AIR QUALITY CONFORMITY DETERMINATION

FOR THE:

MobilityPlan 2040

CONNECTING PEOPLE AND PLACES

and

FY 2017-2020 Transportation Improvement Program

As Amended and Updated to Address Conformity for the 1997 8-Hour Ozone Standard

Adopted by TPO Executive Board

October 24, 2018

Air Quality Conformity Determination Report for the Knoxville Regional TPO 2018 Update of the Metropolitan Long-Range Transportation Plan, known as the "Mobility Plan 2040"

and

the accompanying Knoxville Regional TPO FY 2017-2020 Transportation Improvement Program

Prepared by:

Knoxville Regional TPO Staff

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ADOPTING RESOLUTION BY KNOXVILLE REGIONAL TPO EXECUTIVE BOARD FOR MOBILITY PLAN 2040 AND AIR QUALITY CONFORMITY DETERMINATION

**A RESOLUTION BY THE EXECUTIVE BOARD
OF THE KNOXVILLE REGIONAL
TRANSPORTATION PLANNING ORGANIZATION (TPO)
ADOPTING AMENDMENTS TO THE MOBILITY PLAN 2040 &
UPDATED AIR QUALITY CONFORMITY DETERMINATION REPORT**

WHEREAS, the Fixing America's Surface Transportation Act (FAST Act) requires that each MPO have a current metropolitan transportation plan; and,

WHEREAS, the guidance for the development of the metropolitan transportation plan, as found in the Final Rule for Metropolitan Transportation Planning and Programming in the Federal Register under section 23 CFR 450.322, was followed and,

WHEREAS, the metropolitan transportation plan must address all modes of transportation in an urban area, have a planning horizon of at least 20 years, and be financially constrained; and,

WHEREAS, the Clean Air Act Amendments of 1990 (CAAA) and the FAST Act require that transportation plans and programs conform to air quality goals established by the State Implementation Plan (SIP) for regions in nonattainment of an air pollution standard; and,

WHEREAS, the Knoxville Region is subject to air quality conformity requirements under the 1997 and 2008 8-Hour Ozone Standards and the 2006 Daily PM2.5 Standard; and,

WHEREAS, an Air Quality Conformity Determination Report was prepared to quantitatively demonstrate conformity of the Mobility Plan 2040 and FY 2017-2020 Transportation Improvement Program based on the required emissions tests and using the latest emissions model from the Environmental Protection Agency; and,

WHEREAS, the TPO's public outreach and Interagency Consultation procedures were adhered to with Mobility Plan 2040 and the Air Quality Determination being circulated for public review, presented at more than two open public meetings and coordinated with stakeholder and regulatory agencies through the Interagency Consultation process; and,

WHEREAS, the TPO Technical Committee has recommended the adoption of Amended Mobility Plan 2040; and,

NOW, THEREFORE, BE IT RESOLVED BY THE KNOXVILLE REGIONAL TRANSPORTATION PLANNING ORGANIZATION EXECUTIVE BOARD:

That Mobility Plan 2040 and the Air Quality Conformity Determination Report as Amended be adopted as the basis for transportation planning decisions in the Knoxville air quality non-attainment area including the TPO Planning area.

October 24, 2018
Date

Mayor Terry Frank
Anderson County
TPO Executive Board Vice Chair

Jeffrey A. Welch, AICP
Director
Knoxville Regional TPO

ADOPTING RESOLUTION BY KNOXVILLE REGIONAL TPO EXECUTIVE BOARD FOR FY 2017-2020 TIP AMENDMENTS

A RESOLUTION BY THE EXECUTIVE BOARD
OF THE KNOXVILLE REGIONAL
TRANSPORTATION PLANNING ORGANIZATION (TPO)
AMENDING THE FY 2017-2020 TRANSPORTATION IMPROVEMENT PROGRAM

WHEREAS, the FY 2017-2020 Knoxville Regional Transportation Improvement Program was adopted on October 26, 2016; and

WHEREAS, in accordance with requirements of the U.S. Department of Transportation, the elements of the transportation planning process are to receive final approval from the Executive Board of the local Metropolitan Planning Organization; and

WHEREAS, the Transportation Improvement Program must be updated as needed; and

WHEREAS, the proposed project amendments were reviewed with the Knoxville-Area Air Quality Interagency Consultation Group with respect to air quality conformity requirements and are either exempt from, or were demonstrated to conform with the federal transportation air quality conformity regulations from the Clean Air Act; and

WHEREAS, a conformity determination report with a full revised regional emissions analysis was prepared for the project amendments which concluded that air quality conformity was demonstrated; and

WHEREAS, the amended FY2017-2020 TIP was updated consistent with the Mobility Plan 2040; and

WHEREAS, the Knoxville Regional Transportation Planning Organization Technical Committee recommends approval of the Resolution, and

NOW, THEREFORE, BE IT RESOLVED BY THE KNOXVILLE REGIONAL TRANSPORTATION PLANNING ORGANIZATION EXECUTIVE BOARD;

That the FY 2017-2020 Transportation Improvement Program be amended to include the following changes and that the Tennessee Department of Transportation include these amendments into the State Transportation Improvement Program:

Attachment #3B - Amendment 17-2017-056 (I-75) - Amend the TIP by adding this project. This is a TDOT IMPROVE Act project and involves widening I-75 from 4 to 6 lanes from near SR-131 (Emory Road) to near SR-170 (Raccoon Valley Rd). The project length is 5.14 miles. The project programs $9,600,000 ($8,640,000 federal/$960,000 state) NHPP funding in FY 2019. The total project cost is $98,000,000.

Attachment #3C - Amendment 17-2014-069 (Alcoa Hwy. (SR-115/US-129)) - Amend project by adding construction phase totaling $69,000,000 ($55,200,000 federal/$13,800,000 state) in NHPP funding in FY 2019. This amendment also adds "IA" (denoting Improve Act) to the project description and increases the total project cost from $41,200,000 to $84,004,375.

Attachment #3D - Amendment 17-2011-082 (Montvale Road (SR-336)) - Amend the TIP by adding this project. This project widens SR-336 from Montvale Station Road to SR-73 (Lamar Alexander Parkway). It is funded with $5,300,000 S-STBG ($4,240,000 federal/$1,060,000 state) for FY19 ROW. The total project cost is $12,800,000.

Attachment #3E - Amendment 17-2014-038 (Washington Pike) - Amend the TIP by adding this project for PE-D in FY 2019 (project was previously removed from the 2017-2020 TIP). This project widens Washington Pike from north of I-640 to Murphy Road. It is funded with $300,000 L-STBG ($240,000 federal/$60,000 local). The total project cost is $15,146,000.

October 24, 2018
Date

Mayor Terry Frank
Anderson County
TPO Executive Board Vice Chair

Jeffrey A. Welch, AICP
Director
Knoxville Regional TPO

ADOPTING RESOLUTION BY LAKEWAY AREA METROPOLITAN TRANSPORTATION PLANNING ORGANIZATION EXECUTIVE BOARD FOR AIR QUALITY CONFORMITY DETERMINATION

Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO)
Morristown, TN – Jefferson City, TN – White Pine, TN – Hamblen County, TN – Jefferson County, TN

Resolution Number: 2018-013
A RESOLUTION APPROVING THE AIR QUALITY CONFORMITY DETERMINATION REPORT AS PREPARED BY THE KNOXVILLE TPO

WHEREAS, a comprehensive, cooperative, and continuing transportation planning process is to be carried out in the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) study area; and

WHEREAS, The Executive Board of the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) serves as a forum for cooperative decision making on transportation issues in the Urbanized Area; and

WHEREAS, the Lakeway Area Metropolitan Transportation Planning Organization promotes the safety, protection, and enhancement of transportation corridors within its jurisdictional boundaries, and

WHEREAS, the Lakeway Area Metropolitan Transportation Planning Organization and the Knoxville TPO are within the same area previously designated nonattainment for the 1997 8-Hour Ozone Standard and have a Memorandum of Agreement to cooperatively address transportation conformity requirements for ozone, and

WHEREAS, the Knoxville TPO has prepared Air Quality Conformity Determination that cover the entire Ozone Maintenance Area, including the LAMTPO planning area within Jefferson County, which has determined that all current plans and programs within LAMTPO meet the air quality conformity requirements.

NOW, THEREFORE, BE IT RESOLVED, that the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) Executive Board approves the air quality conformity determination as prepared by the Knoxville TPO.

This Resolution shall be effective upon its passage and approval.

ATTEST:

October 26, 2018

Chairman
LAMTPO Executive Board

Date

APPROVAL LETTER BY U.S. DOT FOR AIR QUALITY CONFORMITY DETERMINATION

U.S. Department of Transportation
Federal Highway Administration

Tennessee Division

404 BNA Drive, Suite 508
Nashville, Tennessee 37217
Phone (615) 781-5770

November 19, 2018

Ms. Tanisha Hall
Director, Long Range Planning Division
Tennessee Department of Transportation
James K. Polk Building, Suite 900
Nashville, TN 37243

In Reply Refer To:
HPD-TN

Subject: Air Quality Conformity Determination for Knoxville, Tennessee

Dear Ms. Hall:

The Federal Highway Administration (FHWA) Tennessee Division and Federal Transit Administration (FTA) Region IV Office, in coordination with the Environmental Protection Agency (EPA) Region IV Office, have reviewed the Air Quality Conformity Determination Report adopted by the Knoxville Regional Transportation Planning Organization (TPO) Executive Board on October 24, 2018 and the Lakeway Metropolitan Transportation Planning Organization (MTPO) Executive Board on October 26, 2018.

The Air Quality Conformity Determination addresses the planned transportation improvements from the Knoxville TPO's amended Mobility Plan 2040; the Knoxville TPO's amended Fiscal Year (FY) 2017-2020 Transportation Improvement Program (TIP); and the Lakeway MTPO's 2040 Long Range Transportation Plan and FY 2017-2020 TIP. This determination covers the Knoxville, TN maintenance area for the 2006 Daily PM2.5 and 2008 8-hour ozone National Ambient Air Quality Standards (NAAQS) as well as the former maintenance area for the 1997 ozone NAAQS in accordance with FHWA's *Updated Interim Guidance on Conformity Requirements for the 1997 Ozone NAAQS*.

Based on our review, we find the above-referenced documents meet the transportation conformity requirements at 40 CFR Part 93 and associated guidance.

FHWA and FTA appreciate the efforts of the Tennessee Department of Transportation (TDOT), Tennessee Department of Environment and Conservation (TDEC), the Knoxville Regional TPO and the Lakeway MTPO in fully addressing the unexpected transportation conformity requirements associated with the 1997 Ozone NAAQS.

If you have any questions regarding this determination, please contact me at (615) 781-5767.

Sincerely,

Sean Santalla
Planning & Air Quality Specialist

cc: Mr. Tom Taylor, Executive Board Chair, Knoxville Regional TPO
Mr. Mark Potts, Executive Board Chair, Lakeway MTPO
Ms. Theresa Claxton, Program Development Team Leader, FHWA TN Division
Mr. Andres Ramirez, Community Planner, FTA Region IV
Ms. Kelly Sheckler, Environmental Scientist, EPA Region IV
Ms. Dianna Myers, Environmental Scientist, EPA Region IV
Mr. Larry McGoogin, Comprehensive Planning Assistant Director, TDOT
Mr. Kwabena Aboagye, OCT Planning Manager, TDOT
Mr. Troy Ebbert, OCT Region 1 Planning Supervisor, TDOT
Ms. Deborah Fleming, Senior Regional Planner, TDOT
Mr. Jeff Welch, Director, Knoxville Regional TPO
Mr. Mike Conger, Senior Transportation Engineer, Knoxville Regional TPO
Mr. Richard DesGroseilliers, MTPO Coordinator, Lakeway MTPO
Mr. Marc Corrigan, Environmental Consultant, TDEC

x

EXECUTIVE SUMMARY

OVERVIEW AND PURPOSE

The Knoxville Regional Transportation Planning Organization (KRTPO) has conducted a regional emissions analysis to support an air quality conformity demonstration for an update to its Metropolitan Long-Range Transportation Plan (LRTP) known as the Mobility Plan 2040 and for resulting amendments to its FY 2017-2020 Transportation Improvement Program (TIP) to ensure that the TIP is a direct subset of the LRTP. The purpose of this report is to document that the updated LRTP and TIP conform to federal regulations from the latest surface transportation act known as "Fixing America's Surface Transportation Act" (FAST Act) and the Clean Air Act Amendments of 1990.

This action is considered a minor update to the LRTP as opposed to one of the major updates that occurs on a 4-year cycle as required by the FAST Act. The last major update of the LRTP was adopted in April 2017 and another major update is not due until April 2021. The main purpose for conducting this interim update is to address a requirement that resulted from a DC Circuit Court ruling on February 16, 2018 in a case brought by environmental group petitioners against the Environmental Protection Agency (EPA). The case involved the treatment of certain "anti-backsliding" requirements that occur in the transition between old and new air quality standards. The EPA had previously removed the requirement to conduct air quality conformity for the 1997 8-hour Ozone Standard for areas that were subject to the new, more stringent 2008 8-hour Ozone Standard. The Court ruled in favor of the plaintiffs who argued that this conformity requirement should remain. It should be noted, however, that EPA has not issued official guidance subsequent to the court decision and has in fact filed a petition for a rehearing of the case. The Federal Highway Administration (FHWA) issued guidance on 4/23/2018 to comply with the intent of the court ruling by advising that certain actions would be considered on-hold including addition of non-exempt projects to a Metropolitan Transportation Plan and TIP until conformity with the 1997 ozone NAAQS is determined.

Therefore, in order to maintain a conforming long-range plan and allow air quality conformity non-exempt projects to be added or amended to the current Transportation Improvement Program, the Knoxville TPO must demonstrate conformity to the 1997 Ozone Standard once again. This document serves that purpose as well as providing an opportunity to address minor changes to the project list as described in a subsequent section.

An Air Quality Conformity Determination for transportation plans and programs within the Knoxville Region is required since it is currently designated as a "Maintenance Area" for the Particulate Matter 2.5 (PM2.5) Daily and Annual Standards and for the 8-Hour Ozone Standard. The United States Environmental Protection Agency (EPA) sets air quality standards through the Clean Air Act in order to protect human health and the environment from unsafe levels of pollution. The transportation conformity process is used to ensure that federal funds will not be spent on projects that cause or contribute to any new violations of the National Ambient Air Quality Standards (NAAQS); increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone.

The Knoxville Region is currently subject to transportation conformity requirements based on the designations under three separate NAAQS in the following specific geographic locations:

- **1997 8-hour Ozone Standard** – Anderson, Blount, Jefferson, Knox, Loudon, Sevier and part of Cocke counties. This standard was revoked by EPA, but currently conformity is required based on the FHWA guidance referred to above.

- Maintenance for **2008 8-hour Ozone Standard** – Blount, Knox, and part of Anderson counties
- Maintenance for **2006 Daily PM2.5 Standard** – Anderson, Blount, Knox, Loudon and part of Roane counties

There are portions of counties designated as Maintenance that lie outside of the KRTPO Metropolitan Planning Area. The KRTPO compiles a single overall transportation plan that encompasses the entire Nonattainment and Maintenance areas for the purposes of demonstrating conformity for the entire region.

EMISSIONS ANALYSIS SUMMARY

In order to be able to demonstrate conformity of the TPO's transportation plans with the applicable NAAQS, a regional emissions analysis is performed using outputs from a regional transportation model and a mobile source emissions model from EPA known as "MOVES" (Motor Vehicle Emission Simulator). An estimate of emissions is generated for various required analysis years between the present year and the final year of the LRTP and compared against allowable amounts that have been formally set as part of a State Implementation Plan known as "Motor Vehicle Emissions Budgets" (MVEB).

2006 DAILY PM2.5 STANDARD

The PM2.5 air quality standard consists of two different measurement timeframes – an annual level and a daily level – based on the health effects that can occur for short-term versus long-term exposures. The designation as a nonattainment area under the Annual PM2.5 Standard became effective on April 5, 2005 and the designation as a nonattainment area for the Daily PM2.5 Standard became effective on December 14, 2009. The EPA approved a redesignation of the area to Attainment with a Maintenance Plan effective on August 28 and 29, 2017 for the daily and annual standards respectively. The Region is meeting the current (2012) Annual PM2.5 Standard of 12 µg/m3 and the 1997 Standard has been revoked by EPA, thereby removing the requirement to demonstrate conformity for the Annual Standard.

The EPA published a notice announcing a finding that the 2014 and 2028 Motor Vehicle Emissions Budgets (MVEB) for Direct PM2.5 and Oxides of Nitrogen (a PM2.5 precursor pollutant) included in the Maintenance SIP are adequate for the purposes of transportation conformity in the Federal Register / Vol. 82, No. 46, page 13347 on March 10, 2017. A regional emissions analysis was conducted using inputs consistent with both the SIP and other latest planning assumptions. The computed emissions from on-road mobile sources compared against the MVEB in the 2006 Daily PM2.5 Maintenance Area for the analysis years of 2024, 2028 (interpolated), 2030 and 2040 are shown in Table 1.

Table 1: MVEB Test for 2006 Daily PM2.5 Standard

Direct Particulate Matter 2.5:	Analysis Year			
	2024	2028	2030	2040
MVEB	1.22	0.67	0.67	0.67
Projected Emissions (tons per day)	0.52 ✓	0.49 ✓	0.44 ✓	0.46 ✓
Oxides of Nitrogen (NOx):	**2024**	**2028**	**2030**	**2040**
MVEB	42.73	19.65	19.65	19.65
Projected Emissions (tons per day)	15.51 ✓	14.11 ✓	11.31 ✓	9.71 ✓

2008 OZONE STANDARD

The nonattainment designation for the 2008 8-hour Ozone Standard became effective on July 20, 2012. A redesignation request to Attainment with a Maintenance Plan was submitted to EPA by the Tennessee Department of Environment and Conservation (TDEC) in November 2014 and approved by EPA on July 13, 2015 with an effective date of August 12, 2015. Therefore, as of August 12, 2015 the Knoxville Region is considered a "Maintenance Area" for the 2008 Ozone Standard.

The EPA published a notice announcing a finding that the 2011 and 2026 Motor Vehicle Emissions Budgets (MVEB) for NOx and VOC included in the Maintenance SIP are adequate for the purposes of transportation conformity in the Federal Register / Vol. 80, No. 133, page 39970 on July 13, 2015.

A regional emissions analysis was conducted using inputs consistent with both the SIP and other latest planning assumptions, which are documented in Chapter 3 of this report. The computed emissions from on-road mobile sources compared against the MVEB in the 2008 Ozone Maintenance Area for the analysis years of 2024, 2026 (interpolated), 2030 and 2040 are shown in Table 2.

Table 2: MVEB Test for 2008 Ozone Standard

Volatile Organic Compounds (VOC):	Analysis Year			
	2024	2026	2030	2040
MVEB	19.71	10.49	10.49	10.49
Projected Emissions (tons per day)	7.35 ✓	6.00 ✓	5.32 ✓	4.14 ✓
Oxides of Nitrogen (NOx):	**2024**	**2026**	**2030**	**2040**
MVEB	41.62	17.69	17.69	17.69
Projected Emissions (tons per day)	10.51 ✓	8.35 ✓	7.27 ✓	5.77 ✓

1997 OZONE STANDARD

The 1997 8-Hour Ozone conformity analysis consists of a Motor Vehicle Emission Budget (MVEB) Test for ozone-forming emissions of "Volatile Organic Compounds" (VOC) and "Oxides of Nitrogen" (NOx). The MVEB was established for the year 2024 as a part of the 8-Hour Ozone Redesignation Request and Maintenance Plan. A notice announcing the effective date of September 30, 2010 for these budgets was published in Federal Register/ Vol. 75, No. 178 on September 15, 2010. The results of the emissions analysis are summarized in Table 3.

Table 3: MVEB Test for 1997 Ozone Standard

Volatile Organic Compounds (VOC):	Analysis Year		
	2024	2030	2040
MVEB (1997 8-Hour for year 2024)	25.19	25.19	25.19
Projected Emissions *(tons per day)*	13.34 ✓	9.90 ✓	8.02 ✓
Oxides of Nitrogen (NOx):	**2024**	**2030**	**2040**
MVEB (1997 8-Hour for year 2024)	36.32	36.32	36.32
Projected Emissions (tons per day)	22.89 ✓	17.15 ✓	14.95 ✓

SUMMARY CONFORMITY STATEMENT

In summary, the emissions analysis performed by the KRTPO demonstrates that the projected emissions from the proposed transportation system are less than the allowable amount for each of the required analysis years and thus conformity for the 2008 8-Hour Ozone, Annual PM2.5, and Daily PM2.5 standards has been demonstrated for the affected current transportation plans and the project amendments thereto.

The conformity determination was coordinated with stakeholder and regulatory agencies through an Interagency Consultation process and a 30-day public review and comment period was held. A summary of comments that were received and responses is included in the report.

CHAPTER 1 - INTRODUCTION AND BACKGROUND INFORMATION

1.0 INTRODUCTION

The primary purpose of this document is to demonstrate that an update to the Knoxville TPO Metropolitan Long Range Transportation Plan, known as "Mobility Plan 2040" and the Knoxville Regional Transportation Planning Organization (KRTPO) FY 2017-2020 Transportation Improvement Program (TIP) (as amended) meet Transportation/Air Quality Conformity requirements of the Clean Air Act and Fixing America's Surface Transportation Act (FAST Act).

Federal Transportation Planning Regulations (23 CFR 450) require Metropolitan Planning Organizations to prepare a comprehensive Long Range Transportation Plan (LRTP) that covers a minimum 20-year horizon. The LRTP is required to be updated every four years in order to ensure that the underlying planning assumptions are still valid. The TPO is also required to prepare a four-year program of projects known as a Transportation Improvement Program (TIP) that must be consistent with the approved LRTP.

This conformity determination is not addressing one of the major update cycles of the LRTP and is instead an interim update that was brought about primarily by a February 16, 2018 ruling by the DC Circuit Court. The case involved the treatment of certain "anti-backsliding" requirements that occur in the transition between old and new air quality standards where the new standard is more stringent than the old. The EPA had previously removed the requirement to conduct air quality conformity for the 1997 8-hour Ozone Standard for areas that were subject to the new, more stringent 2008 8-hour Ozone Standard. The Court ruled in favor of the plaintiffs who argued that this conformity requirement should remain. It should be noted, however, that EPA has not issued official guidance subsequent to the court decision and has in fact filed a petition for a rehearing of the case. The Federal Highway Administration (FHWA) issued guidance on 4/23/2018 to comply with the intent of the court ruling by advising that certain actions would be considered on-hold including addition of non-exempt projects to a Metropolitan Transportation Plan and TIP until conformity with the 1997 ozone NAAQS is determined.

In order to maintain a conforming long-range plan and allow air quality conformity non-exempt projects to be added or amended to the current Transportation Improvement Program, the Knoxville TPO must demonstrate conformity to the 1997 Ozone Standard once again. This document serves that purpose as well as providing an opportunity to address minor changes to the Mobility Plan project list as described in a subsequent section.

1.1 BACKGROUND ON TRANSPORTATION CONFORMITY

Transportation Conformity is required in nonattainment and maintenance areas by federal regulations (40 CFR Parts 51 and 93) and is the mechanism through which on-road mobile source emissions are addressed in the area's goals for cleaner air. The air quality conformity process is used to ensure that federal funds will not be spent on projects that cause or contribute to any new violations of the National Ambient Air Quality Standards (NAAQS); increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone. The CAA requires that metropolitan transportation plans, metropolitan transportation improvement programs (TIPs) and Federal projects conform to the purpose of the State Implementation Plan (SIP), which details the emissions levels from each sector including mobile sources needed to regain compliance with the air quality standard. If conformity is not demonstrated then the area may enter what is known as a conformity "lapse" period, which can trigger highway sanctions by the EPA under the authority of the Clean Air Act (CAA)

meaning only very specific projects may move forward, while funding is essentially frozen for most new roadway construction or widening projects. Under section 179(b)(1) of the CAA, once EPA imposes highway sanctions the FHWA may not approve or award any grants in the sanctioned area except those that are specifically exempted such as safety and air quality improvement projects that do not encourage single occupancy vehicle capacity. The conformity regulations in 40 CFR 93.104(f) allow for a 12-month lapse grace period during which projects that were in the most recent conforming plan and TIP can continue to move forward, but new non-exempt projects cannot be added.

The general criteria and procedures for determining conformity of transportation plans (in this case both the LRTP and TIP) are described in 40 CFR 93.109 as:

- Latest Planning Assumptions (40 CFR 93.110)
- Latest Emissions Model (40 CFR 93.111)
- Consultation (40 CFR 93.112)
- TCMs (40 CFR 93.113)
- Emissions Budget (40 CFR 93.118)

Subsequent sections of this report document the assumptions, model inputs and procedures used to satisfy the above requirements in conducting the regional emissions analysis to demonstrate transportation conformity for the amendments to the Mobility Plan 2040 and the FY 2017-2020 TIP.

1.2 BACKGROUND ON THE KNOXVILLE REGION OZONE AND PM2.5 MAINTENANCE AREAS

The Clean Air Act requires the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for six “Criteria Pollutants” – Particulate Matter, Ozone, Nitrogen Dioxide, Carbon Monoxide, Sulfur Dioxide, and Lead in order to protect human health and the environment from unsafe levels of these pollutants. These pollutants are regulated through the EPA setting maximum limits on exposure levels that must be reviewed periodically. Regions, which are found to be out of compliance with those limits, may be designated as a “Nonattainment Area”.

The Knoxville Region has previously been in non-attainment for two criteria pollutants (ground-level ozone and fine particulate matter) under federal NAAQS with detailed history of EPA designations for Ozone and PM2.5 following below.

1.2.1 OZONE

The region’s first nonattainment designation for ground-level ozone became effective in January 1992 under the “1-Hour Ozone Standard” and included only Knox County. The area was able to demonstrate attainment with that standard effective in October 1993 and was then considered a “Maintenance Area”.

EPA promulgated a more stringent ozone standard in 1997 known as the “1997 8-Hour Ozone Standard” which was set at 80 parts per billion (ppb). The EPA designated the counties of Anderson, Blount, Jefferson, Knox, Loudon, Sevier, and a portion of Cocke within the Great Smoky Mountains National Park in non-attainment of the 1997 8-hour standard for ground level ozone. This nonattainment designation became effective on June 15, 2004. The area demonstrated attainment with this standard effective in March 2011 and was considered a Maintenance Area.

EPA again strengthened the ozone standard in 2008 based on an updated review of scientific and medical data to ensure that air quality standards are set at an appropriate level to protect the environment and human health. This

standard is known as the “2008 8-hour Ozone Standard” and it was set at 75 ppb. A formal designation of nonattainment areas for this standard became effective on July 20, 2012 and included the counties of Blount and Knox plus a portion of Anderson County surrounding the TVA Bull Run Fossil Plant. The EPA approved a re-designation of the area to Attainment with a Maintenance Plan effective on August 12, 2015.

Figures 1 & 2 below show the affected geographies for the 1997 and 2008 Ozone Standards:

Figure 1: Knoxville 1997 8-Hour Ozone Maintenance Area

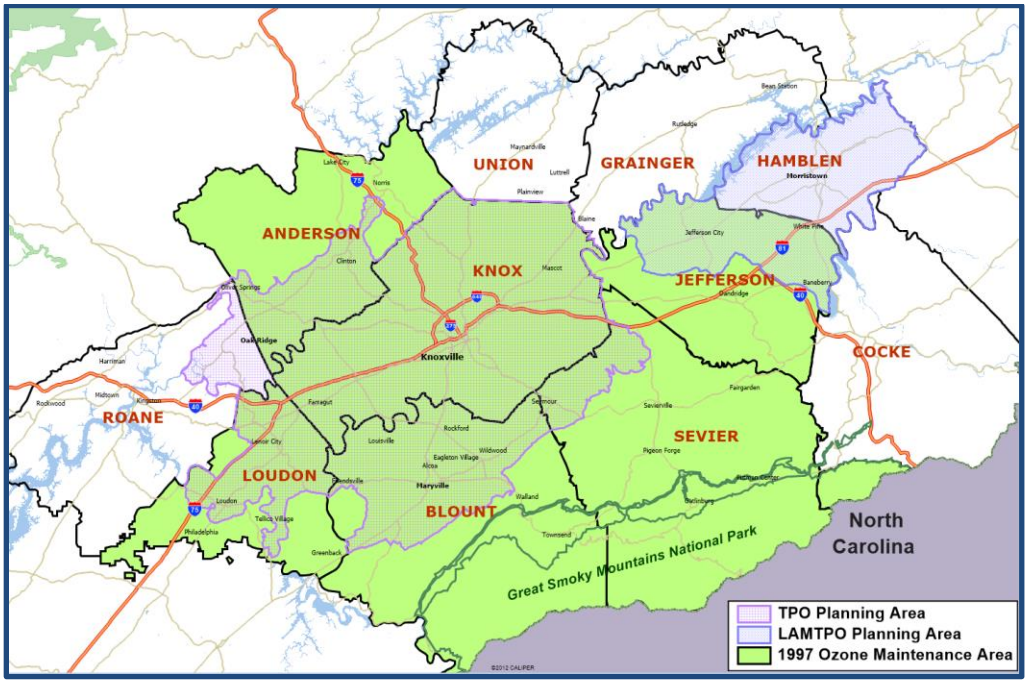
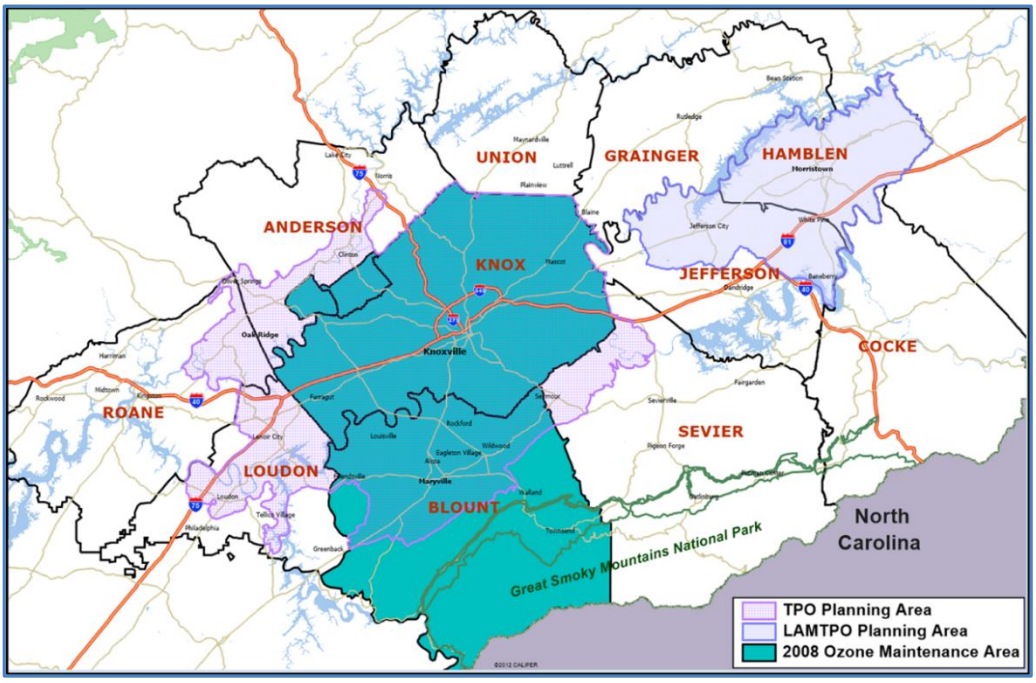


Figure 2: Knoxville 8-Hour Ozone Maintenance Area



1.2.2 PM2.5

The EPA first promulgated air quality standards for fine particulate matter less than 2.5 microns in diameter (PM2.5) in 1997 due to evidence that these fine particles pose a significant health risk because of their ability to lodge deeply within the lungs. The PM2.5 air quality standard consists of two different measurement timeframes – an annual level and a daily level – based on the health effects that can occur for short-term versus long-term exposures. The EPA set these initial standards on a daily (65 micrograms/cubic meter) and an annual (15 micrograms/cubic meter) basis for levels of PM2.5.

