41.81	61.99	1,375.45	60.73	80.43	774.55	38.87	43.91	10,368.28	478.52	593.10

Appendix D

Methodology for Developing Input Datasets for the MOVES Model

Methodology for Developing Input Datasets for the MOVES Model

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TABLE OF CONTENTS

Introduction **5**

Source Type Population **7**

Vehicle Registration Data Method 7

Transit Bus 10

School Bus 10

National Default-Local Data Method 10

Final Statewide Dataset 12

Age Distribution **13**

Road Type Distribution **13**

Vehicle Type VMT **14**

Summary **17**

Conclusions **17**

References **19**

Appendices D.1 and D.2 ..... **20**

Appendix D.1 - Tables mentioned in body of document 21

Appendix D.2 - Equations and sample calculations mentioned in body of document 32

Sample Calculations Source Type Population: 33

Sample Calculations VMT Distribution: 35

Sample Calculations AAVMT Distribution: 38

LIST OF TABLES

Table 1: Input Data Files 22
Table 2: Number of Vehicles in the TDOR Initial Data Extraction 22
Table 3: FHWA and Polk Vehicle Registration Data for Tennessee 23
Table 4: Number of Vehicles after Redistribution of Data 23
Table 5: HPMS 2014 DVMT Rural and Urban 24
Table 6: Class Count 2014 Summary for the Rural and Urban Road System 27
Table 7: HPMS and MOVES Mapping Scheme 28
Table 8: Population Data from National Default-Local Data Method 29
Table 9: Final Statewide Population Data 30
Table 10: 5-Year Average Monthly Variation Factors, by Day of Week for 2014 31

LIST OF EQUATIONS

Equation 1: General formula used to convert default population/VMT data, local DVMT, and local vehicle count summaries into MOVES source type population data 33
Equation 2: General formula used to convert HPMS local DVMT and vehicle classification summaries into MOVES road type VMT distributions by source types 35
Equation 3: General formula used to calculate local AADVMT for HPMS vehicle types 38

Introduction

In April 2004, the U.S. Environmental Protection Agency (EPA) released a new regulatory (computer) model for estimating mobile source emissions called the MOtor Vehicle Emission Simulator (MOVES). This model replaces an earlier one called MOBILE (Mobile Source Emission Factor Model) because the EPA must update its regulatory computer models periodically, as stipulated by the Clean Air Acts.

MOVES is considered to be superior to MOBILE, as it incorporates the most recent advances in the science to better estimate vehicle emissions. More importantly, MOVES has new input data requirements that are not only different but much larger in scope than the data requirements necessary to run the older model. As of March 2, 2013, the EPA requires that MOVES is used for inventory development in State Implementation Plans (SIP) and regional emissions analysis for showing transportation conformity by all states except for California. Currently several versions of the model exist for these purposes: MOVES2010, MOVES2010a, and MOVES2010b. Each version in the series incorporated certain performance enhancements which did not significantly impact any changes on emissions in computer runs at the County or Project Level Scales. However, a newer version of the model (MOVES2014) was released in July 31, 2014 that contains modifications which may impact changes in emissions. Likewise, certain modifications occurred in the format of the MySQL tables that receive the input data between the 2010 and 2014 versions of the model.

On November 4, 2014, EPA released still another version of the model (MOVES2014a) that contains minor revisions to the previously released model (MOVES2014). Since significant changes in criteria pollution emissions did not result, MOVES2014a is not considered to be a new model for SIP and transportation conformity purposes. In the future, MOVES2014 and the minor revisions (currently, only MOVES2014a) will replace MOVES2010 and its minor revisions (MOVES2010a and MOVES2010b) for regulatory purposes. The grace period between using MOVES2010 and MOVES2014 will end on October 7, 2016. Nonetheless, the EPA strongly recommends states use the latest version of MOVES that is available instead of relying on previous versions of the model. The EPA also recommends that states derive input data for the model from local sources. At the moment, adequate data in the appropriate format to run MOVES are not available for many states in the country, and Tennessee is not an exception.

The purpose of this project was to develop several of these new datasets for the State of Tennessee. The input datasets are listed in Table 1. (Note: all tables mentioned in this document are included in Appendix D.1.) These input files will also be formatted to MOVES2014a, which is the most recent version of the model, as of the writing of this document. Thereafter, MOVES2014a will be referred to simply as MOVES.

The CDM (County Data Manager) tab is the dialog box of the importer tool in MOVES; it allows the user to import data into MySQL, which is the data management software package included with the model. Other input datasets, located in the CDM, such as the Average Speed Distribution, Meteorological Data, Fuel, and I/M Programs, will not be discussed in this report; these datasets will be developed by other entities. It is assumed that the reader of this document has some familiarity with using MOVES, so only a minimal discussion of the mechanics of the model will be forthcoming in the following paragraphs. For the interested reader, details concerning MOVES can be found in the EPA documentation on the Internet: http://www.epa.gov/otaq/models/moves/index.htm

Input data (based on the calendar year 2014) were first developed for five counties in Tennessee: Anderson, Blount, Knox, Loudon, and Roane. This region has recently been in non-attainment for two criteria pollutants (ground-level ozone and fine particulate matter), and data were needed as soon as possible by the Tennessee Department of Environment and Conservation (TDEC) to use for modeling transportation conformity analysis. The year 2014 also corresponds to a reporting year for state supplied data to the EPA National Emission Inventory (NEI). Thus, input data developed by this project can also be used to develop mobile source emission inventories using MOVES for the 2014 NEI submission.

Microsoft Excel files will be included with this document to exhibit sample calculations or data manipulation in spreadsheet format for each the five counties mentioned above. Knox County data will discussed independently using formulas or equations to show how the input datasets were developed in a mathematical layout. The Excel files for the five counties will be supplied in a single compressed (zip) file. The input data that are intended for running MOVES will also be supplied in a separate compressed (zip) file containing a total of 95 Excel files (one for each county in Tennessee). These files are named by the county in which the data are intended. The names of zip files will be listed in the Summary section of this document. The

input data will be provided in the appropriate format for use with the CDM importer tool in MOVES. The following methodology will describe the preparation of these input datasets, as well as any quality assurance measures that were taken to ensure the integrity of the data.

Source Type Population

Vehicles in MOVES are categorized into 13 source types: Motorcycle, Passenger Car, Passenger Truck, Light Commercial Truck, Intercity Bus, Transit Bus, School Bus, Refuse Truck, Single Unit Short-haul Truck, Single Unit Long-haul Truck, Motor Home, Combination Short-haul Truck, and Combination Long-haul Truck. The source type population is the actual number of vehicles of each source type in the modeling domain. Vehicles are called source types in MOVES because the model relies more on the activity or use of the vehicles to simulate emissions rather than on engine and/or body style configurations.

Two methods were used to develop the source type populations: the vehicle registration data method and the national default-local data method. The former utilizes statewide motor vehicle registration data or other reliable databases at the state or federal level. This is the preferred EPA procedure when actual road count data are not available. The latter method utilizes the ratio of default population and vehicle miles traveled (VMT) data generated by MOVES, as well as local VMT and vehicle classification data via a calculation procedure. This method is also acceptable by EPA but is used only when motor vehicle registration data are not available and/or inappropriate to use for the source types.

Vehicle Registration Data Method

Motor vehicle registration data were provided by the Tennessee Department of Revenue (TDOR) in the format of a text file. This file contained the vehicles currently registered or scheduled for a license renewal in the state at the time the database query was executed. For the current project, vehicle data were extracted to reflect the end of the calendar year 2014. Each record or row of data in the text file indicated a single motor vehicle. The start- and end-length of each record contains 49 integers and/or spaces; these represented coded or abbreviated information that could be used to identify or clarify source types. Information contained in the record are vehicle identification number (VIN), year, make, model, use, type, body style, fuel, county of registration, and license plate class. Descriptions of the coding were provided by

TDOR for interpretation of the information contained in the text file. Several of the codes, such as use, type, body style, and license class are specific to the state. These codes can change over time as manufacturing adapts to meet changing consumer demand for different body or frame styles and as road tax legislation may alter classifications which are based on gross weight.

Several group discussions were held with TDOR personnel to explain the source type population requirements for MOVES before the motor vehicle data were extracted to the text file. States typically report to the Federal Highway Administration (FHWA) on the operating characteristic of their road systems using Highway Performance Monitoring System (HPMS) classifications, so personnel were somewhat familiar applying these terms. Therefore, the text file contained preliminary MOVES source type and HPMS designations for each record.

Presently, 13 vehicle classes are contained in HPMS, but these should not be confused with the 13 source types used in MOVES. The HPMS classes rely more heavily on frame or body style, number of wheels and/or axles, and gross vehicle weight. The HPMS classes can be reordered into six general categories: Motorcycle, Passenger Car, Other 2-axle 4-tire Vehicles, Buses, Single Unit Trucks, and Combination Trucks. More details of the HPMS format can be found in the FHWA documentation on the Internet:
https://www.fhwa.dot.gov/policyinformation/hpms.cfm

Starting with the 2014 release of the model, the EPA decided that only five subsets of HPMS will be used because of trouble distinguishing between all types of light-duty vehicles using traffic or road tube counters. For this situation, the two HPMS classes (i.e., Passenger Car and Other 2-axle 4-tire Vehicles) were combined into a single class called Light Duty Vehicles. This HPMS (defined by EPA) will include both short and long wheelbases. More will be said later in the paper about this effect on developing the input data for MOVES.

The total number of vehicles in the initial data extraction was 5,513,062. Source types associated with MOVES and the HPMS vehicle categories are listed in Table 2. Heavy-duty freight trucks, utility trailers, and special government vehicles were not included in the extraction. As may be the case, county registered heavy duty vehicles used for hauling freight over short or long distances are not necessarily representative of that portion of the fleet because these vehicles may typically transport freight across state and county borders.

Inspecting the results in the table reveals that the percentages for Passenger Car (HPMS 20 or MOVES 21) and Other 2 axle-4 tire Vehicles (HPMS 30) or Passenger Truck plus Light Commercial Truck (MOVES 32 & 33) are approximately 76% and 16%, respectively. It is believed the number of vehicles initially assigned to Passenger Car in the data extraction were overstated by TDOR. The reason for this is other published data normally show comparable percentages between Passenger Car and Passenger Truck for states that are less urbanized. For example, FHWA highway statistics compiled for Tennessee during 2014 showed about 42% automobiles and 55% trucks. As a second illustration, Polk data for cars and light-duty trucks for the end of the calendar year 2013 showed about 45% cars and 55% light-duty trucks for Tennessee. R.L. Polk & Co. currently operating as IHS Automotive, is a private company that provides automotive information for a fee. The EPA has customarily relied on Polk as one of its sources for quality assurance in developing default vehicle population data for MOVES. For more information on Polk, the Internet site is https://www.ihs.com/btp/polk.html.

The FHWA and Polk data are summarized in Table 3. Several factors may account for the disagreement in the data. For instance, the method in which vehicles were classified and the time period when the data were compiled are not the same across the collection sources. On the other hand, it is believed that further action was needed to transform the state's motor vehicle registration data into results that were more in line with the reported data from FHWA and Polk.

Using a VIN decoder on the Internet and other abbreviated or coded information contained in the text file, such as make, model, type, use, class, body, etc., the vehicles were rearranged into source types by a repetitive trial-and-error procedure using database query software (i.e., Microsoft Access®). The source type population resulting from this activity are shown in Table 4. As can be seen, the percentage for Passenger Car (MOVES 21), Passenger Truck (MOVES 32), and Light Commercial Truck (MOVES 33) are approximately 47%, 41%, and 6%, respectively (or 47% each for cars and light-duty trucks). The data at this stage compares favorably with the FHWA and Polk data.

It should also be noted in the table that the total number of vehicles after redistributing the data were now 5,410,717 because 111,345 vehicles had been removed from the initial data extraction. These vehicles were registered as antique or show cars which were assumed to be driven somewhat rarely on the public roads. It was more difficult to distinguish between buses

(Intercity, Transit, and School Buses), Refuse Truck, and Motor Home with a high level of certainty because these vehicle had similar engine, body, and weight configurations, so other methods were used to develop population data for these source types. In the following paragraphs, the approach is discussed for the two bus source types where other reliable data were available: Transit Bus and School Bus.

Transit Bus

To meet the needs of the public transportation system, the Federal Transit Administration (FTA) maintains a National Transit Database (NTD). Recipients or beneficiaries of grants for public transportation from the FTA are required to submit operating and financial data to the NTD. Among other information, fleet size, vehicle model and year, fuel type, seating and standing capacity, and average mileage per vehicle on a county basis are contained in the database. Data are available at http://www.ntdprogram.gov/ntdprogram/. Statistics from the NTD were used to determine source type population data for Transit Bus. Thus, it was estimated that a total of 827 transit buses, as classified by EPA, were operating in the state during 2014. These buses were found to be operated in just 10 counties of the state.

School Bus

A statistical report is published annually for the public school systems of Tennessee: http://www.tn.gov/assets/entities/education/attachments/asr_1314.pdf. This report contains a record for the school buses that are operated in the state at the county level. From this data source, it was estimated that a total of 8,864 school buses operated throughout all 95 counties of the state during 2014.

National Default-Local Data Method

Local vehicle data were not available for the Single Unit Long-haul Truck and the Combination Short- and Long-haul Trucks. Population data for the Intercity Bus, Refuse Truck, and Motor Home also were not adequately resolved using motor vehicle registration data. In these circumstances, the EPA recommends using other auxiliary methods. For this situation, population data were derived by a ratio computation method using national default data in conjunction with local VMT and statewide vehicle classification summaries.

The ratio factor is the population data for the source type (numerator) by the distance traveled for the road type (denominator). This (activity) data were obtained by running MOVES at the National Scale for the calendar year of interest (2014) on a per county basis. The multiplying factor (numerator) is the local or county VMT data for the vehicle or source type. These data were obtained from the Tennessee Department of Transportation (TDOT) in the form of the annual average daily vehicle miles traveled (DVMT) and the statewide vehicle classification summaries. The DVMT and vehicle summaries for 2014 are shown in Table 5 and Table 6, respectively. Note that the DVMT for rural freeway is zero for all counties because this road classification is not used in Tennessee. Additionally, vehicle class count summaries for Urban Freeways were not compiled for 2014, so data from 2013 were used.

The vehicle and road data for the state are categorized by HPMS, and as mentioned earlier, MOVES does not directly use the HPMS based classifications. Thus, additional preprocessing is required to distribute or map HPMS to MOVES. In HPMS, six (general) functional road classifications exist: Interstate & Freeways, Principal Arterial, Minor Arterial, Major Collector, Minor Collector, and Local, which are further subdivided into Urban and Rural. In MOVES, only four primary road types are used: Rural Restricted, Rural Unrestricted, Urban Restricted, and Urban Unrestricted. A fifth road type is Off-network, but it accounts for locations where the predominant vehicle activity is essentially not conducted on the roadway, such as starting, parking, and idling. Summaries of the mapping scheme between the HPMS and MOVES classifications are shown in Table 7 for both source and road types.

To smooth out yearly fluctuations in the vehicle classification summaries, a five-year average (i.e., years 2010 through 2014) was used. The raw data from these previous years are not shown in this document, however a summary of the data is built-into the Excel files that will demonstrate the sample calculations in spreadsheet format. The name of this spreadsheet is called “5-Year Average”. The final averages were adjusted proportionally across the EPA five HPMS vehicle types, so that the sum of the averaged percentages would equal 100%. In several instances, TDOT did not include a road category in the dataset, so data from the next higher category was used if this data were applicable. For example, Rural Minor Collector data were used for Rural Local data because vehicle traffic on a Rural Minor Collector ultimately passes through a Rural Local road.

The general formula that was used to calculate population source type data is Equation 1. It has three parts represented by the symbols A, B, and C. (Note: all equations mentioned are included in the Appendix D.2 of this document.) The "A" expression evaluates local DVMT for the HPMS vehicle type. The MOVES default population to VMT ratio is the "B" expression. The "C" expression (also a ratio) maps the HPMS vehicle type to the MOVES source type. The C value will equal unity (or 1.0) when the HPMS vehicle type is equivalent to the MOVES source type. Currently this is only the case for Motorcycle, otherwise it is equal to a fraction that sums to unity within MOVES source types that were mapped from the HPMS vehicle type. Sample calculations for the Passenger Car and Combination Long-haul Truck using the equations for Knox County data are include in Appendix D.2.

The supplemental Microsoft Excel file that will show all calculations or data manipulations in spreadsheet format for this section using Knox County data is named Sample Calculations for SourceType Populations - Knox 2014.xlsx. This file contains two spreadsheets. The first spreadsheet is called "SourceType Population" which contains several tables that are used to calculate source type population data using the raw data received from TDOT. The second spreadsheet is called "5-Year Average". This spreadsheet demonstrates how the five-year averages were calculated also using raw data received from TDOT. The sample calculations for Knox County data (shown in Appendix D.2 for Passenger Car and Combination Long-haul Truck, mentioned above) will match the sample calculations shown in the Excel spreadsheets for Knox County.

Lastly, the final results from the national default-local data method are shown in Table 8 for the entire state. The data in the table are for comparison purposes only because all source type population data derived by this method were not used for final population data. Source types used from this method will only include, Intercity Bus, Refuse Truck, Single Unit Long-haul Truck, Motor Home, and Combination Short- and Long-haul Trucks.

Final Statewide Dataset

A summary of the final population data that will be used by source types are shown in Table 9. Motorcycle, Passenger Car, Passenger Truck, Light Commercial Truck, Transit Bus, School Bus, and Single Unit Short-haul Truck were derived from motor vehicle registration data

and other datasets. Intercity Bus, Refuse Truck, Single Unit Long-haul Truck, Motor Home, and Combination Short- and Long-haul Trucks were determined using the calculation method. The data were distributed across counties as per county designation in the respective datasets. The final input data for MOVES are included in the compressed (zip) on a per county basis.

Age Distribution

Age distribution is the age fractions of fleet by age and source type. Vehicle ages in MOVES cover a range of 31 years with vehicles 30 years and older grouped together. States were again encouraged by EPA to develop age distributions with local data. In the present study, local population data were available for only seven of the 13 source types using the motor vehicle registration data and/or other valid data sources. Since the motor vehicle registration data received from TDOT was just a snapshot of registrations for the end of the year, population data needed to be adjusted. Case in point: model year 2015 vehicles were removed from the database and model year 2014 vehicles were assigned to the Age 0 category. Where local population were not available to determine the age distributions, the default age distributions for the year 2014 were used instead. These distributions were obtained from the EPA MOVES Internet site. Default age distributions were used for Intercity Bus, Refuse Truck, Single Unit Long-haul Truck, Motor Home, and Combination Short- and Long-haul Trucks. The final input data for MOVES are included in the compressed (zip) on a per county basis.

Road Type Distribution

Road type distribution is the fraction of source type VMT on each of the four road types. Once again, data in this format are not available for Tennessee, so a calculation method was used to convert HPMS road data into MOVES data. The five-year average vehicle summary classifications by road type (2010-2014) and the 2014 DVMT (both mentioned previously as received from TDOT) were used to develop the road type distributions. Note that local data are classified by HPMS, so the mapping scheme shown in Table 7 had to be applied.

Equation 2 is the overall formula that was used to calculate the VMT road type distributions. It has two parts which are represented by the symbols A and B. The “A” expression evaluates local DVMT for the MOVES road types per HPMS vehicle type. The “B” expression is the MOVES road type ratio that distributes the road type fractions across source

types. Sample calculations for the Passenger Car and Combination Long-haul Truck using the equations for Knox County data are include in Appendix D.2. Off-network was assigned a value of zero. It should be noted that the road type VMT fractions are the same for those source types that were mapped from the HPMS vehicle type. For example, Passenger Car, Passenger Truck, and Light Commercial Truck in MOVES were mapped together from Passenger Car, and Other 2-axle 4-tire Vehicles in HPMS, which are now under the EPA term Light Duty Vehicles - Short and Long Wheelbase, and thus, VMT fractions will be the same for these three source types.

The supplemental Microsoft Excel file showing calculations in spreadsheet format for this section using Knox County data is named Sample Calculations for RoadType VMT Distributions - Knox 2014.xlsx. This file contains two spreadsheets. The first spreadsheet is called "SourceType Pop", which contains several tables that are used to calculate source type VMT distribution data using the raw data received from TDOT. The second spreadsheet is called "5-Year Average". It is the same spreadsheet which was mentioned earlier in the discussion of source type population. The sample calculations for Knox County data (shown in Appendix D.2 for Passenger Car and Combination Long-haul Truck, mentioned above) will match the sample calculations shown in the Excel spreadsheets for Knox County. The final input data for MOVES are included in the compressed (zip) on a per county basis.

Vehicle Type VMT

Annual VMT by the HPMS vehicle classes are required by MOVES. Vehicle type VMT is the total annual or daily VMT by HPMS vehicle type or source type. It includes month, day, and hour VMT fractions. Month VMT fractions are the fraction of annual VMT (per source type) occurring per month. Day VMT fractions are the fraction of monthly VMT (per source type) occurring on one of the two day types (weekday or weekend-day). Hour VMT fractions are the fraction of daily VMT (per source type) occurring per hour.

Once again, the vehicle type VMT data in this format are not available for Tennessee. However, to help the user develop inputs for MOVES, the EPA created several Microsoft Excel spreadsheet-based converter or calculator tools. A modified version of the file named "aadvmtcalculator_hpms.xls" was used to develop the data for vehicle type VMT. First, some

general information will be given about the original EPA file which can be downloaded from the MOVES Internet site listed earlier in the report.

The EPA tool uses annual average weekday (AAD) VMT at the HPMS level to calculate type of day, monthly and yearly VMT in terms of HPMS and/or MOVES source types. The tool contains default vehicle type VMT datasets for monthly, daily, and hourly VMT fractions and provides default monthly and weekend-day adjustment factors if local inputs are not available. However, the decision was made to modify the EPA converter tool after some discussion among stakeholders. The primary concern was that the annual VMT (i.e., the MOVES input for the HPMSBaseYearVMT as calculated via the tool) should equal 365 times the HPMS DVMT data (or 366 if the year for the model run was a leap year).

It is assumed this tool was designed to handle average annual weekday VMT (AAWDVMT) rather than average annual daily traffic (AADVMT). Raw HPMS data from TDOT are reported in terms of AADVMT and by definition represents an average day regardless of weekday or weekend. For their roads analysis, TDOT will normally apply a daily variation factors to represent traffic for a particular weekday or weekend-day. Thus, the EPA tool was modified to essentially multiply daily VMT by 365 (because 2014 was not a leap year) to create the HPMSVTypeYear data. Also since TDOT determines seven-day adjustment factors by months of the year, the weekday and weekend-day adjustment factors could be determined separately. These factors were also added to the modified EPA calculator tool which originally included only default monthly and weekend-day adjustment factors.

A copy of the TDOT five year seasonal variation factors that were used for 2014 are shown in Table 10. Note that the final factors used in the modified tool will be the inverse of the variation factors shown in the table. They are listed for Rural Interstate, Rural Other, Urban, and Recreational. This required preprocessing of the road categories into HPMS road types and averaging the results before the adjustment factors could be applied to the modified EPA calculator tool. The averaging pattern is represented in the Excel file showing the AADVMT sample calculations. It should be noted that the variation factors for Recreational were not used because they are for road traffic in state parks. In effect, weighting factors were created from the road categories that had been mapped to HPMS road types, and then these weighting factors were applied to the averaged adjustment factors to create monthly, weekday, and weekend-day

factors for use in the modified calculator tool. The method of averaging these seasonal variation factors are shown in the Microsoft Excel preprocessing data file mentioned below. One final comment is in order: as of the writing of this document, the EPA has a new converter tool that permits entering ADDVMT data as average day or as an average weekday. This file is called "aadvmt-converter-tool-moves2014.xlsx", but it was decided to say with the original EPA tool because the modified version includes the monthly, weekday and weekend-day adjustment factors.

Once more, it was necessary that local data be preprocessed before it could be used. The general formula that was applied to prepare AADVMT data is Equation 3. Note that this formula is identical to the "A" expression of Equation 1. (It was listed again only to maintain continuity in the narrative.) Sample calculations for the Passenger Car and Combination Long-haul Truck using the equation for Knox County data are include in Appendix D.2.

Two Microsoft Excel file will accompany this section. The names of these files are Sample Calculations for AADVMT - Knox 2014.xlsx and Sample Modified AADVMT Calculator HPMS - Knox 2014.xlsx. The former file includes calculations in spreadsheet format for Knox County that were used to develop the AADVMT input data for the calculation tool. This file contains three spreadsheets. The first spreadsheet is called "AADVMT" which contains several tables that are used to calculate the AADVMT data. The second spreadsheet is called "Adjustment Factors" which contains several tables that are used to calculate the monthly, weekday, and weekend-day adjustment factors. Both of these spreadsheets use raw data received from TDOT. The third spreadsheet is called "5-Year Average". Calculation in this spreadsheet demonstrates how the five-year averages were calculated, using the yearly vehicle summaries by the functional road classes. It is the same spreadsheet that was mentioned earlier in the discussion of source type population and road type distribution. The Sample calculations for Knox County data (shown in Appendix D.2 for Passenger Car and Combination Long-haul Truck, mentioned above) will match the sample calculations shown in the Excel spreadsheets for Knox County.

The latter file is the modified EPA calculator tool that was run using the Knox County AADVMT data. This file contains eight spreadsheets. The main spreadsheet is called "Import HPMS AADVMT and Factors". This spreadsheet accepts the AADVMT and adjustment factor

data generated by the former file (previously discussed). Calculations are shown in the spreadsheet called "Intermediate Calculations". The final calculations become the input data for MOVES which are shown in the three spreadsheets named: "HPMSVTypeYear", "monthVMTFraction-calculated", and "dayVMTFraction-calculated". For closure, the EPA default VMT fractions were included in the file as the following spreadsheets: "monthVMTFraction-default", "dayVMTFraction-default", and "hourVMTFraction-default". The modified tool will only generate the HPMS base year VMT data and the monthly and daily VMT fractions required by MOVES. Therefore, the default hourly VMT fractions are used as input data for MOVES because, at the moment, no hourly vehicle data are available at the local level to aid in calculating hourly fractions. The other two default VMT fractions (month and day) were included for comparison purposes. The final input data for MOVES are included in the compressed (zip) on a per county basis.

Summary

Two compressed (or zip type) files are included with this document. The file named MOVES Input Data files for 2014.zip contains the Excel input data files for the 95 counties of Tennessee. Each file contains eight spreadsheets; seven spreadsheets contain the input data listed in Table 1, and the last spreadsheet contains general comments about the input data. The prefix of the file name is the county name. For example, Knox Input File 2014.xlxs is the Excel file containing MOVES input data for Knox County. The second zip or compressed file contains the Excel files that demonstrate all sample calculations in spreadsheet format for Anderson, Blount, Knox, Loudon, and Roane Counties. The name of this file is Sample Calculations for Five Counties 2014.zip; it contains a total of 20 files, i.e., four sets of sample calculation files per county. Only the files for Knox County were mentioned in this document. However, the naming convention for the files is similar for the other four counties.

Conclusions

Two areas need improvement to enhance the quality of the input data: the motor vehicle registration database and the statewide vehicle classification summaries. A trial-and-error method was required to match vehicles with the MOVES and/or HPMS categories using motor vehicle registration data to generate source type population data. This method is time consuming

and may produce inconsistent results because many of the vehicle categories listed in the registration database are labeled incorrectly and often require a judgment call. For example, vehicle type, use, and body codes exist for commercial bus, school bus, motor home, pick-up truck, and garbage truck in the database, but in many instances, these abbreviations do not match the information derived by querying the VIN. Additional evidence for this problem is shown by the initial data extraction which disclosed almost 80% passenger cars. This is not an attempt to fault TDOR because the purpose of vehicle registration is to collect title information, such as for the establishment of legal ownership of property and to collect road-use taxes, which in turn help finance the construction and/or maintenance of the public roadways. This is to say, the intent of motor vehicle registration data is not to serve as input for the MOVES model.

The final concern involves using statewide data to predict local (county) conditions. The EPA requires that states develop local data for MOVES. Although the quality of data received from TDOT is very high, much of the data have been abridged to generate statewide summaries. In this project, the abridged data were used in various calculation methods to predict local conditions that possibly do not represent the true local condition. The most reliable data are from physical traffic volume counts, which are actual counts of vehicles along a particular road way. However at present, it is very difficult to classify vehicles or distinguish between source types using pneumatic and/or electronic counters. Also the method would be costly and time consuming to perform on all roadways. Therefore, sampling is typically performed on certain roadways on a seasonal basis, and the data are projected to similar locations (i.e., as statewide summaries). Inputs to MOVES require highly detailed data. Concluding: state and local agencies must use computer models for SIPs and transportation conformity analyses. Ultimately the results from these computer programs will influence policy decisions that can have significant economic effects on the community in which they are applied. Therefore, it is paramount that the highest quality of data is used to run the models.

References

1. U.S. Environmental Protection Agency. *Motor Vehicle Emission Simulator (MOVES): User Guide for MOVES2014a*. Assessment and Standards Division, Office of Transportation and Air Quality; EPA-420-B-15-095; November 2015.

2. U.S. Environmental Protection Agency. *MOVES2014 and MOVES2014a Technical Guidance: Using MOVES to Prepare Emission Inventories in State Implementation Plans and Transportation Conformity*. Assessment and Standards Division, Office of Transportation and Air Quality; EPA-420-R-15-093; November 2015.

3. U.S. Environmental Protection Agency. *Population and Activity of On-road Vehicles in MOVES2014*. Assessment and Standards Division, Office of Transportation and Air Quality; EPA-420-R-16-003a; March 2016.

4. U.S. Department of Transportation. *Highway Performance Monitoring System – Field Manual*. Federal Highway Administration (FHWA); Office of Highway Policy Information; Office of Management & Budget (OMB) Control No. 2125-0028; March 2014.

5. U.S. Department of Transportation. *Traffic Monitoring Guide*. Federal Highway Administration (FHWA); Office of Highway Policy Information; September 2013.

Appendix D.1: Tables

Appendix D.2: Equations & Sample Calculations

Appendix D.1
Tables

Table 1: Input Data Files

CDM (tab) Name	Data Source (file) Name
Source Type Population	sourceTypeYear
Age Distribution	sourceTypeAgeDistribution
Road Type Distribution	roadTypeDistribution
Vehicle Type VMT	HPMSVTypeYear
	monthVMTFraction
	dayVMTFraction
	hourVMTFraction

Table 2: Number of Vehicles in the TDOR Initial Data Extraction

HPMS ID	HPMS Vehicle Type	TDOR Extraction	MOVES ID	MOVES Source Type	TDOR Extraction
10	Motorcycle	158,643	11	Motorcycle	158,643
20	Passenger Car	4,215,201	21	Passenger Car	4,215,201
30	Other 2 axle-4 tire Vehicles	872,451	31	Passenger Truck	872,247
			32	Light Commercial Truck	204
40	Buses	3,261	41	Intercity Bus	772
			42	Transit Bus	1,459
			43	School Bus	1,030
50	Single Unit Trucks	263,506	51	Refuse Truck	326
			52	Single Unit Short-haul Truck	256,030
			53	Single Unit Long-haul Truck	na
			54	Motor Home	7,150
60	Combination Trucks	na	61	Combination Short-haul Truck	na
			62	Combination Long-haul Truck	na
	Total	**5,513,062**		**Total**	**5,513,062**

Note: vehicle data from HPMS ID 20 & 30 will be combined, assigned ID 25, and called Light Duty Vehicles - Short and Long Wheelbase for evaluation in MOVES; na = not available

Table 3: FHWA and Polk Vehicle Registration Data for Tennessee

Source	Vehicle Type	Private and Commercial	Publicly Owned	Total
FHWA (2014)	Motorcycles	162,396	2,314	**164,710**
	Automobiles *	2,236,150	37,362	**2,273,512**
	Trucks	2,945,617	85,779	**3,031,396**
	Buses	2,069	23,960	**26,029**
	Total	**5,346,232**	**149,415**	**5,495,647**
Polk **	Cars	-		2,456,340
	Light-duty Trucks	-		3,062,978
	Total	-		**5,519,318**

*** Including Taxicabs; Source: FHWA Highway Statistics; State Motor-Vehicle Registrations, abridged Table MV-1; ** Polk car and light-duty truck registration database; condensed data for end of year 2013.**

Table 4: Number of Vehicles after Redistribution of Data

MOVES ID	MOVES sourceTypeName	TDOR Extraction
11	Motorcycle	158,643
21	Passenger Car	2,565,518
31	Passenger Truck	2,209,403
32	Light Commercial Truck	327,352
41	Intercity Bus	892
42	Transit Bus	1,459
43	School Bus	3,105
51	Refuse Truck	326
52	Single Unit Short-haul Truck	118,362
53	Single Unit Long-haul Truck	na
54	Motor Home	16,657
61	Combination Short-haul Truck	na
62	Combination Long-haul Truck	na
	Total	**5,401,717**

Note: total reflects 111,345 antique vehicles removed from initial TDOT data extraction

Table 5: HPMS 2014 DVMT Rural and Urban

Reg	Co #	County	Interstate		Freeways		Principal Arterial		Minor Arterial		Major Collector	Major Collector	Minor Collector	Minor Collector	Local		County Total
			Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Urban	Rural	Rural	Urban	
1	1	ANDERSON	504,792	0	0	0	32,921	665,757	0	303,626	171,309	153,153	31,696	64,809	69,801	311,192	2,309,056
3	2	BEDFORD	17,519	0	0	0	204,120	223,371	160,467	64,756	111,747	31,894	0	99,898	99,624	67,392	1,080,788
4	3	BENTON	260,616	0	0	0	130,096	0	64,282	0	89,868	0	0	45,880	39,902	0	630,644
2	4	BLEDSOE	0	0	0	0	124,352	0	38,423	0	24,279	0	0	46,467	42,601	0	276,122
1	5	BLOUNT	0	89,422	0	27,928	195,499	1,016,348	84,877	464,579	19,685	368,747	43,606	65,741	136,140	564,908	3,077,480
2	6	BRADLEY	154,368	809,944	0	148,857	0	566,353	34,650	480,515	62,492	178,797	50,618	33,423	56,380	635,809	3,212,206
1	7	CAMPBELL	936,417	0	0	0	158,482	150,132	36,338	8,627	112,700	11,292	0	120,861	125,609	21,348	1,681,806
2	8	CANNON	0	0	0	0	118,413	0	76,107	0	32,652	0	0	43,052	35,879	0	306,103
4	9	CARROLL	19,906	0	0	0	204,487	57,072	180,738	16,590	98,515	14,074	723	59,773	59,481	22,686	734,045
1	10	CARTER	0	52,240	0	0	61,288	325,137	112,559	190,917	55,508	93,643	523	26,905	42,189	118,477	1,079,386
3	11	CHEATHAM	549,278	0	0	0	0	0	331,153	0	170,875	0	0	99,633	113,293	0	1,264,232
4	12	CHESTER	0	0	0	0	44,321	69,746	84,706	16,051	38,240	35,892	0	36,620	34,637	28,893	389,106
1	13	CLAIBORNE	0	0	0	0	372,091	0	144,582	0	34,545	0	0	96,649	94,812	0	742,679
2	14	CLAY	0	0	0	0	65,118	0	42,841	0	11,085	0	0	18,070	28,620	0	165,734
1	15	COCKE	316,413	243,209	0	0	0	150,315	211,345	69,928	46,635	11,122	13,235	62,170	82,996	46,068	1,253,436
2	16	COFFEE	803,585	372,455	0	0	72,086	310,820	29,899	230,497	115,929	88,144	16,674	116,564	97,939	203,835	2,458,427
4	17	CROCKETT	0	0	0	0	260,321	0	41,500	0	115,916	0	0	45,980	35,336	0	499,053
2	18	CUMBERLAND	876,509	233,563	0	0	106,921	160,240	90,305	119,736	184,682	143,217	7,171	75,725	114,813	369,848	2,482,730
3	19	DAVIDSON	711,778	8,995,052	0	1,630,206	149,716	3,284,898	412,949	3,019,604	63,731	903,094	0	104,161	121,768	3,201,874	22,598,831
4	20	DECATUR	171,268	0	0	0	167,322	0	20,066	0	38,751	0	0	30,363	31,330	0	459,100
2	21	DE KALB	0	0	0	0	0	0	282,995	0	58,722	0	0	47,314	73,048	0	462,079
3	22	DICKSON	612,227	30,011	0	0	58,531	227,988	398,200	48,804	117,494	48,895	0	82,982	102,020	56,285	1,783,437
4	23	DYER	122,297	52,973	0	25,772	151,023	276,408	31,742	105,606	80,447	104,513	28,911	60,020	47,542	151,971	1,239,225
4	24	FAYETTE	495,162	0	0	0	282,527	241,304	234,960	35,621	117,271	37,380	0	82,815	79,483	72,684	1,679,207
2	25	FENTRESS	0	0	0	0	160,493	0	90,684	0	43,266	0	0	77,360	116,143	0	487,946
2	26	FRANKLIN	0	0	0	0	167,002	178,923	59,590	89,028	147,681	31,969	8,009	61,977	85,926	78,925	909,030
4	27	GIBSON	0	0	0	0	222,740	219,331	160,971	46,891	175,775	22,153	2,659	106,709	92,578	40,875	1,090,682
3	28	GILES	370,353	0	0	0	134,417	66,787	192,808	72,655	89,271	11,085	5,970	87,352	80,595	21,957	1,133,250
1	29	GRAINGER	0	0	0	0	232,710	0	156,822	0	70,883	0	0	58,857	71,663	0	590,935
1	30	GREENE	864,019	0	0	0	105,693	478,259	155,392	140,174	142,195	64,819	42,193	159,383	156,851	174,734	2,483,712
2	31	GRUNDY	258,186	0	0	0	370	0	126,547	0	75,918	0	0	13,191	34,071	0	508,283
1	32	HAMBLEN	275,070	29,650	0	0	482	657,804	0	234,516	58,260	139,758	24,488	37,147	49,081	256,076	1,762,332
2	33	HAMILTON	0	2,768,873	0	1,156,147	167,270	2,041,882	61,099	2,024,321	10,885	404,106	85,908	64,500	63,678	1,352,142	10,200,811
1	34	HANCOCK	0	0	0	0	0	0	56,752	0	15,264	0	0	13,395	14,060	0	99,471
4	35	HARDEMAN	0	0	0	0	149,631	89,822	181,901	12,168	29,185	5,802	1,445	78,837	56,395	13,290	618,476
4	36	HARDIN	0	0	0	0	90,548	120,040	190,064	55,511	41,315	39,825	3,044	48,312	51,958	65,535	706,152

(continued)

Reg	Co #	County	Interstate		Freeways		Principal Arterial		Minor Arterial		Major Collector	Major Collector	Minor Collector	Minor Collector	Local		County Total
			Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Urban	Rural	Rural	Urban	
1	37	HAWKINS	0	0	0	0	305,562	224,039	148,060	53,996	74,135	34,565	0	95,704	145,357	53,830	1,135,248
4	38	HAYWOOD	716,706	24,212	0	0	0	62,841	129,209	48,675	93,641	14,852	1,397	36,959	35,715	26,562	1,190,769
4	39	HENDERSON	732,888	0	0	0	149,401	164,372	104,969	20,887	73,763	22,845	1,546	47,240	54,239	50,049	1,422,199
4	40	HENRY	0	0	0	0	269,990	164,767	26,788	35,007	130,920	33,861	7,224	44,727	68,934	56,381	838,599
3	41	HICKMAN	479,774	0	0	0	15,415	0	309,160	0	66,709	0	0	63,062	70,101	0	1,004,221
3	42	HOUSTON	0	0	0	0	0	0	82,132	0	36,556	0	0	14,229	19,192	0	152,109
3	43	HUMPHREYS	439,010	0	0	0	0	0	284,417	0	20,702	0	0	93,977	60,131	0	898,237
2	44	JACKSON	0	0	0	0	0	0	133,053	0	42,503	0	0	24,970	30,126	0	230,652
1	45	JEFFERSON	1,253,496	23,315	0	0	0	168,883	307,213	83,700	199,362	18,529	10,183	101,715	125,253	40,471	2,332,120
1	46	JOHNSON	0	0	0	0	3,870	0	172,061	0	87,534	0	0	27,890	40,688	0	332,043
1	47	KNOX	498,500	5,194,493	0	58,604	0	2,662,076	81,947	2,278,761	87,171	810,233	51,429	114,023	117,858	2,815,096	14,770,191
4	48	LAKE	0	0	0	0	0	0	60,434	0	11,334	0	0	12,888	9,013	0	93,669
4	49	LAUDERDALE	0	0	0	0	166,417	114,980	10,090	41,393	87,404	17,655	376	50,870	52,333	23,290	564,808
3	50	LAWRENCE	0	0	0	0	325,996	156,709	20,453	76,530	118,226	18,279	0	115,445	156,300	34,869	1,022,807
3	51	LEWIS	0	0	0	0	84,594	0	65,341	0	9,021	0	0	16,146	18,407	0	193,509
3	52	LINCOLN	0	0	0	0	197,497	267,687	38,929	20,685	113,124	33,467	26,522	81,463	83,134	82,155	944,663
1	53	LOUDON	425,354	712,839	0	0	123,144	236,222	56,845	131,482	34,913	165,584	33,335	75,017	53,020	320,137	2,367,892
2	54	MC MINN	837,204	151,234	0	0	101,467	157,408	225,975	153,961	113,649	83,512	9,771	101,864	121,978	129,272	2,187,295
4	55	MC NAIRY	0	0	0	0	406,230	0	102,677	0	84,588	0	0	86,528	68,751	0	748,774
3	56	MACON	0	0	0	0	184,109	0	41,257	0	84,372	0	0	67,349	62,739	0	439,826
4	57	MADISON	544,216	506,818	0	0	383,706	738,649	54,744	491,513	85,554	238,401	18,537	121,011	81,284	428,274	3,692,707
2	58	MARION	1,294,143	0	0	0	178,499	0	82,272	0	238,016	0	0	60,339	72,999	0	1,926,268
3	59	MARSHALL	252,895	19,336	0	0	0	88,326	268,779	76,839	81,858	22,511	965	44,998	62,799	41,997	961,303
3	60	MAURY	464,675	36,701	0	209,080	294,858	602,808	224,917	162,054	146,204	125,251	0	122,944	105,358	219,575	2,714,425
2	61	MEIGS	0	0	0	0	29,817	0	186,098	0	34,279	0	0	32,802	40,659	0	323,655
1	62	MONROE	190,318	73,365	0	0	215,739	70,298	262,859	34,931	77,723	15,432	9,085	135,025	169,279	30,833	1,284,887
3	63	MONTGOMERY	254,951	529,693	0	0	76,428	1,032,011	233,009	897,830	106,245	215,084	850	111,703	156,820	588,553	4,203,177
3	64	MOORE	0	0	0	0	88,696	941	0	0	21,465	0	0	29,711	25,231	0	166,044
1	65	MORGAN	0	0	0	0	96,554	0	121,897	1,517	35,093	0	60	65,377	51,096	0	371,594
4	66	OBION	0	0	0	0	313,108	135,283	92,458	38,597	106,131	25,015	464	69,626	75,268	28,356	884,306
2	67	OVERTON	0	0	0	0	270,705	0	97,441	0	60,613	0	0	53,661	69,623	0	552,043
3	68	PERRY	0	0	0	0	61,263	0	76,498	0	20,351	0	0	24,310	28,502	0	210,924
2	69	PICKETT	0	0	0	0	69,264	0	1,605	0	16,183	0	0	13,629	19,987	0	120,668
2	70	POLK	0	0	0	0	300,732	0	34,526	0	21,917	0	0	50,272	88,310	0	495,757
2	71	PUTNAM	1,111,229	533,278	0	146,551	10,977	267,623	76,594	301,189	107,924	129,866	51,563	74,207	101,076	372,023	3,284,100
2	72	RHEA	0	0	0	0	217,995	185,123	127,254	58,543	28,684	24,406	16,944	50,989	57,209	49,717	816,864

(continued)

Reg	Co #	County	Interstate		Freeways		Principal Arterial		Minor Arterial		Major Collector	Major Collector	Minor Collector	Minor Collector	Local		County Total
			Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Urban	Rural	Rural	Urban	
1	73	ROANE	258,148	595,334	0	0	58,862	338,293	61,713	184,610	58,359	29,439	43,383	54,854	55,823	123,163	1,861,981
3	74	ROBERTSON	1,225,565	149,162	0	0	4,337	272,330	280,103	61,118	192,339	90,800	0	105,985	125,753	133,035	2,640,527
3	75	RUTHERFORD	233,113	2,324,945	0	257,255	597,556	1,302,462	144,330	1,337,504	228,074	647,124	0	124,469	145,092	1,413,584	8,755,508
1	76	SCOTT	0	0	0	0	182,332	0	90,405	0	52,565	0	0	50,579	71,628	0	447,509
2	77	SEQUATCHIE	0	0	0	0	267,409	0	3,399	149	44,936	0	0	35,590	47,050	0	398,533
1	78	SEVIER	0	309,868	0	0	231,153	989,100	425,109	266,983	142,182	258,441	35,947	119,357	416,818	587,979	3,782,937
4	79	SHELBY	111,617	5,820,404	0	1,437,471	304,233	5,332,115	197,829	5,928,365	15,308	1,508,953	6,233	158,652	140,709	3,471,543	24,433,432
3	80	SMITH	648,175	0	0	0	0	0	221,134	0	62,314	0	0	45,535	38,451	0	1,015,609
3	81	STEWART	0	0	0	0	183,794	0	41,632	0	44,027	0	0	28,167	52,424	0	350,044
1	82	SULLIVAN	57,023	932,670	0	164,912	84,717	1,157,609	27,410	815,503	56,096	205,736	12,887	50,073	107,360	509,517	4,181,513
3	83	SUMNER	0	362,619	0	607,853	292,113	738,958	253,753	319,005	142,932	452,716	0	109,926	151,327	750,767	4,181,969
4	84	TIPTON	0	0	0	0	111,242	330,349	101,046	102,462	84,199	28,981	2,150	120,222	128,021	69,296	1,077,968
3	85	TROUSDALE	0	0	0	0	60,541	0	97,620	0	23,459	0	0	19,595	18,021	0	219,236
1	86	UNICOI	133,805	213,619	0	0	0	0	1,895	68,837	45,983	36,999	3,594	13,249	11,511	72,194	601,686
1	87	UNION	0	0	0	0	0	0	142,415	0	89,821	0	0	38,505	58,204	0	328,945
2	88	VAN BUREN	0	0	0	0	81,472	0	24,781	0	18,231	0	0	22,228	19,605	0	166,317
2	89	WARREN	0	0	0	39,344	179,280	166,710	74,835	94,636	86,694	24,317	4,765	60,483	69,625	52,545	853,234
1	90	WASHINGTON	171,539	634,639	0	0	115,673	512,688	145,535	688,479	76,928	182,783	16,649	78,607	90,719	383,398	3,097,637
3	91	WAYNE	0	0	0	0	82,823	0	102,142	0	47,849	0	0	50,950	52,582	0	336,346
4	92	WEAKLY	0	0	0	0	249,445	104,523	31,554	64,386	162,684	13,745	618	62,391	74,274	37,573	801,193
2	93	WHITE	0	0	0	0	91,428	198,000	81,984	47,533	42,432	27,957	14,949	53,372	44,462	61,781	663,898
3	94	WILLIAMSON	639,041	1,413,470	0	0	777,749	717,750	517,500	555,295	193,017	477,084	0	313,435	263,302	1,028,484	6,896,127
3	95	WILSON	424,271	1,158,077	0	34,687	372,969	565,233	283,792	376,496	170,114	210,532	0	195,259	126,605	301,660	4,219,695
STATE TOTALS			21,717,419	35,397,483	0	5,944,667	13,662,152	31,805,903	12,272,191	23,770,172	7,711,386	9,188,329	748,299	6,617,048	7,546,377	22,264,763	198,646,189
HPMS AREAWIDE DVMT			21,717	35,397	0	5,945	13,662	31,806	12,272	23,770	7,711	9,188	748	6,617	7,546	22,265	198,646

Table 6: Class Count 2014 Summary for the Rural and Urban Road System

Functional Class	(1) RURAL INTERSTATE	(2) RURAL PRINCIPAL ARTERIAL	(6) RURAL MINOR ARTERIA	(7) RURAL MAJOR COLLECTO	(8) RURAL MINOR COLLECTOR	(11) URBAN INTERSTATE	(12) URBAN FREEWAY	(14) URBAN PRINCIPAL ARTERIAL	(16) URBAN MINOR ARTERIAL	(17) URBAN COLLECTOR
Motorcycles (1)	**0.68%**	**0.79%**	**0.63%**	**0.62%**	**0.58%**		**0.18%**	**0.53%**	**0.66%**	**0.45%**
Cars (2)	52.78%	65.04%	68.34%	68.66%	70.85%		74.25%	74.29%	74.19%	77.18%
Pick-ups, Panels & Vans (3)	14.51%	24.64%	25.33%	27.01%	25.87%		19.14%	20.42%	20.36%	20.66%
Passenger Vehicles (2+3)	**67.29%**	**89.68%**	**93.68%**	**95.67%**	**96.72%**		**93.39%**	**94.71%**	**94.55%**	**97.84%**
Buses (4)	**0.24%**	**0.05%**	**0.03%**	**0.02%**	**0.01%**		**0.19%**	**0.02%**	**0.02%**	**0.02%**
Dual Rear Trucks (5)	1.22%	1.08%	0.91%	0.84%	0.81%		1.01%	0.70%	0.70%	0.65%
3-Axle Trucks (6)	0.80%	0.99%	0.82%	0.76%	0.64%		0.51%	0.58%	0.67%	0.33%
4-Axle Trucks (7)	0.36%	0.33%	0.20%	0.20%	0.18%		0.06%	0.34%	0.38%	0.07%
Sinle Unit Trucks (5+6+7)	**2.38%**	**2.41%**	**1.93%**	**1.80%**	**1.62%**		**1.58%**	**1.63%**	**1.75%**	**1.05%**
2S-1, 3S-1, 2S-2 (8)	2.06%	1.29%	0.78%	0.62%	0.47%		1.35%	1.00%	1.15%	0.39%
3S-2, 2S-3 (9)	23.70%	4.38%	2.66%	0.98%	0.52%		2.79%	1.01%	0.56%	0.10%
3S-3, 3S-4 (10)	0.48%	0.42%	0.07%	0.05%	0.01%		0.06%	0.11%	0.09%	0.02%
Tractor Trailer Trucks (8+9+10)	**26.24%**	**6.09%**	**3.51%**	**1.65%**	**1.00%**		**4.21%**	**2.12%**	**1.80%**	**0.51%**
2S-1-2 (11)	1.88%	0.44%	0.07%	0.12%	0.03%		0.28%	0.39%	0.48%	0.07%
2S-2-2, 3S-1-2 (12)	0.87%	0.10%	0.04%	0.04%	0.01%		0.11%	0.20%	0.26%	0.01%
Any 7 Axle (13)	0.42%	0.43%	0.11%	0.08%	0.03%		0.06%	0.40%	0.48%	0.05%
Multi-Trailer Trucks (11+12+13)	**3.17%**	**0.97%**	**0.22%**	**0.23%**	**0.07%**		**0.45%**	**0.99%**	**1.22%**	**0.13%**
Combination Trucks	**29.41%**	**7.06%**	**3.73%**	**1.89%**	**1.07%**		**4.65%**	**3.11%**	**3.02%**	**0.64%**
	100.00%	**100.00%**	**100.00%**	**100.00%**	**100.00%**		**100.00%**	**100.00%**	**100.00%**	**100.00%**

Table 7: HPMS and MOVES Mapping Scheme

Item	HPMS	MOVES
Vehicle Class (Source Type)	Motorcycle	Motorcycle
	Light Duty Vehicles - Short and Long Wheelbases *	Passenger Car
		Passenger Truck
		Light Commercial Truck
	Buses	Intercity Bus
		Transit Bus
		School Bus
	Single Unit Trucks	Refuse Truck
		Single Unit Short-haul Truck
		Single Unit Long-haul Truck
		Motor Home
	Combination Trucks	Combination Short-haul Truck
		Combination Long-haul Truck
Functional Road System (Road Type)	Rural Interstate & Freeway	Rural Restricted
	Rural Principal Arterial	Rural Unrestricted
	Rural Minor Arterial	
	Rural Major Collector	
	Rural Minor Collector	
	Rural Local	
	Urban Interstate & Freeway	Urban Restricted
	Urban Principal Arterial	Urban Unrestricted
	Urban Minor Arterial	
	Urban Major Collector	
	Urban Minor Collector	
	Urban Local	

*** HPMS includes Passenger Cars and Other 2 axle-4 Tire Vehicles**

Table 8: Population Data from National Default-Local Data Method

MOVES SourceType	Population	% of Total
Motorcycle *	229,501	3.7
Passenger Car *	3,080,076	50.2
Passenger Truck *	2,098,594	34.2
Light Commercial Truck *	523,749	8.5
Intercity Bus	83	0.001
Transit Bus *	308	0.005
School Bus *	2,761	0.04
Refuse Truck	2,714	0.04
Single Unit Short-haul Truck *	89,535	1.5
Single Unit Long-haul Truck	3,766	0.06
Motor Home	22,420	0.37
Combination Short-haul Truck	41,938	0.68
Combination Long-haul Truck	46,098	0.75
Total	**6,141,544**	**100**

*** Source Types not used in final database using this method**

Table 9: Final Statewide Population Data

MOVES Source Type	Population	% of Total
Motorcycle	157,540	2.9
Passenger Car	2,530,079	46.6
Passenger Truck	2,182,324	40.2
Light Commercial Truck	319,672	5.9
Intercity Bus	83	0.002
Transit Bus	827	0.02
School Bus	8,864	0.16
Refuse Truck	2,714	0.05
Single Unit Short-haul Truck	111,493	2.1
Single Unit Long-haul Truck	3,766	0.07
Motor Home	22,420	0.41
Combination Short-haul Truck	41,938	0.77
Combination Long-haul Truck	46,098	0.85
Total	**5,427,818**	**100**

Table 10: 5-Year Average Monthly Variation Factors, by Day of Week for 2014

2014	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Rural Interstate												
Sunday	1.29	1.22	1.03	1.01	1.06	0.98	0.95	1.03	1.10	0.99	1.01	1.10
Monday	1.16	1.12	1.03	1.06	1.03	0.98	1.00	1.07	1.08	1.05	1.08	1.07
Tuesday	1.16	1.12	1.05	1.04	1.02	0.98	1.00	1.05	1.06	1.05	1.01	1.02
Wednesday	1.11	1.10	1.00	1.01	0.98	0.94	0.96	1.00	1.05	1.01	0.94	1.01
Thursday	1.08	1.04	0.91	0.92	0.91	0.87	0.90	0.93	0.98	0.94	1.02	0.98
Friday	0.99	0.92	0.80	0.84	0.84	0.80	0.82	0.83	0.86	0.82	0.90	0.91
Saturday	1.17	1.20	0.97	1.03	1.08	0.92	0.92	0.99	1.09	1.03	1.02	1.01
Rural Other												
Sunday	1.50	1.44	1.32	1.22	1.21	1.19	1.18	1.21	1.24	1.25	1.35	1.42
Monday	1.10	1.04	1.02	0.97	0.98	0.94	0.97	0.94	1.01	0.96	0.98	1.04
Tuesday	1.07	1.02	0.98	0.94	0.92	0.93	0.94	0.93	0.93	0.95	0.97	1.02
Wednesday	1.07	1.01	0.96	0.94	0.91	0.92	0.93	0.93	0.93	0.93	0.95	1.01
Thursday	1.03	0.99	0.94	0.90	0.88	0.89	0.91	0.90	0.90	0.90	0.99	0.98
Friday	0.98	0.90	0.90	0.84	0.81	0.82	0.84	0.81	0.81	0.82	0.90	0.92
Saturday	1.24	1.15	1.12	1.02	0.99	0.97	0.98	0.98	1.00	0.99	1.09	1.17
Urban												
Sunday	1.46	1.35	1.21	1.20	1.19	1.14	1.14	1.18	1.22	1.19	1.23	1.33
Monday	1.09	1.03	1.00	0.98	0.99	0.94	0.96	0.96	1.02	0.97	0.99	1.01
Tuesday	1.08	1.00	0.97	0.96	0.94	0.93	0.93	0.94	0.96	0.96	0.95	0.99
Wednesday	1.05	1.01	0.94	0.94	0.92	0.91	0.91	0.92	0.94	0.94	0.93	0.97
Thursday	1.01	0.98	0.89	0.90	0.88	0.87	0.89	0.89	0.90	0.90	0.99	0.95
Friday	0.95	0.88	0.87	0.84	0.82	0.81	0.83	0.82	0.83	0.83	0.90	0.89
Saturday	1.24	1.16	1.08	1.05	1.05	0.99	1.00	1.02	1.06	1.05	1.08	1.14
Recreational												
Sunday	1.41	1.19	1.04	1.00	0.94	0.79	0.71	0.90	0.83	0.76	1.00	1.13
Monday	1.70	1.54	1.16	1.11	1.05	0.87	0.83	1.03	1.06	0.91	1.15	1.31
Tuesday	1.78	1.60	1.22	1.14	1.06	0.83	0.81	1.06	1.11	0.95	1.24	1.28
Wednesday	1.82	1.68	1.20	1.14	1.05	0.85	0.78	1.00	1.11	0.94	1.13	1.28
Thursday	1.61	1.52	1.21	0.99	1.03	0.84	0.76	0.95	1.05	0.89	1.04	1.25
Friday	1.26	1.04	0.97	0.88	0.91	0.73	0.71	0.83	0.91	0.74	0.81	0.95
Saturday	1.09	0.87	0.84	0.87	0.83	0.71	0.66	0.71	0.84	0.68	0.75	0.85

Appendix D.2
Equations and Sample Calculations

Equation 1: General formula used to convert default population/VMT data, local DVMT, and local vehicle count summaries into MOVES source type population data

$$Population_{Source\ Type} = A \cdot B \cdot C$$

where:

$$A = \sum (Vehicle\ Fraction_{Road} \cdot DVMT_{Road})_{HPMS}$$

$$B = \left(\frac{Default\ Population_{\ Source\ Type}}{Default\ VMT_{Source\ Type}}\right)_{MOVES}$$

$$C = \frac{(Default\ VMT_{Source\ Type})_{MOVES}}{\sum(Default\ VMT_{Source\ Type})_{HPMS\ to\ MOVES}}$$

<u>Sample Calculations Source Type Population:</u>

<u>Knox County - Passenger Car</u>

$$\begin{aligned} A = [&(0.7090 \cdot 498{,}500) + (0.8149 \cdot 5{,}194{,}493) + (0.0000 \cdot 0) + (0.9232 \cdot 58{,}604) \\ &+ (0.8973 \cdot 0) + (0.9283 \cdot 2{,}662{,}076) + (0.9356 \cdot 81{,}947) \\ &+ (0.9461 \cdot 2{,}278{,}761) + (0.9523 \cdot 87{,}171) + (0.9686 \cdot 810{,}233) \\ &+ (0.9611 \cdot 114{,}023) + (0.9686 \cdot 51{,}429) + (0.9611 \cdot 117{,}858) \\ &+ (0.9686 \cdot 2{,}815{,}096)] \cong 13{,}211{,}704\ miles/day \end{aligned}$$

$$B = \left(\frac{244{,}705\ Passenger\ Cars}{2{,}628{,}956{,}000\ miles/year}\right) \cong 9.3081 \cdot 10^{-5} \frac{Passenger\ Cars}{miles/year}$$

$$C = \frac{2{,}628{,}956{,}000\, miles/year}{(2{,}628{,}956{,}000 + 1{,}897{,}590{,}600 + 482{,}319{,}900)\, miles/year} \cong 0.5249$$

$$Local\ Population_{Passenger\ Car}$$

$$= 13{,}211{,}704\ \frac{miles}{day} \cdot \left(\frac{9.3081 \cdot 10^{-5}\ Pass\ Cars}{miles/year}\right) \cdot 0.5249 \cdot \left(\frac{365\ days}{year}\right)$$

$$\cong\ 235{,}589\ Passenger\ Cars$$

<u>*Knox County - Combination Long-haul Truck*</u>

$$A = [(0.2465 \cdot 498{,}500) + (0.1536 \cdot 5{,}194{,}493\ ) + (0.0000 \cdot 0) + (0.0499\ \cdot 58{,}604)$$
$$+ (0.0658 \cdot 0) + (0.0444 \cdot 2{,}662{,}076) + (0.0352\ \cdot 81{,}947)$$
$$+ (0.0309 \cdot 2{,}278{,}761) + (0.0193 \cdot 87{,}171) + (0.0138\ \cdot 810{,}233)$$
$$+ (0.0157\ \cdot 114{,}023) + (0.0138 \cdot 51{,}429) + (0.0157\ \cdot 117{,}858\ )$$
$$+ (0.0138\ \cdot 2{,}815{,}096\ )]\ \cong 1{,}171{,}045\ miles/day$$

$$B = \left(\frac{2{,}152\ Comb\ Long - haul\ Trucks}{202{,}807{,}600\ miles/year}\right) \cong 1.0611 \cdot 10^{-5}\, \frac{Comb\ Long - haul\ Trucks}{miles/year}$$

$$C = \frac{202{,}807{,}600\, miles/year}{(59{,}763{,}440 + 202{,}807{,}600)\, miles/year} \cong 0.7724$$

$$Local\ Population_{Combination\ Long-haul\ Truck}$$

$$= 1{,}171{,}045\ \frac{miles}{day} \cdot \left(\frac{1.0611 \cdot 10^{-5}\ Comb\ Long - haul\ Trucks}{miles/year}\right) \cdot 0.7724$$
$$\cdot \left(\frac{365\ days}{year}\right) \cong 3{,}503\ Combination\ Long - haul\ Trucks$$

Equation 2: General formula used to convert HPMS local DVMT and vehicle classification summaries into MOVES road type VMT distributions by source types

$$VMT\ Fraction_{MOVES\ Road\ Type\ for\ Source\ Type} = \left({}^{A}/_{B}\right)_{Road\ Type\ for\ Source\ Type}$$

$$A = \left(\sum Fraction_{Vehicle\ Type} \cdot Local\ DVMT\right)_{HPMS\ to\ MOVES}$$

$$B = \left(\sum A_{Road\ Types}\right)_{HPMS\ to\ MOVES}$$

<u>Sample Calculations VMT Distribution:</u>

<u>Knox County - Passenger Car</u>

$$A_{Rural\ Restricted} = \left((0.7090 \cdot 498{,}500) + (0.0000 \cdot 0)\right) = 353{,}433\ miles/day$$

$$A_{Rural\ Unrestricted} = \left((0.8973 \cdot 0) + (0.9356 \cdot 81{,}947) + (0.9523 \cdot 87{,}171) + (0.9611 \cdot 114{,}023) + (0.9611 \cdot 117{,}858)\right) = 382{,}536\ miles/day$$

$$A_{Urban\ Restricted} = \left((0.8149 \cdot 5{,}194{,}493) + (0.9232 \cdot 58{,}604)\right) = 4{,}287{,}133\ miles/day$$

$$A_{Urban\ Unrestricted} = \left((0.9283 \cdot 2{,}662{,}076) + (0.9461 \cdot 2{,}278{,}761) + (0.9686 \cdot 810{,}233) + (0.9686 \cdot 51{,}429) + (0.9686 \cdot 2{,}815{,}096)\right) = 8{,}188{,}602\ miles/day$$

$$B = 353{,}433 + 382{,}536 + 4{,}287{,}133 + 8{,}188{,}602 = 13{,}211{,}704\ miles/day$$

$$VMT\ Fraction_{Rural\ Restricted} = \left({}^{353{,}433\ miles/day}/_{13{,}211{,}704\ miles/day}\right) = 0.0268$$

$$VMT\ Fraction_{Rural\ Restricted} = \left(382{,}536\ miles/day \Big/ 13{,}211{,}704\ miles/day \right) = 0.0290$$

$$VMT\ Fraction_{Rural\ Restricted} = \left(4{,}287{,}133\ miles/day \Big/ 13{,}211{,}704\ miles/day \right)$$

$$= 0.3245$$

$$VMT\ Fraction_{Rural\ Restricted} = \left(8{,}188{,}602\ miles/day \Big/ 13{,}211{,}704\ miles/day \right)$$

$$= 0.6198$$

<u>*Knox County - Combination Long-haul truck*</u>

$$A_{Rural\ Restricted} = \big((0.2465 \cdot 498{,}500) + (0.0000 \cdot 0)\big) = 122{,}879\ miles/day$$

$$A_{Rural\ Unrestricted}$$
$$= \big((0.0658 \cdot 0) + (0.0352 \cdot 81{,}947) + (0.0193 \cdot 87{,}171)$$
$$+ (0.0157 \cdot 114{,}023) + (0.0157 \cdot 117{,}858)\big) = 8{,}211\ miles/day$$

$$A_{Urban\ Restricted} = \big((0.1536 \cdot 5{,}194{,}493) + (0.0499 \cdot 58{,}604)\big) = 800{,}762\ miles/day$$

$$A_{Urban\ Unrestricted}$$
$$= \big((0.0444 \cdot 2{,}662{,}076) + (0.0309 \cdot 2{,}278{,}761) + (0.0138 \cdot 810{,}233)$$
$$+ (0.0138 \cdot 51{,}429) + (0.0138 \cdot 2{,}815{,}096)\big) = 239{,}194\ miles/day$$

$$B = 122{,}879 + 8{,}211 + 800{,}762 + 239{,}194 = 1{,}171{,}045\ miles/day$$

$$VMT\ Fraction_{Rural\ Restricted} = \left(122{,}879\ miles/day \Big/ 1{,}171{,}045\ miles/day \right) = 0.1049$$

$$VMT\ Fraction_{Rural\ Restricted} = \left(8{,}211\ miles/day \Big/ 1{,}171{,}045\ miles/day \right) = 0.0070$$

$$VMT\ Fraction_{Rural\ Restricted} = \left(800{,}762\ miles/day \Big/ 1{,}171{,}045\ miles/day \right) = 0.6838$$

$$VMT\ Fraction_{Rural\ Restricted} = \left(239{,}194\ miles/day \Big/ 1{,}171{,}045\ miles/day \right) = 0.2043$$

Equation 3: General formula used to calculate local AADVMT for HPMS vehicle types

$$AADVMT = \sum (Vehicle\ Fraction_{Road}\ \cdot\ DVMT_{Road})_{HPMS}$$

<u>Sample Calculations AAVMT Distribution:</u>

<u>Knox County – Passenger Car</u>

$$\begin{aligned} AADVMT = [&(0.7090 \cdot 498{,}500) + (0.8149 \cdot 5{,}194{,}493\ ) + (0.0000 \cdot 0) \\ &+ (0.9232\ \cdot 58{,}604) + (0.8973 \cdot 0) + (0.9283 \cdot 2{,}662{,}076) \\ &+ (0.9356\ \cdot 81{,}947) + (0.9461 \cdot 2{,}278{,}761) + (0.9523 \cdot 87{,}171) \\ &+ (0.9686\ \cdot 810{,}233) + (0.9611\ \cdot 114{,}023) + (0.9686 \cdot 51{,}429) \\ &+ (0.9611\ \cdot 117{,}858\ ) + (0.9686\ \cdot 2{,}815{,}096\ )] \cong 13{,}211{,}704\ miles/day \end{aligned}$$

<u>Knox County – Combination Long-haul Truck</u>

$$\begin{aligned} AADVMT = [&(0.2465 \cdot 498{,}500) + (0.1536 \cdot 5{,}194{,}493\ ) + (0.0000 \cdot 0) \\ &+ (0.0499\ \cdot 58{,}604) + (0.0658 \cdot 0) + (0.0444 \cdot 2{,}662{,}076) \\ &+ (0.0352\ \cdot 81{,}947) + (0.0309 \cdot 2{,}278{,}761) + (0.0193 \cdot 87{,}171) \\ &+ (0.0138\ \cdot 810{,}233) + (0.0157\ \cdot 114{,}023) + (0.0138 \cdot 51{,}429) \\ &+ (0.0157\ \cdot 117{,}858\ ) + (0.0138\ \cdot 2{,}815{,}096\ )] \cong 1{,}171{,}045\ miles/day \end{aligned}$$

Appendix E

Interagency Consultation

Nashville Area
Air Quality Interagency Consultation Group
1:00 pm Central, Thursday, July 12, 2018
Primary Access Number: 720-279-0026
Guest Passcode: 140 699 8445

AGENDA

1. Roll call
2. Purpose of this call - Marc Corrigan
3. Public Chapter 953 - Greg Riggs
4. Required Noninterference Demonstration - EPA
5. Discussion of analysis year(s) - Marc Corrigan, Greg Riggs
6. Discussion of existing MVEBs and SIP considerations - Marc Corrigan, Dianna Myers, All
7. Discussion of planning assumptions and data needs - All
8. Questions, other business - All
9. Next steps - All

Middle Tennessee Summary of Planning Assumptions for the Noninterference Demonstration for the Removal of the Middle Tennessee Inspection and Maintenance (I/M) Program

1. Introduction

Areas designated as moderate nonattainment or higher for carbon monoxide or ozone are required to implement a motor vehicle inspection and maintenance program (I/M; i.e., an emissions inspection program) in accordance with the CAA, Sections 187(a)(4) and 182(b)(4). The requirements for an inspection and maintenance program were established in the Code of Federal Regulation (CFR) under Title 40 CFR Part 51.

Davidson County implemented an I/M program in response to the nonattainment designations from the 1977 Clean Air Act. Davidson County began emissions testing of light duty vehicles in 1985. The passage of the 1990 Clean Air Act Amendments required expansion of the existing vehicle Inspection and Maintenance Program in Davidson County due to the moderate ozone nonattainment classification for the 1-Hour Ozone NAAQS. The EPA published the November 6, 1991, Federal Register, designating Davidson, Rutherford, Sumner, Williamson and Wilson counties as a moderate ozone nonattainment area. A designation of moderate nonattainment required the implementation of an I/M program.

On May 19, 1993, legislation signed by the Governor, becoming Public Chapter 416 of 1993, required county clerks not renew motor vehicle registrations without a passing emissions test in the four county area (Rutherford, Sumner, Williamson and Wilson Counties). The bill established the Tennessee Air Pollution Control Board's authority to implement I/M, allowed for fleet testing, and required counties to pass resolutions requesting that the State implement the program. On December 1, 1994, emissions testing started in the four county Middle Tennessee area.

In August of 2017, it was announced that all counties in Tennessee were meeting the NAAQS for ozone and particulate matter. This was the first time since air quality monitoring started in the 1970s that Tennessee had been designated attainment statewide for both ozone and particulate matter.

In light of the statewide attainment designation, legislation was introduced in January eliminating the I/M program in Hamilton, Rutherford, Sumner, Williamson and Wilson counties. Davidson county was given the option to retain their I/M program. On May 15th, Governor Haslam signed into law Public Chapter 953. Public Chapter 953 essentially directs TDEC to undertake a revision to the State Implementation Plan to eliminate the I/M program.

The Nashville Area has a MVEB for VOCs and NOx approved and corrected on January 23, 2006 (71 FR 3412) as 21.93 and 45.76 tons/day, respectively, established for the 2016 year. If the Nashville area ever becomes nonattainment for ozone these MVEBs

would be the applicable MVEBs. These MVEBs were developed using an earlier version of EPA's onroad emissions factor model, MOBILE6.2. EPA's current onroad emissions factor model estimates emissions at different levels than did MOBILE6.2. One of the objectives of this effort is to evaluate the suitability of the existing MVEBs, and amend as necessary.

> Question: If it is determined that the MVEBs need to be amended, how would that be done? Would a new one need to be set for the same year, different year, other?

This document seeks to provide a detailed listing of the procedures and planning assumptions for the applicable emissions inventory development for a noninterference demonstration and evaluation of the existing MVEB, and if necessary, development of a replacement MVEB.

This summary is submitted to Interagency Consultation (IAC) in accordance with Section 93.105(c)(1)(i) of the Transportation Conformity Rule which requires interagency review of the model(s) and associated methods and assumptions used in the development of MVEBs.

2. Planning Assumptions

Development of the onroad sector of the emissions inventory will be developed per EPA's *Using MOVES to Prepare Emissions Inventories for State Implementation Plans and Transportation Conformity: MOVES2014 Technical Guidance*[1].

General Methods and Assumptions

Geographic area: Middle Tennessee Counties: Davidson, Rutherford, Sumner, Williamson and Wilson

Pollutants: CO, NOx, and VOC

Inventory Sectors: Point, Area, Nonroad and Onroad

Base Year for growth projections (used for point and area source growth): 2014

Analysis Year: 2022

MOVES Model Assumptions

Emission Factor Model: MOVES2014a

[1] *Using MOVES to Prepare Emissions Inventories for State Implementation Plans and Transportation Conformity: MOVES2014 Technical Guidance,* US EPA, EPA-420-B-15-007, January 2015.

MOVES Runspec Development:

- Scale: County level scale – Inventory mode
- Time Span: year, 2022, by hour (will post process to generate annual emissions), all months, weekday and weekend day, all hours
- Geographic bounds: Davidson, Rutherford, Sumner, Williamson and Wilson Counties
- Vehicles/Equipment: Gasoline and diesel fuels, all vehicle combinations (the AVFT file may need to be edited to remove CNG from the transit bus fleet unless there are CNG fueled transit buses)
- Fuels: Adjust RVP for 2022 to regulatory maximum
- Road type: All
- Pollutants and Processes: CO, NOx and VOC and any supporting pollutants
- Output:
    - General:
        - Units: grams, joules, miles
        - Activity: Distance Traveled, Population
    - Output Emissions Detail
        - On road: Road Type, Source Use Type

Table 1 lists the inputs proposed to populate the County Data Manager (CDM) in MOVES.

Table 1. Proposed MOVES Input Data for Middle Tennessee.

	Input Data Requirement:	**Source:**	**Comments:**
1.	Road type distribution: VMT fractions by road type	Data from TDM for 2022, do we need other year(s)?	
2.	Source type population: number of vehicles in the area to be modeled.	sourceType Population: Data developed by TDOT from Dept. of Revenue data for 2014. How do we generate future populations? Use TDM vehicle ownership submodel to grow some source types, and employment growth for commercial vehicles?	
3.	Vehicle type VMT (several different types): 1. VMT by 6 HPMS vehicle types (HPMSvTypeYear) 2. VMT fraction by month by sourcetype 3. VMT fraction by day (weekday vs. weekend) by sourcetype 4. VMT fraction by hour by road type and sourcetype	1. Depending on the year may determine how VMT are generated 2. Month fractions from UT report for 2014 3. Day fractions from UT report for 2014 4. For 2022 will need to come from TDM; earlier year – may have EPA NEI data available	
4.	I/M Programs	Developed by TDEC APC and Metro	
5.	Age distribution: 1 to 30 years for MOVES source types (13 types).	UT data available for 2014. Assume same age distribution for all future years.	

6.	Average speed distribution: fraction of driving time in each speed bin for each sourcetype by roadtype for each hour of the day	Obtained from TDM.	
7.	Fuel supply and formulation information if different from default information.	For historical years, use the MOVES defaults since it is based on sampling data. For future years, develop 'worst case' fuel formulations (maximum RVP) as per EPA guidance	Note: change the year on the FuelSupplyYear tab to applicable year if necessary.
8.	Meteorological data: temperature and humidity for each hour of the day for a typical day in the month.	Average of most recent 3 years of available data	zonemonthhour.xlsx
9.	Ramp fraction: percent VHT on the ramp for controlled access facilities.	Obtain from TDM	

MEETING NOTES
Nashville Area Interagency Consultation (IAC) Group
July 12, 2018

Participants:

Lynorae Benjamin, EPA Region 4
Sean Santalla – FHWA TN
Elizabeth Watkins – FHWA TN
Hary Prawiranata – Nashville MPO
Ian Preston – TDOT
John Finke – Metro Public Health
Eric McCann – Metro Public Health
Blake McClain – Metro Public Health
Marc Corrigan – TDEC APC
Greg Riggs – TDEC APC

Purpose of call:

Marc Corrigan provided an overview of the purpose of today's call which was to discuss proposed planning assumptions for the noninterference demonstration for the removal of the Middle Tennessee I/M Program from the State SIP, and any potential implications to the existing MVEBs.

Public Chapter 953

Greg Riggs provided an overview of Public Chapter 953 which was signed by Governor Haslam on May 15, 2018. The law seeks to eliminate the I/M program in Hamilton, Rutherford, Sumner, Williamson and Wilson counties when the state receives EPA approval to do so. The law allowed Metro Nashville/Davidson County to choose whether to continue its program. The Metro Council voted to keep their testing program and to review it periodically.

Required Noninterference Demonstration

Lynorae Benjamin noted that in order to meet the requirements of the Clean Air Act in removing the I/M program from the state's SIP, the state will need to develop a noninterference demonstration in order to demonstrate that the removal of the program will not interfere with the area's ability to continue to meet all the NAAQS requirements. The demonstration will need to compare the area's emissions with and without the I/M program. This impact needs to be evaluated and considered relative to all of the NAAQS. Lynorae stated that the EPA has recently worked with North Carolina in removing their I/M program from 22 counties in the state and recommended that as an example.

Discussion of analysis years

After internal discussion, and discussion with the Davidson County local air program, an analysis year of 2022 was selected as the most likely first complete calendar year without an I/M program. Thus, 2022 is proposed as the analysis year for the noninterference demonstration. It was agreed by the group that this is the best year for the analysis. Marc discussed the pollutants for which a quantitative versus a qualitative analysis would need to be conducted. Lynorae agreed that looking quantitatively at CO, NOx and VOCs and qualitatively at the other NAAQS would be sufficient.

Discussion of existing MVEBs and SIP considerations

The Nashville Area has MVEBs (or budgets) approved in 2006 for the calendar year 2016 in the Nashville area's second 10-year maintenance plan for the one hour ozone NAAQS. The existing budgets are: 21.93 and 45.76 tons/day for VOCs and NOx, respectively. If the Nashville area ever becomes nonattainment for ozone these MVEBs would be the applicable MVEBs. These MVEBs were developed using an earlier version of EPA's onroad emissions factor model, MOBILE6.2. EPA's current onroad emissions factor model estimates emissions at different levels than did MOBILE6.2. Marc stated that one of the objectives of this effort is to evaluate the suitability of the existing MVEBs, and amend as necessary.

Marc posed the question to the EPA and IAC: if it is determined that the MVEBs need to be amended, how would that be done? Would a new one need to be set for the same year, or would another year address and remove the existing budget? Marc expressed the concern that he wanted to ensure that if the budget needed to be addressed, that the existing budget be removed entirely, and asked EPA how that would be done. He used a theoretical example of setting a new budget for 2022. Then, in theory, if the MPO had to conduct conformity for the year 2020, would the 'old' 2016 MVEB still remain applicable as the relevant budget? Marc wanted to avoid this circumstance, and make certain that what was done fully addressed the existing budget. Marc posed the idea of developing a budget for 2014, if this could fully replace the existing 2016 MVEBs. Marc asked about how any safety margin would be calculated for either the 2014 or 2022 budget, if developed. Lynorae said that Dianna would research these questions and the possibility of using an Early Progress Plan to remove the 2016 budget.

It was decided to wait for Dianna's response on which year, if needed, to develop a new MVEB for the area.

Hary expressed concern about the area meeting the old MVEBs especially in light of the potential increase in emissions from the termination of the I/M program.

John Finke elaborated on the explanation of Metro Council's decision on keeping the I/M Program in Davidson Co. He stated that the council was giving itself some time to

be able to make an informed decision on whether to keep the I/M program. Metro's existing contracts with the testing contractors ends June 30, 2022.

Discussion of planning assumptions and data needs

The MPO and TDEC recently developed planning assumptions for calendar year 2020 in response to legislation passed in 2017 exempting additional model years from the I/M programs in Tennessee. In discussion, it was decided since the MPO did not have a TDM network for 2022, each of the inputs were examined to determine if the already developed input for 2020 would be suitable, and which ones would need to be modified for 2022. Table one below, summarizes the results of the discussion on the determination of data sources for each of the MOVES inputs.

Table 1. **MOVES Input Data Sources for Middle Tennessee**

	Input Data Requirement:	**Source:**
1.	Road type distribution: VMT fractions by road type.	Data from TDM for 2020
2.	Source type population: number of vehicles in the area to be modeled.	Data developed by TDOT from Dept. of Revenue data for 2014 grown using growth factors developed by MPO out to 2022
3.	Vehicle type VMT (several different types): 1. VMT by 5 HPMS vehicle types (HPMSvTypeYear) 2. VMT fraction by hour by road type and sourcetype. 3. VMT fraction by day (weekday vs. weekend) by Sourcetype 4. VMT fraction by hour by road type and sourcetype	1.Use data from TDM interpolated to 2022 2. Month fractions from UT report for 2014 3. Day fractions from UT report for 2014 4. Develop from 2020 TDM
4.	I/M Programs	Developed by TDEC APC and Metro
5.	Age distribution: 1 to 30 years for MOVES source types (13 types)	UT data available for 2014. Assume same age distribution for all future years.
6.	Average speed distribution: fraction of driving time in each speed bin for each sourcetype by roadtype for each hour of the day.	Obtained from TDM for 2020. Convert average speed to distribution using MOVES converter
7.	Fuel supply and formulation information if different from default information.	For historical years, use the MOVES defaults since it is based on sampling data. For future years, develop 'worst case' fuel formulations (maximum RVP) as per EPA guidance
8.	Meteorological data: temperature and humidity for each hour of the	Average of most recent 3 years of available data

	day for a typical day in the month.	
9.	Ramp fraction: percent VHT on the ramp for controlled access facilities.	Obtain from TDM for 2020

Not included in the table, but discussed by the IAC was an 'I/M Fraction' developed by the MPO. This fraction is the fraction of VMT accumulated in each county by vehicles 'subject to I/M' (those actually registered in counties subject to I/M). It was decided that since these are fractions, that 2020 would be suitable.