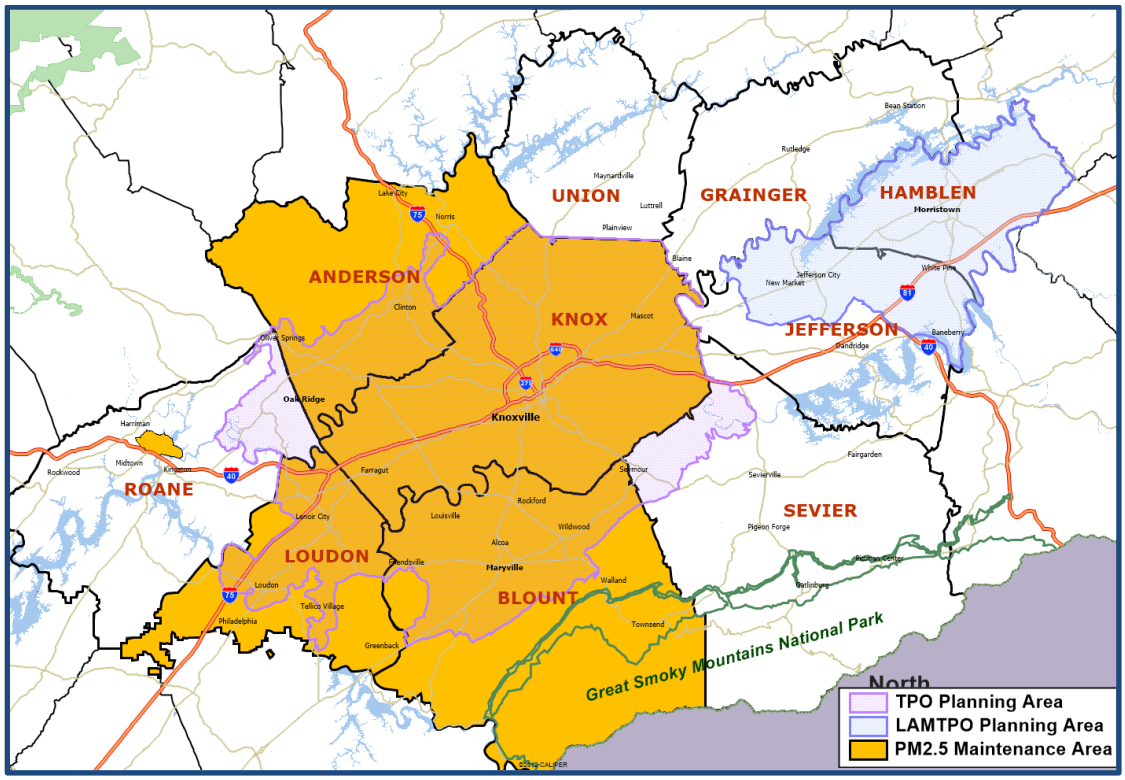
On April 5, 2005, the EPA formally designated the counties of Anderson, Blount, Knox, Loudon, and a portion of Roane in non-attainment for the 1997 Annual PM2.5 Standard. As a result of the PM2.5 designation, the TPO updated the Mobility Plan in 2006, expanding the Knoxville Region to include that portion of Roane County not included in the original Plan and prepared an updated conformity determination.

EPA strengthened the PM2.5 standard in 2006 by reducing the permissible daily levels of PM2.5 from 65 to 35 micrograms per cubic meter. The same counties that were designated under the 1997 Annual PM2.5 Standard were formally designated nonattainment for the 2006 Daily PM2.5 Standard effective December 2009.

The EPA approved a redesignation of the area to Attainment with a Maintenance Plan effective on August 28 and 29, 2017 for the daily and annual standards respectively. The Region is meeting the current (2012) Annual PM2.5 Standard of 12 µg/m3 and the 1997 Standard has been revoked by EPA, thereby removing the requirement to demonstrate conformity for the Annual Standard.

The current Knoxville Region Maintenance Areas for the 2006 Daily PM2.5 Standard is shown in Figure 3 below:

Figure 3: Knoxville PM2.5 Daily Standard Maintenance Area



1.3 EMISSIONS ANALYSIS BACKGROUND

Transportation Conformity is demonstrated through a technical process known as an "emissions analysis", in which future estimates of emissions from the transportation system are compared against what has been determined to be sufficient to allow the area to re-attain the air quality standard. Different types of emissions are involved in the production of Ozone and PM2.5 pollution as described below:

- **Ozone:** Ozone is not directly emitted into the atmosphere; rather it is formed through a chemical reaction between "Volatile Organic Compounds" (VOC) and "Oxides of Nitrogen" (NOx) in the presence of sunlight. Mobile-sources contribute both sources of emissions – VOC are primarily formed from the evaporation of motor fuel, while NOx is formed from the internal combustion process and emitted in vehicle exhaust.
- **PM 2.5:** There are some PM2.5 emissions, known as "Direct PM2.5", that are directly emitted from motor vehicles. Direct PM2.5 emissions consist of elements contained in vehicle exhaust as well as particles resulting from brake and tire wear. In addition, it is believed that NOx emissions can contribute to secondary formation of PM2.5 so it is included in the emissions analysis.

1.4 EMISSIONS ANALYSIS PROCEDURE

The emissions analysis is performed primarily using two different models – a Travel Demand Forecasting Model (TDFM), developed by the KRTPO and the MOVES2014a mobile source emissions model, which was developed by the EPA and allows the user to input localized parameters. The TDFM provides outputs of the estimated Vehicle Miles of Travel (VMT) on the transportation system and associated average speeds by functional classification. The MOVES2014a model uses the activity data from the TDFM and combines it with other inputs describing the analysis area to derive an overall emissions amount. This procedure is known as the "Inventory Mode" of MOVES2014a, which was chosen for this analysis as opposed to the "Emission Rate Mode" of MOVES2014a, which produces emissions rates that must be subsequently post processed with the TDFM activity data.

Appendix B of this document describes the MOVES2014a input structure that was used in the emissions analysis.

Finally, the emissions analysis must also be performed for different years throughout the life of the LRTP. Since the timeframe covered by the LRTP is from 2017-2040, and MVEBs are available for both Ozone and PM2.5, 40 CFR part 93.118 establishes the required analysis years and emissions tests. In general, the required analysis years include:

- Attainment Year for applicable pollutants
- Last Year of the maintenance plan for applicable pollutants
- Any other years for which the maintenance plan establishes budgets
- Last year of the timeframe of the conformity determination
- Years such that there are no more than 10 years between analysis years

Following are the analysis years that were selected to meet the above requirements for this conformity analysis:

- 2024 – Motor Vehicle Emission Budget Year for 1997 Ozone Standard
- 2026 – Last Year of 2008 Ozone Standard Maintenance Plan (interpolated)
- 2028 – Last Year of the 1997 Annual and 2006 Daily PM2.5 Standards Maintenance Plan (interpolated)
- 2030 – Year no greater than 10 years apart
- 2040 – Last Year of Transportation Plan

The reason that years 2026 and 2028 are designated as being interpolated is that per the conformity regulations in 40 CFR 93.118(d) it states “the emissions for years for which consistency with motor vehicle emission budgets must be demonstrated may be determined by interpolating between the years for which the regional emissions analysis is performed”. The interpolation is performed as a linear regression between the two emissions outputs for years 2024 and 2030 and is a much simpler analysis than setting up a travel demand model and MOVES model run to specifically quantify emissions for those years.

CHAPTER 2 – SUMMARY OF PROJECT AMENDMENTS

2.0 INTRODUCTION

As noted previously, the purpose of this conformity analysis is not to address an overall, major update of the Mobility Plan 2040, which was adopted just over one year ago. The primary purpose is to address the requirement to demonstrate conformity to the 1997 8-hour Ozone Standard and allow for minor updates to the project list to ensure continued consistency between the Mobility Plan and the FY 2017 – 2020 Transportation Improvement Program. Appendix D includes the final revised project list and following is a summary of the modifications being made to the project list and TIP amendments that are addressed by this conformity analysis:

- Analysis Year Modification – The previous conformity determination utilized the year 2022 as the first horizon year whereas the year 2024 is being used in this analysis. The main reason for the change is that the year 2024 is a "budget-year" for the 1997 8-hour Ozone Standard and also meets the requirement to have analysis years no more than 10 years apart. The entire set of projects was reviewed to determine their most appropriate horizon year of expected completion based on discussions with local jurisdictions and TDOT regarding project schedules. This resulted predominantly of projects in the previous 2022 analysis year moving to 2024 as well as some of the projects in the 2030 analysis year moving to 2024.

- TIP Amendments - There are four (4) non-exempt project amendments to the FY 2017 – 2020 TIP of projects that are included in the existing Mobility Plan project list. Two of those amendments would likely have been able to demonstrate conformity through a "Short Conformity Report" since they are consistent with how they are shown in the Mobility Plan project list with respect to scope, termini and horizon year. The other two projects cross one or more of the conformity horizon years and therefore a revised regional emissions analysis likely would have been required. Additionally, there is one TDOT STIP amendment for a project in Sevier County, located outside of the TPO planning area, but within the area previously impacted by the 1997 Ozone Area.

- Add Projects from TIP to Mobility Plan – There have been a few smaller-scale projects amended to the FY 2017-2020 TIP since the adoption of the Mobility Plan that were determined to be "consistent" with the Mobility Plan goal areas. These projects must be "exempt" projects by definition since otherwise they would not be able to be amended into the TIP without an accompanying LRTP amendment and revised regional emissions analysis to demonstrate conformity. Each time an LRTP update is conducted it has been the practice of the TPO to assign these projects a Mobility Plan ID number and formally include them in the updated project list for identification and public information.

- Revise Project Descriptions/Termini/Length for Consistency with TIP – As projects progress through the project development process of preliminary engineering and design there are often minor adjustments to the scope and description. This update provides an opportunity to make these minor adjustments and clarify project description consistency between the Mobility Plan and the TIP. These changes are not significant enough to affect the overall manner in which the project was modeled for conformity, i.e. no change in the number of through lanes or other major model attribute that affects capacity.

- Add Projects within 1997 Ozone Area outside TPO Planning Area – The boundary of the area affected by the 1997 Ozone Standard extends well beyond the limits of the TPO Planning Area and also includes portions of the Lakeway Area MTPO Planning Area. The TPO staff consulted with TDOT and LAMTPO staff to determine the additional projects under development within that extended area.

2.1 ANALYSIS YEAR MODIFICATION

As noted in the introduction of this section, the first analysis year was modified from 2022 to 2024 for this updated regional emissions analysis and therefore several projects including all those with a "2022" analysis year were modified. There were some projects that were previously in the 2030 analysis year that were "moved up" to the new 2024 analysis year because although they weren't believed to be able to be completed by 2022 they are currently on track to be complete and open to traffic by the end of 2024. There are also a few projects that have been delayed and are being pushed back to later analysis years as well as some with the opposite action of moving ahead in priority and projected schedule to a nearer-term horizon year. The full revised project list reflects the current analysis year for all projects and is included in Appendix D. The following table highlights those major (non-exempt) projects in the previous 2030 analysis year that are now in the 2024 analysis year, as well as other projects crossing analysis years due to being either delayed or moved up in priority:

Table 4: Projects with Revised Analysis Years

KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	Old Analysis Year	New Analysis Year
Delayed Projects								
09-248a	Topside Road (SR-333) Improvements - Phase 1	Wrights Ferry Rd to TVA Lab Rd	Alcoa	TDOT	1	Add continuous center turn lane	2022	2030
17-417	J. Carmichael Greer Bike/Pedestrian Conversion Project	City Park Drive to Tellico Parkway/Highway 444	Loudon County	Loudon County	1.44	Conversion of existing 2-lane vehicle bridge and approaches at Fort Loudoun Dam to a pedestrian and bicycle shared use path	2022	Illustrative
13-1001	Old Stage Rd/Kingston Pk Greenway Connector	Old Stage Rd.to near Everett Rd.	Farragut	Farragut	0.4	Construction of an 8 foot asphalt greenway from the north side of Kingston Pk. near Everett Rd.	2022	Illustrative
17-201	Amerine Road Improvements	Fielding Drive to Sevierville Rd	Maryville	Maryville	0.5	Reconstruct 2-lane road with addition of turn lanes and sidewalk	2022	2030
Previous Year 2030 Projects Moving to 2024 Analysis Year								
09-262	Montvale Rd (SR-336) Widening	Montvale Station Rd to Lamar Alexander Pkwy (US-321/SR-73)	Maryville	TDOT	0.6	Widen existing roadway to 2-12 foot travel lanes with a 12 foot center turn lane including curb and gutter, sidewalk and a multi-use path	2030	2024
09-257	Relocated Alcoa Hwy (SR-115/US-129)	Proposed interchange at Tyson Blvd. to Pellissippi Pkwy (SR-162)	Alcoa	TDOT	2.9	New alignment, four lane divided facility, construct an interchange at Pellissippi Parkway (SR-162)	2030	2024
09-258	Relocated Alcoa Hwy (SR-115/US-129)	Pellissippi Pkwy (SR-162) to South Singleton Station Rd	Alcoa	TDOT	1.3	Construct new 4-lane divided highway with auxiliary lanes and new interchange at Singleton Station Rd	2030	2024
09-637	Lovell Rd Widening (SR-131)	Cedardale Ln. to Middlebrook Pk. (SR-169)	Knox County	Knox County	1.7	Widen 2-lane to 4-lane, including pedestrian and bicycle facilities.	2030	2024
09-649	Pellissippi Pkwy (SR-162)/Oak Ridge Hwy Interchange	Interchange at Oak Ridge Hwy (SR-62)	Knox County	TDOT		Reconstruct interchange to provide ramp for westbound to southbound movement	2030	2024
09-653	Alcoa Hwy (SR-115/US-129) Widening	Woodson Dr. to Cherokee Trail interchange	Knoxville	TDOT	1.6	Widen 4-lane to 6-lane including pedestrian and bicycle facilities.	2030	2024
Projects Moving To Nearer Term Horizon Year								
09-223	Carpenters Grade Rd Reconstruction and Intersection Improvements	Raulston Rd/Peterson Ln to Cochran Rd	Maryville	Maryville	0.89	Reconstruct 2-lane road with addition of turn lanes and sidewalk. Construct roundabout at Peterson Ln, Cochran Rd and Raulston Rd intersection.	2040	2024
09-615	Washington Pike	North of I-640 to Murphy Rd	Knoxville	Knoxville	1.7	Widen from 2 to 4 lanes	2040	2024
09-692	I-75 Widening	Emory Rd (SR-131) to Raccoon Valley Rd (SR-170)	Knox County	TDOT	5.3	Widen from 4 to 6 lanes	2040	2030

2.2 NON-EXEMPT PROJECT AMENDMENTS TO FY 2017-2020 TIP

This regional emissions analysis and conformity determination report addresses the following non-exempt projects that will be heard as amendments to the FY 2017-2020 TIP at the October 24, 2018 TPO Executive Board meeting:

1. TIP ID# 17-2017-069 – Alcoa Hwy (SR 115 (US-129). Amend the existing TIP project to add the construction phase funded at $69,000,000. The total project cost increased from $41,200,000 to $84,004,375. Project description and termini are unchanged and it is included in the Mobility Plan as project ID# 09-653.

2. TIP ID# 17-2014-038 – Washington Pk. Amend the TIP by adding this project and programming $300,000 for Preliminary Engineering (Design). This project was previously in the FY2017-2020 TIP and temporarily removed, but is being re-added to complete the preliminary engineering phase. The project is included in the Mobility Plan as project ID# 09-615.

3. TIP ID# 17-2017-056 – I-75 Widening. Amend the TIP by adding this project and programming $9,600,000 for preliminary engineering. The project is included in the Mobility Plan as project ID# 09-692.

4. TIP ID# 17-2011-082 – Montvale Road (SR-336). Amend the TIP by adding this project and programming $5,300,000 for right-of-way. The project is included in the Mobility Plan as project ID# 09-262.

In addition to the above, there is one proposed amendment to the TDOT FY 2017-2020 Statewide Transportation Improvement Program (STIP) for an air quality non-exempt project that is covered by this conformity determination report as it is within the area affected by the 1997 8-Hour Ozone Standard, but outside of the TPO Planning Area boundary. It is summarized below:

- STIP ID# 1778085 – Jake Thomas Connector from SR-73 (US-321/441) to SR-449 (Veterans Blvd).

The following table (Table 5) indicates each projects' description in the Mobility Plan project list:

Table 5: Non-Exempt Project Amendments to FY 2017-2020 TIP

KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	Analysis Year
09-262	Montvale Rd (SR-336) Widening	Montvale Station Rd to Lamar Alexander Pkwy (US-321/SR-73)	Maryville	TDOT	0.6	Widen existing roadway to 2-12 foot travel lanes with a 12 foot center turn lane including curb and gutter, sidewalk and a multi-use path	2024
09-653	Alcoa Hwy (SR-115/US-129) Widening	Woodson Dr. to Cherokee Trail interchange	Knoxville	TDOT	1.6	Widen 4-lane to 6-lane including pedestrian and bicycle facilities.	2024
09-615	Washington Pike	North of I-640 to Murphy Rd	Knoxville	Knoxville	1.7	Widen from 2 to 4 lanes	2024
09-692	I-75 Widening	Emory Rd (SR-131) to Raccoon Valley Rd (SR-170)	Knox County	TDOT	5.3	Widen from 4 to 6 lanes	2030
S-1778085	Jake Thomas Connector	SR-73 (US-321/441) to SR-449 (Veterans Blvd)	Pigeon Forge	TDOT	2	Pavement Marking between SR-73 and Teaster Ln. Widen from 2-lane to 4-lane divided between Teaster Ln and New Ripkin Experience Ballpark. Construct new 5-lane from Ballpark to SR-449 (Veterans Blvd)	2024

2.3 ADD PROJECTS FROM TIP TO MOBILITY PLAN

The following table (Table 6) shows the projects that have been amended into the FY 2017-2020 TIP since the Mobility Plan adoption and are now assigned Mobility Plan ID#'s:

Table 6: Projects Added from TIP to Mobility Plan

KRMP ID	Project Name/Route	Termini	Jurisdiction	Length (miles)	Description	FY17-20 TIP ID
18-100	SR 61 at SR 62 Intersection at Winter Gap	SR-61 at SR-62	Oliver Springs	0	Replace outdated traffic signal equipment (controller, signal heads and detection) with modern equipment and either radar or video detection to avoid the problems with in pavement detection loops that are subject to breaking. It will also upgrade from span wire to mast arms	17-2017-043
18-101	Clinton Traffic Signalization Improvements: Ph. 1	Citywide	Clinton	0	Signal Timing Update for each of the City's 15 traffic signals	17-2017-052
18-200	Alcoa Hwy (SR-115/US-129) ITS Expansion	I-140 in Blount County to Cherokee Trail in Knox County	Blount/Knox County	7.4	ITS Smartway Geographic Expansion	17-2017-033
18-201	I-140 ITS Expansion	Near MM 2 to Near MM 11 (SR-115/US-129/Alcoa Hwy)	Blount/Knox County	9.2	I-140 ITS Expansion to include the installation of a power and communication network and ITS Devices such as CCTV cameras, DMS, and RDS	17-2017-050
18-202	Blount County Greenway Trail - Phase 1	Heritage High School to Perry's Mill Parking area	Blount County	2.27	Greenway trail contained completely within US Highway 321 right-of-way from Heritage High School to Perry's Mill Parking area. It will also include additional bike access link to Old Walland Highway across Melrose Station Bridge.	17-2017-048
18-600	I-75 ITS Expansion	MM 109.6 to just before SR-61 (Exit 122)	Knox/Anderson County	13.03	ITS Expansion	17-2017-034
18-601	I-40 ITS Expansion	West of Exit 398 to East of Exit 407	Knox/Sevier County	11.4	ITS Expansion to include the installation of a power and communication network and ITS Devices such as CCTV Cameras, DMS and RDS	17-2017-035
18-602	Kingston Pike at Watt Road Intersection Improvements	Kingston Pike (US 11/70 (SR-1) at Watt Road	Farragut	0	Intersection improvements at the intersection of Kingston Pike (US 11/70 (SR-1) at Watt Road.	17-2017-045
18-603	Middlebrook Pike (SR-169) ATMS Expansion	Middlebrook Pike (SR-169)/University Ave. from College St. to Joe Hinton Rd	Knoxville	6.5	Expand the City of Knoxville's Advanced Traffic Management System along Middlebrook Pike/Univesity Ave.	17-2017-051
18-604	Knoxville Renewable Fueling Station	1206 Proctor St.	Knoxville	n/a	Upgrade fueling terminal for use with biodiesel	17-2017-054
18-605	Knoxville and Holston River Railroad Locomotive Repower	n/a	Knoxville	n/a	Repower 5 unregulated locomotives to Tier 4 Emissions Standards	17-2017-055
18-400	I-75 Exit 81 Interchange Lighting	I-75 at Exit 81 (SR-73/US-321)	Lenoir City	0	Add high mast lighting to Interstate 75 at Exit 81 to improve safety conditions at night and during fog events.	17-2017-041
18-500	Boyds Creek Highway (SR 338) at Old Knoxville Highway Intersection Improvements	Boyds Creek Hwy (SR 338) at Old Knoxville Hwy Intersection	Sevierville	0	Reconfigure existing intersection to improve safety and operations through geometric layout changes, addition of turn lanes, and installation of a new traffic signal.	17-2017-044

2.4 REVISE PROJECT DESCRIPTIONS/TERMINI/LENGTH FOR CONSISTENCY WITH TIP

The following table (Table 7) shows the old and new project information for affected projects.

Table 7: Projects with Revised Descriptions/Termini/Length

KRMP ID	Project Name/Route	Termini	New Termini	Jurisdiction	Length (miles)	Project Description/Type of Improvement	New Description
13-802	Oak Ridge Traffic Control & Communication System Upgrades	Citywide		Oak Ridge		Replace traffic control and communication system, adding pedestrian safety and bicycle friendly elements, including emergency vehicle accommodation.	Replace traffic control and communication system. Installation of fiber network, vehicle detection, accessible pedestrian signals, traffic operations center and other components in a phased implementation period
09-101	Edgemoor Road (SR-170) - Combine previously segmented project	Oak Ridge Hwy (SR-62) to Melton Lake Dr	SR-62 (Oak Ridge Hwy) TO SR-9/US-25W (Clinton Hwy).	Oak Ridge	6.2	Widen from 2 to 4 lanes with addition of bicycle/pedestrian facilities	Widen from 2-lanes to 4-lanes with median and/or center turn lane. Also includes bicycle/pedestrian facilities and a new bridge over the Clinch River.
09-214	Sevierville Rd (SR-35/US-411) Widening	Washington St (SR-35) to Walnut St		Maryville	0.4	Reconstruct 2-lane road with addition of continuous center turn lane and bicycle/pedestrian facilities	Reconstruct Sevierville Rd. (SR-35) from two lanes to three lanes, curb and gutter, and sidewalks with intersection improvements.
13-206	Tesla Boulevard / Assoicates Boulevard Extended	Intersection of Future LIC road & Associates Blvd to Intersection of Springbrook Rd and E. Edison St	Local Interstate Connector/Associate blvd to East Edison/Springbrook Rd	Alcoa	0.8	Construct new 2-lane and 3-lane boulevard with bicycle/pedestrian facilities	Construct new 2 lane boulevard extension from the local interstate connector project to Springbrook Road. The connection will include a multi-use path, sidewalks, and stormwater quality intrinsic with the drainage system.
13-211	Foothills Mall Drive Extension Phase 1	US-129 Bypass (SR-115) to Foch St.		Maryville	0.5	Construct new 2-lane road with center turn lane and sidewalks	Extend Foothills Mall Dr. from US 129 Bypass to Foch St. with 2 to 3 lanes with curb and gutter which includes improvements at US 129 Bypass, Foch Street, Dunlap Street, and Watkins Road intersections
09-262	Montvale Rd (SR-336) Widening	Montvale Station Rd to Lamar Alexander Pkwy (US-321/SR-73)		Maryville	0.6	Reconstruct 2-lane road with addition of continuous center turn lane and bicycle/pedestrian facilities	Widen existing roadway to 2-12 foot travel lanes with a 12 foot center turn lane including curb and gutter, sidewalk and a multi-use path
09-257	Relocated Alcoa Hwy (SR-115/US-129)	Proposed interchange at Tyson Blvd. to Pellissippi Pkwy (SR-162)		Alcoa	2.9	Construct new 4-lane divided highway with auxiliary lanes and new interchanges at McGhee Tyson Airport access, Wright Rd and Pellissippi Pkwy (SR-162)	New alignment, four lane divided facility, construct an interchange at Pellissippi Parkway (SR-162)
09-216	Alcoa Hwy (SR-115/US-129) Widening	Pellissippi Pwy (SR-162) to Little River (Knox/Blount C.L.)	Pellissippi Parkway in Blount County to Little River south of Topside Road in Knox County	Alcoa	2.4	Widen 4-lane to 6-lane with frontage road system and new interchange at Topside Rd (SR-333). Reconfigure existing interchange at Pellissippi Pkwy (SR-162) and signalize ramps	Reconstruct 4-lanes and 6-lanes, including a frontage road system, new interchanges at Singleton Station Road and Topside Road (SR-333), modify the existing SR-115 and SR-162 interchange, and build a multi-use path.
09-223	Carpenters Grade Rd Reconstruction and Intersection Improvements	Raulston Rd to Kirkland Estates Blvd	Raulston Rd/Peterson Ln to Cochran Rd	Maryville	0.89	Reconstruct 2-lane road with addition of turn lanes and sidewalk. Construct roundabout at Peterson Ln, Cochran Rd and Raulston Rd intersection.	
13-863	Knox/Blount Greenway - Phase II	Connect Phase I to Alcoa Highway Bridge over the Little River at the Blount County Line to connect to I.C. King Park.	From U.T. Farm Entrance to Maloney Park on Ginn Drive	Knox County	0.65	Construction of an off-road trail that will connect Phase I of the Knox Blount Greenway to existing pedestrian and bicycle facilities on Alcoa Highway Bridge.	Construction of a multi-use trail that will connect Maloney Road Park on Ginn Drive to Alcoa Highway south of Maloney Road at the UT Farm Entrance where future pedestrian and bicycle facilities are slated for construction as part of the ongoing Alcoa Hwy
09-626	Chapman Hwy (SR-71/US-441) Operational and Safety Improvements	Mountain Grove Dr to Knox/Blount County Line	Blount Avenue to SR-338 (Boyds Creek Highway) in Seymour	Knox County	10.3	Operational and safety improvements including turn lanes at various locations along the corridor.	Intersection improvements and/or driveway improvements and/or left turn lanes at various locations throughout the project area.
09-632	Concord Road (SR-332) Widening	Turkey Creek Rd. to Northshore Dr. (SR-332)	Concord Rd (SR-332) from north of Turkey Creek Rd. to Northshore Dr.	Farragut	0.93	Widen roadway to 4-lanes with median/center turn lane and new bicycle/pedestrian facilities	Widen 2-lanes to 4-lanes including pedestrian and bicycle improvements including a southbound right turn lane at Turkey Creek Rd.
09-628	Alcoa Hwy (SR-115/US-129) Widening	North of Little River (Knox/Blount C.L.) to Maloney Rd	South of Topside Road to North of Maloney Road	Knoxville	2.2	Widen from 4 to 6 lanes including pedestrian and bicycle facilities.	
17-850	South Waterfront Greenway - East of Suttree	Suttree Landing Park to Riverside Landing Park	Suttree Landing Park to Island Home Avenue Riverwalk	Knoxville	0.6	Construct a new shared use path along the Tennessee River connecting South Waterfront Greenway to Will Skelton Greenway and across the river to James White Greenway/Neyland Greenway/Morningside Greenway	Construct riverwalk trail connecting the 0.10 mile section of cantilevered riverwalk along Island Home Avenue, to Suttree Landing Park riverwalk that is just east of Foggy Bottom Street along the Tennessee River.
09-643	Emory Rd (SR-131)	Maynardville Hwy (SR-33) to Tazewell Pk (SR-331)		Knox County	4.9	Widen from 2 to 4 lanes	Widen from 2-lanes to 4-lanes with median and/or center turn lane, and including bicycle/pedestrian facilities.

2.5 NON-EXEMPT PROJECTS WITHIN 1997 OZONE AREA OUTSIDE TPO PLANNING AREA

All roadway projects within the areas outside of the TPO Planning Area but within the extents of the 1997 Ozone Maintenance Area were reviewed for their exempt/non-exempt status and whether they could be included in the regional travel demand forecasting model for the regional emissions analysis. The full list of projects is included in Appendix D and the following table (Table 8) include only the ones determined to be "non-exempt" from the requirement to demonstrated air quality conformity.

Table 8: Non-Exempt Projects within 1997 Ozone Area outside TPO Planning Area

KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles	Description	FY17-20 TIP ID	Analysis Year
J-STIP-1745015	SR-35 (US-411)	Intersection of SR-92/Dickey Road to Grapevine Hollow Road	Jefferson	TDOT	2.6	Construct 5-lane on 4-lane Divided R-O-W	1745015	2024
J-IA-02	I-81 Widening	I-40 to SR-341 (Roy Messer Hwy)	Jefferson County	TDOT	3.8	Widen from 4 to 6 lanes		2030
J-IA-03	SR-35 (US-411)	Near Sims Rd to Near SR-92 (Dickey Rd)	Jefferson/Sevier County	TDOT	3.8	Widen from 2-lanes to 5-lanes on existing and new alignment		2024
J-LAMTPO-17	Old AJ Hwy realignment/ SR92/ Overlook Rd Extension	From SR92 at Old Andrew Johnson Hwy to US 11E/ W. Broadway Blvd	Jefferson City	Jefferson City	0.46	Construct new 2 lane road with curb and gutter, ADA compliant sidewalks, street signs, traffic signalizations, striping	3016	2024
J-LAMTPO-2056	SR-66 Relocated	North of I-81 at SR-341 in Jefferson County to SR-160 in Morristown	Jefferson/Hamblen County	TDOT	5.7	Paving (Completion of Widening and New Alignment Project for 4-laning of SR-66)	32050	2024
S-1778032	SR-73 (US-321)	Buckhorn Road to SR-416 (Phase 2)	Sevier County	TDOT	1.4	Widen 2-lanes to 4-lane Divided	1778032	2030
S-1778080	Veterans Blvd (SR-449) Extended	Veterans Blvd from SR-35 to Robert Henderson Rd	Sevierville	TDOT	0.4	Construct new 5-lane Facility	1778080	2024
S-1778085	Jake Thomas Connector	SR-73 (US-321/441) to SR-449 (Veterans Blvd)	Pigeon Forge	TDOT	2	Pavement Marking between SR-73 and Teaster Ln. Widen from 2-lane to 4-lane divided between Teaster Ln and New Ripkin Experience Ballpark. Construct new 5-lane from Ballpark to SR-449 (Veterans Blvd)	1778085	2024
S-09-509	Veterans Blvd (SR-449) Extended Phase 2	Henderson Rd to SR-66 at Gists Creek Rd	Sevierville	TDOT	3.2	Construct new 4-lane Road		2030

CHAPTER 3 – PLANNING ASSUMPTIONS FOR REGIONAL EMISSIONS ANALYSIS

3.0 INTRODUCTION

An important component of the conformity determination is to ensure that the latest planning assumptions are used in developing the inputs to both the regional travel demand model, which provides the majority of the activity data (vehicle speeds and miles driven) for the various analysis years and the emissions rate model, which requires other locality-specific characteristics. The planning assumptions for this conformity determination were discussed through the Interagency Consultation (IAC) process as required by 40 CFR 93.105, and the draft planning assumptions document provided to the IAC is included in Appendix C. The following sections of this chapter summarize the primary planning assumptions used to support the regional emissions analysis that was conducted as part of this conformity determination.

3.1 PLANNING ASSUMPTIONS FOR DEVELOPING TRAVEL DEMAND FORECASTS:

A full model update was finalized in 2012, which was validated to a 2010 base year. A minor update was conducted for the 2017 LRTP development in which only the input variable and external traffic data sources were modified, but the underlying travel behavior relationships were unchanged. The model has been re-validated to a base year of 2014 to coincide with the latest available traffic and land use data at the time of the model update development and all standard FHWA validation targets have been achieved. Following is a summary of the travel model development and additional information regarding model validation is included in Appendix G of the main 2040 Mobility Plan.

The model outputs for total vehicle miles of travel (VMT) by roadway functional classification have been compared against the estimated actual amount of VMT as reported to FHWA for the Highway Performance Monitoring System (HPMS) and appropriate HPMS adjustment factors have been developed to ensure accurate replication of the amount of travel in the region. The travel demand model encompasses a total of 10 counties in the Knoxville Region and includes the entirety of the previously noted maintenance/nonattainment areas as shown on figures 1 and 2.