Next Steps

Hary Prawarinata requested that Marc send him an email to coordinate with the MPO on interpolating the inputs that will need to be adjusted to 2022.

Nashville Area IAC Call Notes

110(l) Noninterference Demonstration

June 19th, 2019: 10:00 AM Eastern, 9:00 AM Central

Attendees:

Greg Riggs, TDEC APC
Mark Reynolds, TDEC APC
Marc Corrigan, TDEC APC
Kwabena Aboagye (KB), TDOT
Melanie Murphy, TDOT
Hary Prawiranata, Nashville MPO
John Finke, Metro Nashville PCD
Eric McCann, Metro Nashville PCD
Jim Baggett, Intern, TDEC APC
Dianna Myers, EPA
Sean Santalla, FHWA-TN

Marc welcomed the attendees to the call and thanked them for their participation. Greg provided an overview of recent legislation that has led to the preparation of the 110L SIP amendment under discussion today.

Public Chapter 953 was enacted by the 110th General Assembly and signed by Governor Haslam on May 15, 2018. The law seeks to eliminate the vehicle emissions testing program (Inspection and Maintenance Program, or IM) in the state. However, IM programs operating in counties that are managed by a local program were given the option of continuing their program. As a result of this option, the Nashville City Council elected to continue their IM program at least until the impact of the program could be assessed.

As a part of the State Implementation Plan (SIP), Tennessee has used vehicle emissions testing as a control measure to improve air quality and help meet the National Ambient Air Quality Standards, or NAAQS, in the counties that have a vehicle emissions testing program. Currently, Middle Tennessee has no nonattainment areas of the NAAQS for the six criteria pollutants. However, Tennessee is required to attain or maintain air quality if the IM program is eliminated.

In order to eliminate the IM program from the SIP, a SIP revision is required. The EPA requires a demonstration that removal of the IM program will not interfere with attaining or maintaining any air quality standard per section 110(l) of the Clean Air Act. As ozone is the primary standard of concern, the 110(l) demonstration compares the emissions and ozone levels with and without the IM program in the projected future year when the program is removed.

The full requirements of the current IM program are found in Chapter 29 of the Tennessee Air Pollution Control Regulations (TAPCR 1200-03-29). Due to the passage of Public Chapter 953, Chapter 29 will need to be revised to conform to the language in Public Chapter 953.

Marc introduced Mark Reynolds with the Air Pollution Control Division to the IAC. Mark was the principal author of the narrative portion of the 110(l) demonstration. Mark provided an overview of the demonstration's narrative.

This document makes the case that removing the IM program does not interfere with maintaining the NAAQS for the six criteria pollutants and any increases in air pollution are very small. Ozone is the primary standard of concern in the demonstration.

In this document, we are proving that removing the IM program does not interfere with maintaining compliance with the National Ambient Air Quality Standards (NAAQS) for the six criteria pollutants:

- ozone (O3)
- fine particulate matter (PM2.5)
- sulfur dioxide (SO2)
- nitrogen dioxide (NO2)
- carbon monoxide (CO)
- lead (Pb)

Our main reason that removing the IM program will not interfere with the NAAQS is that the increase in emissions is very small.

Mark gave a history of the IM program in Middle Tennessee, which began in the eighties for Davidson County, then expanded to the four surrounding counties in the early nineties, then in 2005 as part of an Early Action Compact (EAC) to avoid being designated as nonattainment for ozone, the program was expanded to begin OBD testing.

Emissions inventories are a key part of the noninterference demonstration. We used the 2014 NEI as the base year in developing the emissions inventory and projected out to 2022 which is the first full year projected without the IM program.

Marc gave a summary of the development of the onroad mobile source emissions portion of the draft limited maintenance plan, contained in Appendix C. Marc stated that the MOVES model (2014b) was run with a large amount of locally developed data, which includes vehicle population, vehicle miles traveled (VMT), speeds, meteorology, day, month and hour fractions, and distribution of the VMT on different road types (road type distribution). Marc noted that all vehicle types were included and CO, NOx and VOCs were the pollutants considered. Emissions were projected in 2022. Local meteorological data was obtained from NOAA at the Nashville airport for 2015-2017. Marc discussed the source type population categories including the passenger car, passenger truck, and light commercial trucks categories. Marc pointed out that Figure 1 in the appendix used a linear line to estimate light duty vehicle population in 2022 based on historical vehicle emissions testing numbers.

The source type population projections for the remaining source types were derived from the Nashville Area TPO's Travel Demand Model (TMD); that data is summarized in Table 4. VMT and average speed distribution also came from the TDM. The vehicle age distribution came from annual registration data

prepared by UT for TDOT. Marc went over the IM related inputs into the MOVES model which uses a compliance factor input to account for IM program compliance rates, waiver rates, and adjustments needed to account for the fraction of vehicles within a source type that are covered by the IM program. Marc concluded by summarizing Tables 12, 13, and 14 in the appendix and pointing out the model predicted an increase in NOx emissions of 478 tons/year due to removal of the I/M program.

Mark briefly discussed what is included in the nonroad mobile, point and nonpoint sectors and how each sector contributes to the total emissions, pointing out the tables in the narrative that summarized these emissions.

Mark reiterated that the onroad sector is the only sector affected by the IM program. Without the IM program, the onroad sector emissions would increase as follows: 12.5% in CO emissions, 2.2% in NOx emissions and a 6.9% in VOC emissions in 2022. Without the IM program, the emissions increase from all sectors combined would be: 6.9% increase in CO emissions, 1.1% increase in NOx emissions and a 1.5% increase in VOC emissions.

The sensitivity of ozone to NOx and VOC emissions was discussed. TDEC APC used a previously completed photochemical modeling sensitivity analysis to help quantify the potential impact of the removal of the IM program on ozone. The analysis indicated that removal of the IM program would only increase the ozone design value by about 0.26 ppb.

Mark mentioned additional measures that may help the area continue demonstrating maintenance of the NAAQS, including the TVA and VW court settlements. Mark illustrated that these settlements may lead to additional reductions in ozone forming pollutants, especially large NOx decreases in the power sector, and additional future decreases anticipated in the onroad sector. This provides further weight of evidence that the removal of the IM program will have insignificant impact on ozone concentrations in Middle Tennessee.

Current air quality data was briefly discussed. Mark pointed out that Table 17 and Figure 1 illustrate that ozone air quality data for the Chattanooga area has for a number of years remained consistently below all ozone NAAQS.

Mark concluded that the 110L demonstration illustrated that removing the IM program in Middle Tennessee will not interfere with continued attainment or maintenance of the NAAQS for the six criteria pollutants.

Hary asked how the impact of open burning is estimated. Mark responded by mentioning that there are records of prescribed burn permits as well as other records used to estimate the impact.

Comments and Responses

Comments received during the June 19, 2019 IAC Call:

Commenter	Comment	Response
Hary Prawiranata, Nashville MPO	Hary asked how the impact of open burning is estimated.	Mark responded by mentioning that there are records of prescribed burn permits as well as other records used to estimate the impact.

Comments received on June 28, 2019

EPA	Key Comment #1. See attached document	TDEC-APC is now requesting that the removal of the entire Chapter 29 of the TAPCR and Regulation 8 of Nashville Code from the Tennessee SIP.
EPA	Key Comment #2. See attached document	After further evaluation, EPA determined that the I/M program did not need to be moved into the contingency portion of the SIP.
EPA	General Comment #1. See attached document	The following sentence was added to Section 2.0: "All of the NAAQS will be evaluated in this demonstration; however, ozone will be the primary focus since the I/M program was a control strategy used to attain the ozone NAAQS."
EPA	General Comment #2. See attached document	The following sentence was added to Section 7.2: "If the increase in ozone (0.26 ppb) from the sensitivity analysis was added to the current ozone design value (67 ppb) then the result (67.26 ppb) would be less than the current NAAQS of 70 ppb."
EPA	General Comment #3. See attached document	The word "unmeasurable" was deleted.
EPA	General Comment #4. See attached document	Monitoring data for NO_2 and CO was added in Section 6.3 and 6.4, respectively.
EPA	General Comment #5. See attached document	This comment relates to the Hamilton County draft only so no changes are needed for the Middle Tennessee draft.

Appendix F

Nonroad Mobile Source Emissions Inventory

for Nine Categories

Nonroad Mobile Source Inventory-9 Major Categories

Emissions in tons per year

Davidson County (2014)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	10.9	12.2	1.3
Commercial Equipment	7,220	310	295
Construction and Mining Equipment	1,438	1,227	187
Industrial Equipment	865	262	39
Lawn and Garden Equipment	17,783	293	1,140
Logging Equipment	1.6	0.2	0.2
Pleasure Craft	932	84	265
Railroad Equipment	5.9	3.1	0.6
Recreational Equipment	2,494	31	767
Total Emissions	30,750	2,223	2,696

Davidson County (2022)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	3.3	3.6	0.4
Commercial Equipment	6,096	177	216
Construction and Mining Equipment	1,001	607	106
Industrial Equipment	689	159	23
Lawn and Garden Equipment	17,396	214	1,024
Logging Equipment	0.9	0.0	0.1
Pleasure Craft	827	73	137
Railroad Equipment	5.7	1.8	0.4
Recreational Equipment	1,212	14	205
Total Emissions	27,231	1,251	1,713

Rutherford County (2014)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	60.8	68.1	7.3
Commercial Equipment	1,351	58	55
Construction and Mining Equipment	1,022	872	133
Industrial Equipment	528	144	23
Lawn and Garden Equipment	3,499	54	227
Logging Equipment	2.0	0.2	0.3
Pleasure Craft	195	18	56
Railroad Equipment	2.6	1.4	0.3
Recreational Equipment	1,042	13	328
Total Emissions	7,703	1,230	830

Rutherford County (2022)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	18.3	20.2	2.0
Commercial Equipment	1,141	33	40
Construction and Mining Equipment	712	432	76
Industrial Equipment	420	88	14
Lawn and Garden Equipment	3,423	40	204
Logging Equipment	1.2	0.1	0.2
Pleasure Craft	173	15	29
Railroad Equipment	2.5	0.8	0.2
Recreational Equipment	507	6	88
Total Emissions	6,398	635	453

Sumner County (2014)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	69.7	78.2	8.4
Commercial Equipment	818	35	33
Construction and Mining Equipment	350	299	46
Industrial Equipment	287	82	13
Lawn and Garden Equipment	1,944	29	127
Logging Equipment	4.7	0.6	0.6
Pleasure Craft	541	49	153
Railroad Equipment	1.1	0.6	0.1
Recreational Equipment	89.4	0.8	2.0
Total Emissions	4,105	574	382

Sumner County (2022)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	21.0	23.2	2.3
Commercial Equipment	691	20	24
Construction and Mining Equipment	244	148	26
Industrial Equipment	229	50	8
Lawn and Garden Equipment	1,901	21	114
Logging Equipment	2.8	0.1	0.3
Pleasure Craft	480	43	79
Railroad Equipment	1.1	0.3	0.1
Recreational Equipment	43.5	0.4	0.5
Total Emissions	3,613	305	254

Williamson County (2014)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	62.7	70.3	7.6
Commercial Equipment	1,702	73	69
Construction and Mining Equipment	699	597	91
Industrial Equipment	136	46	6
Lawn and Garden Equipment	3,282	54	211
Logging Equipment	4.8	0.6	0.6
Pleasure Craft	30.0	2.7	8.5
Railroad Equipment	2.6	1.4	0.3
Recreational Equipment	496	6	112
Total Emissions	6,416	851	507

Williamson County (2022)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	18.9	20.9	2.1
Commercial Equipment	1,437	42	51
Construction and Mining Equipment	487	295	52
Industrial Equipment	108	28	4
Lawn and Garden Equipment	3,211	40	189
Logging Equipment	2.9	0.1	0.4
Pleasure Craft	26.7	2.4	4.4
Railroad Equipment	2.5	0.8	0.2
Recreational Equipment	241	3	30
Total Emissions	5,536	432	333

Wilson County (2014)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	59.8	67.0	7.2
Commercial Equipment	699	30	29
Construction and Mining Equipment	293	250	38
Industrial Equipment	234	65	10
Lawn and Garden Equipment	1,372	21	90
Logging Equipment	3.5	0.4	0.4
Pleasure Craft	496	45	141
Railroad Equipment	0.0	0.0	0.0
Recreational Equipment	1,723	22	547
Total Emissions	4,880	499	862

Wilson County (2022)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	18.0	19.9	2.0
Commercial Equipment	591	17	21
Construction and Mining Equipment	204	124	22
Industrial Equipment	186	39	6
Lawn and Garden Equipment	1,343	15	81
Logging Equipment	2.1	0.1	0.3
Pleasure Craft	440	39	73
Railroad Equipment	0.0	0.0	0.0
Recreational Equipment	837	10	146
Total Emissions	3,621	264	351

Total for all five counties (2014)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	264	296	32
Commercial Equipment	11,791	507	481
Construction and Mining Equipment	3,802	3,244	494
Industrial Equipment	2,050	599	92
Lawn and Garden Equipment	27,880	451	1,795
Logging Equipment	16.7	1.9	2.1
Pleasure Craft	2,194	198	624
Railroad Equipment	12.3	6.4	1.3
Recreational Equipment	5,845	72	1,756
Total Emissions	53,854	5,376	5,278

Total for all five counties (2022)

9 Major Categories	CO	NOx	VOC
Agricultural Equipment	79	88	9
Commercial Equipment	9,956	290	353
Construction and Mining Equipment	2,648	1,606	281
Industrial Equipment	1,632	364	55
Lawn and Garden Equipment	27,274	330	1,612
Logging Equipment	9.9	0.5	1.2
Pleasure Craft	1,947	173	323
Railroad Equipment	11.7	3.7	0.8
Recreational Equipment	2,840	33	469
Total Emissions	46,398	2,887	3,104

Appendix G

Nonroad Mobile Source Emissions Inventory

for Marine, Aircraft, and Rail

Marine, Airport, and Rail Emissions (in ton per year)

Carbon Monoxide (CO), Nitrogen Oxides (NOx), and Volatile Organic Compounds (VOC)

RAIL

			2014			2022		
County	**SCC**	**Description**	**CO**	**NOX**	**VOC**	**CO**	**NOX**	**VOC**
Davidson	2285002006	Line Haul Locomotives: Class I Operations[A]	98.80	584.87	31.54	84.26	498.80	26.90
Davidson	2285002010	Yard Locomotives	25.76	217.60	13.65	21.97	185.58	11.64
Rutherford	2285002010	Yard Locomotives	3.95	31.69	2.27	2.79	22.38	1.60
Rutherford	2285002006	Line Haul Locomotives: Class I Operations	62.19	444.43	21.50	43.91	313.84	15.18
Sumner	2285002006	Line Haul Locomotives: Class I Operations	36.94	263.99	12.77	26.08	186.42	9.02
Williamson	2285002006	Line Haul Locomotives: Class I Operations	67.92	485.42	23.48	47.96	342.78	16.58
Wilson	2285002007	Line Haul Locomotives: Class II / III Operations	2.67	27.09	1.05	1.99	20.26	0.79
Total Emissions			**298.2**	**2,055.1**	**106.3**	**229.0**	**1,570.1**	**81.7**

[A] CSX, which is a Class I railroad, owns the tracks through Davidson County. The emissions are calculated based on their reported ton-miles of freight transported. There is no data for how much of the freight is by Class II/III railroads, which are smaller railways.

MARINE

			2014			2022		
County	**SCC**	**Description**	**CO**	**NOX**	**VOC**	**CO**	**NOX**	**VOC**
Davidson	2280002100	Marine Vessels, Commercial	20.20	56.70	10.10	22.36	62.76	11.18
Sumner	2280002100	Marine Vessels, Commercial	0.16	0.85	0.01	0.20	1.01	0.01
Sumner	2280002200	Marine Vessels, Commercial	3.82	19.77	0.22	4.55	23.52	0.27
Wilson	2280002200	Marine Vessels, Commercial	5.81	30.06	0.34	6.92	35.76	0.41
Total Emissions			**30.0**	**107.4**	**10.7**	**34.0**	**123.1**	**11.9**

AIRPORT

			2014			2022		
County	**SCC**	**Description**	**CO**	**NOX**	**VOC**	**CO**	**NOX**	**VOC**
Davidson	2265008005	Airport Ground Support Equipment (Gasoline 4-stroke)[B]	268.00	36.80	10.10	346.87	47.63	13.07
Davidson	2275050011	General Aviation[C]	1,647.00	687.70	173.00	1,684.28	703.27	176.92
Davidson	2275070000	Aircraft Auxiliary Power Units	2.80	17.10	27.00	2.86	17.49	27.61
Rutherford	2265008005	Airport Ground Support Equipment	0.06	0.01	0.00	0.10	0.02	0.00
Rutherford	2270008005	Airport Ground Support Equipment	0.30	0.05	0.01	0.48	0.08	0.02
Rutherford	2275001000	Military Aircraft	58.45	50.28	24.46	63.64	54.75	26.64
Rutherford	2275020000	Commercial Aircraft	1.37	0.83	0.41	3.20	1.95	0.95
Rutherford	2275050011	General Aviation	196.81	1.06	2.46	199.57	1.08	2.50
Rutherford	2275060011	Air Taxi - Piston	10.14	0.06	0.06	11.01	0.06	0.07
Rutherford	2275060012	Air Taxi - Turbine	5.26	0.99	1.31	5.71	1.08	1.43
Rutherford	2275070000	Aircraft Auxiliary Power Units	0.05	0.02	0.00	0.05	0.02	0.00
Sumner	2265008005	Airport Ground Support Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Sumner	2270008005	Airport Ground Support Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Sumner	2275001000	Military Aircraft	2.92	2.51	1.22	3.18	2.74	1.33
Sumner	2275050011	General Aviation	95.63	0.52	1.20	96.97	0.52	1.21
Sumner	2275060011	Air Taxi - Piston	2.30	0.01	0.01	2.50	0.01	0.02
Sumner	2275060012	Air Taxi - Turbine	1.06	0.23	0.30	1.15	0.25	0.32
Wilson	2275001000	Military Aircraft	2.37	2.04	0.99	2.58	2.22	1.08
Wilson	2275050011	General Aviation	17.64	0.10	0.22	17.88	0.10	0.22
Wilson	2275060011	Air Taxi - Piston	1.43	0.01	0.01	1.55	0.01	0.01
Wilson	2275060012	Air Taxi - Turbine	0.66	0.14	0.18	0.72	0.15	0.20
Total Emissions			**2,314.2**	**800.5**	**243.0**	**2,444.3**	**833.4**	**253.6**

[B] Emissions provided by Metropolitan Nashville Airport Authority do not differentiate between gasoline and diesel-powered ground support equipment

[C] Emissions provided by Metropolitan Nashville Airport Authority put all aircraft emissions (LTO cycle) in one "lump" category

Appendix H

Point Source Emissions Inventory

for Davidson County

Point Source Emissions (in tons per year) for Davidson County Facilities

Actual Emissions in 2017 and Projected Emission in 2022

					Year 2017			Year 2022		
Facility Site Identifier	Facility Site Name	Unit Identifier	Emissions Process Identifier	SCC	NOx (tons)	CO (tons)	VOC (tons)	NOx (tons)	CO (tons)	VOC (tons)
4703700005	Innophos Inc.	003	1	30299998	0.330	0.278	0.018	0.400	0.337	0.022
4703700005	Innophos Inc.	004	1	30299998	0.336	0.280	0.019	0.407	0.339	0.022
4703700005	Innophos Inc.	005	1	30299998	0.323	0.271	0.018	0.391	0.328	0.022
4703700005	Innophos Inc.	006	1	30299998	1.220	1.021	0.067	1.478	1.237	0.081
4703700005	Innophos Inc.	007	1	30299998	2.479	2.082	0.150	3.003	2.522	0.182
4703700005	Innophos Inc.	010	1	10200602	3.338	2.804	0.183	3.965	3.330	0.217
4703700005	Innophos Inc.	011	1	30299998	0.233	0.000	0.000	0.282	0.000	0.000
4703700009	Vulcan Construction Materials, LP	001	2	30500251	3.460	17.280	4.250	3.910	19.527	4.803
4703700009	Vulcan Construction Materials, LP	003	1	30500290	0.000	0.340	2.170	0.000	0.384	2.452
4703700009	Vulcan Construction Materials, LP	004	6	20200102	2.460	0.530	0.200	2.870	0.618	0.233
4703700013	Greer Stop Nut, Inc.	001	2	30988801	0.000	0.000	2.710	0.000	0.000	3.464
4703700014	Gibson Guitar Custom Shop	001	1	40200401	0.000	0.000	18.460	0.000	0.000	25.724
4703700014	Gibson Guitar Custom Shop	001	2	40299998	0.000	0.000	0.004	0.000	0.000	0.006
4703700019	Vulcan Construction Materials, LP	004	1	30504099	3.522	0.759	0.286	4.495	0.969	0.365
4703700022	Dicaperl Minerals Corp.	001	1	30501801	1.530	1.285	0.084	1.953	1.640	0.107
4703700022	Dicaperl Minerals Corp.	001	2	30501801	0.745	0.620	0.039	0.951	0.791	0.050
4703700022	Dicaperl Minerals Corp.	001	3	30501801	0.785	0.665	0.045	1.002	0.849	0.057
4703700023	TruColor Litho, Inc	001	1	40500403	0.000	0.000	0.044	0.000	0.000	0.049
4703700023	TruColor Litho, Inc	001	2	40500403	0.000	0.000	1.010	0.000	0.000	1.133
4703700023	TruColor Litho, Inc	001	3	40500403	0.000	0.000	0.142	0.000	0.000	0.159
4703700023	TruColor Litho, Inc	001	4	40500403	0.000	0.000	0.220	0.000	0.000	0.246
4703700024	Douglas Printing Inc	001	1	40500403	0.000	0.000	2.110	0.000	0.000	2.368
4703700024	Douglas Printing Inc	001	2	40500403	0.000	0.000	0.120	0.000	0.000	0.135
4703700025	Ryman Hospitality Properties, Inc.	001	1	20100107	7.170	2.870	0.730	3.879	1.553	0.395
4703700025	Ryman Hospitality Properties, Inc.	002	1	10300602	1.700	1.290	0.060	2.135	1.620	0.075
4703700025	Ryman Hospitality Properties, Inc.	003	1	10300603	10.200	8.570	1.120	12.811	10.763	1.407
4703700025	Ryman Hospitality Properties, Inc.	003	2	10300501	0.930	0.230	0.030	1.162	0.287	0.037
4703700025	Ryman Hospitality Properties, Inc.	004	1	10300602	18.580	32.780	4.040	23.335	41.170	5.074
4703700025	Ryman Hospitality Properties, Inc.	004	2	10300602	0.970	0.970	0.030	1.218	1.218	0.038
4703700025	Ryman Hospitality Properties, Inc.	004	3	10300602	0.470	0.580	0.020	0.590	0.728	0.025
4703700025	Ryman Hospitality Properties, Inc.	004	4	10300503	0.030	0.020	0.000	0.037	0.025	0.000
4703700025	Ryman Hospitality Properties, Inc.	006	1	40200101	0.000	0.000	0.380	0.000	0.000	0.462
4703700025	Ryman Hospitality Properties, Inc.	006	2	40200901	0.000	0.000	0.040	0.000	0.000	0.056
4703700025	Ryman Hospitality Properties, Inc.	007	1	20100102	0.460	0.100	0.030	0.249	0.054	0.016
4703700025	Ryman Hospitality Properties, Inc.	010	1	10500206	21.900	18.400	2.410	27.505	23.109	3.027
4703700029	Purina Animal Nutrition, LLC	008	1	10200602	1.568	1.317	0.086	1.862	1.564	0.102
4703700032	Safety-Kleen Systems	001	1	49000206	0.000	0.000	0.200	0.000	0.000	0.230
4703700032	Safety-Kleen Systems	002	1	40188898	0.000	0.000	0.001	0.000	0.000	0.001
4703700032	Safety-Kleen Systems	003	1	49099998	0.000	0.000	0.003	0.000	0.000	0.003

4703700032	Safety-Kleen Systems	005	1	49099998	0.000	0.000	0.003	0.000	0.000	0.003
4703700033	Quikrete - Nashville	001	1	30590003	1.080	0.910	0.060	1.187	1.000	0.066
4703700037	Best One Tire & Service	002	1	30899999	0.000	0.000	0.165	0.000	0.000	0.226
4703700037	Best One Tire & Service	003	2	40200101	0.000	0.000	1.193	0.000	0.000	1.449
4703700037	Best One Tire & Service	003	3	40200101	0.000	0.000	0.660	0.000	0.000	0.802
4703700039	Vanderbilt University	004	1	10300603	4.732	3.975	0.260	5.943	4.992	0.327
4703700039	Vanderbilt University	005	1	20200107	3.270	0.720	0.220	3.815	0.840	0.257
4703700039	Vanderbilt University	005	2	20300207	0.350	0.040	0.140	0.440	0.050	0.176
4703700039	Vanderbilt University	008	1	20300202	17.630	19.160	2.480	22.142	24.064	3.115
4703700039	Vanderbilt University	008	2	20300202	20.040	20.420	2.940	25.169	25.646	3.692
4703700039	Vanderbilt University	008	3	20300202	32.930	33.610	4.470	41.358	42.212	5.614
4703700039	Vanderbilt University	009	1	10300602	11.770	12.170	1.490	14.782	15.285	1.871
4703700039	Vanderbilt University	009	2	10300502	0.030	0.020	0.000	0.037	0.025	0.000
4703700040	Carlex Glass America, LLC	001	1	30501403	746.200	6.740	6.240	952.330	8.602	7.964
4703700040	Carlex Glass America, LLC	009	1	10200602	3.140	2.640	0.170	3.729	3.136	0.202
4703700040	Carlex Glass America, LLC	009	2	10200602	0.780	0.660	0.040	0.926	0.784	0.048
4703700040	Carlex Glass America, LLC	009	3	10200602	1.190	1.000	0.070	1.413	1.188	0.083
4703700040	Carlex Glass America, LLC	009	4	10200602	0.890	0.750	0.050	1.057	0.891	0.059
4703700040	Carlex Glass America, LLC	009	5	10200602	1.380	1.160	0.080	1.639	1.378	0.095
4703700040	Carlex Glass America, LLC	009	6	10200602	2.040	1.710	0.110	2.423	2.031	0.131
4703700040	Carlex Glass America, LLC	009	7	10200602	1.530	1.290	0.080	1.817	1.532	0.095
4703700040	Carlex Glass America, LLC	009	8	10200602	0.780	0.660	0.040	0.926	0.784	0.048
4703700040	Carlex Glass America, LLC	009	9	10200602	0.120	0.100	0.006	0.143	0.119	0.007
4703700040	Carlex Glass America, LLC	010	1	40200101	0.000	0.000	10.230	0.000	0.000	12.429
4703700040	Carlex Glass America, LLC	012	1	30501407	3.060	0.640	0.170	3.905	0.817	0.217
4703700040	Carlex Glass America, LLC	013	1	10500106	1.720	0.360	0.090	2.043	0.428	0.107
4703700040	Carlex Glass America, LLC	014	1	40188898	0.000	0.000	7.620	0.000	0.000	9.272
4703700040	Carlex Glass America, LLC	015	1	20100102	0.237	0.054	0.007	0.128	0.029	0.004
4703700040	Carlex Glass America, LLC	015	2	20100102	0.101	0.023	0.003	0.055	0.012	0.002
4703700040	Carlex Glass America, LLC	015	4	20100102	0.048	0.011	0.001	0.026	0.006	0.001
4703700040	Carlex Glass America, LLC	015	5	20100102	0.097	0.022	0.003	0.052	0.012	0.002
4703700040	Carlex Glass America, LLC	015	6	20100102	0.060	0.014	0.002	0.032	0.008	0.001
4703700040	Carlex Glass America, LLC	015	7	20100102	0.139	0.032	0.004	0.075	0.017	0.002
4703700040	Carlex Glass America, LLC	016	1	30501407	0.000	0.000	9.440	0.000	0.000	12.048
4703700040	Carlex Glass America, LLC	017	1	30501407	0.000	0.000	0.170	0.000	0.000	0.217
4703700042	Triumph Aerostructures, LLC	001	1	10200602	0.086	0.072	0.005	0.102	0.086	0.006
4703700042	Triumph Aerostructures, LLC	001	3	10200602	3.158	2.653	0.174	3.751	3.151	0.207
4703700042	Triumph Aerostructures, LLC	002	1	10200603	0.948	0.796	0.052	1.126	0.945	0.062
4703700042	Triumph Aerostructures, LLC	003	1	10500106	4.688	3.938	0.258	5.568	4.677	0.306
4703700042	Triumph Aerostructures, LLC	006	1	20300101	0.172	0.040	0.010	0.215	0.050	0.012
4703700042	Triumph Aerostructures, LLC	007	1	40202499	0.000	0.000	2.729	0.000	0.000	3.353
4703700042	Triumph Aerostructures, LLC	012	1	40202405	0.000	0.000	7.940	0.000	0.000	9.756
4703700042	Triumph Aerostructures, LLC	014	1	40202401	0.000	0.000	2.337	0.000	0.000	2.872
4703700044	Saint Thomas Midtown Hospital	001	1	10300602	7.290	6.010	0.390	9.156	7.548	0.490
4703700044	Saint Thomas Midtown Hospital	001	2	10300502	0.010	0.000	0.000	0.012	0.000	0.000
4703700044	Saint Thomas Midtown Hospital	002	1	10300603	2.690	0.710	0.060	3.378	0.892	0.075
4703700049	Metro Water Services - Central WWTP	008	1	20200102	0.035	0.012	0.000	0.041	0.014	0.000

4703700049	Metro Water Services - Central WWTP	014	1	50100769	0.000	0.000	2.020	0.000	0.000	2.512
4703700049	Metro Water Services - Central WWTP	021	1	50100715	0.000	0.000	0.043	0.000	0.000	0.053
4703700049	Metro Water Services - Central WWTP	022	1	50100715	0.000	0.000	0.011	0.000	0.000	0.013
4703700049	Metro Water Services - Central WWTP	023	1	10300602	1.320	1.110	0.072	1.658	1.394	0.090
4703700049	Metro Water Services - Central WWTP	024	1	50100793	5.640	4.740	0.310	7.013	5.894	0.385
4703700049	Metro Water Services - Central WWTP	025	1	50100793	6.450	5.410	0.354	8.021	6.727	0.440
4703700049	Metro Water Services - Central WWTP	026	1	50100789	0.000	0.000	0.000	0.000	0.000	0.000
4703700050	Nashville District Energy System	010	1	10100602	6.320	22.220	1.450	15.858	55.752	3.638
4703700050	Nashville District Energy System	010	2	10101002	0.005	0.006	0.001	0.009	0.011	0.002
4703700058	The Tennessean	001	1	10300602	0.750	0.630	0.040	0.942	0.791	0.050
4703700058	The Tennessean	002	2	40500403	0.000	0.000	1.660	0.000	0.000	1.863
4703700058	The Tennessean	003	1	20300101	0.010	0.000	0.000	0.012	0.000	0.000
4703700060	Delek Logistics Operating, LLC	001	1	40400109	0.000	0.000	0.060	0.000	0.000	0.073
4703700060	Delek Logistics Operating, LLC	002	1	40400109	0.000	0.000	0.130	0.000	0.000	0.158
4703700060	Delek Logistics Operating, LLC	003	1	40400109	0.000	0.000	0.150	0.000	0.000	0.183
4703700060	Delek Logistics Operating, LLC	004	1	40400140	0.000	0.000	0.867	0.000	0.000	1.056
4703700060	Delek Logistics Operating, LLC	005	1	40400140	0.000	0.000	1.100	0.000	0.000	1.339
4703700060	Delek Logistics Operating, LLC	006	1	40400140	0.000	0.000	0.040	0.000	0.000	0.049
4703700060	Delek Logistics Operating, LLC	007	1	40400160	0.000	0.000	4.720	0.000	0.000	5.747
4703700060	Delek Logistics Operating, LLC	008	1	40600141	0.000	0.000	12.650	0.000	0.000	12.528
4703700060	Delek Logistics Operating, LLC	008	2	40400153	0.000	0.000	0.310	0.000	0.000	0.377
4703700060	Delek Logistics Operating, LLC	008	3	40400154	0.000	0.000	4.700	0.000	0.000	5.723
4703700060	Delek Logistics Operating, LLC	009	1	40400109	0.000	0.000	0.010	0.000	0.000	0.012
4703700061	Citgo Petroleum Corp.	001	1	40400140	0.000	0.000	2.989	0.000	0.000	3.639
4703700061	Citgo Petroleum Corp.	002	1	40400140	0.000	0.000	2.470	0.000	0.000	3.008
4703700061	Citgo Petroleum Corp.	003	1	40400160	0.000	0.000	2.625	0.000	0.000	3.196
4703700061	Citgo Petroleum Corp.	004	1	40400109	0.000	0.000	0.424	0.000	0.000	0.516
4703700061	Citgo Petroleum Corp.	005	1	40400109	0.000	0.000	0.022	0.000	0.000	0.027
4703700061	Citgo Petroleum Corp.	006	1	40400250	2.192	5.480	13.275	2.669	6.673	16.164
4703700061	Citgo Petroleum Corp.	006	2	40400153	0.000	0.000	0.080	0.000	0.000	0.097
4703700061	Citgo Petroleum Corp.	006	3	40400154	0.000	0.000	5.364	0.000	0.000	6.531
4703700061	Citgo Petroleum Corp.	008	1	40400109	0.000	0.000	0.020	0.000	0.000	0.024
4703700061	Citgo Petroleum Corp.	009	1	40400151	0.000	0.000	0.370	0.000	0.000	0.451
4703700061	Citgo Petroleum Corp.	010	1	40400151	0.000	0.000	1.126	0.000	0.000	1.371
4703700061	Citgo Petroleum Corp.	011	1	40400109	0.000	0.000	2.409	0.000	0.000	2.933
4703700062	Cumberland Terminals, Inc.	001	1	40400109	0.000	0.000	0.266	0.000	0.000	0.324
4703700062	Cumberland Terminals, Inc.	002	1	40400160	0.000	0.000	0.030	0.000	0.000	0.037
4703700062	Cumberland Terminals, Inc.	003	1	40400140	0.000	0.000	7.990	0.000	0.000	9.729
4703700062	Cumberland Terminals, Inc.	004	1	40400140	0.000	0.000	7.550	0.000	0.000	9.193
4703700062	Cumberland Terminals, Inc.	005	1	40400160	0.000	0.000	1.530	0.000	0.000	1.863
4703700062	Cumberland Terminals, Inc.	006	1	40400153	2.300	5.740	6.800	2.801	6.989	8.280
4703700062	Cumberland Terminals, Inc.	006	2	40400151	0.000	0.000	6.800	0.000	0.000	8.280
4703700062	Cumberland Terminals, Inc.	006	3	40400154	0.000	0.000	7.460	0.000	0.000	9.083
4703700062	Cumberland Terminals, Inc.	009	1	42500301	0.000	0.000	2.890	0.000	0.000	3.323
4703700064	Blanchard Terminal Company, LLC	001	1	40400109	0.000	0.000	0.780	0.000	0.000	0.950
4703700064	Blanchard Terminal Company, LLC	006	1	40400109	0.000	0.000	8.090	0.000	0.000	9.850
4703700064	Blanchard Terminal Company, LLC	010	1	40400153	0.000	0.000	3.810	0.000	0.000	4.639

4703700064	Blanchard Terminal Company, LLC	010	2	40400151	0.000	0.000	0.550	0.000	0.000	0.670
4703700064	Blanchard Terminal Company, LLC	010	3	40400154	0.000	0.000	15.130	0.000	0.000	18.422
4703700064	Blanchard Terminal Company, LLC	010	5	40400150	0.000	0.000	0.003	0.000	0.000	0.004
4703700064	Blanchard Terminal Company, LLC	010	6	40400150	0.000	0.000	0.080	0.000	0.000	0.097
4703700064	Blanchard Terminal Company, LLC	011	1	40400109	0.000	0.000	0.360	0.000	0.000	0.438
4703700064	Blanchard Terminal Company, LLC	013	1	40400199	0.000	0.000	0.410	0.000	0.000	0.499
4703700065	Shell Oil Products US	001	1	40400205	0.000	0.000	13.100	0.000	0.000	12.974
4703700065	Shell Oil Products US	002	1	40400205	0.000	0.000	1.730	0.000	0.000	1.713
4703700065	Shell Oil Products US	003	1	40400205	0.000	0.000	1.100	0.000	0.000	1.089
4703700065	Shell Oil Products US	008	1	40400250	0.230	0.570	6.710	0.280	0.694	8.170
4703700065	Shell Oil Products US	008	2	40400153	0.000	0.000	1.040	0.000	0.000	1.266
4703700065	Shell Oil Products US	008	3	40400154	0.000	0.000	14.030	0.000	0.000	17.083
4703700065	Shell Oil Products US	008	4	40400251	0.000	0.000	0.070	0.000	0.000	0.085
4703700065	Shell Oil Products US	009	1	40400109	0.000	0.000	0.004	0.000	0.000	0.005
4703700065	Shell Oil Products US	010	1	40400199	0.000	0.000	2.530	0.000	0.000	3.081
4703700065	Shell Oil Products US	011	1	40400122	0.000	0.000	0.770	0.000	0.000	0.938
4703700066	Magellan Terminals Holdings, LP	001	1	40400160	0.000	0.000	1.305	0.000	0.000	1.589
4703700066	Magellan Terminals Holdings, LP	002	1	40400160	0.000	0.000	0.380	0.000	0.000	0.463
4703700066	Magellan Terminals Holdings, LP	003	1	40400140	0.000	0.000	0.028	0.000	0.000	0.034
4703700066	Magellan Terminals Holdings, LP	004	1	40400160	0.000	0.000	2.670	0.000	0.000	3.251
4703700066	Magellan Terminals Holdings, LP	005	1	40400160	0.000	0.000	3.144	0.000	0.000	3.828
4703700066	Magellan Terminals Holdings, LP	006	1	40400109	0.000	0.000	3.854	0.000	0.000	4.693
4703700066	Magellan Terminals Holdings, LP	007	1	40400109	0.000	0.000	0.259	0.000	0.000	0.315
4703700066	Magellan Terminals Holdings, LP	010	1	40600145	4.460	11.150	16.920	5.431	13.576	20.602
4703700066	Magellan Terminals Holdings, LP	010	2	40400153	0.000	0.000	0.372	0.000	0.000	0.453
4703700066	Magellan Terminals Holdings, LP	010	3	40400154	0.000	0.000	0.695	0.000	0.000	0.846
4703700066	Magellan Terminals Holdings, LP	011	1	40400109	0.000	0.000	0.540	0.000	0.000	0.658
4703700066	Magellan Terminals Holdings, LP	012	1	40400109	0.000	0.000	0.537	0.000	0.000	0.654
4703700067	ExxonMobil Pipeline Corporation	004	1	40400160	0.000	0.000	10.186	0.000	0.000	12.403
4703700067	ExxonMobil Pipeline Corporation	007	1	40400109	0.000	0.000	0.271	0.000	0.000	0.330
4703700067	ExxonMobil Pipeline Corporation	024	1	40400150	0.000	0.000	28.213	0.000	0.000	34.352
4703700067	ExxonMobil Pipeline Corporation	024	3	40400154	0.000	0.000	10.479	0.000	0.000	12.759
4703700067	ExxonMobil Pipeline Corporation	025	1	40400109	0.000	0.000	0.037	0.000	0.000	0.045
4703700067	ExxonMobil Pipeline Corporation	027	1	40400163	0.000	0.000	0.044	0.000	0.000	0.054
4703700067	ExxonMobil Pipeline Corporation	028	1	40400151	0.000	0.000	1.295	0.000	0.000	1.577
4703700067	ExxonMobil Pipeline Corporation	999	1	40400151	2.810	6.761	0.284	3.421	8.232	0.346
4703700069	MPLX Terminals LLC - Bordeaux Terminal	001	1	40400109	0.000	0.000	0.970	0.000	0.000	1.181
4703700069	MPLX Terminals LLC - Bordeaux Terminal	006	1	40400160	0.000	0.000	18.650	0.000	0.000	22.708
4703700069	MPLX Terminals LLC - Bordeaux Terminal	010	1	40600145	0.000	0.000	15.380	0.000	0.000	18.727
4703700069	MPLX Terminals LLC - Bordeaux Terminal	010	2	40400153	0.000	0.000	1.550	0.000	0.000	1.887
4703700069	MPLX Terminals LLC - Bordeaux Terminal	010	3	40400154	0.000	0.000	10.680	0.000	0.000	13.004
4703700069	MPLX Terminals LLC - Bordeaux Terminal	011	1	40400108	0.000	0.000	0.750	0.000	0.000	0.913
4703700070	Magellan Terminals Holdings, L.P.	001	1	40400140	0.000	0.000	2.750	0.000	0.000	3.348
4703700070	Magellan Terminals Holdings, L.P.	003	1	40400121	0.000	0.000	0.334	0.000	0.000	0.407
4703700070	Magellan Terminals Holdings, L.P.	007	1	40400153	0.230	0.570	11.600	0.280	0.694	14.124
4703700070	Magellan Terminals Holdings, L.P.	007	2	40400151	0.000	0.000	0.288	0.000	0.000	0.351
4703700070	Magellan Terminals Holdings, L.P.	007	3	40400154	0.000	0.000	0.060	0.000	0.000	0.073

4703700070	Magellan Terminals Holdings, L.P.	008	1	40400109	0.000	0.000	0.858	0.000	0.000	1.045
4703700072	Warren Paint & Color Company	001	1	30101401	0.000	0.000	3.990	0.000	0.000	4.587
4703700076	Marathon Petroleum Company LP	001	1	40400109	0.000	0.000	2.130	0.000	0.000	2.594
4703700076	Marathon Petroleum Company LP	001	2	40400250	0.000	0.000	0.410	0.000	0.000	0.499
4703700076	Marathon Petroleum Company LP	002	1	30500206	2.100	1.750	0.110	2.670	2.225	0.140
4703700079	MPLX Terminals LLC - Nashville Terminal	003	1	40400170	0.000	0.000	5.870	0.000	0.000	7.147
4703700079	MPLX Terminals LLC - Nashville Terminal	008	1	40400316	0.000	0.000	0.500	0.000	0.000	0.565
4703700079	MPLX Terminals LLC - Nashville Terminal	009	1	40400250	0.000	0.000	1.660	0.000	0.000	2.021
4703700079	MPLX Terminals LLC - Nashville Terminal	009	2	40400153	0.000	0.000	0.760	0.000	0.000	0.925
4703700079	MPLX Terminals LLC - Nashville Terminal	009	3	40400154	0.000	0.000	5.410	0.000	0.000	6.587
4703700079	MPLX Terminals LLC - Nashville Terminal	011	1	40400109	0.000	0.000	0.120	0.000	0.000	0.146
4703700079	MPLX Terminals LLC - Nashville Terminal	012	1	40400109	0.000	0.000	0.580	0.000	0.000	0.706
4703700081	United States Tobacco Mfg, LP	002	1	30203399	0.000	0.000	3.370	0.000	0.000	3.792
4703700081	United States Tobacco Mfg, LP	002	3	30203399	0.000	0.000	32.430	0.000	0.000	36.489
4703700081	United States Tobacco Mfg, LP	002	4	30203399	1.087	0.913	0.060	1.223	1.027	0.068
4703700081	United States Tobacco Mfg, LP	003	2	30203399	0.000	0.000	0.005	0.000	0.000	0.006
4703700081	United States Tobacco Mfg, LP	003	3	30203399	0.000	0.000	0.010	0.000	0.000	0.011
4703700081	United States Tobacco Mfg, LP	004	1	30203399	0.000	0.000	0.014	0.000	0.000	0.016
4703700081	United States Tobacco Mfg, LP	006	1	20200107	0.034	0.008	0.001	0.040	0.009	0.001
4703700081	United States Tobacco Mfg, LP	006	2	20200107	0.256	0.070	0.004	0.299	0.082	0.005
4703700081	United States Tobacco Mfg, LP	009	1	10200602	0.329	0.167	0.092	0.391	0.198	0.109
4703700081	United States Tobacco Mfg, LP	009	2	10200502	0.003	0.001	0.000	0.003	0.001	0.000
4703700081	United States Tobacco Mfg, LP	009	3	10200602	1.350	0.684	0.378	1.603	0.812	0.449
4703700081	United States Tobacco Mfg, LP	009	4	10200502	0.002	0.001	0.000	0.002	0.001	0.000
4703700081	United States Tobacco Mfg, LP	009	5	10200602	0.713	0.367	0.081	0.847	0.436	0.096
4703700081	United States Tobacco Mfg, LP	010	2	30203399	0.000	0.000	0.070	0.000	0.000	0.079
4703700081	United States Tobacco Mfg, LP	010	3	30203399	0.000	0.000	0.017	0.000	0.000	0.019
4703700083	Lithographics, Inc.	001	1	40500403	0.000	0.000	0.950	0.000	0.000	1.066
4703700083	Lithographics, Inc.	001	2	40500403	0.000	0.000	4.200	0.000	0.000	4.713
4703700083	Lithographics, Inc.	001	3	40500403	0.000	0.000	0.003	0.000	0.000	0.003
4703700083	Lithographics, Inc.	001	4	40500403	0.000	0.000	0.160	0.000	0.000	0.180
4703700083	Lithographics, Inc.	002	1	40500403	1.730	1.730	0.001	1.941	1.941	0.001
4703700083	Lithographics, Inc.	002	2	40500403	0.000	0.000	0.510	0.000	0.000	0.572
4703700083	Lithographics, Inc.	002	3	40500403	0.000	0.000	0.064	0.000	0.000	0.072
4703700083	Lithographics, Inc.	002	4	40500403	0.000	0.000	0.012	0.000	0.000	0.013
4703700083	Lithographics, Inc.	003	2	40500403	0.000	0.000	1.930	0.000	0.000	2.166
4703700083	Lithographics, Inc.	003	3	40500403	0.000	0.000	0.104	0.000	0.000	0.117
4703700086	Falcon Press, LLC	001	1	40500403	0.000	0.000	0.726	0.000	0.000	0.815
4703700086	Falcon Press, LLC	001	2	40500403	0.000	0.000	2.243	0.000	0.000	2.516
4703700086	Falcon Press, LLC	001	3	40500403	0.000	0.000	0.006	0.000	0.000	0.006
4703700086	Falcon Press, LLC	001	4	40500403	0.000	0.000	0.394	0.000	0.000	0.442
4703700090	Embraer Aircraft Maint Services, Inc	001	1	40100399	0.000	0.000	0.011	0.000	0.000	0.013
4703700090	Embraer Aircraft Maint Services, Inc	002	3	40202406	0.000	0.000	0.215	0.000	0.000	0.264
4703700090	Embraer Aircraft Maint Services, Inc	002	4	40288801	0.000	0.000	0.084	0.000	0.000	0.117
4703700090	Embraer Aircraft Maint Services, Inc	002	5	40288824	0.000	0.000	6.468	0.000	0.000	9.013
4703700090	Embraer Aircraft Maint Services, Inc	004	1	20300101	0.032	0.007	0.003	0.040	0.009	0.004
4703700090	Embraer Aircraft Maint Services, Inc	004	2	20300101	0.086	0.019	0.007	0.107	0.024	0.009

4703700090	Embraer Aircraft Maint Services, Inc	005	1	20300101	0.117	0.025	0.010	0.146	0.031	0.012
4703700090	Embraer Aircraft Maint Services, Inc	005	2	20300101	0.162	0.035	0.013	0.202	0.044	0.016
4703700091	PSC Metals, LLC	005	1	30904600	0.280	0.550	0.000	0.358	0.703	0.000
4703700092	QG Printing II, LLC	001	1	40500403	4.780	4.020	45.850	5.364	4.511	51.452
4703700092	QG Printing II, LLC	001	3	40500403	0.000	0.000	14.690	0.000	0.000	16.485
4703700092	QG Printing II, LLC	002	1	40500403	0.000	0.000	0.004	0.000	0.000	0.004
4703700094	Saint Thomas Hospital West	001	1	10300602	7.310	6.140	0.400	9.181	7.711	0.502
4703700094	Saint Thomas Hospital West	001	2	10300502	0.020	0.000	0.000	0.025	0.000	0.000
4703700094	Saint Thomas Hospital West	003	1	20100102	4.830	0.950	0.110	2.613	0.514	0.060
4703700102	Colonial Pipeline Company	001	1	40400179	0.000	0.000	0.340	0.000	0.000	0.414
4703700102	Colonial Pipeline Company	001	3	40400151	0.000	0.000	0.910	0.000	0.000	1.108
4703700102	Colonial Pipeline Company	001	4	40400151	0.000	0.000	0.100	0.000	0.000	0.122
4703700102	Colonial Pipeline Company	001	5	40400162	0.000	0.000	0.560	0.000	0.000	0.682
4703700102	Colonial Pipeline Company	002	1	20100102	0.030	0.010	0.000	0.016	0.005	0.000
4703700110	CRT Custom Products, Inc.	001	1	40500403	0.000	0.000	0.462	0.000	0.000	0.518
4703700118	Southern Machinery Co	001	1	40202501	0.000	0.000	0.706	0.000	0.000	0.903
4703700126	Nashville Wire Products	001	1	40200801	0.580	0.480	0.030	0.808	0.669	0.042
4703700126	Nashville Wire Products	002	1	40200201	0.000	0.000	22.160	0.000	0.000	30.881
4703700127	United Cabinet Corporation	001	1	40201901	0.000	0.000	11.920	0.000	0.000	15.272
4703700127	United Cabinet Corporation	001	2	40201901	0.000	0.000	31.860	0.000	0.000	40.818
4703700127	United Cabinet Corporation	001	3	40201901	0.000	0.000	19.590	0.000	0.000	25.098
4703700127	United Cabinet Corporation	001	4	40201901	0.000	0.000	31.860	0.000	0.000	40.818
4703700128	Marcus Paint Company	001	1	30101401	0.000	0.000	8.740	0.000	0.000	10.048
4703700134	Rogers Manufacturing Co, Inc	001	1	40202537	0.000	0.000	3.400	0.000	0.000	4.346
4703700134	Rogers Manufacturing Co, Inc	001	2	40299998	0.000	0.000	0.820	0.000	0.000	1.143
4703700135	AmeriColor	001	3	40500403	0.000	0.000	3.770	0.000	0.000	4.231
4703700135	AmeriColor	001	4	40500403	0.000	0.000	0.390	0.000	0.000	0.438
4703700135	AmeriColor	001	6	40500403	0.000	0.000	1.010	0.000	0.000	1.133
4703700139	Hennessy Industries, Inc.	001	1	40200101	0.000	0.000	4.880	0.000	0.000	5.929
4703700139	Hennessy Industries, Inc.	002	1	40200801	1.120	0.940	0.060	1.561	1.310	0.084
4703700144	Wolfe Industrial, Inc.	001	1	40202501	0.000	0.000	0.440	0.000	0.000	0.562
4703700147	VA TN Valley Healthcare Systen	001	1	10200602	5.090	4.280	0.280	6.045	5.083	0.333
4703700147	VA TN Valley Healthcare Systen	001	2	10200502	0.073	0.002	0.001	0.085	0.002	0.001
4703700147	VA TN Valley Healthcare Systen	002	1	31502001	0.000	0.000	0.023	0.000	0.000	0.036
4703700147	VA TN Valley Healthcare Systen	003	1	20100107	0.113	0.366	0.237	0.061	0.198	0.128
4703700149	Cliff's Cabinet Company	001	1	40201901	0.000	0.000	3.160	0.000	0.000	4.049
4703700149	Cliff's Cabinet Company	001	2	40200901	0.000	0.000	0.880	0.000	0.000	1.226
4703700149	Cliff's Cabinet Company	001	3	40200701	0.000	0.000	0.030	0.000	0.000	0.037
4703700156	Gibson USA	001	1	40200101	0.000	0.000	57.490	0.000	0.000	69.846
4703700159	Creative Cabinetry Solutions, Inc.	001	2	40288801	0.000	0.000	2.040	0.000	0.000	2.843
4703700160	Marshall & Bruce Company	001	1	40500403	0.000	0.000	4.500	0.000	0.000	5.050
4703700160	Marshall & Bruce Company	001	2	40500403	0.000	0.000	1.010	0.000	0.000	1.133
4703700160	Marshall & Bruce Company	001	4	40500403	0.000	0.000	0.520	0.000	0.000	0.584
4703700160	Marshall & Bruce Company	001	5	40500403	0.000	0.000	0.240	0.000	0.000	0.269
4703700163	Skyline Madison Campus	001	1	10300602	1.275	1.071	0.070	1.601	1.345	0.088
4703700163	Skyline Madison Campus	001	2	10300501	0.004	0.005	0.001	0.005	0.006	0.001
4703700163	Skyline Madison Campus	003	1	20100107	1.536	0.347	0.064	0.831	0.188	0.035

4703700164	Vulcan Construction Materials, LP	001	1	30500205	1.480	23.730	0.490	1.672	26.816	0.554
4703700164	Vulcan Construction Materials, LP	003	1	30500205	0.000	0.360	2.360	0.000	0.407	2.667
4703700169	Ambrose Printing Co.	003	1	40500403	0.000	0.000	0.770	0.000	0.000	0.864
4703700169	Ambrose Printing Co.	004	1	40500403	0.130	0.110	0.073	0.146	0.123	0.082
4703700169	Ambrose Printing Co.	004	2	40500403	0.000	0.000	0.470	0.000	0.000	0.527
4703700174	Fiserv - Nashville	002	1	40500403	0.000	0.000	3.071	0.000	0.000	3.446
4703700174	Fiserv - Nashville	003	1	40500403	0.000	0.000	4.090	0.000	0.000	4.590
4703700176	Superior Trim	003	1	33088801	0.000	0.000	2.290	0.000	0.000	1.809
4703700179	Commercial Laminations, Inc.	001	1	40201901	0.000	0.000	2.680	0.000	0.000	3.434
4703700179	Commercial Laminations, Inc.	001	2	40299998	0.000	0.000	0.510	0.000	0.000	0.711
4703700179	Commercial Laminations, Inc.	002	1	40288801	0.000	0.000	0.570	0.000	0.000	0.794
4703700179	Commercial Laminations, Inc.	002	2	40299998	0.000	0.000	0.450	0.000	0.000	0.627
4703700179	Commercial Laminations, Inc.	003	1	40288801	0.000	0.000	0.400	0.000	0.000	0.557
4703700179	Commercial Laminations, Inc.	003	2	40299998	0.000	0.000	0.140	0.000	0.000	0.195
4703700179	Commercial Laminations, Inc.	004	1	40299998	0.000	0.000	0.340	0.000	0.000	0.474
4703700186	Servitech Industries, Inc.	001	1	40202501	0.000	0.000	0.313	0.000	0.000	0.400
4703700186	Servitech Industries, Inc.	003	1	40202533	0.000	0.000	0.847	0.000	0.000	1.083
4703700186	Servitech Industries, Inc.	004	1	40288801	0.000	0.000	0.247	0.000	0.000	0.344
4703700186	Servitech Industries, Inc.	005	1	40200801	1.275	1.071	0.070	1.777	1.492	0.098
4703700186	Servitech Industries, Inc.	006	1	40201403	0.000	0.000	0.002	0.000	0.000	0.003
4703700188	Dixie Graphics	001	1	40500403	0.000	0.000	9.830	0.000	0.000	11.031
4703700188	Dixie Graphics	002	1	40500403	0.000	0.000	0.010	0.000	0.000	0.011
4703700188	Dixie Graphics	005	1	40200101	0.000	0.000	2.270	0.000	0.000	2.758
4703700189	Dept. of Public Works Bordeaux Landfill	001	1	50100402	0.000	0.186	0.501	0.000	0.232	0.623
4703700189	Dept. of Public Works Bordeaux Landfill	001	2	50100410	0.780	14.341	0.030	0.780	14.341	0.030
4703700191	Ergon Asphalt & Emulsions, Inc.	002	1	40400199	0.000	0.000	0.700	0.000	0.000	0.852
4703700191	Ergon Asphalt & Emulsions, Inc.	002	3	30500206	0.032	0.027	0.002	0.041	0.034	0.003
4703700191	Ergon Asphalt & Emulsions, Inc.	003	1	40400103	0.000	0.000	0.085	0.000	0.000	0.103
4703700196	Fiberweb, Inc. (A Berry Global Company)	008	1	10200602	6.090	5.120	0.330	7.233	6.081	0.392
4703700196	Fiberweb, Inc. (A Berry Global Company)	010	2	40500403	0.350	0.290	0.020	0.393	0.325	0.022
4703700196	Fiberweb, Inc. (A Berry Global Company)	012	1	30101809	0.000	0.000	0.020	0.000	0.000	0.027
4703700196	Fiberweb, Inc. (A Berry Global Company)	013	1	10200603	0.780	0.790	0.110	0.926	0.938	0.131
4703700196	Fiberweb, Inc. (A Berry Global Company)	014	1	10200601	26.240	54.660	3.930	31.165	64.920	4.668
4703700196	Fiberweb, Inc. (A Berry Global Company)	015	1	20200102	0.010	0.010	0.000	0.012	0.012	0.000
4703700197	Magnetic Ticket & Label Corp.	002	2	40500403	0.004	0.002	0.000	0.004	0.002	0.000
4703700197	Magnetic Ticket & Label Corp.	011	1	40500403	0.000	0.000	0.005	0.000	0.000	0.006
4703700197	Magnetic Ticket & Label Corp.	015	2	40204435	0.000	0.000	0.001	0.000	0.000	0.001
4703700197	Magnetic Ticket & Label Corp.	016	1	40288801	0.000	0.000	0.048	0.000	0.000	0.067
4703700197	Magnetic Ticket & Label Corp.	016	2	40288801	0.000	0.000	3.154	0.000	0.000	4.395
4703700197	Magnetic Ticket & Label Corp.	016	3	40288801	0.000	0.000	0.070	0.000	0.000	0.098
4703700198	Summit Medical Center	001	1	10300602	1.760	1.550	0.170	2.210	1.947	0.214
4703700198	Summit Medical Center	001	2	10300501	0.050	0.010	0.020	0.062	0.012	0.025
4703700198	Summit Medical Center	002	1	10300603	0.490	0.740	0.080	0.615	0.929	0.100
4703700198	Summit Medical Center	003	1	20100107	0.270	0.060	0.010	0.146	0.032	0.005
4703700200	BNA Fuel Company LLC	001	1	40301016	0.000	0.000	1.360	0.000	0.000	1.656
4703700200	BNA Fuel Company LLC	002	1	40301016	0.000	0.000	1.150	0.000	0.000	1.400
4703700200	BNA Fuel Company LLC	003	1	40301016	0.000	0.000	0.480	0.000	0.000	0.584

4703700200	BNA Fuel Company LLC	004	1	40301016	0.000	0.000	0.420	0.000	0.000	0.511
4703700200	BNA Fuel Company LLC	005	1	20300101	0.090	0.020	0.000	0.112	0.025	0.000
4703700203	Davis Cabinet Company	001	1	40201901	0.000	0.000	0.541	0.000	0.000	0.693
4703700203	Davis Cabinet Company	002	1	40288824	0.000	0.000	0.133	0.000	0.000	0.185
4703700204	Jones Bros. Contractors, LLC	001	1	30500205	2.636	13.182	3.245	2.979	14.896	3.667
4703700204	Jones Bros. Contractors, LLC	005	1	30500203	0.000	0.617	4.034	0.000	0.697	4.559
4703700208	Vulcan Construction Materials, LP	001	1	30500205	2.885	14.425	3.551	3.260	16.301	4.013
4703700208	Vulcan Construction Materials, LP	001	3	30500213	0.000	0.281	1.814	0.000	0.318	2.050
4703700208	Vulcan Construction Materials, LP	005	2	20200102	0.143	0.031	0.011	0.167	0.036	0.013
4703700208	Vulcan Construction Materials, LP	008	4	20200107	0.373	0.008	0.003	0.435	0.009	0.003
4703700209	Trailer Conditioners, Inc.	001	1	40202501	0.000	0.000	0.238	0.000	0.000	0.304
4703700209	Trailer Conditioners, Inc.	002	1	40202501	0.000	0.000	0.366	0.000	0.000	0.468
4703700211	NEXEO Solutions, LLC	001	1	40899995	0.000	0.000	0.260	0.000	0.000	0.299
4703700211	NEXEO Solutions, LLC	001	2	40899995	0.000	0.000	4.200	0.000	0.000	4.829
4703700211	NEXEO Solutions, LLC	002	1	40899999	0.000	0.000	0.020	0.000	0.000	0.023
4703700211	NEXEO Solutions, LLC	004	1	40799999	0.000	0.000	0.060	0.000	0.000	0.069
4703700211	NEXEO Solutions, LLC	005	1	40799999	0.000	0.000	1.030	0.000	0.000	1.184
4703700213	Trew Industrial Wheels, Inc.	002	1	30800704	0.000	0.000	1.570	0.000	0.000	2.153
4703700213	Trew Industrial Wheels, Inc.	004	1	40200101	0.000	0.000	0.460	0.000	0.000	0.559
4703700217	Reading Midwest Distribution, LLC	001	1	40200101	0.000	0.000	0.005	0.000	0.000	0.006
4703700220	Rogers Group, Inc.	001	1	30500240	4.885	16.280	0.330	5.520	18.397	0.373
4703700220	Rogers Group, Inc.	002	3	30500214	0.000	0.250	1.600	0.000	0.283	1.808
4703700232	Lellyett & Rogers Company	001	1	40500403	0.000	0.000	0.283	0.000	0.000	0.318
4703700232	Lellyett & Rogers Company	001	2	40500403	0.000	0.000	0.015	0.000	0.000	0.017
4703700232	Lellyett & Rogers Company	001	3	40500403	0.000	0.000	0.017	0.000	0.000	0.019
4703700236	Purity Dairies, Inc.	001	1	10300602	3.050	0.760	0.120	3.831	0.955	0.151
4703700237	Cumberland Architectural Millwork, Inc.	001	1	40200701	0.000	0.000	0.527	0.000	0.000	0.648
4703700237	Cumberland Architectural Millwork, Inc.	002	1	40200101	0.000	0.000	4.520	0.000	0.000	5.491
4703700240	Precision Fabrics Group, Inc.	001	1	40201001	3.390	2.840	0.190	4.026	3.373	0.226
4703700240	Precision Fabrics Group, Inc.	002	1	40204340	0.100	0.090	0.010	0.108	0.097	0.011
4703700240	Precision Fabrics Group, Inc.	003	1	40204421	0.000	0.000	4.890	0.000	0.000	5.271
4703700240	Precision Fabrics Group, Inc.	004	1	10300603	0.160	0.130	0.010	0.201	0.163	0.013
4703700241	Vanderbilt University Medical Center	001	1	10100501	2.000	0.700	0.077	1.082	0.379	0.042
4703700242	Frontier Logistical Services, LLC	001	1	40899995	0.000	0.000	4.010	0.000	0.000	4.610
4703700242	Frontier Logistical Services, LLC	002	1	40899995	0.000	0.000	3.617	0.000	0.000	4.158
4703700242	Frontier Logistical Services, LLC	003	1	40799999	0.000	0.000	0.124	0.000	0.000	0.143
4703700242	Frontier Logistical Services, LLC	004	1	40799999	0.000	0.000	5.068	0.000	0.000	5.826
4703700244	Tristar Centennial Medical Center	001	1	10300602	6.790	5.700	0.370	8.528	7.159	0.465
4703700244	Tristar Centennial Medical Center	001	2	10300502	0.050	0.010	0.001	0.062	0.012	0.001
4703700244	Tristar Centennial Medical Center	002	2	20100102	5.140	1.020	0.170	2.781	0.552	0.092
4703700250	Vanderbilt University Printing Services	001	1	40500403	0.000	0.000	0.090	0.000	0.000	0.101
4703700250	Vanderbilt University Printing Services	001	2	40500403	0.000	0.000	0.928	0.000	0.000	1.041
4703700250	Vanderbilt University Printing Services	001	3	40500403	0.000	0.000	0.032	0.000	0.000	0.036
4703700251	R.J. Wherry and Associates, Inc.	001	1	40200401	0.000	0.000	0.077	0.000	0.000	0.107
4703700251	R.J. Wherry and Associates, Inc.	001	2	40200101	0.000	0.000	0.099	0.000	0.000	0.120
4703700251	R.J. Wherry and Associates, Inc.	001	3	40200601	0.000	0.000	0.045	0.000	0.000	0.056
4703700251	R.J. Wherry and Associates, Inc.	001	4	40200101	0.000	0.000	0.734	0.000	0.000	0.891

4703700251	R.J. Wherry and Associates, Inc.	001	6	40200701	0.000	0.000	2.277	0.000	0.000	2.801
4703700251	R.J. Wherry and Associates, Inc.	001	7	40200901	0.000	0.000	0.896	0.000	0.000	1.248
4703700260	Pollock Printing Company, Inc.	001	1	40500403	0.310	0.260	0.130	0.348	0.292	0.146
4703700260	Pollock Printing Company, Inc.	002	1	40500403	0.000	0.000	4.440	0.000	0.000	4.982
4703700262	CEMEX, Inc.	007	1	20200102	12.130	0.780	0.290	14.152	0.910	0.338
4703700262	CEMEX, Inc.	007	2	20200102	5.780	1.240	0.460	6.743	1.447	0.537
4703700264	Atlantic Aviation	001	1	40688801	0.000	0.000	0.010	0.000	0.000	0.012
4703700264	Atlantic Aviation	001	2	40688801	0.000	0.000	1.544	0.000	0.000	1.880
4703700268	K.R. Harrington Water Plant	001	1	20100102	22.106	3.396	0.788	11.959	1.837	0.427
4703700268	K.R. Harrington Water Plant	002	1	40400316	0.000	0.000	0.005	0.000	0.000	0.005
4703700272	Alternative Energy, LLC	009	1	20200107	2.750	0.627	0.112	3.208	0.731	0.131
4703700272	Alternative Energy, LLC	010	1	20200107	8.030	0.651	0.093	9.368	0.759	0.108
4703700274	Ace Cleaners	001	1	40100104	0.000	0.000	0.140	0.000	0.000	0.179
4703700276	The Mulch Company, LLC	002	1	20200107	14.480	3.110	1.170	16.893	3.628	1.365
4703700277	Tyson Fresh Meats, Inc.	001	1	10500206	0.970	0.810	0.040	1.218	1.017	0.050
4703700277	Tyson Fresh Meats, Inc.	002	1	20100102	0.020	0.000	0.000	0.011	0.000	0.000
4703700279	ARAMARK Uniform Services	001	1	10300602	0.340	0.290	0.020	0.427	0.364	0.025
4703700279	ARAMARK Uniform Services	002	1	39000699	1.320	1.110	0.070	1.568	1.318	0.083
4703700288	Snider Fleet Solutions	001	1	30800501	0.000	0.000	0.110	0.000	0.000	0.151
4703700288	Snider Fleet Solutions	001	2	30800101	0.000	0.000	0.880	0.000	0.000	1.207
4703700288	Snider Fleet Solutions	001	3	30800501	0.000	0.000	0.020	0.000	0.000	0.027
4703700290	AZZ Galvanizing - Nashville	003	1	39000699	1.620	1.360	0.090	1.924	1.615	0.107
4703700293	Marangoni Tread, N.A., Inc.	002	1	30800105	0.000	0.000	0.920	0.000	0.000	1.261
4703700293	Marangoni Tread, N.A., Inc.	002	2	30800199	0.040	0.070	0.000	0.055	0.096	0.000
4703700293	Marangoni Tread, N.A., Inc.	003	1	10200603	1.210	0.610	0.072	1.437	0.724	0.086
4703700294	Berry Film Products Company, Inc.	001	1	40500403	0.350	0.300	0.020	0.393	0.337	0.022
4703700294	Berry Film Products Company, Inc.	001	2	40500403	0.000	0.000	3.840	0.000	0.000	4.309
4703700294	Berry Film Products Company, Inc.	001	3	40500403	0.000	0.000	6.710	0.000	0.000	7.530
4703700294	Berry Film Products Company, Inc.	002	1	40500403	0.560	0.470	0.030	0.628	0.527	0.034
4703700294	Berry Film Products Company, Inc.	002	2	40500403	0.000	0.000	6.080	0.000	0.000	6.823
4703700294	Berry Film Products Company, Inc.	002	3	40500403	0.000	0.000	10.630	0.000	0.000	11.929
4703700294	Berry Film Products Company, Inc.	003	1	40500403	0.000	0.000	0.233	0.000	0.000	0.261
4703700294	Berry Film Products Company, Inc.	003	2	40500403	0.000	0.000	1.590	0.000	0.000	1.784
4703700294	Berry Film Products Company, Inc.	004	1	40500403	0.000	0.000	0.080	0.000	0.000	0.090
4703700294	Berry Film Products Company, Inc.	005	1	40500403	0.000	0.000	0.018	0.000	0.000	0.020
4703700294	Berry Film Products Company, Inc.	006	1	40500403	0.000	0.000	0.010	0.000	0.000	0.011
4703700294	Berry Film Products Company, Inc.	007	1	40500403	0.000	0.000	0.052	0.000	0.000	0.058
4703700294	Berry Film Products Company, Inc.	007	2	40500403	0.000	0.000	0.002	0.000	0.000	0.002
4703700294	Berry Film Products Company, Inc.	008	1	40500403	0.650	0.540	0.035	0.729	0.606	0.039
4703700294	Berry Film Products Company, Inc.	008	2	40500403	0.000	0.000	7.040	0.000	0.000	7.900
4703700294	Berry Film Products Company, Inc.	008	3	40500403	0.000	0.000	12.300	0.000	0.000	13.803
4703700294	Berry Film Products Company, Inc.	009	1	40500403	0.000	0.000	0.340	0.000	0.000	0.382
4703700295	Metropolitan Nashville Airport Authority	001	1	10300602	2.112	1.774	0.116	2.653	2.228	0.146
4703700295	Metropolitan Nashville Airport Authority	002	1	20100107	3.460	0.780	0.130	1.872	0.422	0.070
4703700297	Stone Bridge Cleaners	001	1	41000244	0.000	0.000	0.032	0.000	0.000	0.041
4703700299	Healthcare Realty Services, Inc.	001	1	10300602	1.780	1.500	0.100	2.236	1.884	0.126
4703700299	Healthcare Realty Services, Inc.	002	1	20200102	0.242	0.056	0.007	0.283	0.065	0.008

4703700302	Waste Management of Nashville	014	1	40202520	0.000	0.000	0.840	0.000	0.000	1.074
4703700303	Nashville Bun Company	001	1	30203202	0.000	0.000	2.243	0.000	0.000	2.717
4703700303	Nashville Bun Company	001	2	30203202	0.833	0.700	0.000	1.009	0.848	0.000
4703700303	Nashville Bun Company	002	1	30203202	0.702	0.590	0.039	0.850	0.715	0.047
4703700305	Southern Recycling, LLC	001	1	31401101	0.012	0.000	0.000	0.015	0.000	0.000
4703700309	Nashville Custom Woodwork, Inc.	001	1	40200101	0.000	0.000	0.917	0.000	0.000	1.114
4703700312	Young's Cleaners	001	1	40100102	0.000	0.000	0.005	0.000	0.000	0.006
4703700313	Piedmont Natural Gas	001	1	10200601	0.970	0.705	0.071	1.152	0.837	0.084
4703700313	Piedmont Natural Gas	002	1	20200101	0.003	0.001	0.000	0.004	0.001	0.000
4703700314	Thorntons, Inc.	001	1	40600499	0.000	0.000	0.293	0.000	0.000	0.290
4703700314	Thorntons, Inc.	001	2	40600499	0.000	0.000	0.017	0.000	0.000	0.017
4703700316	CHEP Recycled Pallet Solutions, LLC	001	1	20200102	14.900	3.214	1.208	17.383	3.750	1.409
4703700317	Millwood, Inc.	001	1	40288821	0.000	0.000	0.166	0.000	0.000	0.231
4703700317	Millwood, Inc.	002	1	40288821	0.000	0.000	0.034	0.000	0.000	0.047
4703700318	E & M Cleaners $1.98	001	1	40100102	0.000	0.000	0.177	0.000	0.000	0.226
4703700319	TriStar Transport, LLC	001	1	40400150	0.000	0.000	1.364	0.000	0.000	1.661
4703700319	TriStar Transport, LLC	001	2	40400154	0.000	0.000	1.364	0.000	0.000	1.661
4703700320	D&P Custom Lights and Products, Inc.	001	1	40202501	0.000	0.000	0.335	0.000	0.000	0.428
4703700322	TRANSFLO Terminal Services, Inc.	001	1	40899999	0.000	0.000	0.010	0.000	0.000	0.011
4703700322	TRANSFLO Terminal Services, Inc.	002	1	10200503	0.030	0.010	0.000	0.035	0.012	0.000
4703700323	Belmont University	001	1	10300602	4.080	3.430	0.220	5.124	4.308	0.276
4703700323	Belmont University	002	1	20100102	2.680	0.660	0.130	1.450	0.357	0.070
4703700324	Lipscomb University	001	1	10300602	2.590	2.200	0.140	3.253	2.763	0.176
4703700324	Lipscomb University	002	1	20100102	1.700	0.330	0.120	0.920	0.179	0.065
4703700325	Serra Chevrolet-Buick-GMC	001	1	40201606	0.000	0.000	1.490	0.000	0.000	1.994
4703700328	Fisk University	001	1	10300602	0.910	0.760	0.050	1.143	0.955	0.063
4703700328	Fisk University	002	1	20100202	0.002	0.044	0.012	0.005	0.111	0.031
4703700329	Maaco Collision Center	001	1	40201601	0.000	0.000	1.990	0.000	0.000	2.663
4703700330	Skyline Medical Center	001	1	10300602	2.996	0.449	0.120	3.763	0.564	0.151
4703700330	Skyline Medical Center	001	2	10300502	0.006	0.002	0.000	0.007	0.002	0.000
4703700330	Skyline Medical Center	002	1	20100102	0.627	0.144	0.017	0.339	0.078	0.009
4703700331	Service King Paint & Body, LLC	001	1	40201601	0.000	0.000	1.150	0.000	0.000	1.539
4703700332	Childress Collision Center	001	1	40201601	0.000	0.000	2.080	0.000	0.000	2.784
4703700333	Service King Paint & Body, LLC	001	1	40201601	0.000	0.000	0.190	0.000	0.000	0.254
4703700335	Advanced Composites, Inc.	002	1	30101821	0.000	0.000	7.550	0.000	0.000	10.352
4703700335	Advanced Composites, Inc.	004	1	30101821	0.000	0.000	0.020	0.000	0.000	0.027
4703700335	Advanced Composites, Inc.	005	1	30890013	0.060	0.050	0.000	0.075	0.062	0.000
4703700339	Maaco Auto Painting	001	1	40201601	0.000	0.000	1.860	0.000	0.000	2.489
4703700341	Superior Oil Company, Inc.	001	1	40714697	0.000	0.000	1.248	0.000	0.000	1.435
4703700341	Superior Oil Company, Inc.	002	1	40899999	0.000	0.000	0.265	0.000	0.000	0.305
4703700341	Superior Oil Company, Inc.	002	2	40899999	0.000	0.000	0.767	0.000	0.000	0.882
4703700341	Superior Oil Company, Inc.	002	3	40799999	0.000	0.000	0.839	0.000	0.000	0.965
4703700341	Superior Oil Company, Inc.	002	4	40799999	0.000	0.000	3.100	0.000	0.000	3.564
4703700341	Superior Oil Company, Inc.	002	5	49000499	0.000	0.000	0.150	0.000	0.000	0.208
4703700345	Econo Auto Painting	001	1	40201699	0.000	0.000	3.790	0.000	0.000	5.072
4703700346	Vietti Foods, Inc.	001	1	10300602	13.320	11.190	0.720	16.729	14.054	0.904
4703700347	Sonic Automotive - Crest Cadillac	001	1	40201699	0.000	0.000	1.095	0.000	0.000	1.465

4703700348	3M Company	001	2	33000199	0.000	0.000	0.050	0.000	0.000	0.039
4703700348	3M Company	001	3	33000199	0.000	0.000	0.070	0.000	0.000	0.055
4703700348	3M Company	001	4	33000199	0.000	0.000	0.130	0.000	0.000	0.103
4703700348	3M Company	003	1	40188801	0.000	0.000	0.620	0.000	0.000	0.754
4703700348	3M Company	003	2	10200602	0.890	0.750	0.050	1.057	0.891	0.059
4703700348	3M Company	004	1	20300207	0.010	0.010	0.000	0.013	0.013	0.000
4703700349	ADESA Nashville	001	1	40201601	0.000	0.000	0.100	0.000	0.000	0.134
4703700349	ADESA Nashville	001	2	40201601	0.000	0.000	0.730	0.000	0.000	0.977
4703700349	ADESA Nashville	001	3	40201605	0.000	0.000	0.030	0.000	0.000	0.040
4703700350	CarMax Auto Superstores, Inc.	001	1	40201601	0.000	0.000	2.970	0.000	0.000	3.975
4703700351	American Farms	001	2	20300101	1.180	0.360	0.020	1.475	0.450	0.025
4703700351	American Farms	003	4	20300101	0.030	0.010	0.000	0.037	0.012	0.000
4703700351	American Farms	004	4	20300101	0.240	0.010	0.000	0.300	0.012	0.000
4703700352	Waste Management of Tennessee - MTEC	003	1	20200102	0.419	0.229	0.028	0.489	0.267	0.033
4703700353	VUMC - Case Cart Operations Center	001	1	31502001	0.000	0.000	0.010	0.000	0.000	0.016
4703700353	VUMC - Case Cart Operations Center	002	1	20200102	0.010	0.010	0.000	0.012	0.012	0.000
4703700354	C&J Mulch, Inc.	001	1	20200102	1.049	0.162	0.031	1.224	0.189	0.036
4703700355	Service King Paint & Body, LLC	001	1	40200210	0.000	0.000	0.290	0.000	0.000	0.404
4703700356	CarMax Auto Superstores, Inc.	001	1	40200101	0.000	0.000	2.180	0.000	0.000	2.649
4703700357	Action Nissan Body Shop	001	1	40201625	0.000	0.000	0.120	0.000	0.000	0.161
4703700358	Bank of New York Mellon	001	1	20300101	3.920	0.300	0.060	4.900	0.375	0.075
4703700358	Bank of New York Mellon	001	2	20300101	0.050	0.010	0.000	0.062	0.012	0.000
4703700358	Bank of New York Mellon	001	3	20300101	3.240	0.700	0.140	4.050	0.875	0.175
4703700359	ABRA Auto Body & Glass - Madison	001	1	40201601	0.000	0.000	1.900	0.000	0.000	2.543
4703700360	LBA REIT V, L.P.	001	1	20100102	0.210	0.032	0.010	0.114	0.017	0.005
4703700361	UBS AG	001	1	20200102	0.660	0.070	0.018	0.770	0.082	0.021
4703700362	American Appliance Products, Inc.	001	1	10200602	1.600	1.340	0.090	1.900	1.592	0.107
4703700364	Service King Paint & Body, LLC	001	1	40201620	0.000	0.000	0.170	0.000	0.000	0.228
4703700365	Harpeth Valley Utilities District	001	1	20100102	2.983	1.345	0.318	1.614	0.728	0.172
4703700365	Harpeth Valley Utilities District	001	2	20100102	2.877	1.297	0.307	1.556	0.702	0.166
4703700365	Harpeth Valley Utilities District	001	3	20100102	0.241	0.055	0.007	0.130	0.030	0.004
4703700366	HCA IT&S	001	1	20100102	2.714	0.622	0.080	1.468	0.337	0.043
4703700367	Skyway Studios Enterprises, LLC	001	1	20100102	0.820	0.160	0.010	0.444	0.087	0.005
4703700367	Skyway Studios Enterprises, LLC	001	2	20100102	0.820	0.160	0.010	0.444	0.087	0.005
4703700367	Skyway Studios Enterprises, LLC	001	3	20100102	0.160	0.030	0.010	0.087	0.016	0.005
4703700368	Change Healthcare	001	1	20100102	0.043	0.081	0.002	0.023	0.044	0.001
4703700369	Regions Financial Corporation	001	1	20100102	2.540	0.220	0.080	1.374	0.119	0.043
4703700370	Dollar General Corporation	001	1	20300101	0.120	0.030	0.000	0.150	0.037	0.000
4703700370	Dollar General Corporation	001	2	20300101	0.320	0.070	0.010	0.400	0.087	0.012
4703700370	Dollar General Corporation	001	3	20300101	0.310	0.070	0.010	0.387	0.087	0.012
4703700370	Dollar General Corporation	001	4	20300101	0.120	0.030	0.000	0.150	0.037	0.000
4703700370	Dollar General Corporation	001	5	20300101	0.050	0.010	0.000	0.062	0.012	0.000
4703700370	Dollar General Corporation	001	6	20300101	0.050	0.010	0.000	0.062	0.012	0.000
4703700371	vXchnge-Facilities, LLC	001	1	20100102	0.307	0.030	0.008	0.166	0.016	0.004
4703700372	Music City Center	001	1	20100102	0.280	0.050	0.020	0.151	0.027	0.011
4703700372	Music City Center	001	2	20100102	0.320	0.050	0.020	0.173	0.027	0.011
4703700373	Nippers Corner Cleaners	001	1	41000202	0.000	0.000	0.096	0.000	0.000	0.123

4703700374	Republic Services, Inc.	001	1	40202501	0.000	0.000	0.840	0.000	0.000	1.074
4703700374	Republic Services, Inc.	001	2	40201001	0.040	0.030	0.000	0.048	0.036	0.000
4703700375	Cumberland Stadium, Inc.	001	1	20100102	0.990	0.070	0.030	0.536	0.038	0.016
4703700376	ALSCO, Inc.	001	1	10200602	0.780	0.750	0.010	0.926	0.891	0.012
4703700376	ALSCO, Inc.	001	2	10200502	0.010	0.000	0.000	0.012	0.000	0.000
4703700377	Powers Management, LLC	001	1	20100102	0.604	0.025	0.010	0.327	0.013	0.005
4703700378	Service King Collision Repair Center	001	1	40201621	0.000	0.000	0.149	0.000	0.000	0.199
4703700378	Service King Collision Repair Center	001	3	40201602	0.000	0.000	0.095	0.000	0.000	0.127
4703700378	Service King Collision Repair Center	001	4	40201603	0.000	0.000	0.005	0.000	0.000	0.007
4703700379	HCA Holdings, Inc.	001	1	20100102	0.281	0.060	0.023	0.152	0.032	0.012
4703700379	HCA Holdings, Inc.	001	2	20100102	1.950	1.130	0.057	1.055	0.611	0.031
4703700380	Allen Printing Company	001	1	40500403	0.000	0.000	2.860	0.000	0.000	3.209
4703700381	Kennametal, Inc.	001	1	40100398	0.000	0.000	1.440	0.000	0.000	1.752
4703700381	Kennametal, Inc.	003	1	40100295	0.000	0.000	1.180	0.000	0.000	1.436
4703700381	Kennametal, Inc.	007	1	30402201	0.000	0.016	0.002	0.000	0.018	0.002
4703700381	Kennametal, Inc.	009	1	20100102	0.250	0.053	0.020	0.135	0.029	0.011
4703700382	MidSouth Wire	001	1	30900199	2.660	2.240	0.150	3.400	2.864	0.192
4703700382	MidSouth Wire	002	1	30900199	2.660	2.240	0.150	3.400	2.864	0.192
4703700383	Deloitte Services LP	001	1	20100102	0.215	0.012	0.000	0.116	0.006	0.000
4703700383	Deloitte Services LP	001	2	20100102	0.193	0.011	0.001	0.104	0.006	0.001
4703700383	Deloitte Services LP	001	3	20100102	0.262	0.014	0.001	0.142	0.008	0.001
4703700383	Deloitte Services LP	001	4	20100102	0.876	0.124	0.001	0.474	0.067	0.001
4703700383	Deloitte Services LP	001	5	20100102	0.840	0.119	0.001	0.454	0.064	0.001
4703700383	Deloitte Services LP	001	6	20100102	0.840	0.119	0.001	0.454	0.064	0.001
4703700384	Willis North America, Inc.	001	1	20300101	0.608	0.207	0.027	0.760	0.259	0.034
4703700385	T-Mobile USA	001	1	20300101	2.980	0.410	0.080	3.725	0.512	0.100
4703700389	Caremark, LLC	001	1	20300101	0.550	0.050	0.030	0.687	0.062	0.037
4703700389	Caremark, LLC	001	2	20300101	0.320	0.030	0.010	0.400	0.037	0.012
4703700390	Caterpillar Financial Services Corp.	001	1	20300101	0.111	0.016	0.003	0.139	0.020	0.004
4703700390	Caterpillar Financial Services Corp.	001	2	20300101	0.166	0.024	0.004	0.207	0.030	0.005
4703700391	UniFirst Corporation	001	7	33000106	0.000	0.000	2.700	0.000	0.000	2.132
4703700391	UniFirst Corporation	001	1	10200603	0.450	0.380	0.020	0.534	0.451	0.024
4703700391	UniFirst Corporation	001	2	39000699	0.040	0.030	0.000	0.048	0.036	0.000
4703700391	UniFirst Corporation	001	3	39000699	0.450	0.370	0.020	0.534	0.439	0.024
4703700391	UniFirst Corporation	001	4	10500106	0.040	0.030	0.000	0.048	0.036	0.000
4703700391	UniFirst Corporation	001	5	39000699	0.100	0.090	0.010	0.119	0.107	0.012
4703700392	Pepsi Beverages Company	001	1	40500806	0.000	0.000	0.140	0.000	0.000	0.157
4703700392	Pepsi Beverages Company	001	2	40500806	0.000	0.000	5.570	0.000	0.000	6.250
4703700392	Pepsi Beverages Company	001	3	30299998	0.000	0.000	0.600	0.000	0.000	0.727
4703700394	Level 3 Communications	001	1	20100102	0.540	0.050	0.020	0.292	0.027	0.011
4703700395	Level 3 Communications	001	1	20100102	0.979	0.238	0.029	0.530	0.129	0.016
4703700395	Level 3 Communications	001	2	20100102	0.263	0.060	0.008	0.142	0.032	0.004
4703700396	Living Earth	001	1	20200102	8.080	0.720	0.150	9.427	0.840	0.175
4703700397	AT&T Tennessee	001	1	20300101	0.310	0.070	0.000	0.387	0.087	0.000
4703700398	Sinomax East, Inc.	001	1	30801005	0.000	0.000	0.060	0.000	0.000	0.082
4703700398	Sinomax East, Inc.	002	1	30801005	0.000	0.000	0.370	0.000	0.000	0.507
4703700398	Sinomax East, Inc.	003	1	40706403	0.000	0.000	0.001	0.000	0.000	0.002

4703700601	Mortuary Associates, Inc	001	1	50200101	0.026	0.017	0.001	0.036	0.024	0.002
4703700602	All Seasons Cremations	001	1	50200101	0.040	0.010	0.100	0.056	0.014	0.140
4703700606	Metro Animal Control	001	1	31502102	0.042	0.002	0.002	0.053	0.003	0.003
4703700609	Phillips Robinson Funeral Home	001	1	50200505	0.207	0.001	0.001	0.321	0.002	0.001
4703700610	West Harpeth Funeral Home	001	1	31502102	0.244	0.001	0.001	0.311	0.001	0.001
4703700611	Nashville Funeral & Cremation	001	1	31502102	0.187	0.000	0.035	0.238	0.000	0.045
4703700652	Nashville Cremation Service	001	1	31502102	0.689	0.018	0.009	0.879	0.023	0.012
4703700653	Music City Mortuary	001	1	31502102	0.300	0.997	0.300	0.383	1.272	0.383
4703700653	Music City Mortuary	003	1	31502102	0.401	0.331	0.000	0.512	0.422	0.000
4703700654	Highland Hills Funeral Home & Crematory	001	1	31502102	0.461	0.006	0.004	0.588	0.008	0.005
4703700655	Ellis Funeral Home & Cremation Service	001	1	50200101	0.140	0.000	0.000	0.196	0.000	0.000
4703700720	Joy Cleaners	002	1	41000202	0.000	0.000	0.127	0.000	0.000	0.162
4703700745	Stay Fresh Cleaners	002	1	41000202	0.000	0.000	0.750	0.000	0.000	0.957
4703700762	Mr. C's Cleaners	002	1	40100102	0.000	0.000	0.180	0.000	0.000	0.230
4703700788	Belle Place Cleaners, Inc.	002	1	41000202	0.000	0.000	0.180	0.000	0.000	0.230
4703700806	Park Avenue $2.99 Cleaners	002	1	41000101	0.000	0.000	0.400	0.000	0.000	0.510
4703700831	Belle Meade Cleaners	002	1	40100102	0.000	0.000	0.176	0.000	0.000	0.225
4703700001	Buzzi Unicem USA	011	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	012	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	013	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	014	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	015	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	016	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	017	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	018	1	30510102	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	04A	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	04B	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	04C	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	04D	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	04E	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	04F	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	12A	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	12B	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	38A	1	30510604	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	38B	1	30510604	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	D14	1	30501502	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	D15	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	D16	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	D17	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	D18	1	30501202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	D19	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	D20	1	30510102	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	F12	1	30599999	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	L01	1	30599999	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	L02	1	30599999	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	L03	1	30599999	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	L04	1	30599999	0.000	0.000	0.000	0.000	0.000	0.000

4703700001	Buzzi Unicem USA	L05	1	30599999	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	L06	1	30599999	0.000	0.000	0.000	0.000	0.000	0.000
4703700001	Buzzi Unicem USA	L07	1	30501114	0.000	0.000	0.000	0.000	0.000	0.000
4703700003	Irving Materials, Inc.	001	1	30500628	0.000	0.000	0.000	0.000	0.000	0.000
4703700003	Irving Materials, Inc.	002	1	30500619	0.000	0.000	0.000	0.000	0.000	0.000
4703700003	Irving Materials, Inc.	003	1	30500618	0.000	0.000	0.000	0.000	0.000	0.000
4703700003	Irving Materials, Inc.	004	1	30500618	0.000	0.000	0.000	0.000	0.000	0.000
4703700003	Irving Materials, Inc.	005	1	30500608	0.000	0.000	0.000	0.000	0.000	0.000
4703700003	Irving Materials, Inc.	006	1	30500718	0.000	0.000	0.000	0.000	0.000	0.000
4703700005	Innophos Inc.	008	1	30299998	0.000	0.000	0.000	0.000	0.000	0.000
4703700005	Innophos Inc.	010	2	10200501	0.000	0.000	0.000	0.000	0.000	0.000
4703700005	Innophos Inc.	012	1	20100109	0.000	0.000	0.000	0.000	0.000	0.000
4703700009	Vulcan Construction Materials, LP	001	1	30500252	0.000	0.000	0.000	0.000	0.000	0.000
4703700009	Vulcan Construction Materials, LP	001	3	30500252	0.000	0.000	0.000	0.000	0.000	0.000
4703700009	Vulcan Construction Materials, LP	002	1	30500203	0.000	0.000	0.000	0.000	0.000	0.000
4703700009	Vulcan Construction Materials, LP	004	1	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700009	Vulcan Construction Materials, LP	004	2	30502001	0.000	0.000	0.000	0.000	0.000	0.000
4703700009	Vulcan Construction Materials, LP	004	3	30502015	0.000	0.000	0.000	0.000	0.000	0.000
4703700009	Vulcan Construction Materials, LP	004	4	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700009	Vulcan Construction Materials, LP	004	5	30502007	0.000	0.000	0.000	0.000	0.000	0.000
4703700011	Holcim (US) Inc.	001	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700011	Holcim (US) Inc.	002	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700011	Holcim (US) Inc.	003	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700011	Holcim (US) Inc.	005	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700011	Holcim (US) Inc.	006	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700011	Holcim (US) Inc.	007	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700013	Greer Stop Nut, Inc.	001	1	30988801	0.000	0.000	0.000	0.000	0.000	0.000
4703700013	Greer Stop Nut, Inc.	001	3	30988801	0.000	0.000	0.000	0.000	0.000	0.000
4703700015	Rogers Group, Inc. - REOstone, LLC	001	1	30502001	0.000	0.000	0.000	0.000	0.000	0.000
4703700015	Rogers Group, Inc. - REOstone, LLC	002	1	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700015	Rogers Group, Inc. - REOstone, LLC	003	1	30502007	0.000	0.000	0.000	0.000	0.000	0.000
4703700015	Rogers Group, Inc. - REOstone, LLC	004	1	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700015	Rogers Group, Inc. - REOstone, LLC	005	1	30502011	0.000	0.000	0.000	0.000	0.000	0.000
4703700015	Rogers Group, Inc. - REOstone, LLC	006	1	30502011	0.000	0.000	0.000	0.000	0.000	0.000
4703700015	Rogers Group, Inc. - REOstone, LLC	007	1	30502007	0.000	0.000	0.000	0.000	0.000	0.000
4703700015	Rogers Group, Inc. - REOstone, LLC	008	1	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	001	1	30502010	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	001	2	30502001	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	001	3	30502001	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	001	4	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	001	5	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	002	1	30502002	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	002	2	30502002	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	002	3	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	002	4	30502033	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	002	5	30502011	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	002	6	30502017	0.000	0.000	0.000	0.000	0.000	0.000

4703700016	Rogers Group, Inc.	002	7	30502005	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	003	1	30502007	0.000	0.000	0.000	0.000	0.000	0.000
4703700016	Rogers Group, Inc.	003	2	30502007	0.000	0.000	0.000	0.000	0.000	0.000
4703700017	Vulcan Construction Materials, LP	001	1	30502001	0.000	0.000	0.000	0.000	0.000	0.000
4703700017	Vulcan Construction Materials, LP	002	1	30502005	0.000	0.000	0.000	0.000	0.000	0.000
4703700017	Vulcan Construction Materials, LP	003	1	30502099	0.000	0.000	0.000	0.000	0.000	0.000
4703700017	Vulcan Construction Materials, LP	004	1	30502099	0.000	0.000	0.000	0.000	0.000	0.000
4703700017	Vulcan Construction Materials, LP	005	1	30502007	0.000	0.000	0.000	0.000	0.000	0.000
4703700017	Vulcan Construction Materials, LP	006	1	27000320	0.000	0.000	0.000	0.000	0.000	0.000
4703700017	Vulcan Construction Materials, LP	006	2	27000320	0.000	0.000	0.000	0.000	0.000	0.000
4703700017	Vulcan Construction Materials, LP	007	1	27000320	0.000	0.000	0.000	0.000	0.000	0.000
4703700017	Vulcan Construction Materials, LP	007	2	30502004	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	001	1	30502001	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	002	1	30502002	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	003	1	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	004	1	30502005	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	005	1	30502007	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	006	1	30500205	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	007	1	30502510	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	008	1	30502099	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	009	1	30502001	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	010	1	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	011	1	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	012	1	20300101	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	013	1	20300101	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	014	1	30502017	0.000	0.000	0.000	0.000	0.000	0.000
4703700018	Vulcan Construction Materials, LP	015	1	30502006	0.000	0.000	0.000	0.000	0.000	0.000
4703700019	Vulcan Construction Materials, LP	001	1	30502001	0.000	0.000	0.000	0.000	0.000	0.000
4703700019	Vulcan Construction Materials, LP	002	1	30502002	0.000	0.000	0.000	0.000	0.000	0.000
4703700019	Vulcan Construction Materials, LP	003	1	30502007	0.000	0.000	0.000	0.000	0.000	0.000
4703700019	Vulcan Construction Materials, LP	005	1	30502713	0.000	0.000	0.000	0.000	0.000	0.000
4703700019	Vulcan Construction Materials, LP	005	2	20200102	0.000	0.000	0.000	0.000	0.000	0.000
4703700019	Vulcan Construction Materials, LP	006	1	20200102	0.000	0.000	0.000	0.000	0.000	0.000
4703700019	Vulcan Construction Materials, LP	007	1	20200102	0.000	0.000	0.000	0.000	0.000	0.000
4703700022	Dicaperl Minerals Corp.	002	1	30501801	0.000	0.000	0.000	0.000	0.000	0.000
4703700025	Ryman Hospitality Properties, Inc.	002	2	10300501	0.000	0.000	0.000	0.000	0.000	0.000
4703700025	Ryman Hospitality Properties, Inc.	005	1	40301021	0.000	0.000	0.000	0.000	0.000	0.000
4703700025	Ryman Hospitality Properties, Inc.	006	3	40200901	0.000	0.000	0.000	0.000	0.000	0.000
4703700025	Ryman Hospitality Properties, Inc.	008	1	41000201	0.000	0.000	0.000	0.000	0.000	0.000
4703700025	Ryman Hospitality Properties, Inc.	009	1	40301007	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	016	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	017	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	018	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	024	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	025	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	026	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	027	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000

4703700027	Akzo Nobel Coatings Inc.	028	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	029	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	030	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	031	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	032	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	033	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	034	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	035	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	036	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	037	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	038	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	039	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	040	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	041	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	042	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	043	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	044	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	045	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	046	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700027	Akzo Nobel Coatings Inc.	047	1	30101401	0.000	0.000	0.000	0.000	0.000	0.000
4703700029	Purina Animal Nutrition, LLC	001	1	30200802	0.000	0.000	0.000	0.000	0.000	0.000
4703700029	Purina Animal Nutrition, LLC	003	1	30200803	0.000	0.000	0.000	0.000	0.000	0.000
4703700029	Purina Animal Nutrition, LLC	006	1	30200806	0.000	0.000	0.000	0.000	0.000	0.000
4703700029	Purina Animal Nutrition, LLC	006	2	30200806	0.000	0.000	0.000	0.000	0.000	0.000
4703700029	Purina Animal Nutrition, LLC	006	3	30200806	0.000	0.000	0.000	0.000	0.000	0.000
4703700029	Purina Animal Nutrition, LLC	008	2	10300501	0.000	0.000	0.000	0.000	0.000	0.000
4703700029	Purina Animal Nutrition, LLC	009	1	30200804	0.000	0.000	0.000	0.000	0.000	0.000
4703700029	Purina Animal Nutrition, LLC	010	1	30200805	0.000	0.000	0.000	0.000	0.000	0.000
4703700032	Safety-Kleen Systems	004	1	49099998	0.000	0.000	0.000	0.000	0.000	0.000
4703700033	Quikrete - Nashville	002	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700033	Quikrete - Nashville	003	1	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700033	Quikrete - Nashville	004	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700033	Quikrete - Nashville	005	1	30510203	0.000	0.000	0.000	0.000	0.000	0.000
4703700033	Quikrete - Nashville	006	1	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700033	Quikrete - Nashville	008	1	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700033	Quikrete - Nashville	009	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700033	Quikrete - Nashville	010	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700033	Quikrete - Nashville	011	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700037	Best One Tire & Service	001	1	30800501	0.000	0.000	0.000	0.000	0.000	0.000
4703700037	Best One Tire & Service	003	1	40200101	0.000	0.000	0.000	0.000	0.000	0.000
4703700039	Vanderbilt University	001	1	20200107	0.000	0.000	0.000	0.000	0.000	0.000
4703700039	Vanderbilt University	002	1	10300601	0.000	0.000	0.000	0.000	0.000	0.000
4703700039	Vanderbilt University	002	2	10300501	0.000	0.000	0.000	0.000	0.000	0.000
4703700039	Vanderbilt University	002	3	10300207	0.000	0.000	0.000	0.000	0.000	0.000
4703700039	Vanderbilt University	003	1	10300207	0.000	0.000	0.000	0.000	0.000	0.000
4703700039	Vanderbilt University	003	2	10300207	0.000	0.000	0.000	0.000	0.000	0.000
4703700039	Vanderbilt University	008	4	20300202	0.000	0.000	0.000	0.000	0.000	0.000

4703700040	Carlex Glass America, LLC	001	2	30501403	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	003	1	30501407	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	003	2	30501413	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	005	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	005	2	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	006	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	007	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	007	2	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	008	1	30501413	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	010	2	40200101	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	011	1	40200101	0.000	0.000	0.000	0.000	0.000	0.000
4703700040	Carlex Glass America, LLC	015	3	20100102	0.000	0.000	0.000	0.000	0.000	0.000
4703700042	Triumph Aerostructures, LLC	001	2	10200602	0.000	0.000	0.000	0.000	0.000	0.000
4703700042	Triumph Aerostructures, LLC	006	2	10200501	0.000	0.000	0.000	0.000	0.000	0.000
4703700042	Triumph Aerostructures, LLC	007	2	10200501	0.000	0.000	0.000	0.000	0.000	0.000
4703700042	Triumph Aerostructures, LLC	008	1	10200602	0.000	0.000	0.000	0.000	0.000	0.000
4703700042	Triumph Aerostructures, LLC	008	2	10200501	0.000	0.000	0.000	0.000	0.000	0.000
4703700042	Triumph Aerostructures, LLC	009	1	10200603	0.000	0.000	0.000	0.000	0.000	0.000
4703700042	Triumph Aerostructures, LLC	011	1	40202499	0.000	0.000	0.000	0.000	0.000	0.000
4703700042	Triumph Aerostructures, LLC	013	1	40188898	0.000	0.000	0.000	0.000	0.000	0.000
4703700042	Triumph Aerostructures, LLC	014	2	40202406	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	001	1	30501106	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	002	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	003	1	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	004	1	30501109	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	005	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	006	1	30501109	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	008	1	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	009	1	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	010	1	30502007	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	011	1	30502507	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	012	1	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	013	1	30501106	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	014	1	30502507	0.000	0.000	0.000	0.000	0.000	0.000
4703700047	Smyrna Ready Mix Concrete, LLC	015	1	30502504	0.000	0.000	0.000	0.000	0.000	0.000
4703700049	Metro Water Services - Central WWTP	027	1	50100799	0.000	0.000	0.000	0.000	0.000	0.000
4703700049	Metro Water Services - Central WWTP	028	1	50100799	0.000	0.000	0.000	0.000	0.000	0.000
4703700050	Nashville District Energy System	011	1	38500110	0.000	0.000	0.000	0.000	0.000	0.000
4703700061	Citgo Petroleum Corp.	007	1	40400109	0.000	0.000	0.000	0.000	0.000	0.000
4703700062	Cumberland Terminals, Inc.	007	1	40400150	0.000	0.000	0.000	0.000	0.000	0.000
4703700062	Cumberland Terminals, Inc.	008	1	40400109	0.000	0.000	0.000	0.000	0.000	0.000
4703700064	Blanchard Terminal Company, LLC	006	2	40400171	0.000	0.000	0.000	0.000	0.000	0.000
4703700064	Blanchard Terminal Company, LLC	010	4	40400153	0.000	0.000	0.000	0.000	0.000	0.000
4703700064	Blanchard Terminal Company, LLC	012	1	40400199	0.000	0.000	0.000	0.000	0.000	0.000
4703700065	Shell Oil Products US	008	5	40400199	0.000	0.000	0.000	0.000	0.000	0.000
4703700067	ExxonMobil Pipeline Corporation	006	1	40715811	0.000	0.000	0.000	0.000	0.000	0.000
4703700067	ExxonMobil Pipeline Corporation	024	4	40400150	0.000	0.000	0.000	0.000	0.000	0.000

4703700069	MPLX Terminals LLC - Bordeaux Terminal	010	4	40600145	0.000	0.000	0.000	0.000	0.000	0.000
4703700077	Smyrna Ready Mix Concrete, LLC	001	1	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700077	Smyrna Ready Mix Concrete, LLC	002	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700077	Smyrna Ready Mix Concrete, LLC	003	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700077	Smyrna Ready Mix Concrete, LLC	004	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700077	Smyrna Ready Mix Concrete, LLC	005	1	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700077	Smyrna Ready Mix Concrete, LLC	005	2	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700077	Smyrna Ready Mix Concrete, LLC	005	3	30501106	0.000	0.000	0.000	0.000	0.000	0.000
4703700077	Smyrna Ready Mix Concrete, LLC	006	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700079	MPLX Terminals LLC - Nashville Terminal	009	4	39990024	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	001	1	30501416	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	001	2	30501401	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	001	3	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	004	1	30501416	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	004	2	30501401	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	004	3	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	007	1	30501416	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	007	2	30501401	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	007	3	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	010	1	30501416	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	010	2	30501401	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	010	3	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	013	1	30501416	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	013	2	30501401	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	013	3	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	016	1	30501416	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	016	2	30501401	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	016	3	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	019	1	30501416	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	019	2	30501401	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	019	3	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	022	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	023	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	024	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	025	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	026	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	027	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	028	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	029	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	030	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	031	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	032	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	033	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	034	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	035	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	036	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000
4703700080	GAF Corporation	037	1	30501410	0.000	0.000	0.000	0.000	0.000	0.000

4703700081	United States Tobacco Mfg, LP	001	1	10200206	0.000	0.000	0.000	0.000	0.000	0.000
4703700081	United States Tobacco Mfg, LP	001	2	30203399	0.000	0.000	0.000	0.000	0.000	0.000
4703700081	United States Tobacco Mfg, LP	002	2	30203399	0.000	0.000	0.000	0.000	0.000	0.000
4703700081	United States Tobacco Mfg, LP	003	1	30203399	0.000	0.000	0.000	0.000	0.000	0.000
4703700081	United States Tobacco Mfg, LP	008	1	30203399	0.000	0.000	0.000	0.000	0.000	0.000
4703700081	United States Tobacco Mfg, LP	009	6	10200502	0.000	0.000	0.000	0.000	0.000	0.000
4703700081	United States Tobacco Mfg, LP	009	7	10200602	0.000	0.000	0.000	0.000	0.000	0.000
4703700081	United States Tobacco Mfg, LP	009	8	10200502	0.000	0.000	0.000	0.000	0.000	0.000
4703700081	United States Tobacco Mfg, LP	010	1	30203399	0.000	0.000	0.000	0.000	0.000	0.000
4703700083	Lithographics, Inc.	003	1	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700088	River Cement Sales Co. dba Buzzi Unicem	001	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700088	River Cement Sales Co. dba Buzzi Unicem	002	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700088	River Cement Sales Co. dba Buzzi Unicem	003	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700088	River Cement Sales Co. dba Buzzi Unicem	004	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700088	River Cement Sales Co. dba Buzzi Unicem	005	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700088	River Cement Sales Co. dba Buzzi Unicem	006	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700088	River Cement Sales Co. dba Buzzi Unicem	007	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700088	River Cement Sales Co. dba Buzzi Unicem	011	1	30510202	0.000	0.000	0.000	0.000	0.000	0.000
4703700090	Embraer Aircraft Maint Services, Inc	002	1	40100302	0.000	0.000	0.000	0.000	0.000	0.000
4703700090	Embraer Aircraft Maint Services, Inc	002	2	40202401	0.000	0.000	0.000	0.000	0.000	0.000
4703700090	Embraer Aircraft Maint Services, Inc	002	6	40100399	0.000	0.000	0.000	0.000	0.000	0.000
4703700090	Embraer Aircraft Maint Services, Inc	003	1	40202599	0.000	0.000	0.000	0.000	0.000	0.000
4703700091	PSC Metals, LLC	001	1	31401101	0.000	0.000	0.000	0.000	0.000	0.000
4703700091	PSC Metals, LLC	002	1	31401101	0.000	0.000	0.000	0.000	0.000	0.000
4703700091	PSC Metals, LLC	003	1	30510107	0.000	0.000	0.000	0.000	0.000	0.000
4703700091	PSC Metals, LLC	004	1	31401101	0.000	0.000	0.000	0.000	0.000	0.000
4703700091	PSC Metals, LLC	006	1	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700091	PSC Metals, LLC	008	1	20300107	0.000	0.000	0.000	0.000	0.000	0.000
4703700092	QG Printing II, LLC	003	1	30701201	0.000	0.000	0.000	0.000	0.000	0.000
4703700093	Southland Brick and Block	001	1	30510199	0.000	0.000	0.000	0.000	0.000	0.000
4703700100	Irving Materials, Inc.	001	1	30501108	0.000	0.000	0.000	0.000	0.000	0.000
4703700100	Irving Materials, Inc.	002	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700100	Irving Materials, Inc.	003	1	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700100	Irving Materials, Inc.	004	1	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700100	Irving Materials, Inc.	006	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700100	Irving Materials, Inc.	007	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700101	Pine Bluff Materials Co.	001	1	30510598	0.000	0.000	0.000	0.000	0.000	0.000
4703700101	Pine Bluff Materials Co.	002	1	30510598	0.000	0.000	0.000	0.000	0.000	0.000
4703700101	Pine Bluff Materials Co.	003	1	30510309	0.000	0.000	0.000	0.000	0.000	0.000
4703700102	Colonial Pipeline Company	001	2	40400179	0.000	0.000	0.000	0.000	0.000	0.000
4703700108	LaFarge North America, Inc.	001	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700108	LaFarge North America, Inc.	002	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700108	LaFarge North America, Inc.	003	1	30510502	0.000	0.000	0.000	0.000	0.000	0.000
4703700108	LaFarge North America, Inc.	004	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700108	LaFarge North America, Inc.	005	1	30510402	0.000	0.000	0.000	0.000	0.000	0.000
4703700118	Southern Machinery Co	001	2	40288824	0.000	0.000	0.000	0.000	0.000	0.000
4703700127	United Cabinet Corporation	002	1	30702003	0.000	0.000	0.000	0.000	0.000	0.000

4703700127	United Cabinet Corporation	003	1	50300102	0.000	0.000	0.000	0.000	0.000	0.000
4703700135	AmeriColor	001	1	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700135	AmeriColor	001	2	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700135	AmeriColor	001	5	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700139	Hennessy Industries, Inc.	001	2	40299998	0.000	0.000	0.000	0.000	0.000	0.000
4703700149	Cliff's Cabinet Company	002	1	30799998	0.000	0.000	0.000	0.000	0.000	0.000
4703700159	Creative Cabinetry Solutions, Inc.	002	1	40288801	0.000	0.000	0.000	0.000	0.000	0.000
4703700163	Skyline Madison Campus	002	1	31502001	0.000	0.000	0.000	0.000	0.000	0.000
4703700164	Vulcan Construction Materials, LP	002	1	30500203	0.000	0.000	0.000	0.000	0.000	0.000
4703700164	Vulcan Construction Materials, LP	004	1	30500204	0.000	0.000	0.000	0.000	0.000	0.000
4703700164	Vulcan Construction Materials, LP	004	2	20200102	0.000	0.000	0.000	0.000	0.000	0.000
4703700164	Vulcan Construction Materials, LP	005	1	30500203	0.000	0.000	0.000	0.000	0.000	0.000
4703700164	Vulcan Construction Materials, LP	006	1	30510298	0.000	0.000	0.000	0.000	0.000	0.000
4703700164	Vulcan Construction Materials, LP	006	2	30510105	0.000	0.000	0.000	0.000	0.000	0.000
4703700164	Vulcan Construction Materials, LP	006	3	30510105	0.000	0.000	0.000	0.000	0.000	0.000
4703700164	Vulcan Construction Materials, LP	006	4	20200107	0.000	0.000	0.000	0.000	0.000	0.000
4703700166	Pine Bluff Materials Co.	001	1	30510309	0.000	0.000	0.000	0.000	0.000	0.000
4703700166	Pine Bluff Materials Co.	001	2	30510309	0.000	0.000	0.000	0.000	0.000	0.000
4703700166	Pine Bluff Materials Co.	001	3	30510398	0.000	0.000	0.000	0.000	0.000	0.000
4703700166	Pine Bluff Materials Co.	002	1	30510309	0.000	0.000	0.000	0.000	0.000	0.000
4703700166	Pine Bluff Materials Co.	002	2	30510309	0.000	0.000	0.000	0.000	0.000	0.000
4703700166	Pine Bluff Materials Co.	003	1	30510198	0.000	0.000	0.000	0.000	0.000	0.000
4703700166	Pine Bluff Materials Co.	003	2	30510598	0.000	0.000	0.000	0.000	0.000	0.000
4703700176	Superior Trim	001	1	40200701	0.000	0.000	0.000	0.000	0.000	0.000
4703700176	Superior Trim	002	1	40200701	0.000	0.000	0.000	0.000	0.000	0.000
4703700179	Commercial Laminations, Inc.	005	1	30702003	0.000	0.000	0.000	0.000	0.000	0.000
4703700181	Irving Materials, Inc.	001	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700181	Irving Materials, Inc.	002	1	30501114	0.000	0.000	0.000	0.000	0.000	0.000
4703700181	Irving Materials, Inc.	003	1	30501106	0.000	0.000	0.000	0.000	0.000	0.000
4703700181	Irving Materials, Inc.	004	1	30501108	0.000	0.000	0.000	0.000	0.000	0.000
4703700181	Irving Materials, Inc.	005	1	30501106	0.000	0.000	0.000	0.000	0.000	0.000
4703700183	#N/A	002	1	40202599	0.000	0.000	0.000	0.000	0.000	0.000
4703700186	Servitech Industries, Inc.	002	1	40202501	0.000	0.000	0.000	0.000	0.000	0.000
4703700186	Servitech Industries, Inc.	007	1	30900208	0.000	0.000	0.000	0.000	0.000	0.000
4703700188	Dixie Graphics	003	1	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700188	Dixie Graphics	004	1	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700191	Ergon Asphalt & Emulsions, Inc.	002	2	40400103	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	001	1	30101809	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	002	1	30101809	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	003	1	30108001	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	004	1	30108001	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	008	2	10200602	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	010	1	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	010	3	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	011	1	30101809	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	013	2	10200503	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	014	2	10200601	0.000	0.000	0.000	0.000	0.000	0.000

4703700196	Fiberweb, Inc. (A Berry Global Company)	015	2	20200202	0.000	0.000	0.000	0.000	0.000	0.000
4703700196	Fiberweb, Inc. (A Berry Global Company)	016	1	38500101	0.000	0.000	0.000	0.000	0.000	0.000
4703700197	Magnetic Ticket & Label Corp.	002	1	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700197	Magnetic Ticket & Label Corp.	002	3	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700197	Magnetic Ticket & Label Corp.	002	4	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700197	Magnetic Ticket & Label Corp.	011	2	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700197	Magnetic Ticket & Label Corp.	015	1	40204435	0.000	0.000	0.000	0.000	0.000	0.000
4703700198	Summit Medical Center	003	2	20100107	0.000	0.000	0.000	0.000	0.000	0.000
4703700204	Jones Bros. Contractors, LLC	002	1	30500203	0.000	0.000	0.000	0.000	0.000	0.000
4703700204	Jones Bros. Contractors, LLC	003	1	30500203	0.000	0.000	0.000	0.000	0.000	0.000
4703700204	Jones Bros. Contractors, LLC	004	1	30500203	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	001	2	30500205	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	002	1	30500203	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	003	1	30500204	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	003	2	30500290	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	004	1	30500290	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	004	3	20200102	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	005	1	30504031	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	006	1	30504034	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	006	2	20200102	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	007	1	30504031	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	007	2	20200102	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	008	1	30510298	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	008	2	30510105	0.000	0.000	0.000	0.000	0.000	0.000
4703700208	Vulcan Construction Materials, LP	008	3	30510105	0.000	0.000	0.000	0.000	0.000	0.000
4703700213	Trew Industrial Wheels, Inc.	003	1	30800702	0.000	0.000	0.000	0.000	0.000	0.000
4703700213	Trew Industrial Wheels, Inc.	003	2	30800703	0.000	0.000	0.000	0.000	0.000	0.000
4703700213	Trew Industrial Wheels, Inc.	003	3	30800702	0.000	0.000	0.000	0.000	0.000	0.000
4703700213	Trew Industrial Wheels, Inc.	005	1	30800705	0.000	0.000	0.000	0.000	0.000	0.000
4703700214	Nashville Ready Mix, Inc.	001	1	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700214	Nashville Ready Mix, Inc.	001	2	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700214	Nashville Ready Mix, Inc.	001	3	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700214	Nashville Ready Mix, Inc.	001	4	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700214	Nashville Ready Mix, Inc.	001	5	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700214	Nashville Ready Mix, Inc.	001	6	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700214	Nashville Ready Mix, Inc.	001	7	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700214	Nashville Ready Mix, Inc.	002	1	30501106	0.000	0.000	0.000	0.000	0.000	0.000
4703700220	Rogers Group, Inc.	001	2	30500240	0.000	0.000	0.000	0.000	0.000	0.000
4703700220	Rogers Group, Inc.	002	1	30500204	0.000	0.000	0.000	0.000	0.000	0.000
4703700220	Rogers Group, Inc.	002	2	30500290	0.000	0.000	0.000	0.000	0.000	0.000
4703700220	Rogers Group, Inc.	003	1	30500203	0.000	0.000	0.000	0.000	0.000	0.000
4703700222	TWIG America Inc.	001	1	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700222	TWIG America Inc.	001	2	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700231	S & H Chrome Plating & Powder Coating	001	1	30901028	0.000	0.000	0.000	0.000	0.000	0.000
4703700231	S & H Chrome Plating & Powder Coating	002	1	30901068	0.000	0.000	0.000	0.000	0.000	0.000
4703700233	Smyrna Ready Mix Concrete, LLC	001	1	30510498	0.000	0.000	0.000	0.000	0.000	0.000
4703700233	Smyrna Ready Mix Concrete, LLC	001	2	30510498	0.000	0.000	0.000	0.000	0.000	0.000

4703700233	Smyrna Ready Mix Concrete, LLC	002	3	30510498	0.000	0.000	0.000	0.000	0.000	0.000
4703700233	Smyrna Ready Mix Concrete, LLC	003	4	30510498	0.000	0.000	0.000	0.000	0.000	0.000
4703700251	R.J. Wherry and Associates, Inc.	001	5	40288801	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	001	1	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	001	2	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	001	3	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	002	1	30501112	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	002	2	30501112	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	003	1	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	003	2	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	003	3	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	004	1	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	004	2	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	004	3	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	005	1	30501112	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	005	2	30501112	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	006	1	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	006	2	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700252	Smyrna Ready Mix Concrete, LLC	006	3	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700262	CEMEX, Inc.	001	1	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700262	CEMEX, Inc.	002	1	30500618	0.000	0.000	0.000	0.000	0.000	0.000
4703700262	CEMEX, Inc.	003	1	30500618	0.000	0.000	0.000	0.000	0.000	0.000
4703700262	CEMEX, Inc.	004	1	30501111	0.000	0.000	0.000	0.000	0.000	0.000
4703700262	CEMEX, Inc.	005	1	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700262	CEMEX, Inc.	006	1	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700266	Mid-Tech Gage, Inc.	001	1	30901018	0.000	0.000	0.000	0.000	0.000	0.000
4703700269	North American Composites Co.	001	1	30101866	0.000	0.000	0.000	0.000	0.000	0.000
4703700269	North American Composites Co.	001	2	30101866	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	001	1	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	002	1	20200107	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	003	1	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	004	1	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	005	1	30700821	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	006	1	30704004	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	007	1	20200107	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	008	1	30704002	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	009	2	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700272	Alternative Energy, LLC	010	2	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700276	The Mulch Company, LLC	001	1	30704003	0.000	0.000	0.000	0.000	0.000	0.000
4703700276	The Mulch Company, LLC	001	3	30704002	0.000	0.000	0.000	0.000	0.000	0.000
4703700276	The Mulch Company, LLC	001	4	30704004	0.000	0.000	0.000	0.000	0.000	0.000
4703700276	The Mulch Company, LLC	001	5	30700821	0.000	0.000	0.000	0.000	0.000	0.000
4703700279	ARAMARK Uniform Services	003	1	39000699	0.000	0.000	0.000	0.000	0.000	0.000
4703700279	ARAMARK Uniform Services	003	2	39000699	0.000	0.000	0.000	0.000	0.000	0.000
4703700279	ARAMARK Uniform Services	003	3	39000699	0.000	0.000	0.000	0.000	0.000	0.000
4703700285	Smyrna Ready Mix Concrete, LLC	001	1	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700285	Smyrna Ready Mix Concrete, LLC	002	1	30501106	0.000	0.000	0.000	0.000	0.000	0.000

4703700285	Smyrna Ready Mix Concrete, LLC	003	1	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700285	Smyrna Ready Mix Concrete, LLC	004	1	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700285	Smyrna Ready Mix Concrete, LLC	005	1	30501106	0.000	0.000	0.000	0.000	0.000	0.000
4703700290	AZZ Galvanizing - Nashville	001	1	30901103	0.000	0.000	0.000	0.000	0.000	0.000
4703700290	AZZ Galvanizing - Nashville	001	2	30901103	0.000	0.000	0.000	0.000	0.000	0.000
4703700290	AZZ Galvanizing - Nashville	002	1	30901102	0.000	0.000	0.000	0.000	0.000	0.000
4703700290	AZZ Galvanizing - Nashville	005	1	30901103	0.000	0.000	0.000	0.000	0.000	0.000
4703700290	AZZ Galvanizing - Nashville	005	2	30901103	0.000	0.000	0.000	0.000	0.000	0.000
4703700293	Marangoni Tread, N.A., Inc.	001	1	30800501	0.000	0.000	0.000	0.000	0.000	0.000
4703700294	Berry Film Products Company, Inc.	007	3	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700294	Berry Film Products Company, Inc.	007	4	40500403	0.000	0.000	0.000	0.000	0.000	0.000
4703700296	Smyrna Ready Mix Concrete, LLC	001	1	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700296	Smyrna Ready Mix Concrete, LLC	001	2	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700296	Smyrna Ready Mix Concrete, LLC	001	3	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700296	Smyrna Ready Mix Concrete, LLC	001	4	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700296	Smyrna Ready Mix Concrete, LLC	001	5	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700296	Smyrna Ready Mix Concrete, LLC	001	6	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700296	Smyrna Ready Mix Concrete, LLC	001	7	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700299	Healthcare Realty Services, Inc.	001	2	10300502	0.000	0.000	0.000	0.000	0.000	0.000
4703700300	Nashville Ready Mix, Inc.	001	1	30501113	0.000	0.000	0.000	0.000	0.000	0.000
4703700300	Nashville Ready Mix, Inc.	002	1	30510298	0.000	0.000	0.000	0.000	0.000	0.000
4703700300	Nashville Ready Mix, Inc.	003	1	30501110	0.000	0.000	0.000	0.000	0.000	0.000
4703700300	Nashville Ready Mix, Inc.	004	1	30510305	0.000	0.000	0.000	0.000	0.000	0.000
4703700300	Nashville Ready Mix, Inc.	005	1	30510299	0.000	0.000	0.000	0.000	0.000	0.000
4703700300	Nashville Ready Mix, Inc.	006	1	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700300	Nashville Ready Mix, Inc.	007	1	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700300	Nashville Ready Mix, Inc.	008	1	30501106	0.000	0.000	0.000	0.000	0.000	0.000
4703700302	Waste Management of Nashville	014	2	40201001	0.000	0.000	0.000	0.000	0.000	0.000
4703700316	CHEP Recycled Pallet Solutions, LLC	002	1	30788801	0.000	0.000	0.000	0.000	0.000	0.000
4703700316	CHEP Recycled Pallet Solutions, LLC	002	2	30704005	0.000	0.000	0.000	0.000	0.000	0.000
4703700324	Lipscomb University	001	2	10300502	0.000	0.000	0.000	0.000	0.000	0.000
4703700326	American Sugar Refining	001	1	30201542	0.000	0.000	0.000	0.000	0.000	0.000
4703700326	American Sugar Refining	002	1	30201542	0.000	0.000	0.000	0.000	0.000	0.000
4703700326	American Sugar Refining	003	1	30201542	0.000	0.000	0.000	0.000	0.000	0.000
4703700327	Rogers Group, Inc.	001	1	30510505	0.000	0.000	0.000	0.000	0.000	0.000
4703700327	Rogers Group, Inc.	001	2	30510505	0.000	0.000	0.000	0.000	0.000	0.000
4703700327	Rogers Group, Inc.	001	3	30510405	0.000	0.000	0.000	0.000	0.000	0.000
4703700327	Rogers Group, Inc.	001	4	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700327	Rogers Group, Inc.	002	1	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700335	Advanced Composites, Inc.	001	1	30101864	0.000	0.000	0.000	0.000	0.000	0.000
4703700335	Advanced Composites, Inc.	003	1	30101821	0.000	0.000	0.000	0.000	0.000	0.000
4703700335	Advanced Composites, Inc.	006	1	30101817	0.000	0.000	0.000	0.000	0.000	0.000
4703700348	3M Company	001	1	33000199	0.000	0.000	0.000	0.000	0.000	0.000
4703700348	3M Company	001	5	33000199	0.000	0.000	0.000	0.000	0.000	0.000
4703700348	3M Company	001	6	33000199	0.000	0.000	0.000	0.000	0.000	0.000
4703700348	3M Company	002	1	33000199	0.000	0.000	0.000	0.000	0.000	0.000
4703700348	3M Company	002	2	33000199	0.000	0.000	0.000	0.000	0.000	0.000

4703700351	American Farms	001	1	30502510	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	002	1	30502511	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	002	2	30502511	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	002	3	30502503	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	002	4	20300101	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	002	5	30502502	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	002	6	20300101	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	003	1	30502511	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	003	2	30502503	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	003	3	30502502	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	004	1	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	004	2	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	004	3	30700822	0.000	0.000	0.000	0.000	0.000	0.000
4703700351	American Farms	005	1	30502504	0.000	0.000	0.000	0.000	0.000	0.000
4703700352	Waste Management of Tennessee - MTEC	001	1	31100204	0.000	0.000	0.000	0.000	0.000	0.000
4703700352	Waste Management of Tennessee - MTEC	001	2	31100299	0.000	0.000	0.000	0.000	0.000	0.000
4703700352	Waste Management of Tennessee - MTEC	001	3	30588801	0.000	0.000	0.000	0.000	0.000	0.000
4703700352	Waste Management of Tennessee - MTEC	002	1	31100299	0.000	0.000	0.000	0.000	0.000	0.000
4703700352	Waste Management of Tennessee - MTEC	003	2	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700352	Waste Management of Tennessee - MTEC	003	3	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700352	Waste Management of Tennessee - MTEC	003	4	30700822	0.000	0.000	0.000	0.000	0.000	0.000
4703700354	C&J Mulch, Inc.	002	1	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700354	C&J Mulch, Inc.	003	1	30700821	0.000	0.000	0.000	0.000	0.000	0.000
4703700354	C&J Mulch, Inc.	004	1	30700822	0.000	0.000	0.000	0.000	0.000	0.000
4703700354	C&J Mulch, Inc.	005	1	30700899	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	001	1	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	001	2	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	001	3	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	001	4	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	001	5	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	002	1	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	002	2	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	002	3	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	002	4	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	002	5	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	002	6	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	002	7	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	002	8	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	002	9	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	003	1	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	003	2	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	003	3	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	003	4	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	003	5	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	003	6	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	003	7	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	004	1	30180001	0.000	0.000	0.000	0.000	0.000	0.000

4703700363	Sontara Old Hickory, Inc.	004	2	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	004	3	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	004	4	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700363	Sontara Old Hickory, Inc.	004	5	30180001	0.000	0.000	0.000	0.000	0.000	0.000
4703700364	Service King Paint & Body, LLC	001	2	40201699	0.000	0.000	0.000	0.000	0.000	0.000
4703700378	Service King Collision Repair Center	001	2	40201001	0.000	0.000	0.000	0.000	0.000	0.000
4703700381	Kennametal, Inc.	002	1	30903004	0.000	0.000	0.000	0.000	0.000	0.000
4703700381	Kennametal, Inc.	004	1	40202543	0.000	0.000	0.000	0.000	0.000	0.000
4703700381	Kennametal, Inc.	005	1	40202543	0.000	0.000	0.000	0.000	0.000	0.000
4703700381	Kennametal, Inc.	006	1	30900201	0.000	0.000	0.000	0.000	0.000	0.000
4703700381	Kennametal, Inc.	008	1	30402201	0.000	0.000	0.000	0.000	0.000	0.000
4703700381	Kennametal, Inc.	010	1	40301021	0.000	0.000	0.000	0.000	0.000	0.000
4703700386	Foley Products Company	001	1	30501101	0.000	0.000	0.000	0.000	0.000	0.000
4703700386	Foley Products Company	001	2	30501101	0.000	0.000	0.000	0.000	0.000	0.000
4703700386	Foley Products Company	001	3	30501107	0.000	0.000	0.000	0.000	0.000	0.000
4703700386	Foley Products Company	001	4	30501106	0.000	0.000	0.000	0.000	0.000	0.000
4703700386	Foley Products Company	001	5	30501108	0.000	0.000	0.000	0.000	0.000	0.000
4703700386	Foley Products Company	001	6	30501109	0.000	0.000	0.000	0.000	0.000	0.000
4703700386	Foley Products Company	001	7	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700386	Foley Products Company	001	8	30501115	0.000	0.000	0.000	0.000	0.000	0.000
4703700386	Foley Products Company	001	9	30501199	0.000	0.000	0.000	0.000	0.000	0.000
4703700387	TriStar Southern Hills Medical Center	001	1	10300603	0.000	0.000	0.000	0.000	0.000	0.000
4703700387	TriStar Southern Hills Medical Center	001	2	10300503	0.000	0.000	0.000	0.000	0.000	0.000
4703700387	TriStar Southern Hills Medical Center	002	1	20300101	0.000	0.000	0.000	0.000	0.000	0.000
4703700391	UniFirst Corporation	001	6	33000106	0.000	0.000	0.000	0.000	0.000	0.000
4703700392	Pepsi Beverages Company	001	4	38500101	0.000	0.000	0.000	0.000	0.000	0.000
4703700393	Welcome to 1979 Industries, LLC	001	1	30901068	0.000	0.000	0.000	0.000	0.000	0.000
4703700396	Living Earth	002	1	30700820	0.000	0.000	0.000	0.000	0.000	0.000
4703700396	Living Earth	003	1	30700896	0.000	0.000	0.000	0.000	0.000	0.000
4703700653	Music City Mortuary	002	1	31502102	0.000	0.000	0.000	0.000	0.000	0.000
4703700705	Bordeaux Cleaners	002	1	41000201	0.000	0.000	0.000	0.000	0.000	0.000
4703700720	Joy Cleaners	001	1	40100101	0.000	0.000	0.000	0.000	0.000	0.000
4703700762	Mr. C's Cleaners	001	1	40100101	0.000	0.000	0.000	0.000	0.000	0.000
4703700788	Belle Place Cleaners, Inc.	001	1	41000201	0.000	0.000	0.000	0.000	0.000	0.000
4703700831	Belle Meade Cleaners	001	1	40100101	0.000	0.000	0.000	0.000	0.000	0.000
4703700832	Nashville Dry Cleaners	001	1	40100101	0.000	0.000	0.000	0.000	0.000	0.000
4703700832	Nashville Dry Cleaners	001	2	40100102	0.000	0.000	0.000	0.000	0.000	0.000
			Total Emissions		**1,285.79**	**530.89**	**1,001.45**	**1,567.47**	**657.21**	**1,208.04**

Appendix I

Point Source Emissions Inventory

for Four Facilities

Point Source Emission Inventory for Four Facilities

Baseline (2014 NEI) and projected future (2022) point source VOC, CO, and NO_X emissions are shown below.

Facility	County	Emissions (tons/year)					
		2014 NEI V1			2022 Projection		
		CO	NO_X	VOC	CO	NO_X	VOC
BFI Waste Systems of Tennessee, LLC - Middle Point Landfill	Rutherford	133.02	24.45	25.46	186.47	34.28	28.90
Bridgestone Americas Tire Operations, LLC	Rutherford	26.73	25.92	203.55	26.73	25.92	203.55
Hoeganaes Corporation	Sumner	793.20	94.65	6.73	751.16	89.63	6.37
TVA Gallatin Fossil Plant	Sumner	884.22	5106.17	106.24	872.72	1142.97	102.95

BFI Waste Systems of Tennessee, LLC - Middle Point Landfill

Future emissions were estimated using the Title V renewal application dated August 22, 2018. The Title V renewal application used EPA's LandGEM (Landfill Gas Emissions Model) to calculate future landfill gas generation rates from historic and projected waste acceptance rates. The ratio of 2022 to 2014 landfill gas generation rates was used to scale the 2014 NEI to obtain future emissions.

TVA Gallatin

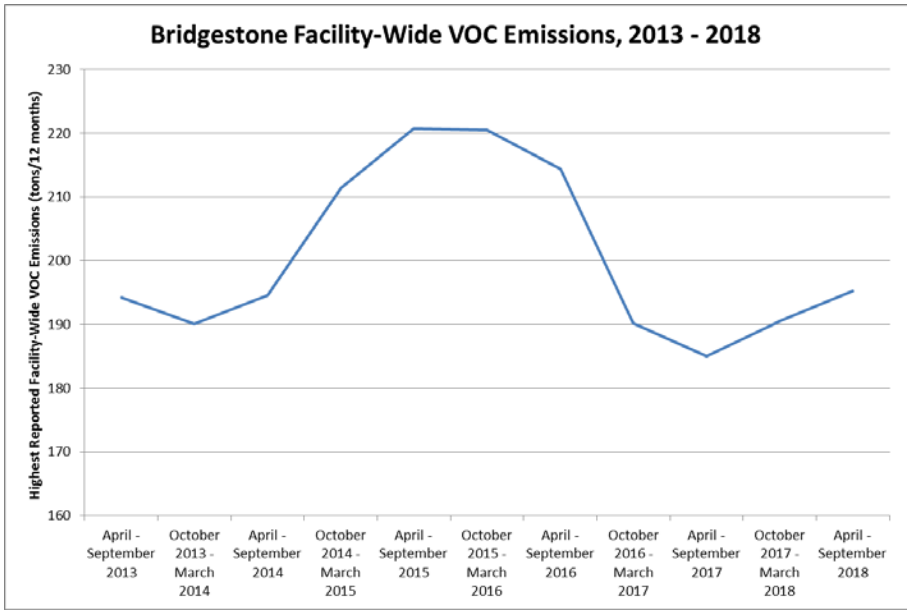
Future NO_X emissions from Gallatin's coal fired boilers were estimated from Acid Rain Program data (EPA Clean Air Markets Division). Since the heat input to these boilers varies from year to year, the median heat input from 1995 to 2017 was used as a basis for future emissions. TVA is installing SCR to control NO_X emissions from the coal-fired boilers, and a controlled emission rate of 0.03 lb/MMBtu was used to project NO_X emissions from these units.

CO and VOC emissions from the coal units were estimated using the 1995-2017 median heat input and an emission factor of 24,317 lb/TBtu for CO and 2,918 lb/TBtu for VOC. These emission factors are based on AP-42 and were obtained from the Title V renewal application for TVA's Kingston Fossil Plant. The AP-42 emission factors are based on pound of emissions per ton of coal, and TVA used the fuel mixture for Kingston to convert emissions into a heat input basis. The amount of coal burned at Gallatin was not known, but the fuel mixtures at Gallatin and Kingston were assumed to be comparable.

For the natural gas-fired combustion turbines, future emissions were estimated using Acid Rain Program data (NO_X) or AP-42 emission factors (CO and VOC). Because TVA has been increasing the use of simple-cycle combustion turbines due to the lower price of natural gas, emissions were based on the highest reported annual heat input and the highest reported NO_X emission rate for 2000- 2017.

Bridgestone Americas Tire Operations, LLC

Bridgestone's Title V semiannual reports for the period of April 1, 2013 to September 30, 2018 were reviewed to determine the trends and variability in facility-wide VOC emissions. The highest reported 12-month total VOC emissions were 220.73 tons (reporting period of April – September 2015). The 12-month total emissions averaged 200.63 tons/year between April 2013 and September 2018, with a minimum of 184.98 tons (April – September 2017) and a maximum of 220.73 tons (April – September 2015). Emissions changed over time as shown below:



Because VOC emissions reported in the 2014 NEI are comparable to the historic average emission rate for this facility, the 2022 projection was based on the 2014 NEI.

Hoeganaes Corporation

Future emissions were estimated from the 2014 emission inventory and the monthly production rates reported in the facility's Title V semiannual reports (October 2013 - September 2018). A comparison of monthly production rates for calendar years 2014 and 2017 indicated a 5.3% decrease in the monthly production rate. Future year emissions were estimated by multiplying the 2014 NEI results by 94.7% (i. e., emissions were adjusted downward based on the change in production).

Appendix J

Nonpoint Emissions Inventory

Appendix J: Nonpoint emission inventory

For the nonpoint emission inventory, fourteen categories were determined to be contributors to the particular pollutants of interest, i.e. CO, NOx, and VOC. The development of the nonpoint emission inventory was completed by following the EPA's established methodologies that are laid out in the nonpoint tools published by the EPA and available on the NOMAD Sharepoint website.

The following is a description of the pages in this appendix:

Page Number	**Description**
J-2	This page shows the fourteen categories and the source of the 2014 data.
J-3	This page shows the fourteen categories and the SCC codes that were examined.
J-4, J-5, J-6	These pages show the description of each individual SCC
J-7, J-8, J-9	These pages give an explanation of how the emissions were projected to 2022.
J-10 through J-15	These pages show the 2014 and 2022 emissions from each individual SCC
J-16 through J-19	This page shows the total 2014 and 2022 emissions for the fourteen categories

2014 Data Sources

Sector (and link to summary table)	sub-sector	Source of 2014 Nonpoint Data	Comment
Ag Live Stock		aglivestock_emissions_2014NEIv2_EPA.xlsx	NOMAD 2014 NEI v2 Tool
Ag Pesticides		2014_Agricultural_Pesticides_2461850000_Emissions_v2.1.xlsx	NOMAD 2014 NEI v2 Tool
Asphalt Paving	cutback	asphalt_paving_cutback_2461021000_emissions_sameas2008 v2.xlsx	NOMAD 2014 NEI v2 Tool
	emulsified	asphalt_paving_emulsified_2461022000_emissions_sameas2008 v2.xlsx	NOMAD 2014 NEI v2 Tool
Aviation Gas	stage 1	2014_Aviation_Gasoline_Distribution_Stage_1_2501080050_Emissions_v4.1.xlsx	NOMAD 2014 NEI v2 Tool
	stage 2	2014_Aviation_Gasoline_Distribution_Stage_2_2501080100_Emissions_v4.1.xlsx	NOMAD 2014 NEI v2 Tool
Commercial Cooking		2014_Commerical Cooking_Emissions_v1.5.accdb	NOMAD 2014 NEI v2 Tool
Composting		2014_Greenwaste_Compost_2680003000_v4.xlsx	NOMAD 2014 NEI v2 Tool
Gasoline - Stage 1 Distribution	Bulk Plants	2014_Gasoline_Distribution_Stage_I_Bulk_Plants_2501055120_CAP_Emissions_v1_1	NOMAD 2014 NEI v2 Tool
	Bulk Terminals	2014_Gasoline_Distribution_Stage_I_Bulk_Terminals_2501050120_CAP_Emissions_v1_1.xls	NOMAD 2014 NEI v2 Tool
	Pipelines	2014_Gasoline_Distribution_Stage_I_Pipelines_2505040120_CAP_Emissions_v1_1.xls	NOMAD 2014 NEI v2 Tool
	Service Station	2014_Gasoline_Distribution_Stage_I_Service_Station_Unloading_v1.2.accdb	NOMAD 2014 NEI v2 Tool
Human Cremation		human_cremation_2810060100_EPA_2014v2.xlsx	NOMAD 2014 NEI v2 Tool
ICI Fuel Combustion		ICI Tool v1.6.accdb	NOMAD 2014 NEI v2 Tool
Open Burning	Land Clearing debris	2014_open_burning_land_clearing_debris_2610000500_CAP_emissions_v1_4.xlsx	NOMAD 2014 NEI v2 Tool
	MSW	2014_open_burning_MSW_2610030000_CAP_emissions_v1.1.xlsx	NOMAD 2014 NEI v2 Tool
	Yard waste brush	2014_open_burning_yard_waste_brush_2610000400_CAP_emissions_v1.1.xlsx	NOMAD 2014 NEI v2 Tool
	Yard waste leaf	2014_open_burning_yard_waste_leaf_2610000100_CAP_emissions_v1.1.xlsx	NOMAD 2014 NEI v2 Tool
Residential Charcoal Grilling (RCG)		NOMAD Residential Charcoal Grilling Tool_v1_1.accdb	NOMAD 2014 NEI v2 Tool
Residential Heating	Coal	2014_residential_coal_2104001000_2104002000_cap_emissions_v1.3.xlsx	NOMAD 2014 NEI v2 Tool
	Distillate	2014_residential_distillate_2104004000_cap_emissions_v1.3.xlsx	NOMAD 2014 NEI v2 Tool
	Kerosene	2014_residential_kerosene_210401100_cap_emissions_v1.3.xlsx	NOMAD 2014 NEI v2 Tool
	LPG	2014_residential_LPG_2104007000_emissions_v1.3.xlsx	NOMAD 2014 NEI v2 Tool
	NG	2014_residential_natural_gas_2104006000_emissions_v1.3.xlsx	NOMAD 2014 NEI v2 Tool
Residential Wood Combustion (RWC)		RWC_Tool_v3.2_DRAFT.accdb	NOMAD 2014 NEI v2 Tool
Solvents		Solvent Tool v1_7_Graphic Arts_Population.accdb	NOMAD 2014 NEI v2 Tool

Nonpoint Inventory Total Emissions

Selected Source Classification Codes (SCC)

Ag Livestock	Ag Pesticides	Asphalt Paving	Aviation Gasoline	Gasoline Stage 1	Commercial Cooking	Composting	Human Cremation	Open Burning	Residential Heating	RWC	RCG	ICI	Solvent SCCs
2805002000	2461850000	2461021000	2501080050	2501055120	2302002100	2680003000	2810060100	2610000500	2104001000	2104008100	2810025000	2102001000	2401001000
2805018000		2461022000	2501080100	2501050120	2302002200			2610030000	2104002000	2104008210		2102002000	2401005000
2805025000				2505040120	2302003000			2610000400	2104004000	2104008220		2102004001	2401008000
2805007100				2501060051	2302003100			2610000100	2104011000	2104008230		2102004002	2401015000
2805009100				2501060052	2302003200				2104007000	2104008310		2102005000	2401020000
				2501060053					2104006000	2104008320		2102006000	2401025000
										2104008330		2102007000	2401030000
										2104008400		2102008000	2401040000
										2104008510		2102011000	2401055000
										2104008610		2103001000	2401060000
										2104008700		2103002000	2401065000
										2104009000		2103004001	2401070000
												2103004002	2401075000
												2103005000	2401080000
												2103006000	2401090000
												2103007000	2401100000
												2103008000	2401200000
												2103011000	2415000000
													2420000000
													2425000000
													2460100000
													2460200000
													2460400000
													2460500000
													2460600000
													2460800000
													2460900000

SCC description

SCC	Category	scc level one>scc level two>scc level three>scc level four
2102001000	Nonpoint	Stationary Source Fuel Combustion>Industrial>Anthracite Coal>Total: All Boiler Types
2102002000	Nonpoint	Stationary Source Fuel Combustion>Industrial>Bituminous/Subbituminous Coal>Total: All Boiler Types
2102004001	Nonpoint	Stationary Source Fuel Combustion>Industrial>Distillate Oil>All Boiler Types
2102004002	Nonpoint	Stationary Source Fuel Combustion>Industrial>Distillate Oil>All IC Engine Types
2102005000	Nonpoint	Stationary Source Fuel Combustion>Industrial>Residual Oil>Total: All Boiler Types
2102006000	Nonpoint	Stationary Source Fuel Combustion>Industrial>Natural Gas>Total: Boilers and IC Engines
2102007000	Nonpoint	Stationary Source Fuel Combustion>Industrial>Liquified Petroleum Gas (LPG)>Total: All Boiler Types
2102008000	Nonpoint	Stationary Source Fuel Combustion>Industrial>Wood>Total: All Boiler Types
2102011000	Nonpoint	Stationary Source Fuel Combustion>Industrial>Kerosene>Total: All Boiler Types
2103001000	Nonpoint	Stationary Source Fuel Combustion>Commercial/Institutional>Anthracite Coal>Total: All Boiler Types
2103002000	Nonpoint	Stationary Source Fuel Combustion>Commercial/Institutional>Bituminous/Subbituminous Coal>Total: All Boiler Types
2103004001	Nonpoint	Stationary Source Fuel Combustion>Commercial/Institutional>Distillate Oil>Boilers
2103004002	Nonpoint	Stationary Source Fuel Combustion>Commercial/Institutional>Distillate Oil>IC Engines
2103005000	Nonpoint	Stationary Source Fuel Combustion>Commercial/Institutional>Residual Oil>Total: All Boiler Types
2103006000	Nonpoint	Stationary Source Fuel Combustion>Commercial/Institutional>Natural Gas>Total: Boilers and IC Engines
2103007000	Nonpoint	Stationary Source Fuel Combustion>Commercial/Institutional>Liquified Petroleum Gas (LPG)>Total: All Combustor Types
2103008000	Nonpoint	Stationary Source Fuel Combustion>Commercial/Institutional>Wood>Total: All Boiler Types
2103011000	Nonpoint	Stationary Source Fuel Combustion>Commercial/Institutional>Kerosene>Total: All Combustor Types
2104001000	Nonpoint	Stationary Source Fuel Combustion>Residential>Anthracite Coal>Total: All Combustor Types
2104002000	Nonpoint	Stationary Source Fuel Combustion>Residential>Bituminous/Subbituminous Coal>Total: All Combustor Types
2104004000	Nonpoint	Stationary Source Fuel Combustion>Residential>Distillate Oil>Total: All Combustor Types
2104006000	Nonpoint	Stationary Source Fuel Combustion>Residential>Natural Gas>Total: All Combustor Types
2104007000	Nonpoint	Stationary Source Fuel Combustion>Residential>Liquified Petroleum Gas (LPG)>Total: All Combustor Types
2104008100	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Fireplace: general
2104008210	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Woodstove: fireplace inserts; non-EPA certified
2104008220	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Woodstove: fireplace inserts; EPA certified; non-catalytic
2104008230	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Woodstove: fireplace inserts; EPA certified; catalytic
2104008310	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Woodstove: freestanding, non-EPA certified
2104008320	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Woodstove: freestanding, EPA certified, non-catalytic
2104008330	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Woodstove: freestanding, EPA certified, catalytic
2104008400	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Woodstove: pellet-fired, general (freestanding or FP insert)
2104008510	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Furnace: Indoor, cordwood-fired, non-EPA certified
2104008610	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Hydronic heater: outdoor

2104008700	Nonpoint	Stationary Source Fuel Combustion>Residential>Wood>Outdoor wood burning device, NEC (fire-pits, chimeas, etc)
2104009000	Nonpoint	Stationary Source Fuel Combustion>Residential>Firelog>Total: All Combustor Types
2104011000	Nonpoint	Stationary Source Fuel Combustion>Residential>Kerosene>Total: All Heater Types
2302002100	Nonpoint	Industrial Processes>Food and Kindred Products: SIC 20>Commercial Cooking - Charbroiling>Conveyorized Charbroiling
2302002200	Nonpoint	Industrial Processes>Food and Kindred Products: SIC 20>Commercial Cooking - Charbroiling>Under-fired Charbroiling
2302003000	Nonpoint	Industrial Processes>Food and Kindred Products: SIC 20>Commercial Cooking - Frying>Deep Fat Frying
2302003100	Nonpoint	Industrial Processes>Food and Kindred Products: SIC 20>Commercial Cooking - Frying>Flat Griddle Frying
2302003200	Nonpoint	Industrial Processes>Food and Kindred Products: SIC 20>Commercial Cooking - Frying>Clamshell Griddle Frying
2401001000	Nonpoint	Solvent Utilization>Surface Coating>Architectural Coatings>Total: All Solvent Types
2401005000	Nonpoint	Solvent Utilization>Surface Coating>Auto Refinishing: SIC 7532>Total: All Solvent Types
2401008000	Nonpoint	Solvent Utilization>Surface Coating>Traffic Markings>Total: All Solvent Types
2401015000	Nonpoint	Solvent Utilization>Surface Coating>Factory Finished Wood: SIC 2426 thru 242>Total: All Solvent Types
2401020000	Nonpoint	Solvent Utilization>Surface Coating>Wood Furniture: SIC 25>Total: All Solvent Types
2401025000	Nonpoint	Solvent Utilization>Surface Coating>Metal Furniture: SIC 25>Total: All Solvent Types
2401030000	Nonpoint	Solvent Utilization>Surface Coating>Paper: SIC 26>Total: All Solvent Types
2401040000	Nonpoint	Solvent Utilization>Surface Coating>Metal Cans: SIC 341>Total: All Solvent Types
2401055000	Nonpoint	Solvent Utilization>Surface Coating>Machinery and Equipment: SIC 35>Total: All Solvent Types
2401060000	Nonpoint	Solvent Utilization>Surface Coating>Large Appliances: SIC 363>Total: All Solvent Types
2401065000	Nonpoint	Solvent Utilization>Surface Coating>Electronic and Other Electrical: SIC 36 - 363>Total: All Solvent Types
2401070000	Nonpoint	Solvent Utilization>Surface Coating>Motor Vehicles: SIC 371>Total: All Solvent Types
2401075000	Nonpoint	Solvent Utilization>Surface Coating>Aircraft: SIC 372>Total: All Solvent Types
2401080000	Nonpoint	Solvent Utilization>Surface Coating>Marine: SIC 373>Total: All Solvent Types
2401090000	Nonpoint	Solvent Utilization>Surface Coating>Miscellaneous Manufacturing>Total: All Solvent Types
2401100000	Nonpoint	Solvent Utilization>Surface Coating>Industrial Maintenance Coatings>Total: All Solvent Types
2401200000	Nonpoint	Solvent Utilization>Surface Coating>Other Special Purpose Coatings>Total: All Solvent Types
2415000000	Nonpoint	Solvent Utilization>Degreasing>All Processes/All Industries>Total: All Solvent Types
2420000000	Nonpoint	Solvent Utilization>Dry Cleaning>All Processes>Total: All Solvent Types
2425000000	Nonpoint	Solvent Utilization>Graphic Arts>All Processes>Total: All Solvent Types
2460100000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Consumer and Commercial>All Personal Care Products>Total: All Solvent Types
2460200000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Consumer and Commercial>All Household Products>Total: All Solvent Types
2460400000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Consumer and Commercial>All Automotive Aftermarket Products>Total: All Solvent Types
2460500000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Consumer and Commercial>All Coatings and Related Products>Total: All Solvent Types
2460600000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Consumer and Commercial>All Adhesives and Sealants>Total: All Solvent Types
2460800000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Consumer and Commercial>All FIFRA Related Products>Total: All Solvent Types
2460900000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Consumer and Commercial>Miscellaneous Products (Not Otherwise Covered)>Total: All Solvent Types
2461021000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Commercial>Cutback Asphalt>Total: All Solvent Types

2461022000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Commercial>Emulsified Asphalt>Total: All Solvent Types
2461850000	Nonpoint	Solvent Utilization>Miscellaneous Non-industrial: Commercial>Pesticide Application: Agricultural>All Processes
2501050120	Nonpoint	Storage and Transport>Petroleum and Petroleum Product Storage>Bulk Terminals: All Evaporative Losses>Gasoline
2501055120	Nonpoint	Storage and Transport>Petroleum and Petroleum Product Storage>Bulk Plants: All Evaporative Losses>Gasoline
2501060051	Nonpoint	Storage and Transport>Petroleum and Petroleum Product Storage>Gasoline Service Stations>Stage 1: Submerged Filling
2501060052	Nonpoint	Storage and Transport>Petroleum and Petroleum Product Storage>Gasoline Service Stations>Stage 1: Splash Filling
2501060053	Nonpoint	Storage and Transport>Petroleum and Petroleum Product Storage>Gasoline Service Stations>Stage 1: Balanced Submerged Filling
2501080050	Nonpoint	Storage and Transport>Petroleum and Petroleum Product Storage>Airports : Aviation Gasoline>Stage 1: Total
2501080100	Nonpoint	Storage and Transport>Petroleum and Petroleum Product Storage>Airports : Aviation Gasoline>Stage 2: Total
2505040120	Nonpoint	Storage and Transport>Petroleum and Petroleum Product Transport>Pipeline>Gasoline
2610000100	Nonpoint	Waste Disposal, Treatment, and Recovery>Open Burning>All Categories>Yard Waste - Leaf Species Unspecified
2610000400	Nonpoint	Waste Disposal, Treatment, and Recovery>Open Burning>All Categories>Yard Waste - Brush Species Unspecified
2610000500	Nonpoint	Waste Disposal, Treatment, and Recovery>Open Burning>All Categories>Land Clearing Debris (use 28-10-005-000 for Logging Debris Burning)
2610030000	Nonpoint	Waste Disposal, Treatment, and Recovery>Open Burning>Residential>Household Waste (use 26-10-000-xxx for Yard Wastes)
2680003000	Nonpoint	Waste Disposal, Treatment, and Recovery>Composting>100% Green Waste (e.g., residential or municipal yard wastes)>All Processes
2805002000	Nonpoint	Miscellaneous Area Sources>Agriculture Production - Livestock>Beef cattle production composite>Not Elsewhere Classified
2805007100	Nonpoint	Miscellaneous Area Sources>Agriculture Production - Livestock>Poultry production - layers with dry manure management systems>Confinement
2805009100	Nonpoint	Miscellaneous Area Sources>Agriculture Production - Livestock>Poultry production - broilers>Confinement
2805018000	Nonpoint	Miscellaneous Area Sources>Agriculture Production - Livestock>Dairy cattle composite>Not Elsewhere Classified
2805025000	Nonpoint	Miscellaneous Area Sources>Agriculture Production - Livestock>Swine production composite>Not Elsewhere Classified (see also 28-05-039, -047, -053)
2810025000	Nonpoint	Miscellaneous Area Sources>Other Combustion>Charcoal Grilling - Residential (see 23-02-002-xxx for Commercial)>Total
2810060100	Nonpoint	Miscellaneous Area Sources>Other Combustion>Cremation>Humans

Explanation of 2022 Emission Projections

Agricultural Livestock - Livestock annual total populations from 2013 through 2016 were used to forecast the livestock total population for 2022. The county populations of livestock as a percentage of the total state livestock population were assumed to be constant. Emission calculations were made following the nonpoint methodology published by EPA.

Agricultural Pesticides - The number of acres of land in each county on which agricultural pesticides are used is assumed to remain constant, thus Ag Pesticide usage is assumed to remain constant.

Asphalt Paving - From the EPA nonpoint tool the 2014 emissions were obtained and the percentages calculated for cutback and emulsified. From research the growth expectation assumption of 3.1 % per year was established for the US totals. From that the US totals are calculated through year 2022. The next assumption was that the percentage split of cutback and emulsified would be constant across the US. From all of this the US total tonnage for both cutback and emulsified asphalt is calculated for each year through 2022. From the NOMAD tools the 2014 tonnage data for TN is used to calculate the state percentage of the total US tonnage. It is assumed that the percentage split between states will remain constant. From this the projected tonnage in TN through year 2022 is calculated. Average county VMT percentages calculated from TDOT data from the 11 year span from 2005 through 2016 are used to apportion the year 2022 TN asphalt totals to the counties. These tonnage numbers are then used to calculate the year 2022 VOC emissions. The conversion equation of tons to barrels is copied from the nonpoint tools. The emission factors are taken from the nonpoint tools.

Aviation Gasoline Distribution - EIA SEDS data was used to forecast the amount of AV GAS consumption for year 2022. FAA TAF data was collected and the OPS data was used to establish the county apportionment of the consumption. The county percentage apportionment developed varied slightly from that developed by the EPA for the tool so assumption was made that the EPA county apportionment percentages will remain constant through year 2022. The year 2022 emissions were calculated by substituting the year 2022 AV GAS consumption forecast into the EPA tool.

Commercial Cooking - The number of restaurants in each county was obtained for years 2012 through 2015 from the US Census County Business Patterns datasets extracting data on the two NAICS specified in the tool (EPA Commercial Cooking Non-Point Tool). From that data the year 2022 number of restaurants in each county was forecast. Then taking from the tool documentation the emission calculation methodology, it is assumed that the percent of restaurants with the type equipment of interest, the number of units per restaurant, and the average amount of food in tons/year cooked at a restaurant are assumed to remain constant. The emission factors from the tool are used in making the final emission calculations.

Composting - Year 2022 TN population was forecast based on US Census estimates for Years 2010-2016. Sector employment is assumed to remain constant. Yard waste per capita is assumed to remain constant. Food composted is assumed to increase by 1%/year. Emission factors are taken from the nonpoint tool.

Gasoline Stage 1 Distribution – This sector has four (4) sub-sectors as follows

> **Bulk Plants** - The total finished motor gasoline consumption data for years 2012 through 2016 was used to forecast the year 2022 value. It is assumed the fraction passing through bulk plants is constant. It is also assumed the county apportionment of national emissions to county emissions according to employee counts to be constant.

Bulk Terminals - The total finished motor gasoline consumption data for years 2012 through 2016 was used to forecast the year 2022 gasoline supplied value from which a national VOC emissions value is derived using the emission factor from the nonpoint tool. The total finished motor gasoline stocks data for years 2014 through 2016 was used to forecast the year 2022 value from which a state apportionment fraction is derived. It is assumed the county apportionment of national emissions to county emissions according to employee counts to be constant.

Pipeline movement of gasoline - The total finished motor gasoline consumption data for years 2012 through 2016 was used to forecast the year 2022 gasoline supplied value from which a national VOC emissions value is derived using the emission factor from the tool. Pipeline gasoline movement data for years 2012 through 2016 was used to forecast Year 2022 pipeline gasoline movement values. From that the Year 2022 fraction for PAD 2 of the total pipeline gasoline movement was calculated and used as an apportionment factor for PAD 2. Then the county apportionment within the PAD is based on employment data from the tool and is assumed to remain constant.

Service Stations - Total gasoline consumption for Tennessee was obtained from the EIA SEDS. Year 2022 total consumption of motor gasoline was forecast using values from years 2000-2015. Total retail sales data from service stations for each county was obtained from the TN Dept. of Revenue. Year 2022 total and county sales were forecast from retail sales data from years 2010 through 2016. The EIA SEDS data for Tennessee gasoline consumption at state level was apportioned to the counties by the percentage of retail sales of the state total at service stations for each county. Emission factors and SCC percentage split of the total gasoline consumption was taken from the non-point tool.

Human Cremation - US Census data for # of deaths in the state is projected to year 2022 # of deaths. US Census population data was used to forecast the year 2022 for county & state population. County % of state population is used to apportion # of deaths in the state in Year 2022 to each county. The Year 2022 projection of US average % cremation of # of deaths is used to calculate the # of bodies cremated in each county. Average body weight & emission factors are taken from the tool.

Open Burning – This sector has four sub-sectors as follows.

Land Clearing - Nonpoint tool methodology was followed for estimation of disturbed acreage from residential, nonresidential, and road construction using US Census data, Federal Highway Administration data, and US Labor Bureau data to forecast Year 2022 disturbed acreage calculations. USDA Forestry Service FIDO database provided vegetation type acreage for the counties from which fuel loading per acre was calculated. Emission factors from the tool were used to calculate emissions for Year 2022.

MSW - MSW tonnage burned for each county is calculated according to the methodology in the nonpoint tool on a per capita basis. US Census data for 2010 through 2016 is used to forecast the Year 2022 population. The rural to urban percentage split of the county population is assumed to remain constant.

Yard Waste Brush - Yard waste brush tonnage burned for each county is calculated according to the methodology in the nonpoint tool on a per capita basis. US Census data for 2010 through 2016 is used to forecast the Year 2022 population. The rural to urban percentage split of the county population is assumed to remain constant. The forested acreage percentage adjusted for farm land is assumed to be constant and is taken from the nonpoint tool.

Yard Waste Leaf - Yard waste leaf tonnage burned for each county is calculated according to the methodology in the nonpoint tool on a per capita basis. US Census data for 2010 through 2016 is used to forecast the Year 2022 population. The rural to urban percentage split of the county population is assumed to remain constant. The forested acreage percentage adjusted for farm land is assumed to be constant and is taken from the nonpoint tool.

Residential Heating - US Census data for home heating fuel type was obtained for TN counties. Year 2022 values for numbers of homes using each type of fuel was forecast using data for years 2010-2015. EIA SEDS residential fuel consumption data was obtained and Year 2022 values for each fuel type was forecast using data from years 2010-2015. The emission calculations were made following the nonpoint tool methodology, and emission factors were taken from the nonpoint tool.

Industrial, Commercial, & Institutional (ICI) Fuel Combustion - The ICI nonpoint tool was used to obtain the Year 2014 emissions which were compared to those from the 2014 NEI v2 for to determine the stationary source emissions subtraction. This method accounts for some Davidson county and Hamilton county data where the fuel consumption is reported totally within their local program point source inventory. The energy data inputs to the tool were then changed to values forecast for Year 2022 from EIA SEDS data collected for the industrial and commercial sectors. The nonpoint tool output is then used for the Year 2022 emissions. Stationary source emissions subtraction is assumed constant for year 2022.

Residential Wood Consumption (RWC) - The Residential Wood Combustion (RWC) nonpoint tool was used to obtain the year 2014 base year data. EIA energy data on residential wood consumption was collected and Year 2022 forecasts were made. US census data was collected for the numbers of housing types to be used in the tool. Year 2022 forecasts of numbers of house types were made. Energy and housing forecast data was input into the RWC nonpoint tool to obtain Year 2022 emissions.

Residential Charcoal Grilling (RCG) - The Residential Charcoal Grilling (RCG) nonpoint tool was used to determine emissions for both Year 2014 and Year 2022. US census data for numbers of housing types was collected and used for tool input. Values for 2022 were forecast using US Census data from years 2010 through 2015.

Solvents - The nonpoint Solvent tool based on county population was used to obtain both the Year 2014 and the Year 2022 Solvent emissions. The Year 2022 county population data was forecast from the US Census data for years 2010 through 2016. Population data was used for input to the nonpoint tool.