The county-level data for base year 2014 population and household characteristics is primarily derived from the U.S. Census Bureau's inter-censal Population Estimates data and American Community Survey (ACS) whereas employment data was obtained through various sources such as the Bureau of Economic Analysis (BEA) and Bureau of Labor Statistics (BLS). The future year 2040 county-level population and employment control totals were developed through a review of available sources of projection data including proprietary data from Woods & Poole Economics, the University of Tennessee Center for Business & Economic Research and previous custom projections developed by a consultant for the TPO. It was determined that the most appropriate source of future year projections remained the previously developed custom set and this recommendation was endorsed for use in preparation of the 2017 LRTP Update by the TPO Executive Board at its August 26, 2015 meeting.

The travel demand model summarizes socioeconomic characteristics (population, employment, household income, etc) into sub-county geographic units of somewhat homogenous land use known as Traffic Analysis Zones (TAZ). The county-level estimates for the base and future analysis years must be allocated to the TAZs. In the case of the base year, population data from the 2010 decennial census is available at very small geographic units known as Census Blocks which are aggregated to the TAZ-level. The net change in population for each county between 2010

and 2014 was then allocated based on recent trends in residential building permit activity. Employment data was allocated based on a proprietary data set known as InfoGroup obtained through TDOT, which provides detailed establishment level information of employment counts by industry type geocoded to its actual location.

The allocation of future year county-level control totals for population and employment represents a significant challenge in terms of attempting to predict the exact locations of growth, which is subject to many various market factors and unforeseen events such as a major auto manufacturer deciding to locate in a previously undeveloped area. A land use allocation modeling tool was developed for the TPO as part of a previous planning effort funded under the HUD Sustainable Communities Initiative grant known as "Plan East Tennessee" (PlanET). Since economic conditions have not changed significantly since this tool's development and the KRMP is maintaining the same future out year of 2040 it was decided to rely again on the allocation results from the trend scenario that was developed for PlanET. The trend scenario was developed to serve as a base "business-as-usual" case to compare against other types of future land use scenarios that were considered such as a transit-oriented development scenario of more clustered and mixed-use growth than that which as occurred over the recent past which is primarily auto-oriented. The allocation results were updated to reflect the most recent "approved development" information, which are major new residential and commercial projects that have been previously announced and are likely to develop over the short term.

3.2 LATEST EMISSIONS MODEL:

The EPA officially released an emissions factor model known as "MOVES2014" through a Federal Register Notice of Availability on October 7, 2014, which set a 2-year grace period for its use instead of the prior version known as "MOVES2010b". There have been subsequent minor updates to MOVES2014 that have been released by EPA and the most recent version available at the time of this conformity analysis is the "November 2016 Update to MOVES2014a". The input default database for the latest version of MOVES2014a used to determine the total on-road emissions of the pollutants of concern for this conformity analysis is known as "movesdb20161117".

3.3 EMISSIONS TESTS:

The emissions tests used for this conformity analysis follow the requirements listed in 40 CFR 93.118 based on the fact that a Motor Vehicle Emissions Budget (MVEB) is available for all pollutants. The following sub-sections of this chapter document the specific MVEBs for each pollutant and note their applicability in terms of the analysis years that were selected as documented in Section 1.4.

3.3.1 FOR 1997 "ANNUAL" OZONE STANDARD

The EPA had previously revoked the requirement to determine transportation conformity for the 1997 8-Hour areas as of the effective date of the 2008 8-Hour Ozone Standard on July 20, 2013. However, a recent ruling on February 16, 2018 by the D.C. Circuit Court overturned the EPA's action to revoke the 1997 standard and therefore prior to any possible rehearing on the matter conformity requirements for this standard once again apply.

The emission test for the 1997 Ozone Standard is a test against the Motor Vehicle Emissions Budget for the year 2024 was established as part of the redesignation of the 1997 Knoxville Region Ozone Nonattainment Area to Maintenance.

The MVEB was determined to be "adequate" for purposes of transportation conformity by EPA on July 20, 2010. A notice announcing the effective date of September 30, 2010 for these budgets was published in Federal Register / Vol. 75, No. 178 on September 15, 2010. The MVEB for the 1997 Ozone NAAQS is provided in Table 9 below:

Table 9: MVEB for 1997 Ozone Standard

Pollutant	2024 MVEB (tons/day)
VOC	25.19
NO_x	36.32

The emissions tests are performed for the analysis years previously identified in Section 1.4 of this report of 2024, 2026, 2030 and 2040 and the above MVEB is applicable to all those analysis years.

3.3.2 FOR 2008 8-HOUR OZONE STANDARD

The emissions test for the 2008 8-Hour Ozone Standard is based on an MVEB set for both an interim year (2011) and the last year of the Maintenance Plan (2026). The EPA published a notice announcing a finding that the 2011 and 2026 Motor Vehicle Emissions Budgets (MVEB) for NOx and VOC included in the Maintenance SIP are adequate for the purposes of transportation conformity in the Federal Register / Vol. 80, No. 133, page 39970 on July 13, 2015. Table 6 shows the MVEB for the 2008 Ozone Standard:

Table 10: MVEB for 2008 Ozone Standard

Pollutant	2011 (tons/day)	2026 (tons/day)
VOC	19.71	10.49
NOx	41.62	17.69

The emissions tests are performed for the analysis years previously identified in Section 1.5 of this report of 2024, 2026, 2030 and 2040. Analysis years prior to 2026 (the 2024 analysis year) use the MVEB for 2011 while all other analysis years are compared against the MVEB for 2026. The year 2026 emissions are interpolated between the 2024 and 2030 analysis year outputs from the emissions modeling process.

3.3.3 FOR 2006 "DAILY" PM2.5 STANDARD

The EPA published a notice announcing a finding that the 2014 and 2028 Motor Vehicle Emissions Budgets (MVEB) for Direct PM2.5 and Oxides of Nitrogen (a PM2.5 precursor pollutant) included in the Maintenance SIP are adequate for the purposes of transportation conformity in the Federal Register / Vol. 82, No. 46, page 13347 on March 10, 2017. The same discussion as above for the 1997 Annual PM2.5 Standard applies to the Daily Standard and the MVEB is essentially the same except the annual emissions budget is simply converted to a daily emissions budget by dividing it by 365. Table 10 shows the MVEB for the 2006 Daily PM2.5 Standard:

Table 11: MVEB for 2006 Daily PM2.5 Standard

Pollutant	2014 (tons/day)	2028 (tons/day)
PM2.5	1.22	0.67
NOx	42.73	19.65

The emissions tests are performed for the analysis years previously identified in Section 1.5 of this report of 2024, 2028, 2030 and 2040. Analysis years prior to 2028 (the 2024 analysis year) use the MVEB for 2014 while all other analysis years are compared against the MVEB for 2028. The year 2028 emissions are interpolated between the 2024 and 2030 analysis year outputs from the emissions modeling process.

3.4 MOVES2014A INPUTS AND RUNSPEC DEVELOPMENT:

In order to set up a MOVES2014a model run the user must first define the "run specification" or "Runspec" for short, which establishes the specific model domain such as the county, time period, road types, vehicle types and pollutants being modeled for. Following the Runspec, the user enters specific input data for the county being modeled through an interface known as a "County Data Manager". The County Data Manager allows inputs for a variety of characteristics affecting emissions generation including the number of vehicles, vehicle miles of travel, average speeds, meteorological information, fuel types and average vehicle fleet age by vehicle type among others. The following sub-sections detail the Runspec and County Data Manager parameters used for this conformity analysis.

3.4.1 MOVES2014A RUNSPEC PARAMETERS

The MOVES model run is first set up based on a number of parameters to define the appropriate geographic scale and other aspects of the modeling domain to be utilized in the analysis, which is referred to as a "run specification" or runspec for short. Following is a list of the MOVES runspec panels and how they were set up for the KRMP conformity analysis and based on appropriate technical guidance documentation from EPA:

1.) Scale:

- Both Pollutants – County level scale – Inventory mode

2.) Time Spans:

- Both Pollutants – Year (separate runs for each required analysis year – 2024, 2030 and 2040), by Hour, all hours
- Ozone – July weekday
- PM2.5 – All months, all days

3.) Geographic Bounds:

- 1997 Ozone – Anderson, Blount, Cocke (partial), Jefferson, Knox, Loudon and Sevier counties
- 2008 Ozone – Anderson (partial), Blount and Knox counties
- PM2.5 – Anderson, Blount, Knox, Loudon and Roane (partial) counties

4.) Vehicles/Equipment:

- Both Pollutants – Gasoline, CNG, ethanol (E85) and diesel fuels, all valid vehicle combinations

5.) Road Type:

- Both Pollutants – All road types

6.) Pollutants and Processes:

- Ozone – NOx and VOC and all other required supporting prerequisite pollutants
- PM2.5 – Primary PM2.5 (exhaust, brake and tire wear), NOx and all supporting prerequisite pollutants
- Note – unchecked the "Refueling Displacement Vapor Loss" and "Refueling Spillage Loss" to exclude refueling emissions that are instead included in the Area source emissions inventory.

7.) Output options:

- Both Pollutants –
    - General Output tab: Units = grams, joules, miles; Activity: checked "Distance Traveled" and "Population"
    - Output Emissions Detail tab: checked "Road Type" and "Source Use Type"

3.4.2 MOVES2014A COUNTY DATA MANAGER INPUT DEVELOPMENT

For the locality-specific inputs required in the "County Data Manager" section of MOVES, the following general information is being provided for how they were developed, additional technical details and example input files are provided in Appendix B.

CDM 1.) Meteorology – this input consists of locality specific values of temperature and humidity covering the required analysis time frame, i.e. summer months for Ozone and all months for annual PM2.5. It is generally required that the conformity analysis must use consistent inputs for meteorology that were developed for an applicable SIP and its MVEBs. Since MVEBs are available in all cases the direct MOVES inputs used in their development will be utilized for this analysis. One special note is that the inputs used for the development of the 1997 Ozone Maintenance Plan were developed using MOBILE6 which was the effective mobile source emissions

model at the time, therefore these inputs will need to be converted from MOBILE6 to MOVES format using the available converter spreadsheets from EPA.

- Analysis Year Variation – This input is held constant for all analysis years.

CDM2.) Source Type Population – this input defines the vehicle population within the study area by type of vehicle and must be generated using local-specific data. This input has been generated for a base year of 2014 by researchers from the Department of Civil and Environmental Engineering at the University of Tennessee, Knoxville under contract to the Tennessee Department of Transportation using a combination of county-level motor vehicle registration data from the Tennessee Department of Revenue, surveys of local school districts and transit agencies on bus ownership and national default ratios to determine vehicle counts of those vehicles not included in the motor vehicle registration database such as long-haul trucks. In order to forecast future-year projections of Source Type Population for the light duty vehicle source types the Knoxville TPO's travel demand model was utilized to develop growth factors from its vehicle ownership model. All other source type growth factors were based on the projected employment growth percentage. Special attention has to be applied to the partial counties of Anderson and Cocke (for Ozone) and Roane (for PM2.5) to ensure that only the vehicles garaged in those specific areas are included.

- Analysis Year Variation – This input is varied for each analysis year based on the projected growth in total vehicles.

CDM3.) Age Distribution – vehicle age distribution datasets were also developed for year 2014 by the University of Tennessee in MOVES format that are utilized for all analysis years.

- Analysis Year Variation – This input is held constant for all analysis years.

CDM4.) Vehicle Type VMT – this MOVES input actually consists of four separate input files related to the estimated vehicle miles of travel in the area being analyzed including:

HPMSVTypeYear – this is the total amount of VMT estimated for each of the analysis years by Source Type. A base year value was developed by UT for 2014 and growth factors by major source type provided by the KRTM are used to develop the future year estimates.

- Analysis Year Variation – This input is varied for each analysis year based on the projected growth in VMT.

Month – this input accounts for the variability in travel throughout the months of the year. These inputs were developed by UT from traffic count data collected by TDOT.

- Analysis Year Variation – This input is held constant for all analysis years.

Day – this input accounts for the differences in weekday travel versus weekend travel and are also available from the UT study.

- Analysis Year Variation – This input is held constant for all analysis years.

Hour – this input accounts for the hourly variation in travel and is provided by the KRTM using a post processing software tool known as PPSUITE.

- Analysis Year Variation – This input is varied for each analysis year based on the results of the travel demand model run.

CDM5.) Average Speed Distribution – this input will be developed for all future years using the KRTM and the PPSUITE post processing tool, which formats the travel model outputs on network speeds into the appropriate MOVES format.

- Analysis Year Variation – This input is varied for each analysis year based on the results of the travel demand model run.

CDM6.) Road Type Distribution – this input provides the distribution of VMT on each road type by source type. This input was developed by UT for 2014 and will be held constant for the future year analyses.

- Analysis Year Variation – This input is held constant for all analysis years.

CDM7.) Ramp Fractions – this input is derived from the TPO's travel demand model and post processing tool PPSUITE to determine the percent VHT spent on urban and rural restricted access ramps.

- Analysis Year Variation – This input is varied for each analysis year based on the results of the travel demand model run.

CDM8.) Fuel – Consists of four separate inputs (Fuel Supply, Fuel Formulation, Fuel Usage Fraction and AVFT). These inputs are provided by TDEC based on EPA guidance to reflect fuels used in the Knoxville Region. Transit fleet data from Knoxville Area Transit (KAT) was used to develop fuel type profiles for transit buses (sourceType 42), which consist only of gasoline and diesel fuel vehicles (no CNG).

- Analysis Year Variation – This input is held constant for all analysis years.

CDM9.) Starts – local information for this input is not currently available and therefore MOVES defaults are utilized for all analysis years.

CDM10.) Hotelling – local information for this input is not currently available and therefore MOVES defaults are utilized for all analysis years.

CDM11.) I/M Programs – this is not applicable to the Knoxville Region as it does not currently have any inspection and maintenance programs.

CHAPTER 4: MOBILE SOURCE EMISSIONS ANALYSIS AND APPLICABLE GOVERNING REGULATIONS

4.0 INTRODUCTION

The Metropolitan Planning Regulations of the FAST Act (23 CFR Parts 450 and 771, May 27, 2016) and the USEPA Transportation Conformity Rule (40 CFR Parts 51 and 93, August 15, 1997 and amended most recently on March 14, 2012) specify certain minimum requirements that must be addressed in performing a mobile source emissions analysis in order to determine conformity of a Long Range Transportation Plan (LRTP). The following sections in this chapter discuss these requirements and how they were addressed by the KRTPO in making the determination of conformity on the updated Mobility Plan 2040 and amended FY2017-2020 Transportation Improvement Program.

4.1 REGULATIONS RELATED TO DEVELOPMENT OF LRTP AND TRANSPORTATION CONFORMITY

The Metropolitan Planning Regulations found in 23 CFR Part 450 specify the content of Long Range Transportation Plans and relevant aspects related to Transportation Conformity.

- **23 CFR 450.322(a)** – The LRTP must have a minimum 20-year planning horizon. The LRTP covers the period of 2017-2040, which meets the requirement for a minimum 20-year planning horizon. The LRTP is known as the Mobility Plan 2040.
- **23 CFR 450.322(b)(6)** – The LRTP must "include design concept and scope descriptions of all existing and proposed transportation facilities in sufficient detail, regardless of the source of funding, in nonattainment and maintenance areas to permit conformity determinations under the U.S. EPA conformity regulations at 40 CFR part 51. In all areas, all proposed improvements shall be described in sufficient detail to develop cost estimates". The project list included in the Mobility Plan document and in Appendix D covers the necessary detail and project scopes to develop cost estimates as accurately as possible.
- **23 CFR 450.322(b)(11)** – The LRTP must "include a financial plan that demonstrates the consistency of proposed transportation investments with already available and projected sources of revenue…" The Mobility Plan 2040 main document contains a financial analysis that demonstrates financial constraint.

4.2 REGULATIONS GOVERNING MOBILE SOURCE EMISSIONS ANALYSES

The Transportation Conformity Rule was first promulgated by EPA on November 24, 1993 (58 FR 62188). It has subsequently been amended several times to cover changes such as the implementation of the 1997 8-Hour Ozone and PM2.5 National Ambient Air Quality Standards on July 1, 2004. The most recent amendment to the Transportation Conformity Rule was published in the Federal Register on March 14, 2012 (75 FR 14979), which was a restructuring of several sections such that the Conformity Rule would not need to be revised each time a new or revised NAAQS is issued by EPA. Applicable guidelines from the Transportation Conformity Rule and how they have been addressed in this conformity determination are as follows:

- **40 CFR 93.106(a)** – The transportation plan must specifically describe the transportation system envisioned for certain future years, which are called horizon years and are subject to the following restrictions:

- The horizon years may be no more than 10 years apart;
- The first horizon year may not be more than 10 years from the base year used to validate the transportation demand planning model;
- If the attainment year is in the time span of the transportation plan, the attainment year must be a horizon year, and;
- The last horizon year must be the last year of the transportation plan's forecast period.

The base year for validation of the KRTPO's transportation demand planning model is 2014 and the KRMP's forecast period is from 2017 to 2040. Therefore, the analysis years used in developing the conformity analysis are:

4.2.1 FOR OZONE (1997 STANDARD):

Analysis Years

- 2024 – First horizon year within 10 years from base year used to validate the transportation demand planning model and Maintenance Plan Motor Vehicle Emission Budget Year
- 2030 – Year such that there are no more than 10 years between analysis years
- 2040 – Final year of Mobility Plan 2040

4.2.2 FOR OZONE (2008 STANDARD):

Analysis Years

- 2024 – First horizon year within 10 years from base year used to validate the transportation demand planning model
- 2026 – Final year of the Maintenance Plan
- 2030 – Year such that there are no more than 10 years between analysis years
- 2040 – Final year of Mobility Plan 2040

4.2.3 FOR PM2.5 (DAILY STANDARD):

Analysis Years

- 2024 – First horizon year within 10 years from base year used to validate the transportation demand planning model
- 2028 – Final year of the Maintenance Plan
- 2030 – Year such that there are no more than 10 years between analysis years
- 2040 – Final year of Mobility Plan 2040

- **40 CFR 93.106(a)(2)(i)** – The transportation plan shall quantify and document the demographic and employment factors influencing the expected transportation demand.

The summary of county-level estimates of socioeconomic data and growth projections for all study years is available upon request. The travel demand model used the following socioeconomic characteristics in order to determine estimates of travel for each analysis year:

- Total Population
- Household Population
- Group Quarters Population
- Number of Households
- Average Persons per Household
- Average Median Household Income
- Workers per Household
- Vehicles per Household
- Students per Household
- School Enrollment (K-12)
- University Student Enrollment
- Total Employment
- Basic Employment
- Industrial Employment
- Retail Trade Employment
- Services Employment

Further information regarding the development of the transportation model socioeconomic data is presented in Section 3.1 and Appendix G of the Mobility Plan document.

- **40 CFR 93.106(a)(2)(i)** – The highway and transit system shall be described in terms of the regionally significant additions or modifications to the existing transportation network which the transportation plan envisions to be operational in the horizon years.

The transportation system is described in the travel demand model through a GIS-based network of links and nodes with attributes describing the character of roadway. Some of the key attributes that were used to account for the improvement projects that are being proposed include:

- FHWA Functional Classification
- Divided or Un-divided Roadway
- Level of Access Control
- Number of Lanes in each direction
- Lane Width
- Posted Speed Limit
- Area Type (Rural, Suburban, Urban or Major Employment District)

Transit mode usage is also estimated as part of the travel demand model as it relates to the fixed route transit service that is provided by Knoxville Area Transit (KAT).

- **40 CFR 93.110** – The conformity determination must be based upon the most recent planning assumptions in force at the time of the conformity determination. The KRTPO documented its assumptions and planning data with the Interagency Consultation Group, which is summarized in the meeting information included in the Appendix C. The demographic and transportation modeling assumptions are documented in Chapter 3.

- **40 CFR 93.111** – The conformity determination must be based on the latest emission estimation model available. This conformity determination utilized the most recent available version of MOVES – the November 2016 update of MOVES2014a, with default database "movesdb20161117".

- **40 CFR 93.112** – The conformity determination must satisfy consultation requirements in the applicable implementation plan. Chapter 6 and documentation in the appendix relate to the interagency consultation process.

- **40 CFR 93.118 and 93.119** – Motor vehicle emissions budget and other applicable conformity tests that must be used. Chapter 5 of this report documents the emissions tests that were used to demonstrate conformity. The emissions tests were discussed in the Interagency Consultation process to determine their appropriateness.

- **40 CFR 93.122** – Procedures for determining transportation-related emissions. The TPO documented its assumptions and methodology for determining future growth in vehicle miles of travel on the regionally significant transportation system with the Interagency Consultation Group. The primary source for projecting future vehicle activity is the travel demand forecasting model, which includes all regionally significant roadways and represents all regionally significant highway projects being proposed for implementation in the Mobility Plan 2040 and FY 2017-2020 TIP by analysis year. All counties in the nonattainment area are represented in the travel demand model.

- **40 CFR 93.126 and 93.127** – Projects exempt from regional emissions analysis. The highway project list included in the Appendix D of this document describes which projects were determined to be exempt from air quality analysis. These projects were deliberated through the Interagency Consultation process to ensure that there was full agreement on the exempt status for projects.

Examples of exempt projects include:

- Bridge Replacement Project – A project that only entails rehabilitating or replacing the existing bridge in-kind without any additional laneage being constructed.
- Pedestrian Improvement Project
- Interchange Reconfiguration Project

- Intersection Project – This could include any type of project that involves only a single intersection such as adding turn lanes (channelization) or a traffic signal.
- Street Lighting
- Pavement Resurfacing
- Reconstruction of a 2-lane roadway, which is only improving the width and geometrics of the roadway and perhaps some additional turn lanes.

4.3 AVAILABILITY OF TECHNICAL INFORMATION RELATED TO EMISSIONS ANALYSES

Additional information regarding specific MOVES2014a emissions model inputs and outputs and travel demand model assumptions is available upon request.

CHAPTER 5 – STATEMENT OF CONFORMITY

5.0 INTRODUCTION

This section of the report covers the conformity requirements for the Knoxville Region under both the 8-Hour Ozone Standard as well as the PM2.5 Standard. The conformity report complies with all applicable requirements found in the State Implementation Plan (SIP), Clean Air Act, Tennessee Transportation Conformity Regulation and the MPO Planning Regulations from FAST ACT (23 CFR 450.322).

5.1 STATEMENT OF CONFORMITY – 1997 8-HOUR OZONE STANDARD

The 1997 8-Hour Ozone Area includes Anderson, Blount, Jefferson, Knox, Loudon, Sevier and a portion of Cocke County within the Great Smoky Mountains National Park). The 1997 8-Hour Ozone conformity analysis consists of a Motor Vehicle Emission Budget (MVEB) Test for ozone-forming emissions of "Volatile Organic Compounds" (VOC) and "Oxides of Nitrogen" (NOx). The MVEB was established for the year 2024 as a part of the 8-Hour Ozone Redesignation Request and Maintenance Plan that was submitted to EPA by the Tennessee Department of Environment & Conservation in May 2010. The MVEB was determined to be "adequate" for purposes of transportation conformity by EPA on July 20, 2010. A notice announcing the effective date of September 30, 2010 for these budgets was published in Federal Register / Vol. 75, No. 178 on September 15, 2010. Table 12 below shows the results of the MVEB test and demonstrates that projected emissions are lower than the MVEB for all required analysis years.

Table 12: MVEB Test for 1997 8-Hour Ozone Standard

	Analysis Year		
Volatile Organic Compounds (VOC):	**2024**	**2030**	**2040**
MVEB (1997 8-Hour for year 2024)	25.19	25.19	25.19
Projected Emissions *(tons per day)*	13.34 ✓	9.90 ✓	8.02 ✓
Oxides of Nitrogen (NOx):	**2024**	**2030**	**2040**
MVEB (1997 8-Hour for year 2024)	36.32	36.32	36.32
Projected Emissions *(tons per day)*	22.89 ✓	17.15 ✓	14.95 ✓

5.1.1 SUMMARY OF 1997 8-HOUR STANDARD CONFORMITY ANALYSIS

Based on the quantitative conformity analysis the KRTPO staff has determined that the Mobility Plan 2040 and the KRTPO FY 2017-2020 TIP demonstrate conformity for the 1997 8-Hour Ozone Standard using the necessary emissions tests. Compliance with the regulations of the Clean Air Act, 40 CFR Parts 51 and 93 (Transportation Conformity Rule) and 23 CFR Part 450 (Metropolitan Planning Regulations established by FAST Act) has also been demonstrated.

5.2 STATEMENT OF CONFORMITY – 2008 OZONE STANDARD

The nonattainment designation for the 2008 Ozone Standard became effective on July 20, 2012 and included the counties of Blount, Knox and the portion of Anderson County surrounding the TVA Bull Run Fossil Plant (2000 Census Tracts 202 and 213.02). A redesignation to Attainment for this Standard was approved by EPA through a Federal Register notice on July 13, 2015 and made effective on August 12, 2015. The conformity analysis documented in this report utilizes the newly approved Motor Vehicle Emissions Budgets (MVEB).

An emissions analysis was conducted for the required analysis years of 2024, 2026, 2030 and 2040, with year 2026 being interpolated between 2024 and 2030. Table 13 below summarizes the MVEB test for all analysis years:

Table 13: MVEB Test for 2008 Ozone Standard

	Analysis Year			
Volatile Organic Compounds (VOC):	**2024**	**2026**	**2030**	**2040**
MVEB	19.71	10.49	10.49	10.49
Projected Emissions *(tons per day)*	7.35 ✓	6.00 ✓	5.32 ✓	4.14 ✓

Oxides of Nitrogen (NOx):	**2024**	**2026**	**2030**	**2040**
MVEB	41.62	17.69	17.69	17.69
Projected Emissions *(tons per day)*	10.51 ✓	8.35 ✓	7.27 ✓	5.77 ✓

5.2.1 SUMMARY OF 2008 8-HOUR STANDARD CONFORMITY ANALYSIS

Based on the quantitative conformity analysis the KRTPO staff has determined that the Mobility Plan 2040 and the KRTPOFY 2017-2020 TIP demonstrate conformity for the 2006 Daily PM2.5 Standard using the necessary emissions tests. Compliance with the regulations of the Clean Air Act, 40 CFR Parts 51 and 93 (Transportation Conformity Rule) and 23 CFR Part 450 (Metropolitan Planning Regulations established by FAST Act) has also been demonstrated.

5.3 STATEMENT OF CONFORMITY – 2006 DAILY PM2.5 STANDARD

The Daily PM2.5 conformity analysis consists of an MVEB test for the annual PM2.5-related emissions from on-road mobile sources resulting from components such as brake and tire wear and vehicle exhaust known as "Direct PM2.5" and "Oxides of Nitrogen" (NOx) which can act as precursors to PM2.5 formation. An emissions analysis was conducted for the required analysis years of 2024, 2028, 2030 and 2040, with year 2028 being interpolated between 2024 and 2030. The results of the emissions analysis are summarized in Table 8:

Table 14: MVEB Test for 2006 Daily PM2.5 Standard

Direct Particulate Matter 2.5:	Analysis Year			
	2024	2028	2030	2040
MVEB	1.22	0.67	0.67	0.67
Projected Emissions *(tons per day)*	0.52 ✓	0.49 ✓	0.44 ✓	0.46 ✓

Oxides of Nitrogen (NOx):	2024	2028	2030	2040
MVEB	42.73	19.65	19.65	19.65
Projected Emissions *(tons per day)*	15.51 ✓	14.11 ✓	11.31 ✓	9.71 ✓

5.3.1 SUMMARY OF 2006 DAILY PM2.5 STANDARD CONFORMITY ANALYSIS

Based on the quantitative conformity analysis the KRTPO staff has determined that the Mobility Plan 2040 and the KRTPOFY 2017-2020 TIP demonstrate conformity for the 2006 Daily PM2.5 Standard using the necessary emissions tests. Compliance with the regulations of the Clean Air Act, 40 CFR Parts 51 and 93 (Transportation Conformity Rule) and 23 CFR Part 450 (Metropolitan Planning Regulations established by FAST Act) has also been demonstrated.

CHAPTER 6 – INTERAGENCY CONSULTATION

6.0 INTRODUCTION

The Transportation Conformity Rule in 40 CFR Part 93.105 requires that Interagency Consultation be a part of conformity determinations. Interagency Consultation allows for formal deliberation of any issues that arise as part of the conformity analysis and allows for input from all stakeholder agencies into the process. Specific consultation procedures are specified in the Tennessee Transportation Conformity Regulation found in 1200-3-34-.01(3) of the Tennessee State Code.

6.1 PARTICIPATING AGENCIES

The core list of Interagency Consultation Participants included representatives from the following agencies:

- Knoxville Regional TPO
- Knox County Department of Air Quality Management
- Tennessee Department of Transportation
- Tennessee Department of Environment & Conservation
- Federal Highway Administration
- United States Environmental Protection Agency
- Federal Transit Administration
- Lakeway Area Metropolitan TPO
- Great Smoky Mountains National Park Service

A list of participant names is included in Appendix C.

6.2 OVERVIEW OF CONSULTATION PROCESS

The development of this conformity determination was coordinated with the Interagency Consultation group. The process began with discussion of latest planning assumptions and required model inputs on an IAC conference call held on June 4, 2018. Subsequent calls were held to further discuss various assumptions and to review drafts of the emissions analysis and documentation. Appendix C contains the minutes of each of the interagency meetings as well as comments and responses to the draft Conformity Determination Report.

CHAPTER 7 – CONCLUSION AND SUMMARY OF COMMENTS RECEIVED

7.0 CONCLUSION

The analysis included in this report has demonstrated that the updated KRTPO Mobility Plan 2040 and accompanying amended FY 2017-2020 Transportation Improvement Program are in conformity with air quality regulations found in the Clean Air Act Amendments of 1990 and FAST Act.

Although Vehicle Miles of Travel are projected to increase steadily in the future, the corresponding emissions rates from vehicles are expected to decrease even more significantly according to the modeling performed by the KRTPO. It should be noted however that the downward trend in emissions does start to slow and even start to curve back upward for the direct PM2.5 emissions after the year 2030 (see Figure 4 below).

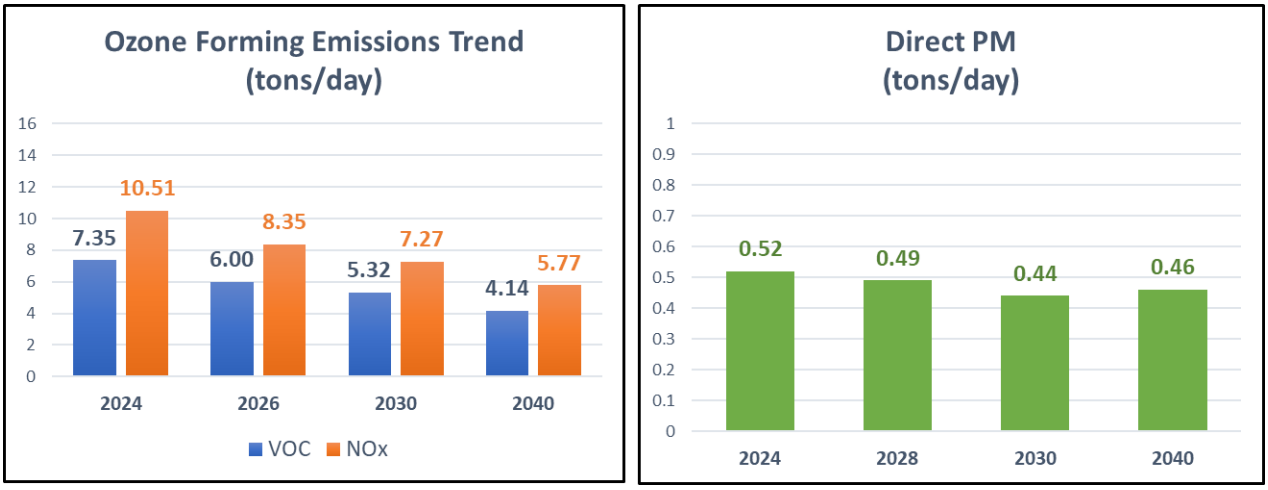


Figure 4: Emissions Trends for Life of Mobility Plan 2040

The primary reason that emission rates are projected to decline is due to stricter tailpipe emission standards enacted by EPA, most notably the "Tier 2" standards that were enacted in 1999 and phased in between 2004 to 2009. The Tier Two standards represented a 77 to 86 percent reduction in nitrogen oxide emissions for cars and a 92 to 95 percent reduction for trucks from previous standards. A primary mechanism used to reduce emissions was through the reduction in fuel sulfur levels (both gasoline and diesel). More recently a new "Tier 3" standards have been promulgated in 2014 that will be phased in beginning in 2017 that will further address tailpipe emissions from motor vehicles. The MOVES model incorporates these regulations into its calculations and determines their impacts, which increase over time as the vehicle fleet turns over and includes more of the vehicles affected by the new regulations.