			Year 2014			Year 2022			
County	FIPS	SCC	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)	
Davidson	47037	2805002000			0.86			0.91	
Rutherford	47149	2805002000			7.07			7.40	
Sumner	47165	2805002000			8.77			9.19	
Williamson	47187	2805002000			5.71			5.98	
Wilson	47189	2805002000			8.45			8.85	
Davidson	47037	2805018000			0.00			0.00	
Rutherford	47149	2805018000			0.78			0.81	
Sumner	47165	2805018000			0.97			1.02	
Williamson	47187	2805018000			0.78			0.81	
Wilson	47189	2805018000			0.58			0.61	
Davidson	47037	2805025000			0.04			0.07	
Rutherford	47149	2805025000			0.93			1.49	
Sumner	47165	2805025000			0.11			0.18	
Williamson	47187	2805025000			0.09			0.14	
Wilson	47189	2805025000			0.32			0.52	
Davidson	47037	2805007100			0.01			0.02	
Rutherford	47149	2805007100			0.27			0.38	
Sumner	47165	2805007100			0.04			0.06	
Williamson	47187	2805007100			0.04			0.06	
Wilson	47189	2805007100			0.06			0.08	
Davidson	47037	2805009100			0.00			0.00	
Rutherford	47149	2805009100			0.00			0.00	
Sumner	47165	2805009100			0.63			0.88	
Williamson	47187	2805009100			0.01			0.02	
Wilson	47189	2805009100			0.01			0.02	**End Ag Livestock**
Davidson	47037	2461850000			1.10			1.10	
Rutherford	47149	2461850000			16.32			16.32	
Sumner	47165	2461850000			21.89			21.89	
Williamson	47187	2461850000			9.09			9.09	
Wilson	47189	2461850000			8.53			8.53	**End Ag Pesticides**
Davidson	47037	2461021000			24.83			32.38	
Rutherford	47149	2461021000			6.89			11.91	
Sumner	47165	2461021000			4.73			5.88	
Williamson	47187	2461021000			4.67			9.19	
Wilson	47189	2461021000			3.63			5.95	
Davidson	47037	2461022000			100.37			130.88	
Rutherford	47149	2461022000			27.85			48.14	
Sumner	47165	2461022000			19.11			23.78	
Williamson	47187	2461022000			18.87			37.15	
Wilson	47189	2461022000			14.65			24.03	**End Asphalt Paving**
Davidson	47037	2501080050			38.97			39.28	
Rutherford	47149	2501080050			37.65			37.95	
Sumner	47165	2501080050			16.78			16.92	
Williamson	47187	2501080050			0.00			0.00	
Wilson	47189	2501080050			3.94			3.97	
Davidson	47037	2501080100			1.33			1.50	
Rutherford	47149	2501080100			1.29			1.45	
Sumner	47165	2501080100			0.57			0.65	
Williamson	47187	2501080100			0.00			0.00	
Wilson	47189	2501080100			0.13			0.15	**End Av Gas**
Davidson	47037	2302002100	16.63	0.00	4.98	19.40	0.00	5.81	
Rutherford	47149	2302002100	4.95	0.00	1.48	5.20	0.00	1.56	
Sumner	47165	2302002100	2.54	0.00	0.76	3.07	0.00	0.92	
Williamson	47187	2302002100	4.35	0.00	1.30	4.82	0.00	1.44	
Wilson	47189	2302002100	2.22	0.00	0.66	2.63	0.00	0.79	
Davidson	47037	2302002200	45.12	0.00	13.79	52.62	0.00	16.09	
Rutherford	47149	2302002200	13.44	0.00	4.11	14.12	0.00	4.31	
Sumner	47165	2302002200	6.90	0.00	2.11	8.32	0.00	2.54	
Williamson	47187	2302002200	11.80	0.00	3.61	13.08	0.00	4.00	
Wilson	47189	2302002200	6.01	0.00	1.84	7.15	0.00	2.18	
Davidson	47037	2302003000	0.00	0.00	3.42	0.00	0.00	3.99	
Rutherford	47149	2302003000	0.00	0.00	1.02	0.00	0.00	1.07	
Sumner	47165	2302003000	0.00	0.00	0.52	0.00	0.00	0.63	
Williamson	47187	2302003000	0.00	0.00	0.90	0.00	0.00	0.99	
Wilson	47189	2302003000	0.00	0.00	0.46	0.00	0.00	0.54	
Davidson	47037	2302003100	3.62	0.00	1.75	4.22	0.00	2.04	
Rutherford	47149	2302003100	1.08	0.00	0.52	1.13	0.00	0.55	
Sumner	47165	2302003100	0.55	0.00	0.27	0.67	0.00	0.32	
Williamson	47187	2302003100	0.95	0.00	0.46	1.05	0.00	0.51	
Wilson	47189	2302003100	0.48	0.00	0.23	0.57	0.00	0.28	
Davidson	47037	2302003200	0.00	0.00	0.07	0.00	0.00	0.08	
Rutherford	47149	2302003200	0.00	0.00	0.02	0.00	0.00	0.02	
Sumner	47165	2302003200	0.00	0.00	0.01	0.00	0.00	0.01	
Williamson	47187	2302003200	0.00	0.00	0.02	0.00	0.00	0.02	
Wilson	47189	2302003200	0.00	0.00	0.01	0.00	0.00	0.01	**End Commercial Cooking**
Davidson	47037	2680003000			19.27			20.42	
Rutherford	47149	2680003000			115.65			122.54	

Sumner	47165	2680003000			19.27			20.42	
Williamson	47187	2680003000			0.00			0.00	
Wilson	47189	2680003000			0.00			0.00	**End Composting**
Davidson	47037	2501055120			107.45			123.88	
Rutherford	47149	2501055120			6.14			7.08	
Sumner	47165	2501055120			6.14			7.08	
Williamson	47187	2501055120			36.84			42.47	
Wilson	47189	2501055120			0.00			0.00	
Davidson	47037	2501050120			100.51			123.19	
Rutherford	47149	2501050120			5.74			7.04	
Sumner	47165	2501050120			5.74			7.04	
Williamson	47187	2501050120			34.46			42.24	
Wilson	47189	2501050120			0.00			0.00	
Davidson	47037	2505040120			68.32			49.05	
Rutherford	47149	2505040120			3.90			2.80	
Sumner	47165	2505040120			3.90			2.80	
Williamson	47187	2505040120			23.42			16.82	
Wilson	47189	2505040120			0.00			0.00	
Davidson	47037	2501060051			708.62			768.03	
Rutherford	47149	2501060051			464.73			571.02	
Sumner	47165	2501060051			148.58			181.74	
Williamson	47187	2501060051			201.84			219.51	
Wilson	47189	2501060051			182.73			277.06	
Davidson	47037	2501060052			0.00			0.00	
Rutherford	47149	2501060052			0.00			0.00	
Sumner	47165	2501060052			0.00			0.00	
Williamson	47187	2501060052			0.00			0.00	
Wilson	47189	2501060052			0.00			0.00	
Davidson	47037	2501060053			27.34			29.64	
Rutherford	47149	2501060053			17.93			22.03	
Sumner	47165	2501060053			5.73			7.01	
Williamson	47187	2501060053			7.79			8.47	
Wilson	47189	2501060053			7.05			10.69	**End Gasoline Stage 1 Distribution**
Davidson	47037	2810060100	0.0146	3.1066	0.0109	0.0147	3.1280	0.0109	
Rutherford	47149	2810060100	0.0063	1.3430	0.0047	0.0053	1.1320	0.0040	
Sumner	47165	2810060100	0.0038	0.8027	0.0028	0.0045	0.9670	0.0034	
Williamson	47187	2810060100	0.0045	0.9538	0.0033	0.0033	0.7110	0.0025	
Wilson	47189	2810060100	0.0027	0.5826	0.0020	0.0032	0.6730	0.0024	**End Human Cremation**
Davidson	47037	2610000500	9494.95	280.92	651.72	11386.09	336.87	781.53	
Rutherford	47149	2610000500	15124.00	447.46	1038.10	14373.23	425.24	986.56	
Sumner	47165	2610000500	885.22	26.19	60.76	974.03	28.82	66.86	
Williamson	47187	2610000500	3718.29	110.01	255.22	5743.62	169.93	394.24	
Wilson	47189	2610000500	784.28	23.20	53.83	1612.10	47.70	110.65	
Davidson	47037	2610030000	111.22	7.85	7.08	124.10	8.76	10.83	
Rutherford	47149	2610030000	239.84	16.93	15.27	290.50	20.51	25.36	
Sumner	47165	2610030000	234.86	16.58	14.95	269.07	18.99	23.49	
Williamson	47187	2610030000	194.04	13.70	12.35	238.97	16.87	20.86	
Wilson	47189	2610030000	235.22	16.60	14.97	281.40	19.86	24.56	
Davidson	47037	2610000400	7.19	0.26	0.98	8.02	0.29	1.09	
Rutherford	47149	2610000400	15.51	0.55	2.10	18.78	0.67	2.55	
Sumner	47165	2610000400	7.59	0.27	1.03	8.70	0.31	1.18	
Williamson	47187	2610000400	12.55	0.45	1.70	15.45	0.55	2.10	
Wilson	47189	2610000400	7.60	0.27	1.03	9.10	0.32	1.23	
Davidson	47037	2610000100	5.75	0.32	1.44	6.42	0.36	1.60	
Rutherford	47149	2610000100	12.41	0.69	3.10	15.03	0.83	3.76	
Sumner	47165	2610000100	6.07	0.34	1.52	6.96	0.39	1.74	
Williamson	47187	2610000100	10.04	0.56	2.51	12.36	0.68	3.09	
Wilson	47189	2610000100	6.08	0.34	1.52	7.28	0.40	1.82	**End Open Burning**
Davidson	47037	2104001000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2104001000	0.00	0.00	0.00	0.00	0.00	0.00	
Sumner	47165	2104001000	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2104001000	0.00	0.00	0.00	0.00	0.00	0.00	
Wilson	47189	2104001000	0.00	0.00	0.00	0.00	0.00	0.00	
Davidson	47037	2104002000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2104002000	0.00	0.00	0.00	0.00	0.00	0.00	
Sumner	47165	2104002000	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2104002000	0.00	0.00	0.00	0.00	0.00	0.00	
Wilson	47189	2104002000	0.00	0.00	0.00	0.00	0.00	0.00	
Davidson	47037	2104004000	0.115	0.414	0.016	0.063	0.225	0.009	
Rutherford	47149	2104004000	0.017	0.062	0.002	0.000	0.000	0.000	
Sumner	47165	2104004000	0.051	0.183	0.007	0.051	0.185	0.007	
Williamson	47187	2104004000	0.026	0.095	0.004	0.000	0.000	0.000	
Wilson	47189	2104004000	0.032	0.114	0.004	0.226	0.815	0.032	
Davidson	47037	2104011000	0.111	0.399	0.016	0.060	0.217	0.008	
Rutherford	47149	2104011000	0.017	0.060	0.002	0.000	0.000	0.000	
Sumner	47165	2104011000	0.049	0.177	0.007	0.050	0.178	0.007	
Williamson	47187	2104011000	0.025	0.092	0.004	0.000	0.000	0.000	
Wilson	47189	2104011000	0.031	0.110	0.004	0.218	0.786	0.031	
Davidson	47037	2104007000	3.71	13.08	0.51	2.34	8.26	0.32	

Rutherford	47149	2104007000	2.73	9.61	0.37	4.23	14.91	0.58	
Sumner	47165	2104007000	3.15	11.10	0.43	2.81	9.90	0.39	
Williamson	47187	2104007000	3.13	11.04	0.43	3.90	13.75	0.54	
Wilson	47189	2104007000	3.59	12.66	0.49	3.78	13.34	0.52	
Davidson	47037	2104006000	166.26	390.72	22.86	157.39	369.86	21.64	
Rutherford	47149	2104006000	51.09	120.05	7.02	46.99	110.42	6.46	
Sumner	47165	2104006000	45.06	105.88	6.20	43.53	102.29	5.98	
Williamson	47187	2104006000	74.90	176.03	10.30	85.11	200.00	11.70	
Wilson	47189	2104006000	28.63	67.29	3.94	31.54	74.11	4.34	**End Residential Heating**
Davidson	47037	2102001000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2102001000	0.00	0.00	0.00	0.00	0.00	0.00	
Sumner	47165	2102001000	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2102001000	0.00	0.00	0.00	0.00	0.00	0.00	
Wilson	47189	2102001000	0.00	0.00	0.00	0.00	0.00	0.00	
Davidson	47037	2102002000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2102002000	159.44	20.67	0.00	104.22	13.51	0.00	
Sumner	47165	2102002000	61.62	7.99	0.00	40.28	5.22	0.00	
Williamson	47187	2102002000	26.97	3.50	0.00	17.63	2.29	0.00	
Wilson	47189	2102002000	31.44	4.08	0.00	20.55	2.66	0.00	
Davidson	47037	2102004001	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2102004001	0.00	0.00	0.00	0.00	0.00	0.00	
Sumner	47165	2102004001	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2102004001	0.00	0.00	0.00	0.00	0.00	0.00	
Wilson	47189	2102004001	0.00	0.00	0.00	0.00	0.00	0.00	
Davidson	47037	2102004002	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2102004002	0.00	0.00	0.00	0.00	0.00	0.00	
Sumner	47165	2102004002	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2102004002	0.00	0.00	0.00	0.00	0.00	0.00	
Wilson	47189	2102004002	0.00	0.00	0.00	0.00	0.00	0.00	
Davidson	47037	2102005000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2102005000	0.00	0.00	0.00	0.00	0.00	0.00	
Sumner	47165	2102005000	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2102005000	0.00	0.00	0.00	0.00	0.00	0.00	
Wilson	47189	2102005000	0.00	0.00	0.00	0.00	0.00	0.00	
Davidson	47037	2102006000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2102006000	84.48	0.00	0.00	103.56	0.00	0.00	
Sumner	47165	2102006000	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2102006000	25.10	0.00	0.00	30.77	0.00	0.00	
Wilson	47189	2102006000	28.89	0.00	0.00	35.42	0.00	0.00	
Davidson	47037	2102007000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2102007000	0.03	0.04	0.00	0.03	0.06	0.00	
Sumner	47165	2102007000	0.01	0.02	0.00	0.01	0.02	0.00	
Williamson	47187	2102007000	0.00	0.01	0.00	0.01	0.01	0.00	
Wilson	47189	2102007000	0.00	0.01	0.00	0.01	0.01	0.00	
Davidson	47037	2102008000	730.39	230.25	18.57	0.00	0.00	0.00	
Rutherford	47149	2102008000	565.40	169.15	14.93	565.40	169.15	14.93	
Sumner	47165	2102008000	218.52	65.37	5.77	218.52	65.37	5.77	
Williamson	47187	2102008000	95.65	28.61	2.53	95.65	28.61	2.53	
Wilson	47189	2102008000	111.48	33.35	2.94	111.48	33.35	2.94	
Davidson	47037	2102011000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2102011000	0.03	0.14	0.00	0.03	0.14	0.00	
Sumner	47165	2102011000	0.01	0.05	0.00	0.01	0.05	0.00	
Williamson	47187	2102011000	0.01	0.02	0.00	0.01	0.02	0.00	
Wilson	47189	2102011000	0.01	0.03	0.00	0.01	0.03	0.00	
Davidson	47037	2103001000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2103001000	0.00	0.00	0.00	0.00	0.00	0.00	
Sumner	47165	2103001000	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2103001000	0.00	0.00	0.00	0.00	0.00	0.00	
Wilson	47189	2103001000	0.00	0.00	0.00	0.00	0.00	0.00	
Davidson	47037	2103002000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2103002000	4.89	9.97	0.05	1.63	3.32	0.02	
Sumner	47165	2103002000	2.17	4.42	0.02	0.72	1.47	0.01	
Williamson	47187	2103002000	6.65	13.55	0.06	2.22	4.52	0.02	
Wilson	47189	2103002000	1.93	3.94	0.02	0.64	1.31	0.01	
Davidson	47037	2103004001	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2103004001	0.00	0.00	0.00	0.00	0.00	0.00	
Sumner	47165	2103004001	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2103004001	0.00	0.00	0.00	0.00	0.00	0.00	
Wilson	47189	2103004001	0.00	0.00	0.00	0.00	0.00	0.00	
Davidson	47037	2103004002	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2103004002	0.54	2.57	0.21	0.56	2.64	0.21	
Sumner	47165	2103004002	0.36	1.67	0.12	0.37	1.72	0.12	
Williamson	47187	2103004002	1.10	5.14	0.36	1.14	5.29	0.37	
Wilson	47189	2103004002	0.32	1.49	0.10	0.33	1.54	0.11	
Davidson	47037	2103005000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2103005000	0.00	0.06	0.00	0.00	0.00	0.00	
Sumner	47165	2103005000	0.00	0.03	0.00	0.00	0.00	0.00	
Williamson	47187	2103005000	0.00	0.08	0.00	0.00	0.00	0.00	
Wilson	47189	2103005000	0.00	0.02	0.00	0.00	0.00	0.00	

Davidson	47037	2103006000	695.90	828.45	45.57	656.68	781.77	43.00	
Rutherford	47149	2103006000	47.50	68.81	3.08	44.82	64.93	2.91	
Sumner	47165	2103006000	20.27	29.36	1.32	19.13	27.71	1.24	
Williamson	47187	2103006000	64.55	93.52	4.19	60.91	88.25	3.96	
Wilson	47189	2103006000	18.76	27.18	1.22	17.70	25.65	1.15	
Davidson	47037	2103007000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2103007000	2.12	3.79	0.14	0.88	1.57	0.06	
Sumner	47165	2103007000	0.94	1.68	0.06	0.39	0.70	0.03	
Williamson	47187	2103007000	2.89	5.16	0.19	1.20	2.14	0.08	
Wilson	47189	2103007000	0.84	1.50	0.05	0.35	0.62	0.02	
Davidson	47037	2103008000	50.57	18.54	1.43	0.00	0.00	0.00	
Rutherford	47149	2103008000	0.00	0.00	0.00	0.00	0.00	0.00	
Sumner	47165	2103008000	0.00	0.00	0.00	0.00	0.00	0.00	
Williamson	47187	2103008000	0.00	0.00	0.00	0.00	0.00	0.00	
Wilson	47189	2103008000	0.00	0.00	0.00	0.00	0.00	0.00	
Davidson	47037	2103011000	0.00	0.00	0.00	0.00	0.00	0.00	
Rutherford	47149	2103011000	0.01	0.05	0.00	0.01	0.05	0.00	
Sumner	47165	2103011000	0.01	0.02	0.00	0.01	0.02	0.00	
Williamson	47187	2103011000	0.02	0.07	0.00	0.02	0.07	0.00	
Wilson	47189	2103011000	0.00	0.02	0.00	0.00	0.02	0.00	**End ICI Fuel Combustion**
Davidson	47037	2104008100	157.52	2.75	19.98	253.36	5.27	26.18	
Rutherford	47149	2104008100	97.47	1.70	12.36	125.28	2.19	15.89	
Sumner	47165	2104008100	75.72	1.32	9.61	97.60	1.70	12.38	
Williamson	47187	2104008100	79.90	1.39	10.13	102.86	1.79	13.05	
Wilson	47189	2104008100	58.51	1.02	7.42	75.51	1.32	9.58	
Davidson	47037	2104008210	97.60	1.18	22.41	124.00	1.50	28.48	
Rutherford	47149	2104008210	60.39	0.73	13.87	77.62	0.94	17.82	
Sumner	47165	2104008210	46.92	0.57	10.77	60.47	0.73	13.89	
Williamson	47187	2104008210	49.51	0.60	11.37	63.73	0.77	14.63	
Wilson	47189	2104008210	36.25	0.44	8.32	46.79	0.57	10.74	
Davidson	47037	2104008220	34.04	0.47	2.46	42.10	0.51	2.67	
Rutherford	47149	2104008220	21.06	0.29	1.53	26.36	0.32	1.67	
Sumner	47165	2104008220	16.36	0.23	1.18	20.53	0.25	1.30	
Williamson	47187	2104008220	17.26	0.24	1.25	21.64	0.26	1.37	
Wilson	47189	2104008220	12.64	0.17	0.92	15.89	0.19	1.01	
Davidson	47037	2104008230	7.47	0.12	0.90	9.29	0.13	0.99	
Rutherford	47149	2104008230	4.62	0.07	0.56	5.82	0.08	0.62	
Sumner	47165	2104008230	3.59	0.06	0.43	4.53	0.06	0.48	
Williamson	47187	2104008230	3.79	0.06	0.46	4.78	0.07	0.51	
Wilson	47189	2104008230	2.77	0.04	0.34	3.51	0.05	0.37	
Davidson	47037	2104008310	275.10	3.34	63.17	348.08	4.22	79.93	
Rutherford	47149	2104008310	256.78	3.12	58.97	329.51	4.00	75.67	
Sumner	47165	2104008310	235.71	2.86	54.13	303.40	3.68	69.67	
Williamson	47187	2104008310	221.31	2.68	50.82	284.51	3.45	65.33	
Wilson	47189	2104008310	204.09	2.48	46.87	262.84	3.19	60.36	
Davidson	47037	2104008320	181.21	2.49	13.12	223.22	2.69	14.17	
Rutherford	47149	2104008320	169.14	2.33	12.25	211.33	2.55	13.41	
Sumner	47165	2104008320	155.26	2.14	11.24	194.59	2.35	12.35	
Williamson	47187	2104008320	145.78	2.01	10.56	182.47	2.20	11.58	
Wilson	47189	2104008320	134.43	1.85	9.73	168.57	2.03	10.70	
Davidson	47037	2104008330	90.95	1.47	11.01	112.71	1.60	12.00	
Rutherford	47149	2104008330	84.89	1.37	10.28	106.70	1.51	11.36	
Sumner	47165	2104008330	77.93	1.26	9.44	98.25	1.39	10.46	
Williamson	47187	2104008330	73.17	1.18	8.86	92.13	1.31	9.81	
Wilson	47189	2104008330	67.47	1.09	8.17	85.11	1.21	9.06	
Davidson	47037	2104008400	8.04	1.92	1.11	10.17	2.43	1.41	
Rutherford	47149	2104008400	7.50	1.79	1.04	9.63	2.30	1.33	
Sumner	47165	2104008400	6.89	1.65	0.95	8.87	2.12	1.23	
Williamson	47187	2104008400	6.47	1.55	0.89	8.32	1.99	1.15	
Wilson	47189	2104008400	5.96	1.43	0.82	7.68	1.84	1.06	
Davidson	47037	2104008510	6.41	0.06	0.41	8.08	0.08	0.52	
Rutherford	47149	2104008510	12.04	0.12	0.77	15.43	0.15	0.99	
Sumner	47165	2104008510	12.73	0.13	0.82	16.38	0.16	1.05	
Williamson	47187	2104008510	11.08	0.11	0.71	14.23	0.14	0.91	
Wilson	47189	2104008510	11.86	0.12	0.76	15.28	0.15	0.98	
Davidson	47037	2104008610	30.52	0.17	5.71	30.52	0.17	5.71	
Rutherford	47149	2104008610	57.40	0.32	10.75	57.40	0.32	10.75	
Sumner	47165	2104008610	58.00	0.32	10.86	58.00	0.32	10.86	
Williamson	47187	2104008610	47.80	0.27	8.95	47.80	0.26	8.95	
Wilson	47189	2104008610	52.14	0.29	9.76	52.14	0.29	9.76	
Davidson	47037	2104008700	6.74	0.12	0.86	6.74	0.12	0.86	
Rutherford	47149	2104008700	2.49	0.04	0.32	2.49	0.04	0.32	
Sumner	47165	2104008700	1.55	0.03	0.20	1.55	0.03	0.20	
Williamson	47187	2104008700	1.69	0.03	0.21	1.69	0.03	0.21	
Wilson	47189	2104008700	0.86	0.02	0.11	0.86	0.02	0.11	
Davidson	47037	2104009000	80.15	4.92	25.35	80.15	4.92	25.35	
Rutherford	47149	2104009000	30.37	1.87	9.61	30.37	1.87	9.61	
Sumner	47165	2104009000	18.92	1.16	5.99	18.92	1.16	5.99	
Williamson	47187	2104009000	21.04	1.29	6.65	21.04	1.29	6.65	

Wilson	47189	2104009000	13.49	0.83	4.27	13.49	0.83	4.27	**End Residential Wood Combustion**
Davidson	47037	2810025000	1250.30	26.83	23.38	1280.36	27.47	23.94	
Rutherford	47149	2810025000	586.58	12.59	10.97	626.20	13.44	11.71	
Sumner	47165	2810025000	370.31	7.95	6.92	374.36	8.03	7.00	
Williamson	47187	2810025000	457.06	9.81	8.55	477.88	10.25	8.94	
Wilson	47189	2810025000	264.46	5.67	4.94	276.89	5.94	5.18	**End Residential Charcoal Grilling**
Davidson	47037	2401001000			771.08			872.53	
Rutherford	47149	2401001000			329.21			409.41	
Sumner	47165	2401001000			197.86			231.50	
Williamson	47187	2401001000			232.80			295.71	
Wilson	47189	2401001000			142.76			175.48	
Davidson	47037	2401005000			177.48			177.48	
Rutherford	47149	2401005000			43.67			43.67	
Sumner	47165	2401005000			22.28			22.28	
Williamson	47187	2401005000			83.52			83.52	
Wilson	47189	2401005000			21.02			21.02	
Davidson	47037	2401008000			103.57			103.57	
Rutherford	47149	2401008000			44.22			44.22	
Sumner	47165	2401008000			26.58			26.58	
Williamson	47187	2401008000			31.27			31.27	
Wilson	47189	2401008000			19.17			19.17	
Davidson	47037	2401015000			10.68			10.68	
Rutherford	47149	2401015000			7.34			7.34	
Sumner	47165	2401015000			1.27			1.27	
Williamson	47187	2401015000			0.86			0.86	
Wilson	47189	2401015000			3.74			3.74	
Davidson	47037	2401020000			89.53			89.53	
Rutherford	47149	2401020000			25.13			25.13	
Sumner	47165	2401020000			3.48			3.48	
Williamson	47187	2401020000			1.58			1.58	
Wilson	47189	2401020000			4.40			4.40	
Davidson	47037	2401025000			43.48			43.48	
Wilson	47189	2401025000			3.37			3.37	
Davidson	47037	2401030000			11.32			11.32	
Sumner	47165	2401030000			1.81			1.81	
Williamson	47187	2401030000			11.32			11.32	
Wilson	47189	2401030000			1.81			1.81	
Davidson	47037	2401055000			10.10			10.10	
Rutherford	47149	2401055000			1.26			1.26	
Sumner	47165	2401055000			3.37			3.37	
Williamson	47187	2401055000			1.67			1.67	
Williamson	47187	2401060000			28.59			28.59	
Davidson	47037	2401065000			0.09			0.09	
Davidson	47037	2401070000			40.15			40.15	
Rutherford	47149	2401070000			593.69			593.69	
Sumner	47165	2401070000			117.27			117.27	
Williamson	47187	2401070000			3.36			3.36	
Wilson	47189	2401070000			57.32			57.32	
Davidson	47037	2401075000			5.56			5.56	
Rutherford	47149	2401075000			0.07			0.07	
Wilson	47189	2401075000			0.07			0.07	
Williamson	47187	2401080000			0.28			0.28	
Davidson	47037	2401090000			62.00			62.00	
Rutherford	47149	2401090000			10.30			10.30	
Sumner	47165	2401090000			3.16			3.16	
Williamson	47187	2401090000			2.11			2.11	
Wilson	47189	2401090000			0.34			0.34	
Davidson	47037	2401100000			198.74			224.89	
Rutherford	47149	2401100000			84.85			105.52	
Sumner	47165	2401100000			51.00			59.67	
Williamson	47187	2401100000			60.00			76.22	
Wilson	47189	2401100000			36.80			45.23	
Davidson	47037	2401200000			1.98			2.24	
Rutherford	47149	2401200000			0.84			1.05	
Sumner	47165	2401200000			0.51			0.59	
Williamson	47187	2401200000			0.60			0.76	
Wilson	47189	2401200000			0.37			0.45	
Davidson	47037	2415000000			517.78			517.78	
Rutherford	47149	2415000000			267.16			267.16	
Sumner	47165	2415000000			110.49			110.49	
Williamson	47187	2415000000			78.10			78.10	
Wilson	47189	2415000000			93.77			93.77	
Davidson	47037	2420000000			2.01			2.01	
Rutherford	47149	2420000000			0.37			0.37	
Sumner	47165	2420000000			0.29			0.29	
Williamson	47187	2420000000			0.45			0.45	
Wilson	47189	2420000000			0.21			0.21	
Davidson	47037	2425000000			1219.23			1379.64	
Rutherford	47149	2425000000			520.54			647.35	

Sumner	47165	2425000000			312.86			366.04	
Williamson	47187	2425000000			368.10			467.58	
Wilson	47189	2425000000			225.73			277.47	
Davidson	47037	2460100000			659.04			745.75	
Rutherford	47149	2460100000			281.37			349.92	
Sumner	47165	2460100000			169.11			197.86	
Williamson	47187	2460100000			198.98			252.74	
Wilson	47189	2460100000			122.02			149.99	
Davidson	47037	2460200000			724.95			820.33	
Rutherford	47149	2460200000			309.51			384.91	
Sumner	47165	2460200000			186.03			217.65	
Williamson	47187	2460200000			218.87			278.02	
Wilson	47189	2460200000			134.22			164.98	
Davidson	47037	2460400000			448.15			507.11	
Rutherford	47149	2460400000			191.33			237.95	
Sumner	47165	2460400000			115.00			134.55	
Williamson	47187	2460400000			135.30			171.87	
Wilson	47189	2460400000			82.97			101.99	
Davidson	47037	2460500000			313.04			354.23	
Rutherford	47149	2460500000			133.65			166.21	
Sumner	47165	2460500000			80.33			93.98	
Williamson	47187	2460500000			94.51			120.05	
Wilson	47189	2460500000			57.96			71.24	
Davidson	47037	2460600000			187.83			212.54	
Rutherford	47149	2460600000			80.19			99.73	
Sumner	47165	2460600000			48.20			56.39	
Williamson	47187	2460600000			56.71			72.03	
Wilson	47189	2460600000			34.77			42.75	
Davidson	47037	2460800000			586.55			663.72	
Rutherford	47149	2460800000			250.42			311.43	
Sumner	47165	2460800000			150.51			176.10	
Williamson	47187	2460800000			177.09			224.94	
Wilson	47189	2460800000			108.59			133.49	
Davidson	47037	2460900000			23.07			26.10	
Rutherford	47149	2460900000			9.85			12.25	
Sumner	47165	2460900000			5.92			6.93	
Williamson	47187	2460900000			6.96			8.85	
Wilson	47189	2460900000			4.27			5.25	**End Solvents**
Davidson	47037	**County Total**	13,557.59	1,820.13	8,370.55	14,946.22	1,560.85	9,313.44	
Rutherford	47149	**County Total**	17,720.28	898.35	5,132.90	17,214.49	858.80	5,799.39	
Sumner	47165	**County Total**	2,575.86	291.80	2,088.71	2,854.15	286.31	2,395.87	
Williamson	47187	**County Total**	5,388.88	483.77	2,552.21	7,650.95	557.51	3,193.36	
Wilson	47189	**County Total**	2,132.82	208.23	1,571.55	3,167.04	240.82	1,988.39	**County Totals**
		5 County Total	41,375	3,702	19,716	45,833	3,504	22,690	

Agricultural Livestock		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	0.00	0.00	0.92	0.00	0.00	1.00
Rutherford	47149	0.00	0.00	9.05	0.00	0.00	10.09
Sumner	47165	0.00	0.00	10.52	0.00	0.00	11.31
Williamsor	47187	0.00	0.00	6.63	0.00	0.00	7.01
Wilson	47189	0.00	0.00	9.43	0.00	0.00	10.08
		0.00	0.00	36.56	0.00	0.00	39.49

Agricultural Pesticides		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	0.00	0.00	1.10	0.00	0.00	1.10
Rutherford	47149	0.00	0.00	16.32	0.00	0.00	16.32
Sumner	47165	0.00	0.00	21.89	0.00	0.00	21.89
Williamsor	47187	0.00	0.00	9.09	0.00	0.00	9.09
Wilson	47189	0.00	0.00	8.53	0.00	0.00	8.53
		0.00	0.00	56.92	0.00	0.00	56.92

Asphalt Paving		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	0.00	0.00	125.21	0.00	0.00	163.26
Rutherford	47149	0.00	0.00	34.74	0.00	0.00	60.05
Sumner	47165	0.00	0.00	23.84	0.00	0.00	29.67
Williamsor	47187	0.00	0.00	23.54	0.00	0.00	46.34
Wilson	47189	0.00	0.00	18.28	0.00	0.00	29.98
		0.00	0.00	225.61	0.00	0.00	329.30

Aviation Gasoline		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	0.00	0.00	40.30	0.00	0.00	40.79
Rutherford	47149	0.00	0.00	38.93	0.00	0.00	39.40
Sumner	47165	0.00	0.00	17.36	0.00	0.00	17.56
Williamsor	47187	0.00	0.00	0.00	0.00	0.00	0.00
Wilson	47189	0.00	0.00	4.07	0.00	0.00	4.12
		0.00	0.00	100.66	0.00	0.00	101.87

Commercial Cooking		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	65.37	0.00	24.01	76.24	0.00	28.01
Rutherford	47149	19.47	0.00	7.15	20.45	0.00	7.51
Sumner	47165	9.99	0.00	3.67	12.06	0.00	4.42
Williamsor	47187	17.10	0.00	6.29	18.95	0.00	6.96
Wilson	47189	8.71	0.00	3.20	10.35	0.00	3.80
		120.64	0.00	44.32	138.05	0.00	50.70

Composting

County	FIPS	Year 2014 CO (tons)	Year 2014 NOX (tons)	Year 2014 VOC (tons)	Year 2022 CO (tons)	Year 2022 NOX (tons)	Year 2022 VOC (tons)
Davidson	47037	0.00	0.00	19.27	0.00	0.00	20.42
Rutherford	47149	0.00	0.00	115.65	0.00	0.00	122.54
Sumner	47165	0.00	0.00	19.27	0.00	0.00	20.42
Williamsor	47187	0.00	0.00	0.00	0.00	0.00	0.00
Wilson	47189	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	154.20	0.00	0.00	163.38

Gasoline Stage 1 Distribution

County	FIPS	Year 2014 CO (tons)	Year 2014 NOX (tons)	Year 2014 VOC (tons)	Year 2022 CO (tons)	Year 2022 NOX (tons)	Year 2022 VOC (tons)
Davidson	47037	0.00	0.00	1,012.24	0.00	0.00	1,093.79
Rutherford	47149	0.00	0.00	498.45	0.00	0.00	609.98
Sumner	47165	0.00	0.00	170.10	0.00	0.00	205.67
Williamsor	47187	0.00	0.00	304.35	0.00	0.00	329.51
Wilson	47189	0.00	0.00	189.78	0.00	0.00	287.75
		0.00	0.00	2,174.90	0.00	0.00	2,526.70

Human Cremation

County	FIPS	Year 2014 CO (tons)	Year 2014 NOX (tons)	Year 2014 VOC (tons)	Year 2022 CO (tons)	Year 2022 NOX (tons)	Year 2022 VOC (tons)
Davidson	47037	0.01	3.11	0.01	0.01	3.13	0.01
Rutherford	47149	0.01	1.34	0.00	0.01	1.13	0.00
Sumner	47165	0.00	0.80	0.00	0.00	0.97	0.00
Williamsor	47187	0.00	0.95	0.00	0.00	0.71	0.00
Wilson	47189	0.00	0.58	0.00	0.00	0.67	0.00
		0.03	6.79	0.02	0.03	6.61	0.02

Open Burning

County	FIPS	Year 2014 CO (tons)	Year 2014 NOX (tons)	Year 2014 VOC (tons)	Year 2022 CO (tons)	Year 2022 NOX (tons)	Year 2022 VOC (tons)
Davidson	47037	9,619.12	289.34	661.22	11,524.63	346.27	795.06
Rutherford	47149	15,391.76	465.63	1,058.57	14,697.54	447.25	1,018.23
Sumner	47165	1,133.75	43.38	78.26	1,258.76	48.51	93.27
Williamsor	47187	3,934.92	124.71	271.78	6,010.40	188.03	420.28
Wilson	47189	1,033.20	40.42	71.36	1,909.88	68.29	138.27
		31,112.74	963.47	2,141.20	35,401.21	1,098.35	2,465.11

Residential Heating

County	FIPS	Year 2014 CO (tons)	Year 2014 NOX (tons)	Year 2014 VOC (tons)	Year 2022 CO (tons)	Year 2022 NOX (tons)	Year 2022 VOC (tons)
Davidson	47037	170.20	404.60	23.40	159.85	378.57	21.98
Rutherford	47149	53.85	129.79	7.40	51.21	125.33	7.04
Sumner	47165	48.31	117.35	6.64	46.43	112.55	6.38
Williamsor	47187	78.09	187.25	10.74	89.01	213.75	12.24
Wilson	47189	32.28	80.17	4.44	35.76	89.05	4.92
		382.72	919.16	52.62	382.27	919.24	52.56

ICI Fuel Combustion		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	1,476.86	1,077.24	65.57	656.68	781.77	43.00
Rutherford	47149	864.45	275.25	18.41	821.15	255.38	18.13
Sumner	47165	303.91	110.62	7.29	279.45	102.30	7.17
Williamsor	47187	222.94	149.65	7.33	209.54	131.19	6.95
Wilson	47189	193.68	71.61	4.34	186.49	65.19	4.23
		3,061.83	1,684.36	102.94	2,153.32	1,335.82	79.48

Residential Wood Combustion		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	975.74	19.02	166.51	1,248.43	23.65	198.26
Rutherford	47149	804.17	13.75	132.29	997.93	16.27	159.44
Sumner	47165	709.59	11.71	115.62	883.09	13.96	139.85
Williamsor	47187	678.78	11.41	110.87	845.17	13.57	134.17
Wilson	47189	600.49	9.77	97.49	747.67	11.68	118.00
		3,768.77	65.67	622.78	4,722.29	79.13	749.72

Residential Charcoal Grilling		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	1,250.30	26.83	23.38	1,280.36	27.47	23.94
Rutherford	47149	586.58	12.59	10.97	626.20	13.44	11.71
Sumner	47165	370.31	7.95	6.92	374.36	8.03	7.00
Williamsor	47187	457.06	9.81	8.55	477.88	10.25	8.94
Wilson	47189	264.46	5.67	4.94	276.89	5.94	5.18
		2,928.71	62.84	54.76	3,035.68	65.14	56.76

Solvents		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	0.00	0.00	6,207.41	0.00	0.00	6,882.82
Rutherford	47149	0.00	0.00	3,184.97	0.00	0.00	3,718.95
Sumner	47165	0.00	0.00	1,607.33	0.00	0.00	1,831.25
Williamsor	47187	0.00	0.00	1,793.03	0.00	0.00	2,211.86
Wilson	47189	0.00	0.00	1,155.68	0.00	0.00	1,373.53
		0.00	0.00	13,948.42	0.00	0.00	16,018.41

Non-Point Inventory Totals		Year 2014			Year 2022		
County	FIPS	CO (tons)	NOX (tons)	VOC (tons)	CO (tons)	NOX (tons)	VOC (tons)
Davidson	47037	13,557.59	1,820.13	8,370.55	14,946.22	1,560.85	9,313.44
Rutherford	47149	17,720.28	898.35	5,132.90	17,214.49	858.80	5,799.39
Sumner	47165	2,575.86	291.80	2,088.71	2,854.15	286.31	2,395.87
Williamsor	47187	5,388.88	483.77	2,552.21	7,650.95	557.51	3,193.36
Wilson	47189	2,132.82	208.23	1,571.55	3,167.04	240.82	1,988.39
		41,375.44	3,702.28	19,715.92	45,832.86	3,504.30	22,690.44

Nonpoint emissions (in tons per year)

Carbon Monoxide (CO), Nitrogen Oxides (NOx), and Volatile Organic Compounds (VOC)

	2014		
Category	**CO**	**NOx**	**VOC**
Agricultural Livestock	0	0	37
Agricultural Pesticides	0	0	57
Asphalt Paving	0	0	226
Aviation Gasoline	0	0	101
Commercial Cooking	121	0	44
Composting	0	0	154
Gasoline Stage 1 Distribution	0	0	2,175
Human Cremation	0.03	6.79	0.02
Open Burning	31,113	963	2,141
Residential Heating	383	919	53
Industrial, Commercial, & Institutional Fuel Combustion	3,062	1,684	103
Residential Wood Combustion	3,769	66	623
Residential Charcoal Grilling	2,929	63	55
Solvents	0	0	13,948
Total Emissions	41,375	3,702	19,716

	2022		
Category	**CO**	**NOx**	**VOC**
Agricultural Livestock	0	0	39
Agricultural Pesticides	0	0	57
Asphalt Paving	0	0	329
Aviation Gasoline	0	0	102
Commercial Cooking	138	0	51
Composting	0	0	163
Gasoline Stage 1 Distribution	0	0	2,527
Human Cremation	0.03	6.61	0.02
Open Burning	35,401	1,098	2,465
Residential Heating	382	919	53
Industrial, Commercial, & Institutional Fuel Combustion	2,153	1,336	79
Residential Wood Combustion	4,722	79	750
Residential Charcoal Grilling	3,036	65	57
Solvents	0	0	16,018
Total Emissions	45,833	3,504	22,690

Appendix K

Sensitivity Analysis

of Ozone to NOx and VOC

Sensitivity Analysis

As part of the **S**outh**E**astern **M**odeling, **A**nalysis, and **P**lanning (SEMAP) project, Georgia Tech performed an analysis of the sensitivity of ozone concentrations in the Eastern U.S. to reductions in emissions of both nitrogen oxides (NOx) and volatile organic compounds (VOCs). This analysis was based off of the 2007 and 2018 SEMAP modeling which used CMAQ version 5.01 with updates to the vertical mixing coefficients and land-water interface. The entire "ozone season" was modeled (May 1 – September 30) using a 12-km modeling grid that covered the Eastern U.S.

Sensitivities were modeled relative to 2018 emissions to evaluate the impact of NOx and VOC reductions on daily 8-hour maximum ozone concentrations. Each emission sensitivity run reduced the 2018 anthropogenic NOx or VOC emissions (point, area, mobile, nonroad, marine/aircraft/rail) within a specific geographic region by 30%. The 14 geographic regions included Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia, Maryland, MANE-VU (minus MD), LADCO, and CENRAP. This resulted in a total of 28 model runs (2 precursors x 14 regions). The NOx and VOC sensitivities were evaluated at every ozone monitor in the domain.

The TDEC-APC used the SEMAP NOx and VOC sensitivity modeling to examine the normalized sensitivities of NOx and VOC emissions on 8-hour daily maximum ozone concentrations (part per billion ozone/ton per day, ppb/TPD) at five ozone monitors in Middle Tennessee area (which includes Davidson, Sumner, Wilson, Rutherford, and Williamson Counties). This analysis started with the day-by-day NOx and VOC emission sensitivities (ppb) for May 1 – September 30. Not all modeled days were used in the calculations. The criteria for selecting days to include in the calculation generally follows the approach used by EPA to select days to include in the relative response factor (RRF) calculation as described in EPA's "Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze" (December 3, 2014). For this analysis, the 10 highest modeled days in 2018 were selected to be included in the average sensitivity calculation at each monitoring site to address the 2008 and 2015 ozone NAAQS.

The average absolute sensitivity was calculated for NOx and VOCs at each Middle Tennessee ozone monitor location (Table 1). The average absolute NOx sensitivity across Middle Tennessee is **3.326 ppb** for a 30% reduction in NOx emissions across Tennessee and the average absolute VOC sensitivity across Middle Tennessee County is **0.061 ppb** for a 30% reduction in VOC emissions across Tennessee.

Table 1: Absolute NOx and VOC Sensitivity at five Middle Tennessee Ozone Monitors

Site ID	**Location**	**Site Name**	**30% NOx (ppb)**	**30% VOC (ppb)**
47-037-0026	Davidson County	Percy Priest	-4.015	-0.140
47-037-0011	Davidson County	Trinity Lane	-3.795	-0.159
47-165-0007	Sumner County	Rockland Recreation Area	-3.083	-0.004
47-187-0106	Williamson County	Fairview Middle School	-2.921	-0.008
47-189-0103	Wilson County	Cedars of Lebanon State Park	-2.818	0.005
		Average	-3.326	-0.061

Next, the average absolute sensitivity at each monitor was normalized by the emission reduction to give the normalized sensitivity (ppb/TPD). The SEMAP 30% emission reductions were statewide, but the ozone impacts at the Middle Tennessee monitors will mostly results from the local NOx and VOC emission reductions in the Middle Tennessee 5-county area. Therefore, it was not appropriate to normalize the local NOx and VOC sensitivity results by the statewide emission reduction. Instead, a conservative approach would be to assume the ozone impacts at the Middle Tennessee monitors resulted solely from the local NOx and VOC emission reductions in Middle Tennessee. Therefore, the average absolute sensitivity was normalized by the emission reductions from NOx and VOC reductions in Middle Tennessee. The anthropogenic NOx emissions in Middle Tennessee are 25,160 TPY, so a 30% reduction is 7,548.0 TPY or 20.68 TPD. The anthropogenic VOC emissions in Middle Tennessee are 35,382 TPY, so a 30% reduction is 10,614.6 TPY or 29.08 TPD. The normalized sensitivity was calculated for NOx and VOCs at each Middle Tennessee ozone monitor location (Table 2). The average normalized NOx sensitivity across Middle Tennessee is **0.1609 ppb/TPD** and the average normalized VOC sensitivity across Middle Tennessee is **0.00210 ppb/TPD**.

Table 2: Normalized NOx and VOC Sensitivity at five Middle Tennessee Ozone Monitors

Site ID	**Location**	**Site Name**	**30% NOx (ppb/TPD)**	**30% VOC (ppb/TPD)**
47-037-0026	Davidson County	Percy Priest	-0.1942	-0.00481
47-037-0011	Davidson County	Trinity Lane	-0.1835	-0.00547
47-165-0007	Sumner County	Rockland Recreation Area	-0.1491	-0.00014
47-187-0106	Williamson County	Fairview Middle School	-0.1413	-0.00028
47-189-0103	Wilson County	Cedars of Lebanon State Park	-0.1363	0.00017
		Average	-0.1609	-0.00210

Although the SEMAP study projected emissions and ozone concentrations in 2018, it is estimated that a similar response to NOx and VOC reductions would occur in 2022. In order to look at the impact of the removal of the I/M program, the site-specific normalized sensitivities are multiplied by the increase in NOx and/or VOC emissions. The site-specific normalized NOx and VOC sensitivities were applied to the expected emissions increases due to the removal of the I/M program. The emissions increases are based on 2022 values. As stated in Section 3.5, the removal of the I/M program results in an increase in NOx emissions of 478.52 tons per year and VOC emissions of 593.1 tons per year in 2022. A simple average of these totals results in an increase in NOx emissions of 1.311 tons per day and VOC emissions of 1.625 tons per day in 2022. Although these values represent an average day and the SEMAP project used an ozone season day, it is expected that the increase in emissions on an average day and an ozone season day would be similar and would not change the conclusions drawn from this sensitivity analysis.

The corresponding ozone increases at each monitor are found in Table 3 and demonstrate a very small increase in ozone concentrations. The highest increase was 0.262 ppb at the Percy Priest monitor (AIRS ID 47-037-0026). The calculated changes in ozone levels are well below the level of precision of the ambient ozone monitors (1 ppb).

Table 3: Emissions Increases Due to I/M removal and Effects on Ozone Formation

AIRS ID	2022 NO_X Emissions Increase (tons/day)	Corresponding O_3 Increase at Monitor due to NO_X Increase (ppb)	2022 VOC Emissions Increase (tons/day)	Corresponding O_3 Increase at Monitor due to VOC Increase (ppb)	Corresponding O_3 Increase at Monitor due to combined NOx and VOC increases (ppb)
47-037-0026	1.311	0.25454	1.625	0.00782	0.262
47-037-0011	1.311	0.24059	1.625	0.00888	0.249
47-165-0007	1.311	0.19545	1.625	0.00022	0.196
47-187-0106	1.311	0.18518	1.625	0.00045	0.186
47-189-0103	1.311	0.17865	1.625	-0.00028	0.178

Attachment 2

Public Hearing Documents

NOTICE OF HEARING

TENNESSEE DEPARTMENT OF ENVIRONMENT AND
CONSERVATION DIVISION OF AIR POLLUTION CONTROL
WILLIAM R. SNODGRASS TENNESSEE
TOWER 312 ROSA L. PARKS AVENUE, 15TH
FLOOR NASHVILLE, TENNESSEE 37243
PHONE: (615) 532-0554 FAX: (615) 532-0614

NOTICE IS HEREBY GIVEN, the Division of Air Pollution Control will hold a public hearing pursuant to Tennessee Code Annotated, Section 68-201-105:

Date:	Tuesday, November 19, 2019
Information Session:	5:00 - 5:15 PM
Public Hearing:	5:15 - 6:15 PM
Location:	Tennessee Bureau of Investigation 901 R. S. Gass Blvd Nashville, Tennessee

There will be a public hearing before the Technical Secretary of the Tennessee Air Pollution Control Board to consider a proposed change to the State Implementation Plan (SIP) under the authority of Tennessee Code Annotated, Section 68-201-105.

The hearing will be conducted as prescribed by the Uniform Administrative Procedures Act, Tennessee Code Annotated, Section 4-5-201 et. seq. and will take place at the date, time and location indicated above.

The public hearing has been called to consider the Clean Air Act Section 110(l) Noninterference Demonstration for removal of the Inspection and Maintenance (I/M) program for Middle Tennessee. Public Chapter No. 953, signed into law on May 15, 2018, called for the elimination of the I/M program 120 days after final EPA approval of the 110(l) report. The I/M program is currently required as part of the State Implementation Plan (SIP) in Hamilton County and Middle Tennessee (Davidson, Sumner, Wilson, Rutherford, and Williamson Counties). In order to remove the requirement from the SIP, the Division must demonstrate that I/M removal does not interfere with attainment or maintenance of National Ambient Air Quality Standards (NAAQS) for ozone, $PM_{2.5}$, SO_2, NO_2, CO, and lead.

The I/M program requires an annual light-duty motor vehicle onboard diagnostic (OBD) inspection or tailpipe inspection to ensure that the vehicle's emissions are properly controlled. The 110(l) technical report details the results of a sensitivity analysis showing a projected small increase in ozone values. Middle Tennessee is currently in compliance with all National Ambient Air Quality Standards, and removal the I/M program will not interfere with continued attainment or maintenance of the air quality standards.

The SIP revision will remove the Federally mandated requirement for and I/M program in Middle Tennessee. Metro Nashville retains the right to continue a vehicle emission testing program on a voluntary basis.

All persons interested will be allowed to present testimony to the hearing officer regarding the proposed revision to the SIP. Anyone desiring to make oral comments at this public hearing should prepare a written copy of their comments to submit to the hearing officer at the hearing. The hearing officer may limit the length of oral comments in order to allow all parties an opportunity to speak, and will require that all comments be relevant to the proposed SIP revision. Written statements not presented at the hearing will only be considered part of the record if received by close of business (4:30 PM Central) on November 19, 2019, at office of the Division of Air Pollution Control at the address provided above.

Individuals with disabilities who wish to participate in the hearing (or review the file record) should contact TDEC to discuss any auxiliary aids or services needed to facilitate participation. Contact may be in person, by writing, telephone, or other means, and should be made no less than ten working days prior to November 19, 2019, to allow time to provide such aid or services. Contact the ADA Coordinator (615- 532-0207) for further information. Hearing impaired callers may use the Tennessee Relay Service (800- 848-0298).

If it is hard for you to read, speak, or understand English, TDEC may be able to provide translation or interpretation services free of charge. Please contact Saul Castillo at (615) 532-0462 for more information.

If you have any questions about the proposed revision to the SIP, you may contact Paul LaRock by phone at (615) 532-0093 or by email at paul.larock@tn.gov. Materials concerning the proposed action are available at https://www.tn.gov/environment/ppo-public-participation/ppo-public-participation/ppo-air.html.

Public Hearing Transcript

Date of Public Hearing: November 19, 2019

Public Hearing for the Removal of the Inspection and Maintenance (I/M) Program in Middle Tennessee

Jaclyn Mothupi, with TDEC's Office of External Affairs, opened the Public Hearing with the following statement:

I would like to call these public meeting to order. Good evening! My name is Jaclyn Mothupi. I am from the Office of External Affairs of Tennessee Department of Environment and Conservation and I am your facilitator for this hearing, welcome and thank you for being here. This hearing is being held under the authority of the Tennessee Air Pollution Control Board. It is important to note that I am not representing the Division of Air Pollution Control, but am here to ensure that the evening runs smoothly. At this time, I would like to advise everyone to please be aware that this meeting is being recorded. Before we begin, please ensure your cell phones are silenced. The fire exits in the event of an emergency are the doorways in which you entered. Bathrooms are located out the doorway. By the entrance there is a table with a sign in sheet. Please complete the sign in sheet. This sheet will be used as contact information for distribution of the Response to Comments document and as a means of organizing persons who wish to make a comment at today's public meeting. If you have not indicated that you want to offer comments on that sheet and would like to do so, please check the comment box with "YES" as we will be collecting it shortly. While it is helpful to indicate you wish to speak now, if you have not done so already, I will give you opportunities throughout the meeting to provide comments. This public hearing has been called to consider the following: Clean Air Act Section 110(l) Noninterference Demonstration for removal of the Inspection and Maintenance (I/M) program for Middle Tennessee. Public Chapter No. 953, signed into law on May 15, 2018, called for the elimination of the I/M program after EPA approval of the 110(l) report. The I/M program is currently required as part of the State Implementation Plan (SIP) in Hamilton County and Middle Tennessee (Davidson, Sumner, Wilson, Rutherford, and Williamson Counties). In order to remove the requirement from the SIP, the Division must demonstrate that I/M removal does not interfere with attainment or maintenance of National Ambient Air Quality Standards (NAAQS) for ozone, PM2.5, SO2, NO2, CO, and lead. The I/M program requires an annual light-duty motor vehicle onboard diagnostic (OBD) inspection or tailpipe inspection to ensure that the vehicle's emissions are properly controlled. The 110(l) technical report details the results of a sensitivity analysis showed a projected small increase in ozone values. Middle Tennessee is currently in compliance with the National Ambient Air Quality Standards, and removal the I/M program will not interfere with continued attainment or maintenance of the air quality standards. This hearing is a requirement of the Uniform Administrative Procedures Act, and the Federal Clean Air Act. We will now receive comments. If you would like to comment in writing, but not speak today, you have two options. First, you may submit your written comments before the end of the hearing to a TDEC staff member. Second, you may submit them via mail or email at the contact information on the agenda. Please be aware that the comment period will remain open until November 21, 2019. All

comments made orally during this hearing are being recorded and will be included as part of the administrative record. All written comments are also included as part of the administrative record. To ensure everyone has an opportunity to speak, I will be limiting comments to 3 minutes. I will be keeping time with a stopwatch. At the two minute mark, I will raise a "1 minute left" sign, and at 3 minutes, I will raise a "time out" sign. We respectfully request that you keep the comments to the time and remember that any comments not provided orally can still be submitted in writing. All comments are given the same consideration. We will not be answering questions while receiving public comments. While a commenter can ask a question as a part of their public comment, that matter will be addressed along with others in the Board's official response to comments and not at this hearing. At this time I will call the names of people who have indicated they wish to comment. When I call your name, please come to the microphone, state your name and your affiliation and make your statements for the record. Once everyone that has asked to comment has been called, additional comments may be taken from persons who wish to comment but did not indicate so on the sign in sheet. Please be brief and concise and limit your comments to 3 minutes so that everyone may have the opportunity to speak. If you are speaking from written comments, then please submit a copy. As a reminder, your comments are being recorded.

The following is a transcript of the oral comments that were made during the public hearing.

Commenter: Stephen Foster

Comment: My name is Stephen Foster, program manager for Opus Inspections Envirotest, representing 85 employees in the middle Tennessee and Chattanooga areas of vehicle emission testing. We have successfully run this program for over 25 years. We have submitted a comment and report from Alpine Geophysics. Their findings are that the elimination of the program will have an adverse effect on the air quality in Middle Tennessee and potential loss of attainment status. In addition, the removal of the program will have a negative economic impact on the automotive industry in Tennessee. We have submitted these findings in printed and email copy to TDEC for public record.

Commenter: Robert Crissy

Comment: One thing I wanted to comment on is that a car usually has a check engine light and with late model cars computer if it is an oxygen sensor which is the sensor before and after the catalytic converter if those don't match then the check engine light comes on. Anybody with a grain of sand in their brains is going to fix their car when the check engine light comes on because it is not performing. It is going to guzzle gas and they are not going to pull into an emission test center because it is kind of a waste. There is the other side that's the tailpipe probe they put the tailpipe probe in there. Those are older cars that don't have computers and they check that. I'll tell you this in an old S10 if you pull the PVC valve out and lay it there on the manifold and drive in there it's barely running but it will pass inspection every time. I know that is on the public record and I no longer own that truck. Those people in the middle Tennessee counties what do they do? They sell their vehicle outside those 5 counties. I mean it just doesn't make any sense. It's not across the state. It's not even. It employs 85 people in a bureaucracy that we pay for and that's just wrong and thank you for calling this session.

Commenter: Brandi Prewitt

Comment: I am Brandi Prewitt and am just representing myself. I feel better knowing that only 8% of the vehicles fail the first time around. I thought it would be higher. I'm all for exceeding standards instead of just meeting them. I think generally the EPA's standards are not strong enough for air quality and water quality. I'd like to see not only Nashville but the State of Tennessee exceed these standards. Considering the comments of the gentlemen who went before me, your comments do make sense if someone can just sell their car in a county that doesn't do this testing. I know this is not what we are here to discuss; I would like to see the testing standardized across the state instead of just a few counties doing it. I just want to reiterate that I like clean air and I like clean water and I want us to exceed those requirements not just do what is federally required by EPA. Someone who owns a car and lives in Davidson county, it doesn't bother me to have to do this once a year. It takes just a few minutes. It only costs $9. It's not a big deal.

Commenter: Senator Ferrell Haile

Comment: I am Senator Ferrell Haile representing Davidson, Trousdale, and Sumner county. The question that I asked earlier is what percentage of the failures are emission failures are really electronic. I would guess that the majority is electronic. In the conversations that I have had that is a $600 repair it is not a $9 or $10 that is for testing. It is what we are putting on people that can least afford this. We exceed currently these standards and we will continue to exceed these standards. This is not going to cause any raise of significance concerning our air quality. I come from a farming background and environmental is very important to me. I do not believe that this effects this at all. I was cosponsor of this bill and feel like this is a benefit to the residents and constituents that I serve and out of 100 responses, 99 has been to eliminate this practice.

Commenter: Michael Creed

Comment: My name is Michael Creed and I am just representing myself. I want to say thank you to the senator for being cosponsor. I think there is more to be said about the vehicles and the effect to the low income group of people that are affected by these vehicles that may be failing. Are they failing for mechanical reasons? Are they failing for sensor? There are a lot of variables there for failing. I also don't have the numbers in front of me but I did reference some of the official documentation on the actual pollutants that the vehicles are putting into in comparison to other pollutants from other sources and the vehicle numbers are actually relatively small. This is just the general vehicle pollutants that are put into the air so that was reassuring also that number was small in comparison to the other numbers that were out there. It is a small dollar amount, but it is one more leach onto the taxpayer on the citizens of Tennessee. One or two don't seems like anything but they build up over time. As someone who was originally from California I know very well on the nickel and diming that happens in that state and the bureaucracies grow, complications around them grow. So looking at the numbers that have been presented on the increase in emissions that are growing are so very small in comparison to the breathe of space where we would go over the EPA allotment. I don't see any threat there. I am an advocate of this system being shut down.

Commenter: Stephy Jean Moore

Comment: My name is Stephy and I am a resident of Davidson County. I wasn't planning on getting up here and talking but I felt like it was my duty as a resident to say something about this. I'm not supporting of this. I'm disappointed that this is being removed. We need to see the trends of climate change happening and realize that the science is that it is not getting better and by removing this it is definitely not making it better. If you care about the citizens of this state, I would please advise that you to reconsider this removal and also I would like a reason why it is being removed. If it is a financial reason then I would like that to be told to me, not just saying that it is because someone was told that this had to happen.

Jaclyn Mothupi, with TDEC's Office of External Affairs, closed the Public Hearing with the following statement:

Are there any others who would like to present an oral comment today? Again, if you have written comments which you wish entered into the hearing record, please give them directly to a TDEC staff person present today or submit them via email or mail at the information provided on the agenda. Written comments will be received until COB, November 21, 2019. Details on how to submit a comment via email or through the USPS is on your agenda. I appreciate everyone's participation and cooperation.

TN Department of Environment & Conservation

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
RECORD OF ATTENDANCE
November 19, 2019

Name & Representing	Email	Would like to Comment (check box)
Stephen Foster, Opus	Stephen.Foster@opusinspection.com	✓
JOHN FINKE, METRO	JOHN.FINKE@NASHVILLE.GOV	
Mike Carter - Myself	Rep.Mike.Carter@Capitol.Tn.gov	
Michael Stagg	michael.stagg@wallerlaw.com	
Morgan Kreitner	morganclark@gmail.com	
Michael Creed		✓
Rep. Tim Rudd	Rep.Tim.Rudd@Capitol.TN.Gov	

TN Department of Environment & Conservation

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
RECORD OF ATTENDANCE
November 19, 2019

Name & Representing	Email	Would like to Comment (check box)
Stephy Jean Moore - self	stephyjeanmoore95@gmail.com	✓
Robert Crissey - self.	BRCRISS@EMAIL.COM	✓
Trey Bussey - Southern Envtl Law Center	tbussey@selctn.org	
CASEY BARKER - SELF	BALK191910 GMAIL.COM	
Brandi Prewitt	brandi@tectn.org	✓

TN Department of Environment & Conservation

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
RECORD OF ATTENDANCE
November 19, 2019

Name & Representing	Email	Would like to Comment (check box)
Mike Terry / HEAT	mike@heatrsd.com	
Ferrell Haile	Sen.ferrell.haile@capitol.tn.gov	✓

Attachment 3

Comments Received
(1st Public Notice)

waller

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November 19, 2019

VIA HAND DELIVERY AND EMAIL (air.pollution.control@tn.gov)

Michelle Walker Owenby
Director
Division of Air Pollution Control
Tennessee Department of Environment and Conservation
William R. Snodgrass Tennessee Tower, 15th Floor
312 Rosa L. Parks Avenue
Nashville, TN 37243

Re: Clean Air Act Section 110(*l*) Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in the Middle Tennessee Area: Comment Submitted by Opus Inspection, Inc.

Dear Ms. Owenby:

Attached is a report prepared by Alpine Geophysics, LLC, commissioned by Opus Inspection, Inc. Opus hereby submits this report in response to the Air Pollution Control Division's Notice of Hearing posted on its website on October 18, 2019, in which the Division requested comments on its Noninterference Demonstration regarding removal of the inspection and maintenance (I/M) program requirement from the State of Tennessee's State Implementation Plan (SIP). Opus endorses the Alpine report and opposes removal of the I/M program requirement from the SIP. Opus believes the Division's Noninterference Demonstration is inadequate to support the Division's proposed SIP revision and encourages the Division to implement Alpine's recommendations before it submits any proposed SIP revision to the United States Environmental Protection Agency for its approval.

Please make this letter and the attached report part of the public record in this matter. Thank you.

Very truly yours,

Michael K. Stagg

Michael K. Stagg

MKS:mcw
cc: Jim Sands, Vice President, Business Development, Opus
Bill Dell, Executive Director, Business Development, Opus
Stephen L. Foster, III, Program Manager - Tennessee, Opus

4842-0182-6477.2

Independent Review of the Tennessee Department of Environment and Conservation's Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in the Middle Tennessee Area

Prepared for:

Opus Inspection, Inc.

1893 Elm Tree Drive

Nashville, TN 37210

via request from

Waller Lansden Dortch & Davis, LLP

511 Union Street, Suite 2700

Nashville, TN 37219

Prepared by:

Alpine Geophysics, LLC

387 Pollard Mine Road

Burnsville, NC 28714

Prepared and Authorized by:

Gregory Stella
Managing Partner

November 19, 2019

My name is Gregory Stella. I am currently a Managing Partner of Alpine Geophysics, LLC, ("Alpine") a firm that offers highly specialized research and engineering services in the atmospheric sciences.

From 1997 until 2003, I served as an emissions and modeling specialist at the U.S. Environmental Protection Agency ("EPA" or "Agency"), Office of Air Quality Planning and Standards, where I managed and prepared the emission inventories, control strategies, and associated temporal, spatial, and speciation data for the Regional Transport NOx SIP Call, Section 126 rulemaking, Tier-2 tailpipe standards, 1-hour attainment demonstrations, Heavy-Duty Diesel Engine standards, Multi-Pollutant legislation, Clear Skies Analysis, and US/Canadian Air Quality Agreements. For my efforts while at EPA, I received two U.S. EPA Gold Medals, for the NOx SIP Call Rulemaking (1999) and the Tier-2 Tailpipe Standard (2001), as well as a U.S. Department of Justice Certificate of Commendation for working with the Environment and Natural Resources Division (2000) and multiple Bronze Medals for Commendable Service.

Since 2003, I have been with Alpine where I am internationally recognized as a technical authority in the planning, design, development, evaluation, application, and modeling of local, national, and international emission inventories. My focus is on the policy options used for the projection and control of ozone and particulate matter pollutants and precursors. I have coordinated with Federal, State, Regional, Local, International, Tribal, and private workgroups; modeling centers; and stakeholders to develop, evaluate, and apply alternative control measures and control program designs in support of emissions and air quality analyses.

In September 2011 and again in June 2018, I was invited by and provided testimony before the U.S. House of Representatives Committee on Space, Science and Technology regarding work conducted by Alpine in modeling U.S. air quality, including discussion of analyses related to recent technological and air quality changes, and corresponding attainment results for federal ozone and particulate matter standards.

I have been tasked by the law firm of Waller Lansden Dortch & Davis, LLP, on behalf of Opus Inspection, Inc., to provide a review of the Tennessee Department of Environment and Conservation's (TDEC) assumptions related to its proposed change to the State Implementation Plan (SIP) under the authority of Tennessee Code Annotated, Section 68-201-105. This review is in preparation for a public hearing that has been called to consider TDEC's " Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance in the Middle Tennessee Area" (Noninterference Demonstration), which supports the removal of the program for Davidson, Williamson, Wilson, Sumner and Rutherford Counties' inspection and maintenance (I/M) programs from the SIP. Public Chapter No. 953, signed into law on May 15, 2018, requires the elimination of the Inspection & Maintenance program 120 days after final EPA approval of the 110(l) report.

Summary of Observations

Based on my review of TDEC's proposed SIP changes and associated technical documentation[1], a summary of my observations follows. Justifications for the observations and recommendations for additional analyses are presented later in this report.

1. While current NAAQS-related design values are below levels of the standard in the Middle Tennessee domain, recent observations in air quality in the region have shown an upward trend in highest concentrations across all monitors indicating the reversal of improvements resulting from existing control programs. Between 2014 and 2018, 4th high maximum daily average (MDA8) values have remained the same or increased at every monitor in the domain.

2. TDEC has failed to simulate the impact of removal of the I/M program using air quality modeling. Ozone concentrations have non-linear correlation to NOx and VOC emission changes and cannot adequately be estimated exclusively using scaling ratios based on emission reduction sensitivities.

3. TDEC bases both its base year and future year emission assumptions on a version of EPA's 2014 National Emission Inventory (NEI) that is now multi-versions old. TDEC should consider revising its analysis using the most current, more appropriate version of the NEI that is based on a 2016 calendar year and was developed with significant input from state and regional organizations.

4. 2014 was not a conducive year for ozone sensitivity simulations, nor did it contain high ozone periods that would adequately allow for the determination of impact of control strategies and air quality response.

5. TDEC relies on a technical analysis completed in 2014 and that is based on inventories and assumptions now considered aged in their application of ozone sensitivity factors to estimate the impact of the removal of the I/M program. The factors generated from that work were identified as being inappropriate for other simulations beyond the scope of the original work.

6. TDEC makes an assumption that each ton of a pollutant precursor emission has an equal impact on air quality as compared to every other ton of the same pollutant precursor, regardless of emission source and where in the state the emissions occur. Recent modeling on this subject demonstrates that local motor vehicle source emissions have significantly greater impact on local air quality compared to all other source categories and regions.

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1 https://www.tn.gov/content/dam/tn/environment/air/documents/publicnotices/apc_SIP_IM_Removal_Middle_TN_08-28-19.pdf

7. Category-specific source apportionment analyses conducted elsewhere indicate that NOx emissions from Tennessee's motor vehicle source category may have a much greater impact on local air quality than estimated by TDEC.

8. TDEC includes in its assumptions that existing emission control programs will remain in force during the foreseeable future. As has been demonstrated by EPA, a significant number of federal air quality regulations have been "rolled back", removed from requirements, or are in the courts pending review and decision. Should these regulations be partially or completely stricken from the list of required control programs, assumptions included that assume emission decreases and associated air quality improvements will be invalidated.

The following statement has been taken from TDEC's website[2] and stresses the importance of the current I/M program on maintaining clean air in the Middle Tennessee region today and in the future (emphasis added):

> *"The State of Tennessee developed more restrictive regulations to control air pollution from mobile sources in counties that were not meeting the new 8-hour ozone Federal Standards for air quality. As a result, certain vehicles registered in Hamilton, Davidson, Rutherford, Sumner, Williamson and Wilson counties are required to pass a vehicle emission test. Gasoline and diesel vehicles with a model year of 1975 and newer and a Gross Vehicle Weight Rate (GVWR) of 10,500 lbs or less must pass an emission test before the vehicle's registration can be renewed. Motorcycles are exempt.*
>
> *Inspection programs such as the one implemented in Tennessee have proven to be very beneficial in reducing harmful ozone air pollution. Emissions from an individual car are generally low, relative to the smokestack image many associate with air pollution. But in numerous cities across the country,* ***the personal automobile is the single greatest polluter, as emissions from millions of vehicles on the road add up****. Driving a private car is probably a typical citizen's most "polluting" daily activity. Ozone levels in many cities have been reduced with the introduction of lower volatility gasoline, and as newer cars with improved emission control systems replaced older models. There has been significant progress in reducing vehicle emissions, but the number of cars on the road and the miles they travel make mobile sources an ongoing problem. Unless we dramatically reduce the amount of pollution vehicles emit in actual use, or drastically cut back on the amount we drive, smog-free air may become a problem for many of our cities."*

With this statement, TDEC recognizes the importance of emission control programs in Tennessee for achieving the clean air quality objectives required by EPA and for ensuring that people of the state can breathe freely without fear of health issues resulting from these emission sources. Compromising residents health and the current attainment status by removing the I/M program in the Middle Tennessee area is contrary to TDEC's objectives.

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[2] https://www.tn.gov/environment/program-areas/apc-air-pollution-control-home/apc/vehicle-inspection-program/important-information.html

1. Design Values Are On The Rise

While current 3-year averaged, NAAQS-related design values are below levels of the standard in the Middle Tennessee domain, recent observations in air quality in the region have shown an upward trend in highest ozone concentrations across regional regulatory monitors (listed in Table 1 and presented in Figure 1) indicating the reversal of improvements resulting from existing control programs inclusive of Tennessee's I/M program.

Table 1. Middle Tennessee regulatory ozone monitors.

AQS Site ID	County Name	Local Site Name
470370011	Davidson	East Health
470370026	Davidson	Percy Priest Dam
471650007	Sumner	Hendersonville Ozone Site at Old Hickory Dam
471870106	Williamson	Fairview Middle School
471890103	Wilson	Cedars of Lebanon

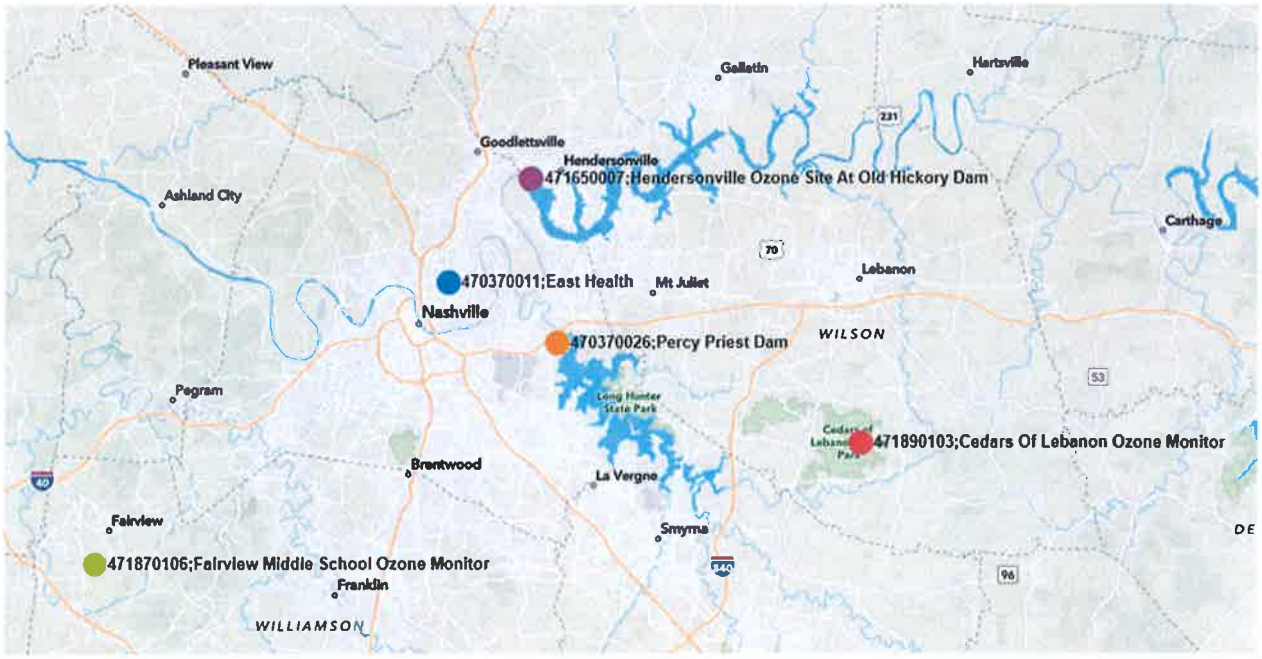


Figure 1. Location of Middle Tennessee regulatory ozone monitors.

Figure 2 presents the highest four observed MDA8 values across all monitors in the Middle Tennessee Core Based Statistical Area (CBSA) of Nashville-Davidson-Murfreesboro-Franklin, Tennessee for the years of 2014 through 2018. As can be seen in this figure, for each of the top four observations each year, the trend has shown an increase (noted by the linear trend; dotted line).

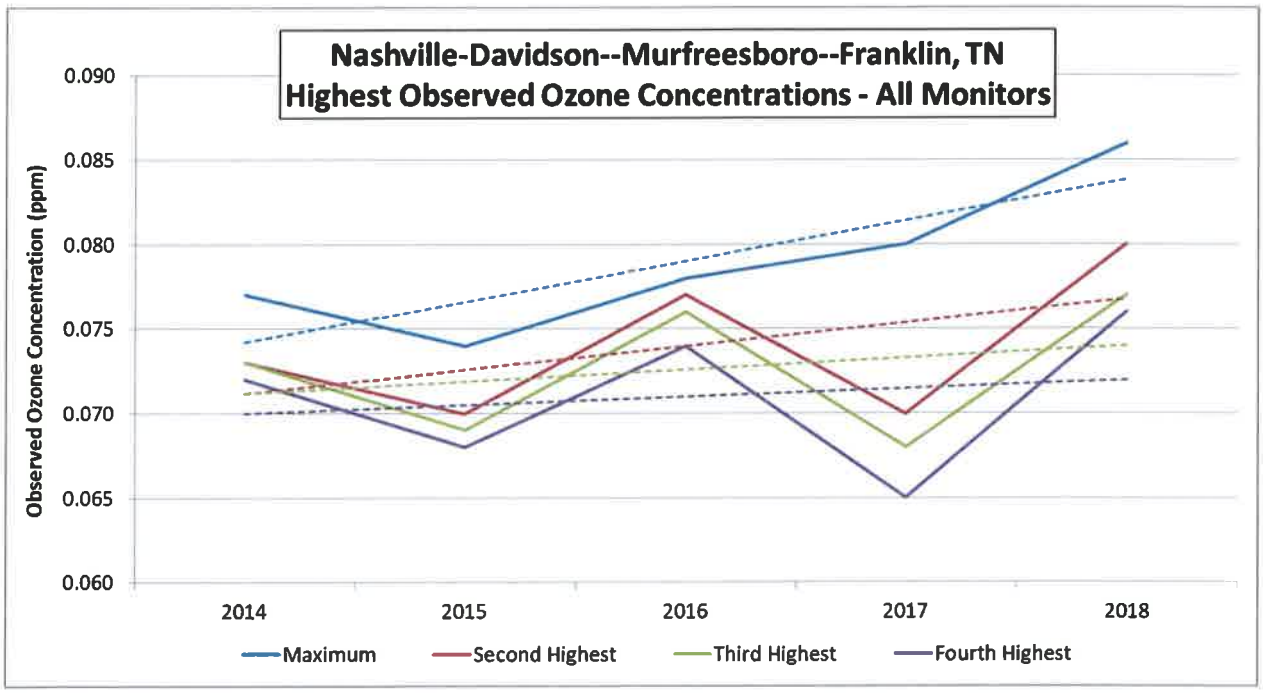


Figure 2. Increasing trend of MDA8 ozone concentrations at Middle Tennessee monitors between 2014 and 2018.

Additionally, when comparing monitor-level 4th high ozone MDA8 concentrations for receptors in the Middle Tennessee region, values that are used by EPA in determining ozone attainment and designations, not a single monitor has shown a decrease between 2014 and 2018. In fact, of the five monitors in the domain, as shown in Figure 3, three show no change in 4th high MDA8 concentrations between the two years while the other two monitors show an increase of up to 3 parts per billion (ppb) in the MDA8 concentration observed.

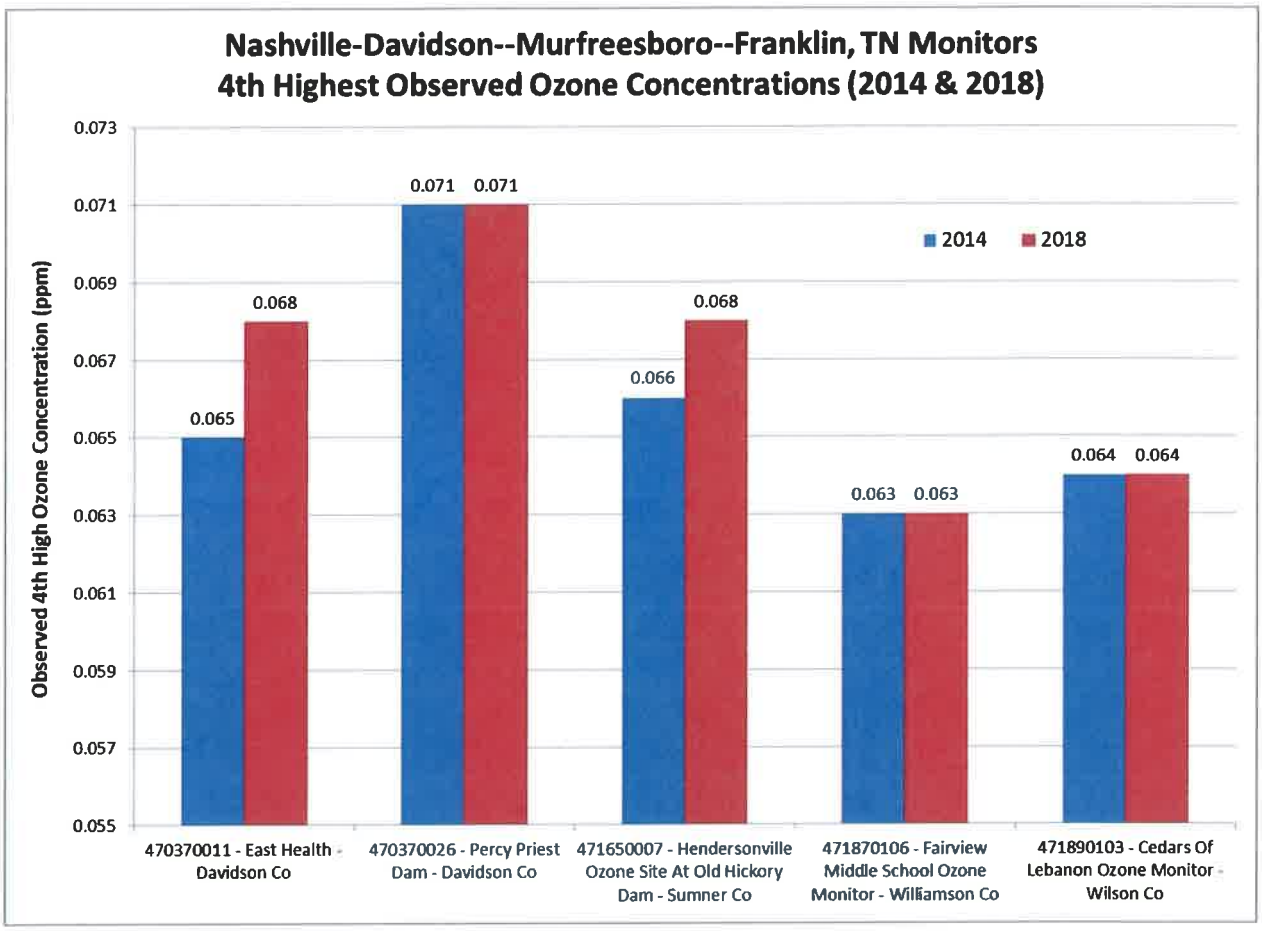


Figure 3. Comparison of 4th High MDA8 Ozone Concentrations at Regulatory Monitors in Middle Tennessee Region.

2. Air Quality Modeling Is Absent In The Analysis

TDEC has failed to simulate the impact of removal of the I/M program using air quality modeling. Ozone concentrations have non-linear correlation to NOx and VOC emission changes and cannot adequately be estimated exclusively using scaling ratios based on emission reduction sensitivities.

EPA SIP modeling guidance[3] notes that "[t]he application of a chemical transport grid model on a regional or local scale is the best tool available to judge the impacts of changes in future year emissions on concentrations." It further goes on to say "[a]ir agencies should determine whether a control program scenario will provide sufficient emission reductions to demonstrate attainment of the NAAQS using the modeled attainment test. The modeled attainment test is a technical procedure in which an air quality model is used to simulate base year and future air pollutant concentrations for the purpose of demonstrating attainment of the relevant NAAQS."

[3] https://www3.epa.gov/ttn/scram/guidance/guide/O3-PM-RH-Modeling_Guidance-2018.pdf

Formulation of a successful strategy against ozone pollution requires knowledge of the chemical regime for ozone production. Successive generations of atmospheric chemistry models have been developed to address this issue. Generally, air quality models are regarded as the most appropriate tools for assessing the expected impacts of a change in emissions.

TDEC, however, has failed to simulate the impacts of the I/M program removal with any air quality modeling. Instead, it has chosen to use external ozone sensitivity factors (inappropriate for this purpose as discussed elsewhere in this document) to estimate the changes in Tennessee air quality relative to the removal of this program.

While it may be possible to evaluate progress towards or degradation away from attainment of the ozone or PM2.5 NAAQS based on measured historical trends of air quality and emissions, there are several elements to that type of analysis that are difficult to quantify. First, in most cases, the ambient data trends are best assessed by normalizing to account for year-to-year meteorological variations. Second, one must have an accurate accounting of the year-to-year changes in actual emissions (NOx, VOC, and/or SO2 and NH3) for the given area and any surrounding areas, the emissions from which may impact local concentrations. Third, one must have a solid conceptual model of how ozone or PM2.5 is formed in the local area (e.g., influence of meteorology, NOx-limited, ammonia limited, transport-influenced, etc.).