7.1 TRANSPORTATION CONTROL MEASURES

Currently there are no transportation control measures (TCMs) in the Tennessee SIP for the Knoxville 8-hour ozone and PM2.5 nonattainment areas. However, should TCMs be introduced in the area, nothing in the KRMP nor the Transportation Improvement Program will prohibit the timely implementation of any that are approved in the SIP for the Knoxville area.

7.2 PUBLIC INVOLVEMENT SUMMARY

The Knoxville Regional TPO conducted a 30-day comment period between September 24, 2018 and October 24, 2018 to allow for public review and comment on the 2040 Mobility Plan and accompanying Air Quality Conformity Determination. Public hearings were held on October 9, 2018 and October 24, 2018.

Copies of the Conformity Determination Report were made available on the KRTPO web site. Public notice and advertisements for the hearings and locations to view the draft conformity determination report were placed in newspapers by both KRTPO and LAMTPO including: The Knoxville News Sentinel, Maryville Daily Times, The Oak Ridger, Loudon County News Herald, Mountain Press, Citizen Tribune, Jefferson Standard Banner, Enlightener (paper targeted toward minority population) and Mundo Hispano (papers targeted toward Hispanic population).

7.3 PUBLIC COMMENT AND RESPONSE

No public comments were received.

APPENDIX A – EMISSIONS SUMMARIES BY COUNTY

A.1 EMISSIONS FOR THE 2008 8-HOUR OZONE STANDARD ANALYSIS

Table A-1 – Volatile Organic Compounds (VOC) emissions summary (tons per day) by county for 2008 8-Hour Ozone Standard

	VOC Emissions (tons per day)			
	Analysis Year			
	2024	2026	2030	2040
Anderson (partial)	0.25	0.19	0.17	0.12
Blount	1.94	1.55	1.35	1.01
Knox	5.16	4.25	3.80	3.02
Total	**7.35**	**6.00**	**5.32**	**4.14**

Table A-2 – Oxides of Nitrogen (NOx) emissions summary (tons per day) by county for 2008 8-Hour Ozone Standard

	NOx Emissions (tons per day)			
	Analysis Year			
	2024	2026	2030	2040
Anderson (partial)	0.24	0.17	0.14	0.07
Blount	1.75	1.34	1.13	0.69
Knox	8.52	6.84	5.99	5.01
Total	**10.51**	**8.35**	**7.27**	**5.77**

A.2 EMISSIONS FOR THE 1997 8-HOUR OZONE STANDARD ANALYSIS

Table A-3 – Volatile Organic Compounds (VOC) emissions summary (tons per day) by county for 2008 8-Hour Ozone Standard

	VOC Emissions (tons per day)		
	Analysis Year		
	2024	2030	2040
Anderson	1.38	0.98	0.76
Blount	2.13	1.50	1.13
Cocke (partial)	0.01	0.00	0.00
Jefferson	1.32	1.06	0.98
Knox	5.63	4.17	3.34
Loudon	1.02	0.77	0.64
Sevier	1.85	1.42	1.16
Total	**13.34**	**9.90**	**8.02**

Table A-4 – Oxides of Nitrogen (NOx) emissions summary (tons per day) by county for 1997 8-Hour Ozone Standard

	NOx Emissions (tons per day)		
	Analysis Year		
	2024	2030	2040
Anderson	2.54	2.02	1.83
Blount	1.87	1.21	0.74
Cocke (partial)	0.01	0.01	0.00
Jefferson	4.71	4.16	4.29
Knox	9.16	6.44	5.38
Loudon	2.45	1.96	1.83
Sevier	2.14	1.37	0.87
Total	**22.89**	**17.15**	**14.95**

A.3 EMISSIONS FOR THE 2006 DAILY PM2.5 STANDARDS

Table A-5 –MOVES Emissions Outputs for Daily Direct PM2.5 Emissions by County

	Direct PM2.5 Emissions (tons per day)			
	Analysis Year			
	2024	2028	2030	2040
Anderson	0.05	0.05	0.04	0.04
Blount	0.07	0.07	0.06	0.06
Knox	0.34	0.32	0.29	0.31
Loudon	0.06	0.05	0.05	0.05
Roane (partial)	0.00	0.00	0.00	0.00
Total	**0.52**	**0.49**	**0.44**	**0.46**

Table A-6 –MOVES Emissions Outputs for Daily NOx Emissions by County

	NOx Emissions (tons per day)			
	Analysis Year			
	2024	2028	2030	2040
Anderson	2.43	2.27	1.94	1.79
Blount	1.84	1.61	1.16	0.74
Knox	8.65	7.82	6.15	5.25
Loudon	2.49	2.33	2.00	1.88
Roane (partial)	0.09	0.08	0.06	0.05
Total	**15.51**	**14.11**	**11.31**	**9.71**

APPENDIX B – MOVES2014A INPUT DEVELOPMENT DOCUMENTATION

B.1 BACKGROUND

General information regarding the MOVES2014 runspec and county data manager input development was provided in Section 3.4 of this report. The purpose of this appendix is to provide additional details and example input files used for the county data manager. Several of the inputs were derived as part of other efforts, primarily the development of the onroad mobile source emissions inventories to support both recent Redesignation Requests and Maintenance Plans for Ozone and PM2.5 prepared by the Tennessee Department of Environment & Conservation (TDEC). A primary source of inputs utilized by TDEC was from a report and research conducted by the University of Tennessee, Knoxville Department of Civil & Environmental Engineering, titled "Methodology for Developing Input Datasets for the MOVES Model", August 2014. These additional reference materials are not repeated in this document, but are available upon request.

B.2 MOVES COUNTY DATA MANAGER INPUT DATA SOURCES

Several of the following data sets required for MOVES are extremely large and impossible to fully copy into the following sections. Some of the smaller datasets, or parts of datasets for illustration, are included in this document and general descriptions of how each were derived are provided as well, with full data sets being available upon request to KRTPO staff.

B.2.1 METEOROLOGY

Meteorology defined in a relevant SIP for which a MVEB is being used should be incorporated into the relevant analysis. The meteorology inputs (temperature and humidity) were developed and documented by TDEC in the Redesignation Requests and Maintenance Plans for both Ozone and PM2.5 following the appropriate EPA Technical Guidance. The 1997 8-hour Ozone inputs are based on the Maintenance Plan which used a min/max temperature of 66/96 and default humidity inputs for MOBILE6.2 that have now been put through the MOBILE6 to MOVES converter. The 2008 8-hour Ozone inputs are based on an average of 3-years between 2009-2011 while the PM2.5 inputs are based on a 3-year average spanning 2012-2014. This input is the same for all counties and all analysis years for the applicable pollutant.

B.2.2 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) 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 noted previously, the data for this input was obtained from U.T. which developed county level estimates of source type population for all 95 counties in Tennessee for the year 2014. Source type population projections for

future years were based on growth in household vehicle ownership derived from the Knoxville Regional TPO's Travel Demand Model (TDM). The TDM has a vehicle ownership sub-model that allocates vehicle ownership based on population. The vehicle ownership is used in helping the TDM 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, passenger car and passenger truck (source types 11, 21 and 31) populations derived from vehicle registration data. Source type population for the remaining source types was grown using employment growth projections from the travel demand model.

Since there are three partial counties included within the nonattainment/maintenance areas for the Knoxville Region, special attention was paid to those areas to develop the sub-area source type populations for the specific affected areas. The partial county analyses affected the following areas:

- Anderson County – Partial Area included in the 2008 8-hour Ozone Nonattainment Areas covering the portion of Anderson County surrounding the TVA Bull Run Fossil Plant, which corresponds to Anderson County 2000 Census Tracts 202 and 213.02.
- Cocke County – Partial area designated with 1997 8-Hr Ozone Standard consisting of the portion within the Great Smoky Mountains National Park boundary and corresponding to 2010 Census Tract 9801. Size of area = 26.5 sq. miles, 2010 Population = 4.
- Roane County – Partial Area included in the 1997 Annual and 2006 Daily PM2.5 Nonattainment Areas covering the portion of Roane County surrounding the TVA Kingston Fossil Plant, which corresponds to 2000 Census Block Group 471450307002

In order to develop the partial area source type populations, the 2010 Census data was reviewed to determine the percentage of both population and household vehicle ownership for the partial areas versus the entirety of each county. This review demonstrated that generally both people population and vehicle population percentages were relatively consistent so the most conservative values were chosen. A value of 21% was used for the Anderson County partial area and a value of 1.3% was chosen for the Roane County partial area, which is consistent with the approach taken in the development of the Maintenance Plans. A separate methodology was derived for the Cocke County partial area due to it not being included within the TPO travel demand model area and having such a small population, this methodology is described in Appendix C as part of the Planning Assumptions presented to the Interagency Consultation Group.

Table B-1 on the following pages shows the projected growth rates of source type population for all counties in the study area:

Table B-1 – Source Type Population Growth by County 2014 - 2040

	Vehicle Type	MOVES sourceType ID	Source Type Population 2014	2024 Growth Factor	Source Type Population 2024	2030 Growth Factor	Source Type Population 2030	2040 Growth Factor	Source Type Population 2040
Anderson County (partial)	Motorcycle	11	533	1.064	567	1.117	595	1.201	640
	Passenger Car	21	8,181	1.064	8,704	1.117	9,138	1.201	9,825
	Passenger Truck	31	6,848	1.064	7,286	1.117	7,649	1.201	8,225
	Light Commercial Truck	32	943	1.173	1,106	1.279	1,206	1.467	1,383
	Intercity Bus	41	0	1.173	-	1.279	-	1.467	-
	Transit Bus	42	-	1.173	-	1.279	-	1.467	-
	School Bus	43	19	1.173	22	1.279	24	1.467	28
	Refuse Truck	51	7	1.173	8	1.279	8	1.467	10
	Single Unit Short-haul Truck	52	248	1.173	291	1.279	318	1.467	364
	Single Unit Long-haul Truck	53	9	1.173	10	1.279	11	1.467	13
	Motor Home	54	51	1.173	60	1.279	65	1.467	74
	Combination Short-haul Truck	61	101	1.173	119	1.279	130	1.467	149
	Combination Long-haul Truck	62	112	1.173	131	1.279	143	1.467	164
Anderson County (Partial) Totals			**17,052**		**18,304**		**19,287**		**20,875**
Anderson County (whole)	Motorcycle	11	2,538	1.064	2,700	1.117	2,835	1.201	3,048
	Passenger Car	21	38,956	1.064	41,449	1.117	43,514	1.201	46,786
	Passenger Truck	31	32,610	1.064	34,697	1.117	36,425	1.201	39,165
	Light Commercial Truck	32	4,489	1.173	5,266	1.279	5,741	1.467	6,585
	Intercity Bus	41	1	1.173	1	1.279	1	1.467	1
	Transit Bus	42	-	1.173	-	1.279	-	1.467	-
	School Bus	43	90	1.173	106	1.279	115	1.467	132
	Refuse Truck	51	32	1.173	37	1.279	40	1.467	46
	Single Unit Short-haul Truck	52	1,183	1.173	1,388	1.279	1,513	1.467	1,735
	Single Unit Long-haul Truck	53	42	1.173	49	1.279	53	1.467	61
	Motor Home	54	242	1.173	284	1.279	309	1.467	355
	Combination Short-haul Truck	61	483	1.173	567	1.279	618	1.467	709
	Combination Long-haul Truck	62	533	1.173	626	1.279	682	1.467	783
Anderson County Totals			**81,198**		**87,170**		**91,846**		**99,406**
Blount County	Motorcycle	11	5,024	1.202	6,039	1.325	6,657	1.55	7,787
	Passenger Car	21	51,652	1.202	62,086	1.325	68,439	1.55	80,061
	Passenger Truck	31	54,328	1.202	65,302	1.325	71,985	1.55	84,208
	Light Commercial Truck	32	7,862	1.143	8,986	1.239	9,741	1.417	11,140
	Intercity Bus	41	1	1.143	1	1.239	1	1.417	1
	Transit Bus	42	-	1.143	-	1.239	-	1.417	-
	School Bus	43	155	1.143	177	1.239	192	1.417	220
	Refuse Truck	51	30	1.143	34	1.239	37	1.417	43
	Single Unit Short-haul Truck	52	2,200	1.143	2,515	1.239	2,726	1.417	3,117
	Single Unit Long-haul Truck	53	49	1.143	56	1.239	61	1.417	69
	Motor Home	54	320	1.143	366	1.239	396	1.417	453
	Combination Short-haul Truck	61	300	1.143	343	1.239	372	1.417	425
	Combination Long-haul Truck	62	320	1.143	366	1.239	396	1.417	453
Blount County Totals			**122,241**		**146,271**		**161,003**		**187,977**
Cocke County	Motorcycle	11	-	1.3	-	1.48	-	1.78	-
	Passenger Car	21	42	1.3	55	1.48	62	1.78	75
	Passenger Truck	31	58	1.3	75	1.48	86	1.78	103
	Light Commercial Truck	32	-	1.3	-	1.48	-	1.78	-
	Intercity Bus	41	-	1.3	-	1.48	-	1.78	-
	Transit Bus	42	-	1.3	-	1.48	-	1.78	-
	School Bus	43	-	1.3	-	1.48	-	1.78	-
	Refuse Truck	51	-	1.3	-	1.48	-	1.78	-
	Single Unit Short-haul Truck	52	-	1.3	-	1.48	-	1.78	-
	Single Unit Long-haul Truck	53	-	1.3	-	1.48	-	1.78	-
	Motor Home	54	65	1.3	85	1.48	96	1.78	116
	Combination Short-haul Truck	61	-	1.3	-	1.48	-	1.78	-
	Combination Long-haul Truck	62	-	1.3	-	1.48	-	1.78	-
Cocke County Totals			**165**		**215**		**244**		**294**

Table B-1 – Continued

	Vehicle Type	MOVES sourceType ID	Source Type Population 2014	2024 Growth Factor	Source Type Population 2024	2030 Growth Factor	Source Type Population 2030	2040 Growth Factor	Source Type Population 2040
Jefferson County	Motorcycle	11	1,679	1.2	2,015	1.324	2,223	1.595	2,678
	Passenger Car	21	18,354	1.2	22,025	1.324	24,301	1.595	29,275
	Passenger Truck	31	20,274	1.2	24,329	1.324	26,843	1.595	32,337
	Light Commercial Truck	32	2,596	1.131	2,936	1.234	3,203	1.412	3,666
	Intercity Bus	41	2	1.131	2	1.234	2	1.412	2
	Transit Bus	42	-	1.131	-	1.234	-	1.412	-
	School Bus	43	86	1.131	97	1.234	106	1.412	121
	Refuse Truck	51	47	1.131	54	1.234	59	1.412	67
	Single Unit Short-haul Truck	52	829	1.131	938	1.234	1,023	1.412	1,171
	Single Unit Long-haul Truck	53	52	1.131	59	1.234	64	1.412	73
	Motor Home	54	262	1.131	296	1.234	323	1.412	370
	Combination Short-haul Truck	61	913	1.131	1,032	1.234	1,126	1.412	1,289
	Combination Long-haul Truck	62	1,031	1.131	1,166	1.234	1,272	1.412	1,456
Jefferson County Totals			**44,446**		**52,934**		**58,322**		**69,827**
Knox County	Motorcycle	11	8,817	1.198	10,563	1.325	11,683	1.553	13,693
	Passenger Car	21	171,062	1.198	204,932	1.325	226,657	1.553	265,659
	Passenger Truck	31	140,750	1.198	168,619	1.325	186,494	1.553	218,585
	Light Commercial Truck	32	24,722	1.204	29,765	1.333	32,954	1.553	38,393
	Intercity Bus	41	6	1.204	7	1.333	8	1.553	9
	Transit Bus	42	153	1.204	184	1.333	204	1.553	238
	School Bus	43	383	1.204	461	1.333	511	1.553	595
	Refuse Truck	51	184	1.204	222	1.333	245	1.553	286
	Single Unit Short-haul Truck	52	7,683	1.204	9,250	1.333	10,241	1.553	11,932
	Single Unit Long-haul Truck	53	271	1.204	326	1.333	361	1.553	421
	Motor Home	54	1,683	1.204	2,026	1.333	2,243	1.553	2,614
	Combination Short-haul Truck	61	3,217	1.204	3,873	1.333	4,288	1.553	4,996
	Combination Long-haul Truck	62	3,503	1.204	4,218	1.333	4,669	1.553	5,440
Knox County Totals			**362,434**		**434,446**		**480,558**		**562,861**
Loudon County	Motorcycle	11	1,784	1.242	2,216	1.404	2,505	1.685	3,006
	Passenger Car	21	21,973	1.242	27,290	1.404	30,850	1.685	37,025
	Passenger Truck	31	22,856	1.242	28,387	1.404	32,090	1.685	38,512
	Light Commercial Truck	32	2,869	1.176	3,374	1.318	3,781	1.575	4,519
	Intercity Bus	41	1	1.176	1	1.318	1	1.575	2
	Transit Bus	42	-	1.176	-	1.318	-	1.575	-
	School Bus	43	57	1.176	67	1.318	75	1.575	90
	Refuse Truck	51	42	1.176	49	1.318	55	1.575	66
	Single Unit Short-haul Truck	52	1,061	1.176	1,248	1.318	1,398	1.575	1,671
	Single Unit Long-haul Truck	53	47	1.176	55	1.318	62	1.575	74
	Motor Home	54	246	1.176	289	1.318	324	1.575	387
	Combination Short-haul Truck	61	667	1.176	784	1.318	879	1.575	1,051
	Combination Long-haul Truck	62	750	1.176	882	1.318	989	1.575	1,181
Loudon County Totals			**52,353**		**64,642**		**73,009**		**87,584**
Roane County (partial)	Motorcycle	11	21	1.131	24	1.217	25	1.365	28
	Passenger Car	21	268	1.131	303	1.217	326	1.365	366
	Passenger Truck	31	271	1.131	306	1.217	330	1.365	370
	Light Commercial Truck	32	34	1.128	39	1.219	42	1.376	47
	Intercity Bus	41	0	1.128	-	1.219	-	1.376	-
	Transit Bus	42	0	1.128	-	1.219	-	1.376	-
	School Bus	43	1	1.128	1	1.219	1	1.376	1
	Refuse Truck	51	0	1.128	-	1.219	-	1.376	1
	Single Unit Short-haul Truck	52	11	1.128	12	1.219	13	1.376	15
	Single Unit Long-haul Truck	53	0	1.128	1	1.219	1	1.376	1
	Motor Home	54	3	1.128	3	1.219	3	1.376	4
	Combination Short-haul Truck	61	7	1.128	7	1.219	8	1.376	9
	Combination Long-haul Truck	62	7	1.128	8	1.219	9	1.376	10
Roane County (Partial) Totals			**624**		**704**		**758**		**852**

Table B-1 – Continued

	Vehicle Type	MOVES sourceType ID	Source Type Population 2014	2024 Growth Factor	Source Type Population 2024	2030 Growth Factor	Source Type Population 2030	2040 Growth Factor	Source Type Population 2040
Roane County (whole)	Motorcycle	11	1606	1.131	1,816	1.217	1,955	1.365	2,192
	Passenger Car	21	20625	1.131	23,327	1.217	25,101	1.365	28,153
	Passenger Truck	31	20842	1.131	23,572	1.217	25,365	1.365	28,449
	Light Commercial Truck	32	2652	1.128	2,991	1.219	3,233	1.376	3,649
	Intercity Bus	41	1	1.128	1	1.219	1	1.376	1
	Transit Bus	42	0	1.128	-	1.219	-	1.376	-
	School Bus	43	78	1.128	88	1.219	95	1.376	107
	Refuse Truck	51	30	1.128	34	1.219	37	1.376	42
	Single Unit Short-haul Truck	52	818	1.128	923	1.219	997	1.376	1,126
	Single Unit Long-haul Truck	53	38	1.128	43	1.219	46	1.376	52
	Motor Home	54	209	1.128	235	1.219	254	1.376	287
	Combination Short-haul Truck	61	506	1.128	571	1.219	617	1.376	697
	Combination Long-haul Truck	62	563	1.128	635	1.219	687	1.376	775
Roane County (Whole) Totals			**47,968**		**54,236**		**58,388**		**65,530**
Sevier County	Motorcycle	11	3,206	1.303	4,177	1.609	5,158	2.089	6,697
	Passenger Car	21	35,345	1.303	46,055	1.609	56,870	2.089	73,836
	Passenger Truck	31	41,095	1.303	53,547	1.609	66,122	2.089	85,847
	Light Commercial Truck	32	5,226	1.234	6,449	1.387	7,248	1.656	8,654
	Intercity Bus	41	1	1.234	1	1.387	1	1.656	1
	Transit Bus	42	-	1.234	-	1.387	-	1.656	-
	School Bus	43	189	1.234	233	1.387	262	1.656	313
	Refuse Truck	51	41	1.234	50	1.387	57	1.656	67
	Single Unit Short-haul Truck	52	1,374	1.234	1,696	1.387	1,906	1.656	2,275
	Single Unit Long-haul Truck	53	64	1.234	79	1.387	89	1.656	106
	Motor Home	54	405	1.234	499	1.387	561	1.656	670
	Combination Short-haul Truck	61	425	1.234	525	1.387	590	1.656	704
	Combination Long-haul Truck	62	457	1.234	564	1.387	634	1.656	757
Sevier County Totals			**87,828**		**113,875**		**139,498**		**179,927**

B.2.3 AGE DISTRIBUTION

The EPA strongly recommends the use of local specific data for vehicle age distribution as it can vary greatly for various areas based on a number of factors. This input is important because of the fact that older vehicles generally exhibit higher emissions than newer vehicles due to fewer controls required to meet newer emissions standards and deterioration of other emissions control systems components. The Age Distribution inputs for this regional emissions analysis were obtained from U.T. as developed based on year 2014 motor vehicle registration data for each county, which were used for all analysis years.

B.2.4 VEHICLE TYPE VEHICLE MILES TRAVELED (VMT)

MOVES defines roadways into five different functional types: Off-Network, Rural Restricted Access, Rural Unrestricted Access, Urban Restricted Access and Urban Unrestricted Access. The TPO's Travel Demand Model uses a different roadway classification system, however it is easily converted to the MOVES road types as the Restricted categories involve roadways with no direct access such as Interstates and the Unrestricted road type includes all other types of roadways. The Vehicle Miles Traveled (VMT) from the TDM were then aggregated into the respective MOVES road types

The Knoxville Regional TPO's TDM predicts average weekday traffic volumes for all arterials and collectors and some major local roads in the 10-county modeling region. The model's roadway network covers over 7,500 lane miles in total over an area of 3,725 square miles represented by 1,186 traffic analysis zones. The current version of the model also predicts the Knoxville Area Transit (KAT) average weekday system ridership and the number of average weekday bicycle and pedestrian trips within the region. All current nonattainment/maintenance area counties are included in the TDM with the exception of the Cocke County partial 8-hour ozone maintenance area.

The methodology used to grow VMT to the future analysis years was to compare the base year 2014 VMT developed from actual traffic count data and reported by the Tennessee Department of Transportation for the federal Highway Performance Monitoring System (HPMS) to the travel demand model VMT. Correction factors for the model volume were developed and then subsequently applied to the growth rates exhibited for each future network year of the travel demand model based on changes in population and proposed transportation projects included in the Long Range Transportation Plan.

The travel demand model forecasts VMT growth for four different vehicle types of: Passenger Vehicles, Four-Tire Commercial Vehicles, Single-Unit Trucks and Multi-Unit Trucks. Growth factors for each vehicle type were applied to the base year data separately. Spreadsheets were used for each analysis year and county. Figure B-1 below shows an example VMT growth calculator spreadsheet used to develop the 2040 VMT for Knox County.

Figure B-1 – Example VMT Growth Calculator Spreadsheet for 2040 Knox County VMT

Knox County

HPMS Vtype Year 2014 (Original From UT December 2015):

CountyID	HPMSVtypeID	yearID	HPMSBaseYearVMT
47093	10	2014	29,532,294
47093	25	2014	4,822,272,035
47093	40	2014	4,304,486
47093	50	2014	107,579,518
47093	60	2014	427,431,382

Knox 2014 TDM	Passenger Vehicles	4 Tire Comm Veh	SU	MU	Total
TOTAL VMT	10,800,442.61	142,883.50	299,797.11	705,105.81	11,948,229.03

Knox 2040 TDM	Passenger Vehicles	4 Tire Comm Veh	SU	MU	Total
TOTAL VMT	15,676,716.50	214,188.45	434,174.39	981,523.63	17,306,602.97

Others Growth (applied to 10, 25)	SU Growth (applied to 40, 50)	MU Growth (applied to 60)
45.21%	44.82%	39.20%

Note: Others = Model types Passenger Veh + 4 Tire Comm Veh

HPMS Vtype Year 2040 Calculated from Model Growth Rate applied to Base Year 2014:

CountyID	HPMSVtypeID	yearID	HPMSBaseYearVMT
47093	10	2040	42,884,117
47093	25	2040	7,002,465,779
47093	40	2040	6,233,875
47093	50	2040	155,799,604
47093	60	2040	594,994,388

In order to more simply document the projected growth in VMT for each analysis year covered in this conformity determination, the following table (Table B-2) depicts only the total county-level Daily VMT for each analysis year.

Table B-2 – Growth in Total Daily (July Weekday) VMT (by Source Type) for Ozone Analysis

		Analysis Year		
County	**Source Type**	**2024**	**2030**	**2040**
ANDERSON (Partial)	Motorcycle	6,427	7,282	8,200
	Passenger Car	359,025	405,601	454,300
	Passenger Truck	305,754	345,406	386,922
	Light Commercial Truck	55,840	65,521	78,275
	Intercity Bus	-	-	-
	Transit Bus	-	-	-
	School Bus	478	541	609
	Refuse Truck	488	508	621
	Single Unit Short-haul Truck	10,742	12,213	13,691
	Single Unit Long-haul Truck	495	567	656
	Motor Home	346	389	434
	Combination Short-haul Truck	1,729	1,960	2,206
	Combination Long-haul Truck	5,929	6,717	7,565
	TOTALS	**747,251**	**846,705**	**953,480**
ANDERSON (Whole)	Motorcycle	22,753	24,913	27,917
	Passenger Car	1,271,113	1,387,658	1,546,643
	Passenger Truck	1,082,528	1,181,763	1,317,194
	Light Commercial Truck	197,669	224,093	266,452
	Intercity Bus	122	120	117
	Transit Bus	-	-	-
	School Bus	2,144	2,300	2,568
	Refuse Truck	2,245	2,381	2,647
	Single Unit Short-haul Truck	50,994	54,511	60,437
	Single Unit Long-haul Truck	2,416	2,562	2,851
	Motor Home	1,628	1,737	1,929
	Combination Short-haul Truck	50,845	53,299	57,958
	Combination Long-haul Truck	174,919	183,279	199,445
	TOTALS	**2,859,377**	**3,118,618**	**3,486,156**
BLOUNT	Motorcycle	25,155	30,739	36,568
	Passenger Car	1,618,194	1,979,961	2,359,501
	Passenger Truck	1,782,004	2,180,416	2,598,347
	Light Commercial Truck	288,931	347,653	405,018
	Intercity Bus	47	49	50
	Transit Bus	-	-	-
	School Bus	1,394	1,564	1,835
	Refuse Truck	1,528	1,717	2,039
	Single Unit Short-haul Truck	62,157	69,537	81,253
	Single Unit Long-haul Truck	2,045	2,299	2,657
	Motor Home	1,554	1,735	2,028
	Combination Short-haul Truck	32,736	37,012	42,553
	Combination Long-haul Truck	108,846	122,768	141,331
	TOTALS	**3,924,591**	**4,775,450**	**5,673,181**

Table B-2 – Continued

COCKE	Motorcycle	-	-	-
	Passenger Car	13,154	14,632	17,412
	Passenger Truck	18,286	20,690	24,378
	Light Commercial Truck	-	-	-
	Intercity Bus	-	-	-
	Transit Bus	-	-	-
	School Bus	-	-	-
	Refuse Truck	-	-	-
	Single Unit Short-haul Truck	-	-	-
	Single Unit Long-haul Truck	-	-	-
	Motor Home	389	437	517
	Combination Short-haul Truck	-	-	-
	Combination Long-haul Truck	-	-	-
	TOTALS	**31,829**	**35,758**	**42,307**
JEFFERSON	Motorcycle	30,610	32,834	37,600
	Passenger Car	1,046,191	1,123,103	1,290,705
	Passenger Truck	1,201,312	1,289,624	1,482,062
	Light Commercial Truck	173,627	184,297	201,228
	Intercity Bus	494	489	490
	Transit Bus	-	-	-
	School Bus	3,976	4,299	4,920
	Refuse Truck	6,583	7,065	7,927
	Single Unit Short-haul Truck	57,065	61,131	69,144
	Single Unit Long-haul Truck	5,842	6,225	7,016
	Motor Home	3,408	3,653	4,135
	Combination Short-haul Truck	98,310	105,441	118,786
	Combination Long-haul Truck	346,107	371,154	418,089
	TOTALS	**2,973,526**	**3,189,316**	**3,642,102**
KNOX	Motorcycle	102,801	112,683	128,308
	Passenger Car	8,099,723	8,877,512	10,113,826
	Passenger Truck	7,227,865	7,921,918	9,025,154
	Light Commercial Truck	1,458,449	1,600,130	1,812,041
	Intercity Bus	528	588	642
	Transit Bus	8,959	9,673	10,961
	School Bus	5,772	6,231	7,047
	Refuse Truck	10,910	11,754	13,317
	Single Unit Short-haul Truck	348,041	376,171	425,371
	Single Unit Long-haul Truck	13,014	14,069	15,924
	Motor Home	9,404	10,164	11,496
	Combination Short-haul Truck	344,923	366,964	405,253
	Combination Long-haul Truck	1,170,513	1,245,050	1,374,981
	TOTALS	**18,800,904**	**20,552,905**	**23,344,321**

Table B-2 – Continued

LOUDON	Motorcycle	22,158	24,033	27,664
	Passenger Car	1,253,609	1,360,478	1,566,495
	Passenger Truck	1,375,476	1,492,730	1,718,719
	Light Commercial Truck	190,394	204,829	234,869
	Intercity Bus	287	279	498
	Transit Bus	-	-	-
	School Bus	3,187	3,473	3,723
	Refuse Truck	4,418	4,780	5,398
	Single Unit Short-haul Truck	59,100	63,810	71,787
	Single Unit Long-haul Truck	4,028	4,377	4,916
	Motor Home	2,461	2,659	2,990
	Combination Short-haul Truck	74,537	79,795	88,501
	Combination Long-haul Truck	261,288	279,756	309,878
	TOTALS	**3,250,941**	**3,520,999**	**4,035,438**
SEVIER	Motorcycle	31,810	36,225	42,848
	Passenger Car	1,889,991	2,166,592	2,576,616
	Passenger Truck	2,321,694	2,661,503	3,165,145
	Light Commercial Truck	333,590	348,057	380,659
	Intercity Bus	53	52	51
	Transit Bus	-	-	-
	School Bus	2,040	2,273	2,637
	Refuse Truck	4,316	4,861	5,538
	Single Unit Short-haul Truck	75,744	84,099	97,303
	Single Unit Long-haul Truck	5,539	6,165	7,118
	Motor Home	4,068	4,518	5,231
	Combination Short-haul Truck	45,916	49,692	56,261
	Combination Long-haul Truck	153,703	166,388	188,506
	TOTALS	**4,868,464**	**5,530,427**	**6,527,913**

Table B-3 – Growth in Total Annual VMT (by Source Type) for PM2.5 Analysis

		Analysis Year		
County	**Source Type**	**2024**	**2030**	**2040**
ANDERSON	Motorcycle	7,643,021	8,368,598	9,377,479
	Passenger Car	426,978,828	466,127,495	519,531,962
	Passenger Truck	363,631,450	396,965,290	442,457,695
	Light Commercial Truck	66,398,957	75,275,090	89,503,552
	Intercity Bus	40,935	40,476	39,361
	Transit Bus	-	-	-
	School Bus	720,271	772,667	862,461
	Refuse Truck	754,282	799,673	889,129
	Single Unit Short-haul Truck	17,129,263	18,310,844	20,301,298
	Single Unit Long-haul Truck	811,416	860,684	957,751
	Motor Home	546,807	583,438	648,066
	Combination Short-haul Truck	17,079,426	17,903,765	19,468,588
	Combination Long-haul Truck	58,756,934	61,565,140	66,995,335
	TOTALS	**960,491,590**	**1,047,573,160**	**1,171,032,676**
BLOUNT	Motorcycle	9,002,574	10,277,198	12,226,018
	Passenger Car	579,120,232	661,971,564	788,865,829
	Passenger Truck	637,743,980	728,991,527	868,720,875
	Light Commercial Truck	103,402,686	116,233,007	135,412,159
	Intercity Bus	16,184	16,405	16,796
	Transit Bus	-	-	-
	School Bus	475,496	522,861	613,366
	Refuse Truck	521,290	573,915	681,597
	Single Unit Short-haul Truck	21,201,430	23,248,701	27,165,849
	Single Unit Long-haul Truck	697,435	768,583	888,431
	Motor Home	529,987	580,129	678,174
	Combination Short-haul Truck	11,358,329	12,374,347	14,227,109
	Combination Long-haul Truck	37,765,563	41,045,834	47,252,033
	TOTALS	**1,401,835,186**	**1,596,604,073**	**1,896,748,237**
KNOX	Motorcycle	34,361,510	37,664,438	42,887,350
	Passenger Car	2,707,350,059	2,967,327,969	3,380,568,091
	Passenger Truck	2,415,930,261	2,647,918,331	3,016,676,986
	Light Commercial Truck	487,489,767	534,846,997	605,678,534
	Intercity Bus	176,486	196,417	214,627
	Transit Bus	2,994,701	3,233,279	3,663,879
	School Bus	1,929,350	2,082,612	2,355,350
	Refuse Truck	3,646,789	3,928,959	4,451,329
	Single Unit Short-haul Truck	116,333,457	125,735,840	142,181,220
	Single Unit Long-haul Truck	4,350,014	4,702,557	5,322,568
	Motor Home	3,143,263	3,397,226	3,842,492
	Combination Short-haul Truck	115,291,387	122,658,363	135,456,527
	Combination Long-haul Truck	391,246,529	416,160,493	459,590,417
	TOTALS	**6,284,243,572**	**6,869,853,480**	**7,802,889,369**

Table B-3 (continued)

		Analysis Year		
County	**Source Type**	**2024**	**2030**	**2040**
LOUDON	Motorcycle	7,436,899	8,066,145	9,284,872
	Passenger Car	420,754,558	456,623,779	525,769,749
	Passenger Truck	461,657,263	501,011,953	576,861,521
	Light Commercial Truck	63,902,693	68,747,812	78,830,034
	Intercity Bus	96,172	93,632	167,294
	Transit Bus	-	-	-
	School Bus	1,069,595	1,165,687	1,249,656
	Refuse Truck	1,482,781	1,604,168	1,811,838
	Single Unit Short-haul Truck	19,836,013	21,416,735	24,094,106
	Single Unit Long-haul Truck	1,351,945	1,468,907	1,650,147
	Motor Home	825,967	892,516	1,003,391
	Combination Short-haul Truck	25,017,219	26,782,121	29,704,068
	Combination Long-haul Truck	87,697,269	93,895,970	104,005,822
	TOTALS	**1,091,128,372**	**1,181,769,425**	**1,354,432,498**
ROANE (Partial)	Motorcycle	399,629	429,086	479,374
	Passenger Car	23,497,044	25,244,207	28,177,093
	Passenger Truck	24,747,826	26,650,365	29,707,216
	Light Commercial Truck	3,908,368	4,102,874	4,675,986
	Intercity Bus	-	-	-
	Transit Bus	-	-	-
	School Bus	74,361	79,842	89,199
	Refuse Truck	-	-	202,559
	Single Unit Short-haul Truck	1,349,887	1,448,781	1,479,293
	Single Unit Long-haul Truck	187,681	185,936	164,538
	Motor Home	65,465	86,475	76,524
	Combination Short-haul Truck	1,704,287	2,027,813	2,089,694
	Combination Long-haul Truck	6,069,168	6,318,622	7,234,936
	TOTALS	**62,003,716**	**66,574,001**	**74,376,412**

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. These fractions for July were used to adjust annual average weekday VMT to July average weekday VMT for the Ozone analysis.

Hourly VMT fractions by road type were developed from the TPO's travel demand model and a separate post-processing software platform known as "PPSUITE". The post-processer is required in order to disaggregate the TDM traffic volume outputs from three time periods (AM, PM and rest of day) into individual hourly volumes for each of the twenty-four hours in a day. The hourly volumes are developed primarily by pattern matching based on the MOVES defaults for VMT by hour, which vary by road type (urban and rural) but not source type. The PPSUITE software uses the four vehicle types from the TDM (passenger vehicles, four-tire commercial vehicles, single-unit trucks and multi-unit trucks) to generate hourly VMT fractions for the different source types that are associated with those categories. In addition, special hourly distributions were applied to source types 42 and 43 (transit bus and school bus) to reflect the unique operating characteristics of these vehicles; for example, school buses basically only operate during school beginning and dismissal periods.

B.2.5 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. Average speed distribution for the Knoxville Nonattainment Area is developed by the TPO's TDM along with the aforementioned PPSUITE post-processer. 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 disaggregate level of detail needed for MOVES inputs. Speed is a direct function of several roadway characteristics and the amount of congestion that is present. The PPSUITE software develops separate 24-hour traffic volumes for each direction of travel on every roadway link in the model network and determines the average speed based on the amount of congestion (link volume-to-capacity ratio) and other characteristics, such as presence of traffic signals. The same speeds were assumed for all vehicle types. The speeds change over the course of the analysis years in this conformity analysis. The difference accounts for increased congestion and the impact of any changes to the transportation network such as road widening or new roadway construction projects.

B.2.6 ROAD TYPE DISTRIBUTION

Road type distribution is the distribution of VMT on each roadtype by sourcetype. Road type distribution data was provided by TDOT for the base year 2014. Road type distribution was held constant between the base and future year analyses. The off-network road type represents areas where start and idling activity occur. No VMT is assigned to this road type.

B.2.7 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 TPO's TDM.

B.2.8 FUELTYPE AND TECHNOLOGIES

Data for this input was developed and provided by TDEC. A copy of the methodology is provided as follows:

Fuel Type and Technology was formerly called Alternative Vehicle Fuels & Technology (AVFT). This data is now entered in the County Data Manager in MOVES2014a. 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 diesel fuel.

Local information for the Knoxville Area Transit (KAT) fleet was obtained by the Knoxville Regional TPO. This information included bus size, fuel type, model year and number of miles driven in the last year. This data was examined for use in developing local fuelEngFraction fractions. Table B-4 illustrates 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). Note, the KAT fleet does not have any model year 2006 or 2010

buses or vans (sourceType 42 is defined by EPA as passenger vehicles with a capacity of 15 or more persons primarily used for transport within cities).

Table B-4. Local fuelEngFraction From KAT Data.

sourceTypeID	modelYearID	fuelTypeID	engTechID	fuelEngFraction
42	2002	1	1	0
42	2003	1	1	0
42	2004	1	1	0
42	2005	1	1	0
42	2007	1	1	1
42	2008	1	1	0
42	2009	1	1	0
42	2011	1	1	0.389721741
42	2012	1	1	0.623587602
42	2013	1	1	0
42	2002	2	1	1
42	2003	2	1	1
42	2004	2	1	1
42	2005	2	1	1
42	2007	2	1	0
42	2008	2	1	1
42	2009	2	1	1
42	2011	2	1	0.610278259
42	2012	2	1	0.376412398
42	2013	2	1	1

Some model year vehicles in the KAT fleet are comprised strictly of gas or diesel powered vehicles. Only a couple model years have both gas and diesel vehicles. 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. After examining the distribution of gasoline and diesel transit buses and their VMT in the last year, a more homogenized approach was considered. The VMT were used to develop overall fractions based on fuel type (Table B-5).

Table B-5. Overall KAT Fleet Statistics.

	VMT	Fraction
Gasoline:	712,109	0.25798
Diesel:	2,048,262	0.74202
Total:	2,760,371	1

Using the total fraction of VMT attributable to gasoline vehicles versus diesel vehicles homogenizes the distribution of VMT across all model years while still maintaining the contribution from both diesel vehicles and gasoline vehicles to the overall vehicle miles traveled (approximately 26 percent gasoline and 74 percent diesel) by the transit fleet. This approach is more appropriate for the application of future-year analysis since the specific model year makeup in the future is unknown.

Applying the revised values for the transit bus fleet results in the values contained below in Table B-6. Note fuelTypeID 3 is CNG. These values are set to zero since there are no CNG buses in the KAT fleet. For any future year these same fractions would be applied.

Table B-6. Revised AVFT Values for sourceType 42.

sourceTypeID	modelYearID	fuelTypeID	engTechID	fuelEngFraction
42	2002	1	1	0.25797583
42	2003	1	1	0.25797583
42	2004	1	1	0.25797583
42	2005	1	1	0.25797583
42	2006	1	1	0.25797583
42	2007	1	1	0.25797583
42	2008	1	1	0.25797583
42	2009	1	1	0.25797583
42	2010	1	1	0.25797583
42	2011	1	1	0.25797583
42	2012	1	1	0.25797583
42	2013	1	1	0.25797583
42	2002	2	1	0.74202417
42	2003	2	1	0.74202417
42	2004	2	1	0.74202417
42	2005	2	1	0.74202417
42	2006	2	1	0.74202417
42	2007	2	1	0.74202417
42	2008	2	1	0.74202417
42	2009	2	1	0.74202417
42	2010	2	1	0.74202417
42	2011	2	1	0.74202417
42	2012	2	1	0.74202417
42	2013	2	1	0.74202417
42	2002	3	1	0
42	2003	3	1	0
42	2004	3	1	0
42	2005	3	1	0
42	2006	3	1	0
42	2007	3	1	0
42	2008	3	1	0
42	2009	3	1	0
42	2010	3	1	0
42	2011	3	1	0
42	2012	3	1	0
42	2013	3	1	0

B.2.9 FUEL

The fuel input was also developed and provided by TDEC based on EPA guidance. Essentially the fuels inputs reflect the maximum regulatory RVP levels by month for Tennessee. In addition, since EPA anticipates (based on the 2012 fuel formulations and supply information in MOVES) that essentially all gasoline sold in Tennessee in 2012 and later will contain at least nine percent ethanol, an additional 1.0 PSI waiver applies to the RVP values. Therefore, the RVP values developed are 1.0 PSI above the listed regulatory maximum as allowed by the 1.0 PSI waiver. Additionally, the fuels input provided by TDEC to the TPO includes the appropriate "fuel region" for Knoxville. For the historical baseline year analyses of 2002 and 2008, the MOVES default fuels were used as exported from the County Data Manager for each analysis county.

B.2.10 I/M PROGRAMS

Not applicable to the Knoxville Region

APPENDIX C – INTERAGENCY CONSULTATION

C.1 INTERAGENCY CONSULTATION PARTICIPANTS

Table C-1 shows the current participants in the Knoxville Interagency Consultation process

Table C-1 Knoxville IAC Participants

Agency	Representative(s)
Knoxville Regional Transportation Planning Organization (TPO) 400 Main Street, Suite 403 Knoxville, TN 37902 (865) 215-2500 | FAX: (865) 215-2068	Jeff Welch, TPO Director Mike Conger, Transportation Engineer
Knox County Department of Air Quality Management 140 Dameron Avenue Knoxville, TN 37917 (865) 215-5900 | FAX: (865) 215-5902	Lynne Liddington, Director Brian Rivera, Engineer
Tennessee Department of Transportation (TDOT) 505 Deaderick Street Nashville, TN 37243 (615) 741-2848 | FAX: (615) 532-8451	Deborah Fleming, MPO Program Manager
Tennessee Department of Environment and Conservation (TDEC), **Air Pollution Control Division** Tennessee Tower, 15th Floor 312 Rosa L. Parks Ave. Nashville, TN 37243 (615) 532-0616	Marc Corrigan, Environmental Consultant Greg Riggs, Environmental Consultant 3
Federal Highway Administration, Tennessee Division 404 BNA Drive, Building 200, Suite 508 Nashville, TN 37217 (615) 781-5767 | FAX: (615) 781-5773	Sean Santalla, Planning & Air Quality Specialist
U.S. Environmental Protection Agency (EPA), Region 4 61 Forsyth Street Atlanta, GA 30303 (404) 562-9077 | FAX: (404) 562-9019	Kelly Sheckler, Environmental Planner Dianna Myers, Environmental Scientist

Agency	Representative(s)
Federal Transit Administration (FTA), Region 4 (Atlanta) 61 Forsyth Street Atlanta, GA 30303 (404) 562-3500 | FAX: (404) 562-3505	Andres Ramirez, Community Planner
Lakeway Area Metropolitan Transportation Planning Organization (TPO) 100 W. 1st North Street Morristown, TN 37814 (423)581-0100 | FAX: (423) 585-4679	Rich DesGrosseillers, MTPO Director
Great Smoky Mountains National Park (GSMNP), Resource Management & Science Division 1314 Cherokee Orchard Road Gatlinburg, TN 37738 (865)436-1708 | FAX: (865) 430-4753	Jim Renfro, Air Quality Branch Chief Teresa Cantrell, Transportation Planner

C.2 INTERAGENCY CONSULTATION MEETING MINUTES

The following meeting minutes were applicable to this transportation conformity determination:

C.2.1 MEETING MINUTES FOR IAC CONFERENCE CALL ON 6/4/18

Knoxville Air Quality Interagency Consultation Conference Call
Meeting Minutes for 6/4/18

Call Participants:

Knoxville TPO:
- Mike Conger
- Jeff Welch
- Craig Luebke

Lakeway MTPO:
- Rich DesGrosseillers

EPA:
- Dianna Myers
- Jane Spann
- Richard Montieth
- Richard Wong

FHWA:
- Sean Santalla
- Elizabeth Watkins
- Theresa Claxton
- Mike Claggett

Karen Perritt

FTA:

None

National Park Service:

None

Tennessee Department of Transportation:

Deborah Fleming
Ronnie Porter
Tanisha Hall
Darlene Reiter

Tennessee Department of Environment & Conservation:

Marc Corrigan
Greg Riggs
Paul LaRock

Knox County Air Quality Management:

Brian Rivera

Discussion Items:

Note: a separate background information document was provided to the IAC group to accompany the agenda for the conference call. That document is attached to these minutes and should be referenced for additional supporting information.

1.) Purpose of this Call

Mike Conger provided an overview of the purpose of today's call which was to mainly discuss initial planning for how to address the recent resurrection of the conformity requirements for the 1997 Ozone Standard. He also noted that since this conformity analysis had to be conducted that the TPO would likely be revisiting the entire project list for the LRTP and TIP to account for changes that have occurred since their original adoption and redetermine their conformity for all other applicable standards. Marc Corrigan provided background for a secondary topic today which involves the requirement to develop a second 10-year Maintenance Plan for the 1997 Ozone Standard. Marc also asked for consideration of adding another agenda item at the end of the call to discuss a recent request by TDOT for IAC review of a regional significance determination. Mike agreed that this could be discussed today as well as an additional item regarding upcoming TIP and STIP amendments that he wanted to advise the IAC of.

2.) EPA & FHWA Updates on South Coast v. EPA Litigation and Interim Guidance

Dianna Myers provided an overview of the recent court decision and EPA's initial response which was to file a request for rehearing that was made on April 23, 2018. They are awaiting the Court's response. She noted that one item which they did not seek a rehearing on was the requirement for a second 10-year Maintenance Plan for the 1997 Ozone Standard. She mentioned that they are also asking for the Court to remand the vacatur of the revocation of

the 1997 Ozone Standard back to EPA in order to allow them to figure out how to best implement the decision. She said that EPA was working on some formal interim guidance in the meantime and their staff is available to assist in helping determine what is required to keep things moving as they await the Court response.

Sean Santalla reviewed the current interim guidance developed by FHWA for how to interpret the Court ruling. He noted that essentially three major actions pertaining to U.S. DOT approvals of TIP/STIP project amendments or NEPA findings (if not included in TIP/STIP) for non-exempt projects are currently on hold prior to areas being able to demonstrate conformity for the 1997 Ozone Standard or the Court modifying its decision based on EPA's petition for rehearing.

Karen Perritt and Mike Claggett from FHWA's Resource Center were on the call and noted that in response to this issue that a technical services team had been developed in order to assist areas. It was noted that two upcoming webinars would be held to provide training in terms of conformity and the MOVES model.

3.) Review of Current Conformity Status, Analysis Years and TDM Development

Mike provided an overview as noted in the background information.

4.) Discussion of Required Analysis Years for 1997 Ozone Standard

Mike described the requirements for analysis years. The Attainment Year was 2009 so that will not be applicable since it is in the past. Dianna Myers corrected the second bullet of the background document, which should have been the last year of the LRTP for conformity purposes and not the last year of the Maintenance Plan. Mike asked for agreement of the proposed analysis years of 2024, 2030 and 2040 with 2024 being an interpolation between 2022 and 2030. Dianna Myers stated that if the year 2022 was used for this analysis in that way then it would also need to be included as a formal analysis year and compared against an applicable budget. There was discussion regarding which budget would apply for a 2022 analysis year and it was unknown at this time whether it would be the older 1-hour budget for 2014 or perhaps the 2011 budget used in the 2008 Ozone Standard attainment demonstration. It was suggested that the TPO may want to explore the option of developing a 2024 network year for the model to avoid the issue of determining applicable budgets prior to 2024. Mike stated that they would investigate this further prior to the next discussion.

5.) Discussion of Applicable MVEBs and SIP Considerations

Refer to background information.

6.) Discussion of CDR Planning Assumptions and Data

Mike noted that more detail would be covered at a subsequent IAC call for planning assumption and MOVES inputs. Marc Corrigan raised an issue with regard to the different geographies involved for the 1997 and 2008 ozone standards and in particular how Anderson County would be handled since it was a partial area for 2008 and the whole county for 1997. It was determined that additional discussion would be needed to specifically identify applicable MOVES inputs in this situation.

7.) Discussion of SIP budgets and second ten-year Maintenance Plan

To reiterate earlier discussion, as Dianna pointed out, EPA is not anticipating a request on a rehearing of the second 10-year maintenance plan requirement. Thus, State and Local Air Agencies will need to develop the second 10-year maintenance plan for the 1997 8-hour ozone maintenance areas. With regards to meeting the current MVEBs, there may be a couple potential scenarios and options for consideration:

1) The area can demonstrate conformity under the existing MVEBs; or

2) The area cannot demonstrate conformity, but the emissions are easily within reach of the available safety margin, thus we may need to seek a change to the safety margin to amend the MVEBs; or

3) The MVEBs will not work with the addition of the safety margin and thus need to be revised in the maintenance plan or new maintenance plan.

8.) Discussion of SIP base year and final year, and MVEBs

Regardless of whether the area can meet the MVEB currently included in the first 10-year maintenance plan, a second 10-year maintenance plan will need to be developed. After some discussion, it was agreed that the last year of the 20-year maintenance plan would need to be 2031. The base year for the development of the maintenance plan, or from where emissions inventory projections can be made is any year that the area has attaining air quality data for the relevant NAAQS (any year since 2009). Thus, it was proposed that if the year from which the inventory is developed is 2014, the interim years used in the projections would be: 2020, 2023, 2026 and 2031. A MVEB would be established for 2031. There was discussion on the need to consider other years to establishing a budget for. One of the considerations that may still be needed are existing budgets; and how those should be address through new budgets.

9.) Next Steps

Mike stated that immediate next steps involved reaching out to the TPO jurisdictions and TDOT for up to date status and project information to determine any changes or new projects that should be addressed as this update regional emissions analysis is being conducted. Another next step is to draft detailed planning assumptions and MOVES input documentation for IAC review. Mike noted that in terms of an overall schedule for completing the conformity analysis that a best case scenario right now would be to have something ready for adoption by the TPO Executive Board at their September 26th meeting. Mike stated that he would be looking to hold the next IAC call in the time frame of the week of July 9th and that information would be provided to the IAC for review prior to then.

10.) Additional Agenda Item 1 – Regional Significance Determination

TDOT issued a regional significance determination for a proposed new roadway being constructed for a manufacturing facility (DENSO) in the City of Maryville under the TDOT's State Industrial Access program. Darlene Reiter provided some basic information on the project and

the finding that it should be considered not regionally significant. She noted that the comment period was scheduled to end on June 5th but that additional time could be provided if necessary. Marc Corrigan asked a question regarding how the regional travel demand model would account for the projected additional 250 daily truck trips that were noted in the determination documentation. Mike Conger replied that specific truck generators were not modeled but rather the model accounted for a generic calculation of expected truck trips based on the type and amount of employment included in each traffic zone.

11.) Additional Agenda Item 2 – Upcoming TIP and STIP amendments

Mike stated that he would be sending out a couple of proposed TIP and STIP amendments soon for IAC review. The TIP amendment involves a previously determined exempt project so he expected that would be straightforward. The two STIP amendments are both in Sevier County which is once again subject to conformity requirements under the current situation. Mike noted that one STIP amendment was just a diesel vehicle replacement but the other involved a non-exempt roadway project. He asked if it might be possible to proceed with amending the non-exempt project if it was funding only the preliminary engineering phase and no construction. Sean Santalla responded that their current interpretation was that this was one of those actions noted earlier as being on hold until conformity can be demonstrated for the 1997 standard so it can not be amended at this time.

C.2.2 MEETING MINUTES FOR IAC CONFERENCE CALL ON 7/13/18

Knoxville Air Quality Interagency Consultation Conference Call
Meeting Minutes for 7/13/18

Call Participants:

Knoxville TPO:
- Mike Conger
- Jeff Welch
- Craig Luebke

Lakeway MTPO:
- Rich DesGrosseillers

EPA:
- Dianna Myers
- Richard Montieth
- Egide Louis

FHWA:
- Sean Santalla
- Mike Claggett
- Karen Perritt

FTA:
- None

National Park Service:
- Jim Renfro

Tennessee Department of Transportation:

Deborah Fleming
Tom Doherty

Tennessee Department of Environment & Conservation:
Marc Corrigan
Greg Riggs

Knox County Air Quality Management:
Brian Rivera

Discussion Items:

1.) Updates on Court Decision and Guidance for South Coast v. EPA

Mike Conger asked if there were any updates from EPA and/or FHWA regarding the status of the rehearing by EPA for the DC Circuit Court decision affecting the 1997 Ozone Standard or new guidance. Karen Perritt responded that she only knew of preliminary process oriented activity with regard to the court rehearing and that the interim guidance issued by FHWA was still in effect regarding the implementation of the court decision.

2.) Discussion of CDR Planning Assumptions and MOVES Inputs

Mike provided a summary of the planning assumptions document that was provided to the group prior to this call. A summary of discussion related to each section is provided below:

Section I – Background: Karen Perritt commented that the statement made regarding the overturn of the revocation of the 1997 Ozone Standard was inaccurate and that the standard was still technically revoked by EPA but certain provisions including the requirement to do conformity were upheld by the Court as an anti-backsliding requirement.

There was also discussion regarding the proposal made by the TPO to address the 1997 Annual PM2.5 Standard due to the fact that it was a simple process to include since those annual-level emissions are computed anyway and used in the calculation for the 2006 Daily PM2.5 Standard. Mike stated that this might be worthwhile to include since we don't know whether a precedent may have been set with the decision affecting ozone and therefore being applied to the similar case of PM2.5 where a previous standard was replaced and revoked. Karen Perritt commented that to this point there had been no discussion regarding the application of the court decision to other standards and therefore this was not something they were prepared to specifically address as to how FHWA would react to the TPO's inclusion of this information in the CDR. She stated that this was the first case she was aware of where this was being considered and that she would check further into how FHWA would likely respond in terms of the overall final conformity finding and advise this group of that at a later date.

Section II – Planning Assumptions for Developing Travel Demand Forecasts: Marc Corrigan asked if the 2014 base year update provided ability to account for recent increasing growth trends assuming that Knoxville is seeing the same type of explosive growth as the Nashville

Region. Mike replied that the Knoxville Region had not been seeing the same level of growth as Nashville and has generally exhibited its continued slow and steady growth pattern. Following the call this was further verified by reviewing census population estimates from 2010-2016 in which Davidson County grew by nearly 10% in population versus around 5% for Knox County.

Section III – Latest Emission Model: Mike asked if there was a schedule for the release of the MOVES2014b edition and Egide Louis replied that there was no definitive date set yet and the 2014a edition was still the most current and should be used. Brian Rivera commented that the only change with 2014b was in terms of the non-road portion and therefore shouldn't affect anything for on-road mobile.

Section IV – Analysis Years: Mike confirmed the discussion from the previous IAC call where it was noted that a network year for 2024 could be used instead of 2022 to address the first year with an available budget. Karen Perritt asked whether it would be appropriate to interpolate for both 2026 and 2028 since normally only one data point between analysis years could be interpolated. Mike responded that those two years were for separate standards (ozone and PM2.5) and there was agreement that this was acceptable.

Section V – Emissions Tests: There was no additional discussion for this section.
Section VI – MOVES2014a Runspec Parameters: Egide Louis asked about the geographic bounds setting and specifically how the partial counties are handled in terms of county-level or as a custom domain. Mike responded that the county-level was used and the partial counties were handled by just using the applicable inputs for those areas for example only using the population and vehicles within the specific partial area. Egide stated that this was fine but needs to be documented. Mike agreed that further documentation would be provided.

Section VII – MOVES County Data Manager Inputs: Sean Santalla asked about the recent changes in methodology for local road VMT computation by TDOT and whether those would potentially affect this analysis. Mike responded that those changes would not impact this effort since they were done subsequent to the year 2014 HPMS submittal which is what the current TDM is calibrated to.

3.) Discussion of Planning Assumptions for Second Ten-Year Maintenance Plan

See separately attached notes provided by Marc Corrigan with TDEC.

4.) Next Steps/Schedule

Mike went through the proposed schedule that was sent to the IAC group via email the prior day. He noted that the adoption date was now being projected for October 24th instead of the previously mentioned September date to allow for more time. Mike noted that the next IAC call would likely be scheduled during the week of August 6th.

Knoxville Air Quality Interagency Consultation Conference Call
Meeting Minutes for 8/10/18

Call Participants:

Knoxville TPO:
- Mike Conger
- Craig Luebke

Lakeway MTPO:
- None

EPA:
- Dianna Myers
- Richard Wong
- Richard Montieth

FHWA:
- Sean Santalla
- Elizabeth Watkins
- Karen Perritt

FTA:
- None

National Park Service:
- None

Tennessee Department of Transportation:
- Deborah Fleming
- Troy Ebbert
- Kwabena Aboagye (KB)
- Michelle Christian

Tennessee Department of Environment & Conservation:
- Marc Corrigan
- Greg Riggs

Knox County Air Quality Management:
- Brian Rivera

Discussion Items:

1.) Discussion of Partial Area Emissions Analysis Methodology

Mike Conger provided an overview of the document that was provided to the IAC outlining the methodology and some of the assumptions used in developing the emissions analysis for the three partial areas within the study area. Sean Santalla asked a question regarding the time frame for when the actual MOVES inputs would be developed and Mike responded that they were under development currently and pending final runs of the travel demand model so within

the next few days. Marc Corrigan asked for clarification regarding the seasonal adjustment factor noted in the footnotes of the VMT trend table and whether that was only applied to the SR 32 count. Mike replied that it was only applied to SR 32 because that was an average annual daily traffic count number obtained from TDOT whereas the other two roadway count information came from the NPS and only reflected the summer months of June, July and August.

Subsequent to the IAC call, Marc Corrigan sent Mike a couple of other comments regarding the partial area methodology document, which were corrected -
In the partial county emissions analysis methodology document, in section C, regarding the Cocke County Partial area, you have fuels listed as an item that does not vary by year. It does vary by year, but does not vary between the partial and whole county analysis.

In the MOVES input description document, on page 4, there is an extra "between" in section II E near the end of the paragraph. In section II H, the table references do not match the table numbers. Also there is a "2" after "Guidance" under Table 1 that I think was a footnote at one time.

2.) Discussion of MOVES Inputs and Finalize Planning Assumptions

Mike provided an overview of the document that was provided to the IAC with further description of the source of data to develop the MOVES inputs. Mike noted that many of these items had already been discussed on previous calls and this was just to provide additional technical background for some of the inputs. Mike asked Marc for clarification regarding the fuels-related inputs since the topic came up on the last IAC call when Marc was reviewing planning assumptions for the development of the second ten-year maintenance plan. On that call Egide Louis from EPA had commented that he would prefer to handle the CNG vehicle type differently and Mike wanted to make sure he knew what that entailed. Marc responded that this was in reference to adding the CNG transit bus as a vehicle-fuel type in the MOVES runspec settings. Mike stated he would look into this further and contact Marc separately for any further guidance.

3.) Discussion of Revised Roadway Project List

Mike described the updated roadway project list and noted the proposed changes being made. He stated that no new projects were being added beyond those that had already been amended in the Transportation Improvement Program (TIP) since the last full update of the long-range transportation plan. He noted that some projects would be changing horizon years and these would be revised in the travel demand model as appropriate for the revised emissions analysis. He also discussed the projects being incorporated in this analysis within the 1997 ozone area but outside of the TPO planning area and the main sources of these projects being the TDOT FY 17-20 STIP, the TDOT IMPROVE Act, the LAMTPO 2040 Long Range Plan and other needs that have been identified and still being planned.

Mike discussed the Exempt and Regional Significance status of the projects and the fact that these determinations were previously made and being carried forward from the previous plans. He did note that one project for Morganton Rd was just beginning the design/NEPA phase and it may change from an exempt type of project of reconstruct 2-lane to having a continuous

center turn lane which would be non-exempt. On the other hand it may consist of shorter segments of turn lanes that could still qualify as exempt. Along those lines, Mike stated that he had seen a relatively new published interpretation by FHWA on exempt status for certain project types such as this, specifically that auxiliary lanes of less than 1 mile in length are to be considered exempt. Mike stated he had contacted Sean Santalla for further clarification as to exactly what fit under the definition of an auxiliary lane. Karen Perritt responded that they were still seeking additional guidance from EPA on that specific definition from EPA's perspective, but that this interpretation that was first published in a Conformity Highlights newsletter had subsequently been more officially documented in an EPA FAQ publication for PM hotspot analyses and a link to that can be provided. Mike thanked Sean and Karen from FHWA for their follow-up on this matter and said he would await any further specific guidance.

Marc asked for clarification regarding the termini for one of the projects where two separate sections were listed that have the identical revised termini. Mike responded that in that case it was a project previously split into two phases in the previous LRTP, but that TDOT had identified as one overall project in the IMPROVE Act so it was being proposed to consolidate it for the updated list.

KB asked if the recent TAP grant project awards that had been announced for the Knoxville Region were included in this project list. Mike responded that those had just come out within the past couple of days and had not been added to the list. He further noted that the TPO staff was still evaluating whether those projects might be able to be added to the current TIP under the TAP Grouping that had been set up and therefore they probably would not be called out individually in the long-range plan.

4.) Discussion of Planning Assumptions for Second Ten-Year Maintenance Plan

Marc wanted to follow up on a few items from the last call and solicit any questions on the second 10-year maintenance plan. Marc asked if participants received and had any trouble accessing the information discussed on the last call regarding the CRC-A100 data. Mike mentioned he had accessed the information and was reviewing it.

Marc asked EPA about an earlier question posed to EPA, who were going to research the question: for the second 10-year maintenance plan, what year are used to calculate the safety margin against? Dianna responded that in this case, the safety margin would be calculated against the 2014 year. Additionally, EPA was asked about how to 'completely' eliminate the 2024 MVEB that was set in the first 10 year maintenance plan. Dianna responded that EPA would need to be asked to remove the 2024 MVEB for future consideration. Marc asked whether this could be in the maintenance plan or the submittal letter. Dianna indicated that either would work.

5.) Updates on Court Decision and Guidance for South Coast v. EPA

An additional agenda item was added to get an update on the current status of the court litigation in the matter of South Coast v. EPA. Dianna Myers noted that there was an update in that the Court requested a response from the environmental petitioners by August 1, 2018 to EPA's request for a remand without vacatur which was an "ask" filed in the rehearing petition (April 23, 2018) and also wanted to know the petitioner's and EPA's thoughts on to a potential stay of the vacatur. The petitioners responded to the rehearing request and EPA has until

August 15, 2018 to respond to the court regarding the potential stay of the vacatur. Marc Corrigan noted that he believed that he had a copy of the petitioners latest filing and would send that to the group after the call.

6.) Next Steps/Schedule

Mike noted that the plan was still to have a draft Conformity Determination Report (CDR) document ready by Thursday, August 16th and continue progress towards an October TPO Board adoption date. He stated he would work on scheduling the next IAC call to be held sometime during the week of August 27th in order to get initial feedback from the IAC on the draft CDR.