Because TDEC has chosen to forego this most important step of simulating the removal of the I/M program with an air quality run, results presented in the noninterference demonstration cannot be considered technically complete.

It is my recommendation that TDEC conduct a full air quality simulation of the impact of removal of the I/M program in Middle Tennessee before making any determination of its interference effect.

3. Newer Modeling Platforms Are Available for Use

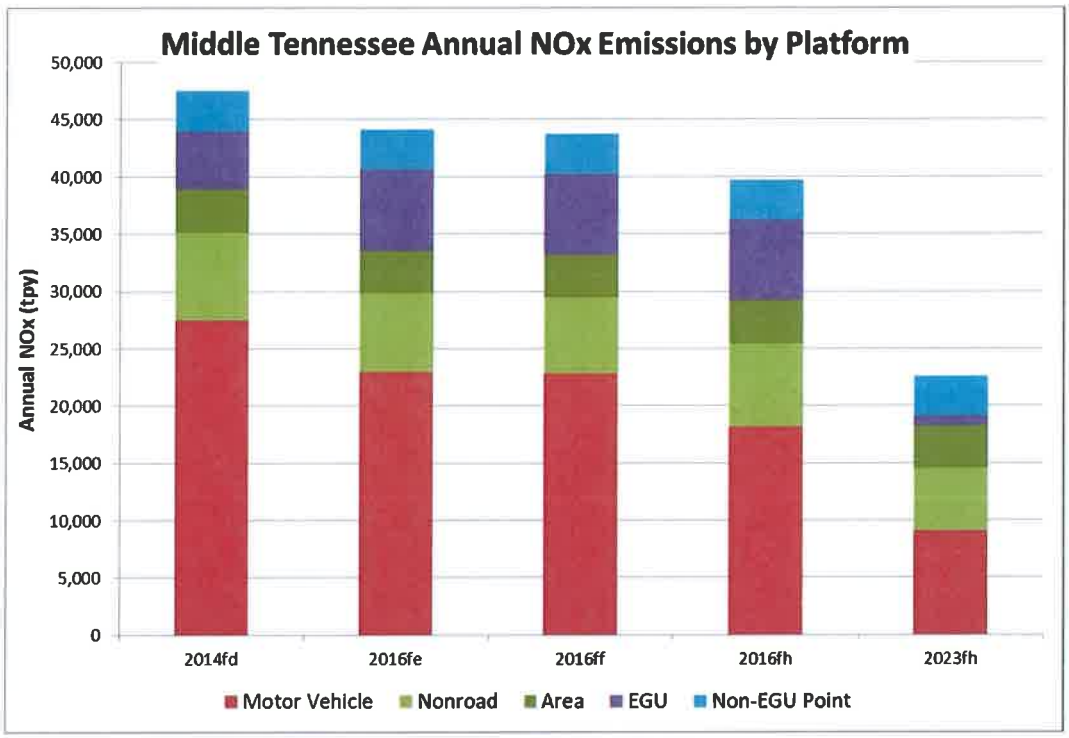
TDEC bases both its base year and future year emission assumptions on a version of EPA's 2014 National Emission Inventory (NEI), version 2 that is now multi-versions old. TDEC should revise its analysis using the most current version of the NEI that is based on a 2016 calendar year that was developed with significant input from state and regional organizations.

Since the publication of EPA's 2014v2 NEI modeling platform (2014fd in Figure 4 below), EPA has released three incrementally newer modeling platforms using national, state, and local data sources[4]. These updated platforms improve estimates for emissions activity, magnitude, and temporal and spatial distribution, and use newer emission factors, methods, and models to derive their values.

The most current version of EPA's modeling platform is the 2016v1 (2016fh in Figure 4 below) platform that is described as a coordinated effort across over 245 state and regional air agency, EPA, and Federal Land Manager employees. Figure 4 below demonstrates the differences published in Middle Tennessee

[4] https://www.epa.gov/air-emissions-modeling/2014-2016-version-7-air-emissions-modeling-platforms

counties, annual emissions for NOx and VOC by major category across the multiple platforms and associated projections, including the two discussed above.



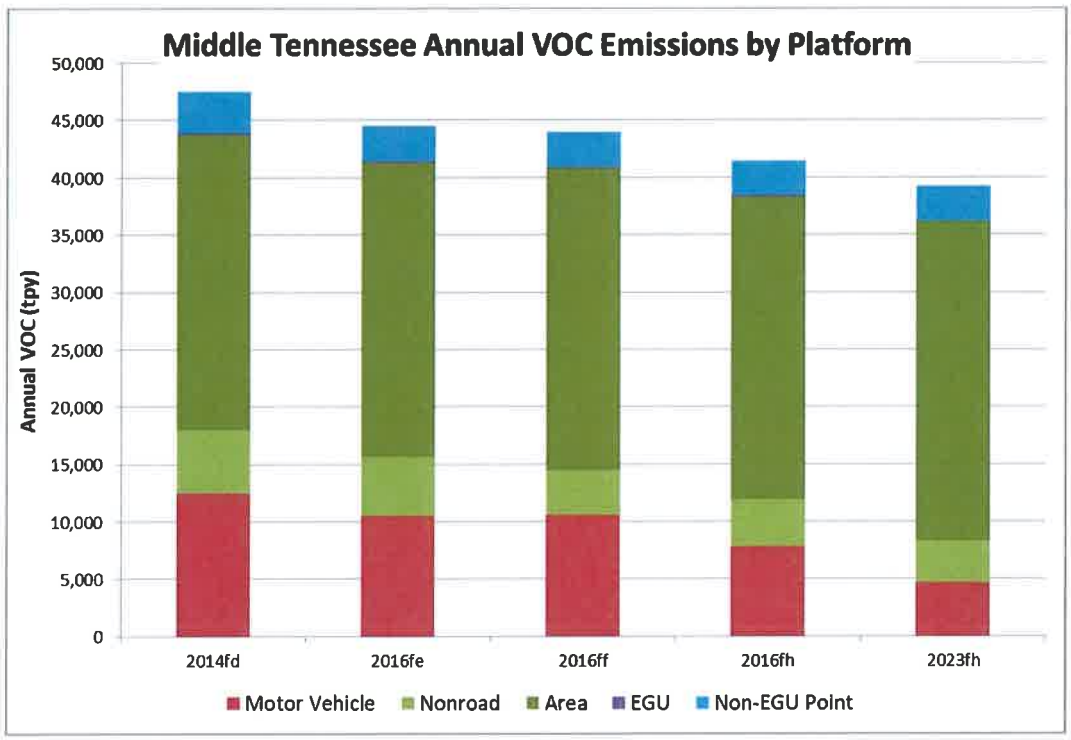


Figure 4. Annual emission summary of various EPA modeling platforms and associated projections for NOx (top) and VOC (bottom) Middle Tennessee counties.

The 2016fh platform and associated emission projections are demonstrably different in annual NOx and VOC from anthropogenic sources compared to the 2014fd platform cited by TDEC in its sensitivity analysis and likely contain updated emission estimates for Middle Tennessee (and regionally impacting) source categories. Additionally, the fact that current emission estimates for motor vehicles in the Middle Tennessee region are decreasing, yet air quality has deteriorated in recent years, indicates that an additional increase in emissions, via the removal of the I/M program, may have an additional, accelerated deterioration impact on local air quality.

It is my recommendation that the most current modeling platform and associated emission projections be used to update the I/M analysis conducted by TDEC to account for improvements in emission estimates.

4. 2014 Inventory Is A Bad Year For Sensitivity Analysis

As noted in TDEC's Noninterference Demonstration, TDEC selected 2014 as a base year to develop estimated air quality impacts of the removal of the I/M program in Middle Tennessee.

Meteorological conditions including temperature, humidity, winds, solar radiation, and vertical mixing affect the formation and transport of ambient ozone concentrations. Ozone is more readily formed on warm, sunny days when the air is stagnant and/or when the winds are favorable for transport from upwind source areas. Conversely, ozone production is more limited on days that are cloudy, cool, rainy, and windy. In general, below average temperatures are an indication that meteorological conditions are unconducive for ozone formation, whereas above average temperatures are an indication that meteorology is conducive to ozone formation.

EPA notes in its ozone and PM modeling guidance document that the selection of a base year for SIP and sensitivity modeling is dependent on model performance evaluations and the response to emissions controls over time periods that include a ramp-up to a high ozone period and a ramp-down to cleaner conditions. This allows for a more complete evaluation of model performance under a variety of meteorological conditions. EPA recommends that one should choose time periods which reflect a variety of meteorological conditions that frequently correspond with observed 8-hour daily maximum concentrations greater than the level of the NAAQS at monitoring sites in the nonattainment area.

We note, as do EPA and others, that 2014 was not a conducive year for such an analysis, nor did it contain high ozone periods that would adequately allow for the determination of impact of control strategies and air quality response. In recent modeling documentation[5], EPA notes that the summer of 2014 was not particularly conducive for ozone formation in the Upper Midwest, Ohio Valley, South, and Southeast. EPA provides supporting information from NOAA's Temperature, Precipitation, and Drought website[6] that shows 2014 was a below average temperature year (Figure 5) and an above average precipitation year (Figure 6).

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[5] http://www.midwestozonegroup.com/files/EPA_maintenance_flexibility_Oct_19_2018.pdf
[6] https://www.ncdc.noaa.gov/temp-and-precip/

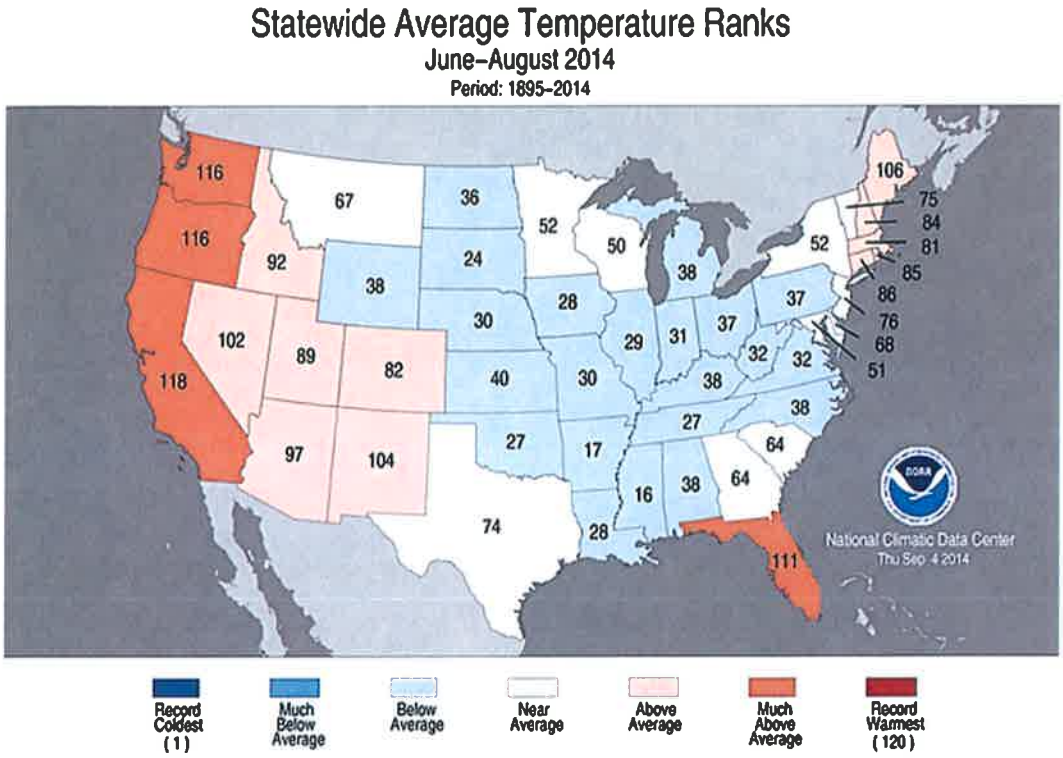

Figure 5. Statewide average temperature ranks, summer 2014.

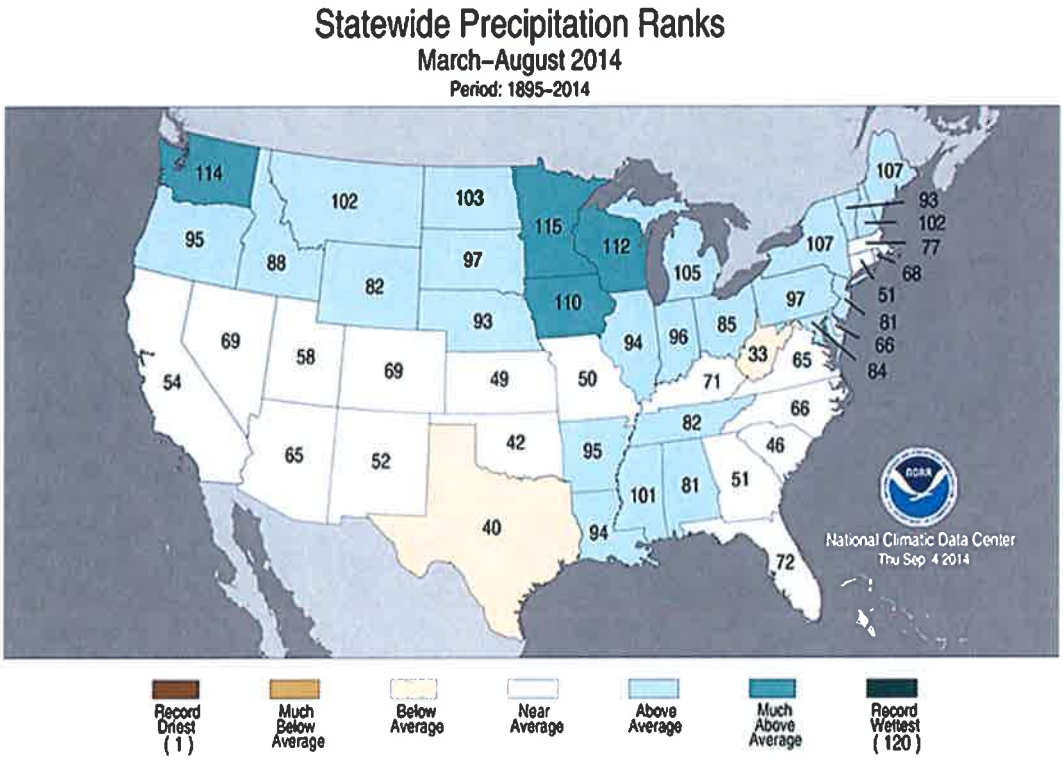

Figure 6. Statewide average precipitation ranks, summer 2014.

In contrast, 2016 was an abnormally above average temperature year (Figure 7) for Tennessee and the Southeast, providing an alternative base year (as further discussed below) for this type of sensitivity to be conducted. This year is also consistent with EPA's latest modeling platform that could be used for this purpose.

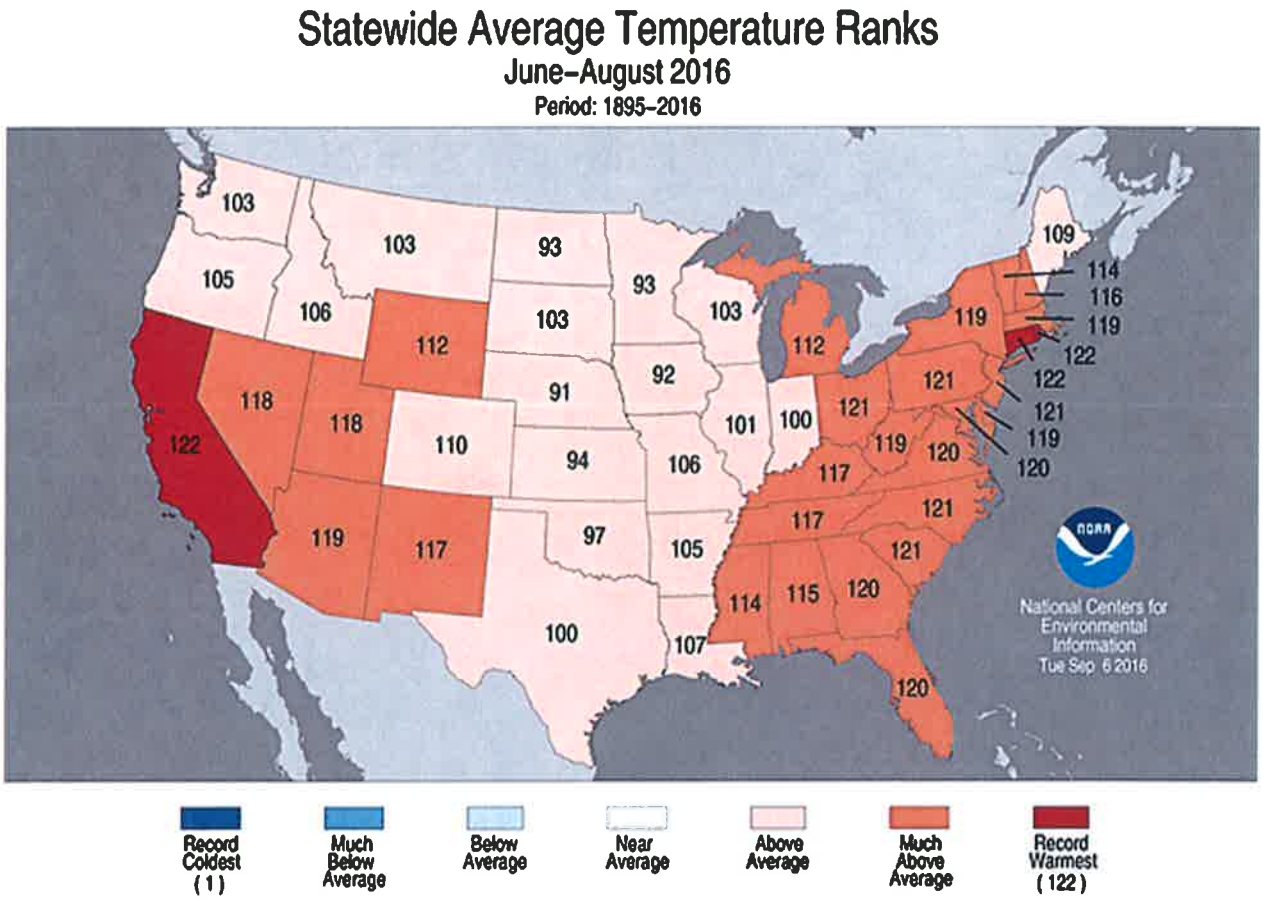

Figure 7. Statewide average temperature ranks, summer 2016.

It is my recommendation that TDEC conduct future ozone and PM modeling using a meteorological and associated base year inventory that meets the requirements of EPA guidance for the determination of impact of control strategies and air quality response.

5. Ozone Sensitivity Factors Are Based On 2007 Data Projected to 2018

TDEC relies on a technical analysis completed in 2014 that is based on inventories and assumptions now considered aged in their application of ozone sensitivity factors to estimate the impact of the removal of the I/M program. The "brute force" factors generated from this work are not applicable to current conditions and to the mix of sources and emissions in the analyzed region and are based on a calculation of emission reductions across all source sectors (not just I/M impacted sources) and across the entire state of Tennessee (not just the Nashville, Middle Tennessee region).

TDEC has relied on an analysis[7] conducted by Georgia Tech in 2014 (SEMAP) that is based on a 2007 base year emission inventory with 2018 projections using assumptions considered "On The Way" or "On The Books" at that time. My review of this study and platform find the following issues related to the study's use in TDEC's ozone sensitivity analysis.

To start, total Tennessee annual anthropogenic NOx emissions projected to 2018 in the SEMAP analysis (267,700 tpy) are 25% greater than actual emissions currently reported in Tennessee in the 2016v1 platform (214,542 tpy). This direction is reversed for anthropogenic VOC emissions where EPA's 2016v1 platform is 7% higher than the SEMAP 2018 projection (227,090 tpy v 210,706 tpy). This initially complicates the ozone sensitivity factor, as the ratio of ozone to NOx and VOC used by TDEC is based on emission levels significantly different than actual, current conditions.

Furthermore, when looking at motor vehicle source emission comparisons exclusively, EPA estimates that in 2016, onroad annual NOx (106,069 tpy) comprises 49% of total anthropogenic emissions from Tennessee. The SEMAP analysis estimated a significantly lower composition (36%; 95,973 tpy) in its 2018 projections used to create the ozone sensitivy factors used by TDEC. Annual motor vehicle VOC emissions also differ in contribution with SEMAP estimating 19% of total anthropogenic VOC (40,676 tpy) in 2018 from motor vehicle sources compared to EPA's 24% (53,649 tpy) from this same category-state combination. Figures 8 and 9 present this comparison for NOx and VOC, respectively.

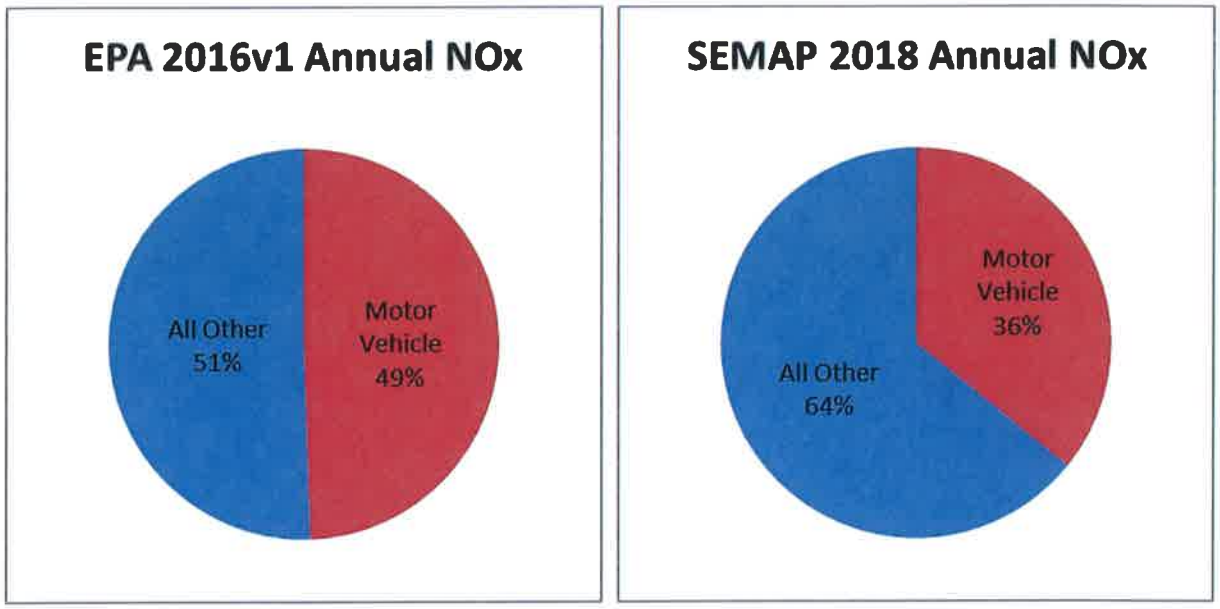

Figure 8. Comparison of annual NOx emissions from Tennessee motor vehicle sources as a percentage of total Tennessee NOx emissions.

[7] http://semap.ce.gatech.edu/sites/default/files/files/SEMAP-Revised-Final-Report_Final.pdf

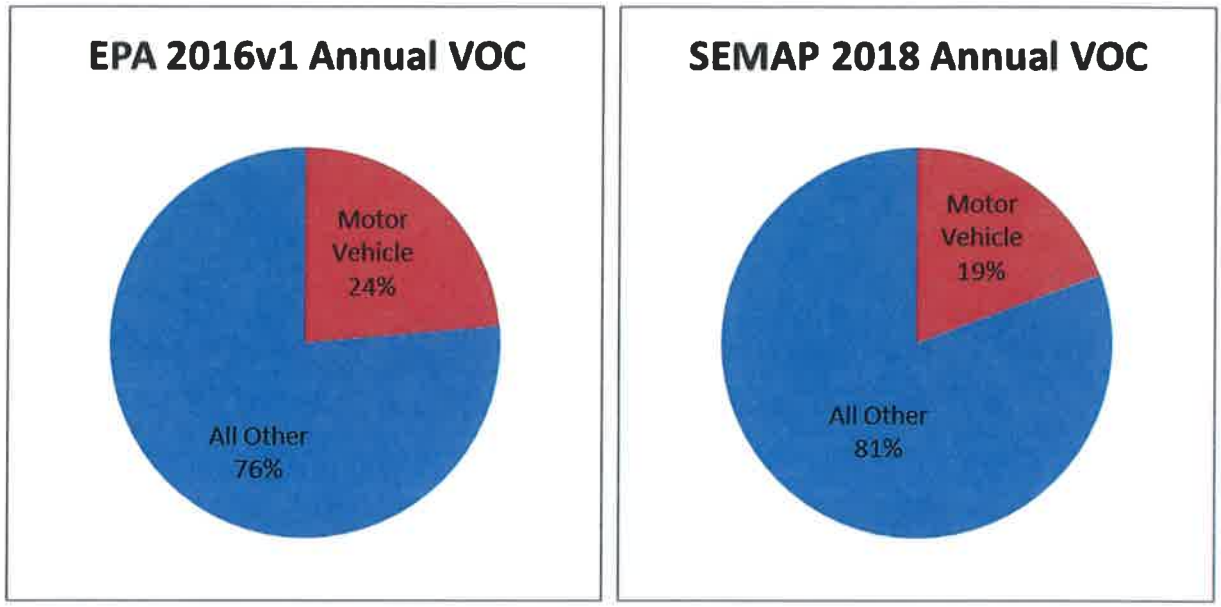

Figure 9. Comparison of annual VOC emissions from Tennessee motor vehicle sources as a percentage of total Tennessee VOC emissions.

As a result, the SEMAP calculated ozone sensitivity factor is based on an emissions magnitude AND a presumed source category emission ratio significantly different than today's actual distribution ratio as represented in the 2016v1 platform. This results in a sensitivity factor (ppb/ton reduced) calculated from the SEMAP work that is not directly applicable to today's ozone conditions and that is likely not representative of the air quality change reflected in the removal of the I/M program.

It is my recommendation that TDEC consider alternate methods and air quality modeling than using an outdated modeling platform and projections, with source category distribution assumptions, significantly different than today's actual category and emissions mix, to determine the air quality impact of removing Middle Tennessee's I/M program.

6. TDEC's Misuse of the SEMAP Ozone Sensitivity Factor

TDEC notes in the Noninterference Demonstration document (page 14) that:

> *"Although the SEMAP study projected emissions and ozone concentrations in 2018, it is estimated that a similar response to NOx and VOC reductions would occur in 2022."*

In fact, the SEMAP report itself indicates the limitations of using these data for purposes other than identical to the conditions in that analysis. Specifically, the report notes[8]:

> *"Since ozone response is nonlinear the results are most accurate for the amount of reduction used here, i.e., 30% of either NOx or VOC emissions. Caution should be exercised if the results are used for other purposes, for example in attempts to calculate the responses to other levels of*

[8] Id. Page 5-1.

emission reductions, especially those larger than 30%, or responses to combined NOx and VOC reductions. An extreme attempt might be to extrapolate the results to 100% and calculate interstate contributions. The nonlinear nature of the relation between ozone and NOx or VOC emissions should be kept in mind in such interpretations of the results. Any such attempt can only be a first estimate and should be followed by simulations of the actual emission reduction case."

This caveat to the SEMAP results is clear in noting that (1) the sensitivity factors generated from the analysis are most accurate for reducing NOx or VOC emissions across all categories across the entire state by 30%, (2) caution should be exercised if the results are to be used for purposes other than the original intent of the analysis, (3) using the sensitivity factors should only be considered a first estimate and not a final application of the emission change, and (4) an actual emission reduction scenario and air quality modeling simulation should be conducted with the strategy outlined.

TDEC has made no documented effort to follow this guidance from the SEMAP report and from where the ozone sensitivity factors were taken.

It is my recommendation that TDEC consider using alternate methods and air quality modeling to determine the air quality impact of removing Middle Tennessee's I/M program.

7. Calculations Show Onroad Emissions From Tennessee Have The Greatest Ozone Formation Potential

By using the SEMAP ozone sensitivity factors, TDEC makes an assumption that each ton of a pollutant precursor emission has an equal impact on air quality as compared to every other ton of the same pollutant precursor, regardless of emission source. Recent modeling on this subject demonstrates that local motor vehicle source emissions have significantly greater impact on local air quality compared to all other source categories and regions.

Assuming that non-linear ozone formation and the use of an older modeling platform and associated emission projections were to be acceptable approaches to reviewing the impact of air quality change resulting from removal of the I/M program, recent category-specific source apportionment analyses conducted elsewhere by Alpine indicate that NOx emissions from Tennessee's motor vehicle source category have a much greater impact on local air quality than estimated by TDEC.

In the statement from TDEC's website presented above, the following sentence has significant relevance to the review here:

"But in numerous cities across the country, the personal automobile is the single greatest polluter, as emissions from millions of vehicles on the road add up."

Using methods previously established under other work[9], Alpine has reviewed the recent EPA modeling platform used in the Cross-State Air Pollution Rule (CSAPR) Close-Out modeling and developed ozone source apportionment results and relationships between State-source category specific ozone source apportionment modeling and the seasonal NOx emissions used to develop the ozone concentrations. We used the **C**omprehensive **A**ir quality **M**odel with e**X**tensions/**O**zone **S**ource **A**pportionment **T**echnology[10] (CAMx/OSAT) technique to quantify the contribution of 2023 base case NOx and VOC emissions from anthropogenic source categories in each region to projected 2023 ozone concentrations at ozone monitoring sites based on EPA's CSAPR "Closeout" base case scenario from EPA's 2011/2023en modeling platform.

This analysis is important as the results provide indicators of relative contribution of source regions (states) and categories (e.g., motor vehicle) NOx and VOC emissions to downwind monitor ozone concentrations. Our findings for the 2023 simulation at Middle Tennessee monitors are presented in Figures 10 through 13 below.

Each figure presents the relative contribution of NOx and VOC emissions to the modeled ozone concentration at the presented receptor. The relative height of the bars indicates the source region (x-axis) of contribution with taller bars indicating greater relative contribution. The individual colored segments of each bar (e.g., red indicating motor vehicles) indicate the relative contribution of source categories within each region to the monitor's modeled ozone concentration.

In all cases listed in the following four Figures, emissions from motor vehicle sources contribute the greatest relative concentration from U.S. anthropogenic emissions to the four monitors presented (e.g., red portion of bar from Tennessee). Based on the understanding of local impact from mobile sources, it could also be estimated that more localized reductions (e.g., Middle Tennessee counties only) would have an even greater relative impact on ozone concentrations per ton than a statewide estimation.

Note that the blue "BC" bar indicates contribution from emissions generated from boundary condition sources that include, but are not limited to, concentrations transported into the national modeling domain (e.g., international transport, stratospheric intrusion, domain initialization conditions) and are not controllable by U.S. regulation.

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9 http://midwestozonegroup.com/files/RelativeImpactofStateandSourceCategoryNOxEmissionsonDownwindMonitorsIdentifiedUsingthe2017CrossStateAirPollutionRuleModelingPlatform.pdf

10 http://www.camx.com/files/camxusersguide_v6-40.pdf

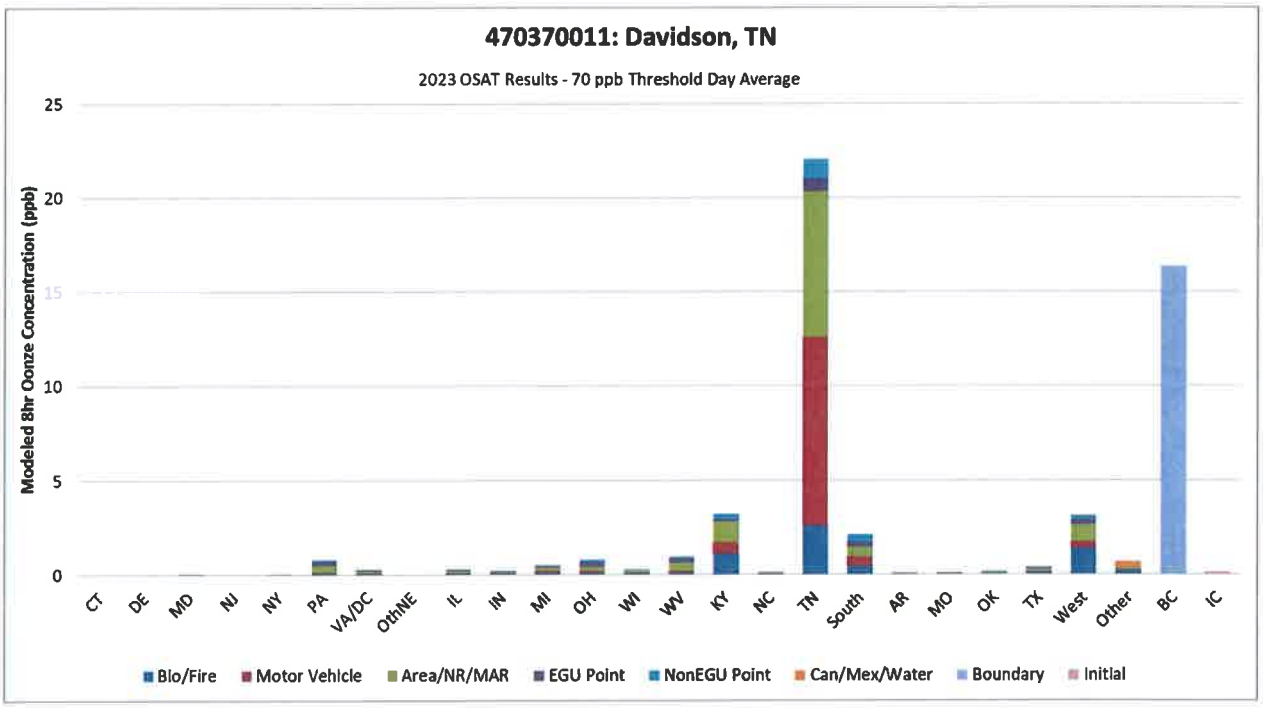


Figure 10. Relative contribution of ozone concentration (ppb) from source region and category combinations for East Health monitor.

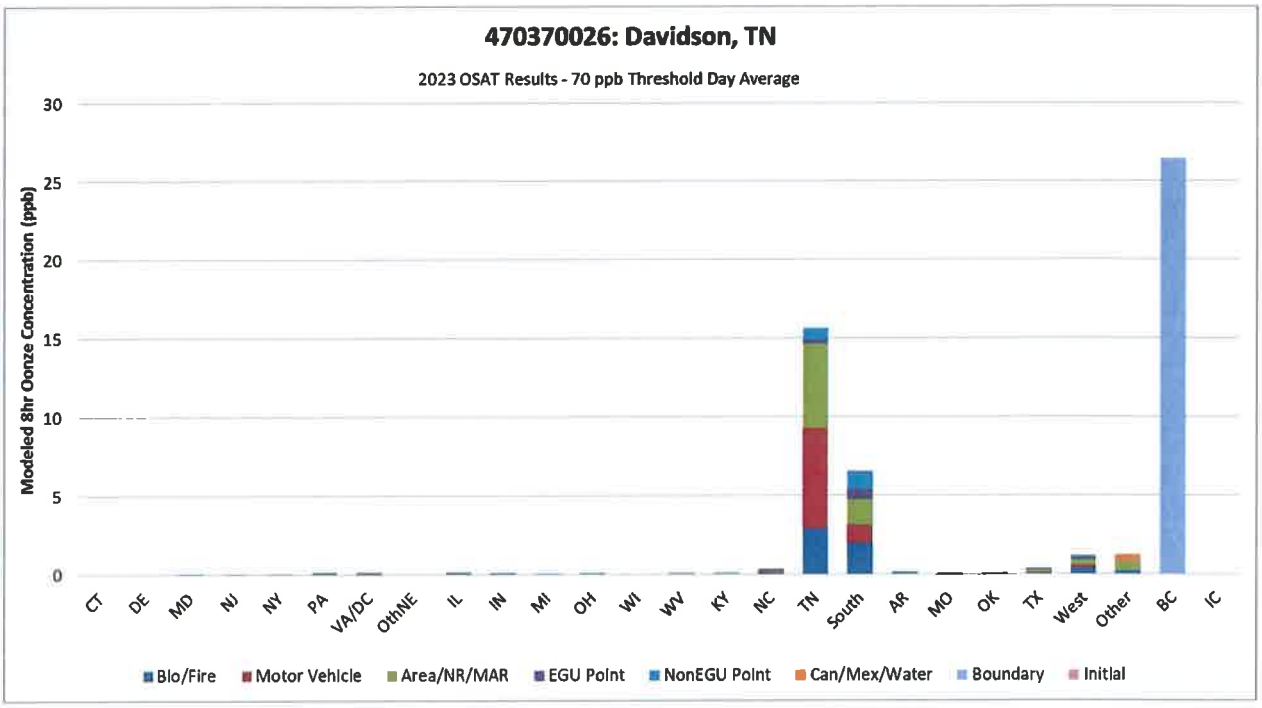


Figure 11. Relative contribution of ozone concentration (ppb) from source region and category combinations for Percy Priest Dam monitor.

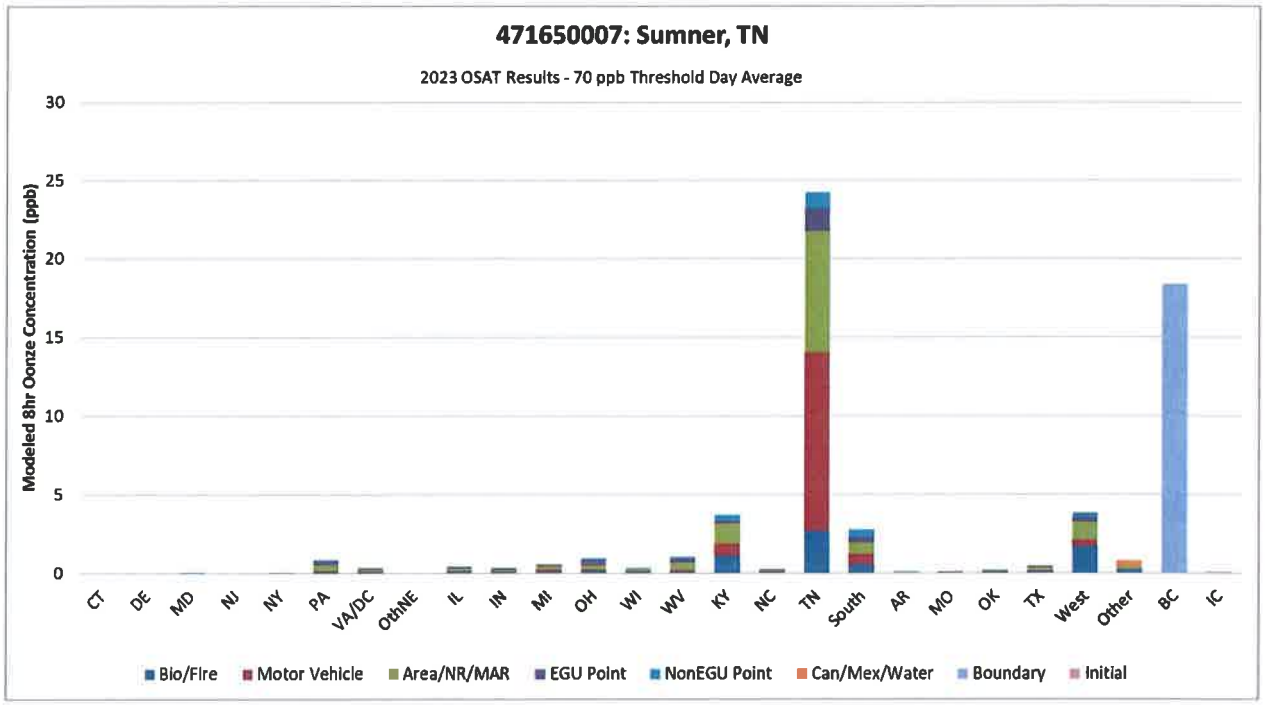


Figure 12. Relative contribution of ozone concentration (ppb) from source region and category combinations for Hendersonville Ozone Site at Old Hickory Dam.

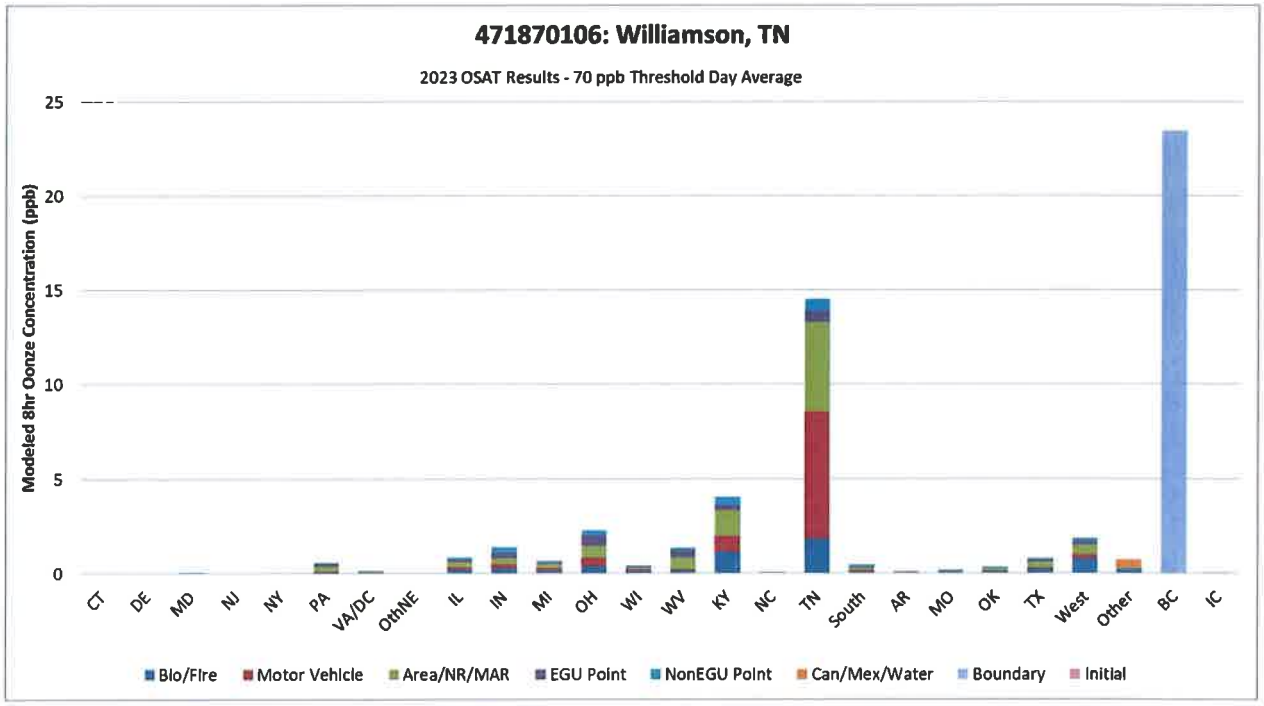


Figure 13. Relative contribution of ozone concentration (ppb) from source region and category combinations for Fairview Middle School monitor.

Furthermore, using these same source apportionment results and monthly, county, and source category specific emissions published by EPA, we developed relational "impact factors" (units of ppb/ton). We define this "impact factor" as representative of the relative contribution of modeled emissions (tons) to resultant ozone concentrations (in ppb), similar to TDEC's used SEMAP ozone sensitivity factor.

In Alpine's analysis, using updated emissions, projections, and models, we find that the relative impact of NOx emissions from mobile sources in Tennessee have factors significantly higher than most other regional-category combinations, leading us to conclude that motor vehicle and nonroad source emissions have the greatest impact on ozone concentrations in the Middle Tennessee region at the monitors reviewed.

The following four figures present the graphical results of our analysis for four Middle Tennessee monitors (presented above) with representation by state and major source sector of the impact factor calculation for the 2023 projection simulation. In all cases, either the emissions from motor vehicle sources from Tennessee (red bar) or contributions from the nonroad mobile source sector (portion of green bar) are visibly greater in relative contribution impact than any other state or category.

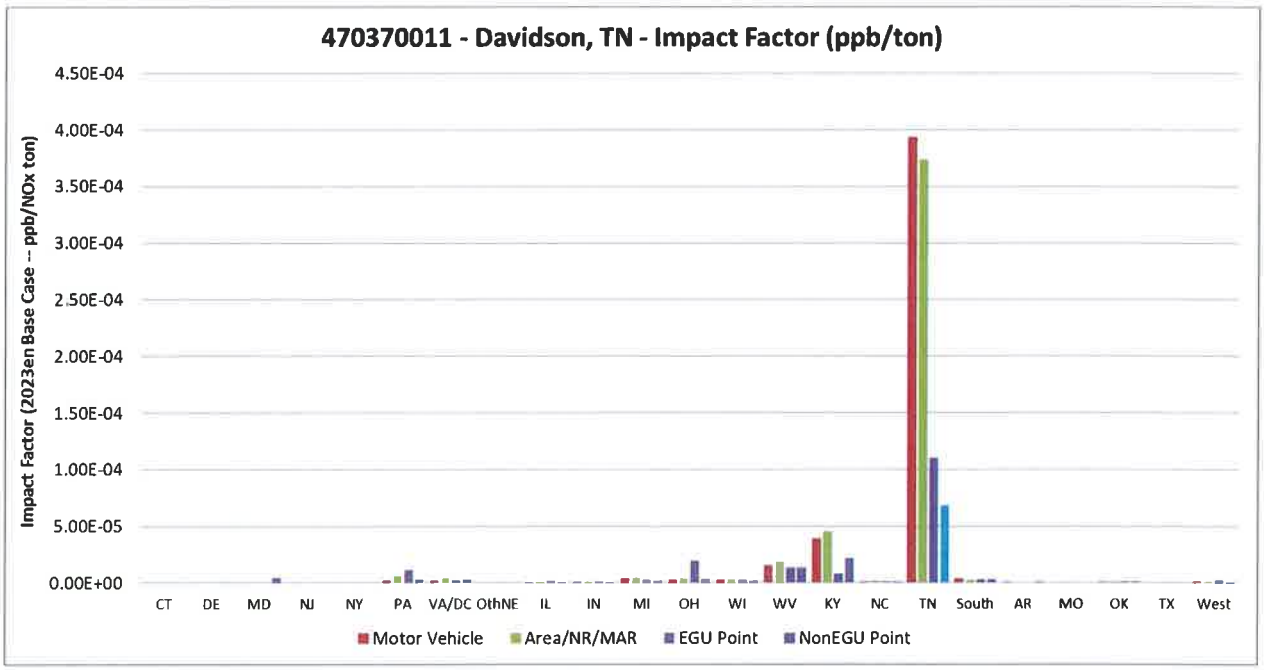


Figure 14. Impact factor calculation (ppb/ton) from source region and category combinations for East Health monitor.

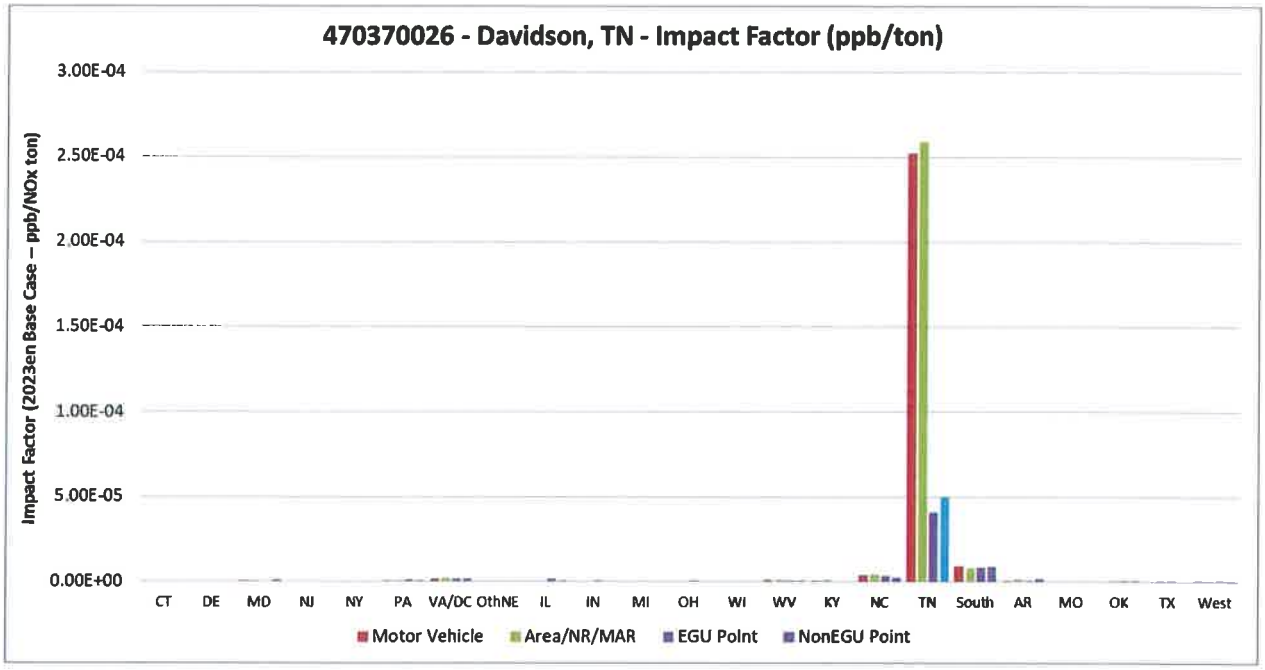


Figure 15. Impact factor calculation (ppb/ton) from source region and category combinations for Percy Priest Dam monitor.

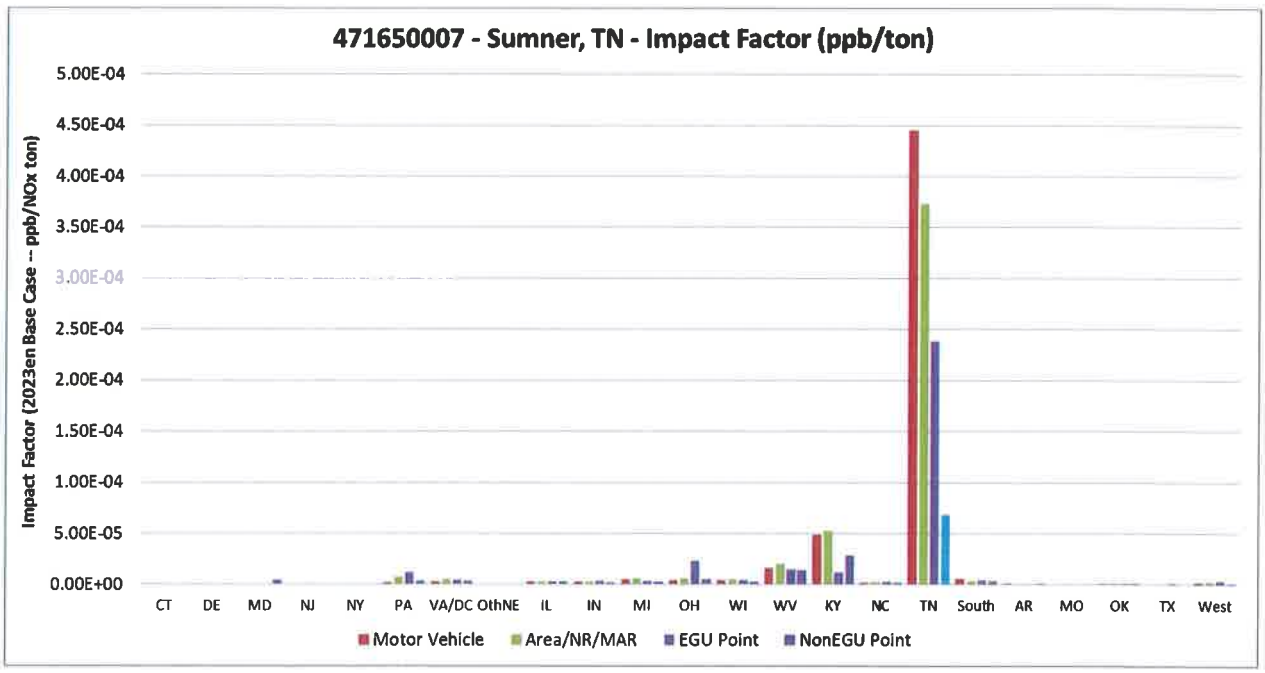


Figure 16. Impact factor calculation (ppb/ton) from source region and category combinations for Hendersonville Ozone Site at Old Hickory Dam.

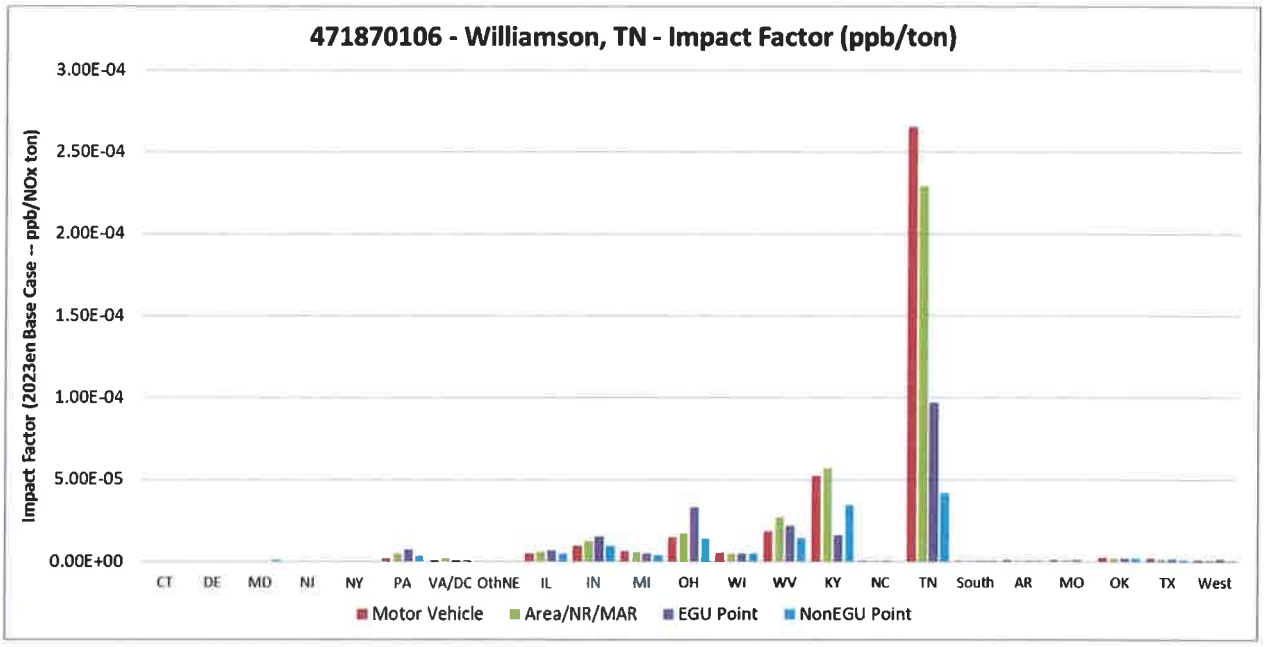


Figure 17. Impact factor calculation (ppb/ton) from source region and category combinations for Fairview Middle School monitor.

Using the results of these recent state and source category specific source contribution modeling analyses, I believe that the ozone sensitivity factors used by TDEC to estimate the impacts of the removal of the I/M program in the Middle Tennessee domain are inapplicable to current conditions based on TDEC's generic calculation and brute force application, and that actual air quality modeling is necessary to estimate the air quality impact of this action.

It is my recommendation that TDEC consider using alternate methods and air quality modeling to determine the air quality impact of removing Middle Tennessee's I/M program. Absent the decision to run an air quality simulation, it is my recommendation that should TDEC consider using an "impact factor"-like application to determine the impact of the removal of the I/M program in Middle Tennessee, it should use county and motor vehicle specific factors to make this first step assessment.

8. EPA Is Rolling Back Other Regulations That Will Likely Increase Emissions

TDEC includes in its assumptions that existing non-mobile control programs will remain in force during the foreseeable future. As has been demonstrated by EPA, a significant number of federal air quality regulations have been "rolled back", removed from requirements, or are in the courts pending review and decision. Should these regulations be stricken from the list of required control programs, assumptions included that assume emission decreases and associated air quality improvements will be invalidated.

Multiple sources, including EPA itself, have summarized the dozens of air quality related regulatory programs that have been "rolled back", challenged in the courts, or are no longer being enforced in the past few years and that have demonstrated negative impact on air quality progress. These rules,

whether related to motor vehicle and nonroad mobile sources (proposing weakening existing fuel economy standards, lifting summertime ban on ethanol-based fuel blends, etc.), electric generating utilities (proposing repeal of Clean Power Plan; Power Plant Startup, Shutdown, and Malfunction Rule; etc.), or other categories and emission sources that impact air quality in Middle Tennessee have all been part of earlier improvements in ozone and PM concentration observations in the region.

However, now that these rules have been and continue to be eliminated, air quality in the region has shown deterioration and movement towards nonattainment of the various NAAQS. Removal of yet another regional rule like the I/M program will only work to worsen air quality for the population of Nashville and the entire Middle Tennessee region.

It is my recommendation that TDEC collectively consider the impact of these additional regulations before removing the I/M program from Middle Tennessee.

Summary of Recommendations

The Tennessee Department of Environment and Conservation , Air Pollution Control Division has requested that the United States Environmental Protection Agency remove the requirement for an Inspection and Maintenance program for the five-county Middle Tennessee area, which includes Davidson, Sumner, Wilson, Rutherford, and Williamson Counties, from Tennessee's State Implementation Plan. To support this request, TDEC has conducted a demonstration designed to show that removing the I/M program from Tennessee's SIP will not interfere with attainment or maintenance of various air quality NAAQS.

Based on a technical review conducted of the request for removal and associated documentation, I have concluded that the Noninterference Demonstration is inadequate to support the conclusion that removal of the I/M program from the SIP will not interfere with attainment of the NAAQS. In addition, I have made the following recommendations that are further detailed above.

- It is my recommendation that TDEC conduct a full air quality simulation of the impact of removal of the I/M program in Middle Tennessee before making any determination of its interference effect.
- It is my recommendation that the most current modeling platform and associated emission projections be used in this air quality simulation to update the I/M analysis conducted by TDEC to account for improvements in emission estimates.
- It is my recommendation that TDEC conduct this air quality modeling using a meteorological and associated base year inventory that meets the requirements of EPA guidance for the determination of impact of control strategies and air quality response.
- It is my recommendation that should TDEC still consider alternate methods to air quality modeling, that it use sensitivity factors based on source category distribution assumptions consistent with today's actual category and emissions mix to estimate the impact of removing Middle Tennessee's I/M program.

- It is my recommendation that TDEC consider the collective impact of additional regulations currently rolled back or in courts pending rollback decisions, before removing the I/M program from Middle Tennessee.

Clean Air Tennessee

Submission Date	2019-11-19 00:44:32
Name	Chad Harris
Email	chadharris1@hotmail.com
Address	1225 Davidson Rd Nashville TN 37205
Phone Number	(615) 8919023
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 18:50:10
Name	Jan Routon
Email	jrouton@bellsouth.net
Address	712 Ebenway Dr Nashville Tn 37205
Phone Number	(615) 3564878
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality. Please work to do everything possible to improve our air quality, and keep testing vehicles.

Clean Air Tennessee

Submission Date	2019-11-18 18:49:30
Name	James Thoman
Email	jrthoman4047@gmail.com
Address	4047 Mill Rd Hermitage Tennessee 37076
Phone Number	(615) 8918435
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 18:46:50
Name	Kayla Young
Email	kaylamarie59@gmail.com
Address	320 11th Ave S Nashville TN 37203
Phone Number	(865) 5853181
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 18:43:13
Name	Jennifer Ohnstad
Email	ohnjc@hotmail.com
Address	437 Annex Ave Nashville TN 37209
Phone Number	(615) 3539566
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 18:34:16
Name	Doug Berry
Email	tennreia@gmail.com
Address	1610 Knowles Street Nashville Tennessee 37208
Phone Number	(615) 4242140
Write a message to TDEC and the EPA:	I fully support the ROLLBACK for emissions testing in Tennessee. PLEASE HELP US SAVE TIME & Money for the lower income & disadvantaged residents of Tennessee. We can't afford the testing! Thank you!

Clean Air Tennessee

Submission Date	2019-11-18 18:12:08
Name	Deanna Bowden
Email	deannabowden@netscape.net
Address	1215 Haber Drive Brentwood TN 37027
Phone Number	(615) 5840567
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 17:25:31
Name	Denise Germino
Email	dgermino@yahoo.com
Address	736 Adkisson Lane Nashville TN 37205
Phone Number	(615) 5213850
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 17:08:47
Name	Mary Kiwalski
Email	kowalskimary18@gmail.com
Address	1013 Edwin Warner Dr Nashville TN 37205
Phone Number	(37205) 6156278273
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 16:45:44
Name	Emily Beckman
Email	emilybec@gmail.com
Address	1041 Matheus Dr. Murfreesboro TN 37128
Phone Number	(615) 5569095
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 16:33:19
Name	Morgan Kreitner
Email	mkreitn@yahoo.com
Address	934 Ramsey St. Nashville TN 37206
Phone Number	(618) 567-1235
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 16:05:58
Name	Angela Schmidt
Email	schmidt.angela24@gmail.com
Address	911 Delmas Avenue Nashville TN 37216
Phone Number	(615) 419-6358
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. It is irresponsible to end emissions protections. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 16:02:00
Name	Joel Jensen
Email	joelaajensen@gmail.com
Address	2129 Acklen Ave #2 Nashville Tn 37212
Phone Number	(206) 3341262
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 16:01:02
Name	Christina Bennett
Email	wardbennett@gmail.com
Address	708 Darden Place Nashville Tennessee Nashville
Phone Number	(615) 3539299
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 16:00:35
Name	Katherine Allison
Email	kallison14@outlook.com
Address	2129 Acklen ave Nashville Tennessee 37212
Phone Number	(425) 2699239
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 15:54:47
Name	Kathy Baker
Email	baker3975@yahoo.com
Address	6811 Fleetwood Dr. Nashville TN 37205
Phone Number	(615) 356-3975
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. It is because of this very testing that our air is now clean enough that we no longer are required to do the testing. It would be like someone who discontinues their blood pressure medicine because now their blood pressure is normal because they took the medicine! It makes no sense. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 15:53:15
Name	Duncan Ragsdale
Email	duncanrag@comcast.net
Address	6453 fleetwood dr nashville tn 37209
Phone Number	(615) 2945441
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 15:42:57
Name	Susan Sasser
Email	susansasser@bellsouth.net
Address	880 Bresslyn Rd Nashville TN 37205
Phone Number	(615) 356-5118
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 15:35:05
Name	Jim Wohlglemuth Wohlglemuth
Email	jrwohlgemuth@juno.com
Address	800 Gloucester Lane NASHVILLE 37221
Phone Number	(703) 4036135
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 23:53:01
Name	Renee Diaa
Email	renee.m.dias1@gmail.com
Address	725 E Woodlands Nashville TN 37211
Phone Number	(985) 2460976
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 23:13:48
Name	Meghan Scalf
Email	senilith@aol.com
Address	420 Murfreesboro Rd Franklin TN 37064
Phone Number	(615) 2025962
Write a message to TDEC and the EPA:	I am a born and raised Tennessean and proud of it. I am also an asthma sufferer. As such Tennessee's air quality affects me every day, as well as many others like myself. I am also a mother and am deeply concerned for the world we will be leaving our children. I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 22:45:27
Name	John Mallery
Email	johnmallery@comcast.net
Address	3412 Laurel Mountain Rd Murfreesboro Tennessee 37129
Phone Number	(615) 4100077
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 21:21:35
Name	Miranda Clements
Email	mirandaclements2729@gmail.com
Address	520 General George Patton Road Nashville Tn 37221
Phone Number	(270) 7998891
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 20:33:58
Name	Benjamin Rohrbach
Email	lilrohrbs@gmail.com
Address	3513 Crestridge Dr Nashville TN 37204
Phone Number	(615) 8306688
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 20:25:05
Name	Sara Oaks
Email	sacoaks@att.net
Address	73 Viking Cv. Cordova TN 38018
Phone Number	(901) 7589075
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 20:20:19
Name	Teena Cohen
Email	teenacohen@comcast.net
Address	6613 Ellwood Ct. Nashville TN 37205
Phone Number	(615) 3527041
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 20:15:32
Name	Alece Ronzino
Email	alece@gritandglory.com
Address	1027 McClurkin Avenue Nashville TN 37206
Phone Number	(770) 8566410
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 19:36:38
Name	Kailey Whitehead
Email	kailey.whitehead@gmail.con
Address	517 veritas street Nashville TN 37211
Phone Number	(615) 5219869
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 18:55:56
Name	Logan Hinders
Email	loganhinders@me.com
Address	1515 5th Ave N Apt 302 Nashville TN 37208
Phone Number	(806) 3415112
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 18:54:43
Name	Janice & Wallace Lampley
Email	wallace.lampley506@comcast.net
Address	506 Achievement Drive Nashville Tennessee 37209
Phone Number	(615) 352-0528
Write a message to TDEC and the EPA:	We feel that emissions testing is putting undue pressure on the poor and middle class, because they may not be able to purchase a new car that is more efficient emissions wise. We think after a certain period of time cars should drop off the list. Our '76 pickup driven less than 500 miles a year that an antique license is not wanted. But, we have had in the past spent $500+ to get through emissions, but we took it through emissions and both times they failed it, even though our local mechanic said it passed on his machine, so he took it third time to see what the problem was, and it passed. We were furious, for vehicle driven less than 500+ miles a year, when other county workers driving into Davidson County every day from Wilson, Williamson, Sumner, Robertson, Montgomery, etc don't do emmissions testing. Just not fair to us or others!! Yes, we like clean air, and it's lots better than back in the 50-60's, but this needs to change or stop. Thank you for asking for our input!!

Clean Air Tennessee

Submission Date	2019-11-19 00:04:19
Name	Brant Miller
Email	finalvinyl@comcast.net
Address	13566 Old Hickory Blvd Antioch TN 37013
Phone Number	(615) 5122360
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 10:26:12
Name	John Saltanovitz
Email	johnsaltanovitz@gmail.com
Address	4510 charlotte ave apt 310 Nashville TN 37209
Phone Number	(219) 5107216
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 12:14:31
Name	Edward Playfair
Email	edwardplayfair@yahoo.com
Address	120 Dunham Springs Lane Nashville TN 37205
Phone Number	(615) 8910377
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 09:35:26
Name	John Hawkins
Email	jahjah3@hotmail.com
Address	1415b Russell St. Nashville TN 37206
Phone Number	(615) 3393072
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 08:52:26
Name	Annie Cowherd
Email	anniecowherd@gmail.com
Address	5905 Stone Brook Drive Brentwood TN 37027
Phone Number	(615) 4232934
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 07:12:41
Name	Heather Waldrup
Email	hjwaldrup@gmail.com
Address	2313 Benay Rd Nashville TN 37214
Phone Number	(615) 4784861
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 04:49:28
Name	Waverly Harris
Email	waveann@gmail.com
Address	1108 Jennings Street Nashville Tn 37208
Phone Number	(931) 8021092
Write a message to TDEC and the EPA:	Air quality is VERY important to me! I want to see more standards that improve the health of current and future residents. I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 03:35:38
Name	Lailah Abonami
Email	labonami16@hotmail.com
Address	822 Douglas Ave Nashville TN 37206
Phone Number	(561) 8090835
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Public Comment Regarding Emissions Testing in Tennessee

Name	Shelley Courington
Email	shelley.courington@gmail.com
Address	108 Abbeywood Drive Nashville, TN, 37215
Phone Number	(629) 200-1600

Message:

I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations.

Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Public Comment Regarding Emissions Testing in Tennessee

Name	Elizabeth Knox
Email	knoxel@comcast.net
Address	819 Bresslyn Rd Nashville, TN, 37205
Phone Number	(615) 352-9785

Message:

I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations.

Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Public Comment Regarding Emissions Testing in Tennessee

Name	Mary Clement
Email	mary.clement814@gmail.com
Address	14000 Iron Horse Lane #14312 Franklin, TN, 37069
Phone Number	(412) 719-4360

Message:

I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations.

Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Public Comment Regarding Emissions Testing in Tennessee

Name	jimmy driver
Email	jimma341@gmail.com
Address	307 north chancery street mcminnville, TN, 37110
Phone Number	(931) 607-4982

Message:

I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations.

Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 14:30:24
Name	Raleigh Barnes
Email	raleighubarnes@gmail.com
Address	701 Sills Court Nashville TN 37220
Phone Number	(615) 5577287
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 14:22:18
Name	Dennis Alpert
Email	denniswalpert@gmail.com
Address	10 Gaston Park Drive APT 207 Lebanon Tennessee 37087
Phone Number	(615) 943-2770
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 14:06:20
Name	Pasquale Martinelli
Email	pasqualevmartinelli@gmail.com
Address	720 Craighead st #486 Nashville TN 37204
Phone Number	(608) 3344275
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 12:57:51
Name	Morgan Greenwood
Email	morganleegreen@gmail.com
Address	3123 Traviston Dr Franklin Tennessee 37064
Phone Number	(949) 2928807
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 12:36:14
Name	Ohyoon Kim
Email	nashvilleviolin@gmail.com
Address	100 Stratton Blvd Ashland City TN 37015
Phone Number	(615) 4998633
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 15:19:24
Name	Monica Dunn
Email	monicardunn@gmail.com
Address	319 50th Ave N Nashville TN 37209
Phone Number	(301) 6464642
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 15:10:19
Name	Angela Payne
Email	angelamae1995@gmail.com
Address	1988 Shaylin Loop Antioch TENNESSEE 37013
Phone Number	(270) 6899758
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Emissions tests are incredibly important in the fight for a better, cleaner environment. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 14:55:27
Name	Elizabeth Wright
Email	simplysouthernevents3@gmail.com
Address	1203 Kermit Drive Nashville Tn 37217
Phone Number	(731) 6955752
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 14:47:07
Name	brandi prewitt
Email	brandi@tectn.org
Address	2205 Stratford Ave Nashville TN 37216
Phone Number	(347) 5126702
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 14:32:33
Name	Renee Shoop
Email	renee.shoop@gmail.com
Address	2823 Kell Road Signal Mountain Tennessee 37377
Phone Number	(423) 8864423
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 14:15:30
Name	Lauren Borders
Email	lauren.i.borders@gmail.com
Address	920 Woodmont Blvd. #B6 Nashville TN 37204
Phone Number	(678) 7906303
Write a message to TDEC and the EPA:	Nashville and Chattanooga have a much higher risk of smog than Tennessee's rural counties and should be able to continue with emissions testing. This is an irresponsible decision in a time when climate change and pollution are among the nation's top issues. I absolutely believe that emissions testing affects the cleanliness of our air and am skeptical about data that says otherwise. I would encourage the EPA to maintain its standards in Tennessee and continue emissions testing.

Clean Air Tennessee

Submission Date	2019-11-18 14:04:42
Name	Melanie Baker
Email	bakermh0@sewanee.edu
Address	6811 Fleetwood Dr. Nashville Tennessee 37205
Phone Number	(615) 3970546
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 13:32:50
Name	Katie Bauer
Email	bauerkatie116@gmail.com
Address	4510 Charlotte Ave Nashville TN 37209
Phone Number	(502) 6936959
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 12:58:07
Name	Sara Wigal
Email	saraewigal@gmail.com
Address	944 strouse ave Nashville Tn 37206
Phone Number	(949) 9814772
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 12:21:46
Name	Delaney Brown
Email	delaneydeniseb@gmail.com
Address	209 Louise Ave Nashville TN 37203
Phone Number	(615) 8230360
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 12:10:20
Name	Laura Davidson
Email	haleylowman@gmail.com
Address	704B Crescent Road Nashville TN 37205
Phone Number	(615) 483-2345
Write a message to TDEC and the EPA:	Cities should make their own decisions for clean air policy. We should keep emissions testing and strengthen other environmental regulations, not loosen them.

Clean Air Tennessee

Submission Date	2019-11-18 10:39:01
Name	Alma Sanford
Email	almasanford@gmail.com
Address	6317 Paddington Way Antioch Tennessee 37013
Phone Number	(615) 828-5470
Write a message to TDEC and the EPA:	As an asthma sufferer, I wish to express my support for continued emissions testing in Tennessee's major cities. I live in Nashville and I find that the quality of life in Nashville, is deteriorating because of the huge influx of new citizens and new automobiles. We do not deserve to have the added issues of rampant air pollution caused by auto emissions. Tennessee already ranks in the bottom half of the country in terms of overall air quality. Restricting emissions testing sets the wrong precedent and endangers our communities. As a citizen of this state and of the United States, I believe our country has always tried to protect its citizens. That is the role of government and we need the best possible protections for the health of our citizens. Do not roll back emissions testing requirements for Nashville or any other area of the state or the United States.

Clean Air Tennessee

Submission Date	2019-11-18 10:37:58
Name	Andy Ellis
Email	twangmon@gmail.com
Address	1400 Rosa L. Parks Blvd. Apt. 418 Nashville TN 37208
Phone Number	(615) 823-1923
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. I moved to Nashville 17 years ago from the SF Bay Area—I know first-hand about air pollution generated by autos, especially commuter traffic. As Tennessee's cities grow, we must continue to monitor and test vehicle emissions. Other countries that do not have or enforce emission laws, such as India and China, face choking pollution that causes serious health problems for their citizens. That must not happen here. But unless we plan ahead and take preventative action, it can. Tennessee's natural beauty attracts tourists and new residents. As our cities grow, we must be mindful not to spoil those the very things that bring people here—fresh, breathable air being one of them. AE

Clean Air Tennessee

Submission Date	2019-11-18 10:09:59
Name	Brandon Puttbrese
Email	brandonputtbrese@gmail.com
Address	921 Ward Street Nashville TN 37207
Phone Number	(615) 6132598
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 09:49:32
Name	Rebecca Bilbrey
Email	rbilbrey@ascension.org
Address	4220 Harding Road Nashville TN 37205
Phone Number	(615) 222-3034
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 09:43:05
Name	William Painton
Email	williampainton@bellsouth.net
Address	228 Bonnabrook Dr. Hermitage TN 37076
Phone Number	(615) 5330592
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 09:20:53
Name	Sherry Oziminski
Email	ozland@tds.net
Address	1008 Callaway Drive Lebanon Tn 37087
Phone Number	(615) 4804174
Write a message to TDEC and the EPA:	We need to do more to support and promote electric vehicles in the way of funding and infrastructure of electric charging stations in Tennessee. I Also wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 08:35:48
Name	Margie Parsley
Email	mparsley99@yahoo.com
Address	6200 vosswood dr Nashville Tn 37205
Phone Number	(615) 3527551
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 07:19:58
Name	Stacey Whetstone
Email	staceyw1919@gmail.com
Address	427 E 4th N street Morristown TN 37814
Phone Number	(423) 2313113
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 07:10:15
Name	Philip Zuvichaux
Email	zuvichaux@yahoo.com
Address	8456 Briarbirch Cove Germantown TN 38139
Phone Number	(901) 5700876
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville, Memphis and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 06:03:49
Name	Helen Martin
Email	hb.martin@comcast.net
Address	625 Casa Loma Blvd, 702 Boynton Beach FL 33435
Phone Number	(404) 2755678
Write a message to TDEC and the EPA:	I qm considering a move to Nashville with my family. We already have lots 9f family living there. How is it that you are thinking of harming citizens with this awful change? I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-18 05:28:13
Name	Cody Ringer
Email	Ringer.cody@yahoo.com
Address	1006 Dogwood Drive Murfreesboro TN 37129
Phone Number	(330) 8835603
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-17 23:35:55
Name	Ashley Evans
Email	ashrunner26@gmail.com
Address	3901 Kingswood Ave. A Tennessee 37216
Phone Number	(731) 3431395
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-17 20:11:14
Name	Ann Ercelawn
Email	ann.ercelawn@gmail.com
Address	3611 Saratoga Dr Nashville TN 37205
Phone Number	(615) 2984766
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-19 12:57:30
Name	Pamela Talley
Email	talley.pamela@gmail.com
Address	905 Phillips St Nashville TN 37208
Phone Number	(303) 8706048
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-17 19:56:43
Name	Michael Kramer
Email	mpkramer71@gmail.com
Address	3747 W Trimble Rd Milton Tn 37118
Phone Number	(253) 2193606
Write a message to TDEC and the EPA:	I wish to express my support for discontinuing emissions testing in Tennessee. I feel the current emissions standards set on modern vehicle manufacturing eliminates the need for continued testing.

Clean Air Tennessee

Submission Date	2019-11-17 19:12:49
Name	Margie Hunter
Email	mhunter55@comcast.net
Address	2709 Woodlawn Dr NASHVILLE TN 37212
Phone Number	(615) 430-8903
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. The state's topography would allow harmful pollutants to stagnate over Nashville and compromise the health and mobility of many citizens. Rolling back any environmental protections for air or water is a foolhardy and unjustifiable action, particularly in light of the growing climate crisis. TDEC's job is to protect the environment, not sabotage it. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. You must continue to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-17 13:26:11
Name	Matthew Glassmeyer
Email	glassmeyermatt@gmail.com
Address	1403 McKennie Avenue Nashville TN 37206
Phone Number	(615) 2281974

Write a message to TDEC and the EPA:

Tennessee already ranks in the bottom half of the country in terms of overall air quality. Attempting to design a future with deregulation of environmental standards is, among many concerns, detrimental to our regional income, tourism, and tax base. People come to Nashville because it is smaller and not a polluted city.

Clean Air Tennessee

Submission Date	2019-11-17 10:00:06
Name	Mark Brasfield
Email	av88tor@msn.com
Address	1004 4th ave South Nashville TN 37210
Phone Number	(615) 2550500
Write a message to TDEC and the EPA:	I wish to express my support for either eliminating emissions testing in Tennessee's OR making it apply to vehicles that are older and more likely to pollute .

Clean Air Tennessee

Submission Date	2019-11-17 09:20:34
Name	Betty Ann Lay
Email	bettyannlay@gmail.com
Address	1284 Cedar Hill Rd Kingston Springs TN 37072
Phone Number	(615) 352-0497
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-16 18:13:32
Name	Michelle Totherow
Email	m.totherow@comcast.net
Address	99 Berkley Dr Madison Tn 37115
Phone Number	(615) 3394133
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-16 13:39:37
Name	Scott Banbury
Email	smbanbury@gmail.com
Address	1051 Stonewall St Memphis TN 38107
Phone Number	(901) 6198567
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-16 12:51:23
Name	Mark Bjordahl
Email	mark.bjordahl@comcast.net
Address	829D Clayton Ave Nashville TN 37204
Phone Number	(615) 5875452
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-16 11:36:15
Name	Claudia Lofton
Email	cclofton@gmail.com
Address	1117 N. 2nd St. Nashville TN 37207
Phone Number	(843) 2707836
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-16 10:51:37
Name	Trina Taylor
Email	Hottieinavette64@yahoo.com
Address	269 Croft Way Mt Juliet Tennessee 37122
Phone Number	(615) 4389571
Write a message to TDEC and the EPA:	I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-16 09:31:11
Name	Lynn Blocher Blocher
Email	lblocher@uncbusiness.net
Address	1509 Ferguson Ave Nashville TN 37212
Phone Number	(919) 257-0387
Write a message to TDEC and the EPA:	I wish to express my opposition to Public Chapter No. 953 that would eliminate vehicle emission testing in Tennessee. Allowing State Representatives from rural and suburban areas to dictate how major population centers protect their citizens' air is a mistake. Tennessee already ranks in the bottom half of the country in terms of overall air quality. In fact, I feel strongly that EVERY county in TN should have to participate in emissions testing; in Davidson county alone, we have vehicles from multiple surrounding counties which are not subject to emissions tests, yet drive in and out of our county by the tens of thousands daily for jobs and activities. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Seventy-five cents a month is an incredibly small price to pay to protect the air we all breathe. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-16 09:06:43
Name	Susannah Felts
Email	susannah.felts@gmail.com
Address	1430 Roberts Ave. Nashville TN 37206
Phone Number	(205) 7902096
Write a message to TDEC and the EPA:	I wish to express my opposition to Public Chapter No. 953 that would eliminate vehicle emission testing in Tennessee. Allowing State Representatives from rural and suburban areas to dictate how major population centers protect their citizens' air is a mistake. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Seventy-five cents a month is an incredibly small price to pay to protect the air we all breathe. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-15 19:05:11
Name	Andrew Cox
Email	dew85@sbcglobal.net
Address	126 Piedmont Ave Nashville TN 37216
Phone Number	(626) 3724636
Write a message to TDEC and the EPA:	I wish to express my opposition to Public Chapter No. 953 that would eliminate vehicle emission testing in Tennessee. Allowing State Representatives from rural and suburban areas to dictate how major population centers protect their citizens' air is a mistake. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Seventy-five cents a month is an incredibly small price to pay to protect the air we all breathe. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Clean Air Tennessee

Submission Date	2019-11-15 19:01:11
Name	Peter Stockus
Email	peterwstockus@gmail.com
Address	1903 Upland Drive Nashville TN 37216
Phone Number	(630) 3068325
Write a message to TDEC and the EPA:	I wish to express my opposition to Public Chapter No. 953 that would eliminate vehicle emission testing in Tennessee. Allowing State Representatives from rural and suburban areas to dictate how major population centers protect their citizens' air is a mistake. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Seventy-five cents a month is an incredibly small price to pay to protect the air we all breathe. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

From: LaDonna Jerrell
To: lborders@calvertstreet.com; Air.Pollution Control
Subject: [EXTERNAL] LaDonna Jerrell supports continued emissions testing!
Date: Tuesday, November 19, 2019 11:24:25 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

I wish to express my support for REDUCED emissions testing in Tennessee.
We are wasting time, money, and resources testing new cars. A new schedule for testing after 5 years would be a much welcome change to the current method.