C.2.4 MEETING MINUTES FOR IAC CONFERENCE CALL ON 8/29/18

Knoxville Air Quality Interagency Consultation Conference Call

Meeting Minutes for 8/29/18

Call Participants:

Knoxville TPO:
- Mike Conger
- Craig Luebke

Lakeway MTPO:
- None

EPA:
- Dianna Myers
- Egide Louis

FHWA:
- Sean Santalla
- Mike Claggett
- Karen Perritt

FTA:
- None

National Park Service:
- None

Tennessee Department of Transportation:
- Deborah Fleming
- Tom Doherty
- Michelle Christian

Tennessee Department of Environment & Conservation:
- Marc Corrigan
- Greg Riggs

Knox County Air Quality Management:

Brian Rivera

Discussion Items:

1.) Discussion of Draft Conformity Determination Report

Mike Conger provided an overview of the draft conformity determination report that was provided to the IAC on August 20th and currently in the 30-day IAC review period. Dianna Myers pointed out that the resolution included an incorrect reference to the 1997 PM2.5 Standard. Mike replied that there were likely some errors in the document since the previous report was used as a starting point and some incorrect references would need to be updated. Mike also noted that this document does not address the 1997 Annual PM2.5 Standard since it has been revoked although there was previous discussion at one of the first IAC calls about whether it made sense to do so in case that revocation was overturned similar to what happened with the 1997 Ozone Standard. This was further discussed and Karen Perritt pointed out that there was really no mechanism for the FHWA to make a conformity finding for that standard since it was not applicable at this time. Marc Corrigan asked a question about the project list and why certain cells were highlighted yellow. Mike replied that was to indicate which projects had been determined to be non-exempt from conformity for easier future reference.

Mike asked the group if they would support a reduction in the 30-day IAC period to a 25-day period, i.e. from August 20 to September 14 instead of out to September 19. Mike stated the main reason was to allow a bit more time for TPO staff to respond to any comments and still begin the required 30-day public review period on time. This would allow four full work-weeks of review time and also the TPO has had three prior IAC calls to review the majority of the information in the report itself. Marc Corrigan responded that he felt like he could complete his review by September 14th. No adverse comments were received and Mike stated that he would move forward with the reduced time period but that if there was objection later we could revisit this discussion.

2.) Discussion of Planning Assumptions for Second Ten-Year Maintenance Plan

Marc Corrigan stated that he did not have a significant update for this item and noted that there was less urgency overall in completing this task since based on the draft CDR results that Mike presented there would not be a need to revisit the actual motor vehicle emissions budgets since the current ones were all shown to be passed. Marc stated that there was still some needed clarification and guidance from EPA to move forward and would do so once that was clarified.

3.) Next Steps/Schedule

Mike stated that he did not believe a subsequent IAC call would be needed however one could be scheduled if any member desired. A future call will only be scheduled if determined necessary.

Regional Emissions Analysis Planning Assumptions and MOVES2014a Inputs for Development of 2017 KRMP Revised CDR

for IAC Review
July 13, 2018

I. Background:

The intent of this document is to establish the planning assumptions for a conformity analysis that will be undertaken as part of an update to the Long-Range Transportation Plan for the Knoxville Regional TPO. The Knoxville TPO compiles a single overall Long-Range Plan – known as the Knoxville Regional Mobility Plan (KRMP) for the entirety of the air quality non-attainment / maintenance areas in order to ensure all planned projects meet air quality conformity requirements. The ultimate horizon year for the KRMP is the year 2040.

The need for this particular conformity analysis is largely being driven by a recent court ruling in which the EPA's revocation of the 1997 Ozone Standard was overturned therefore causing a need to demonstrate conformity to that standard in order to avoid potential issues with amending non-exempt transportation projects into the current KRMP and Transportation Improvement Program (TIP). The TPO staff is taking this opportunity to revisit the overall project list in the KRMP to address any needed changes since its original adoption.

The conformity determination is proposed to address the following 4 separate NAAQS –

- 1997 8-Hour Ozone Standard (Maintenance Area) – Anderson, Blount, Jefferson, Knox, Loudon, Sevier and part of Cocke counties
- 2008 8-hour Ozone Standard (Maintenance Area) – Blount, Knox and part of Anderson counties
- 1997 Annual PM2.5 Standard* (Maintenance Area) – Anderson, Blount, Knox, Loudon and part of Roane counties
- 2006 Daily PM2.5 Standard (Maintenance Area) – same area as Annual PM2.5 Standard

* Note that the 1997 Annual PM2.5 Standard has technically been revoked for the Knoxville Region since it was replaced by the more stringent 2012 Annual PM2.5 Standard for which the Knoxville Region was designated Attainment. The TPO staff proposes to go ahead and document conformity to the 1997 standard regardless in order to avoid a possible future interpretation of the court ruling for Ozone being applied to PM2.5 and associated overturning of its revocation.

Attachment 1 is a map showing both the Ozone maintenance areas and the PM2.5 nonattainment areas along with the TPO Planning Area.

II. Planning Assumptions for developing Travel Demand Forecasts:

Following is a summary of the current travel demand forecasting model process including the associated socioeconomic data development. Note that this section is a direct carry-over from the planning assumptions document developed for the most recent full CDR for the 2017 KRMP update. No changes or updates to the travel demand model have been made since that time with the next major update scheduled to occur in conjunction with the next major 4-year update cycle of the long-range transportation plan scheduled to be adopted in mid-2021.

A full model update was finalized in 2012, which was validated to a 2010 base year. A minor update was conducted for the 2017 KRMP development in which only the input variable and external traffic data sources were modified, but the underlying travel behavior relationships were unchanged. The model has been re-validated to a base year of 2014 to coincide with the latest available traffic and land use data at the time of the model update development and all standard FHWA validation targets have been achieved.

The model outputs for total vehicle miles of travel (VMT) by roadway functional classification have been compared against the estimated actual amount of VMT as reported to FHWA for the Highway Performance Monitoring System (HPMS) and appropriate HPMS adjustment factors have been developed to ensure accurate replication of the amount of travel in the region. The travel demand model encompasses a total of 10 counties in the Knoxville Region and includes the entirety of the previously noted maintenance/nonattainment areas as shown on Attachment 1 with the exception of the partial Cocke County area subject to the 1997 Ozone Standard.

The county-level data for base year 2014 population and household characteristics is primarily derived from the U.S. Census Bureau's inter-censal Population Estimates data and American Community Survey (ACS) whereas employment data was obtained through various sources such as the Bureau of Economic Analysis (BEA) and Bureau of Labor Statistics (BLS). The future year 2040 county-level population and employment control totals were developed through a review of available sources of projection data including proprietary data from Woods & Poole Economics, the University of Tennessee Center for Business & Economic Research and previous custom projections developed by a consultant for the TPO. It was determined that the most appropriate source of future year projections remained the previously developed custom set and this recommendation was endorsed for use in preparation of the 2017 KRMP Update by the TPO Executive Board at its August 26, 2015 meeting.

The travel demand model summarizes socioeconomic characteristics (population, employment, household income, etc) into sub-county geographic units of somewhat homogenous land use known as Traffic Analysis Zones (TAZ). The county-level estimates for the base and future analysis years must be allocated to the TAZs. In the case of the base year, population data from the 2010 decennial census is available at very small geographic units known as Census Blocks which are aggregated to the TAZ-level. The net change in population for each county between 2010 and 2014 was then allocated based on recent trends in residential building permit activity. Employment data was allocated based on a proprietary data set known as InfoGroup obtained through TDOT, which provides detailed establishment level information of employment counts by industry type geocoded to its actual location.

The allocation of future year county-level control totals for population and employment represents a significant challenge in terms of attempting to predict the exact locations of growth, which is subject to many various market factors and unforeseen events such as a major auto manufacturer deciding to locate in a previously undeveloped area. A land use allocation modeling tool was developed for the TPO as part of a previous planning effort funded under the HUD Sustainable Communities Initiative grant known as "Plan East Tennessee" (PlanET). Since economic conditions have not changed significantly

since this tool's development and the KRMP is maintaining the same future out year of 2040 it was decided to rely again on the allocation results from the trend scenario that was developed for PlanET. The trend scenario was developed to serve as a base "business-as-usual" case to compare against other types of future land use scenarios that were considered such as a transit-oriented development scenario of more clustered and mixed-use growth than that which as occurred over the recent past which is primarily auto-oriented. The allocation results were updated to reflect the most recent "approved development" information, which are major new residential and commercial projects that have been previously announced and are likely to develop over the short term.

Other future years were developed between 2014 and 2040 in order to meet air quality horizon year analysis requirements as well as the need to identify priority needs as part of the process to select projects for inclusion in the 2040 Mobility Plan. The other network analysis years developed were for 2022 and 2030. For this updated analysis being conducted to satisfy the requirements to address the 1997 Ozone Standard, an additional network year of 2024 is being developed with the socio-economic inputs being derived primarily through interpolation of TAZ-attributes between the years of 2022 and 2030.

Attachment 2 provides a summary of the projected population and employment growth for the six counties within the travel demand model coverage area that are subject to conformity and a separate Excel file is provided that contains all socioeconomic attributes used in the model for each analysis year.

III. Latest Emissions Model:

The latest on-road emissions model from EPA as of this document's writing is known as MOVES2014a. This is the model that will be utilized to determine the total on-road emissions of the pollutants of concern related to Ozone and PM2.5 for each required analysis year.

IV. Analysis Years:

Analysis year requirements are described in 40 CFR 93.118 (Motor Vehicle Emissions Budget) and in general include:

- Attainment Year for applicable pollutant
- Years for which the maintenance plan establishes budgets
- Last year of the timeframe of the long-range transportation plan
- Years such that there are no more than 10 years between analysis years

The years for which budgets have been established for the various applicable NAAQS in the Knoxville Region are as follows:

Ozone:

- 1997 NAAQS – An approved MVEB is in place and established for year 2024.
- 2008 NAAQS – An approved MVEB is in place and established for years 2011 and 2026.

PM2.5:

- 1997 NAAQS – An approved MVEB is in place and established for years 2014 and 2028.
- 2006 NAAQS – An approved MVEB is in place and established for years 2014 and 2028.

Based on the above information, the following analysis years are proposed:

- 2024 – Budget Year for 1997 Ozone Maintenance Plan
- 2026 – Budget Year for 2008 Ozone Maintenance Plan
- 2028 – Budget Year for 1997 and 2006 PM2.5 Maintenance Plans
- 2030 – Year such that there are no more than 10 years between analysis years
- 2040 – Final Year of KRMP

It is proposed to develop travel demand model networks and MOVES inputs for the years of 2024, 2030 and 2040 to directly analyze the emissions for those required analysis years while using interpolated values for the analysis years of 2026 and 2028 to show consistency with the applicable MVEBs above.

V. Emissions Tests:

1997 Ozone Standard:

The EPA had previously revoked the requirement to determine transportation conformity for the 1997 8-Hour areas as of the effective date of the 2008 8-Hour Ozone Standard on July 20, 2013. However, a recent ruling on February 16, 2018 by the D.C. Circuit Court overturned the EPA's action to revoke the 1997 standard and therefore prior to any possible rehearing on the matter conformity requirements for this standard once again apply, at least in cases where any new non-exempt project amendments are required.

The emission test for the 1997 Ozone Standard is proposed to be a test against the Motor Vehicle Emissions Budget for the year 2024 was established as part of the redesignation of the 1997 Knoxville Region Ozone Nonattainment Area to Maintenance that will be applicable to all analysis years as described above.

The MVEB was determined to be "adequate" for purposes of transportation conformity by EPA on July 20, 2010. A notice announcing the effective date of September 30, 2010 for these budgets was published in Federal Register / Vol. 75, No. 178 on September 15, 2010. The MVEB for the 1997 Ozone NAAQS is provided below:

Pollutant	2024 MVEB (tons/day)
VOC	25.19
NO_x	36.32

2008 8-Hour Ozone Standard:

The emissions test for the 2008 8-Hour Ozone Standard is based on an MVEB set for both an interim year (2011) and the last year of the Maintenance Plan (2026). The EPA published a notice announcing a finding that the 2011 and 2026 Motor Vehicle Emissions Budgets (MVEB) for NOx and VOC included in the Maintenance SIP are adequate for the purposes of transportation conformity in the Federal Register / Vol. 80, No. 133, page 39970 on July 13, 2015. The following table provides the MVEBs for the 2008 Ozone NAAQS:

Pollutant	2011 (tons/day)	2026 (tons/day)
VOC	19.71	10.49
NOx	41.62	17.69

The emissions tests are performed for the analysis years of 2024, 2026, 2030 and 2040. Analysis years prior to 2026 (the 2024 analysis year) use the MVEB for 2011 while all other analysis years are compared against the MVEB for 2026.

1997 Annual PM2.5 Standard:

The emissions test for the 1997 Annual PM2.5 Standard is based on an MVEB set for both an interim year (2014) and the last year of the Maintenance Plan (2028). The EPA published a notice announcing a finding that the 2014 and 2028 Motor Vehicle Emissions Budgets (MVEB) for Direct PM2.5 and Oxides of Nitrogen (a PM2.5 precursor pollutant) included in the Maintenance SIP are adequate for the purposes of transportation conformity in the Federal Register / Vol. 82, No. 46, page 13338 on March 10, 2017. The following table shows the MVEB for the 1997 Annual PM2.5 Standard:

Pollutant	2014 (tons/year)	2028 (tons/year)
PM2.5	444.78	245.00
NOx	15,597.73	7,171.14

The emissions tests are performed for the analysis years of 2024, 2028, 2030 and 2040. Analysis years prior to 2028 (the 2024 analysis year) use the MVEB for 2014 while all other analysis years are compared against the MVEB for 2028.

2006 Daily PM2.5 Standard:

The EPA published a notice announcing a finding that the 2014 and 2028 Motor Vehicle Emissions Budgets (MVEB) for Direct PM2.5 and Oxides of Nitrogen (a PM2.5 precursor pollutant) included in the Maintenance SIP are adequate for the purposes of transportation conformity in the Federal Register / Vol. 82, No. 46, page 13347 on March 10, 2017. The same discussion as above for the 1997 Annual PM2.5 Standard applies to the Daily Standard and the MVEB is essentially the same except the annual emissions budget is simply converted to a daily emissions budget by dividing it by 365. The following table shows the MVEB for the 2006 Daily PM2.5 Standard:

Pollutant	2014 (tons/day)	2028 (tons/day)
PM2.5	1.22	0.67
NOx	42.73	19.65

The emissions tests are performed for the analysis years of 2024, 2028, 2030 and 2040. Analysis years prior to 2028 (the 2024 analysis year) use the MVEB for 2014 while all other analysis years are compared against the MVEB for 2028.

VI. MOVES2014a Runspec Parameters

The MOVES model run is first set up based on a number of parameters to define the appropriate geographic scale and other aspects of the modeling domain to be utilized in the analysis, which is referred to as a "run specification" or runspec for short. Following is a list of the MOVES runspec panels and how they are proposed to be set up for the KRMP conformity analysis and based on appropriate technical guidance documentation from EPA:

1.) Scale:

- Both Pollutants – County level scale – Inventory mode

2.) Time Spans:

- Both Pollutants – Year (based on analysis years as ultimately selected, most likely 2024, 2030 and 2040), by Hour, all hours
- Ozone – July weekday
- PM2.5 – All months, all days

3.) Geographic Bounds:

- 1997 Ozone – Anderson, Blount, Cocke (partial), Jefferson, Knox, Loudon and Sevier counties
- 2008 Ozone – Anderson (partial), Blount and Knox counties
- PM2.5 – Anderson, Blount, Knox, Loudon and Roane (partial) counties

4.) Vehicles/Equipment:

- Both Pollutants – Gasoline, CNG, ethanol (E85) and diesel fuels, all valid vehicle combinations

5.) Road Type:

- Both Pollutants – All road types

6.) Pollutants and Processes:

- Ozone – NOx and VOC and all other required supporting prerequisite pollutants
- PM2.5 – Primary PM2.5 (exhaust, brake and tire wear), NOx and all supporting prerequisite pollutants
- Note – unchecked the "Refueling Displacement Vapor Loss" and "Refueling Spillage Loss" to exclude refueling emissions that are instead included in the Area source emissions inventory.

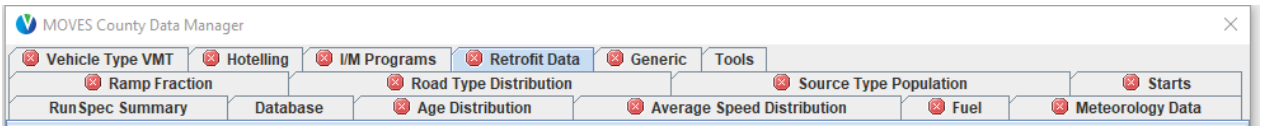
7.) Output options:

- Both Pollutants –
    - General Output tab: Units = grams, joules, miles; Activity: checked "Distance Traveled" and "Population"
    - Output Emissions Detail tab: checked "Road Type" and "Source Use Type"

VII. MOVES2014a County Data Manager Input Data Sources and Assumptions

The “County Data Manager” portion of MOVES allows the user to input specific data for several required inputs that effect and are used to compute emissions. Locality-specific data is required for some inputs and is always desired if available rather than using national defaults. For purposes of the pre-analysis consensus plan this document will only cover the general proposed sources for each input and further review of specific inputs will occur as part of the forthcoming analysis.

Below is a screenshot showing the county data manager tabs in the MOVES software where the data is loaded for each input and following that is an overview of each input and its data source.



CDM 1.) Meteorology – this input consists of locality specific values of temperature and humidity covering the required analysis time frame, i.e. summer months for Ozone and all months for annual PM2.5. It is generally required that the conformity analysis must use consistent inputs for meteorology that were developed for an applicable SIP and its MVEBs. Since MVEBs are available in all cases the direct MOVES inputs used in their development will be utilized for this analysis. One special note is that the inputs used for the development of the 1997 Ozone Maintenance Plan were developed using MOBILE6 which was the effective mobile source emissions model at the time, therefore these inputs will need to be converted from MOBILE6 to MOVES format using the available converter spreadsheets from EPA.

- Analysis Year Variation – This input is held constant for all analysis years.

CDM2.) Source Type Population – this input defines the vehicle population within the study area by type of vehicle and must be generated using local-specific data. This input has been generated for a base year of 2014 by researchers from the Department of Civil and Environmental Engineering at the University of Tennessee, Knoxville under contract to the Tennessee Department of Transportation using a combination of county-level motor vehicle registration data from the Tennessee Department of Revenue, surveys of local school districts and transit agencies on bus ownership and national default ratios to determine vehicle counts of those vehicles not included in the motor vehicle registration database such as long-haul trucks. In order to forecast future-year projections of Source Type Population for the light duty vehicle source types the Knoxville TPO’s travel demand model was utilized to develop growth factors from its vehicle ownership model. All other source type growth factors were based on the projected employment growth percentage. Special attention has to be applied to the partial counties of Anderson and Cocke (for Ozone) and Roane (for PM2.5) to ensure that only the vehicles garaged in those specific areas are included.

- Analysis Year Variation – This input is varied for each analysis year based on the projected growth in total vehicles.

CDM3.) Age Distribution – vehicle age distribution datasets were also developed for year 2014 by the University of Tennessee in MOVES format that are utilized for all analysis years.

- Analysis Year Variation – This input is held constant for all analysis years.

CDM4.) Vehicle Type VMT – this MOVES input actually consists of four separate input files related to the estimated vehicle miles of travel in the area being analyzed including:

- HPMSVTypeYear – this is the total amount of VMT estimated for each of the analysis years by Source Type. A base year value was developed by UT for 2014 and growth factors by major source type provided by the KRTM are used to develop the future year estimates.
    - Analysis Year Variation – This input is varied for each analysis year based on the projected growth in VMT.
- Month – this input accounts for the variability in travel throughout the months of the year. These inputs were developed by UT from traffic count data collected by TDOT.
    - Analysis Year Variation – This input is held constant for all analysis years.
- Day – this input accounts for the differences in weekday travel versus weekend travel and are also available from the UT study.
    - Analysis Year Variation – This input is held constant for all analysis years.
- Hour – this input accounts for the hourly variation in travel and is provided by the KRTM using a post processing software tool known as PPSUITE.
    - Analysis Year Variation – This input is varied for each analysis year based on the results of the travel demand model run.

CDM5.) Average Speed Distribution – this input will be developed for all future years using the KRTM and the PPSUITE post processing tool, which formats the travel model outputs on network speeds into the appropriate MOVES format.

CDM6.) Road Type Distribution – this input provides the distribution of VMT on each road type by source type. This input was developed by UT for 2014 and will be held constant for the future year analyses.

- Analysis Year Variation – This input is held constant for all analysis years.

CDM7.) Ramp Fractions – this input is derived from the TPO's travel demand model and post processing tool PPSUITE to determine the percent VHT spent on urban and rural restricted access ramps.

- Analysis Year Variation – This input is varied for each analysis year based on the results of the travel demand model run.

CDM8.) Fuel – Consists of four separate inputs (Fuel Supply, Fuel Formulation, Fuel Usage Fraction and AVFT). These inputs are provided by TDEC based on EPA guidance to reflect fuels used in the Knoxville Region. Transit fleet data from Knoxville Area Transit (KAT) was used to develop fuel type profiles for transit buses (sourceType 42), which consist only of gasoline and diesel fuel vehicles (no CNG).

- Analysis Year Variation – This input is held constant for all analysis years.

CDM9.) Starts – local information for this input is not currently available and therefore MOVES defaults are utilized for all analysis years.

CDM10.) Hotelling – local information for this input is not currently available and therefore MOVES defaults are utilized for all analysis years.

CDM11.) I/M Programs – this is not applicable to the Knoxville Region as it does not currently have any inspection and maintenance programs.

Anderson, Roane & Cocke County
Partial County Emissions Analysis Methodology

for IAC Review
August 10, 2018

I. Background:
The purpose of this document is to summarize the methodology used to account for the on-road mobile source emissions that are generated within the partial county areas subject to transportation conformity in the Knoxville Region. There are three separate partial counties as designated by EPA for various NAAQS as follows and shown in the maps at the end of this document:

- Anderson County – Partial area designated with 2008 8-Hr Ozone Standard consisting of the area surrounding the TVA Bull Run Fossil Plant and corresponding to 2000 Census Tracts 202 and 213.02. Size of area = 35.0 sq. miles, 2010 Population = 15,372.
- Cocke County – Partial area designated with 1997 8-Hr Ozone Standard consisting of the portion within the Great Smoky Mountains National Park boundary and corresponding to 2010 Census Tract 9801. Size of area = 26.5 sq. miles, 2010 Population = 4.
- Roane County – Partial area designated with 1997 and 2006 PM2.5 Annual & Daily Standards consisting of the area surrounding the TVA Kingston Fossil Plant and corresponding to 2000 Census Block Group 471450307002. Size of area = 5.8 sq. miles, 2010 Population = 711.

II. General Overview of MOVES Model Parameters for Partial County Analysis:
The EPA MOVES is set up to use full counties as the base level of analysis and its "County Data Manager" is pre-populated with certain default information for all counties in the United States. In order to account for partial county emissions, one can set up the MOVES model with either a "custom domain" or use the county-level option with modified input parameters to account for only the partial area's contribution. Previous practice for the Knoxville Region has been to use the latter option, both in development of state implementation plans as well as conformity determinations.

It is believed that this is the most straightforward approach since the MOVES Runspec is identical for both a full and partial county analysis and several of the inputs in the County Data Manager apply to both levels of analysis as described for each input as follows (inputs that vary between the two levels of analysis are in **bold**):

- Meteorology – this input is constant between full and partial county analyses.
- **Source Type Population** – this input is different between the two levels of analysis since there will be a different number (fewer) vehicles garaged within the partial county area.
- Age Distribution – this input is constant between full and partial county analyses.

- Vehicle Type VMT – this MOVES input consists of four separate input files including:
  - **HPMSVTypeYear** – this input is different between the two levels of analysis since there will a different (less) VMT within the partial county area.
  - Month – this input is constant between full and partial county analyses.

    - Day – this input is constant between full and partial county analyses.
    - **Hour** – this input is different between the two levels of analysis since it is post-processed from the travel demand model results particular to the roadways within the partial area.
- **Average Speed Distribution** – this input is different between the two levels of analysis since it is post-processed from the travel demand model results particular to the roadways within the partial area.
- **Road Type Distribution** – this input is different between the two levels of analysis since it is particular to the roadways within the partial area.
- **Ramp Fractions** – this input is different between the two levels of analysis since it is particular to the roadways within the partial area.
- Fuel – this input is constant between full and partial county analyses.

III. Specific Input Development for Partial Areas:

This section will describe in more detail how the specific inputs were developed that vary between the full and partial county-level analyses for each partial area separately. Note that since the two partial areas of Anderson and Roane counties are included within the TPO's regional travel demand forecasting model most of the "activity" inputs, i.e. VMT speed, etc. that are needed are derived directly from the travel demand model and/or its post-processing tool. Since Cocke County is not included within the travel demand model various assumptions must be made to develop the activity inputs and future-year forecasts for such using an "off-model" process.

A. Anderson County Partial Area:

1. Source Type Population – In previous analyses for establishment of the Maintenance Plan and subsequent conformity determinations it was determined that an acceptable assumption would be to base the source type (vehicle) population of the Anderson County partial area on the percent of people residing within that portion of the county. A value of 21% was derived based on the latest (2010) decennial census which has the most reliable estimates of population at both the county and census tract levels. The 2010 total county population was 75,129 and the population of the partial area (census tracts 202.01, 202.02 and 213.02) was 15,553.

   Therefore, in order to derive the base year 2014 Source Type Population for the partial area of Anderson County, a factor of 0.21 is multiplied by the year 2014 data at the whole county-level that was provided by the University of Tennessee as shown in the table below:

Vehicle Type	MOVES SourceType ID	Whole County Source Type Population	Partial County Source Type Pop
Motorcycle	11	2,538	533
Passenger Car	21	38,956	8,181
Passenger Truck	31	32,610	6,848
Light Commercial Truck	32	4,489	943
Intercity Bus	41	1	0
Transit Bus	42	-	-
School Bus	43	90	19
Refuse Truck	51	32	7
Single Unit Short-haul Truck	52	1,183	248
Single Unit Long-haul Truck	53	42	9
Motor Home	54	242	51
Combination Short-haul Truck	61	483	101
Combination Long-haul Truck	62	533	112
	TOTALS	**81,198**	**17,052**

2. HPMSVTypeYear – This input to MOVES provides an estimate of the total vehicle miles of travel (VMT) broken down by five major source types – Motorcycles, Light Duty Vehicles, Buses, Single Unit Trucks and Combination Trucks. Shown below is a copy of the spreadsheet calculator tool developed to derive partial area VMT:

HPMS Vtype Year 2014 (Original From UT):

countyID	HPMSVtypeID	yearID	HPMSBaseYearVMT
47001	10	2014	6,724,150
47001	25	2014	753,976,516
47001	40	2014	655,326
47001	50	2014	16,565,143
47001	60	2014	64,884,305

Travel Demand Model VMT by Vehicle Type

2014 TDM VMT	Passenger Vehicles	4 Tire Comm Veh	SU	MU	Total
Whole County	1,648,070.04	17,114.78	46,182.51	185,044.99	**1,896,412.32**
Partial Area	463,004.41	6,615.42	9,930.11	6,444.19	**485,994.13**
% Partial		28%	22%	3%	**26%**

HPMS Vtype Year 2014 (Derived for Partial Area):

countyID	HPMSVtypeID	yearID	HPMSBaseYearVMT
47001	10	2014	1,896,363
47001	25	2014	212,638,454
47001	40	2014	140,907
47001	50	2014	3,561,817
47001	60	2014	2,259,595

The top table has the "actual" VMT by source type for Anderson County derived by U.T. using TDOT's HPMS data for year 2014. The middle table shows the travel demand model estimated VMT for year 2014 by the four vehicle types included in the model for both the entirety of Anderson County and the roadways within the partial area. A factor is derived for each vehicle type to match the source types needed for MOVES as indicated by the color-codes. The factors are then multiplied by the original VMT to compute the partial area VMT. The importance of including the vehicle types in this calculation rather than using a single

factor for all vehicle types together is demonstrated by looking at the factor for Source Type 60 (combination trucks). The factor of 3% of the combination or multi-unit (MU) trucks applied to the partial area makes sense because the vast majority of trucks in Anderson County would be using I-75, which is outside of the partial area boundary.

3. Other Activity Inputs – The other four activity inputs (VMT by Hour, Average Speed, Road Type Distribution and Ramp Fractions) are simply derived from post-processing the travel demand model outputs using only the appropriate roadway network within the partial area with PPSUITE software. The PPSUITE software provides the outputs ready for use directly in MOVES.

B. Roane County Partial Area:

The derivation of inputs for the Roane County Partial Area is essentially identical to that of the Anderson County Partial Area. The Roane County area is much smaller in terms of population however and the source type population is therefore much less. The derivation of the source type population was done using the travel demand model estimation of number of vehicles within the partial area compared with the whole county as being slightly more conservative than the percentage of people population at 1.3%. The table below is copied from the PM2.5 Maintenance Plan and shows the various metrics looked at for the partial area source type population.

Roane County Nonattainment Area Statistics for 2010: Percentages of Entire County[a]	
Census People Population	1.1%
Census Number of Households	1.1%
Census Household Vehicles[b]	1.0%
Travel Demand Model Predicted Vehicles	1.3%

[a] Census Block Group 471450307002

[b] 2010 Vehicle ownership is from 2010-2014 ACS 5-year estimate (margin of error +/- 140 for partial area)

C. Cocke County Partial Area:

Following is a description of how each input was developed including forecasting techniques (if applicable) for the Cocke County partial area analysis. The inputs of Meteorology, Age Distribution and VMT by Month/Day/Hour are applicable to both the partial and whole county-level and do not vary by analysis year therefore the base year 2014 inputs derived by U.T. will be used. The Fuels inputs are provided by TDEC and vary by analysis year, but not between the partial and full county analysis.

1. Source Type Population – The 2010 Census shows a population of only 4 people within the Cocke County Partial Area. This is somewhat to be expected since the area is comprised of National Park boundary and the only likely residents would be perhaps Park Service personnel. There is however a campground within the partial area, known as Cosby Campground that should be accounted for. The campground contains 165 spaces so a conservative estimate that all spaces were occupied was used to develop the source type population input. Another assumption made was that the only vehicle types present would be source types 21 (Passenger Car), 31 (Passenger Truck) and 54 (Motorhome). The 165 vehicles were broken down by assigning 65 to Motorhome and the remaining 100 vehicles

were split proportionally based on the 2014 Cocke County source type population received from U.T., resulting in 46 passenger cars and 54 passenger trucks. This value was set for 2014 and a growth rate corresponding to VMT growth used for the Cocke County partial area of 3% per year was applied to grow the population to year 2040. The growth rate of 3% allows for a conservative estimate of around 5 new campground spaces being added each year to accommodate potential growth in visitation.

2. HPMS VType Year – The Ozone partial nonattainment area in Cocke County consists of only the portion of Cocke County within the confines of the Great Smoky Mountains National Park. Three roadways were determined to be included in the partial nonattainment area as agreed upon previously through the IAC process, which are SR 32, Cosby Campground Road and the Foothills Parkway. The emissions analysis methodology for this area consists of an off-model analysis of future traffic growth on these three roadways since they are not represented in the TPO travel demand model.

   Actual traffic counts for each of the three roadways were used to develop an estimated overall VMT in the partial area. Historical traffic counts back to the year 2000 were reviewed and used to develop a trendline to forecast expected growth in VMT out to the year 2040 in the absence of a travel demand model. The most recent growth rate was based on year 2012 traffic count information and reviewed against data obtained from both TDOT and the National Park Service through year 2016. In all cases the forecasted year 2016 traffic volume was higher than the actual year 2016 traffic volume, therefore the previous growth rate is still assumed to be valid, if not somewhat conservative. The historical traffic volume (converted to summer time daily VMT) and future projections for each roadway are shown on the chart on the following page.

   The final step in obtaining the HPMSVTypeYear input was to utilize the EPA MOBILE6 to MOVES spreadsheet converter known as “vmt-converter-road-veh16-20100209.xls” to input the annualized VMT by road type and fractions of VMT on road type by vehicle type from past conformity analyses for Cocke County for each analysis year.

Cocke County Partial Ozone Nonattainment Area VMT Projections for 2018 KRMP Conformity Determination

	Cosby Campground Road (Rural Local)		Foothills Pkwy East (Rural MinorArterial)		SR 32 (Rural Major Collector)	
	Actual	Forecasted	Actual	Forecasted	Actual	Forecasted
2000	452		6,919		9,315	
2001	341		5,570		10,082	
2002	471		5,662		11,347	
2003	425		6,257		10,951	
2004	351		6,513		10,273	
2005	274		6,026		11,487	
2006	435		7,224		10,324	
2007	414		7,125		10,823	
2008	849		7,205		10,606	
2009	1,040		10,282		12,101	
2010	986		10,487		10,478	
2011	1,005		10,696		11,308	
2012	1,046		10,910		11,429	
2013	703	1,081	10,248	10,969	12,241	11,532
2014	995	1,146	7,618	11,427	12,369	11,635
2015	465	1,212	8,534	11,886	12,880	11,739
2016	452	1,277	8,508	12,344	11,053	11,842
2017		1,343		12,803		11,945
2018		1,408		13,261		12,048
2019		1,474		13,720		12,152
2020		1,539		14,178		12,255
2021		1,605		14,636		12,358
2022		1,670		15,095		12,461
2023		1,736		15,553		12,565
2024		1,802		16,012		12,668
2025		1,867		16,470		12,771
2026		1,933		16,929		12,874
2027		1,998		17,387		12,978
2028		2,064		17,846		13,081
2029		2,129		18,304		13,184
2030		2,195		18,763		13,287
2031		2,260		19,221		13,391
2032		2,326		19,679		13,494
2033		2,391		20,138		13,597
2034		2,457		20,596		13,700
2035		2,522		21,055		13,804
2036		2,588		21,513		13,907
2037		2,653		21,972		14,010
2038		2,719		22,430		14,113
2039		2,784		22,889		14,217
2040		2,850		23,347		14,320

Count Source: NPS, Public Use Statistics Office & TDOT

Cosby Campground/picnic area access road is 2.4 miles in length

Foothills Parkway East is 5.6 miles in length.

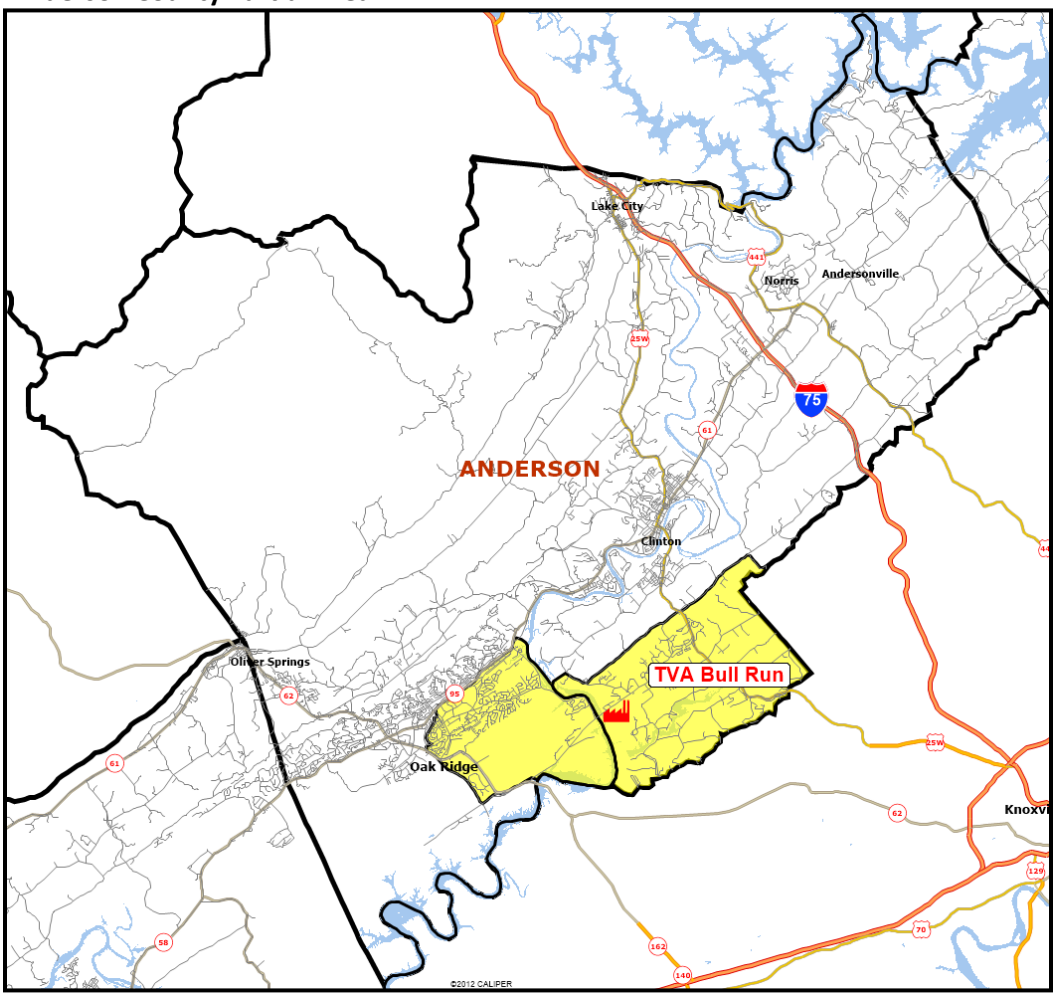
SR 32 is 9.2 miles and a summertime recreational Seasonal Adj Factor of 0.72 was applied to AADT

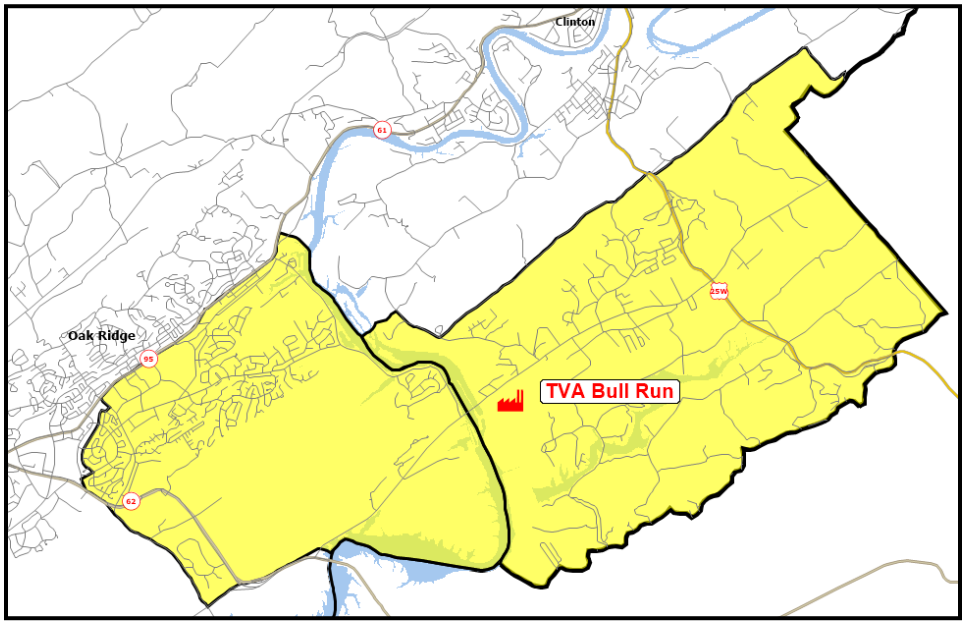
3. Average Speed Distribution – All previous conformity analyses performed for Cocke County that used MOBILE6.2 assumed a single daily average speed of 45 mph for the combination of roadways in the Cocke County Partial Area. This assumption was made based on the premise of no congestion in the area and the amount of available roadway capacity meaning that future years will likely not be subject to congestion either. The previous MOBILE6.2 input was put into the EPA MOBILE6 to MOVES converter spreadsheet known as "averagespeedconverter_mobile6.xls" in order to derive the MOVES formatted input for average speed distribution.

4. Road Type Distribution – This input is also provided from the same MOBILE6 to MOVES converter spreadsheet as the one for VMT. Since all three roadways located in the partial area are non-access controlled facilities within an area classified as rural they fall under the Road Type category of "3" for rural unrestricted access.

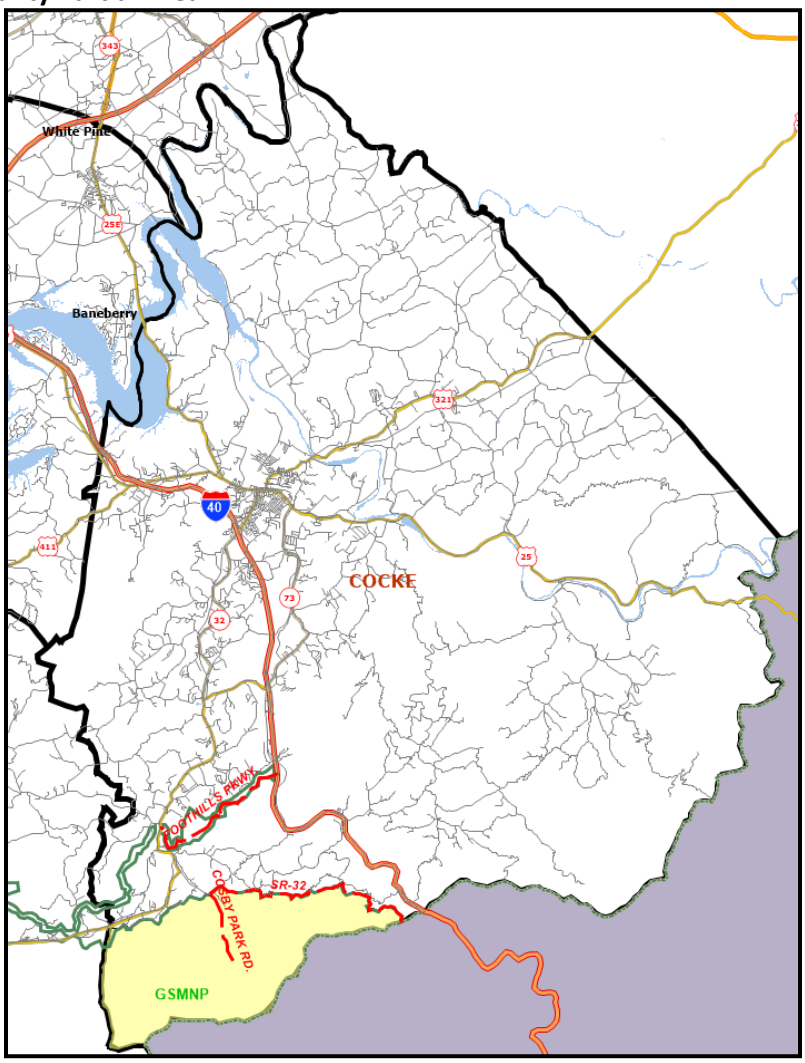
5. Ramp Fraction – This input is set to zero since none of the roadways in the partial area use ramps and are not access controlled.

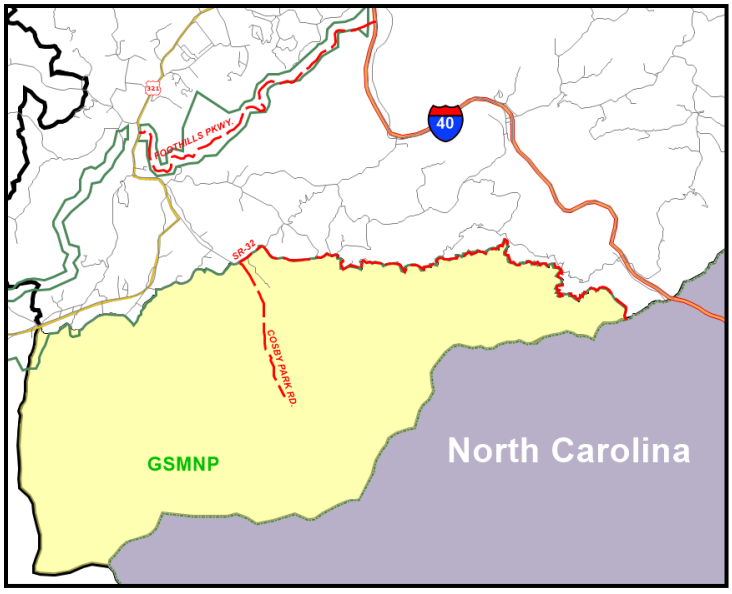
Map 1 – Anderson County Partial Area



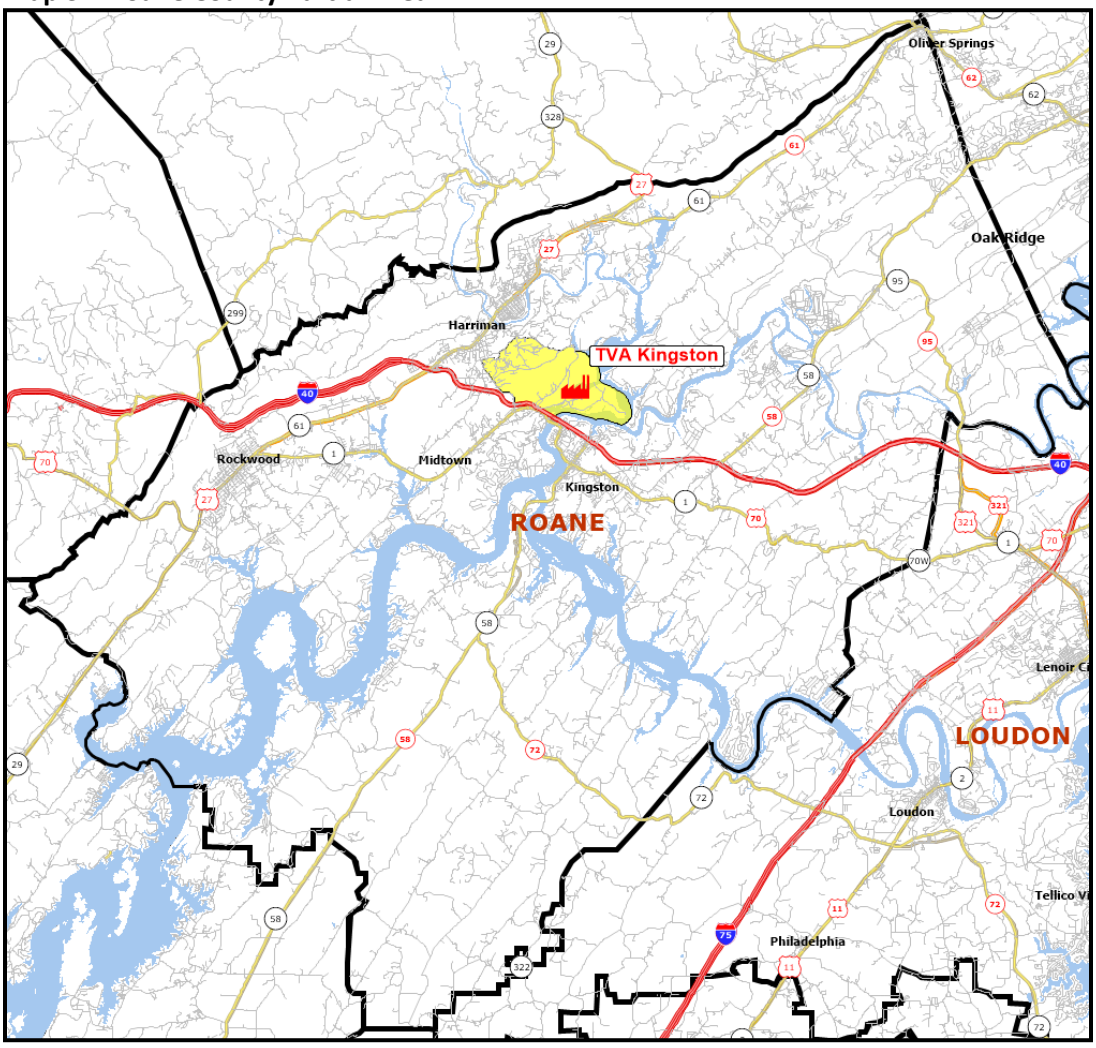


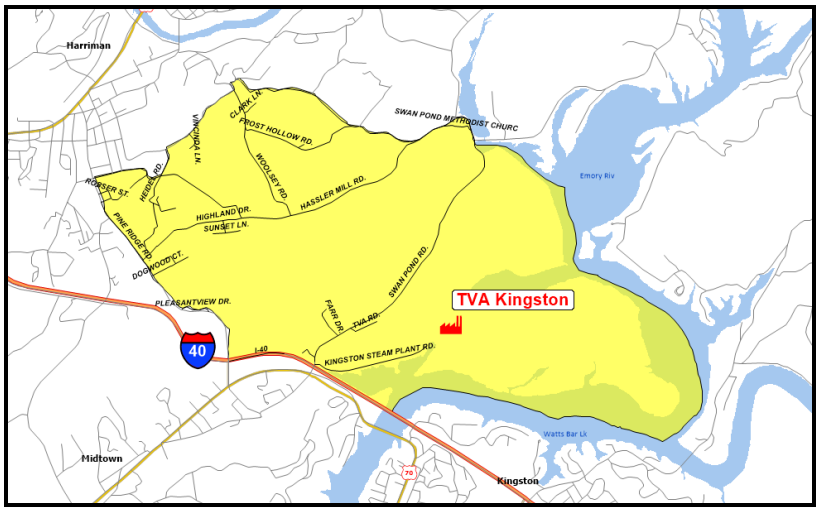
Map 2 – Cocke County Partial Area





Map 3 – Roane County Partial Area





C.5 RESPONSES TO COMMENTS FROM IAC PARTICIPANTS

Comments from TDEC:

The resolution on page v, in the 5th paragraph includes the 1997 Annual PM NAAQS.
Response: Corrected

Page 2: under "Emissions Analysis Summary", last sentence, you have an "either" in there that you don't need.
Response: Corrected

Page 15: The last sentence has a "the" instead of a "be".
Response: Corrected

Page 28: The title to Table 12 may actually need to be for the ozone NAAQS.
Response: Corrected

Was there intended to be a Section A.2 with tables for the 1997 Area emissions?
Response: Table was added summarizing county-level emissions for the 1997 Ozone Area.

Table B-2: Is this table missing other counties (Loudon, Jefferson, Sevier)?
Response: All counties applicable to either the 1997 or 2008 Ozone standards were added to the table.

In Table B-2, in looking at the 2024 VMT for Knox County, it looks like the VMT in the SQL output database is 18,800,904, which differs from the results in Table B-2. It appears that VMT is only missing from sourcetype 62.
Response: There was an error in the spreadsheet calculation where the pivot table that was created did not include all rows of data – this was corrected.

Table B-3, looking at the annual VMT for Knox County in 2040, the HPMSVTypeYear file indicates a total of 7,802,889,357 miles, which varies from the total amount in Table B-3 (but not by a whole lot), and also appears to vary significantly from the SQL movesactivtyoutput table results.
Response: It was discovered that the MySQL script that was used to summarize the MOVES Activity Output table was causing some VMT data to be lost. The script was revised and re-run for all outputs and the corrected information has been updated in the report.

Comments from FHWA:

Pg.1 – Overview and Purpose - To be clear, the court decision itself did not reinstate the requirement for the 1997 Ozone areas to conduct transportation conformity; this resulted from FHWA's *Interim Guidance on Conformity Requirements for the Ozone NAAQS* (dated 4/23/18), which is our agency's action to comply with the intent of the court's decision while waiting on guidance from EPA.
Response: Additional verbiage added to clarify that it was the FHWA guidance that triggered the conformity.

Pg.1 – The area has not formally been designated as maintenance for the 1997 Ozone standard. As previously stated, the area is required to conformity determinations to comply with FHWA's guidance, but EPA has not issued any guidance or designations for the 1997 Ozone NAAQS. Technically, this standard is still revoked for the Knoxville region.

Response: Deleted "Maintenance"

Pg. 2 – For my own clarification - the 1997 Ozone NAAQS is the only standard which includes a portion of the Lakeway MTPO, correct? In the past, was this CDR also taken before the Lakeway MTPO Board as well as Knoxville, and incorporated into the Lakeway MTP?

Response: That is correct. LAMTPO will adopt a resolution on or near the same date as the TPO to recognize the conformity determination.

Pg. 6 – Was the area then designated "maintenance area"? When did this occur - same time (March 2011)?

Response: Yes, we transitioned to a Maintenance Area until the time it was revoked with the institution of the 2008 8-Hour Standard.

Pg. 9 – Consider clarifying the difference between an interpolated year and an analysis year.

Response: Added clarification

Pg. 15 – Table 8, Check title - looks like this carried over from the previous table.

Response: Correction made

Pg. 15 – Table 8, Inferring that this TIP ID is either the ID from the Lakeway TIP or the rural STIP, correct? Why the missing fields (ex: Veterans Blvd/SR-449 is in the STIP and has a STIP ID, but this field is blank)?

Response: STIP IDs were added for the projects that were missing them.

Pg. 18 – Table 9, Check title

Response: Correction made

APPENDIX D – MOBILITY PLAN 2040 PROJECT LIST WITH EXEMPT AND REGIONAL SIGNIFICANCE STATUS

D.1 BACKGROUND

The purpose of this list is to specifically document the current projected horizon year for each project and to identify each project's air quality conformity exempt/non-exempt status as well as whether it has been determined to be regionally significant. It should be noted that the Mobility Plan 2040 identifies separate interim horizon years of 2022, 2026 and 2034 that were used to better define a project's priority within the required 10 year intervals for conformity purposes, however these are still consistent with the conformity project list.

D.2 LIST OF ALL MOBILITY PLAN PROJECTS BY COUNTY AND HORIZON YEAR

The following project list (Table D-1) represent the updated Mobility Plan 2040 based on the project selection process and are being covered by this regional emissions analysis and conformity determination. The last two columns in this table are important for transportation conformity as they indicate (1) whether a project has been determined to be Exempt or Non-Exempt with respect to the requirement to demonstrate conformity, i.e. generally any project affecting roadway capacity will be considered "Non-exempt" and (2) whether a project is Regionally Significant or not. The regional significance of a project can affect whether a regional emissions analysis may be required for the project or a project change as non-regionally significant projects may be able to rely on a previous regional emissions analysis to determine conformity.

The project list is sorted by county and conformity analysis year as follows:

Counties:

- Anderson
- Blount
- Knox
- Loudon
- Sevier
- Transit Capital Project
- Projects in Regional Area – outside TPO Planning Area but within 1997 Ozone Area

Conformity Analysis Years:

- 2024
- 2030
- 2040

Table D-1: Projects from 2040 Mobility Plan and Regional Area Subject to Conformity

KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
Anderson County Projects										
13-1005	Oak Ridge Turnpike Pedestrian Safety Improvements	Oak Ridge Turnpike at South Tulane intersection and Oak Ridge Turnpike at East Division/Tennyson intersection	Oak Ridge	Oak Ridge	0.06	Pedestrian safety improvements, including marked crosswalks, ramps and pedestrian indications, at two intersections. Includes mast arm replacement, to be funded by L-STP funds.	17-2014-081	2024	Exempt	N/A
17-1001	Solway Park and Ride	N/A	Oak Ridge	Oak Ridge	0	Improve and expand existing parking area located at the TVA boat launch along Edgemoor Rd (SR-170) to accommodate park and ride opportunities		2024	Exempt	N/A
17-101	Emory Valley Road at Lafayette Drive Intersection	Emory Valley Road at Lafayette Drive Intersection	Oak Ridge	Oak Ridge	0	Remove dedicated right turn lane from Emory Valley (west) to Lafayette Drive (north) with standard right turn lane.		2024	Exempt	N/A
13-802	Oak Ridge Traffic Control & Communication System Upgrades	Citywide	Oak Ridge	Oak Ridge		Replace traffic control and communication system. Installation of fiber network, vehicle detection, accessible pedestrian signals, traffic operations center and other components in a phased implementation period	17-2017-053	2024	Exempt	N/A
13-102	Tulane Avenue at Pennsylvania Avenue Roundabout Construction	Intersection of Tulane Ave at Pennsylvania Ave	Oak Ridge	Oak Ridge	0	Construct roundabout	17-2017-301 (HSIP)	2024	Exempt	N/A
18-100	SR 61 at SR 62 Intersection at Winter Gap	SR-61 at SR-62	Oliver Springs	TDOT	0	Replace outdated traffic signal equipment (controller, signal heads and detection) with modern equipment and either radar or video detection	17-2017-043	2024	Exempt	N/A
18-101	Clinton Traffic Signalization Improvements: Ph. 1	Citywide	Clinton	Clinton	0	Signal Timing Update for each of the City's 15 traffic signals	17-2017-052	2024	Exempt	N/A
13-830	Oak Ridge Rails to Trails	Melton Lake Rd/Greenway to Scarboro Rd	Oak Ridge	Oak Ridge	4.5	Construct new shared use "rails-to-trails" path along an abandoned rail line through the City of Oak Ridge.	17-2017-046	2030	Exempt	N/A
13-101	Emory Valley Road at Melton Lake Drive Roundabout	Intersection of Emory Valley Road at Melton Lake Dr	Oak Ridge	Oak Ridge	0	Construct roundabout		2030	Exempt	N/A
09-101	Edgemoor Road (SR-170) - Phase 1	SR-62 (Oak Ridge Hwy) TO SR-9/US-25W (Clinton Hwy).	Oak Ridge	TDOT	6.2	Widen from 2-lanes to 4-lanes with median and/or center turn lane. Also includes bicycle/pedestrian facilities and a new bridge over the Clinch River.	17-2017-037	2030	Non-Exempt	Regionally Significant

Table D-1: Projects from 2040 Mobility Plan and Regional Area Subject to Conformity

KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
Blount County Projects										
13-1002	Pistol Creek Greenway - Phase IV	Pistol Creek Phase II Greenway at Wright Rd (Meadowood Apartments) to Clayton Greenway Trail segment and adjoining sidewalk system near Clayton Dr (South)	Alcoa	Alcoa	2.2	Construction of 10 foot wide greenway trail and amenities consisting of approximately 11,716 linear feet of asphaltic trail and 200 feet of wood boardwalk generally paralleling Pistol Creek.	17-2014-028	2024	Exempt	N/A
13-833	Maryville to Townsend Greenway - Phase 1 (Brown Creek)	Aluminum Ave to US 321	Maryville	Maryville	1.2	Construct a new shared use path between the existing Maryville/Alcoa Greenway at Aluminum Avenue to Lamar Alexander Pkwy along Brown Creek	17-2017-006	2024	Exempt	N/A
13-210	North Park Blvd & Airbase Rd Safety Improvements	Intersection of North Park Blvd & Airbase Rd	Alcoa	Alcoa	0.3	Realign North Park Boulevard to Airbase Road		2024	Exempt	N/A
09-214	Sevierville Rd (SR-35/US-411) Widening	Washington St (SR-35) to Walnut St	Maryville	TDOT	0.4	Reconstruct Sevierville Rd. (SR-35) from two lanes to three lanes, curb and gutter, and sidewalks with intersection improvements.	17-2014-059	2024	Non-Exempt	Regionally Significant
09-224	Foothills Parkway	From U.S. 321 (SR-73) in Walland (Blount County) to U.S. 321 (SR-73) in Wears Valley (Sevier County)	Blount County/Sevier County	NPS	16	Construct a new 2-lane roadway	TIGER, outside MPA	2024	Non-Exempt	Regionally Significant
13-214	Old Lowes Ferry Rd at Louisville Rd (SR-333) Intersection Improvements	Intersection of Old Lowes Ferry Rd at Louisville Rd (SR-333)	Blount County	TDOT	0	Realign intersection and add turn lanes		2024	Exempt	N/A
13-206	Tesla Boulevard / Assoicates Boulevard Extended	Local Interstate Connector/Associate blvd to East Edison/Springbrook Rd	Alcoa	Alcoa	0.8	Construct new 2 lane boulevard extension from the local interstate connector project to Springbrook Road. The connection will include a multi-use path, sidewalks, and stormwater quality intrinsic with the drainage system.	17-2017-023	2024	Non-Exempt	Regionally Significant
13-808	Maryville Alcoa Advanced Traffic Management System Phase II	Various intersections along US 411, US 321, US 129 and SR 33	Maryville	Maryville	N/A	Upgrade signal communications and equipment along US411/US321, US129 and SR33.	17-2014-077	2024	Exempt	N/A
09-238	Robert C. Jackson Drive Extension	Lamar Alexander Pkwy (US - 321/SR-73) to Morganton Rd	Maryville	Maryville	1.2	Construct new 2-lane roadway with sidewalks	Local	2024	Non-Exempt	Regionally Significant
17-202	US 129 Widening	Hall Rd (SR-35) to US 321	Maryville	TDOT	2.6	Widen from 4 to 6 lanes within existing right-of-way	17-2017-005	2024	Non-Exempt	Regionally Significant
13-211	Foothills Mall Drive Extension Phase 1	US-129 Bypass (SR-115) to Foch St.	Maryville	Maryville	0.5	Extend Foothills Mall Dr. from US 129 Bypass to Foch St. with 2 to 3 lanes with curb and gutter which includes improvements at US 129 Bypass, Foch Street, Dunlap	17-2014-007	2024	Non-Exempt	Not Regionally Significant

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KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
17-203	US 129/W. Broadway Avenue (SR-33/US-411) Intersection Improvements	Foothills Mall Dr to Mall Rd	Maryville	TDOT	0.3	Intersection improvements at Foothills Mall Dr/Montgomery Ln and addition of turn/auxiliary lanes	17-2017 301 (HSIP)	2024	Exempt	N/A
17-204	US 129 Bypass/SR 115 Intersection Improvements	Mall Rd to Lamar Alexander Pkwy (US-321/SR-73)	Maryville	TDOT	0.7	Intersection improvements at W. Lamar Alexander Pkwy (US-321/SR-73) and addition of turn/auxiliary lanes	17-2017-301 (HSIP)	2024	Exempt	N/A
09-237	E Broadway (SR-33) at Brown School Rd	Intersection of E Broadway (SR-33) at Brown School Rd	Maryville	TDOT	0	Realign intersection, add turn lanes and new traffic signal	17-2017-301 (HSIP)	2024	Exempt	N/A
09-218	Alcoa Hwy (SR-115/US-129)	Hall Rd (SR-35) to proposed interchange at Tyson Blvd.	Alcoa	TDOT	1.3	Widen from 4-lane divided to a 6-lane divided highway. Extend Tyson Boulevard under SR-115 and reconstruct Hunt Rd overpass.	17-2014-005	2024	Non-Exempt	Regionally Significant
09-262	Montvale Rd (SR-336) Widening	Montvale Station Rd to Lamar Alexander Pkwy (US-321/SR-73)	Maryville	TDOT	0.6	Widen existing roadway to 2-12 foot travel lanes with a 12 foot center turn lane including curb and gutter, sidewalk and a multi-use path	17-2011-082	2024	Non-Exempt	Not Regionally Significant
09-211	Morganton Road Reconstruction - Phase 1	Foothills Mall Dr to William Blount Dr (SR-335)	Blount County	Blount County	2.2	Reconstruct 2-lane road with addition of turn lanes	17-2014-060	2024	Exempt	N/A
09-257	Relocated Alcoa Hwy (SR-115/US-129)	Proposed interchange at Tyson Blvd. to Pellissippi Pkwy (SR-162)	Alcoa	TDOT	2.9	New alignment, four lane divided facility, construct an interchange at Pellissippi Parkway (SR-162)	17-2014-035	2024	Non-Exempt	Regionally Significant
09-258	Relocated Alcoa Hwy (SR-115/US-129)	Pellissippi Pkwy (SR-162) to South Singleton Station Rd	Alcoa	TDOT	1.3	Construct new 4-lane divided highway with auxiliary lanes and new interchange at Singleton Station Rd	17-2014-084	2024	Non-Exempt	Regionally Significant
09-223	Carpenters Grade Rd Reconstruction and Intersection Improvements	Raulston Rd/Peterson Ln to Cochran Rd	Maryville	Maryville	0.89	Reconstruct 2-lane road with addition of turn lanes and sidewalk. Construct roundabout at Peterson Ln, Cochran Rd and Raulston Rd intersection.		2024	Exempt	N/A
18-200	Alcoa Hwy (SR-115/US-129) ITS Expansion	I-140 in Blount County to Cherokee Trail in Knox County	Blount/Knox County	TDOT	7.4	ITS Smartway Geographic Expansion	17-2017-033	2024	Exempt	N/A
18-201	I-140 ITS Expansion	Near MM 2 to Near MM 11 (SR-115/US-129/Alcoa Hwy)	Blount/Knox County	TDOT	9.2	I-140 ITS Expansion to include the installation of a power and communication network and ITS Devices such as CCTV cameras, DMS, and RDS	17-2017-050	2024	Exempt	N/A
18-202	Blount County Greenway Trail - Phase 1	Heritage High School to Perry's Mill Parking area	Blount County	Blount County	2.27	Greenway trail contained completely within US Highway 321 right-of-way from Heritage High School to Perry's Mill Parking area. It will also include additional bike access link	17-2017-048	2024	Exempt	N/A
09-248a	Topside Road (SR-333) Improvements - Phase 1	Wrights Ferry Rd to TVA Lab Rd	Alcoa	TDOT	1	Add continuous center turn lane		2030	Non-Exempt	Not Regionally Significant
17-201	Amerine Road Improvements	Fielding Drive to Sevierville Rd	Maryville	Maryville	0.5	Reconstruct 2-lane road with addition of turn lanes and sidewalk		2030	Exempt	N/A
09-242	W Broadway Ave (SR-33/US-411) Improvements	S Cedar St to Lamar Alexander Pkwy (US-321/SR-73)	Maryville	Maryville	0.5	Construct additional westbound left turn lane at intersection with Lamar Alexander Pkwy and convert continuous center turn lane to additional westbound		2030	Non-Exempt	Regionally Significant