Regards,
LaDonna

Thank you,

LaDonna Jerrell

Street Address: 4121 Wallingford Way
City: Franklin
State : TN
Zip Code: 37069

From: Roy Claverie
To: lborders@calvertstreet.com; Air.Pollution Control
Subject: [EXTERNAL] Roy Claverie supports continued emissions testing!
Date: Tuesday, November 19, 2019 11:09:10 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

I wish to express my support for ENDING emissions testing in Tennessee.

Please end emissions testing.

Thank you,

Roy Claverie

Street Address: 6220 robin hill rd
City: Nashville
State : Tn
Zip Code: 37205

From: Taffy Ragan
To: lborders@calvertstreet.com; Air.Pollution Control
Subject: [EXTERNAL] Taffy Ragan supports continued emissions testing!
Date: Tuesday, November 19, 2019 12:53:34 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

Please do away with the emmissions testing. I feel like it's a tax on those with newer cars. Those with older vehicles are exempt from it anyway and those are the ones with the problems.

Thank you,

Taffy Ragan

Street Address: 245 BLANTON AVE
City: Nashville
State : TN
Zip Code: 37210

Attachment 4

Response to Comments
(1st Public Notice)

Response to Comments

Date of Public Hearing: November 19, 2019

Public Hearing for the Removal of the Inspection and Maintenance (I/M) Program in Middle Tennessee

The Tennessee Department of Environment and Conservation, Air Pollution Control Division (TDEC-APC) appreciates everyone's attendance and participation at the public hearing on November 19, 2019. The purpose of this public hearing was to hear comments on the Division's proposed removal of the Inspection and Maintenance (I/M) Program in Middle Tennessee.

The Tennessee legislature initiated legislation, which resulted in Public Chapter 953, to eliminate the I/M program. The TDEC-APC did not initiate the process of eliminating the I/M program. The Tennessee General Assembly passed a law requiring the I/M program be removed from Tennessee's State Implementation Plan and be eliminated. Once the law was passed, the TDEC-APC developed a noninterference demonstration that demonstrates removing the I/M program does not interfere with attainment or maintenance of the National Ambient Air Quality Standards (NAAQS).

The public hearing started with Jaclyn Mothupi, with TDEC's Office of External Affairs, reading an opening statement. Then, attendees were asked if they would like to make comments for the record. Six people made oral comments for the record. Additionally, 89 people submitted written comments. In this document, the TDEC-APC responds to the comments made during the public hearing and submitted in writing.

Commenter: Opus Inspection, Inc.

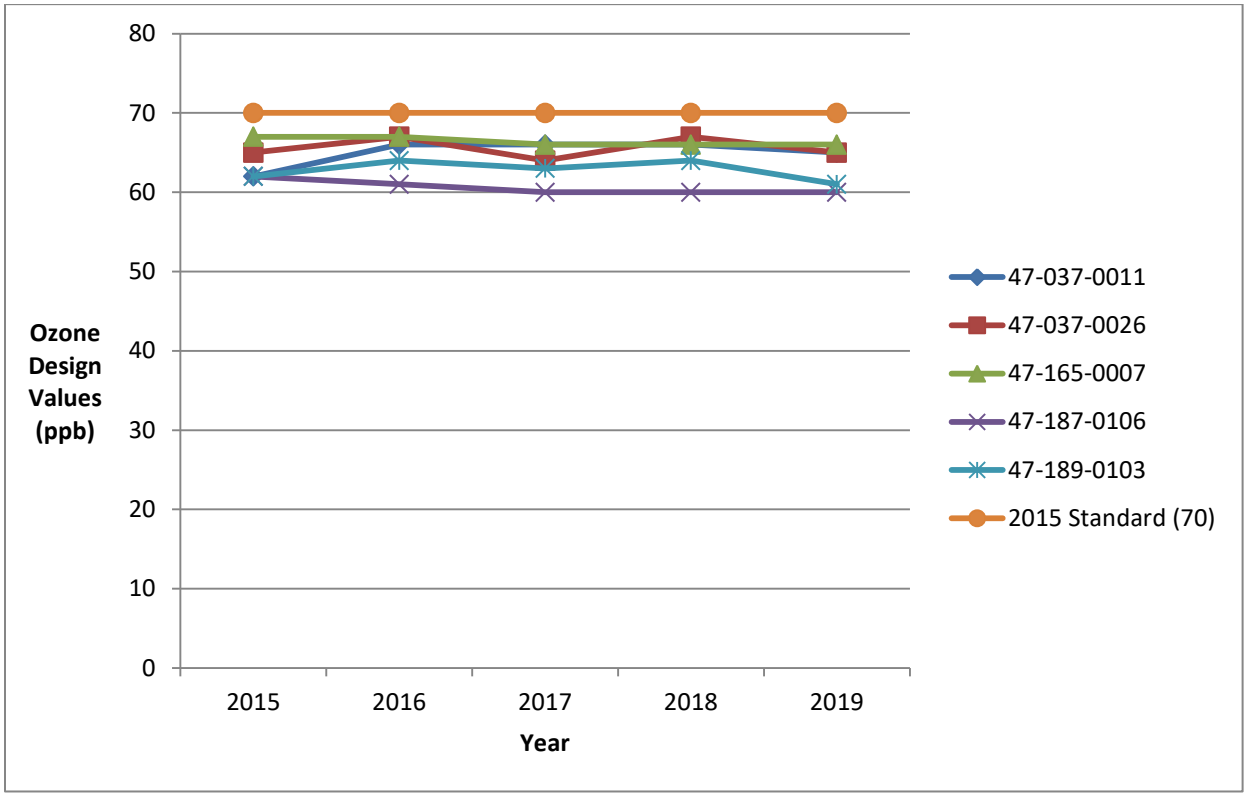
Comment: While current NAAQS-related design values are below levels of the standard in Middle Tennessee, recent observations in air quality in the region have shown an upward trend in highest concentrations across all monitors indicating the reversal of improvements resulting from existing control programs. Between 2014 and 2018, 4th high maximum daily average (MDA8) values have remained the same or increased at every monitor in the domain.

Response: The TDEC-APC agrees with the part of the comment that Middle Tennessee is currently in attainment with all of the ozone NAAQS including the current 2015 ozone NAAQS of 70 ppb. The TDEC-APC disagrees with the assessment that there is an upward trend in ozone values. The commenter did not use the correct metric for assessing ozone values. The commenter looked at the highest four values in each year from all of the monitors combined. The ozone values should be looked at separately for each monitor. The metric established by EPA that is used for the NAAQS is called the design value, which is

the fourth–highest daily maximum, averaged across three consecutive years for each monitor. The highest design value for the five ozone monitors in Middle Tennessee is 72 in 2014, 67 ppb in 2015, 67 ppb in 2016, 66 ppb in 2017, and 67 ppb in 2018. Preliminary data in 2019, indicates that the highest design value for the five ozone monitors will be 66 ppb. The TDEC-APC would characterize this as a flat trend or even a slightly downward trend. The data and figure below show the design values for each of the five ozone monitors for 2015-2019, which are all below the current 2015 ozone NAAQS of 70 ppb.

Ozone Design Values (DV in ppb) for 2015-2019

AIRS ID	Site Name	2015	2016	2017	2018	2019
47-037-0011	Trinity Lane	62	66	66	66	65
47-037-0026	Percy Priest	65	67	64	67	65
47-165-0007	Rockland Recreation Area	67	67	66	66	66
47-187-0106	Fairview Middle School	62	61	60	60	60
47-189-0103	Cedars of Lebanon State Park	62	64	63	64	61



Commenter: Opus Inspection, Inc.

Comment: TDEC has failed to simulate the impact of removal of the I/M program using air quality modeling. Ozone concentrations have non-linear correlation to NOx and VOC emission changes and cannot adequately be estimated exclusively using scaling ratios based on emission reduction sensitivities.

Response: Early in the process of developing the Noninterference Demonstration, the TDEC-APC consulted with the EPA on what information would be necessary to include in the demonstration. The EPA advised the TDEC-APC that an emission inventory projected out to 2022 would be needed in the demonstration, and the inventory should show two scenarios: (1) emissions with the I/M program and (2) emissions without the I/M program. Since the increase in emissions between the two scenarios was very small, the EPA advised the TDEC-APC that a full air quality photochemical modeling analysis was not required for the demonstration. The TDEC-APC included the sensitivity analysis based on the SEMAP modeling in the Noninterference Demonstration as a weight of evidence. The EPA's Noninterference Demonstration guidance (dated June 8, 2005) allows for the EPA to make case-by-case determinations on what is required to be included in a demonstration based on the current air quality in the region and the magnitude of the increase in emissions due to the removal of a control measure.

Commenter: Opus Inspection, Inc.

Comment: TDEC bases both its base year and future year emission assumptions on a version of EPA's 2014 National Emission Inventory (NEI) that is now multi-versions old. TDEC should consider revising its analysis using the most current, more appropriate version of the NEI that is based on a 2016 calendar year and was developed with significant input from state and regional organizations

Response: The TDEC-APC started the emission inventory analysis and projection work in July 2018, shortly after the passage of Public Chapter 953. The most important sector to analyze was the onroad sector since the elimination of the I/M program affects the onroad sector. For the onroad sector, the TDEC-APC did not use the 2014 NEI to project emissions. Instead, emissions from onroad sources are estimated through the use of locally gathered information on the vehicle population and the miles driven in each county, as well as a number of other inputs, combined with the EPA's Motor Vehicle Emissions Simulator (MOVES) model. For the nonroad and non-point sectors, the TDEC-APC used the 2014 NEI as a starting point to project emissions to 2022. These projections used commonly-used methodologies. For point sources with Major Source Permits in Sumner, Wilson, Rutherford, and Williamson Counties, the TDEC-APC projected emissions to 2022. Metro Nashville/Davidson County Pollution Control Division projected emissions to 2022 for all point sources in Davidson County. The 2016 base year platform, version 1 was not released until October 2019. Thus, the 2016 platform was not available when the TDEC-APC started its emission inventory work. The first draft of the Noninterference Demonstration was submitted to the EPA on April 29, 2019, well before the release of the 2016 base year platform. Regardless, the 2014 NEI was put together by EPA with information provided by State, Local, and Tribal agencies

and, according to the EPA's website, is a comprehensive and detailed estimate of air emissions of criteria pollutants, criteria precursors, and hazardous air pollutants from air emission sources.

Commenter: Opus Inspection, Inc.

Comment: 2014 was not a conducive year for ozone sensitivity simulations, nor did it contain high ozone periods that would adequately allow for the determination of impact of control strategies and air quality response.

Response: The TDEC-APC did not use 2014 as a base year for photochemical modeling so the meteorological conditions in this year are irrelevant. As discussed in the previous response, the TDEC-APC used the 2014 NEI as a starting point for many of the sectors to project emissions to 2022. However, for the most critical portion of the emissions inventories, the onroad sector, the TDEC-APC projected 2022 emissions from locally gathered information and the EPA' MOVES model.

Commenter: Opus Inspection, Inc.

Comment: TDEC relies on a technical analysis completed in 2014 and that is based on inventories and assumptions now considered aged in their application of ozone sensitivity factors to estimate the impact of the removal of the I/M program. The factors generated from that work were identified as being inappropriate for other simulations beyond the scope of the original work.

Response: The TDEC-APC used the sensitivity analysis as a weight-of-evidence in the Noninterference Demonstration. The State of Georgia used the same SEMAP study to perform a similar sensitivity analysis for inclusion in their document titled "Noninterference Demonstration for the Relaxation of the Summertime Reid Vapor Pressure (RVP) Requirements in the Former 13-County Atlanta Designated Volatility Nonattainment Area". Georgia's Noninterference Demonstration was approved by the EPA in the Federal Register on September 20, 2019 (49470 Federal Register). The TDEC-APC believes that the EPA will approve Tennessee's Noninterference Demonstration with a sensitivity analysis based on the SEMAP study since Georgia's Noninterference Demonstration with a similar sensitivity analysis based on the same SEMAP study was approved by the EPA.

Commenter: Opus Inspection, Inc.

Comment: TDEC misused the SEMAP ozone sensitivity factor.

Response: The TDEC-APC acknowledges that trying to use the scaling analysis with percentage changes well above 30% would yield erroneous results, as stated in the SEMAP report. The TDEC-APC believes that scaling ratios are valid in this sensitivity analysis since the

percentage change in NOx (1.9%) and VOC (1.7%) emissions due to the removal of the I/M program are less than the 30% change in NOx and VOC emissions that were modeled in the SEMAP project. The TDEC-APC was conservative in its approach since average absolute sensitivities were normalized by the emission reduction from NOx and VOC in Middle Tennessee only and not by reductions in the entire state or entire region. If average absolute sensitivities were normalized by the emission reduction from NOx and VOC in the entire state or entire region, then the predicted increase in ozone would have been lower. As stated in the previous response, the TDEC-APC believes that the EPA will approve Tennessee's Noninterference Demonstration with a sensitivity analysis based on the SEMAP study since Georgia's Noninterference Demonstration with a similar sensitivity analysis based on the same SEMAP study was approved by the EPA. Similar to Tennessee's sensitivity analysis, the percentage increase in NOx and VOC in Georgia's sensitivity analysis were well below the 30% change in the SEMAP study. As mentioned previously, the sensitivity analysis was included as a weight-of-evidence and the main reason for concluding that there will not be interference with the NAAQS is that the increase in NOx and VOC is very small.

Commenter: Opus Inspection, Inc.

Comment: TDEC makes an assumption that each ton of a pollutant precursor emission has an equal impact on air quality as compared to every other ton of the same pollutant precursor, regardless of emission source and where in the state the emission occur. Recent modeling on this subject demonstrates that local motor vehicle source emissions have significantly greater impact on local air quality compared to all other source categories and regions. Category-specific source apportionment analyses conducted elsewhere indicate that NOx emissions from Tennessee's motor vehicle source category may have a much greater impact on local air quality than estimated by TDEC.

Response: The TDEC-APC used the "impact factors" displayed in the Alpine report in Figures 14-17 to calculate the projected increase in ozone due to the elimination of the I/M program. The TDEC-APC multiplied the "impact factor" for mobile sources by the projected increase in NOx (478.52 ton/year) to calculate the projected increase in ozone at each monitor due to the NOx increase from removal of the I/M program. The "impact factor" is listed in the second column. The NOx increase is listed in the third column. The projected increase is listed in the fourth column. The TDEC-APC obtained the following results:

AIRS ID	"Impact Factor" for mobile sources O3 ppb/NOx ton	Increase in NOx ton/year	Increase in O3 (ppb) due to NOx increase
47-037-0011	0.00039	478.52	0.187
47-037-0026	0.00025	478.52	0.120
47-165-0007	0.000445	478.52	0.213
47-187-0106	0.00027	478.52	0.129

The TDEC-APC compared these results to Table 16 in the TDEC-APC's Noninterference Demonstration, which is displayed here in summary.

AIRS ID	Increase in O3 (ppb) due to NOx increase	Increase in O3 (ppb) due to VOC increase	Increase in O3 (ppb) due to NOx & VOC increases
47-037-0011	0.24059	0.00888	0.249
47-037-0026	0.25454	0.00782	0.262
47-165-0007	0.19545	0.00022	0.196
47-187-0106	0.18518	0.00045	0.186

When these results are compared, the resulting increase in ozone from Alpine's "impact factors" are actually less than the increase in ozone that were calculated using TDEC-APC's sensitivity analysis approach.

Commenter: Opus Inspection, Inc.

Comment: TDEC includes in its assumptions that existing emission control programs will remain in force during the foreseeable future. As has been demonstrated by EPA, a significant number of federal air quality regulations have been "rolled back", removed from requirements, or are in the courts pending review and decision. Should these regulations be partially or completely stricken from the list of required control programs, assumptions included that assume emission decreases and associated air quality improvements will be invalidated.

Response: The TDEC-APC believes that the commenter is overstating the facts by stating that a "significant number of federal air quality regulations have been "rolled back", removed from requirements, or are in the courts pending review and decision." The TDEC-APC has projected emissions to 2022 with currently promulgated state and federal regulations including some that have future compliance dates. Since it was only necessary to project emissions out a few years into 2022 for the Noninterference Demonstration, the TDEC-APC is confident that the projections are fairly accurate. The Noninterference Demonstration is a demonstration for the removal of one regulation, the I/M regulation, and is not intended to show the effects of speculative regulatory changes that may be made by the EPA or federal courts for which Tennessee has no control.

Commenter: Stephen Foster, Opus Inspection, Inc.

Comment: We have submitted a comment and report from Alpine Geophysics. Their findings are that the elimination of the program will have an adverse effect on the air quality in Middle Tennessee and potential loss of attainment status. In addition, the removal of the program will have a negative economic impact on the automotive industry in Tennessee.

Response: The TDEC-APC disagrees with the conclusion that the elimination of the I/M program will have an adverse effect on the air quality in Middle Tennessee and potential loss of attainment status. The noninterference demonstration shows that removing the I/M program will increase CO, NOx, and VOC by a small amount, which will cause a small increase in ozone values and will not interfere with attainment or maintenance of the NAAQS. The commenter did not elaborate on why they stated that the removal of the I/M program will have a negative economic impact on the automotive industry in Tennessee. The TDEC-APC is not aware of any job loss that will occur other than those associated with the contractor, Opus Inspection, Inc., that operates the I/M testing stations.

Commenter: Stephy Jean Moore

Comment: The commenter was opposed to the removal of the I/M program and was concerned about the effects it would have on climate change. She also asked for a reason the I/M program was being removed.

Response: Light-duty motor vehicles do emit carbon dioxide (CO_2), which is a greenhouse gas. The I/M program is designed to ensure that vehicle emissions of carbon monoxide (CO), nitrogen oxides (NOx), and volatile organic compounds (VOC) are properly controlled. The I/M program was not designed to ensure that vehicle emissions of carbon dioxide are properly controlled. Thus, removing the I/M program does not directly affect the control of carbon dioxide. The Tennessee legislature initiated legislation, which resulted in Public Chapter 953, to eliminate the I/M program. Once the law was passed, the TDEC-APC had to develop a noninterference demonstration that demonstrates removing the I/M program does not interfere with attainment or maintenance of the NAAQS.

Commenter: Several commenters submitted comments that were almost identical to the following comment.

Comment: I wish to express my support for continued emissions testing in Tennessee's major cities. Rural and urban regions face different issues when it comes to pollution and air quality, and doing away with emissions testing in cities like Nashville and Chattanooga could have disastrous effects on our environment, current quality of life, and the lives of future generations. Tennessee already ranks in the bottom half of the country in terms of overall air quality. As Tennessee grows, it will only become more important to protect our air quality so that it can continue to be a beautiful and healthy place for all who wish to call this place home. Restricting emissions testing sets the wrong precedent and endangers our communities. I hope that you consider continuing to allow our counties to take the steps necessary to protect their citizen's air quality.

Response: Except for a small portion of Sullivan County that is designated as nonattainment for sulfur dioxide, the entire State of Tennessee is in attainment with all of the National Ambient Air Quality Standards (NAAQS). Air quality in the Middle Tennessee area and Hamilton County has improved greatly over the years and both areas are currently in

attainment with all of the NAAQS. The noninterference demonstration shows that removing the I/M program does not interfere with attainment or maintenance of the NAAQS.

Commenter: Several commenters including Senator Ferrell Haile

Comment: Several commenters stated that they were in favor of eliminating the I/M program due to the fact that if a vehicle fails the inspection, the repairs required to fix the problem can be very expensive.

Response: The TDEC-APC is aware that repairs can be very expensive to fix a vehicle that fails inspection. As Senator Ferrell Haile stated in his comment, the expense to low income households is one of the reasons that he cosponsored the legislation. Other legislators who cosponsored the legislation have made this same comment about the expense of repairing a vehicle. As part of the current I/M program, the TDEC-APC offers waivers based on financial hardship that allow vehicle owners to register their vehicles after failing a test even if some or all of the necessary repairs are not made. Obviously, once the I/M program ends, this expense would end if an owner chooses to ignore a check engine light and not repair their vehicle. Even after the I/M program ends, the TDEC-APC urges vehicle owners to properly maintain their vehicle in order to minimize the effects of air pollution from their motor vehicle.

Attachment 5

2nd Public Notice

Public Notice posted on TDEC website on January 16, 2020

The Tennessee Air Pollution Control Board has requested a re-opening of the public comment period to consider a proposed change to the State Implementation Plan (SIP) under the authority of Tennessee Code Annotated, Section 68-201-105. The public comment period has been re-opened to consider the Clean Air Act Section 110(l) Noninterference Demonstration Reports for removal of the Vehicle Inspection and Maintenance program for Davidson, Williamson, Wilson, Sumner and Rutherford Counties in Middle Tennessee and Hamilton County, Tennessee from the State Implementation Plan. Public Chapter No. 953, signed into law on May 15, 2018, requires the elimination of the Inspection & Maintenance program 120 days after final EPA approval of the 110(l) reports. To assist in public review, links to the following documents are provided below:

The Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in Middle Tennessee

The Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in Hamilton County Tennessee

Comments received during the first comment period and public hearing :

Opus Inspection Inc. Comments Middle TN

Opus Inspection Inc. Comments Hamilton County

Public Comments

The Tennessee Division of Air Pollution Control's response to comments

Response to Comments Middle TN

Response to Comments Hamilton County

Only written comments will be accepted during this comment period and there will not be a second public hearing. Written comments are due by February 15, 2020. Comments can be sent via email to air.pollution.control@tn.gov. Written comments will only be considered part of the record if received by close of business (4:30 PM Central) on February 15, 2020, at the aforementioned email address or at:

Tennessee Department Of Environment and Conservation - Division of Air Pollution Control
William R. Snodgrass Tennessee Tower
312 Rose L. Parks Avenue, 15th Floor
Nashville, TN 37243

Attachment 6

Comments Received
(2nd Public Notice)

waller

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February 14, 2020

VIA HAND DELIVERY AND EMAIL (air.pollution.control@tn.gov)

Michelle Walker Owenby
Director
Division of Air Pollution Control
Tennessee Department of Environment and Conservation
William R. Snodgrass Tennessee Tower, 15th Floor
312 Rosa L. Parks Avenue
Nashville, TN 37243

Re: Clean Air Act Section 110(*l*) Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in the Middle Tennessee Area: Revised Comment Submitted by Opus Inspection, Inc. to Reply to the Air Division's Responses to Opus's Original Comment

Dear Ms. Owenby:

Attached is a revised report prepared by Alpine Geophysics, LLC, commissioned by Opus Inspection, Inc. This report originally was submitted on November 19, 2019, in response to the Air Pollution Control Division's Notice of Hearing posted on its website on October 18, 2019, in which the Division requested comments on its Noninterference Demonstration regarding removal of the inspection and maintenance (I/M) program requirement from the State of Tennessee's State Implementation Plan (SIP). The Tennessee Air Pollution Control Board, at its meeting on January 8, 2020, voted to re-open the public comment period to allow Alpine to reply to the Division's responses to Alpine's original report, as well as to allow any other persons to submit comments on the Middle Tennessee Noninterference Demonstration. The public notice of the re-opening was issued on January 16, 2020, and the comment period closes on February 15, 2020. This revised report contains Alpine's eight original observations and recommendations for additional analyses, followed by the Air Division's responses, and Alpine's replies to the Air Division.

Opus endorses the revised Alpine report and opposes removal of the I/M program requirement from the SIP. Opus believes the Division's Noninterference Demonstration remains inadequate to support the Division's proposed SIP revision and once again encourages the Division to implement Alpine's recommendations before it submits any proposed SIP revision to the United States Environmental Protection Agency for its approval.

Please make this letter and the attached report part of the public record in this matter. Thank you.

Very truly yours,

Michael K. Stagg

Michael K. Stagg

MKS:mcw
cc: Jim Sands, Vice President, Business Development, Opus
Bill Dell, Executive Director, Business Development, Opus
Stephen L. Foster, III, Program Manager - Tennessee, Opus

Independent Review of the Tennessee Department of Environment and Conservation's Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in the Middle Tennessee Area

And

Response to TDEC-APC Comments

Prepared for:

Opus Inspection, Inc.

1893 Elm Tree Drive

Nashville, TN 37210

via request from

Waller Lansden Dortch & Davis, LLP

511 Union Street, Suite 2700

Nashville, TN 37219

Prepared by:

Alpine Geophysics, LLC

387 Pollard Mine Road

Burnsville, NC 28714

Prepared and Authorized by:

Gregory Stella

Managing Partner

February 2020

My name is Gregory Stella. I am currently a Managing Partner of Alpine Geophysics, LLC, ("Alpine") a firm that offers highly specialized research and engineering services in the atmospheric sciences.

From 1997 until 2003, I served as an emissions and modeling specialist at the U.S. Environmental Protection Agency ("EPA" or "Agency"), Office of Air Quality Planning and Standards, where I managed and prepared the emission inventories, control strategies, and associated temporal, spatial and speciation data for the Regional Transport NOx SIP Call, Section 126 rulemaking, Tier-2 tailpipe standards, 1-hour attainment demonstrations, Heavy-Duty Diesel Engine standards, Multi-Pollutant legislation, Clear Skies Analysis, and US/Canadian Air Quality Agreements. For my efforts while at EPA, I received two U.S. EPA Gold Medals, for the NOx SIP Call Rulemaking (1999) and the Tier-2 Tailpipe Standard (2001) as well as a U.S. Department of Justice Certificate of Commendation for working with the Environment and Natural Resources Division (2000) and multiple Bronze Medals for Commendable Service.

Since 2003, I have been with Alpine where I am internationally recognized as a technical authority in the planning, design, development, evaluation, application, and modeling of local, national, and international emission inventories. My focus is on the policy options used for the projection and control of ozone and particulate matter pollutants and precursors. I have coordinated with Federal, State, Regional, Local, International, Tribal, and private workgroups, modeling centers, and stakeholders to develop, evaluate, and apply alternative control measures and control program designs in support of emissions and air quality analyses.

In September 2011 and again in June 2018, I was invited by and provided testimony before the U.S. House of Representatives Committee on Space, Science and Technology regarding work conducted by Alpine in modeling U.S. air quality, including discussion of analyses related to recent technological and air quality changes, and corresponding attainment results for federal ozone and particulate matter standards.

I have been tasked by the law firm of Waller Lansden Dortch & Davis, LLP, on behalf of Opus Inspection, Inc., to provide a review of the Tennessee Department of Environment and Conservation's (TDEC) assumptions related to its proposed change to the State Implementation Plan (SIP) under the authority of Tennessee Code Annotated, Section 68-201-105. This review is in preparation for a public hearing that has been called to consider TDEC's "Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance in the Middle Tennessee Area" (Noninterference Demonstration), which supports the removal of the program for Davidson, Williamson, Wilson, Sumner and Rutherford Counties' inspection and maintenance (I/M) programs from the SIP. Public Chapter No. 953, signed into law on May 15, 2018, requires the elimination of the Inspection & Maintenance program 120 days after final EPA approval of the 110(l) report.

This report originally was submitted on November 19, 2019, in response to the Air Pollution Control Division's Notice of Hearing posted on its website on October 18, 2019, in which the Division requested comments on its Noninterference Demonstration regarding removal of the inspection and maintenance (I/M) program requirement for the Middle Tennessee area from the State of Tennessee's State Implementation Plan (SIP). The Tennessee Air Pollution Control Board, at its meeting on January 8, 2020, voted to re-open the public comment period to allow Alpine to reply to the Division's responses to Alpine's original report, as well as to allow any other persons to submit comments on the Middle Tennessee Noninterference Demonstration. The public notice of the re-opening was issued on January 16, 2020, and the comment period closes on February 15, 2020. This revised report contains Alpine's eight original observations and recommendations for additional analyses, followed by the Air Division's responses, and Alpine's replies to the Air Division.

As you can see from my replies to the Air Division's responses to my original report, I firmly stand by my original observations and recommendations, and in some instances, provide additional justification to support my comments.

Summary of Observations

Based on my review of TDEC's proposed SIP changes and associated technical documentation[1], a summary of my observations follows. Justifications for the observations and recommendations for additional analyses are presented later in this report.

1. While current NAAQS-related design values are below levels of the standard in the Middle Tennessee domain, recent observations in air quality in the region have shown an upward trend in highest concentrations across all monitors indicating the reversal of improvements resulting from existing control programs. Between 2014 and 2018, 4th high maximum daily average (MDA8) values have remained the same or increased at every monitor in the domain.

2. TDEC has failed to simulate the impact of removal of the I/M program using air quality modeling. Ozone concentrations have non-linear correlation to NOx and VOC emission changes and cannot adequately be estimated exclusively using scaling ratios based on emission reduction sensitivities.

3. TDEC bases both its base year and future year emission assumptions on a version of EPA's 2014 National Emission Inventory (NEI) that is now multi-versions old. TDEC should consider revising its analysis using the most current, more appropriate version of the NEI that is based on a 2016 calendar year and was developed with significant input from state and regional organizations.

4. 2014 was not a conducive year for ozone sensitivity simulations, nor did it contain high ozone periods that would adequately allow for the determination of impact of control strategies and air quality response.

5. TDEC relies on a technical analysis completed in 2014 and that is based on inventories and assumptions now considered aged in their application of ozone sensitivity factors to estimate the impact of the removal of the I/M program. The factors generated from that work were identified as being inappropriate for other simulations beyond the scope of the original work.

6. TDEC makes an assumption that each ton of a pollutant precursor emission has an equal impact on air quality as compared to every other ton of the same pollutant precursor, regardless of emission source and where in the state the emissions occur. Recent modeling on this subject demonstrates that local motor vehicle source emissions have significantly greater impact on local air quality compared to all other source categories and regions.

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1 https://www.tn.gov/content/dam/tn/environment/air/documents/publicnotices/apc_SIP_IM_Removal_Middle_TN_08-28-19.pdf

7. Category-specific source apportionment analyses conducted elsewhere indicate that NOx emissions from Tennessee's motor vehicle source category may have a much greater impact on local air quality than estimated by TDEC.

8. TDEC includes in its assumptions that existing emission control programs will remain in force during the foreseeable future. As has been demonstrated by EPA, a significant number of federal air quality regulations have been "rolled back", removed from requirements, or are in the courts pending review and decision. Should these regulations be partially or completely stricken from the list of required control programs, assumptions included that assume emission decreases and associated air quality improvements will be invalidated.

The following statement has been taken from TDEC's website[2] and stresses the importance of the current I/M program on maintaining clean air in the Middle Tennessee region today and in the future (emphasis added):

> *"The State of Tennessee developed more restrictive regulations to control air pollution from mobile sources in counties that were not meeting the new 8-hour ozone Federal Standards for air quality. As a result, certain vehicles registered in Hamilton, Davidson, Rutherford, Sumner, Williamson and Wilson counties are required to pass a vehicle emission test. Gasoline and diesel vehicles with a model year of 1975 and newer and a Gross Vehicle Weight Rate (GVWR) of 10,500 lbs or less must pass an emission test before the vehicle's registration can be renewed. Motorcycles are exempt.*
>
> *Inspection programs such as the one implemented in Tennessee have proven to be very beneficial in reducing harmful ozone air pollution. Emissions from an individual car are generally low, relative to the smokestack image many associate with air pollution. But in numerous cities across the country,* ***the personal automobile is the single greatest polluter, as emissions from millions of vehicles on the road add up****. Driving a private car is probably a typical citizen's most "polluting" daily activity. Ozone levels in many cities have been reduced with the introduction of lower volatility gasoline, and as newer cars with improved emission control systems replaced older models. There has been significant progress in reducing vehicle emissions, but the number of cars on the road and the miles they travel make mobile sources an ongoing problem. Unless we dramatically reduce the amount of pollution vehicles emit in actual use, or drastically cut back on the amount we drive, smog-free air may become a problem for many of our cities."*

With this statement, TDEC recognizes the importance of emission control programs in Tennessee for achieving the clean air quality objectives required by EPA and for ensuring that people of the state can breathe freely without fear of health issues resulting from these emission sources. Compromising residents health and the current attainment status by removing the I/M program in the Middle Tennessee area is contrary to TDEC's objectives.

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[2] https://www.tn.gov/environment/program-areas/apc-air-pollution-control-home/apc/vehicle-inspection-program/important-information.html

1. Design Values Are On The Rise

While current 3-year averaged, NAAQS-related design values are below levels of the standard in the Middle Tennessee domain, recent observations in air quality in the region have shown an upward trend in highest ozone concentrations across regional regulatory monitors (listed in Table 1 and presented in Figure 1) indicating the reversal of improvements resulting from existing control programs inclusive of Tennessee's I/M program.

Table 1. Middle Tennessee regulatory ozone monitors.

AQS Site ID	County Name	Local Site Name
470370011	Davidson	East Health
470370026	Davidson	Percy Priest Dam
471650007	Sumner	Hendersonville Ozone Site at Old Hickory Dam
471870106	Williamson	Fairview Middle School
471890103	Wilson	Cedars of Lebanon

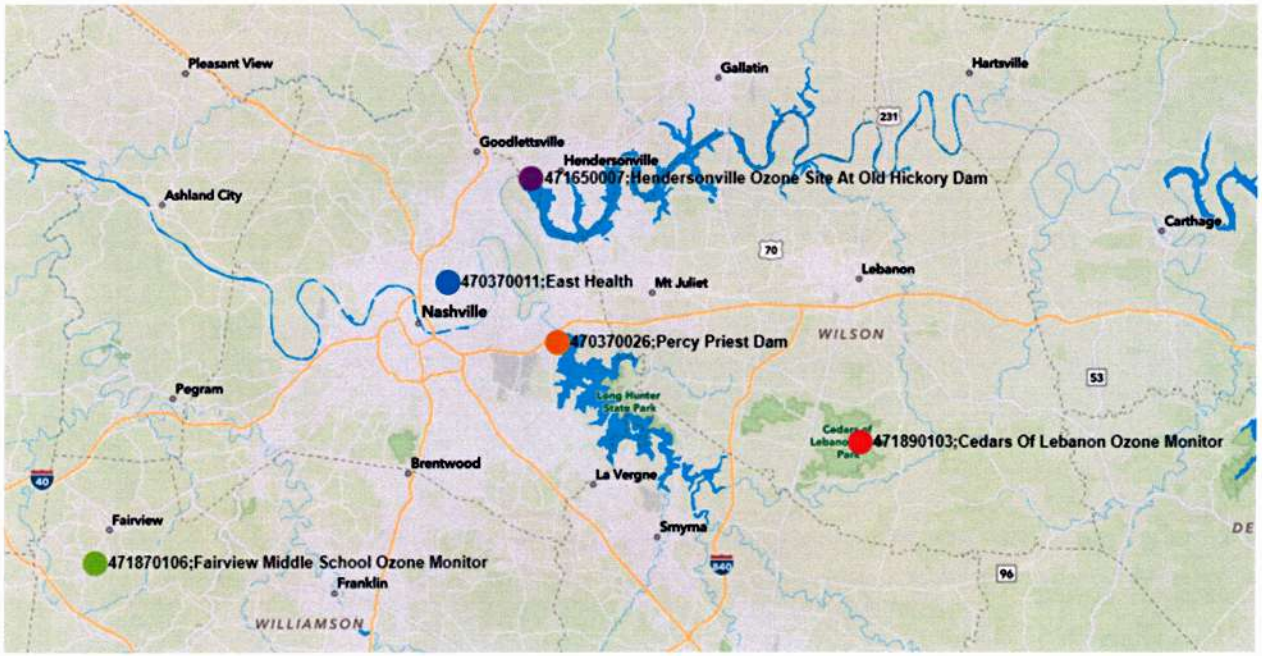

Figure 1. Location of Middle Tennessee regulatory ozone monitors.

Figure 2 presents the highest four observed MDA8 values across all monitors in the Middle Tennessee Core Based Statistical Area (CBSA) of Nashville-Davidson-Murfreesboro-Franklin, Tennessee for the years of 2014 through 2018. As can be seen in this figure, for each of the top four observations each year, the trend has shown an increase (noted by the linear trend; dotted line).

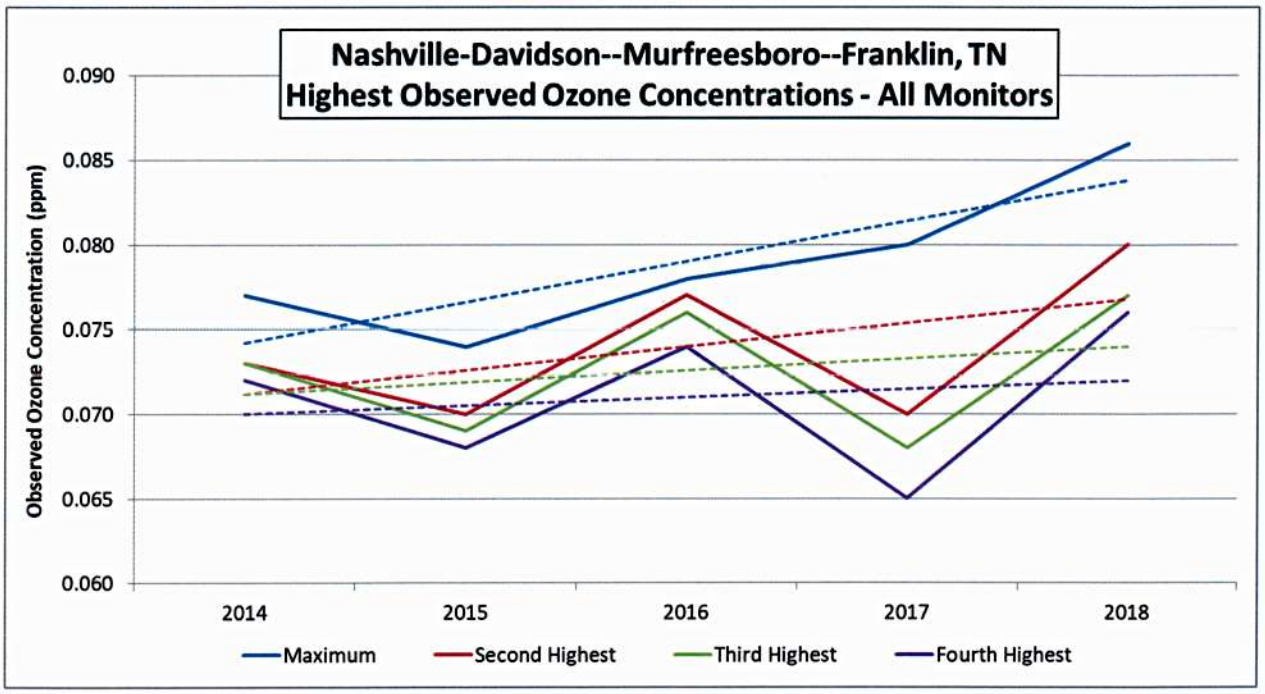

Figure 2. Increasing trend of MDA8 ozone concentrations at Middle Tennessee monitors between 2014 and 2018.

Additionally, when comparing monitor-level 4th high ozone MDA8 concentrations for receptors in the Middle Tennessee region, values that are used by EPA in determining ozone attainment and designations, not a single monitor has shown a decrease between 2014 and 2018. In fact, of the five monitors in the domain, as shown in Figure 3, three show no change in 4th high MDA8 concentrations between the two years while the other two monitors show an increase of up to 3 parts per billion (ppb) in the MDA8 concentration observed.

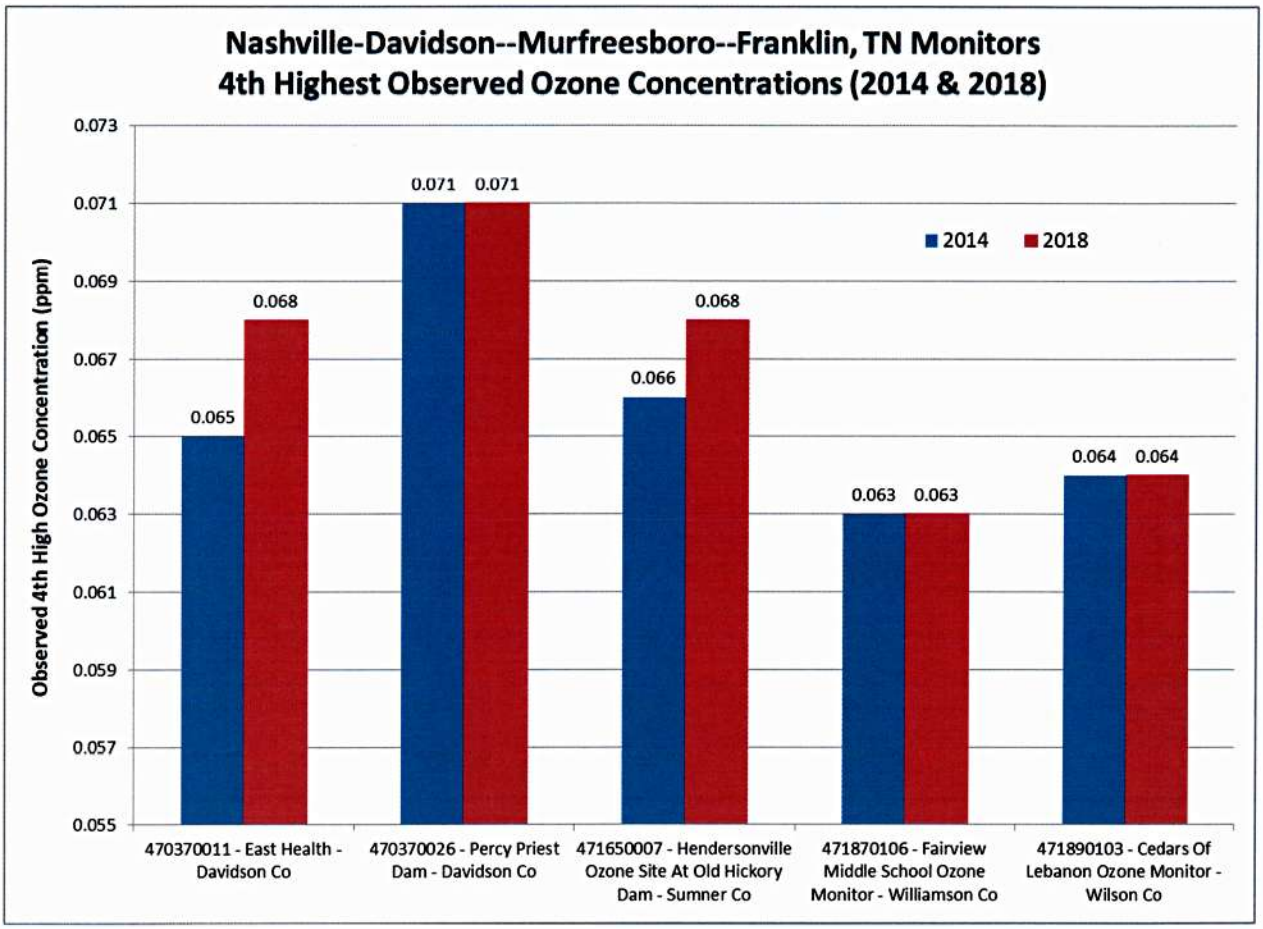

Figure 3. Comparison of 4th High MDA8 Ozone Concentrations at Regulatory Monitors in Middle Tennessee Region.

TDEC-APC Comment: The TDEC-APC agrees with the part of the comment that Middle Tennessee is currently in attainment with all of the ozone NAAQS including the current 2015 ozone NAAQS of 70 ppb. The TDEC-APC disagrees with the assessment that there is an upward trend in ozone values. The commenter did not use the correct metric for assessing ozone values. The commenter looked at the highest four values in each year from all of the monitors combined. The ozone values should be looked at separately for each monitor. The metric established by EPA that is used for the NAAQS is called the design value, which is the fourth–highest daily maximum, averaged across three consecutive years for each monitor. The highest design value for the five ozone monitors in Middle Tennessee is 72 in 2014, 67 ppb in 2015, 67 ppb in 2016, 66 ppb in 2017, and 67 ppb in 2018. Preliminary data in 2019, indicates that the highest design value for the five ozone monitors will be 66 ppb. The TDEC-APC would characterize this as a flat trend or even a slightly downward trend.

Response: I agree that for purposes of calculating attainment with the ozone NAAQS, a three year average of the 4th highest observations at individual design values is the appropriate metric to use. However, I disagree with TDEC-APC that this is the only correct metric that can and should be used to demonstrate air quality changes in the region. My use of 4th high trends across all monitors in the

region is consistent with practices that demonstrate changes in ozone concentrations across an entire region. EPA does not selectively choose a single monitor within an air shed to represent the entire area, instead, it looks at all the monitors in the region, recognizing that meteorology, economic trends, changes in activity, etc. all play a role in how air quality in an area can move in time and space.

I stand behind my review of using the highest observations across each monitor to demonstrate that air quality is not improving in the Middle Tennessee area and add the following observations to our assessment.

EPA also uses the Air Quality Index (AQI) metric to demonstrate how air quality changes over time. The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects that may be experienced within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country.

An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level EPA has set to protect public health. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy-at first for certain sensitive groups of people, then for everyone as AQI values get higher.

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
When the AQI is in this range:	*..air quality conditions are:*	*...as symbolized by this color:*
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

Figure 4. EPA Air Quality Index (AQI) color coded values.

When I look at these published AQI data for the 2014 through 2018 period, as seen in Figure 5, I see that the number of days observed at values at or above 100 (black line with red diamonds), considered unhealthy for sensitive groups, has an upward trend. In 2014, the number of days within the Nashville

air shed with days at or above the unhealthy for sensitive group value of 100 was 6 days. This number decreased to 2 days in 2015, increased again to 5 days in 2016, decreased again to the same value as reported in 2015 (2 days) and then increased four-fold to 8 days in 2018.

In fact, not only is there an upward annual trend in the number of days unhealthy for sensitive groups, the maximum value per year has shown an annual increase over this same period. In Figure 5, this value is represented by the bars and shows that between 2014 through 2018, this maximum value increases to the point of exceeding the unhealthy for all groups (red bar) value of 151 in 2018.

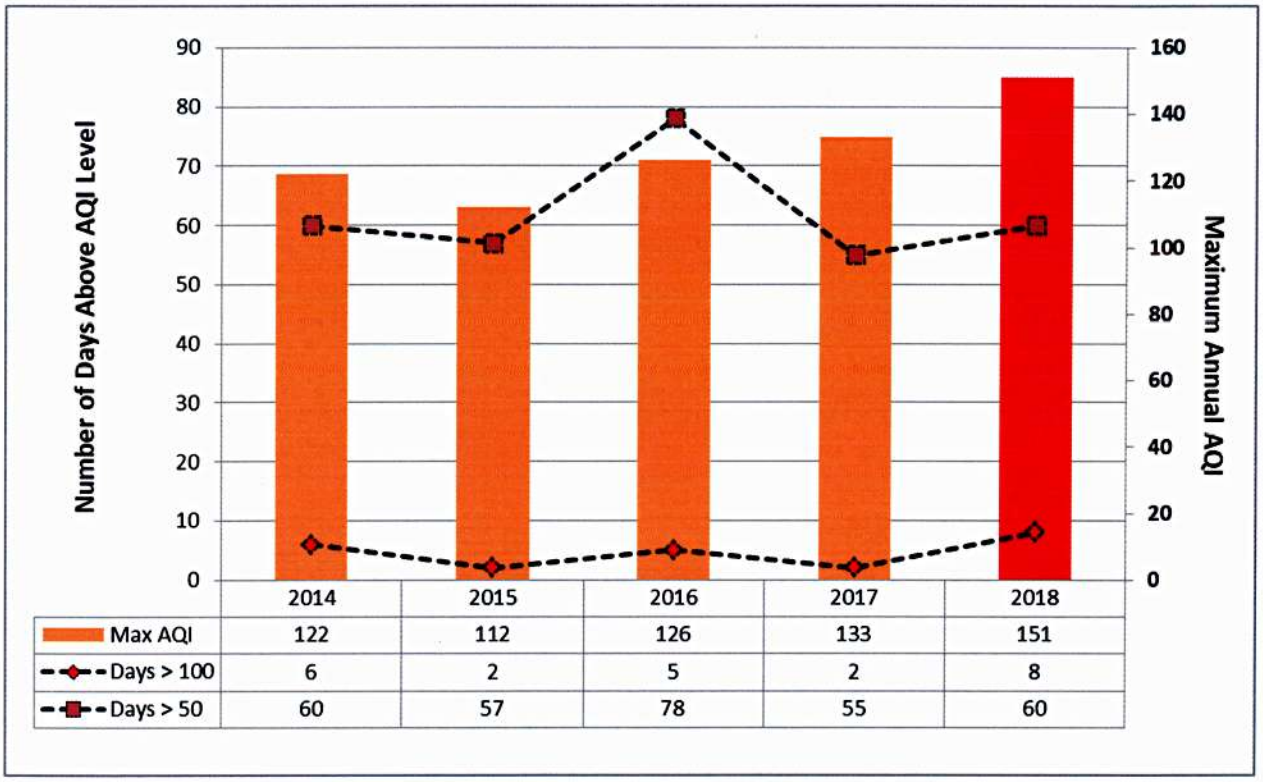

Figure 5. AQI metrics for Nashville-Davidson-Murferesboro-Franklin, TN area.

Interestingly, this increase in number of unhealthy days is indirectly proportional to decreases in ozone precursor emissions during this same time period. EPA publishes state-level emission totals by year for major source sectors within each state. At this time, state-level emissions by category for years up through 2017 are available. When I reviewed these emissions and their trends over time, I note decreases in annual NOx and VOC between 2014 and 2017.

Figures 6 and 7 show major category emission trends within Tennessee during this period with highlighted highway vehicle emissions noted on each bar. Figure 6 presents annual NOx emissions with calculated highway vehicle emissions decreasing from 148,000 tons per year in 2014 to 116,000 tons per year in 2017. Similarly, as shown in Figure 7, VOC emissions have also decreased over this period of time. Highway vehicle VOC emissions have decreased from 69,000 annual tons to 54,000 annual tons between 2014 and 2017.

This demonstrates a precarious relationship between emissions and air quality in the region because even with reductions in ozone precursor emissions reported in the state, air quality metrics used to measure health impacts have increased during the same time frame.

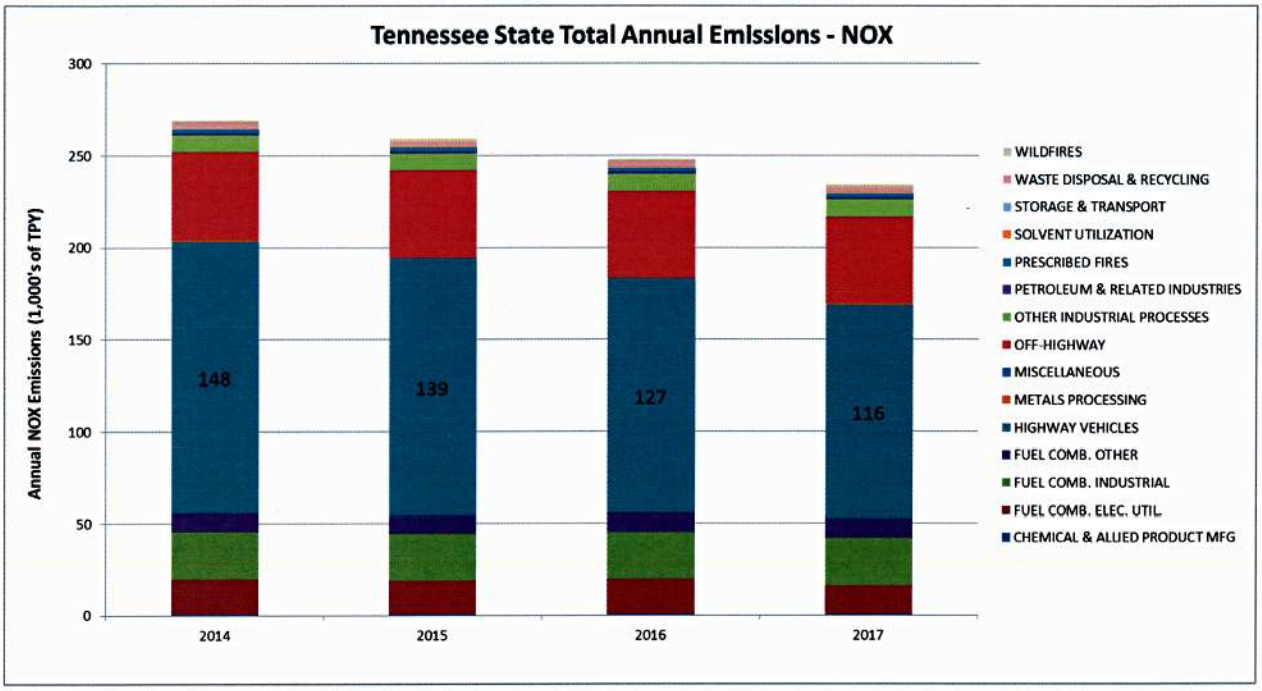

Figure 6. Tennessee NOx emission trends by major category.

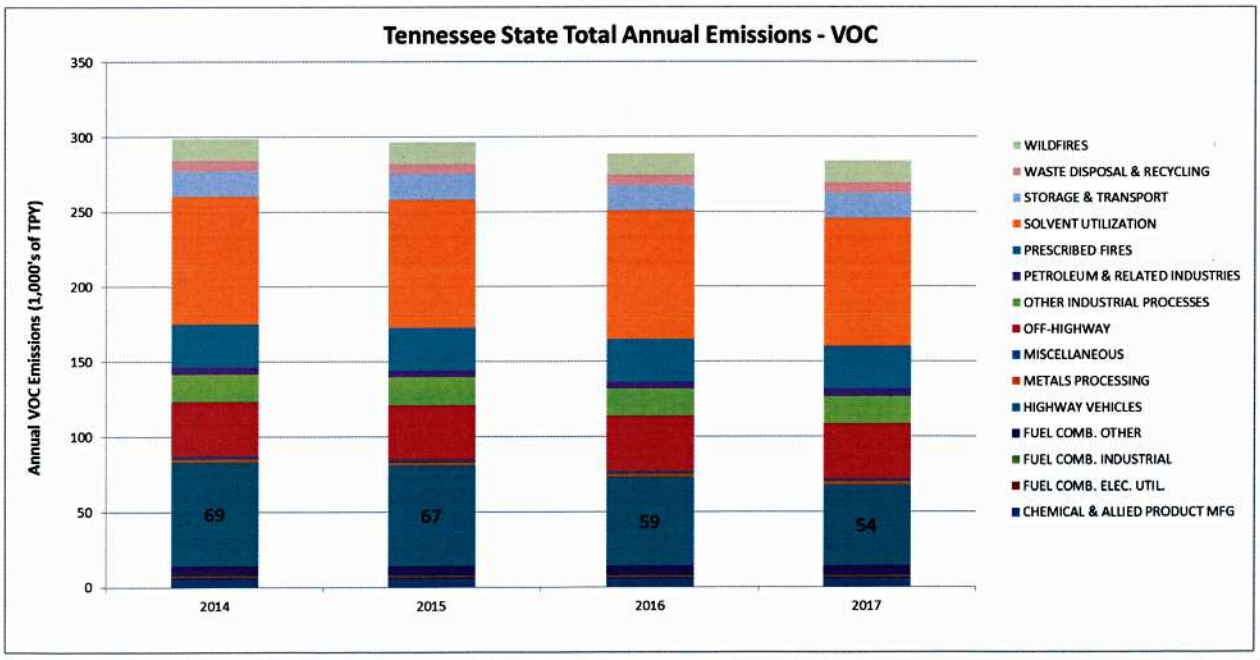

Figure 7. Tennessee VOC emission trends by major category.

Should TDEC-APC remove the I/M program in the Middle Tennessee area, increasing ozone precursor emissions from the highway vehicle sector by any amount, one can reasonably assume that AQI values and associated air quality concentrations would rise even more.

2. Air Quality Modeling Is Absent In The Analysis

TDEC has failed to simulate the impact of removal of the I/M program using air quality modeling. Ozone concentrations have non-linear correlation to NOx and VOC emission changes and cannot adequately be estimated exclusively using scaling ratios based on emission reduction sensitivities.

EPA SIP modeling guidance[3] notes that "[t]he application of a chemical transport grid model on a regional or local scale is the best tool available to judge the impacts of changes in future year emissions on concentrations." It further goes on to say "[a]ir agencies should determine whether a control program scenario will provide sufficient emission reductions to demonstrate attainment of the NAAQS using the modeled attainment test. The modeled attainment test is a technical procedure in which an air quality model is used to simulate base year and future air pollutant concentrations for the purpose of demonstrating attainment of the relevant NAAQS."

Formulation of a successful strategy against ozone pollution requires knowledge of the chemical regime for ozone production. Successive generations of atmospheric chemistry models have been developed to address this issue. Generally, air quality models are regarded as the most appropriate tools for assessing the expected impacts of a change in emissions.

TDEC, however, has failed to simulate the impacts of the I/M program removal with any air quality modeling. Instead, it has chosen to use external ozone sensitivity factors (inappropriate for this purpose as discussed elsewhere in this document) to estimate the changes in Tennessee air quality relative to the removal of this program.

While it may be possible to evaluate progress towards or degradation away from attainment of the ozone or PM2.5 NAAQS based on measured historical trends of air quality and emissions, there are several elements to that type of analysis that are difficult to quantify. First, in most cases, the ambient data trends are best assessed by normalizing to account for year-to-year meteorological variations. Second, one must have an accurate accounting of the year-to-year changes in actual emissions (NOx, VOC, and/or SO2 and NH3) for the given area and any surrounding areas, the emissions from which may impact local concentrations. Third, one must have a solid conceptual model of how ozone or PM2.5 is formed in the local area (e.g., influence of meteorology, NOx-limited, ammonia limited, transport-influenced, etc.).

Because TDEC has chosen to forego this most important step of simulating the removal of the I/M program with an air quality run, results presented in the noninterference demonstration cannot be considered technically complete.

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[3] https://www3.epa.gov/ttn/scram/guidance/guide/O3-PM-RH-Modeling_Guidance-2018.pdf

It is my recommendation that TDEC conduct a full air quality simulation of the impact of removal of the I/M program in Middle Tennessee before making any determination of its interference effect.

TDEC-APC Comment: Early in the process of developing the Noninterference Demonstration, the TDEC-APC consulted with the EPA on what information would be necessary to include in the demonstration. The EPA advised the TDEC-APC that an emission inventory projected out to 2022 would be needed in the demonstration, and the inventory should show two scenarios: (1) emissions with the I/M program and (2) emissions without the I/M program. Since the increase in emissions between the two scenarios was very small, the EPA advised the TDEC-APC that a full air quality photochemical modeling analysis was not required for the demonstration.

Response: I recognize that TDEC-APC consulted with EPA on what information would be necessary to include in the demonstration. However, it is still my recommendation that TDEC-APC simulate air quality changes resulting from the removal of the I/M program in the Middle Tennessee area using a chemical transport grid model to ensure that increases in air pollutant concentrations do not exceed NAAQS and health-based recommendations.

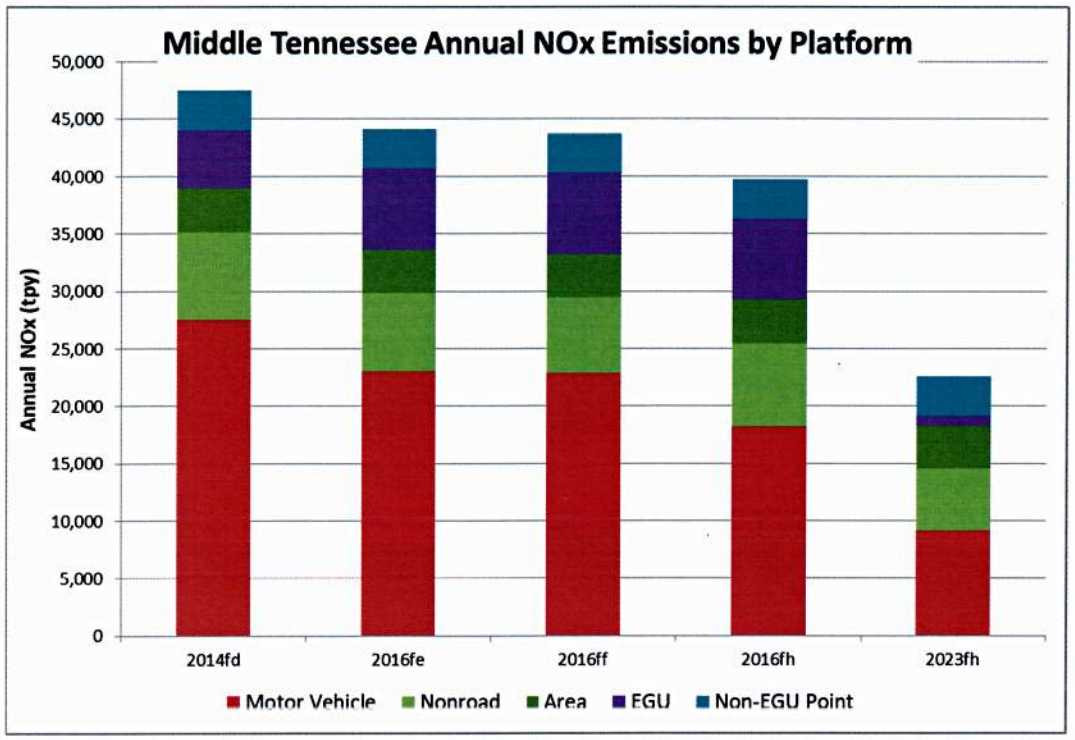
3. Newer Modeling Platforms Are Available for Use

TDEC bases both its base year and future year emission assumptions on a version of EPA's 2014 National Emission Inventory (NEI), version 2 that is now multi-versions old. TDEC should revise its analysis using the most current version of the NEI that is based on a 2016 calendar year that was developed with significant input from state and regional organizations.

Since the publication of EPA's 2014v2 NEI modeling platform (2014fd in Figure 8 below), EPA has released three incrementally newer modeling platforms using national, state, and local data sources[4]. These updated platforms improve estimates for emissions activity, magnitude, and temporal and spatial distribution, and use newer emission factors, methods, and models to derive their values.

The most current version of EPA's modeling platform is the 2016v1 (2016fh in Figure 8 below) platform that is described as a coordinated effort across over 245 state and regional air agency, EPA, and Federal Land Manager employees. Figure 8 below demonstrates the differences published in Middle Tennessee counties, annual emissions for NOx and VOC by major category across the multiple platforms and associated projections, including the two discussed above.

[4] https://www.epa.gov/air-emissions-modeling/2014-2016-version-7-air-emissions-modeling-platforms



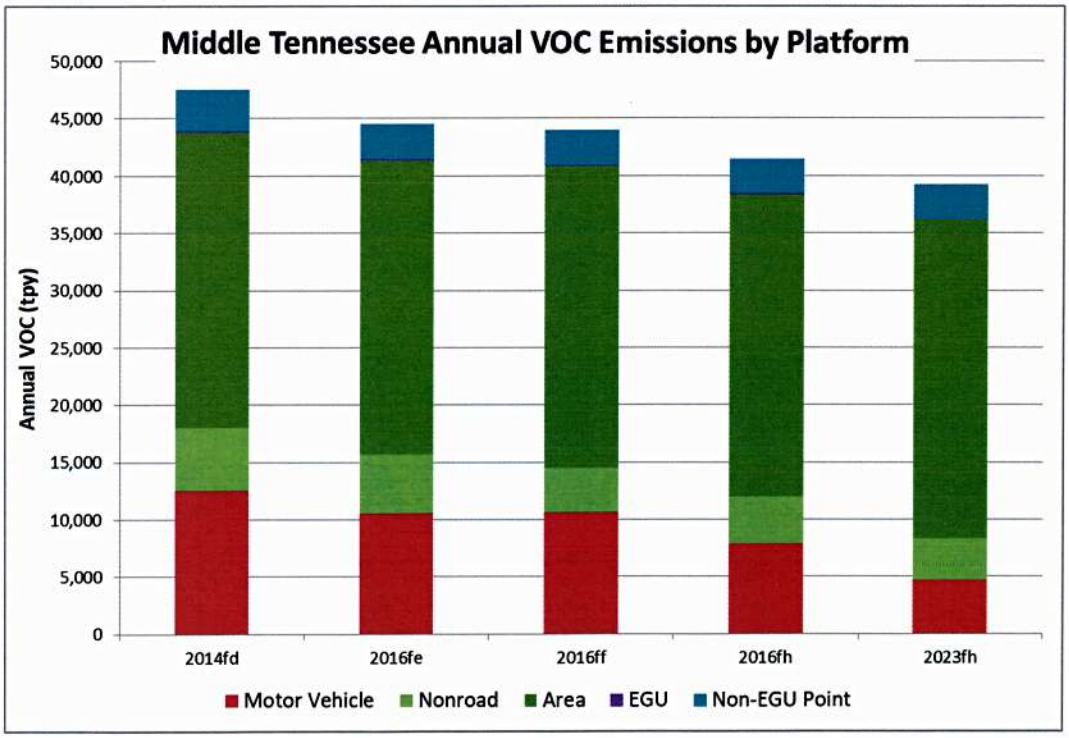


Figure 8. Annual emission summary of various EPA modeling platforms and associated projections for NOx (top) and VOC (bottom) Middle Tennessee counties.

The 2016fh platform and associated emission projections are demonstrably different in annual NOx and VOC from anthropogenic sources compared to the 2014fd platform cited by TDEC in its sensitivity

analysis and likely contain updated emission estimates for Middle Tennessee (and regionally impacting) source categories. Additionally, the fact that current emission estimates for motor vehicles in the Middle Tennessee region are decreasing, yet air quality has deteriorated in recent years, indicates that an additional increase in emissions, via the removal of the I/M program, may have an additional, accelerated deterioration impact on local air quality.

It is my recommendation that the most current modeling platform and associated emission projections be used to update the I/M analysis conducted by TDEC to account for improvements in emission estimates.

TDEC-APC Comment: For the onroad sector, the TDEC-APC did not use the 2014 NEI to project emissions. Instead, emissions from onroad sources are estimated through the use of locally gathered information on the vehicle population and the miles driven in each county, as well as a number of other inputs, combined with the EPA's Motor Vehicle Emissions Simulator (MOVES) model. For the nonroad and non-point sectors, the TDEC-APC used the 2014 NEI as a starting point to project emissions to 2022. For point sources with Major Source Permits in Sumner, Wilson, Rutherford, and Williamson Counties, the TDEC-APC projected emissions to 2022. Metro Nashville/Davidson County Pollution Control Division projected emissions to 2022 for all point sources in Davidson County. The 2016 base year platform, version 1 was not released until October 2019. Thus, the 2016 platform was not available when the TDEC-APC started its emission inventory work. The first draft of the Noninterference Demonstration was submitted to the EPA on April 29, 2019, well before the release of the 2016 base year platform.

Response: It is recognized that TDEC-APC was using the most current version of the national emission inventory at the time its noninterference demonstration was being prepared. Should revisions or reruns of the analysis be conducted (either emissions only or emissions and air quality), I continue to recommend that the most current modeling platform and associated emission projections be used to update the I/M analysis and to account for improvements in emission estimates across all sectors.

4. 2014 Inventory Is A Bad Year For Sensitivity Analysis

As noted in TDEC's Noninterference Demonstration, TDEC selected 2014 as a base year to develop estimated air quality impacts of the removal of the I/M program in Middle Tennessee.

Meteorological conditions including temperature, humidity, winds, solar radiation, and vertical mixing affect the formation and transport of ambient ozone concentrations. Ozone is more readily formed on warm, sunny days when the air is stagnant and/or when the winds are favorable for transport from upwind source areas. Conversely, ozone production is more limited on days that are cloudy, cool, rainy, and windy. In general, below average temperatures are an indication that meteorological conditions are unconducive for ozone formation, whereas above average temperatures are an indication that meteorology is conducive to ozone formation.

EPA notes in its ozone and PM modeling guidance document that the selection of a base year for SIP and sensitivity modeling is dependent on model performance evaluations and the response to emissions controls over time periods that include a ramp-up to a high ozone period and a ramp-down to cleaner

conditions. This allows for a more complete evaluation of model performance under a variety of meteorological conditions. EPA recommends that one should choose time periods which reflect a variety of meteorological conditions that frequently correspond with observed 8-hour daily maximum concentrations greater than the level of the NAAQS at monitoring sites in the nonattainment area.

We note, as do EPA and others, that 2014 was not a conducive year for such an analysis, nor did it contain high ozone periods that would adequately allow for the determination of impact of control strategies and air quality response. In recent modeling documentation[5], EPA notes that the summer of 2014 was not particularly conducive for ozone formation in the Upper Midwest, Ohio Valley, South, and Southeast. EPA provides supporting information from NOAA's Temperature, Precipitation, and Drought website[6] that shows 2014 was a below average temperature year (Figure 9) and an above average precipitation year (Figure 10).

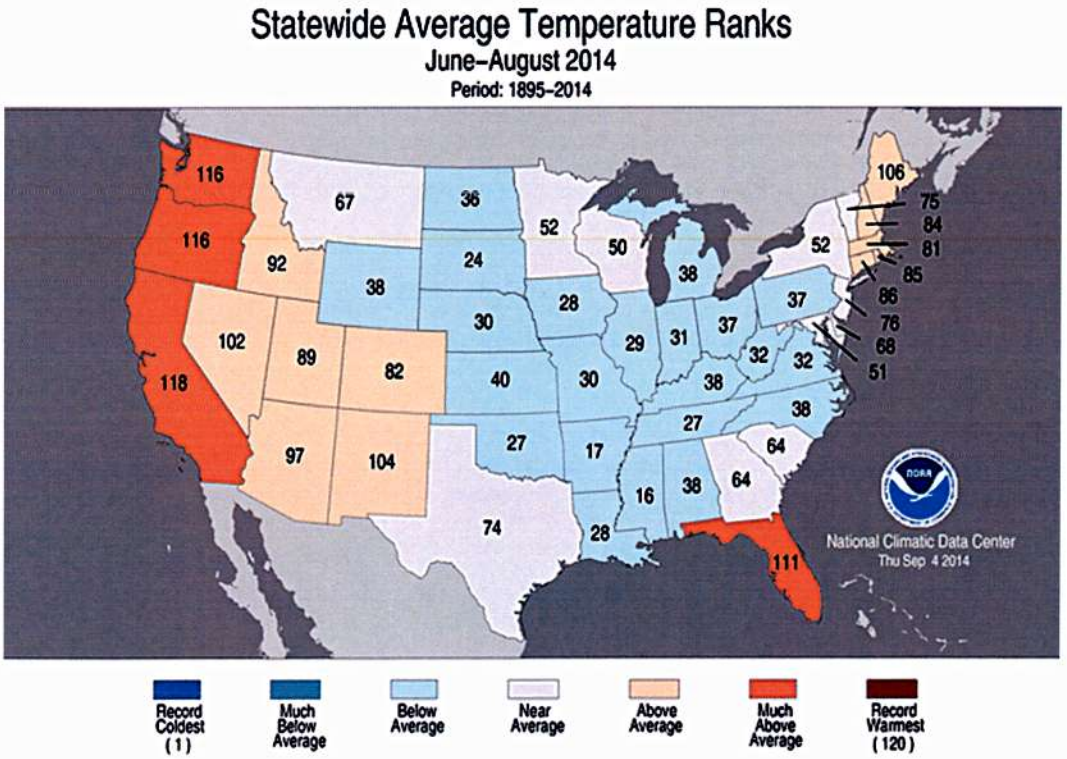


Figure 9. Statewide average temperature ranks, summer 2014.

In contrast, 2016 was an abnormally above average temperature year (Figure 11) for Tennessee and the Southeast, providing an alternative base year (as further discussed below) for this type of sensitivity to be conducted. This year is also consistent with EPA's latest modeling platform that could be used for this purpose.

[5] http://www.midwestozonegroup.com/files/EPA_maintenance_flexibility_Oct_19_2018.pdf
[6] https://www.ncdc.noaa.gov/temp-and-precip/

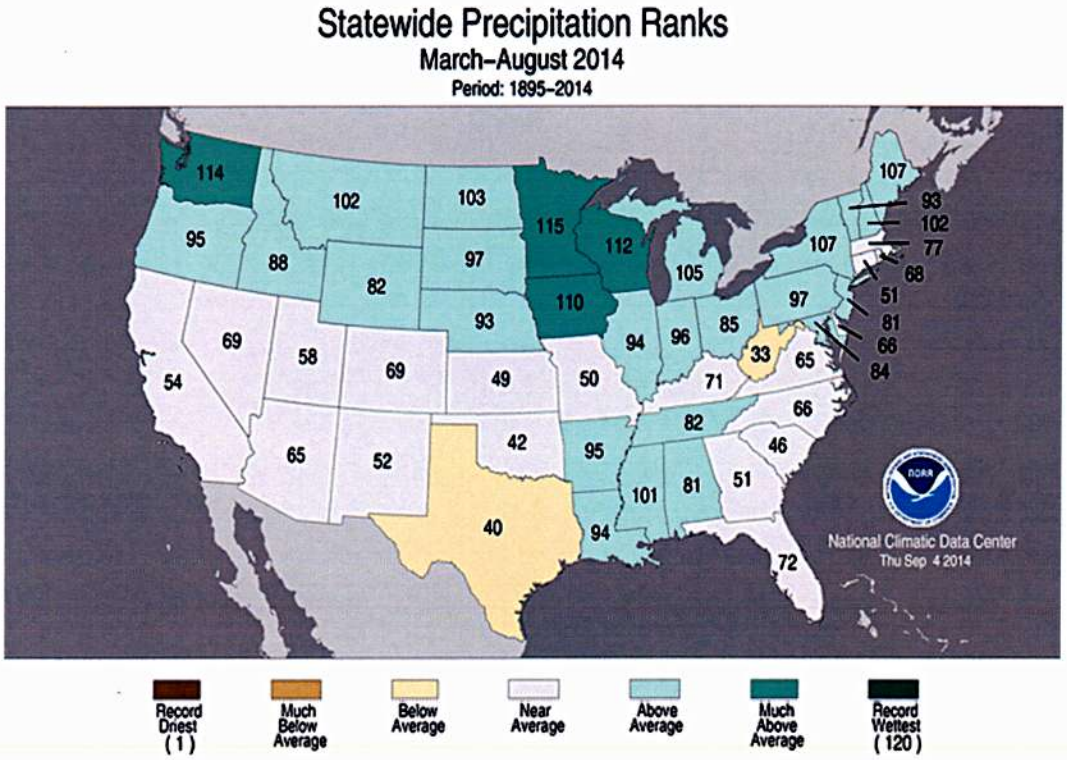


Figure 10. Statewide average precipitation ranks, summer 2014.

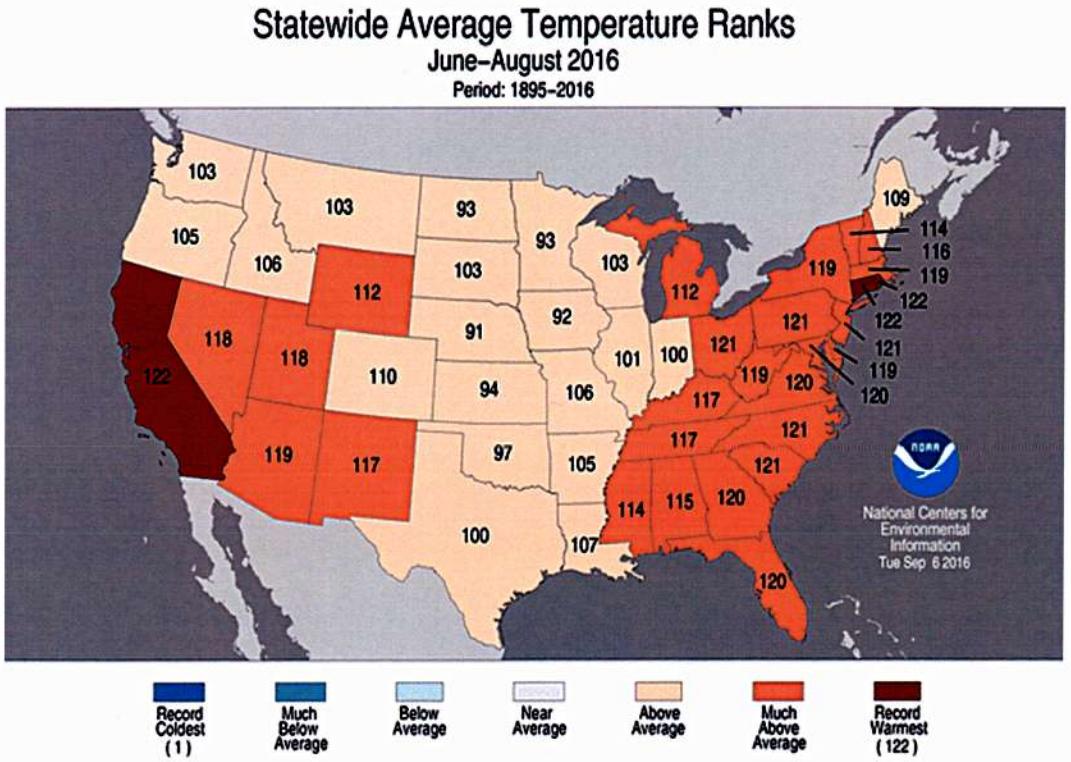


Figure 11. Statewide average temperature ranks, summer 2016.

It is my recommendation that TDEC conduct future ozone and PM modeling using a meteorological and associated base year inventory that meets the requirements of EPA guidance for the determination of impact of control strategies and air quality response.

TDEC-APC Comment: The TDEC-APC did not use 2014 as a base year for photochemical modeling so the meteorological conditions in this year are irrelevant. The TDEC-APC used the 2014 NEI as a starting point for many of the sectors to project emissions to 2022. However, for the most critical portion of the emissions inventories, the onroad sector, the TDEC-APC projected 2022 emissions from locally gathered information and the EPA' MOVES model.

Response: My recommendation for future year air quality modeling still applies and is relevant to demonstrating air quality changes associated with the removal of the I/M rule and should be undertaken using EPA guidance reflecting ozone-conducive years to establish base year model conditions.

5. Ozone Sensitivity Factors Are Based On 2007 Data Projected to 2018

TDEC relies on a technical analysis completed in 2014 that is based on inventories and assumptions now considered aged in their application of ozone sensitivity factors to estimate the impact of the removal of the I/M program. The "brute force" factors generated from this work are not applicable to current conditions and to the mix of sources and emissions in the analyzed region and are based on a calculation of emission reductions across all source sectors (not just I/M impacted sources) and across the entire state of Tennessee (not just the Nashville, Middle Tennessee region).

TDEC has relied on an analysis[7] conducted by Georgia Tech in 2014 (SEMAP) that is based on a 2007 base year emission inventory with 2018 projections using assumptions considered "On The Way" or "On The Books" at that time. My review of this study and platform find the following issues related to the study's use in TDEC's ozone sensitivity analysis.

To start, total Tennessee annual anthropogenic NOx emissions projected to 2018 in the SEMAP analysis (267,700 tpy) are 25% greater than actual emissions currently reported in Tennessee in the 2016v1 platform (214,542 tpy). This direction is reversed for anthropogenic VOC emissions where EPA's 2016v1 platform is 7% higher than the SEMAP 2018 projection (227,090 tpy v 210,706 tpy). This initially complicates the ozone sensitivity factor, as the ratio of ozone to NOx and VOC used by TDEC is based on emission levels significantly different than actual, current conditions.

Furthermore, when looking at motor vehicle source emission comparisons exclusively, EPA estimates that in 2016, onroad annual NOx (106,069 tpy) comprises 49% of total anthropogenic emissions from Tennessee. The SEMAP analysis estimated a significantly lower composition (36%; 95,973 tpy) in its 2018 projections used to create the ozone sensitivy factors used by TDEC. Annual motor vehicle VOC emissions also differ in contribution with SEMAP estimating 19% of total anthropogenic VOC (40,676

[7] http://semap.ce.gatech.edu/sites/default/files/files/SEMAP-Revised-Final-Report_Final.pdf

tpy) in 2018 from motor vehicle sources compared to EPA's 24% (53,649 tpy) from this same category-state combination. Figures 12 and 13 present this comparison for NOx and VOC, respectively.

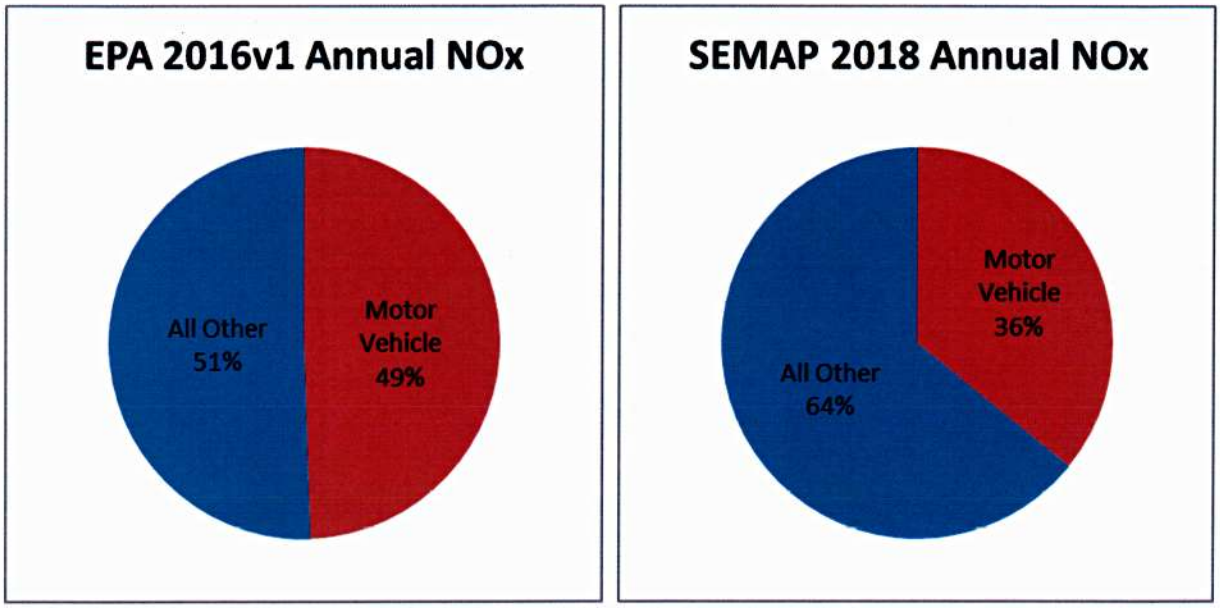


Figure 12. Comparison of annual NOx emissions from Tennessee motor vehicle sources as a percentage of total Tennessee NOx emissions.

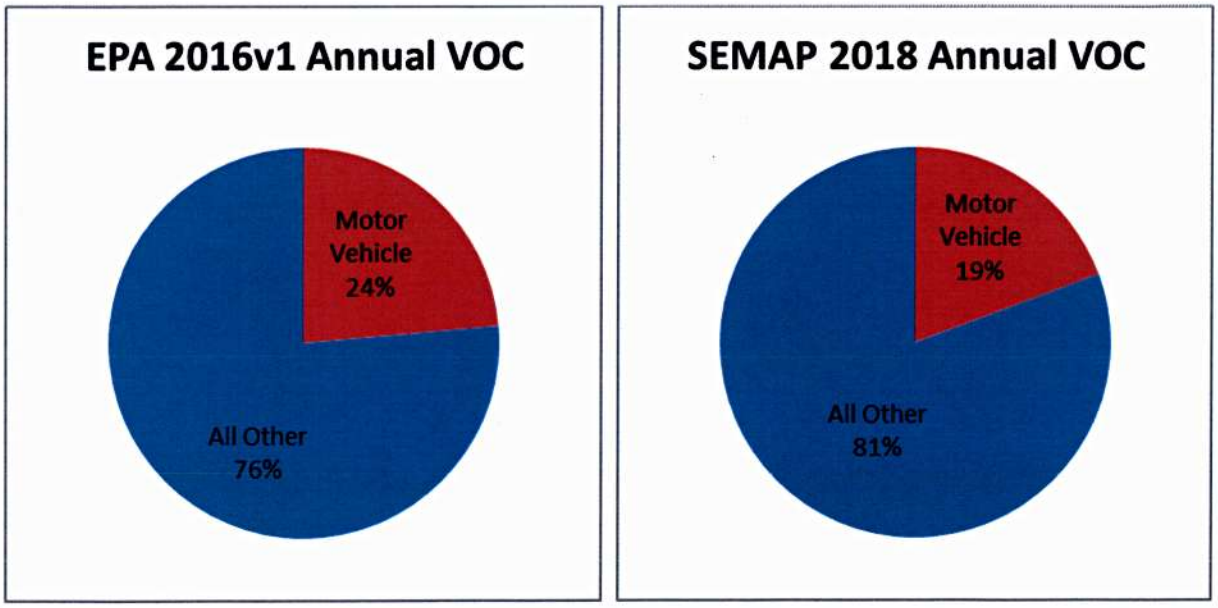


Figure 13. Comparison of annual VOC emissions from Tennessee motor vehicle sources as a percentage of total Tennessee VOC emissions.

As a result, the SEMAP calculated ozone sensitivity factor is based on an emissions magnitude AND a presumed source category emission ratio significantly different than today's actual distribution ratio as represented in the 2016v1 platform. This results in a sensitivity factor (ppb/ton reduced) calculated

from the SEMAP work that is not directly applicable to today's ozone conditions and that is likely not representative of the air quality change reflected in the removal of the I/M program.

It is my recommendation that TDEC consider alternate methods and air quality modeling than using an outdated modeling platform and projections, with source category distribution assumptions, significantly different than today's actual category and emissions mix, to determine the air quality impact of removing Middle Tennessee's I/M program.

TDEC-APC Comment: The TDEC-APC used the sensitivity analysis as a weight-of-evidence in the Noninterference Demonstration. The State of Georgia used the same SEMAP study to perform a similar sensitivity analysis for inclusion in their document titled "Noninterference Demonstration for the Relaxation of the Summertime Reid Vapor Pressure (RVP) Requirements in the Former 13-County Atlanta Designated Volatility Nonattainment Area". Georgia's Noninterference Demonstration was approved by the EPA in the Federal Register on September 20, 2019 (49470 Federal Register). The TDEC-APC believes that the EPA will approve Tennessee's Noninterference Demonstration with a sensitivity analysis based on the SEMAP study since Georgia's Noninterference Demonstration with a similar sensitivity analysis based on the same SEMAP study was approved by the EPA.

Response: The TDEC-APC is correct that Georgia used the same SEMAP study to perform and similar noninterference demonstration for relaxation of the summertime RVP requirements, however, TDEC-APC fails to note that Georgia DEP also proposed to demonstrate noninterference by substituting quantifiable, permanent, surplus, enforceable, and contemporaneous measures to achieve equivalent emissions reductions to offset the potential emissions increases associated with removal of the program[8]. In its approval notice[9], EPA noted that "[t]his RVP relaxation will not worsen air quality because Georgia's offsets provided compensating, equivalent emissions reductions to negate the increases in emissions from NOX and VOC."

In fact, Georgia established a current mobile vehicle emissions budget (MVEB) and secured emission offsets to the increases anticipated from the removal of the RVP program. They offered an offset equivalency demonstration as part of the noninterference demonstration. These offsets included locomotive conversation offsets, that replace higher-emitting, existing diesel locomotive engines with lower emitting locomotive engines, and school bus early replacement offsets, replacing older, higher emitting school buses with newer, lower emitting buses.

Georgia further demonstrates in their relaxed RVP gasoline analysis that the NOX and VOC emissions after 2014 are well below their calculated 2014 MVEB and project emissions and emissions increases to 2040 demonstrating that emissions from 2030-2040 never exceed their 2030 MVEB.

TDEC-APC does not provide any offset equivalency demonstration to counter the anticipated emission increases associated with the removal of the I/M program in Middle Tennessee nor does it calculate and provide additional support of meeting current and future year motor vehicle emission budgets. In fact,

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[8] file:///C:/Users/winst/Downloads/9_RVP_Relaxation_110l_Final_Narrative.pdf
[9] 84 FR 16787

at Nashville Area Interagency Consolation Group meetings, concern was expressed about the area meeting the old MVEBs especially in light of the potential increase in emissions from the termination of the I/M program[10].

Because of these omissions, TDEC-APC has not provided comparable supporting analyses compared to Georgia's noninterference demonstration and therefore may fall short of EPA's approval.

6. TDEC's Misuse of the SEMAP Ozone Sensitivity Factor

TDEC notes in the Noninterference Demonstration document (page 14) that:

> *"Although the SEMAP study projected emissions and ozone concentrations in 2018, it is estimated that a similar response to NOx and VOC reductions would occur in 2022."*

In fact, the SEMAP report itself indicates the limitations of using these data for purposes other than identical to the conditions in that analysis. Specifically, the report notes[11]:

> *"Since ozone response is nonlinear the results are most accurate for the amount of reduction used here, i.e., 30% of either NOx or VOC emissions. Caution should be exercised if the results are used for other purposes, for example in attempts to calculate the responses to other levels of emission reductions, especially those larger than 30%, or responses to combined NOx and VOC reductions. An extreme attempt might be to extrapolate the results to 100% and calculate interstate contributions. The nonlinear nature of the relation between ozone and NOx or VOC emissions should be kept in mind in such interpretations of the results. Any such attempt can only be a first estimate and should be followed by simulations of the actual emission reduction case."*

This caveat to the SEMAP results is clear in noting that (1) the sensitivity factors generated from the analysis are most accurate for reducing NOx or VOC emissions across all categories across the entire state by 30%, (2) caution should be exercised if the results are to be used for purposes other than the original intent of the analysis, (3) using the sensitivity factors should only be considered a first estimate and not a final application of the emission change, and (4) an actual emission reduction scenario and air quality modeling simulation should be conducted with the strategy outlined.

TDEC has made no documented effort to follow this guidance from the SEMAP report and from where the ozone sensitivity factors were taken.

It is my recommendation that TDEC consider using alternate methods and air quality modeling to determine the air quality impact of removing Middle Tennessee's I/M program.

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10 https://www.tn.gov/content/dam/tn/environment/air/documents/publicnotices/apc_SIP_IM_Removal_Middle_TN_08-28-19.pdf. Page E-6.

11 http://semap.ce.gatech.edu/sites/default/files/files/SEMAP-Revised-Final-Report_Final.pdf. Page 5-1.

TDEC-APC Comment: The TDEC-APC acknowledges that trying to use the scaling analysis with percentage changes well above 30% would yield erroneous results, as stated in the SEMAP report. The TDEC-APC believes that scaling ratios are valid in this sensitivity analysis since the percentage change in NOx (1.9%) and VOC (1.7%) emissions due to the removal of the I/M program are less than the 30% change in NOx and VOC emissions that were modeled in the SEMAP project. The TDEC-APC was conservative in its approach since average absolute sensitivities were normalized by the emission reduction from NOx and VOC in Middle Tennessee only and not by reductions in the entire state or entire region.

Response: I believe that TDEC-APC's recognition that its use of the scaling analysis would yield erroneous results should be adequate enough for the agency to reconsider using its analysis as a weight-of evidence approach to removal of the I/M program. Even though EPA approved a separate state's weight-of-evidence analysis for a totally different region and program removal, erroneous results are erroneous results and should not be used to justify removal of an emissions reduction program that historically TDEC-APC felt so strongly to support and has impact on improving air quality in the region.

I also refer back to the previous comment for concerns in the difference between TDEC-APC's supporting analysis for the noninterference demonstration compared to Georgia's more complete analysis.

7. **Calculations Show Onroad Emissions From Tennessee Have The Greatest Ozone Formation Potential**

By using the SEMAP ozone sensitivity factors, TDEC makes an assumption that each ton of a pollutant precursor emission has an equal impact on air quality as compared to every other ton of the same pollutant precursor, regardless of emission source. Recent modeling on this subject demonstrates that local motor vehicle source emissions have significantly greater impact on local air quality compared to all other source categories and regions.

Assuming that non-linear ozone formation and the use of an older modeling platform and associated emission projections were to be acceptable approaches to reviewing the impact of air quality change resulting from removal of the I/M program, recent category-specific source apportionment analyses conducted elsewhere by Alpine indicate that NOx emissions from Tennessee's motor vehicle source category have a much greater impact on local air quality than estimated by TDEC.

In the statement from TDEC's website presented above, the following sentence has significant relevance to the review here:

> *"But in numerous cities across the country, the personal automobile is the single greatest polluter, as emissions from millions of vehicles on the road add up."*

Using methods previously established under other work[12], Alpine has reviewed the recent EPA modeling platform used in the Cross-State Air Pollution Rule (CSAPR) Close-Out modeling and developed ozone source apportionment results and relationships between State-source category specific ozone source apportionment modeling and the seasonal NOx emissions used to develop the ozone concentrations. We used the **C**omprehensive **A**ir quality **M**odel with e**X**tensions/**O**zone **S**ource **A**pportionment **T**echnology[13] (CAMx/OSAT) technique to quantify the contribution of 2023 base case NOx and VOC emissions from anthropogenic source categories in each region to projected 2023 ozone concentrations at ozone monitoring sites based on EPA's CSAPR "Closeout" base case scenario from EPA's 2011/2023en modeling platform.

This analysis is important as the results provide indicators of relative contribution of source regions (states) and categories (e.g., motor vehicle) NOx and VOC emissions to downwind monitor ozone concentrations. Our findings for the 2023 simulation at Middle Tennessee monitors are presented in Figures 14 through 17 below.

Each figure presents the relative contribution of NOx and VOC emissions to the modeled ozone concentration at the presented receptor. The relative height of the bars indicates the source region (x-axis) of contribution with taller bars indicating greater relative contribution. The individual colored segments of each bar (e.g., red indicating motor vehicles) indicate the relative contribution of source categories within each region to the monitor's modeled ozone concentration.

In all cases listed in the following four Figures, emissions from motor vehicle sources contribute the greatest relative concentration from U.S. anthropogenic emissions to the four monitors presented (e.g., red portion of bar from Tennessee). Based on the understanding of local impact from mobile sources, it could also be estimated that more localized reductions (e.g., Middle Tennessee counties only) would have an even greater relative impact on ozone concentrations per ton than a statewide estimation.

Note that the blue "BC" bar indicates contribution from emissions generated from boundary condition sources that include, but are not limited to, concentrations transported into the national modeling domain (e.g., international transport, stratospheric intrusion, domain initialization conditions) and are not controllable by U.S. regulation.

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12 http://midwestozonegroup.com/files/RelativeImpactofStateandSourceCategoryNOxEmissionsonDownwindMonitorsIdentifiedUsingthe2017CrossStateAirPollutionRuleModelingPlatform.pdf

13 http://www.camx.com/files/camxusersguide_v6-40.pdf

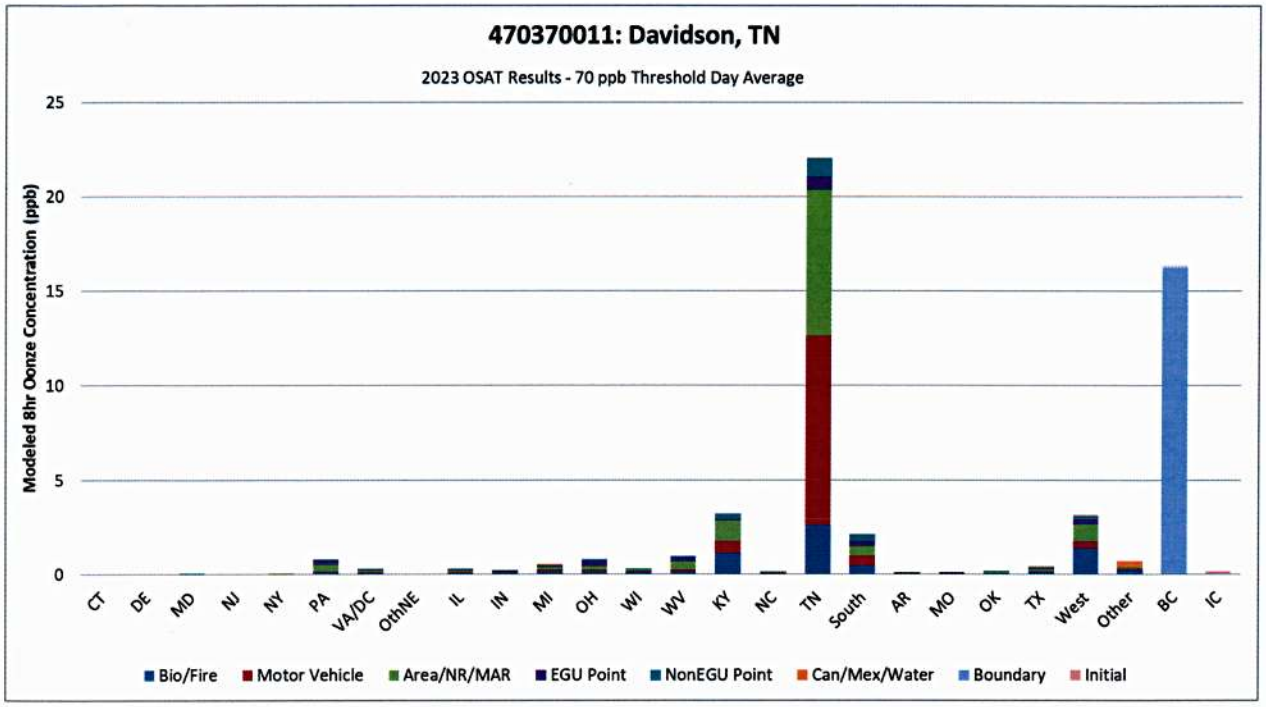

Figure 14. Relative contribution of ozone concentration (ppb) from source region and category combinations for East Health monitor.

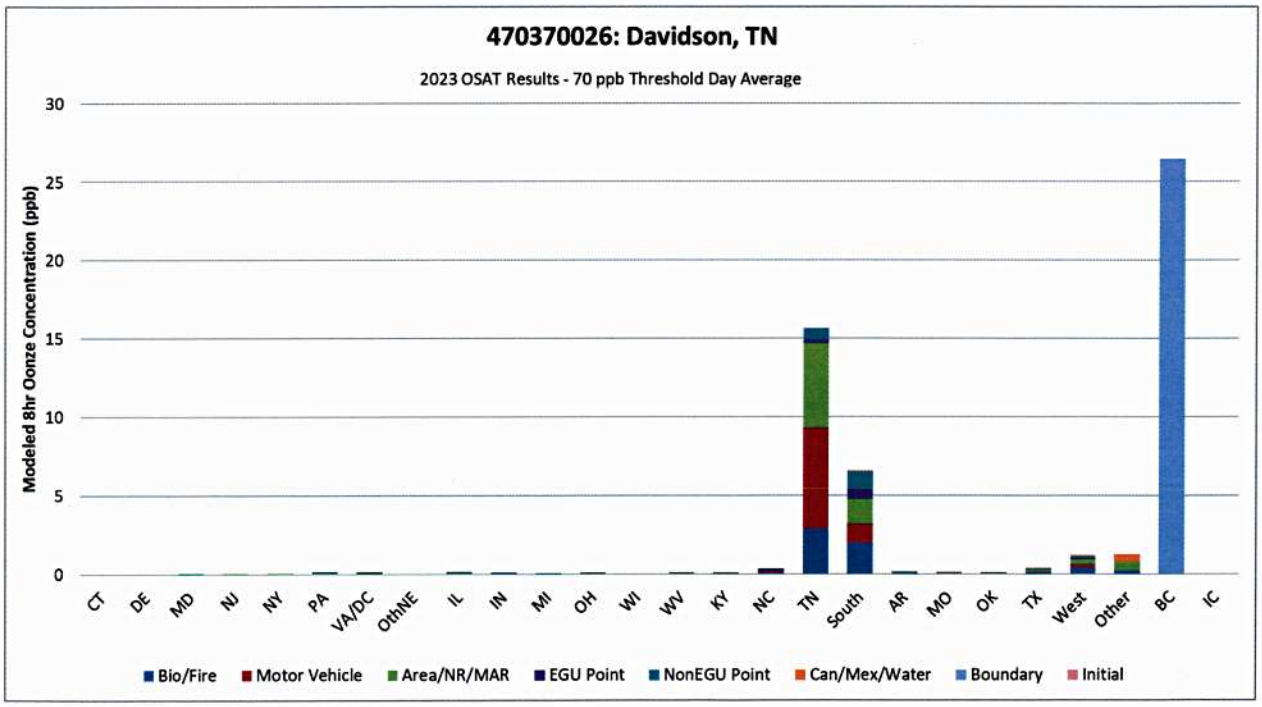

Figure 15. Relative contribution of ozone concentration (ppb) from source region and category combinations for Percy Priest Dam monitor.

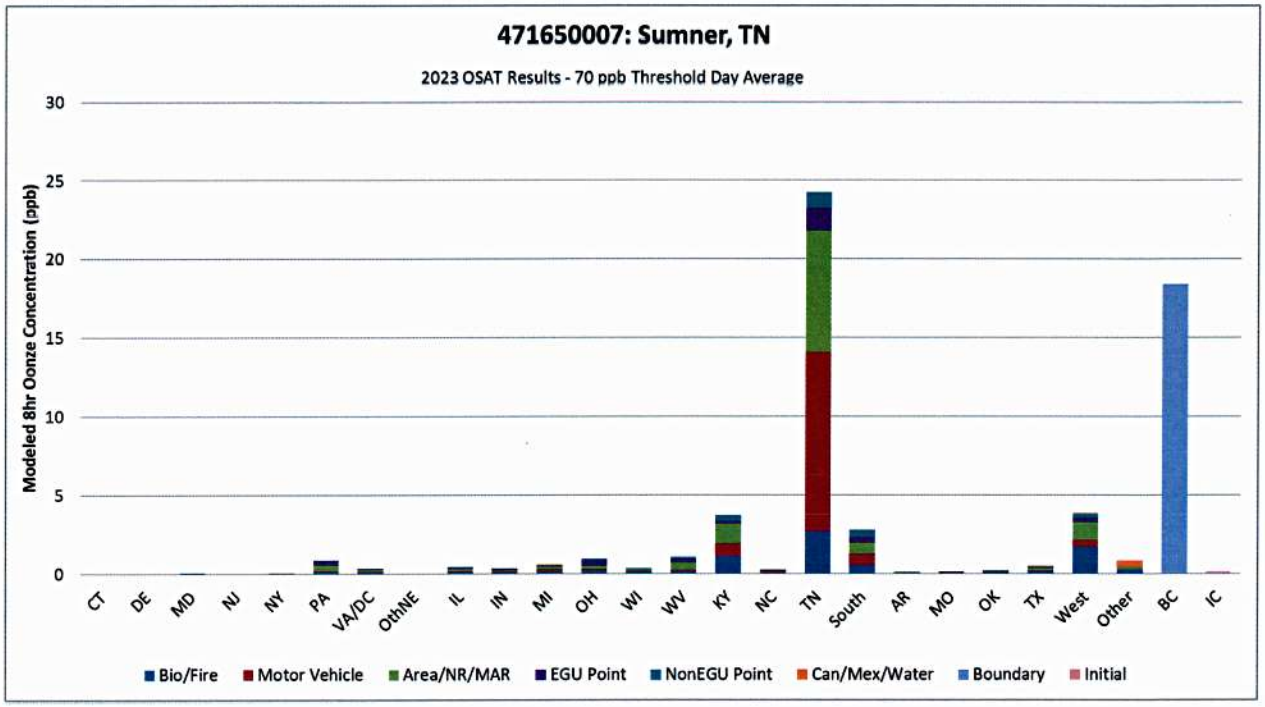

Figure 16. Relative contribution of ozone concentration (ppb) from source region and category combinations for Hendersonville Ozone Site at Old Hickory Dam.

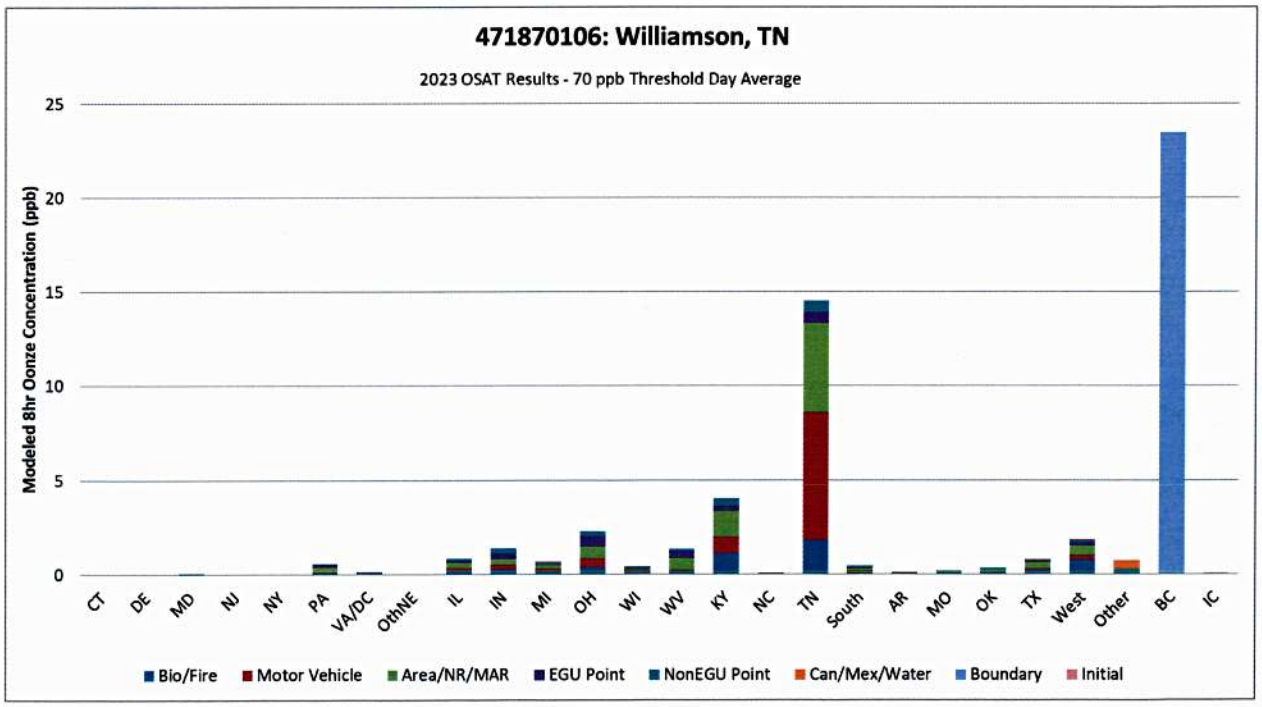

Figure 17. Relative contribution of ozone concentration (ppb) from source region and category combinations for Fairview Middle School monitor.

Furthermore, using these same source apportionment results and monthly, county, and source category specific emissions published by EPA, we developed relational "impact factors" (units of ppb/ton). We define this "impact factor" as representative of the relative contribution of modeled emissions (tons) to resultant ozone concentrations (in ppb), similar to TDEC's used SEMAP ozone sensitivity factor.

In Alpine's analysis, using updated emissions, projections, and models, we find that the relative impact of NOx emissions from mobile sources in Tennessee have factors significantly higher than most other regional-category combinations, leading us to conclude that motor vehicle and nonroad source emissions have the greatest impact on ozone concentrations in the Middle Tennessee region at the monitors reviewed.

The following four figures present the graphical results of our analysis for four Middle Tennessee monitors (presented above) with representation by state and major source sector of the impact factor calculation for the 2023 projection simulation. In all cases, either the emissions from motor vehicle sources from Tennessee (red bar) or contributions from the nonroad mobile source sector (portion of green bar) are visibly greater in relative contribution impact than any other state or category.

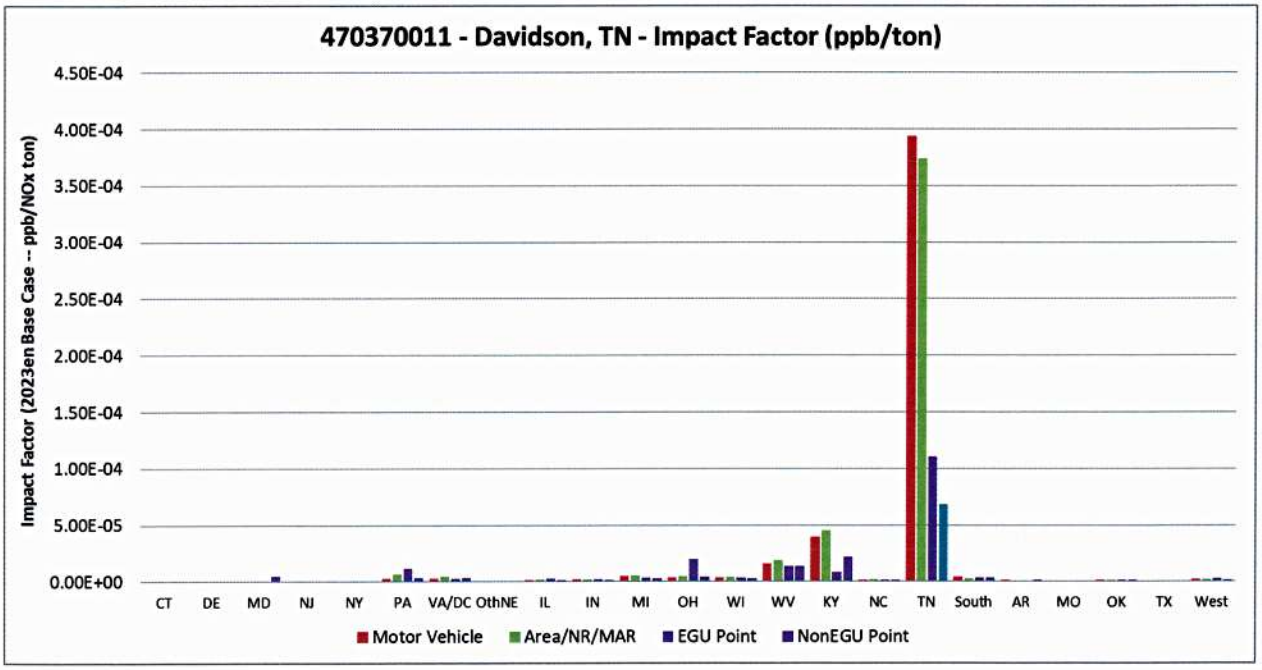

Figure 18. Impact factor calculation (ppb/ton) from source region and category combinations for East Health monitor.

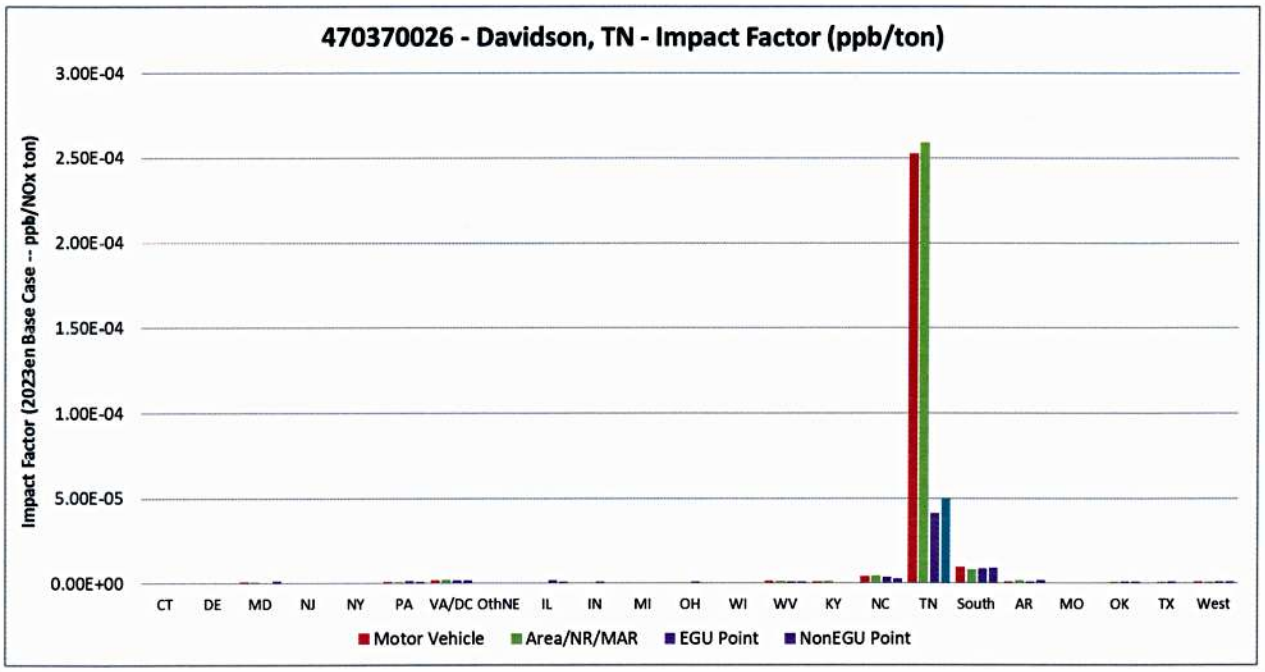

Figure 19. Impact factor calculation (ppb/ton) from source region and category combinations for Percy Priest Dam monitor.

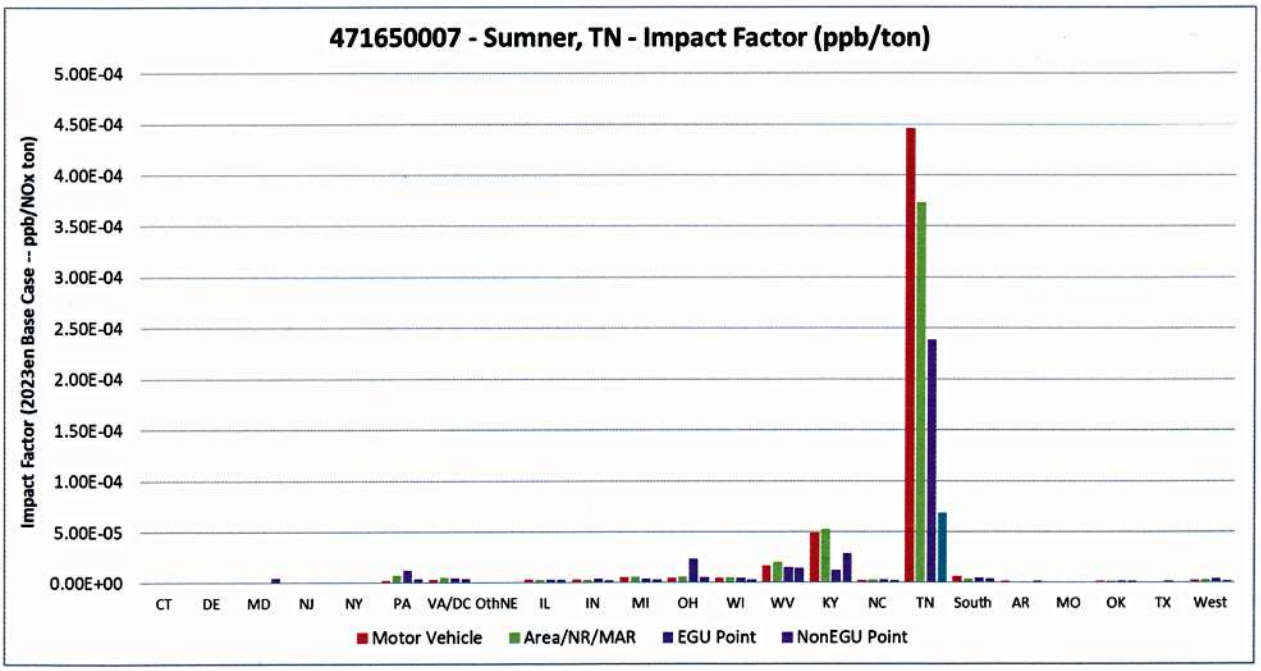

Figure 20. Impact factor calculation (ppb/ton) from source region and category combinations for Hendersonville Ozone Site at Old Hickory Dam.

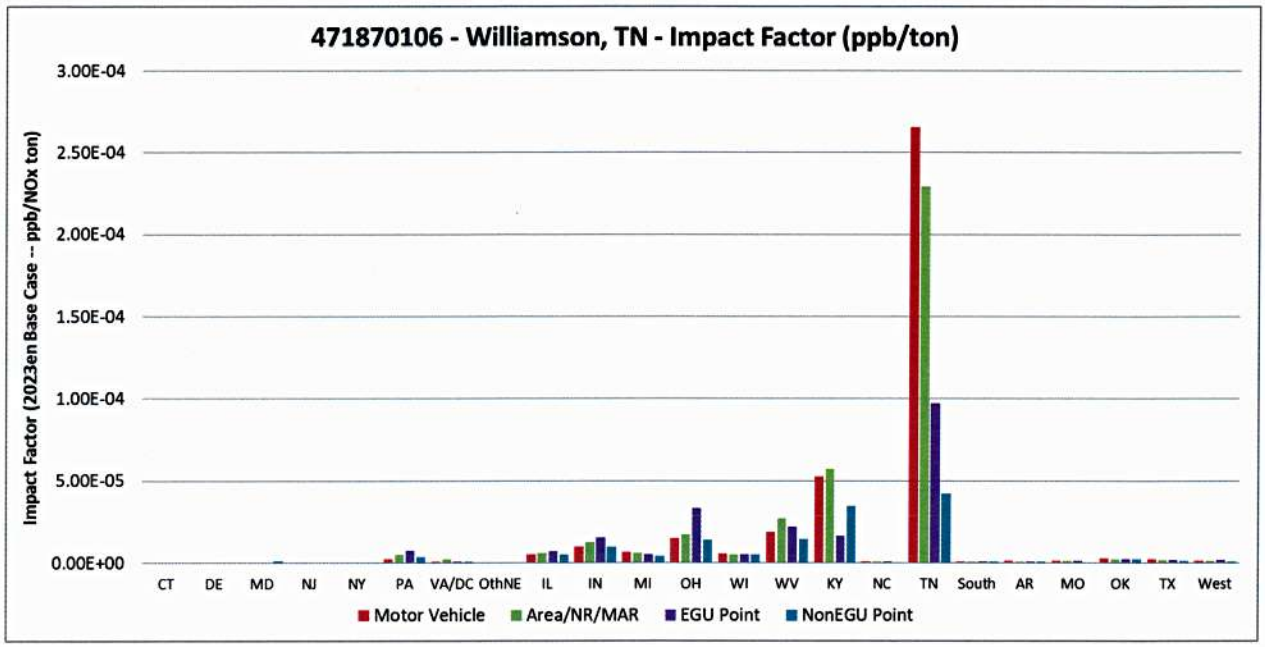

Figure 21. Impact factor calculation (ppb/ton) from source region and category combinations for Fairview Middle School monitor.

Using the results of these recent state and source category specific source contribution modeling analyses, I believe that the ozone sensitivity factors used by TDEC to estimate the impacts of the removal of the I/M program in the Middle Tennessee domain are inapplicable to current conditions based on TDEC's generic calculation and brute force application, and that actual air quality modeling is necessary to estimate the air quality impact of this action.

It is my recommendation that TDEC consider using alternate methods and air quality modeling to determine the air quality impact of removing Middle Tennessee's I/M program. Absent the decision to run an air quality simulation, it is my recommendation that should TDEC consider using an "impact factor"-like application to determine the impact of the removal of the I/M program in Middle Tennessee, it should use county and motor vehicle specific factors to make this first step assessment.

TDEC-APC Comment: The TDEC-APC used the "impact factors" displayed in the Alpine report to calculate the projected increase in ozone due to the elimination of the I/M program. When these results were compared, the resulting increase in ozone from Alpine's "impact factors" are actually less than the increase in ozone that were calculated using TDEC-APC's sensitivity analysis approach.

Response: I appreciate TDEC-APC's consideration of use of alternate sensitivity factors to those determined to give erroneous results in its original study. I note that in my original comments, I did recommended that TDEC-APC consider using alternate methods and air quality modeling to determine the air quality impact of removing Middle Tennessee's I/M program. Absent the decision to run an air quality simulation (which appears to be the case here), it was my recommendation that should TDEC consider using an "impact factor"-like application to determine the impact of the removal of the I/M

program in Middle Tennessee, it should use county and motor vehicle specific factors to make this first step assessment.

Instead, TDEC-APC used the pre-generated state-level impact factor values referenced by me and that I note are not consistent with the county-based analysis (or the most current emissions and emission projection estimates) recommended to be applied. The uniqueness of highway vehicle emissions in the Middle Tennessee area are likely significantly different that the mix of highway vehicle emissions in the entire state of Tennessee (as presented in Alpine's referenced report).

I continue to recommend that TDEC-APC consider using an "impact factor"-like application to determine the impact of the removal of the I/M program in Middle Tennessee, and it should use county and motor vehicle specific factors to make this first step assessment.

8. EPA Is Rolling Back Other Regulations That Will Likely Increase Emissions

TDEC includes in its assumptions that existing non-mobile control programs will remain in force during the foreseeable future. As has been demonstrated by EPA, a significant number of federal air quality regulations have been "rolled back", removed from requirements, or are in the courts pending review and decision. Should these regulations be stricken from the list of required control programs, assumptions included that assume emission decreases and associated air quality improvements will be invalidated.

Multiple sources, including EPA itself, have summarized the dozens of air quality related regulatory programs that have been "rolled back", challenged in the courts, or are no longer being enforced in the past few years and that have demonstrated negative impact on air quality progress. These rules, whether related to motor vehicle and nonroad mobile sources (proposing weakening existing fuel economy standards, lifting summertime ban on ethanol-based fuel blends, etc.), electric generating utilities (proposing repeal of Clean Power Plan; Power Plant Startup, Shutdown, and Malfunction Rule; etc.), or other categories and emission sources that impact air quality in Middle Tennessee have all been part of earlier improvements in ozone and PM concentration observations in the region.

However, now that these rules have been and continue to be eliminated, air quality in the region has shown deterioration and movement towards nonattainment of the various NAAQS. Removal of yet another regional rule like the I/M program will only work to worsen air quality for the population of Nashville and the entire Middle Tennessee region.

It is my recommendation that TDEC collectively consider the impact of these additional regulations before removing the I/M program from Middle Tennessee.

TDEC-APC Comment: The TDEC-APC believes that the commenter is overstating the facts by stating that a "significant number of federal air quality regulations have been "rolled back", removed from requirements, or are in the courts pending review and decision." The Noninterference Demonstration is a demonstration for the removal of one regulation, the I/M regulation, and is not intended to show the

effects of speculative regulatory changes that may be made by the EPA or federal courts for which Tennessee has no control.

Response: All programs that impact the air shed in the Middle Tennessee area should be considered when estimating what the incremental impacts of the removal of the I/M program would have on ozone concentrations. EPA has shown that air packets from as far away as California or New York can have impact on air quality in Tennessee[14]. As a result, any regulation that has an impact to increase emissions could have an impact on Middle Tennessee air quality.

According to a report prepared by New York University Law School's State Energy and Environmental Impact Center[15], recent environmental rollbacks under the direction of the current administration could significantly increase greenhouse gas emissions and lead to thousands of extra deaths from poor air quality every year. Below is a list of 25 policy changes, classified into two categories: rules that were officially reversed and rollbacks still in progress.

Completed

1. Canceled a requirement for oil and gas companies to report methane emissions[16].

2. Revised and partially repealed an Obama-era rule limiting methane emissions on public lands, including intentional venting and flaring from drilling operations[17].

3. Replaced the Obama-era Clean Power Plan, which would have set strict limits on carbon emissions from coal- and gas-fired power plants, with a new version that would let states set their own rules[18].

4. Revoked California's power to set its own more stringent emissions standards for cars and light trucks[19].

5. Repealed a requirement that state and regional authorities track tailpipe emissions from vehicles traveling on federal highways[20].

6. Loosened a Clinton-era rule designed to limit toxic emissions from major industrial polluters[21].

7. Revised a permiting program designed to safeguard communities from increases in pollution from new power plants to make it easier for facilities to avoid emissions regulations[22].

8. Amended rules that govern how refineries monitor pollution in surrounding communities[23].

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[14] https://www.epa.gov/interstate-air-pollution-transport/what-interstate-air-pollution-transport
[15] https://www.law.nyu.edu/sites/default/files/climate-and-health-showdown-in-the-courts.pdf
[16] https://www.epa.gov/newsreleases/epa-withdraws-information-request-oil-and-gas-industry
[17] https://www.nytimes.com/2018/09/18/climate/trump-methane-rollback.html
[18] https://www.nytimes.com/2019/06/19/climate/epa-coal-emissions.html
[19] https://climate.law.columbia.edu/content/epa-revokes-californias-authority-set-climate-protective-vehicle-emissions-standards
[20] https://usa.streetsblog.org/2018/05/31/trump-admin-snuffs-out-climate-progress-at-u-s-dot/
[21] https://www.vox.com/energy-and-environment/2018/1/26/16936104/epa-trump-toxic-air-pollution
[22] https://eelp.law.harvard.edu/2018/12/new-source-review/

9. Stopped enforcing a 2015 rule that prohibited the use of hydrofluorocarbons, powerful greenhouse gases, in air-conditioners and refrigerators[24].

10. Weakened an Obama-era rule meant to reduce air pollution in national parks and wilderness areas[25].

11. Weakened oversight of some state plans for reducing air pollution in national parks[26].

12. Directed agencies to stop using an Obama-era calculation of the "social cost of carbon" that rulemakers used to estimate the long-term economic benefits of reducing carbon dioxide emissions[27].

13. Withdrew guidance that federal agencies include greenhouse gas emissions in environmental reviews. But several district courts have ruled that emissions must be included in such reviews[28].

14. Lifted a summertime ban on the use of E15, a gasoline blend made of 15 percent ethanol. (Burning gasoline with a higher concentration of ethanol in hot conditions increases smog.)[29]

15. Changed rules to allow states and the E.P.A. to take longer to develop and approve plans aimed at cutting methane emissions from existing landfills[30].

16. Revoked an Obama executive order that set a goal of cutting the federal government's greenhouse gas emissions by 40 percent over 10 years[31].

<u>In Process</u>

17. Proposed relaxing Obama-era requirements that companies monitor and repair methane leaks at oil and gas facilities[32].

18. Proposed weakening Obama-era fuel-economy standards for cars and light trucks[33].

19. Submitted notice of intent to withdraw the United States from the Paris climate agreement. The process of withdrawing cannot be completed until November 2020[34].

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[23] https://eelp.law.harvard.edu/2018/12/petroleum-refinery-sector-rule-neshaps-nsps/
[24] https://insideclimatenews.org/news/27062018/hfcs-global-warming-climate-pollution-lawsuit-trump-epa-regulations-kigali-amendment
[25] https://www.eenews.net/eenewspm/2019/08/20/stories/1061013699
[26] https://eelp.law.harvard.edu/2018/04/regional-haze-state-implementation-plans/
[27] http://www.sciencemag.org/news/2017/08/trump-s-attack-social-cost-carbon-could-end-hurting-his-fossil-fuel-push
[28] https://www.eenews.net/greenwire/stories/1060052285
[29] https://www.nytimes.com/2019/05/31/climate/trump-ethanol-fuel-ban.html
[30] https://eelp.law.harvard.edu/2017/09/municipal-solid-waste-landfill-new-source-performance-standards-and-emissions-guidelines/
[31] http://columbiaclimatelaw.com/climate-deregulation-tracker/president-issues-executive-order-revoking-federal-sustainability-plan/
[32] https://www.nytimes.com/2019/08/29/climate/epa-methane-greenhouse-gas.html
[33] https://www.nytimes.com/2018/08/02/climate/trump-auto-emissions-california.html?module=inline
[34] https://www.nytimes.com/2019/11/04/climate/trump-paris-agreement-climate.html

20. Proposed eliminating Obama-era restrictions that in effect required newly built coal power plants to capture carbon dioxide emissions[35].

21. Proposed a legal justification for weakening an Obama-era rule that limited mercury emissions from coal power plants[36].

22. Proposed revisions to standards for carbon dioxide emissions from new, modified and reconstructed power plants[37].

23. Began a review of emissions rules for power plant start-ups, shutdowns and malfunctions. In April, the E.P.A. proposed reversing a requirement that Texas follow the emissions rule, with implications for 35 other states[38].

24. Proposed the repeal of rules meant to reduce leaking and venting of hydrofluorocarbons from large refrigeration and air conditioning systems[39].

25. Opened for comment a proposal limiting the ability of individuals and communities to challenge E.P.A.-issued pollution permits before a panel of agency judges[40].

Summary of Recommendations

The Tennessee Department of Environment and Conservation , Air Pollution Control Division has requested that the United States Environmental Protection Agency remove the requirement for an Inspection and Maintenance program for the five-county Middle Tennessee area, which includes Davidson, Sumner, Wilson, Rutherford, and Williamson Counties, from Tennessee's State Implementation Plan. To support this request, TDEC has conducted a demonstration designed to show that removing the I/M program from Tennessee's SIP will not interfere with attainment or maintenance of various air quality NAAQS.

Based on a technical review conducted of the request for removal and associated documentation, I have concluded that the Noninterference Demonstration is inadequate to support the conclusion that removal of the I/M program from the SIP will not interfere with attainment of the NAAQS. In addition, I have made the following recommendations that are further detailed above.

- It is my recommendation that TDEC conduct a full air quality simulation of the impact of removal of the I/M program in Middle Tennessee before making any determination of its interference effect.

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[35] https://www.nytimes.com/2018/12/04/climate/epa-coal-carbon-capture.html
[36] https://www.nytimes.com/2018/12/28/climate/mercury-coal-pollution-regulations.html
[37] https://eelp.law.harvard.edu/2017/09/ghg-new-source-performance-standards-for-power-plants/
[38] https://eelp.law.harvard.edu/2017/09/power-plant-startup-shutdown-and-malfunction-rule/
[39] https://www.washingtonpost.com/news/powerpost/paloma/the-energy-202/2018/09/21/the-energy-202-trump-s-epa-is-targeting-rules-for-yet-another-greenhouse-gas/5ba3eda31b326b7c8a8d158e/?utm_term=.09df110e1f6c
[40] https://www.federalregister.gov/documents/2019/12/03/2019-24940/modernizing-the-administrative-exhaustion-requirement-for-permitting-decisions-and-streamlining

- It is my recommendation that the most current modeling platform and associated emission projections be used in this air quality simulation to update the I/M analysis conducted by TDEC to account for improvements in emission estimates.
- It is my recommendation that TDEC conduct this air quality modeling using a meteorological and associated base year inventory that meets the requirements of EPA guidance for the determination of impact of control strategies and air quality response.
- It is my recommendation that should TDEC still consider alternate methods to air quality modeling, that it use sensitivity factors based on source category distribution assumptions consistent with today's actual category and emissions mix to estimate the impact of removing Middle Tennessee's I/M program.
- It is my recommendation that TDEC consider the collective impact of additional regulations currently rolled back or in courts pending rollback decisions, before removing the I/M program from Middle Tennessee.

February 14, 2020

Air Pollution Control Board
312 Rosa L. Parks Avenue
3rd Floor Nashville Room
Nashville, TN 37243

Dear Air Pollution Control Board Members:

Transportation is a primary source of air pollution in our region. Emission testing has been an effective tool to lower the pollutants vehicles release and prevent unnecessary pollution. The American Lung Association requests the Air Pollution Control Board to allow local governments to opt-in to continue testing and using this tool to protect air quality.

The American Lung Association has tracked Tennessee's air quality for over 20 years and has seen Tennessee make great progress cleaning up its air. We were pleased when Tennessee achieved attainment status in 2017 thanks to many of the Board's diligent efforts and practices, including emission testing. However, with more extreme weather events and a number of policy changes, our annual State of the Air Report indicates air quality across the country is beginning to decline.

Vehicle emissions can result in a range of health problems, such as shortness of breath, wheezing, coughing, asthma attacks, and pulmonary inflammation. Children, older adults, people with lung disease, cardiovascular disease and diabetes are particularly vulnerable. In Tennessee, there are more than 146,000 children and 525,000 adults with asthma who could be more likely to have an asthma attack on days with high levels of pollution.[1] Additionally, studies also show that air pollution contributes to cardiovascular harm and increases the risk of premature death.[2] Considering that nearly 609,000 Tennesseans are living with cardiovascular diseases, maintaining programs that will improve our air will protect their health and their lives. [3]

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[1] *State of the Air 2019*. American Lung Association; 2019. https://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/states/tennessee/

[2] Lee BJ, Kim B, Lee K. Air pollution exposure and cardiovascular disease. *Toxicol Res*. 2014;30(2):71–75. doi:10.5487/TR.2014.30.2.071

[3] *State of the Air 2019*. American Lung Association; 2019. https://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/states/tennessee/.

At the American Lung Association, we hear stories from people across Tennessee who suffer from lung disease. They share how pollution affects them daily while living with asthma, COPD, and other respiratory or cardiovascular diseases. Having a strong approach to reducing emissions is essential for these at-risk populations.

Emission testing is important to ensure Tennessee stays in attainment and continues improving its air quality. Please continue to allow local governments the ability to opt-in to testing and use this tool to protect air quality. Our health depends on it.

Sincerely,

Christine Hart
American Lung Association
Manager | Healthy Air Campaign in Tennessee
423-661-7593
Christine.Hart@lung.org

Dear Air Pollution Control Board members,

Middle Tennessee is on the brink of a clean air crisis. While local governments are gridlocked and have been unable to address the region's mass transit problem, traffic congestion worsens by the day.

As local governments work on a comprehensive mass transit plan, cars will continue to be the primary source of transportation for Middle Tennessee residents.

The only public safeguard we have to ensure that the millions of vehicles clogging our roads during rush hour each day are safe for the ozone is county-run emissions testing.

Because of a reckless and drastic measure by the state legislature, the Tennessee Department of Environment and Conservation is rampaging forward with a proposed rule change to eliminate mandatory emissions testing. In its proposal to the Environmental Protection Agency, TDEC contends that regional air quality has improved to the point where such testing is unnecessary.

This is the metaphorical equivalent of a person eating well and exercising regularly and then being told by their doctor, "Ok, you're healthy enough, go ahead and eat whatever you want and give up the exercising!"

The proposed rule change carelessly ignores other metrics that show our regional air quality is getting worse, not better.

The 2019 American Lung Association State of Air Report found that "hotter temperatures and more extreme weather events, air quality across the country is beginning to decline. This combined with policy changes puts our air quality in a vulnerable state." The report highlighted that Tennesseans should be aware that "four in 10 Americans are living with unhealthy air, and we're heading in the wrong direction when it comes to protecting public health."

Even though the vast majority of cars pass emissions testing without issue, just a 5 percent failure rate identifies and requires fixes annually for more than 29,000 vehicles with possible air pollution problems in Davidson County alone.

Emissions testing also has a positive financial impact, because $2.50 from each $9 testing fee is dedicated to the local Health Department for other clean air initiatives. The proposal may also have unintended consequences on region businesses in the future, because it could trigger the implementation of a contingency plan leading to stricter testing and more expensive federal regulations on stationary sources.

At the TDEC public comment period in November, more than 100 citizens and environmental groups submitted comments in opposition to this rule change – substantially more than those in favor.

Emissions testing is not a cure-all for air pollution control. But because the program has proven to safeguard against some harmful emissions, it is incumbent on the Air Pollution Control Board to do its work and vote to strike down this dangerous proposal.

This letter is from a diverse coalition of public health advocates, environmental groups and community leaders who oppose the elimination of the emissions testing program.

Thank you for your consideration,

Sierra Club, Tennessee Chapter

TN Public Employees for Environmental Responsibility

Indivisible Nashville and Middle Tennessee

Walk Bike Nashville

Vanderbilt Students Promoting Environmental Responsibility

METROPOLITAN COUNCIL

Member of Council

February 12, 2020

To the members of the Tennessee Air Pollution Control Board,

The undersigned members of the Metro Council write to voice our opposition to proposed changes to the State Implementation Plan that would end mandatory emissions testing.

Although vehicle emissions testing is not a silver bullet to address air quality and ozone pollution, it is one of very few tools a local government may use to do its part to protect the environment.

Davidson County residents remain mostly reliant on cars as their source of transportation and there is precious little progress on a long-term mass transit solution. That makes regulation of vehicle emissions even more important.

As you may know, the American Lung Association found in its 2019 air quality report that Tennessee residents should be aware that in some places, including Nashville, we're breathing unhealthy air.

The report found that 4 in 10 Americans are living with unhealthy air and we're heading in the wrong direction when it comes to protecting public health.

The Metro emissions testing program also has a valuable budgetary benefit because $2.50 from every test is directed to the county Health Department and $1 from each test is dedicated to the Metropolitan Clerk.

Although Metro Council voted in 2019 to at least temporarily continue its emissions testing program, eliminating the mandatory requirement would set the state on a dangerous path toward even less oversight of our air quality and overall ozone health.

We add our voice to the opposition to the proposed rule change and you to vote against the proposal.

Signed,

Freddie O'Connell
Member of Council, District 19

One Public Square, Suite 204, Nashville, Tennessee 37201
615-862-6780

Ginny Welsch
Member of Council, District 16

Tonya Hancock
Member of Council, District 9

Sandra Sepulveda
Member of Council, District 30

Tanaka Vercher
Member of Council, District 28

Emily Benedict
Member of Council, District 7

Russ Bradford
Member of Council, District 13

Sharon W. Hurt
Member of Council, At-Large

BOB FREEMAN
STATE REPRESENTATIVE
56th LEGISLATIVE DISTRICT

592 CORDELL HULL BLDG.
NASHVILLE, TN 37243
(615) 741-0709
rep.bob.freeman@capitol.tn.gov

DISTRICT ADDRESS:
1109B LIPSCOMB DRIVE
NASHVILLE, TN 37204

House of Representatives
State of Tennessee

NASHVILLE

CHAIRMAN
DAVIDSON CO. DELEGATION

COMMITTEES:
CONSUMER & HUMAN RESOURCES

EMPLOYEE AFFAIRS SUB

HEALTH

FACILITIES, LICENSURE & REGULATIONS SUB

ETHICS

February 12, 2020

Tennessee Air Pollution Control Board
Department of Environment & Conservation
312 Rosa L. Parks Ave
Nashville, TN 37243

Dear Board Members:

Thank you for serving on behalf of all Tennesseans on the Air Pollution Control Board. I am writing today to voice concern on the proposal to eliminate mandatory emissions testing.

As Tennessee continues to rapidly grow, it is imperative that we protect our air quality to ensure the health of our citizens and maintain a high quality of life. Our population is expected to grow to 7.84 million people over the next 20 years. Mobile sources like automobiles contribute significantly to pollution levels, and we should be prepared to use every tool possible to combat pollution.

The American Lung Association's State of the Air Report found that more than 4 in 10 Americans live in a city with unhealthy air quality. In 2018, Nashville plummeted to the bottom of the American Lung Association's State of Air report with unhealthy levels of ozone that put "citizens at risk for premature death and other health effects such as asthma attacks and greater difficulty breathing for those living with a lung disease like COPD."

Programs like emissions testing implemented by the EPA and state agencies have significantly improved our air quality outlook. Rolling back regulations is a step in the wrong direction and could worsen health conditions for our most vulnerable populations. Because the health and safety of my constituents is a top priority, I respectfully urge you to vote against the proposed rule change.

Best,

James R. Freeman

Bob Freeman

Dear Air Pollution Control Board,

Along with this letter, I am submitting a petition co-signed by 211 college and high school student activists in Tennessee. Each one of these student activists is **strongly opposed** to the elimination of mandatory emissions testing. This is a diverse group that includes students concerned about the negative climate and health effects that this rule change would impose.

As the climate crisis worsens it is important that now more than ever we continue improving environmental regulations rather than dismantling them. In addition, asthma and allergy sufferers, who would feel the worst effects of this decision, rely on others doing their part to keep air quality at the highest levels in order to breathe and live. Poor air quality negatively impacts everyone.

As you contemplate your vote, we urge you to consider our voices that stand together in their **opposition** to this rule change.

Sincerely Signed,

Mason Eiss
Vanderbilt University class of 2021

151 signatures

CLEAN AIR TENNESSEE

In 2018, lawmakers rolled back environmental protections and we think that's the *wrong* direction.

Sign to support clean air in Tennessee!

ACT NOW!

PRINT NAME	EMAIL ADDRESS	SIGNATURE
Marguerite Manning	marguerite.r.manning@vanderbilt.edu	
Maddie Guy	madeline.a.guy@vanderbilt.edu	
Joy Tang	joy.l.tang@vanderbilt.edu	
Claudia Bender	claudia.g.bender@vanderbilt.edu	
Rachel Rosenberg	rachel.a.rosenberg@vanderbilt.edu	
Aaron Niederman	aaron.niederman@vanderbilt.edu	
Leah Shelton	leah.b.shelton@vanderbilt.edu	

CLEAN AIR TENNESSEE

In 2018, lawmakers rolled back environmental protections and we think that's the *wrong* direction.

Sign to support clean air in Tennessee!

ACT NOW!

PRINT NAME	EMAIL ADDRESS	SIGNATURE
Madeline Schmitt	madeline.l.schmitt @vanderbilt.edu	Madeline Schmitt
Maria Pena	maria.a.pena @vanderbilt.edu	Maria Pena
Cameron Richey	cameron.e.richey @vanderbilt.edu	Cameron Richey
Hope Hunter	hope.hunter@vanderbilt.edu	Hope Hunter
Erin Smith	erin.t.smith@	
Jamie Woolley	jamie.l.woolley@vanderbilt.edu	Jamie Woolley
Masahiro Kato	masahiro.kato @vandy	

CLEAN AIR TENNESSEE

In 2018, lawmakers rolled back environmental protections and we think that's the *wrong* direction.

Sign to support clean air in Tennessee!

ACT NOW!

PRINT NAME	EMAIL ADDRESS	SIGNATURE
Emily Alpin	emilyalpin@gmail.com	Emily L Alpin
Dailey Nichols	dailey.nichols@gmail	[illegible]
Calvin Beck	~~calvin.t~~	Calvin Beck
Jack Blevins		[illegible]
Natalie Urban	natalieurbann@gmail.	[illegible]
Camille Murphy		[illegible]
Griffin Patterson		[illegible]

CLEAN AIR TENNESSEE

In 2018, lawmakers rolled back environmental protections and we think that's the *wrong* direction.

Sign to support clean air in Tennessee!

ACT NOW!

PRINT NAME	EMAIL ADDRESS	SIGNATURE
Haley Frey	haley.g.frey@ vanderbilt.edu	
Brendan Gregg	Brendan.t.gregg @vanderbilt.edu	
Ben Carper	benjamin.e.carper@ vanderbilt.edu	
Noah Barboza	noah.barboza@ vanderbilt.edu	
Brooke Landry	brooke.a.landry @vanderbilt.edu	
Heath		
Magejie Ford		

CLEAN AIR TENNESSEE

In 2018, lawmakers rolled back environmental protections and we think that's the *wrong* direction.

Sign to support clean air in Tennessee!

ACT NOW!

PRINT NAME	EMAIL ADDRESS	SIGNATURE
Matthew Arcuri	Matthew.Arcuri@vanderbilt.edu	
Laura Hill	laura.g.hill@vanderbilt.edu	
Emily Sexton	emily.a.sexton@vanderbilt.edu	
Traylan Semrad	traylan.semrad@vanderbilt.edu	
Nicole Brogher	nicole.brogher@vanderbilt.edu	
Krista Nayden	KN3998@gmail.com	Krista Nayden
Mailin Struck	mailin.struck@vanderbilt.edu	M. Struck

CLEAN AIR TENNESSEE

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Salasha Dixit	salasha.dixit@vanderbilt.edu	
Jeremy Gimbel	jeremy.a.gimbel@vanderbilt.edu	
Sam Sobkov	samuel.r.sobkov@vanderbilt.edu	
Savannah Larkin	savannah.m.larkin@vanderbilt.edu	
Grace Lu	grace.m.lu@vanderbilt.edu	
Brad Gellman	bradley.gellman@vanderbilt.edu	
Ben Seltzer	benjamin.seltzer@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Collin Penbody	collin.h.penbody@vanderbilt.edu	
Jessica Prus	jessica.m.prus@vanderbilt.edu	
Reilly Menchaca	reilly.k.menchaca@vandy	
Gabrielle Guarna	gabrielle.k.guarna@vanderbilt.edu	
Juliana Cantillo	juliana.m.cantillo@vandy	
Deniz Gungor	denizgungor987@gmail.com	
Aakash Manapat	aakash.p.manapat@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Emily Hogan	emilycrystal@comcast.net	Emily Hogan
Theresa Szydlik	theresa.r.szydlik@vanderbilt.edu	TR Szydlik
Sophia Norton	sophia.norton@vanderbilt.edu	[illegible]
Grace Sweeney	grace.e.sweeney@vanderbilt.edu	[illegible]
Jon Marchinek	jmarchinek@gmail.com	[illegible]
Remi Williams	remi.k.williams@vanderbilt.edu	[illegible]
Hannah Sidhan	hannah.m.sidhan@vanderbilt.edu	[illegible]

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Tristan Patterson	tbonetristan@gmail.com	
John White	john.w.white@vanderbilt.edu	
AJ Kolondra	~~andrew.g.~~ ajkolondra@gmail.com	
Ulysses Yu	ulyu1898@gmail.com	
Sam Wright	samuel.h.wright@vanderbilt.edu	
Jenny	jennyst08@gmail.com	
Kevin Mills	kecchimo@gmail.com	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Veronica Zancho	veronica.j.zancho @vanderbilt.edu	
Edwin Williamson	edwin.williamson@ vumc.org	
Bryce Collings	montgomery.b.collings @vanderbilt.edu	
Rebecca Rossi	Rebecca.k.rossi @vanderbilt.edu	
Julia Iorio	julia.j.iorio@ vanderbilt.edu	
Sophie Kaiser	sophia.m.kaiser @vanderbilt.edu	
Mara Yella	mara.e.yella @vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Caroline Heyl	caroline.m.heyl@vanderbilt.edu	
Grace Adcox	grace.adcox@vanderbilt.edu	
Joy Stewart	joy.stewart@vanderbilt.edu	
Arman Moazampour	arman.moazampour@vanderbilt.edu	
Alysia (Allie) Green	alysia.f.green@vanderbilt.edu	
Annabelle Clarke	annabelle.j.clarke@vanderbilt.edu	
Alex Mills	philip.a.mills@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Quint Gfroerer	george.l.gfroerer@vanderbilt.edu	
Brennan Cegelka	william.b.cegelka@vanderbilt.edu	
Emily Roberson	emily.s.roberson@vanderbilt.edu	
James Blair	James Blair	
Kelsey Recinas	Kelsey Recinas	kelsey.d.recinas@vanderbilt.edu
Rose Herdejurgen	rose.a.herdejurgen@vanderbilt.edu	Rose Herdejurgen
Quinton Hoffman	quinton.hoffman@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Ruby Drizin-Kahn	ruby.drizin-kahn@vanderbilt.edu	
Taylor Lomax	taylor.lomax@vanderbilt	
Hanna Goldberg	hanna.l.goldberg@vanderbilt.edu	
Talia Bulz	talia.m.bulz@vanderbilt.edu	
Dani Lennon	dani.a.lennon@vanderbilt.edu	
Phia Pannullo	sophia.j.pannullo@vanderbilt.edu	
Emily Welch	emily.c.welch@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Leah Taylor	leah.e.taylor@ vanderbilt.edu	
Ryan Joyce	ryan.t.joyce@vanderbilt.edu	
Vineet Desai	vineet.desai@ vanderbilt.edu	
Jenna Tuccio	jenna.c.tuccio@ vanderbilt.edu	
Rachael Marglous	rachael.g.marglous@ vanderbilt.edu	
Caden Felton	caden.m.felton@vanderbilt.edu	
Jeremiah Egosso	jeremiah.b.egosso@ vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Nick Lowe	nicholas.d.lowe@vanderbilt.edu	
Nicole Cuthbert	nicole.e.cuthbert@gmail.com	
Rachel Roberts	rachel.l.roberts@vanderbilt.edu	
ANIL CHAKKA	anil.chakka@vanderbilt.edu	
Justin Ball	justin.a.ball@vanderbilt.edu	
Anfernee Orji	Anfernee.C.Orji@vanderbilt.edu	
Jaylen Mahoney	Jaylen.e.mahoney@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Katie Wahl	katherine.l.wahl@ vanderbilt.edu	
Julie Layne Curry	julie.l.curry@ vanderbilt.edu	
Kayla Ortiz	kayla.ortiz@ vandy	
Lucus Cheng	Lucus.x.cheng @ vandy	
Matt Steele	matthew.r.steele@ vanderbilt.edu	
Mason Ellis	mason.f.ellis @ vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Matt Trotsky	matt-1245@gmail.com	Matthew Trotsky
JOHN DEGNAN	john.m.degnan@vanderbilt.edu	
Adreanna Hernandez	adreanna.b.hernandez@vanderbilt.edu	Adreanna Hernandez
Sophia Chen	ecouncilsd@gmail.com	
Christina Moraes	christina.y.moraes@vanderbilt.edu	
Olivia Troyer	gwyneth.o.troyer@vanderbilt.edu	Olivia Troyer
Naomi Layton	naomi.k.layton@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Hunter Spivey	hunter.j.spivey@vanderbilt.edu	
William Shelton	william.r.shelton@vanderbilt.edu	
Emma Ratatjuu	emma.g.ratatjuu@vanderbilt.edu	
Jeffrey Song	jeffrey.song@vandy	
Jenna Meltzer	jenna.meltzer@vanderbilt.edu	
Justin Carway	justin.d.carway@vanderbilt.edu	
Maddie Woods	madison.c.woods@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Will Henke	william.c.henke@vanderbilt.edu	
Peyton Boyd	peyton.m.boyd@vanderbilt.edu	
Alexandra Grace	alexandra.r.grace@vanderbilt.edu	
Cristian Ochoa	cristian.l.ochoa@vanderbilt.edu	
Nick Gehring	nicholas.k.gehring@vanderbilt.edu	
Vikas Dodda	vikas.c.dodda@vanderbilt.edu	
Erin Turner	erin.turner@vanderbilt.edu	Erin Turner

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Austin Hoag	austin.hoag@icloud.com	
Christopher Owen	Christopher095@gmail.com	
Chris Marzouca	Christopher.marzouca@gmail.com	
Datura Zhou	datura.zhou@icloud.com	
Allison Juback	allison.juback@vanderbilt.edu	Allison Juback
Sami Podell	samipodell@gmail.com	
Lauren Demarchi	lauren.e.demarchi@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Madeline Amend	madeline.amend@gmail.com	
Spencer Sanders	spencer.sanders@vanderbilt.edu	Spencer S. Sanders
Abby Waldron	abigail.waldron@vanderbilt.edu	
Jessica Perkins	jessica.m.perkins@vanderbilt.edu	
Valon Brown	vob2g@mtmail.mtsu.edu	Valon Brown
Philip Gubbins	philip.h.gubbins@vanderbilt.edu	
ANDREI OLARU	andrei.olaru@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
GRACE ZWEMMER	grace.s.zwemmer@ vanderbilt.edu	Grace Zwemmer
Joanna Stathopoulos	joanna.v.stathopoulos@ vanderbilt.edu ~~joanna.stathopoulos@ gla~~	Joanna Stathopoulos
Megan Gabruk	megan.e.gabruk@vanderbilt.edu	
Sophie Thermann	Sophie.thermann@ vanderbilt.edu	Sophie T
Dana Herman	dana.c.herman@ vanderbilt.edu	
Keshav Kundassery	Keshav.b.Kundassery @ vanderbilt.edu	Keshav K.
Hitha Uday	hitha.uday@vander-bilt.edu	Hitha Uday

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Katelyn Gonzalez	katelyn.gonzalez@vanderbilt.edu	
Jimmy Liu	jimmy.y.liu@vanderbilt.edu	
Bhavika Rajan	bhavika.rajan@vanderbilt.edu	
Justin Holmes	justin.a.holmes@vanderbilt.edu	
Manny Zagorianos	emmanuel.d.zagorianos@vanderbilt.edu	
Rahul Devathu	rahul.a.devathu@vanderbilt.edu	
Grace Oladapo	grace.b.oladapo@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Darren Francis	darren.t.francis @vanderbilt.edu	Darren Francis
Sophia Clark	sophia.a.clark@ vanderbilt.edu	
Donyea James	donyea.v.james @ vanderbilt.edu	
Ellie Gmichael	elidad.s.gmichael @vanderbilt.edu	Elidad Gmichael
Kayla Powell	kayla.a.powell @Vanderbilt.edu	
Jalil Mitchell	jalil.a.mitchell @vanderbilt.edu	Jalil Mitchell
Chuma Chukwuma	chuma.f.chukwuma @vande.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
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Julia Lotan	julia.m.lotan@vanderbilt.edu	
Rachel Lee	rachel.r.lee@vanderbilt.edu	
Josh Peng	joshua.z.peng@vanderbilt.edu	
Katherine Xie	katherine.c.xie@vanderbilt.edu	
John Roberts	robert wallip@gmail.com	
Emma Baldwin	emma.k.baldwin@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Yousset Monamed	yousset.k.monamed @vanderbilt.edu	
Arlene Charles	arlene.t.charles @ vanderbilt.edu	
Jenna Phillips	jenna.l.phillips@ vanderbilt.edu	
Lauren Elias	lauren.f.elias @vanderbilt.edu	
Holly Krynicki	~~holly.krynicki~~ hollykrynicki@yahoo.com	
Ivy Han	ivy.s.han@vanderbilt.edu	
Jason Brauer	jason.d.brauer@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
John Latacka	john.d.latacka@vanderbilt.edu	
Keith Kim	kee-hyun.kim@vanderbilt.edu	
Andrew Noonan	andrew.p.noonan@vanderbilt.edu	
Sophia Brent	sophia.e.brent@vanderbilt.edu	
Niav Layton	niav.l.layton@vanderbilt.edu	
Ally Sewell	allison.e.sewell@vanderbilt.edu	
Nicholas Brainard	nicholas.b.brainard@vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
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Kristi Kim	kristi.kim@vanderbilt.edu	
Eugene Chi	eugene.chi@vanderbilt.edu	
Alexander Hasse	alexander.c.hasse av	
Roshni Shah	roshni.m.shah @..	
Ismene Germanakos	ismene.s.germanakos @ vanderbilt.edu	
Isabel Peppard	isabel.e.peppard @ vanderbilt.edu	

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Rebecca Dubin	rebecca.m.dubin@vanderbilt.edu	
Rekha Iyer	rekha.iyer@vanderbilt.edu	
Lily Gussis	lily.c.gussis@vanderbilt.edu	
Elyse Sparks	elyse.a.sparks@vandy	Elyse Sparks
Rahan Arasteh	rahan.arasteh@vanderbilt.edu	
Maya Biran	maya.b.biran@vandy	
Amanda Ruzumna	amanda.c.ruzumna@vanderbilt.edu	

160 signatures

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PRINT NAME	EMAIL ADDRESS	SIGNATURE
Carson Ferrara	carson.f.ferrara @vanderbilt.edu	
Vidhya Sundar	Vidhya.shunmugasundaram @vanderbilt.edu	
Neel Triparaneni	neel.m.triparaneni@ vanderbilt.edu	
Peter Liang	peter.q.liang @vanderbilt.edu	
Indraneel Pai	indraneel.pai@vanderbilt.edu	
Amanda Nolan	amanda.r.nolan@ vanderbilt.edu	
Zak Stengel	zps stengel@vanderbilt.edu	

From: Aaron Talbot
To: Air.Pollution Control
Subject: [EXTERNAL] Vehicle emission testing
Date: Saturday, February 8, 2020 5:36:59 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please stop it. It's a complete and total waste of money. Stop emissions testing now

Sent from my iPhone

From: Alexander Mangrum
To: Air.Pollution Control
Subject: [EXTERNAL] Please End Emission Testing
Date: Friday, February 7, 2020 1:44:05 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I support ending emission testing in Sumner county as soon as possible.

Thank you,
Alexander Mangrum

From: Alison Asaro
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing
Date: Saturday, February 15, 2020 10:18:00 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please do not eliminate auto emissions testing in Tennessee! As a pediatrician and asthma patient myself, I see and feel firsthand the effects that poor air quality and environmental triggers have on humans. Denying the contribution that auto emissions have on air quality and climate change is a dangerous step back in time for Tennesseans!! Please put people, and not politics, first and keep mandatory auto emissions a part of yearly car registrations in Davidson Co and beyond.

Alison Asaro, MD
Nashville

From: Allison Smith
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing to continue
Date: Saturday, February 8, 2020 5:59:33 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

As a life long resident of Davidson county, I'd like to request that emissions testing continues. Please do not end this requirement.

Thank you
Allison Smith
37221

From: Lena Pedigo
To: Air.Pollution Control
Subject: [EXTERNAL] Emission testing Davidson County, TN
Date: Wednesday, February 12, 2020 9:05:21 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

My name is Amanda Pedigo at 309 Archwood Dr, Madison, TN 37115.

I want to continue emission testing for the state of Tennessee and Davidson County the air quality is very important to me. I have family members who have suffered from asthma all their lives.

Amanda Pedigo

From: amber williams
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions needs to stop
Date: Saturday, February 8, 2020 6:31:13 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

I am writing this to urge you to listen to the majority of Tennesseans that have struggled to afford expensive car repairs in order to get tags for a vehicle. You are misguided if you think the majority of people think this is a good program. Please do the right thing and stop this worthless program.

Amber Williams
448 Fern Valley Rd
White House, TN 37188
615-598-1754

Sent from my iPhone

From: Andrew Davidson
To: Air.Pollution Control; Paul LaRock
Subject: [EXTERNAL] Air pollution in TN / hearing
Date: Tuesday, February 11, 2020 1:22:42 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

We should not roll back regulations that might protect our air in the future. Please allow Davidson County to have the power to test emissions. Other counties should be able to opt-in for future needs, too.

Thank you,

Andrew Davidson

Street Address: 704 Crescent Road
City: Nashville
State : TN
Zip Code: 37204

From: Angie Morris
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing
Date: Saturday, February 8, 2020 10:25:32 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

This is only occurring in particular counties in TN. I do not see the need to continue emissions testing. Please consider eliminating this in Rutherford county.

Angie Morris
Principal Broker
615-556-8554 direct
615-896-5697 office
License #313861
https://urldefense.com/v3/__http://www.AngieMorrisBroker.com__;!!PRtDf9A!-U4pKSp-RFADv5EL2Km9QL1R7lMpUv-Hfu6FbetmD88McAGe8WkhDxTRbbaynHImbBwyHuWHCg$

From: April Williams
To: Air.Pollution Control
Subject: [EXTERNAL] End Emissions Testing
Date: Saturday, February 8, 2020 6:10:49 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Hello,

I am writing to show my support to end all emissions testing in Tennessee. Evidence has shown that this testing does NOT improve air quality. This is an unnecessary extra expense for Tennessee residents and a waste of time and resources. Please end all emissions NOW!

Thank you,
April Williams
615-669-6321
Sent from my iPad

From:	BAKER RING
To:	Air.Pollution Control
Subject:	[EXTERNAL] Emissions testing
Date:	Friday, February 7, 2020 10:31:29 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

My name is Baker Ring and I am a County Commissioner in Sumner County. Our Commission voted unanimously to end the emissions testing in Sumner County. Because of the CAFE standards, todays automobiles produce much less pollutants than in the past. We encourage the State of Tennessee to do whatever is necessary to assist us with ending this practice which only places a burden on our citizens.

Baker Ring
Sumner County Commissioner
District 5

From: Barbara Clark
To: Air.Pollution Control
Subject: [EXTERNAL] Emission Testing
Date: Saturday, February 8, 2020 4:27:00 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please end the emissions testing. It is not making a large enough difference in our environment. It's only a hardship on law abiding citizens.

Thank you

Sent from my iPhone

From: Belinda
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing
Date: Saturday, February 8, 2020 9:33:25 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please discontinue the required emissions testing for the counties involved. It is very costly and inconvenient for many people. Thank you so much!

Sent from Xfinity Connect Application

From:	Ben Oldham
To:	Air.Pollution Control
Subject:	[EXTERNAL] End emissions testing
Date:	Saturday, February 8, 2020 6:57:40 PM

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I fully support the ending of the emissions testing in Nashville / Davidson County. It is frustrating when there are so many ways to fail unfairly. Not to mention, many of the employees are rude.

Thanks,

Ben Oldham

From: Bill Beeskow
To: Air.Pollution Control
Subject: [EXTERNAL] End emissions testing
Date: Saturday, February 8, 2020 11:52:43 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Hello.

There are so many new cars on the road, and folks that maintain classic cars spend a lot of time, effort and money keeping their cars in good running order, the need for emissions testing is over. Please end it as soon as you can.

Thank you for your time.

Bill

_____

Bill Beeskow
615.301.1856

From: Brian Gentry
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions Testing
Date: Saturday, February 8, 2020 5:53:35 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Hello,
As a taxpaying citizen of Rutherford County, I am opposed to emissions testing in our county. I believe that it is unnecessary given all of the improvements to emissions devices on cars in the last 20 years, as well as cleaner fuels being used currently. Please stop the testing as soon as possible.
Thanks,
Brian Gentry
Sent from my iPhone

From: Brian Sullivan
To: Air.Pollution Control
Subject: [EXTERNAL] EMISSIONS TESTING
Date: Saturday, February 8, 2020 8:49:18 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Scientific testing has proven that emissions testing no longer has a significant impact on our amazingly clean air. In fact, we are already at historic levels on air quality mainly due to improvements in fossil fuel plants, factories and federal vehicle production requirements that have all been extremely effective. The vehicle emissions program is no longer needed.

From: bridgett crowder
To: Air.Pollution Control
Subject: [EXTERNAL] Stopk Emission testing in Sumner County
Date: Saturday, February 8, 2020 7:51:02 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I live in the small town of Westmoreland, TN northern part of Sumner County. We don't have much air pollution here. I believe the factories in the cities are doing more harm to our air than vehicles are. We need this Emission testing to STOP now! We already pay more than most counties to have our vehicles registered along with having insurance on our vehicles. And then another nine dollars to see if your vehicle is not polluting the air. Too, when a vehicle fails sometimes it doesn't have anything to do with pollution it could be something like plug fouling out, or alternator, speedometer not working, in which has been one reason my daughter's explorer she did have didn't pass emissions because she had a turn off switch to her battery, because something was causing it to go dead and by the time she get it emissions checked it failed because it didn't reset itself because not ran enough miles. This Emission testing is to line the government with more money and it's just wrong period. We live on a limited income being disabled and don't make much money on Social Security to pay our bills and buy groceries. Yes, my husband works but nothing is free. We have medical bills, medications, groceries, gas , electricity, phone, insurance on vehicles and home. It takes all we have to get by as it is. There's many of us that can't afford to take our vehicles to get small things fixed on our vehicles just because it won't pass EMISSIONS. So STOP Emissions testing it's another thing we don't need.

Bridgett Crowder

Sent from Yahoo Mail on Android

From:	Bryan Lowhorn
To:	Air.Pollution Control
Subject:	[EXTERNAL] Emission Testing
Date:	Saturday, February 8, 2020 11:03:06 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

It is time to end this program. If it has been ceased across the state other than a handful of counties here in the mid state, then it it should be ended completely. I live on the outskirts of Sumner County and while my neighbors in Macon county use the same roads I do, they are not required to pass emissions while I am. End this useless program now.

Thank you,

Bryan Lowhorn

From:	Caitlin Craig
To:	Air.Pollution Control
Subject:	[EXTERNAL] Emmisions Testing
Date:	Wednesday, February 12, 2020 4:23:10 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Hello,
My name is Caitlin Craig, I am a current resident of Davidson County. I am contacting you to make my voice heared about emissions testing.
We MUST keep testing in TN.
Air pollution is one the leading risk factors for death world wide and that doesnt even touch that the disease factors!
I am proud to be raising two young boys here in Nashville, Wallace is 5 and Rowan just turned 2. Im begging all involved in the decision to keep air quality measure in place, like emmissions testing, think of my boys and all the young residents across our state who deserve to breathe the cleanest air we can provide.

I am including links to statistics about pollution for you to take in consideration.

Thank you for your time and consideration.
Best wishes,
Caitlin Craig

https://www.who.int/health-topics/air-pollution

https://www.google.com/amp/s/www.washingtonpost.com/business/2019/10/23/air-pollution-is-getting-worse-data-show-more-people-are-dying/%3foutputType=amp

From: Cam Cornelius
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing in Summer County
Date: Sunday, February 9, 2020 12:10:15 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please stop this outdated practice now.

The emission testing center near my house (Vol State) constantly backs up to Nashville Pike. The employees then have to turn the line around the other way backing it up to my neighborhood and putting cones in the road. The business on either side of the way to my neighborhood have blocked the entrances to their parking lots to prevent people from turning around in them. Many times when I try to exit my neighborhood, the cars are already lined up to our subdivision entrance and I have to drive in the oncoming lane to be able to get to Nashville Pike. This is a safety issue and a nuisance to the residents and businesses near the testing center. I'll be glad when the program is gone...plus all that idling while waiting to get tested can't be good for the environment. Also all of the cars that are currently exempt from testing (because of age, etc) are the ones that are the actual emissions offenders (what sense does that make?)

Sincerely,
Cam Cornelius
Gallatin, TN
615-300-0792

From: Carol Ellis
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing
Date: Saturday, February 8, 2020 1:44:14 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

I am writing to try to get the Emissions testing removed from Rutherford county . I believe it is an inconvenience and there is not a need for it anymore.
Thank you

Carol Ellis

From: Caroline Duley
To: Air.Pollution Control
Subject: [EXTERNAL] Keep emissions testing
Date: Tuesday, February 11, 2020 11:11:15 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

I urge Tennessee to keep emissions testing to maintain better air quality. Without testing we will certainly have vehicles on the road that will disproportionately worsen air pollution. Air quality affects the health of everyone but people with respiratory problems are affected even more.

Greenhouse gases need to be decreased not increased. Please ensure emissions testing continues to help keep the air cleaner for our health and the health of our planet.

Sincerely,
Caroline Duley
900 Waldkirch Ave.
Nashville, TN 37204

From: Cassandra Anello
To: Air.Pollution Control
Subject: [EXTERNAL] Clean Air Rocks!
Date: Saturday, February 8, 2020 4:33:34 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Keep emissions testing so we all can breathe clean air!

From: celiamoorman@gmail.com
To: Air.Pollution Control
Subject: [EXTERNAL] End Emissions- Sumner County
Date: Saturday, February 8, 2020 5:44:16 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

To whom it may concern,

I am a lifelong Tennessee resident, and have lived in Sumner County for close to 20 years. Emissions testing is beyond irrelevant for the vehicles on the road today and has been for over a decade. This system is also a waste of our governments funds to operate, and costs citizens unnecessary dollars - basically an added tax/revenue stream. If that money is needed, then increase the cost of plates or registration- which is a far more efficient way to collect those dollars. I appreciate your time and consideration.

Thank you,
Celia Moorman
celiamoorman@gmail.com
Hendersonville, TN

Sent from my iPhone

From: cahigh1722
To: Air.Pollution Control
Subject: [EXTERNAL] Testing cars
Date: Tuesday, February 11, 2020 10:55:00 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please keep testing cars in Metro Nashville. Charles High, 1722 Sweetbriar Avenue, Nashville, TN 37212. 615 500 5499 We need clean air.

Sent from my Samsung Galaxy smartphone.

From: Charles Ray
To: Air.Pollution Control
Subject: [EXTERNAL] Emission testing
Date: Saturday, February 8, 2020 10:17:54 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

There is no longer a need for emissions testing because there are so few old vehicle on the road.
Charles Ray
1164. W. Jefferson Pike
Murfreesboro
Rutherford Co.

Charles Ray

From: chasity sanders
To: Air.Pollution Control
Subject: [EXTERNAL] emissions
Date: Saturday, February 8, 2020 6:45:25 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please stop emissions testing in Rutherford county. Not only have other countries stopped already. But its a waste of time for people short on it. Something like a bad gas cap or a new battery can make you fail a emissions test making you lose time at work and money from work because of lose time. Most people now drive newer cars so there isnt a big need for it. Thank you for your time Rutherford county resident Chasity Sanders

From:	chris hunnicutt
To:	Air.Pollution Control
Subject:	[EXTERNAL] Emissions testing
Date:	Saturday, February 8, 2020 12:59:06 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Why has this outdated program continued this long? Cars are producing lower emissions every year. This program is an unnecessary burden on all of us, but even more so on low income families. A failed test could cost hundreds to diagnose and repair. Not to mention losing access to your vehicle while it is being repaired. It's time to end this pointless burden.

Chris Hunnicutt
Murfreesboro, Tn

Sent from Yahoo Mail on Android

From: Chuck Williams
To: Air.Pollution Control
Subject: [EXTERNAL] Stop emissions testing
Date: Saturday, February 8, 2020 5:46:37 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:
I am writing in hopes that the state will stop emissions testing in the only few counties left that are still having to jump through this unnecessary hoop. In 2008, I owned a Dodge Pickup truck with less than 40,000 miles. The check engine light came on and I was unable to get my tags. I paid a mechanic $1200.00 to fix the codes that were supposedly the problem. After about a week the light came back on. I sent it to a different mechanic who stated that there was absolutely nothing wrong with the truck and it was not putting off any emissions more than normal and that a new computer would be the only fix. He stated that the repair would costs thousands of dollars. I spent another $100 for that opinion. Ultimately, I had to trade a perfectly good running vehicle, costing me thousands of dollars just to be legal with my tags. This caused my family unneeded financial struggles for several years. The emissions is a joke and nothing but government bureaucracy. I think it is doing nothing for the environment as testing results have shown, but it is definitely impacting people financially. Please stop this once and for all! If its not required for all counties, then don't single out us few that unfortunately live close to metropolitan cities.

Chuck Williams
448 Fern Valley Rd
White House, TN 37188
615-829-3128

From: Stephens, Keith (MNPD)
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions Testing
Date: Saturday, February 8, 2020 11:43:19 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

I would like to know show these counties have to continue emissions testing? As a law enforcement professional, we are asked this frequently and I would like to give them an honest answer.

I would love to see this end for the listed counties below. Thanks and I look for to your response.

EMISSIONS TESTING is still occurring in the following counties: Sumner, Rutherford, Davidson, Williamson, Wilson, and Hamilton. If you want this to END as soon as possible, please make your voice heard! Only written comments will be accepted. Written comments are due by 4:30 p.m. February 15, 2020. Comments are sent to air.pollution.control@tn.gov

Commander Keith Stephens
South Precinct
5101 Harding Place
Nashville, TN 37211
Metropolitan Nashville Police Department
(615) 862-7744

From: Crys Zinkiewicz
To: Air.Pollution Control
Subject: [EXTERNAL] Stopping Emissions Testing
Date: Wednesday, February 12, 2020 10:06:15 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I lived in southern California before coming here to escape the smog! There I was a school teacher and went through days the children were not allow out at recess because of the bad air.

Since moving here, I've also experienced the "bowl effect" of smog in Nashville. But over the years, less and less so. But **doing away with emissions testing is NOT a good idea.**

Especially, if Trump rolls back the requirements for vehicles to meet the current standards on emissions! If that happens, who will hold the line against polluting the air we all breathe? **Who will make it possible for our children to grow up without having their health compromised?**

We need the testing! **Stand firm for health!**

Crystal Zinkiewicz
214 Mockingbird Road
Nashville, TN 37205

From:	Rhonda
To:	Air.Pollution Control
Subject:	[EXTERNAL]
Date:	Saturday, February 8, 2020 12:05:53 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

EMISSIONS TESTING needs to end in Sumner County , TN. If you are going to do an inspection how about something concerning SAFETY ! I have seen cars with white showing on their rear lights, bald tires, no bumpers, cracked windshields...the list could go on !! The emissions is a joke !! Just a revenue to the County !

Sincerely,
Mrs. Cuffee

From: Dana Barnes
To: Air.Pollution Control
Subject: [EXTERNAL] GET RID OF EMISSIONS TESTING
Date: Saturday, February 8, 2020 8:59:33 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please put an end to emissions testing in Sumner County.
Thank you!
D. Barnes

From: Dan Barber
To: Air.Pollution Control
Subject: [EXTERNAL] Vehicle inspection
Date: Sunday, February 9, 2020 5:47:29 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

It was my understanding that the vehicle inspection was going to be discontinued a couple of years ago. Why is this now unnecessary practice still being done? Why should we have to set in long lines to get an unnecessary inspection done? It's time to stop this unnecessary inspection Every vehicles that I have had never failed, but I had to drive to the testing station and wait in a long line for nothing.
Sent from my iPhone

From: Daniel Gammon
To: Air.Pollution Control
Subject: [EXTERNAL]
Date: Saturday, February 8, 2020 8:59:58 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Hello I am a resident of Sumner county, I vote to eliminate emissions testing in all counties. Today's vehicles shouldn't have to be questioned as to whether or not they are emitting substantial emissions or not. Thanks.

From: david knight
To: Air.Pollution Control
Subject: [EXTERNAL] End Emissions Testing Now
Date: Sunday, February 9, 2020 8:39:52 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I am sending this written document asking that the somehow required but removed emissions testing in my county be removed. I am a resident of Sumner County, Tennessee, more specifically, Cottontown. Emissions testing is a joke and an unnecessary burden. WOW, what a burden. We, taxpayers, have to take off from our jobs to go let someone prove we have a gas cap, catalytic converter, and the check engine light isn't on? And for what? Because Sumner County is producing so much smog that in the atmosphere that we are the problem but the other counties and states and countries aren't? I'm a math and science guy! And a good one. We have a hole in the Ozone for a reason. What happens when too much heat is applied to a container full of gases??? That's right. Our earth doesn't explode because there is a hole in the Ozone... and there is supposed to be. Climate change? Of course, we have been in climate change since the beginning of time. There are only a few "laws" because a "law" in science has to happen "every time." The greenhouse effect is not a law. Climate change is not a law. They are theories with independent and dependent variables. Weather changes, climates change, our emissions testing is NOT going to stop that.

Please, stop the madness of the emissions testing. It is not necessary and a frustrating burden.

Thank You,

Sincerely,

David R. Knight
Sumner County Resident

From: David Stephenson
To: Air.Pollution Control
Subject: [EXTERNAL] Huge scam
Date: Friday, February 7, 2020 12:30:31 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Vehicle emissions testing is the work of lobbyists to line the pockets of the vendor that provides these services. It is worthless and does nothing to protect the environment. There are very few automobiles still on the road that do not have catalytic converters, therefore it is a waste of time and money.

Repeal all legislation requiring emissions testing.

Thank you.

Kind regards,
David Stephenson
727 Reliance Drive
Franklin, TN. 37067
615.585.0361

I Sent from my iPhone

From: DEBORAH HADDOCK
To: Air.Pollution Control
Subject: [EXTERNAL] Sumner County Emissions Testing
Date: Saturday, February 8, 2020 1:18:23 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please do away with this requirement. The studies have been done. Our air quality is fine. This is an unnecessary bureaucratic inconvenience. Why the delay in suspending this requirement for renewing plates? End it now.

Debby Haddock
1247 Stanfield Court
Gallatin, TN 37066

From: Deborah Holmes
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions Testing
Date: Wednesday, February 12, 2020 5:58:31 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

To whom it may concern:

Emissions testing for Sumner County MUST STOP!!!!

Deborah Holmes
2134 Long Hollow Pike
Gallatin, TN 37066

(615)243-7681
renee0110@aol.com

Eph 4:29

From: Debra Dickey
To: Air.Pollution Control
Subject: [EXTERNAL] Do Not Stop Emission Testing
Date: Wednesday, February 12, 2020 10:16:45 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Hello
Emission Testing helped Nashville achieve better air quality. We have occasional bad days, but if we stop emission testing it will only get worse and worse. I ask you to please help keep our air clean and our people healthier.

Sincerely
Debra Dickey
2813 Sherbourne Ave
37204

From: Diana Andrew
To: Air.Pollution Control
Subject: [EXTERNAL] Keep emission testing
Date: Wednesday, February 12, 2020 9:46:30 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

I strongly believe that requiring emission testing helps to reduce our air pollution in Nashville and surrounding counties. Please continue this process and requirements.

Diana Andrew
2413 N 16th St.
Nashville, TN 37206

From:	Don Long
To:	Air.Pollution Control
Cc:	Ferrell Haile
Subject:	[EXTERNAL] Emissions Testing
Date:	Friday, February 7, 2020 10:08:00 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please end this burdensome and unfair requirement.

I had a vehicle that I used to get to work each day that failed testing in 2017 because the check engine light was on.

I was told at the testing center I was not producing any pollutants but they couldn't pass me because of the light.

I took it to a mechanic and paid him $480 to replace the knock sensors as the trouble code indicated. He did, the check engine light went off, I went back to the testing center as and the vehicle passed.

On the way back home from purchasing the plates, the light came back on. I immediately checked the code and it indicated the exact issue I had just paid to rectify.

I called my mechanic and he said, "I hate to tell you this but it's likely a faulty computer and will cost you $2500 to fix it.

The 20 year old vehicle is not worth an additional $2500. I parked it.

Keep in mind, the vehicle is emitting no harmful emissions but has a check engine light on because of a faulty computer.

This insanity needs to end.

From:	Linda Bilbrey
To:	Mark A. Reynolds
Subject:	FW: [EXTERNAL] Emissions Testing/Metro Davidson County
Date:	Monday, February 10, 2020 7:55:40 AM

From: Donna & Pj [mailto:shantiseafood@aol.com]
Sent: Sunday, February 9, 2020 11:53 AM
To: Linda Bilbrey
Subject: [EXTERNAL] Emissions Testing/Metro Davidson County

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

My apology if you are not the correct person to receive my request. If you are not, I would ***appreciate*** *if you would forward to the proper channel.*

To Whom It May Concern:

I am requesting your consideration for termination of Metro Davidson County's Emission's Testing. IMO, it no longer serves as any major value to our city, nor its citizens. Thank You!

Respectfully,
Donna Reid
Email: Shantiseafood@aol.com
Address: 606 South Club Court
Hermitage, TN 37076

From: Dylan Hood
To: Air.Pollution Control
Subject: [EXTERNAL] emissions STOP
Date: Saturday, February 8, 2020 6:27:08 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

This is such a waste of resources for Tennesseans. It is a waste of time and money and we want this program to stop immediately. I have had to spend thousands of dollars to get vehicles that would be acceptable in other counties just to buy a 75 dollar tag.
>
> Dylan Hood
> 214 Fischer Dr
> White House, TN 37188
> 615-308-8670
>
> Sent from my iPhone

From:	Eric Hoke
To:	Air.Pollution Control
Subject:	[EXTERNAL] Please Continue Emission Testing
Date:	Wednesday, February 12, 2020 10:12:37 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Hello,
Please continue to test vehicle emissions in Tennessee. It is important to maintain air quality and general living conditions for the great state!
Thank you,
Eric

--

Eric R. Hoke
Design Director | **Nashville Civic Design Center** | *www.civicdesigncenter.org*

C: 847.302.1164

The mission of the Nashville Civic Design Center is to elevate the quality of Nashville's built environment and to promote public participation in the creation of a more beautiful and functional city for all.

Sign up to receive NCDC's monthly e-newsletter here

From: erikwright17@yahoo.com
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing is theft
Date: Saturday, February 8, 2020 10:00:33 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Emissions testing is a tax. Taxation is theft.
.0001% of cars and trucks fall. Average life of a vehicle is twenty years. Emissions on vehicles are built to last the life of the vehicles these days. My trucks catalytic converter is guaranteed for the life of the vehicle just like the transmission. The time has come to end vehicle emissions testing. I have 210,000 miles on my truck and passed emissions with flying colors.

Sent from my iPhone

From: Frank Bass
To: Air.Pollution Control
Subject: [EXTERNAL] Emission testing
Date: Saturday, February 8, 2020 10:08:46 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Sent from my iPad
I am a resident of Sumner County and I am tired of having to get my car & truck tested to keep emissions down in Nashville. The newer vehicles have all kinds of emission controls build into them and I feel it is time to shut down the testing stations...

From:	Nancy Hagemeyer
To:	Air.Pollution Control
Cc:	1hagemeyer@comcast.net
Subject:	[EXTERNAL] Stop Emission Testing
Date:	Saturday, February 8, 2020 3:54:09 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Senator Haile,

With all the regulations on auto manufacturing, and just observing the vehicles currently on our roadways, this annual testing is just no longer needed. It is a total waste of money for our citizens. And, why do some counties require and others do not? Simply not fair or smart. Stop the waste now.

Thank you!
George and Nancy Hagemeyer
1523 Highway 25
Gallatin, TN 37066

Sent from my iPhone

From:	Georgia Caplen
To:	Air.Pollution Control
Subject:	[EXTERNAL] Keep Annual Emission Tests
Date:	Thursday, February 13, 2020 2:44:01 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please keep annual emission testing to provide a safer environment for our communities, families, and children. These simple tests help keep our environment safe for us to breathe. Please do your part and keep these tests. Georgia Caplen georgiacaplen@gmail.com

From: Air.Pollution Control
To: Paul LaRock
Cc: Mark A. Reynolds
Subject: FW: [EXTERNAL] Keep emissions testing
Date: Wednesday, February 12, 2020 3:04:41 PM

-----Original Message-----
From: Heather Andrews [mailto:heatherandr@gmail.com]
Sent: Wednesday, February 12, 2020 2:49 PM
To: Air.Pollution Control
Subject: [EXTERNAL] Keep emissions testing

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please keep annual emissions testing in Tennessee!! I live in Davidson County, and am hopeful we'll continue to have testing. As a physician, a mom, and a mild asthmatic, I am all too aware of the air quality on health, on all sorts of health measures.
Thank you for considering.
Heather Andrews, MD
1008 Halcyon Ave
Nashville, TN 37204
6153379377

Sent from my iPhone

From: Cj travis
To: Air.Pollution Control
Subject: [EXTERNAL] End emission testing
Date: Saturday, February 8, 2020 9:22:52 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please end the emissions testing. It is a waste of time and money and causes serious inconveniences to our citizens.

Jason Travis
113 beechwood court
Hendersonville TN
Sumner county.

From: jeffrey manni
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing
Date: Saturday, February 8, 2020 4:14:14 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern;

Please, discontinue emissions testing. Newer vehicles are on the road now. This is an unnecessary expense & waste of precious time for struggling families.

From: J. Briley
To: Air.Pollution Control
Subject: [EXTERNAL] End emissions testing in TN
Date: Saturday, February 8, 2020 9:51:21 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

It's time to end emissions testing in TN -please do not continue this antiquated practice.

Jennifer Briley
Gallatin, TN
615.420.5807

From: Jennifer Capps
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions-Rutherford County
Date: Saturday, February 8, 2020 7:34:20 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please end emissions testing in Rutherford County as soon as possible.

Thank you!!!

Sent from my iPhone

From: Jennifer Duvall
To: Air.Pollution Control; Paul LaRock
Subject: [EXTERNAL] Air Testing/Emissions Hearing
Date: Tuesday, February 11, 2020 1:42:55 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

The air quality is terrible especially in the summer, rolling back protection would worsen the quality of air!

Thank you,

Jennifer Duvall

Street Address: 15825 Coulterville Rd
City: Sale Creek
State : TN
Zip Code: 37373

From:	Jennifer Minor
To:	Air.Pollution Control
Subject:	[EXTERNAL] Stop emissions testing!!
Date:	Saturday, February 8, 2020 6:24:41 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I am writing to make it known that I would like emissions testing to stop in summer county. We have a truck that will cost over 2,000 dollars to get electric system to work where it will not fail stupid emissions testing. So the truck sits in our driveway instead of being used even though it actually runs just fine. We bought from someone in Pickett county and they did not have to worry about emissions testing. Please make this test a thing in our past ASAP.
Thank you for your time,

Jennifer Minor
Summer county Tennessee

Sent from Yahoo Mail for iPhone

From: Jill Smith
To: Air.Pollution Control; Paul LaRock
Subject: [EXTERNAL] We need our environment clean
Date: Sunday, February 9, 2020 5:05:06 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

Stop! We need clean air and water in Tennessee! We need to lead the way not be the cause of pollution! We been there, it's BAD and stupid. No body wants to live in a dirty state!

Thank you,

Jill Smith

Street Address: 7707 Moses Rd
City: Hixson
State : Tenn
Zip Code: 37343

From:	Joel Cummings
To:	Air.Pollution Control
Subject:	[EXTERNAL] Emissions Testing
Date:	Friday, February 7, 2020 5:26:13 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Good evening,

I'm writing in after being encouraged by some state legislators to make my voice heard regarding required emissions testing. I live in Davidson county and have had my emissions tested over the past 10 years as needed. I am thankful for the testing and the proactive stance it takes to ensuring the my children can enjoy cleaner air as they grow up in Nashville. I'm always pleased by the speed and professionalism if the next emissions testing station staff. Having these policies in place before a problem gets out of hand is crucial to creating an environment where our city can grow without a literal cloud looking over it.

Best,
Joel M. Cummings

From: johnavaritt@bellsouth.net
To: Air.Pollution Control
Subject: [EXTERNAL] End emissions testing
Date: Saturday, February 8, 2020 9:49:47 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please end emissions testing in Rutherford County. A question I have is how many cars actually fail the test? I have had a number of vehicles and only one has failed the test and it was due to a fan clutch which didn't have anything to do with emissions. Please stop this needless test.

Sent via the Samsung Galaxy S8, an AT&T 5G Evolution capable smartphone

From: Josh Vantrease
To: Air.Pollution Control
Subject: [EXTERNAL] End Emissions Testing in Sumner County
Date: Friday, February 7, 2020 8:45:13 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern,

I was raised in Trousdale county my entire life and had no emissions testing. Westmoreland, TN is where I live currently and has basically the same demographic. Westmoreland, being part of sumner county, has emissions testing. Emissions testing has never made any sense to me. out of all 95 counties, only 6 require emissions testing. According to the release statement a few years ago, the air quality for the entire state was good. Since this is the case, I don't see how requiring the resident of 6 counties to continue to be forced to comply with something that is obviously not making any difference. End Emissions Testing Now. Stop costing tax payers even more money to keep these mandates and facilities running.

Thanks,

Josh Vantrease
(615)374-1484

From: June Hawkins
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions Testing
Date: Saturday, February 15, 2020 5:51:06 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Hello
Emission Testing helped Nashville achieve better air quality. We have occasional bad days, but if we stop emission testing it will only get worse and worse. I remember when we had many bad days. Please help keep our air clean and our people healthier.

Sincerely
June Hawkins
3210 Avenal Ave
Nashville TN 37211

Sent from my iPhone

From: Karen Hunter
To: Air.Pollution Control
Subject: [EXTERNAL] Emission testing
Date: Friday, February 7, 2020 9:27:08 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I am asking for emission testing to be discontinued. At this day and age most cars have good air quality control. The older cars are beginning to be in compliance as the really old cars are breaking down and being replaced. It is a hassle and a cost that is unfair to the citizens of Sumner County. Thank you, Karen Hunter 250 Wagoners Way, Westmoreland,Tn.37186

--
Thank You, Karen Hunter

From: McIntyre, Karen
To: Air.Pollution Control
Subject: [EXTERNAL] Keep emissions testing
Date: Wednesday, February 12, 2020 6:20:20 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

WHY would we go back to a time where air quality was worse!??? KEEP EMISSIONS TESTING IN PLACE ---

Personal address is
Karen McIntyre
2501 Ravine Dr.
Nashville, TN 37217

Karen McIntyre, Librarian Westmeade Elementary
6641 Clearbrook Dr.
Nashville, TN 37205 615-353-2066

From:	Air.Pollution Control
To:	Paul LaRock
Cc:	Mark A. Reynolds
Subject:	FW: [EXTERNAL] Emissions Testing
Date:	Wednesday, February 12, 2020 3:03:24 PM

From: Kate Moore [mailto:kate@getfit615.com]
Sent: Wednesday, February 12, 2020 3:01 PM
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions Testing

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Hi,

Thank you so much for taking the time to engage with my email -

Emissions testing is an important part of how we care for each other and the world - as I'm sure you are well versed in the science of climate change and how it is inner woven with racial and social justice issues, please keep all current emissions testing requirements in tact. Unless, the Tennessee government has found a more significant way to reduce our carbon footprint, emissions testing, in our highly cars-as-our-main-form-of-transportation-centered state, is one of the current requirements we must keep in place to keep our air inhabitable.

I would feel far more frustrated for us to have to implement a "cars who's license plates end in a number can drive on MWF" rule than to have to go to emissions testing annually.

Thank you,

Kate Moore - Doak Ave. 37218 - business owner: getFIT615 Music Row 37203

Kate Moore (she/her)
65 Music Sq E.
kate@getFIT615.com
facebook
www.getFIT615.com
@moore_kate @getfit615

*Please be advised that I generally check and reply to emails on Wednesdays and Thursdays between 10am-2pm. Thank you for your patience and understanding.

From: Katie Bauer
To: Air.Pollution Control; Paul LaRock
Subject: [EXTERNAL] Keep Emissions Testing in Middle Tennessee
Date: Tuesday, February 11, 2020 2:26:26 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

To whom it may concern,

I strongly urge you to maintain clean air protections in Middle Tennessee.

Please consider the families in local neighborhoods, especially those near major roadways. Removing emissions testing puts our children and families at risk for lung, brain and heart issues. It also harms our surrounding environment from our parks to our own backyards.

In Davidson County, we have many regularly traveled highways and major roadways. These roads have heavy traffic throughout the week due to lack of local transit. I live close to a major highway as well as a very busy roadway, both which are constantly busy and not slowing down anytime soon.

We all have a responsibility to maintain our home and air quality here in Davidson County. With the influx of new residents far from decreasing, we have to take action now.

I strongly urge you to continue requiring emissions testing in Middle Tennessee. Our community's health and future depend on it.

Sincerely,
Katie Bauer

Thank you,

Katie Bauer

Street Address: 4510 Charlotte Ave, Apt 310
City: Nashville
State : Tennessee
Zip Code: 37209

From: Kirk Terhune
To: Air.Pollution Control
Subject: [EXTERNAL] end emmissions
Date: Saturday, February 8, 2020 4:29:52 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

> I wish to state my support to end emissions in Rutherford county.
>
> Sincerely,
>
> a registered voter in Rutherford county TN.

From: Kristen Stark
To: Air.Pollution Control
Subject: [EXTERNAL] Auto Emissions
Date: Sunday, February 9, 2020 3:47:38 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

PLEASE end them for ALL newer vehicles because they are/were made with much tougher standards and DO NOT pollute. I'd say any vehicle manufactured prior to say 1985 could have to be tested. This is a much better argument indeed!
Thank you,
Ms. Kristen Stark

Sent from my iPhone

From:	Kyle Ledford
To:	Air.Pollution Control
Subject:	[EXTERNAL] End Vehicle Emissions Testing
Date:	Saturday, February 8, 2020 5:25:56 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

End vehicle emissions testing. Waste of money and time needed to go get it done.

Kyle Ledford
Nolensville TN
801-824-0603

From: lanecorey123
To: Air.Pollution Control
Subject: [EXTERNAL] Emission test
Date: Saturday, February 8, 2020 11:18:06 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Sumner county should no longer be made to have emissions testing. Our air is clean and this test is not improving things. If is not needed for the rest of the country then it is not needed for sumner county.
It should be discontinued immediately.

Sent from my Sprint Samsung Galaxy S9+.

From: lcook
To: Air.Pollution Control
Subject: [EXTERNAL] Sumner county emission testing
Date: Saturday, February 8, 2020 11:56:44 AM
Attachments: SENDER_EMAILlcook@nctc@@com.png

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I want emission test to stop in Sumner county.

Larry Cook

FREE Animations for your email **Click Here!**

From: Air.Pollution Control
To: Paul LaRock
Subject: FW: [EXTERNAL] Testing
Date: Friday, February 7, 2020 3:44:00 PM

-----Original Message-----
From: Larry McClanahan [mailto:ldmcc@comcast.net]
Sent: Friday, February 7, 2020 3:14 PM
To: Air.Pollution Control
Subject: [EXTERNAL] Testing

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

In my opinion as a retired Professional environmental engineer, it is time to completely end auto emissions testing in Tennessee!
Larry D. McClanshan

Sent from my iPad

From: Lauren Borders
To: Air.Pollution Control; Paul LaRock
Subject: [EXTERNAL] Re: Emissions Testing
Date: Tuesday, February 11, 2020 2:57:09 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

Please keep mandatory emissions testing in Tennessee. Middle Tennessee is a growing area with a history of air pollution, and I do not want to see this issue worsen with time.

I understand that emissions testing is not a perfect system. However, this system protects our environment, and provides important revenue for the health department. Your job is to ensure that our air quality is preserved for future generations. Please keep emissions testing in Tennessee.

Thank you,

Lauren Borders

Street Address: 920 Woodmont Blvd
City: Nashville
State : TN
Zip Code: 37204

Clean Air Tennessee Outreach

Submission Date	2020-02-13 12:43:41
Name	Lauren Teel
Email	ldt3q@mtmail.mtsu.edu
Subject	ldt3q@mtmail.mtsu.edu
Address	1020 Webbs Retreat Ln Murfreesboro TN 37128 United States
Phone Number	(214) 3547479
Why do you support keeping clean air protections in Tennessee? Let the board know!	I am a non-smoker with chronic bronchitis, so having clean air is extremely important to me.

From: Buddy Woodson
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions Testing
Date: Saturday, February 8, 2020 9:31:31 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please discontinue to Automobile Emissions Testing in Rutherford County Tennessee. I feel is it a hardship for many residents.

Leslie F. Woodson Jr.
13637 Hwy 99
Eagleville, Tn 37060

Sent from my iPhone

From: baileyed@aol.com
To: Air.Pollution Control
Subject: [EXTERNAL] Stop Emmision testing
Date: Saturday, February 8, 2020 4:12:10 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

It is unfair for some Tennesseans to suffer having to do emissions testing while others do not have to pay. I live in Rutherford County (Murfreesboro). Why should I have to pay while someone in Knoxville or Memphis does not?
Please end this requirement. It has been shut down all over the place. Why not everywhere?

Dr. M J Bailey
2943 Longford Dr
Murfreesboro, TN 37129

From: Marguerite Manning
To: Air.Pollution Control; Paul LaRock
Subject: [EXTERNAL] marguerite.r.manning@vanderbilt.edu
Date: Tuesday, February 11, 2020 1:34:49 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

Without a mass transit plan in Nashville and with unprecedented population growth, vehicle emissions will only increase. It is imperative that we maintain emissions testing in Tennessee to keep our air clean and breathable.

Rolling back emissions testing might seem like a small change, but it can have ripple effects across the environmental policy sphere that will motivate lawmakers to further roll back environmental regulations, thus hurting the health of our environment and the health of Tennesseans.

I urge you to please oppose the rule change to rollback mandatory emissions testing. Thank you.

Thank you,

Marguerite Manning

Street Address: PMB 353956
City: NASHVILLE
State : TN
Zip Code: 37235
Country: United States

From:	Marquis Gough
To:	Air.Pollution Control; Paul LaRock
Subject:	[EXTERNAL] Please keep emissions testing in Tennessee!
Date:	Tuesday, February 11, 2020 3:57:00 PM

To whom it may concern:

Clean air is an absolute necessity for a healthy population, especially for children and those with certain conditions that cause breathing complications. My girlfriend is one of the latter individuals; after two weeks on a ventilator and quite literally on death's door, she managed to recover from the numerous illnesses that assaulted her lungs but not without permanent lung damage. Now she is required to use a machine costing over $10,000 to do breathing treatments and to wear a special mask when exposed to smoke or other dangerous air pollutants. Without controlled emissions, those very same pollutants will pose a very serious threat to people like my girlfriend. I urge you not to do away with emissions testing!

Thank you,

Marquis Gough

Street Address: 608 Tywater Crossing Blvd
City: Franklin
State : TN
Zip Code: 37064

From: Mary Anne Ferrell
To: Air.Pollution Control
Subject: [EXTERNAL] End Emissions Testing in Wilson Co.
Date: Saturday, February 8, 2020 2:05:55 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Emissions testing needs to be stopped in Wilson County. This is a hardship, and a burdensome tax on those in our society who were less fortunate. It is no problem for those of means to be able to comply. For them, it is a nuisance. But for the single mom, the working poor, it can be a nightmare. The car you need to get back and forth to school or work, doesn't pass emissions... You can't get tags... You have no money for expensive car repairs. (And these days, every repair is expensive).
Untold revenues are lost to the county because people, illegally, will tag their vehicle in an outlying county that doesn't require emissions testing. They don't want to break the law, but sometimes keeping gas in the car to get to work is a struggle.
You make the choice... Do I feed my kids this month, or fix my car? When frequently the problem has no bearing on the quality of emissions.
The OBD-II was never intended to be used to determine how clean an engine was running, but rather as a tool to enable a mechanic to diagnose a mechanical issue in the ever more complex vehicle.
I've heard that air quality in our county is in compliance. I've also heard it was never at issue, but a means to "catch" and monitor vehicles that might be coming IN to Davidson County, and thereby affecting, adding to the pollution there.
It's time to stop penalizing those less fortunate, struggling to maintain some standard of living, penalizing them for doing the best they can at the time. Forcing them to break the law, just to keep transportation, and a job.
End the unfair emissions testing tax.

--
Mary Anne Ferrell

Clean Air Tennessee Outreach

Submission Date	2020-02-12 23:06:39
Name	Mary Kate Jackson
Email	mkoj100@gmail.com
Subject	Keeping our air clean
Address	2123 14th ave North Nashville TN 37208
Phone Number	(708) 7032244
Why do you support keeping clean air protections in Tennessee? Let the board know!	I don't even know why this is a question. Protect our air in this simple way. Nashville is already expanding and bringing more cars into the city than before. Do NOT roll this back. I don't care how much somebody might pay you to roll it. You will breathe the same shitty air as the rest of us if you roll this back. Do the right thing and keep emissions testing up. People have some janky cars here in TN so keep the even jankier ones odd the street and keep their nasty out of our air. Please. Please. Please.

From: Mason Eiss
To: Air.Pollution Control; Paul LaRock
Subject: [EXTERNAL] Please Keep Emissions Testing!
Date: Tuesday, February 11, 2020 1:33:21 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

As a Vanderbilt student, I have a vested interest in the quality of Tennessee's air. As someone who has struggled with allergies all of my life, I know the importance of regulating air quality. I am writing to oppose this proposal to remove emissions testing as it will substantially harm the residents of this state! Please keep in mind the many people who could face serious breathing and respiratory problems as a result of this proposal.

Thank you for your consideration, and I hope you reject this proposal,

Mason Eiss

Thank you,

Mason Eiss

Street Address: 1522 Sandpiper Circle
City: Weston
State : FL
Zip Code: 33327
Country: United States

From: missymo69
To: Air.Pollution Control
Subject: [EXTERNAL] Sumner county emissions
Date: Saturday, February 8, 2020 10:32:33 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I am all for pollution control but feel the cost and time for emissions testing is ridiculous. I would rather pay the fee to the county than the hassle of going through inspection. I don't drive to work but one day a month now. Please stop emissions testing. Put the emissions control on new cars being made. Please please stop emissions testing!!!

Thank you

Melissa Horsley
237 Southburn Dr
Hendersonville TN. 37075

Sent via the Samsung Galaxy S8, an AT&T 5G Evolution capable smartphone

From: melissa Lynn
To: Air.Pollution Control
Subject: [EXTERNAL] EMISSIONS TESTING
Date: Saturday, February 8, 2020 4:48:49 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Being that only a few counties have emission testing and being that test results show our air quality is acceptable, please stop emission testing. Push to have the bill signed into law.

Melissa Lynn

From: Mickey Summers
To: Air.Pollution Control
Subject: [EXTERNAL] Sumner County Emissions Testing
Date: Saturday, February 8, 2020 9:01:43 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Good morning! I would like to see Sumner County opted out of having to do these emissions test. It's no for me but there is several Sumner County residents that it puts a great burden on when having to make repairs to vehicles when they are trying to live pay check to paycheck. I just feel like we are at a point that this could be stopped. Thanks for your time!

Mickey Summers

From: Mike Callis
To: Air.Pollution Control
Subject: [EXTERNAL] Emission Testing
Date: Friday, February 7, 2020 4:25:15 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please end emission testing in Sumner County.
Thank you.

Have a great day! ~Mayor Mike Callis
City of Portland, TN
"And as you wish that others would do to you, do so to them."
Luke 6:31

From:	Moe Taylor
To:	Air.Pollution Control
Cc:	Moe Taylor; William Taylor
Subject:	[EXTERNAL] Emissions Testing
Date:	Friday, February 7, 2020 10:41:18 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

TN State Representatives and Senators,

It is past time to end the Unnecessary burden of Emissions Testing in the State of Tennessee. The State Legislative Process passed Legislation in 2018 to end this in the very few Counties it was required in.

I understand and know how the Federal and State Government processes work as related to issues such as this. But, I refuse to accept it on behalf of the Hard Working Tax Paying Citizens of Sumner County, and the District I serve on the County Commission.

I respectfully request every Sumner County State Elected Official to apply their Political pressure on whoever they can to end this unnecessary Burden on our Citizens.

I am extremely Frustrated, and have no good explanation to the Constituents I serve in Sumner County, why this has been drug out for almost two years now.

Regards,

Moe Taylor
Sumner County Commissioner
615-388-9255

Sent from my iPhone

From: Namrah Ajmal
To: Air.Pollution Control; Paul LaRock
Subject: [EXTERNAL] Please continue to test emissions in TN
Date: Tuesday, February 11, 2020 1:35:24 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

To whom it may concern:

Air quality is already declining, and we love our lungs and the environment

Thank you,

Namrah Ajmal

Street Address: 5172 Remington Drive
City: Brentwood
State : TN
Zip Code: 37027

Clean Air Tennessee Outreach

Submission Date	2020-02-12 17:14:13
Name	Nancy McFadden
Email	nmcfadden9@gmail.com
Subject	nmcfadden9@gmail.com
Address	2813 Blair Blvd Nashville TN 37212 United States
Phone Number	(615) 3369249
Why do you support keeping clean air protections in Tennessee? Let the board know!	Emissions testing helps the air be cleaner than it would be without the testing. In addition, the emissions also impacts climate change.

From:	Bryan Smith
To:	Air.Pollution Control
Subject:	[EXTERNAL] End Emissions Testing!
Date:	Friday, February 7, 2020 8:52:18 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Emissions testing is an unnecessary burden on everyone in Middle Tennessee and hits our poorest citizens the hardest of all. Please end this now!

All the best,

Neil Smith
DANDY DJ and PHOTO BOOTH

615-200-8335
neil@dandydj.com
http://www.dandydj.com

"If it deserves to celebrated, it deserves to be DANDY!"

From: netacassetty@aol.com
To: Air.Pollution Control
Subject: [EXTERNAL] Summer County
Date: Saturday, February 8, 2020 8:22:18 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Stop emissions testing
Sent from my iPhone

From: Nicole Brose
To: Air.Pollution Control
Subject: [EXTERNAL] Emisions Testing
Date: Wednesday, February 12, 2020 9:53:02 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Hello,

I'm writing to let you know that I am in favor of keeping emissions testing mandatory is my state of Tennessee. Living in the Metro Nashville area, I've witnessed first hand the amount of growth we've experienced in the last ten years and that growth has resulted in A LOT of cars on the road. The emissions tests help keep the air in our state cleaner and I personally think it is worth getting my car checked every year to ensure a cleaner future for this beautiful state.

Thank you,
Nicole Brose
1536 Cardinal Ln, Mt. Juliet, TN 37122

Clean Air Tennessee Outreach

Submission Date	2020-02-13 08:11:06
Name	Philip Zuvichaux
Email	zuvichaux@yahoo.com
Subject	Air Testing Emissions
Address	8456 Briarbirch Cove Germantown Tennessee 38139
Phone Number	(901) 5700876
Why do you support keeping clean air protections in Tennessee? Let the board know!	We need to maintain car emissions testing that further support the health and wellness of all communities and wildlife. Unfortunately, I see more personal owned and commercial vehicles spewing dark and dangerous exhaust near schools, shopping districts and where people live and work. If it is against any regulations to throw trash out of one's car window, it must also be prohibited in throwing dirty emissions out of one's car too.

From:	Phyllis Williams
To:	Air.Pollution Control
Subject:	[EXTERNAL] Emission testing
Date:	Saturday, February 8, 2020 6:01:36 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please discontinue the Emission testing in Davidson County.

Phyllis Williams
615.943.8545
mailto:misspw@comcast.net

From:	Piper Niemann
To:	Air.Pollution Control
Subject:	[EXTERNAL] Keep our air clean!
Date:	Thursday, February 13, 2020 8:14:25 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Emission Testing helped Nashville achieve better air quality. We have occasional bad days, but if we stop emission testing it will only get worse and worse. I ask you to please help keep our air clean and our people healthier.

Piper Niemann
8222 Persia Way, Nashville, TN 37211

From: Pippa Holloway
To: Air.Pollution Control
Subject: [EXTERNAL] emission testing
Date: Thursday, February 13, 2020 8:13:07 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please keep emission testing in Tennessee. Emission Testing helped Nashville achieve better air quality. It also helped me take care of my car. A few years ago I found out that I had a bad catalytic converter due to emissions testing.

Thanks
Pippa Holloway
605 Rudolph Ave
Nashville TN
37206

Pippa Holloway
Professor of History
Middle Tennessee State University
President, Tennessee University Faculty Senates, 2019-2020

From: Bobby Souza
To: Air.Pollution Control
Subject: [EXTERNAL] Eliminate MARTA
Date: Friday, February 7, 2020 1:37:25 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I vote to join the rest of our great counties in Tennessee and eliminate auto emission testing.

Thank You
Robert Souza
Gallatin, TN 37066

From: Ronda Hazelet
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions
Date: Sunday, February 9, 2020 10:32:50 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Please stop the Emissions testing. It is unnecessary.

Ronda Hazelet

Sent from my iPhone

From:	RONNIE BRILEY
To:	Air.Pollution Control
Subject:	[EXTERNAL] emmision testing
Date:	Monday, February 10, 2020 9:56:32 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

It is time to stop vehicle emission testing in Sumner County, Tennessee. Do not renew this practice.

Ronnie Briley
Sumner County, Tennessee

From: Rose Robertson-smith
To: Air.Pollution Control
Subject: [EXTERNAL] Keep testing
Date: Wednesday, February 12, 2020 6:10:13 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

I support keeping emissions testing in Davidson county. Do not remove this control for air quality.
Sent from my iPhone, Rose

From:	samddurrett
To:	Air.Pollution Control
Subject:	[EXTERNAL] EMISSIONS TESTING
Date:	Saturday, February 8, 2020 6:03:28 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

EMISSIONS TESTING is no longer needed. Please end this. I am a resident of Sumner County.

Sammy Durrett

Sent from my Verizon, Samsung Galaxy smartphone

From:	Sandra Hofer
To:	Air.Pollution Control
Subject:	[EXTERNAL] STOP the Sumner County Emissions testing
Date:	Friday, February 7, 2020 6:08:18 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

I do not understand why this testing continues !
Why is this necessary on any vehicle ?
Even more ridiculous on CURRENT MODELS !?

STOP THIS FOOLISH PRACTICE !!!

PLEASE.

Sandra Hofer
sandrahofer73@yahoo.com

From: Sandra Shelton
To: Air.Pollution Control
Subject: [EXTERNAL] Emission Testing
Date: Saturday, February 15, 2020 5:15:35 PM

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Hello
Emission Testing helped Nashville achieve better air quality. We have occasional bad days, but if we stop emission testing it will only get worse and worse. I ask you to please help keep our air clean and our people healthier.

I was a student a Vanderbilt back in the day before we had no clean air controls. When I lived in the dorm and left my windows open, everything in my room would have a fine layer of soot on it. And even later as you approached downtown on Broadway, you could hardly see the buildings downtown for the pollution! Let’s not go back to the Dark Ages! Let's keep our air clean. I have no problem taking my car each year to be checked, in fact I appreciate it!

Thank you,
Sandra Shelton
1830 Wildwood Ave
Nashville, TN 32712

From: Air.Pollution Control
To: Marc Corrigan; Mark A. Reynolds; Paul LaRock
Subject: FW: [EXTERNAL] Air testing
Date: Wednesday, February 19, 2020 7:41:07 AM

From: Shaun Bowman [mailto:noreply@jotform.com]
Sent: Tuesday, February 18, 2020 4:25 PM
To: Air.Pollution Control; Paul LaRock
Subject: [EXTERNAL] Air testing

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To whom it may concern:

I believe in protecting our environment, and protecting all wildlife. Our air everything goes together. We help one, and we help the whole.

Thank you,

Shaun Bowman

Street Address: 87 Belmeade drive
City: Rossville
State : Georgia
Zip Code: 30741

From:	Shawn Braswell
To:	Air.Pollution Control
Subject:	[EXTERNAL] Sumner County Marta
Date:	Saturday, February 8, 2020 12:03:32 AM

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Hello, end it now!

Shawn Braswell

Sent from Yahoo Mail on Android

From: shelbeykc5
To: Air.Pollution Control
Subject: [EXTERNAL] Stop emissions testing
Date: Sunday, February 9, 2020 7:00:43 AM

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A wilson county resident here. Emissions testing should be stopped. There are too many other ways of air pollution and a few cars isnt going to change anything.

From: Silvia Hix
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing
Date: Saturday, February 8, 2020 6:26:45 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

I am writing to ask you to please eliminate emissions testing. It is overdue to be eliminated. Thank you, Sylvia Hix
Sent from my iPhone

From: Stephanie Sinclair
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing in Tennessee
Date: Saturday, February 8, 2020 8:23:30 AM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

I live in Sumner County and am tired of having to pay more money to get my car registered. Emissions testing does nothing but steal taxpayer money. The resolution was passed in 2018 and other counties have benefited. It's time the rest of us did too.

End emissions testing in ALL of Tennessee.

Sincerely,
Stephanie Sinclair

From: Stephen Gibson
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions Testing Comments
Date: Saturday, February 8, 2020 8:28:07 AM

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II am a citizen of Sumner county. It makes no sense why my vehicle needs to be tested because the county shares a border with Davidson county. I see people from Rutherford county which also borders Davidson county, and they drive in Nashville everyday. Why do they not need emissions? I drive in Nashville every day just like people from Kentucky with their cars spewing black soot and pouring oil. Why do they not need their vehicles tested?

In addition, this is a sham. I watched last year as a car with black soot pulled in "was tested" and pulled out with a passing score. If we are testing for air pollution I can see coming from the car, how did it pass?

Also, if we were really concerned, why would we have waiting lines for cars running to be tested? Is this not just adding to the emissions you are testing for in order to prevent?

Put some logic behind this or end it!!!

Best Regards,
Stephen Gibson

Get Outlook for Android

From: john harris
To: Air.Pollution Control
Subject: [EXTERNAL] End emissions testing
Date: Saturday, February 8, 2020 9:45:23 AM

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ither counties have stopped this and ours should too. It is no longer needed with today's technology.

Tammy

From: Tara Rowland
To: Air.Pollution Control
Subject: [EXTERNAL] Rutherford county vehicle emissions
Date: Saturday, February 8, 2020 4:01:03 PM

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Enough is enough with vehicle emissions testing in Rutherford County. Let's stop this now please!!!
Tara Rowland
615-427-3335

Sent from my iPhone

From: Tina Patel
To: Air.Pollution Control
Subject: [EXTERNAL] Emission testing in Rutherford Co
Date: Saturday, February 8, 2020 8:31:58 AM

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Please end this wasteful expensive and unnecessary practice unless one owns an “antique car” or only for trucks etc.

Tina Gupta Patel
615.557.6787

From: Tifani
To: Air.Pollution Control
Date: Saturday, February 8, 2020 7:10:39 PM

Hello,

I am writing to show my support to end all emissions testing in Tennessee. Evidence has shown that this testing does NOT improve air quality. This is an unnecessary extra expense for Tennessee residents and a waste of time and resources. Please end all emissions NOW!

Thank you,

From: T. J. Spradling
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions Testing
Date: Friday, February 7, 2020 7:40:14 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

EMISSIONS TESTING is still occurring in Sumner county TN. We want this to END as soon as possible, please help us stop this requirement.

Thank you!

T.J. Spradling
Summer county, TN resident

From:	Todd Kaestner
To:	Air.Pollution Control
Subject:	[EXTERNAL] Emissions testing bill coming up
Date:	Saturday, February 8, 2020 3:00:35 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Stop requiring emissions testing in Williamson County! Enough is enough.

Todd Kaestner

615.594.1862 - Cell

...never confuse luck with intellect...

From: Valerie Rogers
To: Air.Pollution Control
Subject: [EXTERNAL] End Emissions
Date: Saturday, February 8, 2020 3:03:00 PM

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Let's stop this ridiculous practice of emissions testing.

Valerie Rogers

Cell: 615-587-1448

Office: 615-672-0333 x.102
Sent from my iPhone

Clean Air Tennessee Outreach

Submission Date	2020-02-12 14:58:22
Name	Vickie Casey
Email	kulgrani@hotmail.com
Subject	Keep testing vehicle emissions
Address	435 Pole Hill Road Goodlettsville TN 37072
Phone Number	(615) 9159516
Why do you support keeping clean air protections in Tennessee? Let the board know!	To me, maintaining and protecting clean air everywhere is a win win win! No debate is necessary. I live in the quiet country NE of Nashville, near Millersville. I had a job in Nashville. After two years I quit because of the hour plus long commute one way on highly polluted highways. Round trip my commute exceeded two hours. Some days it took me two hours to return home, which increased my commute to three hours round trip.

From: wes.o.dunn
To: Air.Pollution Control
Subject: [EXTERNAL] Emissions testing
Date: Saturday, February 8, 2020 4:36:19 PM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Please help stop emissions testing. It is costing us, whom dont make a ot of m I'll ne, too much money to repair our vehicles and potentially not be able to drive to work. This is not fair!

Sent from my Verizon, Samsung Galaxy smartphone

From:	William Tate
To:	Air.Pollution Control
Subject:	[EXTERNAL] Testing is a Huge waste of time and causes pollution from people idling in cars waiting
Date:	Monday, February 10, 2020 9:27:55 AM

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Testing is a Huge waste of time and causes pollution from people idling in cars waiting
Also causes huge waste of money for computer glitches that are not real and cause wasted time going to dealers to fix things that are not broken

William H. Tate, Esq.
Rule 31 Mediator
(615) 256-1125

Attachment 7

Response to Comments
(2nd Public Notice)

On January 8, 2020, the Tennessee Air Pollution Control Board directed the Division of Air Pollution Control (the Division) to re-open the public comment period to consider a proposed change to the State Implementation Plan (SIP) under the authority of Tennessee Code Annotated, Section 68-201-105. The public comment period was re-opened to consider the Clean Air Act Section 110(l) Noninterference Demonstration Reports (110(l) demonstration) for removal of the Vehicle Inspection and Maintenance program for Davidson, Williamson, Wilson, Sumner and Rutherford Counties in Middle Tennessee and Hamilton County, Tennessee from the State Implementation Plan. Re-opening of the public comment period was posted on the Division of Air Pollution Control's Public Notices web page on January 16, 2020, and stated that written comments were due by February 15, 2020.

Response to Comments from Opus, Inc.

Comments were received regarding the proposed 110(1) Noninterference Demonstration Report for Middle Tennessee from Opus Inspections, Inc. (Opus) and from numerous individual and entities, including health advocates, environmental groups, and members of the Davidson County Metropolitan Council. This document provides responses to comments submitted by Opus. The responses to comments from the other entities are provided in a separate document.

Comments were received from the law firm of Waller Lansden Dortch & Davis, LLP, on behalf of Opus. Attached to the comments is a revised report that was commissioned by Opus and prepared by Alpine Geophysics, LLC (Alpine). The revised report contains Alpine's original comments, a summary of the Division's initial response (labeled in the Alpine report as "TDEC-APC Comment") and Alpine's response to the Division's response. Below are Alpine's responses (labeled as "comment") followed by the Division's responses to that comment. Opus' original comments and the Division's initial responses were made available on the Division's Public Notices web page.

Comment: I agree that for purposes of calculating attainment with the ozone NAAQS, a three year average of the 4th highest observations at individual design values is the appropriate metric to use. However, I disagree with TDEC-APC that this is the only correct metric that can and should be used to demonstrate air quality changes in the region. My use of 4th high trends across all monitors in the region is consistent with practices that demonstrate changes in ozone concentrations across an entire region. EPA does not selectively choose a single monitor within an air shed to represent the entire area, instead, it looks at all the monitors in the region, recognizing that meteorology, economic trends, changes in activity, etc. all play a role in how air quality in an area can move in time and space.

I stand behind my review of using the highest observations across each monitor to demonstrate that air quality is not improving in the Middle Tennessee area and add the following observations to our assessment.

FPA also uses the Air Quality Index (AQI) metric to demonstrate how air quality changes overtime. The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects that may be experienced within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country.

An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level EPA has set to protect public health. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy-at first for certain sensitive groups of people, then for everyone as AQI values get higher.

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
When the AQI is in this range:	*..air quality conditions are:*	*...as symbolized by this color:*
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

Figure 4. EPA Air Quality Index (AQI) color coded values.

When I look at these published AQI data for the 2014 through 2018 period, as seen in Figure 5,1 see that the number of days observed at values at or above 100 (black line with red diamonds), considered unhealthy for sensitive groups, has an upward trend. In 2014, the number of days within the Nashville air shed with days at or above the unhealthy for sensitive group value of 100 was 6 days. This number decreased to 2 days in 2015, increased again to 5 days in 2016, decreased again to the same value as reported in 2015 (2 days) and then increased four-fold to 8 days in 2018.

In fact, not only is there an upward annual trend in the number of days unhealthy for sensitive groups, the maximum value per year has shown an annual increase over this same period. In Figure 5, this value is represented by the bars and shows that between

2014 through 2018, this maximum value increases to the point of exceeding the unhealthy for all groups (red bar) value of 151 in 2018.

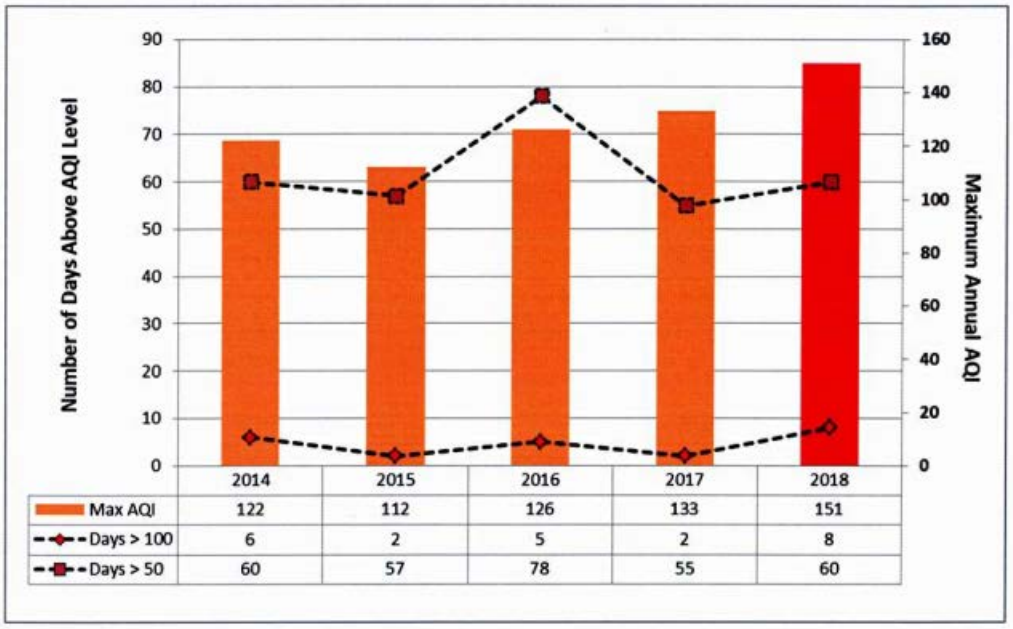

Figure 5. AQI metrics for Nashville-Davidson-Murfreesboro-Franklin, TN area.

Interestingly, this increase in number of unhealthy days is indirectly proportional to decreases in ozone precursor emissions during this same time period. EPA publishes state-level emission totals by year for major source sectors within each state. At this time, state-level emissions by category for years up through 2017 are available. When I reviewed these emissions and their trends over time, I note decreases in annual NOx and VOC between 2014 and 2017.

Figures 6 and 7 show major category emission trends within Tennessee during this period with highlighted highway vehicle emissions noted on each bar. Figure 6 presents annual NOx emissions with calculated highway vehicle emissions decreasing from 148,000 tons per year in 2014 to 116,000 tons per year in 2017. Similarly, as shown in Figure 7, VOC emissions have also decreased over this period of time. Highway vehicle VOC emissions have decreased from 69,000 annual tons to 54,000 annual tons between 2014 and 2017.

This demonstrates a precarious relationship between emissions and air quality in the region because even with reductions in ozone precursor emissions reported in the state, air quality metrics used to measure health impacts have increased during the same time frame.

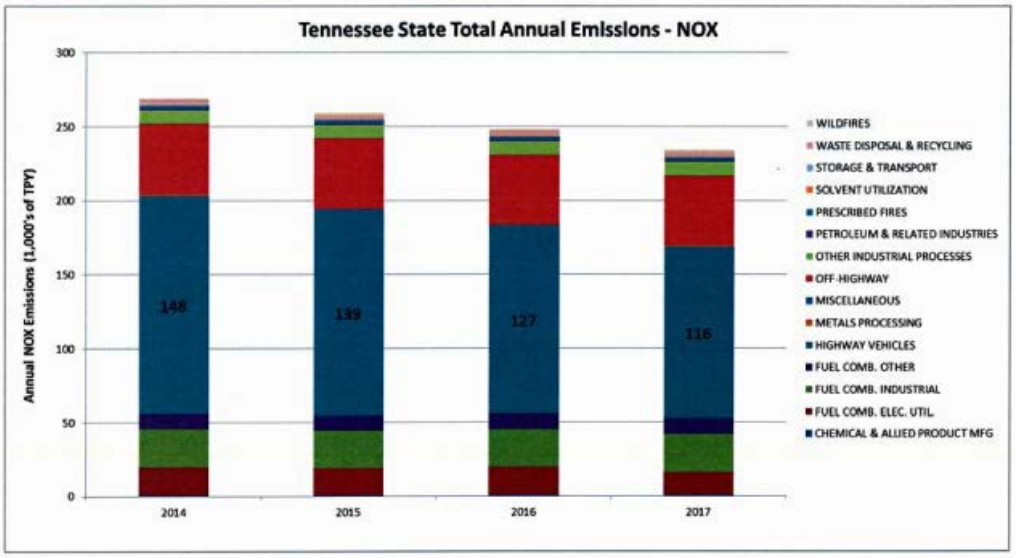

Figure 6. Tennessee NOx emission trends by major category.

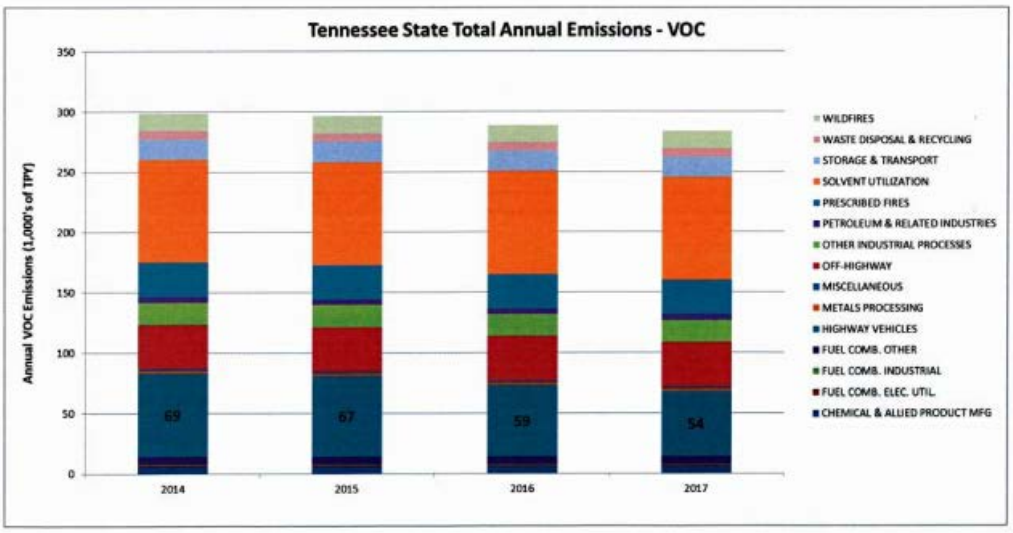

Figure 7. Tennessee VOC emission trends by major category.

Should TDEC-APC remove the I/M program in the Middle Tennessee area, increasing ozone precursor emissions from the highway vehicle sector by any amount, one can reasonably assume that AQI values and associated air quality concentrations would rise even more.

Response: Alpine included information regarding the Air Quality Index (AQI) in their comments. The AQI is a tool that provides general information to the public about air quality and associated health effects. The AQI is an index for reporting daily air quality. While the AQI is useful for the purpose indicated above, the federal regulatory requirement for determining attainment with the ambient air quality standard for ozone is to compare the measured three-year "design value" against the standard. As indicated in the Division's initial responses to comment document, ozone levels in middle Tennessee, as

measured by the design value, would be characterized as a flat trend or, when taking preliminary 2019 data into consideration, even a slightly downward trend. It is important to note that changes in emissions are only one factor that influences ozone levels. Other factors, including meteorology, can influence the formation of ozone. This is one of the reasons that the ambient air quality standard for ozone is a three-year average which compensate weather and other year-to-year variations. It should also be noted that the Division has obtained 2019 AQI data for Middle Tennessee. 2019 AQI data shows maximum of 101 and one day over 100, which is lower than any of the data included in Alpine's comments. Thus, there is not a clear upward trend as Alpine claims.

Alpine also provided data on annual state-wide NOx and VOC emissions. Alpine provided data for 2014, 2015, 2016, and 2017, which Alpine states is from EPA published data.

The state of Tennessee did not compile state-wide emissions inventory for 2015 or 2016, thus it appears that the 2015 and 2016 data are linear interpolations between the 2014 and 2017 data. Also, the 2017 National Emissions Inventory has not been finalized by U.S. EPA, and thus any data regarding 2017 has not been verified as accurate. Of most importance, many of the on-road emission sectors, including on-road light and heavy duty vehicles, have not been made available. It appears that the data included in Alpine's report is from the State Annual Emission Trend report available on EPA's public National Emissions Inventory website. Upon cursory review of this data, the Division notices that the largest source of VOC emissions, namely biogenic VOCs, is not included in the trend report data. Therefore, the use of the data provided by Alpine is questionable because it ignores the largest category of VOC emissions in the state. The Division then used two approaches to analyze Alpine's position regarding the relationship between emissions and air quality. The first approach uses the data supplied by Alpine. The second approach uses data compiled by the Division.

The data from the EPA trend report that was used by Alpine shows that state-wide NOx emissions decreased from 269,201 tons per year in 2014 to 234,092 tons per year in 2017 and state-wide VOC emissions decrease from 298,625 in 2014 to 283,779 tons per year in 2017. Even if one were to assume that this data is correct, it represents a 13.0% decrease in NOx and 5.0% decrease in VOC emissions over the three-year period. The projected state-wide increase in emissions from the removal of the I/M program in 2022 is estimated to be 578 tons of NOx per year and 739 tons of VOC per year[1]. This represents an estimated 0.2% increase in NOx and 0.3% increase in VOC from 2017 levels.

The most up-to-date, complete, state-wide emissions data compiled by Tennessee and reported to EPA was compiled by the Division. For categories where 2017 data is not yet available, the Division conservatively assumed that 2017 emissions are the same as

[1] From Table 5 of the Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in the Middle Tennessee Area - 78.52 tons/year of NOx and 593.10 tons/year of VOC. From Table 5 of the Clean Air Act Section 110(l) Noninterference Demonstration for the Removal of the Inspection and Maintenance Program in Hamilton County, Tennessee - 99.70 tons/year of NOx and 146.23 tons/year of VOC.

2014 emissions. Based on this data, state-wide NOx emissions decreased from 283,058 tons per year in 2014 to 253,008 tons per year in 2017 and state-wide VOC emissions decrease from 1,100,488 in 2014 to 1,075,359 tons per year in 2017. This represents a 10.6% decrease in NOx and 2.3% decrease in VOC emissions over the three-year period. Using the projected state-wide increase in emissions from the removal of the I/M program as indicated in the previous paragraph, NOx emissions will increase by an estimated 0.2% and VOC emissions will increase by an estimated 0.05%, both from 2017 levels.

In both approaches, the downward trend of applicable emissions is larger than the negligible increase in emission we might see from elimination of the I/M program; therefore, the Division is confident that removing the I/M program will not interfere with the continued attainment or maintenance of the National Ambient Air Quality Standards..

Comment: I recognize that TDEC-APC consulted with EPA on what information would be necessary to include in the demonstration. However, it is still my recommendation that TDEC-APC simulate air quality changes resulting from the removal of the I/M program in the Middle Tennessee area using a chemical transport grid model to ensure that increases in air pollutant concentrations do not exceed NAAQS and health-based recommendations.

Response: Neither section 110(l) of the Clean Air Act nor the EPA guidance document entitled *Demonstrating Noninterference Under Section 110(l) of the Clean Air Act When Revising a State Implementation Plan* (dated June 8, 2005); hereinafter referred to as the EPA 110(l) guidance, mandate air quality modeling. The methods used in the 110(l) analysis have been discussed with U.S. EPA prior to, during, and following development of the analysis. Federal requirements and guidance do not require the Division to conduct air quality modeling; therefore the Division, in consultation with EPA, has elected not to conduct air quality modeling.

Comment: It is recognized that TDEC-APC was using the most current version of the national emission inventory at the time its noninterference demonstration was being prepared. Should revisions or reruns of the analysis be conducted (either emissions only or emissions and air quality), I continue to recommend that the most current modeling platform and associated emission projections be used to update the I/M analysis and to account for improvements in emission estimates across all sectors.

Response: Neither section 110(l) of the Clean Air Act nor EPA 110(l) guidance mandate air quality modeling. The methods used in the 110(l) analysis have been discussed with U.S. EPA prior to, during, and following development of the analysis. Federal requirements and guidance do not require the Division to conduct air quality modeling; therefore the Division, in consultation with EPA, has elected not to conduct air quality modeling. As noted in the initial response to comments, the Division used the most up-to-date information to project 2022 emissions that are the basis for the 110(l) demonstration.

Comment: My recommendation for future year air quality modeling still applies and is relevant to demonstrating air quality changes associated with the removal of the I/M rule and

should be undertaken using EPA guidance reflecting ozone-conducive years to establish base year model conditions.

Response: Neither section 110(l) of the Clean Air Act nor EPA 110(l) guidance mandate air quality modeling. The methods used in the 110(l) analysis have been discussed with U.S. EPA prior to, during, and following development of the analysis. Federal requirements and guidance do not require the Division to conduct air quality modeling; therefore the Division, in consultation with EPA, has elected not to conduct air quality modeling.

Comment: The TDEC-APC is correct that Georgia used the same SEMAP study to perform and similar noninterference demonstration for relaxation of the summertime RVP requirements, however, TDECAPC fails to note that Georgia DEP also proposed to demonstrate noninterference by substituting quantifiable, permanent, surplus, enforceable, and contemporaneous measures to achieve equivalent emissions reductions to offset the potential emissions increases associated with removal of the program. In its approval notice, EPA noted that "[t]his RVP relaxation will not worsen air quality because Georgia's offsets provided compensating, equivalent emissions reductions to negate the increases in emissions from NOX and VOC."

In fact, Georgia established a current mobile vehicle emissions budget (MVEB) and secured emission offsets to the increases anticipated from the removal of the RVP program. They offered an offset equivalency demonstration as part of the noninterference demonstration. These offsets included locomotive conversation offsets, that replace higher-emitting, existing diesel locomotive engines with lower emitting locomotive engines, and school bus early replacement offsets, replacing older, higher emitting school buses with newer, lower emitting buses.

Georgia further demonstrates in their relaxed RVP gasoline analysis that the NOX and VOC emissions after 2014 are well below their calculated 2014 MVEB and project emissions and emissions increases to 2040 demonstrating that emissions from 2030-2040 never exceed their 2030 MVEB.

TDEC-APC does not provide any offset equivalency demonstration to counter the anticipated emission increases associated with the removal of the I/M program in Middle Tennessee nor does it calculate and provide additional support of meeting current and future year motor vehicle emission budgets. In fact, at Nashville Area Interagency Consolation Group meetings, concern was expressed about the area meeting the old MVEBs especially in light of the potential increase in emissions from the termination of the I/M program.

Because of these omissions, TDEC APC has not provided comparable supporting analyses compared to Georgia's noninterference demonstration and therefore may fall short of EPA's approval.

Response: Georgia was required to obtain offsetting emission reductions because the metro-Atlanta area was, and still is, in violation of the ozone NAAQS. Middle Tennessee is in attainment with all ambient air quality standards. Therefore, no offsets are required.

Regarding Alpine's comments regarding motor vehicle emission budgets (MVEBs), the Middle Tennessee area is currently not required to make conformity demonstrations. TDEC APC raised the question as part of the federally required Middle Tennessee Interagency Coordination process (IAC) on the July 12, 2018 call to gain guidance from U.S. EPA on how the Division would develop new MVEBs if it were found that new MVEBs were needed. As a part of the development of the 2022 on road emissions for the 110(l) analysis, the Division looked at evaluating existing MVEBs (not currently used as the area is not currently subject to the requirements of transportation conformity) in case the area, at any time in the future, becomes nonattainment for ozone and, once again, be required to demonstrate transportation conformity. The ___ court, in {CASE NAME} determined that if an area has to demonstrate transportation conformity and there is an existing MVEB for the same pollutant (ozone in this case), but for an earlier level of the NAAQS, that MVEB must be used, even if it was for an earlier level of the NAAQS. As the current MVEB was developed many years ago using EPA's MOBILE6 emissions factor model, there was some concern as to the adequacy of this MVEB given the current MOVES model general projects higher than the older MOBILE6 model. In order to address this concern, the Division used the development of the emissions inventories for year 2022 to evaluate the existing MVEBs and would, if needed, establish new MVEBs. The evaluation determined that the existing MVEBs appeared to be sufficient and did not require updating at this time.

Comment: I believe that TDEC-APC's recognition that its use of the scaling analysis would yield erroneous results should be adequate enough for the agency to reconsider using its analysis as a weight of evidence approach to removal of the I/M program. Even though EPA approved a separate state's weight-of-evidence analysis for a totally different region and program removal, erroneous results are erroneous results and should not be used to justify removal of an emissions reduction program that historically TDEC-APC felt so strongly to support and has impact on improving air quality in the region.

I also refer back to the previous comment for concerns in the difference between TDEC-APC's supporting analysis for the noninterference demonstration compared to Georgia's more complete analysis.

Response: Alpine incorrectly stated that the Division recognized that the use of the scaling analysis would yield erroneously results. As stated in the Division's original response to comments, "The TDEC-APC acknowledges that trying to use the scaling analysis with percentage changes <u>well above 30% would yield erroneous results</u>, as stated in the SEMAP report. The <u>TDEC-APC believes that scaling ratios are valid in this sensitivity analysis</u> since the percentage change in NOx (1.9%) and VOC (1.7%) emissions due to the removal of the I/M program are less than the 30% change in NOx and VOC emissions that were modeled in the SEMAP project." (emphasis added) The Division continues to contend that the sensitivity analysis included in the 110(l) analysis is a conservative approach for quantifying air quality impacts of the removal of the I/M program and is appropriate as weight-of-evidence for the SIP revision.

Regarding Alpine's comments regarding Georgia's noninterference demonstration, please see the Division's response to the previous comment.

Comment: I appreciate TDEC-APC's consideration of use of alternate sensitivity factors to those determined to give erroneous results in its original study. I note that in my original comments, I did recommended that TDEC-APC consider using alternate methods and air quality modeling to determine the air quality impact of removing Middle Tennessee's I/M program. Absent the decision to run an air quality simulation (which appears to be the case here), it was my recommendation that should TDEC consider using an "impact factor"-like application to determine the impact of the removal of the I/M program in Middle Tennessee, it should use county and motor vehicle specific factors to make this first step assessment.

Instead, TDEC-APC used the pre-generated state-level impact factor values referenced by me and that I note are not consistent with the county-based analysis (or the most current emissions and emission projection estimates) recommended to be applied. The uniqueness of highway vehicle emissions in the Middle Tennessee area are likely significantly different that the mix of highway vehicle emissions in the entire state of Tennessee (as presented in Alpine's referenced report).

I continue to recommend that TDEC-APC consider using an "impact factor"-like application to determine the impact of the removal of the I/M program in Middle Tennessee, and it should use county and motor vehicle specific factors to make this first step assessment.

Response: The Division has used ozone sensitivity factors developed as part of the SEMAP project discussed in the 110(l) analysis. Those factors estimate how air quality levels respond to reduction in emissions from all source categories across the entire southeast. The Division then used, in the original response to comment document, Tennessee motor vehicle source category sensitivity factors that were developed by Alpine Geophysics. The Tennessee motor vehicle source category sensitivity factors estimated how air quality levels respond to reductions in emissions from mobile sources state-wide. Use of the more-specific factors showed that the removal of the I/M programs would have a lesser impact on air quality levels than the analysis using the SEMAP factors did. Based on these analyses, the Division finds no reason to believe that county based motor vehicle source category sensitivity factors (e.g., factors derived by modeling the reduction of emissions only in the county where the monitor is located) would yield significantly different results. For these reasons, the Division has determined that the generation and use of county based motor vehicle source category sensitivity factors, which would require modeling, is not necessary. The Division still contends that the sensitivity analysis included in the 110(l) analysis is a conservative approach for quantifying air quality impacts of the removal of the I/M program and is appropriate as weight-of-evidence for the SIP revision.

Comment: All programs that impact the air shed in the Middle Tennessee area should be considered when estimating what the incremental impacts of the removal of the I/M program would have on ozone concentrations. EPA has shown that air packets from as far away as California or New York can have impact on air quality in Tennessee. As a result, any regulation that has an impact to increase emissions could have an impact on Middle Tennessee air quality.

According to a report prepared by New York University Law School's State Energy and Environmental Impact Center, recent environmental rollbacks under the direction of the current administration could significantly increase greenhouse gas emissions and lead to thousands of extra deaths from poor air quality every year. Below is a list of 25 policy changes, classified into two categories: rules that were officially reversed and rollbacks still in progress.

(Note that the list of policy changes included in Alpine's comments are not included in this document.)

Response: Alpine is incorrect that all programs that impact Middle Tennessee should be considered in the analysis of removal of the I/M program. The Division will be submitting a State Implementation Plan revision for the removal of the I/M program. Section 110(l) of the Clean Air Act states, in pertinent part "The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment…" (emphasis added). In addition, the EPA guidance document entitled *Demonstrating Noninterference Under Section 110(l) of the Clean Air Act When Revising a State Implementation Plan* (dated June 8, 2005), instructs states to develop demonstrations pertaining to "a SIP revision that removes or modifies control measure(s) in the SIP." There is nothing in either the Act or guidance that would indicate that one should consider changes unrelated to the SIP revision. None of the policy changes included in Alpine's comments will be part of the SIP revision; therefore, the Clean Air Act does not require that they be addressed in this demonstration. The approach contained in the 110(l) analyses (comparing emissions with and without the I/M programs) was discussed with EPA prior to and during development of the analyses. Furthermore, EPA has reviewed the draft analyses and at no time suggested that emission changes unrelated to the SIP revision should be considered.

Response to Comments

Commenter: Several commenters

Comment: Several commenters stated that they were in favor of eliminating the I/M program due to the fact that if a vehicle fails the inspection, the repairs required to fix the problem can be very expensive.

Response: The TDEC-APC is aware that repairs can be very expensive to fix a vehicle that fails inspection. Several legislators who cosponsored the legislation have made this same comment about the expense of repairing a vehicle. As part of the current I/M program, the TDEC-APC offers waivers based on financial hardship that allow vehicle owners to register their vehicles after failing a test even if some or all of the necessary repairs are not made. If EPA approves removal of the I/M program, this expense would end. TDEC-APC encourages vehicle owners to properly maintain their vehicle in order to minimize the effects of air pollution from their motor vehicle.

Commenter: Several commenters

Comment: Several commenters stated that they were in favor of eliminating the I/M program due to the fact that vehicles are cleaner now than when the I/M program first started so the program is no longer necessary.

Response: It is true that new vehicles are less polluting than older vehicles. Total vehicle emissions for the Middle Tennessee area are projected to decrease as older more polluting vehicles are replaced by newer less polluting vehicles.

Commenter: Several commenters

Comment: The commenters were opposed to the removal of the I/M program. They expressed concern that the growing population in Middle Tennessee would increase air pollution from vehicles. Additionally, they were concerned with people who have respiratory illnesses.

Response: Except for a small portion of Sullivan County that is designated as nonattainment for sulfur dioxide, the entire State of Tennessee is in attainment with all of the National Ambient Air Quality Standards (NAAQS). Air quality in the Middle Tennessee area has improved greatly over the years and is currently in attainment with all of the NAAQS.

The NAAQS are set to protect public health with an adequate margin of safety. The noninterference demonstration shows that removing the I/M program does not interfere with attainment or maintenance of the NAAQS. Even though the population in Middle Tennessee is expected to grow, vehicle emissions are projected to decrease as older more polluting vehicles are replaced by newer less polluting vehicles.

Commenter: Several commenters

Comment: The commenters were opposed to the removal of the I/M program. They were concerned about the effects it would have on climate change.

Response: Light-duty motor vehicles do emit carbon dioxide (CO_2), which is a greenhouse gas. The I/M program in Tennessee is designed to address light-duty motor vehicles and ensure that vehicle emissions of carbon monoxide (CO), nitrogen oxides (NOx), and volatile organic compounds (VOC) are properly controlled. Thus, removing the I/M program does not directly affect the control of carbon dioxide.

Commenter: Commander Keith Stephens, MNPD

Comment: I would like to know if these counties (Davidson, Sumner, Wilson, Rutherford, Williamson, and Hamilton) have to continue emissions testing.

Response: These six counties (Davidson, Sumner, Wilson, Rutherford, Williamson, and Hamilton) are currently required to have vehicle emission testing. If the Environmental Protection Agency (EPA) approves the removal of the I/M program from the State Implementation Plan, then the I/M program in these five counties (Sumner, Wilson, Rutherford, Williamson, and Hamilton) will end 120 days after EPA approval. Under state law, Davidson County would have the option of continuing their program, but it is not mandatory.

Commenter: American Lung Association

Comment: The commenter requests the Air Pollution Control Board to allow local government to opt-in to continue testing and using this tool to protect air quality.

Response: By law (Public Chapter 953), the only county that can continue vehicle emission testing after the removal of the I/M program from the State Implementation Plan is Davidson County.

Commenter: American Lung Association, Representative Bob Freeman, Metropolitan Council, PEER, Indivisible Nashville and Middle Tennessee, Walk Bike Nashville, SPEAR

Comment: The commenters were opposed to the removal of the I/M program. They cited an American Lung Association report that states that four in ten American are living with unhealthy air.

Response: Except for a small portion of Sullivan County that is designated as nonattainment for sulfur dioxide, the entire State of Tennessee is in attainment with all of the National Ambient Air Quality Standards (NAAQS). Air quality in the Middle Tennessee area has improved greatly over the years and is currently in attainment with all of the NAAQS. The NAAQS are set to protect public health with an adequate margin of safety. The noninterference demonstration shows that removing the I/M program does not interfere with attainment or maintenance of the NAAQS.

Attachment 8

Board Order 20-003

TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
BUREAU OF ENVIRONMENT
DIVISION OF AIR POLLUTION CONTROL

IN THE MATTER OF

CLEAN AIR ACT SECTION 110(l)	)	
NONINTERFERENCE DEMONSTRATION FOR	)	
THE REMOVAL OF THE INSPECTION AND	)	ORDER NO. 20-003
MAINTENANCE PROGRAM IN MIDDLE TENNESSEE	)	

BOARD ORDER

The following matter came before the Tennessee Air Pollution Control Board on February 26, 2020.

The Tennessee Department of Environment and Conservation, Air Pollution Control Division (TDEC-APC) has prepared a Clean Air Act 110(l) Noninterference Demonstration for the removal of the inspection and maintenance (I/M) program in Middle Tennessee, which includes Davidson, Sumner, Wilson, Rutherford, and Williamson Counties. The I/M program started in Davidson County in 1985 and started in Sumner, Wilson, Rutherford, and Williamson Counties in 1994. The I/M program is currently required by the State Implementation Plan (SIP). On May 15, 2018, a new law (Public Chapter No. 953) was passed in Tennessee that calls for the elimination of the I/M program in Tennessee after the U.S. Environmental Protection Agency (EPA) approves a SIP revision. The TDEC-APC developed an emission inventory for the year 2022, and it shows small increases in emissions of carbon monoxide (CO), volatile organic compounds (VOC), and nitrogen oxides (NOx) due to the removal of the I/M program. These small increases in emissions are only expected to cause a small increase in ozone. The Noninterference Demonstration demonstrates that removing the I/M program from Tennessee's SIP will not interfere with attainment or maintenance of the ozone (O_3), fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), or lead (Pb) National Ambient Air Quality Standards (NAAQS).

A public hearing notice of the proposed Noninterference Demonstration was posted on the TDEC website on October 18, 2019. A Public Hearing was held on November 19, 2019. A public notice was posted on the TDEC website on January 16, 2020, for an additional 30-day comment period.

Following the Board's approval, the Noninterference Demonstration for the removal of the I/M program in Middle Tennessee shall be adopted.

Approved by the following members of the Air Pollution Control Board of the State of Tennessee, and entered on the 26th day of February 2020.