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KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
09-245	Sevierville Rd (SR-35/US-411) Widening	Everett High Rd to Maryville City Limits	Maryville	TDOT	2	Reconstruct 2-lane road with addition of continuous center turn lane and bicycle/pedestrian facilities		2030	Non-Exempt	Regionally Significant
09-240	Sandy Springs Rd at Montgomery Ln Intersection Improvements	Intersection of Sandy Springs Rd at Montgomery Ln	Maryville	Maryville	0	Intersection improvements including turn lanes and new traffic signal		2030	Exempt	N/A
09-202	Robert C Jackson Dr Extension - Ph I	Middlesettlements Rd to Louisville Rd (SR-334)	Alcoa	Alcoa	0.7	Construct new 4-lane roadway		2030	Non-Exempt	Regionally Significant
10-260	Foothills Mall Drive Extension Phase II	Foch Street to McCammon Ave	Maryville	Maryville	0.7	Construct new 2-lane road with center turn lane and sidewalks		2030	Non-Exempt	Not Regionally Significant
09-232	Pellissippi Pkwy (SR-162) Extension	Old Knoxville Hwy (SR-33) to SR-73 (US-321)	Blount County	TDOT	4.4	Construct new 4-lane highway	17-2014-025	2030	Non-Exempt	Regionally Significant
09-216	Alcoa Hwy (SR-115/US-129) Widening	Pellissippi Parkway in Blount County to Little River south of Topside Road in Knox County	Alcoa	TDOT	2.4	Reconstruct 4-lanes and 6-lanes, including a frontage road system, new interchanges at Singleton Station Road and Topside Road (SR-333), modify the existing SR-115 and SR-162 interchange, and build a multi-use path.	17-2014-003	2030	Non-Exempt	Regionally Significant
13-218	Middlesettlements Rd at Miser Station Rd Intersection Improvements	Intersection of Middlesettlements Rd at Miser Station Rd	Blount County	Blount County	0	Realign intersection and add turn lanes		2030	Exempt	N/A
13-215	Louisville Rd (SR-333/SR-334) Reconstruction - Phase 1	Alcoa City Limts to Lackey Creek Bridge	Blount County	TDOT	1.9	Reconstruct 2-lane road with addition of turn lanes		2030	Exempt	N/A
09-213	Old Niles Ferry Road Reconstruction	Maryville City Limits to Calderwood Hwy (SR-115)	Blount County	Blount County	3.3	Reconstruct 2-lane road with addition of turn lanes		2030	Exempt	N/A
09-204	Pellissippi Place Access Road Extension	Pellissippi Place Exist Terminus to Wildwood Rd	Alcoa	Alcoa	1.2	Construct new 2-lane road with center turn lane or median and bicycle/pedestrian facilities		2030	Non-Exempt	Regionally Significant
13-208	Harvest Lane Extension	Existing Harvest Ln terminus to Louisville Rd (SR-334)	Alcoa	Alcoa	0.2	Construct new 2-lane road with sidewalks		2030	Non-Exempt	Not Regionally Significant
13-204	Bessemer Boulevard Phase 1	Hall Rd (SR-35) to N. Wright Rd	Alcoa	Alcoa	1.4	Widen from 2 to 4 lanes with addition of bicycle/pedestrian facilities		2040	Non-Exempt	Regionally Significant
09-212	Old Knoxville Hwy (SR-33) Reconstruction	Wildwood Rd to E. Hunt Rd (SR-335)	Blount County	TDOT	1.3	Reconstruct 2-lane road with addition of turn lanes		2040	Exempt	N/A
09-239	Montvale Rd (SR-336) Widening	Montvale Station Rd to Maryville South City Limits	Maryville	TDOT	2.4	Reconstruct 2-lane road with addition of continuous center turn lane and bicycle/pedestrian facilities		2040	Non-Exempt	Not Regionally Significant
09-248b	Topside Road (SR-333) Improvements - Phase 2	TVA Lab Rd to Alcoa Hwy (US-129/SR-115)	Alcoa	TDOT	1.3	Reconstruct 2-lane road with addition of continuous center turn lane and bicycle/pedestrian facilities		2040	Non-Exempt	Not Regionally Significant
09-207	Wrights Ferry Road Center Turn Lane Improvements	Airbase Rd to Topside Rd	Alcoa	Alcoa	1.4	Reconstruct 2-lane road with addition of continuous center turn lane and bicycle/pedestrian facilities		2040	Exempt	N/A

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KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
13-205	Bessemer Boulevard Phase 2	Calderwood St to N Hall Rd (SR-35)	Alcoa	Alcoa	0.5	Widen from 2 to 4 lanes with addition of bicycle/pedestrian facilities		2040	Non-Exempt	Regionally Significant
13-203	Robert C Jackson Dr Extension - Ph II	Louisville Rd (SR-334) to US 129 Bypass (SR-115)	Alcoa	Alcoa	0.5	Construct new 4-lane roadway and grade separated interchange connecting US-129 and Associates Boulevard		2040	Non-Exempt	Regionally Significant
09-241	Tuckaleechee Pike Reconstruction	US 321 to Grandview Dr	Maryville	Maryville	1.1	Reconstruct 2-lane road with addition of turn lanes and sidewalk		2040	Exempt	N/A
09-243	Wilkinson Pike Widening	Court Street to City Limits	Maryville	Maryville	0.9	Reconstruct 2-lane road with addition of turn lanes and sidewalk		2040	Exempt	N/A
09-231	Old Knoxville Hwy (SR-33) Reconstruction - Rockford	Pellissippi Pkwy (SR-162) to Knox County Line	Blount County	TDOT	4.6	Reconstruct 2-lane road with addition of turn lanes		2040	Exempt	N/A
09-220	Home Avenue Extension	McCammon Ave to Calderwood St	Alcoa	Alcoa	0.2	Construct new 2-lane road with center turn lane to extend Home Ave through existing shopping center to Calderwood St		2040	Non-Exempt	Not Regionally Significant
09-250	Sevierville Rd (SR-35/US-411) Reconstruction	Swanee Dr (Maryville City Limits) to Chapman Hwy (US-441/SR-71)	Blount County	TDOT	11.9	Reconstruct 2-lane road with addition of turn lanes		2040	Exempt	N/A
09-249	Montvale Rd (SR-336) Reconstruction	Maryville City Limits to Six Mile Rd	Blount County	TDOT	4.4	Reconstruct 2-lane road with addition of turn lanes		2040	Exempt	N/A
13-216	Louisville Rd (SR-333) Reconstruction - Phase 2	Lackey Creek Bridge to Old Lowes Ferry Rd	Blount County	TDOT	2.3	Reconstruct 2-lane road with addition of turn lanes		2040	Exempt	N/A
Knox County Projects										
13-602	Knoxville Advanced Traffic Management System - Phase 1	Kingston Pike (US-70/SR-1) from Metron Center Way to Lovell Rd (12 miles) and Broadway (US-441/SR-33) from Jackson Ave to Foley Dr (7 miles)	Knoxville	Knoxville	19	Purchase, installation and integration of signal controllers, signal monitors, closed loop equipment and software. Project also includes development of new signal timing plans for the new equipment and software	17-2014-042	2024	Exempt	N/A
13-1003	Chapman Highway Advanced Traffic Management System	Chapman Hwy (US-441/SR-71) from Mountain Grove Dr to Blount Ave	Knoxville	Knoxville	6.3	Expand the City of Knoxville's Advanced Traffic Management System along Chapman Highway.	17-2014-078	2024	Exempt	N/A
13-1004	Liberty Street Multimodal Project	Middlebrook Pike (SR-169) to Sutherland Avenue	Knoxville	Knoxville	1.1	Addition of sidewalks and bicycle facilities along Liberty and Division Streets.	17-2014-080	2024	Exempt	N/A

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KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
13-816	Knox County Advanced Traffic Management System - Phase 1	Cedar Bluff Rd from Sherrill Blvd to Middlebrook Pk (SR-169) (1.3 miles) and Maynardville Pk from Rifle Range Rd to E. Emory Rd (2.0 miles)	Knox County	Knox County	3.3	Cedar Bluff Rd from Sherrill Blvd to Middlebrook Pk (SR-169) (1.3 miles) and Maynardville Pk from Rifle Range Rd to E. Emory Rd (2.0 miles)	17-2014-229	2024	Exempt	N/A
13-813	Farragut Advanced Traffic Management System - Phase 1	All 26 Signailzed Intersections within Town Limits	Farragut	Farragut		Upgrade signal communications and equipment at all signalized intersections within the Town to allow for a centrally controlled signal system	17-2017-024	2024	Exempt	N/A
13-863	Knox/Blount Greenway - Phase II	From U.T. Farm Entrance to Maloney Park on Ginn Drive	Knox County	Knox County	0.65	Construction of a multi-use trail that will connect Maloney Road Park on Ginn Drive to Alcoa Highway south of Maloney Road at the UT Farm Entrance where future pedestrian and bicycle facilities are slated for construction as part of the ongoing Alcoa Hwy	17-2014-044	2024	Exempt	N/A
13-1006	East Knoxville Sidewalk Improvements	S. Castle St. from Martin Luther King Jr. Ave. to Wilson Ave.	Knoxville	Knoxville	0.3	Complete a sidewalk network between a high school and nearby neighborhoods along S. Castle St. Approximately 1,400 linear feet of sidewalk.	17-2014-047	2024	Exempt	N/A
13-838	First Creek Greenway - Broadway Streetscape	Woodland Ave to Cecil Ave	Knoxville	Knoxville	0.3	Construct a new shared use path extending First Creek Greenway from near Cecil Ave to near Woodland Ave	17-2017-009	2024	Exempt	N/A
17-911	Tyson Fort Sanders Bike Connection	Fort Sanders Neighborhood to Tyson Park	Knoxville	Knoxville	0.5	Construct new shared use path between Fort Sanders Neighborhood and Tyson Park	17-2017-010	2024	Exempt	N/A
17-901	East Knox Greenway - Phase 1	Willow Ave to Knoxville Botanical Gardens	Knoxville	Knoxville	1.6	Construct a new shared use path connecting First Creek Greenway to Knoxville Botanical Gardens and Arboretum	17-2017-011	2024	Exempt	N/A
13-880	Atlantic Avenue Sidewalk	Pershing St to Broadway	Knoxville	Knoxville	0.6	Construct 3,000 linear feet of sidewalks on Atlantic Ave between Pershing St and Broadway	17-2017-013	2024	Exempt	N/A
17-910	Tazewell Pike Sidewalk	Old Broadway to Jacksboro Pk	Knoxville	Knoxville	0.6	Construct sidewalk along Tazewell Pike from Old Broadway to Jacksboro Pike	17-2017-014	2024	Exempt	N/A
09-626	Chapman Hwy (SR-71/US-441) Operational and Safety Improvements	Blount Avenue to SR-338 (Boyds Creek Highway) in Seymour	Knox County	TDOT	10.3	Intersection improvements and/or driveway improvements and/or left turn lanes at various locations throughout the project area.	17-2017-040	2024	Exempt	N/A
09-626b	Chapman Hwy (US-441/SR-71)	Evans Rd to Burnett Ln	Knox County/Sevier County	TDOT	0.9	Add center turn lane	17-2017-301 (HSIP)	2024	Non-Exempt	Regionally Significant
09-626d	Chapman Hwy (US-441/SR-71)	Hendron Chapel Rd to Simpson Rd	Knox County	TDOT	0.9	Add center turn lane	17-2017-301 (HSIP)	2024	Non-Exempt	Regionally Significant

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KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
17-606	Magnolia Avenue Streetscape - Phase 1	Jessamine St to Myrtle St	Knoxville	Knoxville	0.2	Construct streetscape improvements in the existing right of way that include raised medians replacing center left-turn lane, signal improvements, bike lanes, improved sidewalks, bus pull-offs, and amenities	Local	2024	Exempt	N/A
17-607	Magnolia Avenue Streetscape - Phase 2	Myrtle St to N. Bertrand St	Knoxville	Knoxville	0.2	Construct streetscape improvements in the existing right of way that include raised medians replacing center left-turn lane, signal improvements, bike lanes, improved sidewalks, bus pull-offs, and amenities	Local	2024	Exempt	N/A
10-697	North Central Street Road Diet and Streetscape	Woodland Ave to Depot St	Knoxville	Knoxville	1.2	Road diet and streetscape along North Central Street, reducing four lanes to two lanes with center turn lane	17-2014-031	2024	Non-Exempt	Not Regionally Significant
09-617	South Knoxville Waterfront Roadway Improvements	Sevier Ave from Davenport Rd to new roundabout at Island Home Ave	Knoxville	Knoxville	0.3	Construct roadway streetscape improvements and utility relocations along Sevier Ave and new roundabout at the intersection of Foggy Bottom/Seiver Ave/Island Home Ave.	17-2014-032	2024	Exempt	N/A
13-834	Kingston Pike Sidewalk in Farragut	Old Stage Rd to Virtue Rd	Farragut	Farragut	0.4	Construct sidewalk along the southern side of Kingston Pike between Old Stage Road and Virtue Road	17-2014-010	2024	Exempt	N/A
09-632	Concord Road (SR-332) Widening	Concord Rd (SR-332) from north of Turkey Creek Rd. to Northshore Dr.	Farragut	TDOT	0.93	Widen 2-lanes to 4-lanes including pedestrian and bicycle improvements including a southbound right turn lane at Turkey Creek Rd.	17-2014-058	2024	Non-Exempt	Regionally Significant
17-601	Asheville Hwy/Magnolia Ave/Rutledge Pk Intersection Study	N/A	Knoxville	Knoxville	0	Conduct a planning study to investigate multi-modal improvement options at this location	17-2017-018	2024	Exempt	N/A
09-616	Pleasant Ridge Road	Merchant Dr to Knoxville City limits (Country Brook Dr)	Knoxville	Knoxville	1.6	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities - Scope Change from previous Plan, was a continuous center turn lane and included section of adjoining road (Merchant Dr)	17-2014-037	2024	Exempt	N/A
17-609	Safer and Complete Streets Study	N/A	Knoxville	Knoxville		Conduct a planning study to identify and prioritize projects to correct safety deficiencies on non-state maintained federal aid routes in the City of Knoxville	17-2017-019	2024	Exempt	N/A
17-604	Jackson Avenue Ramps	Ramps from Jackson Ave to Gay St Intersection	Knoxville	Knoxville	0.1	Replacement of existing ramps from Gay Street to Jackson Avenue	17-2017-001	2024	Exempt	N/A
09-625	Schaad Rd Widening	Oak Ridge Hwy. (SR-62) to Pleasant Ridge Rd.	Knox County	Knox County	1.5	Widen from 2 to 4 lanes with addition of sidewalks	17-2014-006	2024	Non-Exempt	Regionally Significant
09-634	Pellissippi Pkwy/Hardin Valley Interchange	Interchange at Hardin Valley Rd	Knox County	TDOT		Reconfigure existing interchange to improve capacity, safety and operations. Add new northbound on-ramp in northeast quadrant.	17-2017-003	2024	Non-Exempt	Regionally Significant
13-601	Union Rd/N Hobbs Rd Reconstruction	Union Road from N. Hobbs Road to Everett Road (approx. 4,500 ft); N. Hobbs Road from Kingston Pike (SR-1) to Union Road (approx. 750 ft)	Farragut	Farragut	1	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities	17-2014-082	2024	Exempt	N/A

Table D-1: Projects from 2040 Mobility Plan and Regional Area Subject to Conformity

KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
09-618	I-275 Industrial Park Access Improvements	Blackstock Ave: Extend from W. Fifth Ave. to Bernard Ave. Marion St: Realign between Bernard Ave. and Baxter Ave. Improve intersections of University Ave. with W. Fifth	Knoxville	Knoxville	0.5	Roadway and intersection improvements to enhance access to I-275 Business Park. Blackstock Ave: extend from Fifth Ave. to Bernard Ave.; Marion St: realign; University Ave: intersections with W Fifth Ave. and Bernard Ave.	17-2014-001	2024	Non-Exempt	Regionally Significant
17-801	Knoxville Advanced Traffic Management System - Phase 2	Citywide	Knoxville	Knoxville		Additional upgrades of the City traffic signal system following Phase 1.		2024	Exempt	N/A
17-603	Chapman Hwy Planning Study	Blount Ave to Mountain Grove Dr	Knoxville	Knoxville	6.2	Conduct study to develop prioritized project list by integrating existing plans.	17-2017-020	2024	Exempt	N/A
09-605	Schaad Rd Extension	Middlebrook Pk (SR 169) to W of Oak Ridge Hwy (SR 62)	Knox County	Knox County	4.6	Construct new 4-lane roadway with sidewalks	17-2017-030	2024	Non-Exempt	Regionally Significant
17-605	Knoxville Center Mall Area Circulation Study	N/A	Knoxville	Knoxville		Conduct a planning study of the Knoxville Center and I-640 Interchange and frontage roads including a feasibility study to add a new exit from I-640		2024	Exempt	N/A
09-635	Karns Connector	Oak Ridge Hwy (SR-62) to Westcott Blvd	Knox County	Knox County	0.8	Construct new 2-lane road with center turn lane		2024	Non-Exempt	Not Regionally Significant
17-909	Sidewalk Strategic Study	N/A	Knoxville	Knoxville		Conduct a planning study to determine and prioritize sidewalk needs in City of Knoxville.	17-2017-022	2024	Exempt	N/A
09-628	Alcoa Hwy (SR-115/US-129) Widening	South of Topside Road to North of Maloney Road	Knoxville	TDOT	2.2	Widen from 4 to 6 lanes including pedestrian and bicycle facilities.	17-2014-004	2024	Non-Exempt	Regionally Significant
09-623	Pellissippi Pkwy (I-140) and Dutchtown Rd Interchange	I-40 to Dutchtown Rd	Knoxville	TDOT	0.4	Widen I-140 from 1 to 2 lanes northbound and lengthen storage of northbound off-ramp at Dutchtown Road interchange	17-2017-301 (HSIP)	2024	Non-Exempt	Regionally Significant
09-662	I-75 at Merchant Dr Interchange	I-75 at Merchant Dr Interchange	Knoxville	TDOT	0	Increase northbound off-ramp storage as part of the Ramp Queue Safety Program.		2024	Exempt	N/A
09-652	I-75 at Emory Rd (SR-131) Interchange	I-75 at Emory Rd (SR-131) Interchange	Knoxville	TDOT	0	Reconfigure existing interchange to improve capacity, safety and operations.		2024	Exempt	N/A
17-612	I-40 at Asheville Hwy (SR-9) Interchange	I-40 at Asheville Hwy (SR-9) Interchange	Knoxville	TDOT	0	Increase eastbound off-ramp storage as part of the Ramp Queue Safety Program.		2024	Exempt	N/A
09-661	I-75 at Callahan Dr Interchange	I-75 at Callahan Dr Interchange	Knoxville	TDOT	0	Increase southbound off-ramp storage as part of the Ramp Queue Safety Program.	17-2017-301 (HSIP)	2024	Exempt	N/A
17-850	South Waterfront Greenway - East of Suttree	Suttree Landing Park to Island Home Avenue Riverwalk	Knoxville	Knoxville	0.6	Construct riverwalk trail connecting the 0.10 mile section of cantilevered riverwalk along Island Home Avenue, to Suttree Landing Park riverwalk that is just east of Foggy	17-2017-012	2024	Exempt	N/A
09-658	Northshore Drive at Kingston Pike Intersection Improvements	Intersection of Northshore Dr and Kingston Pk	Knoxville	Knoxville	0	Intersection Improvements	17-2017-039	2024	Exempt	N/A

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KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
09-637	Lovell Rd Widening (SR-131)	Cedardale Ln. to Middlebrook Pk. (SR-169)	Knox County	Knox County	1.7	Widen 2-lane to 4-lane, including pedestrian and bicycle facilities.	17-2014-002	2024	Non-Exempt	Regionally Significant
09-649	Pellissippi Pkwy (SR-162)/Oak Ridge Hwy Interchange	Interchange at Oak Ridge Hwy (SR-62)	Knox County	TDOT		Reconstruct interchange to provide ramp for westbound to southbound movement		2024	Non-Exempt	Regionally Significant
09-653	Alcoa Hwy (SR-115/US-129) Widening	Woodson Dr. to Cherokee Trail interchange	Knoxville	TDOT	1.6	Widen 4-lane to 6-lane including pedestrian and bicycle facilities.	17-2014-069	2024	Non-Exempt	Regionally Significant
09-615	Washington Pike	North of I-640 to Murphy Rd	Knoxville	Knoxville	1.7	Widen from 2 to 4 lanes	17-2014-038	2024	Non-Exempt	Regionally Significant
18-600	I-75 ITS Expansion	MM 109.6 to just before SR-61 (Exit 122)	Knox/Anderson County	TDOT	13.03	ITS Expansion	17-2017-034	2024	Exempt	N/a
18-601	I-40 ITS Expansion	West of Exit 398 to East of Exit 407	Knox/Sevier County	TDOT	11.4	ITS Expansion to include the installation of a power and communication network and ITS Devices such as CCTV Cameras, DMS and RDS	17-2017-035	2024	Exempt	N/a
18-602	Kingston Pike at Watt Road Intersection Improvements	Kingston Pike (US 11/70 (SR-1) at Watt Road	Farragut	TDOT	0	Intersection improvements at the intersection of Kingston Pike (US 11/70 (SR-1) at Watt Road.	17-2017-045	2024	Exempt	N/A
18-603	Middlebrook Pike (SR-169) ATMS Expansion	Middlebrook Pike (SR-169)/University Ave. from College St. to Joe Hinton Rd. (6.5	Knoxville	Knoxville	6.5	Expand the City of Knoxville's Advanced Traffic Management System along Middlebrook Pike/University Ave	17-2017-051	2024	Exempt	N/A
18-604	Knoxville Renewable Fueling Station	1206 Proctor St.	Knoxville	TDOT	n/a	Upgrade fueling terminal for use with biodiesel	17-2017-054	2024	Exempt	N/A
18-605	Knoxville and Holston River Railroad Locomotive Repower	n/a	Knoxville	TDOT	n/a	Repower 5 unregulated locomotives to Tier 4 Emissions Standards	17-2017-055	2024	Exempt	N/A
13-884	Chapman Highway Multiuse Path	Young High Pk to Stone Rd	Knoxville	Knoxville	0.8	Construct a new shared use path along Chapman Highway from Young High Pike to Stone Road		2030	Exempt	N/A
09-689	Papermill Drive Complete Street	Weisgarber Rd to Kingston Pk (SR-1)	Knoxville	Knoxville	0.6	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities	17-2017-015	2030	Exempt	N/A
13-852	Knoxville South Waterfront Pedestrian/Bicycle Bridge	University of Tennessee campus to Scottish Pike	Knoxville	Knoxville	0.3	Construct a new pedestrian/bicycle bridge over the Tennessee River connecting the South Knoxville Waterfront redevelopment area to the University of Tennessee	17-2014-073	2030	Exempt	N/A
17-608	Magnolia Avenue Streetscape - Phase 3 and 4	N. Bertrand St to Cherry St	Knoxville	Knoxville	0.9	Construct streetscape improvements in the existing right of way that include raised medians replacing center left-turn lane, signal improvements, bike lanes, improved sidewalks, bus pull-offs, and amenities	17-2017-017	2030	Exempt	N/A
17-602	Cecil Ave and Broadway Realignment	Intersection of Cecil Ave at Broadway	Knoxville	Knoxville	0	Realign Cecil Avenue at North Broadway to tie into the existing Broadway Plaza access just north of Cecil Avenue		2030	Exempt	N/A
13-603	I-40/75 Auxiliary Lanes	Campbell Station Rd Interchange to Lovell Rd Interchange	Farragut	TDOT	1.4	Construct eastbound and westbound auxiliary lanes between interchanges		2030	Non-Exempt	Regionally Significant

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KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
09-647	Pellissippi Pkwy (SR-162)	Edgemoor Rd (SR-170) to Dutchtown Rd	Knox County	TDOT	6	Corridor safety and capacity improvements to include access control, interchange reconstruction, frontage roads, auxiliary lanes and provision for a shared use path		2030	Non-Exempt	Regionally Significant
17-913	Westland Drive Bike Lane	Morrell Rd to Northshore Dr (SR-332)	Knoxville	Knoxville	1.9	Construct bicycle lanes along both sides of roadway		2030	Exempt	N/A
10-699	Kingston Pike (SR-1) at Campbell Station Rd Intersection Improvements	Intersection of Kingston Pike and Campbell Station Rd.	Farragut	Farragut	0.4	Construct additional eastbound left turn lane on Kingston Pike		2030	Exempt	N/A
09-629	I-40/I-75/Campbell Station Road Interchange	Interchange of I-40/75 at Campbell Station Rd	Farragut	TDOT	0	Reconfigure existing interchange to improve capacity, safety and operations.		2030	Exempt	N/A
09-645	Northshore Dr (SR-332)	Morrell Rd to Ebenezer Rd	Knox County	TDOT	3.5	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities		2030	Exempt	N/A
09-643	Emory Rd (SR-131)	Maynardville Hwy (SR-33) to Tazewell Pk (SR-331)	Knox County	TDOT	4.9	Widen from 2-lanes to 4-lanes with median and/or center turn lane, and including bicycle/pedestrian facilities.		2030	Non-Exempt	Regionally Significant
09-638	Oak Ridge Hwy (SR-62)	Schaad Rd to Byington Beaver Ridge Rd	Knox County	TDOT	4.2	Widen from 2 to 4 lanes		2030	Non-Exempt	Regionally Significant
09-654	I-75/I-640/I-275 Interchange	I-75/I-640/I-275 Interchange	Knoxville	TDOT	1.6	Interchange improvements to include additional through lanes on I-75 north and southbound ramps.		2030	Non-Exempt	Regionally Significant
09-692	I-75 Widening	Emory Rd (SR-131) to Raccoon Valley Rd (SR-170)	Knox County	TDOT	5.3	Widen from 4 to 6 lanes	17-2017-056	2030	Non-Exempt	Regionally Significant
13-844	First Creek Greenway - Downtown East	Caswell Park to Morningside Park	Knoxville	Knoxville	1.4	Construct a new shared use path along First Creek connecting Caswell Greenway to Morningside Greenway		2040	Exempt	N/A
13-855	First Creek Greenway - North Knox	Edgewood Park to Mineral Springs Ave	Knoxville	Knoxville	1.3	Construct a new shared use path along First Creek connecting Edgewood Park to the proposed First Creek Greenway - Old Broadway segment at Mineral Springs Avenue		2040	Exempt	N/A
09-673	Oak Ridge Hwy (SR-62)	Byington Beaver Ridge Rd (SR-131) to Pellissippi Pkwy (SR-162)	Knox County	TDOT	4.2	Widen from 2 to 4 lanes		2040	Non-Exempt	Regionally Significant
09-651	I-40/I-75/Watt Rd Interchange	Interchange at Watt Rd	Knox County	Knox County		Reconfigure existing interchange to improve capacity, safety and operations.		2040	Exempt	N/A
09-691	I-40/75 Widening	I-40/75 Interchange to Campbell Station Rd Interchange	Farragut	TDOT	5.3	Widen from 6 to 8 lanes		2040	Non-Exempt	Regionally Significant
09-644	Gov John Sevier Hwy (SR-168)	Alcoa Hwy (SR-115/US-129) to Chapman Hwy (US-441/SR-71)	Knox County	TDOT	6.5	Widen from 3 to 4-lane divided roadway		2040	Non-Exempt	Regionally Significant
17-903	Lonsdale Greenway	Baxter Ave to Western Ave	Knoxville	Knoxville	2.7	Construct a new shared use path through Lonsdale, connecting the proposed section of Second Creek Greenway in Happy Holler to Lonsdale Park and Western Avenue		2040	Exempt	N/A

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13-854	Baker Creek Greenway	Maynard Glenn Park to Island Home Ave	Knoxville	Knoxville	1	Construct a new shared use path along Baker Creek, connecting Maynard Glenn Park, Mary James Park, to the proposed South Waterfront Greenway		2040	Exempt	N/A
09-669	Everett Road Improvements	Watt Rd to Split Rail Ln	Farragut	Farragut	2.5	Reconstruct 2-lane road with addition of continuous center turn lane and bicycle/pedestrian facilities		2040	Exempt	N/A
09-630	Virtue Road Reconstruction	Boyd Station Rd to Kingston Pk (US-70/SR-1)	Farragut	Farragut	1.4	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities		2040	Exempt	N/A
09-668	Kingston Pike (SR-1) Widening	Smith Rd to Campbell Station Rd	Farragut	TDOT	1.4	Widen from 4 to 6 lanes with addition of bicycle/pedestrian facilities		2040	Non-Exempt	Regionally Significant
09-646	Northshore Dr (SR-332)	Pellissippi Pkwy (SR-162) to Concord Rd (SR-332)	Knox County	TDOT	4.5	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities		2040	Exempt	N/A
09-675	Maryville Pk (SR-33)	Gov John Sevier Hwy (SR-168) to Blount County Line	Knox County	TDOT	1.2	Reconstruct 2-lane road with addition of turn lanes		2040	Exempt	N/A
09-636	W. Emory Rd (SR-131)	Oak Ridge Hwy (SR-62) to Clinton Hwy (US-25W/SR-9)	Knox County	TDOT	5	Reconstruct 2-lane road with addition of turn lanes		2040	Exempt	N/A
09-679	I-75 at Raccoon Valley Rd (SR-170) Interchange	I-75 at Raccoon Valley Rd (SR-170) Interchange	Knox County	TDOT		Reconfigure existing interchange to improve capacity, safety and operations		2040	Exempt	N/A
09-693	I-40/Gov John Sevier Hwy New Interchange	New Interchange	Knox County	TDOT		Construct new interstate interchange		2040	Non-Exempt	Regionally Significant
Loudon County Projects										
09-402	Lenoir City Downtown Streetscapes - Phase 2	Broadway St (US-11/SR-2) from C Street to A Street (0.14 miles) and from Kingston Street to Grand Street (0.19 miles) and B Street between 1st Avenue and Broadway Street (0.07 miles)	Lenoir City	Lenoir City	0.4	Streetscape improvements along Hwy. 11/S.R. 2 (Broadway) between Grand Street and C Street, and B Street between 1st Avenue and Broadway Street	17-2014-070	2024	Exempt	N/A
13-403	Tellico Parkway at SR 72	Intersection of Tellico Pkwy (SR-444) and Hwy 72 (SR-72)	Loudon County	Loudon County	0	Construction of 5 to 7 light standards along 1500 feet. Installation of aluminum poles, conduit, wiring, transformer and luminaries	17-2014-019	2024	Exempt	N/A
13-401	Simpson Road Reconstruction	US-321 (SR-73) to Shaw Ferry Rd.	Lenoir City	Lenoir City	0.7	Reconstruct 2-lane road with addition of turn lanes and sidewalk along one side	17-2014-015	2024	Exempt	N/A
13-812	Lenoir City ITS: Signal System Design	U.S. 11 from G St to U.S. 321 (1.2 miles) and U.S. 321 from U.S. 11 to I-75 SB ramps (2.7 miles)	Lenoir City	Lenoir City	3.9	The project is to design and implement ITS signal system for 20 coordinated signals along US-321/SR-73 and US-11/SR-2.	17-2014-232	2024	Exempt	N/A

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09-407	US-11 Realignment Project at Loudon High School	Intersection of US-11(SR-2) at Loudon High School	City of Loudon	City of Loudon	0.05	Intersection Improvements	17-2017-301 (HSIP)	2024	Exempt	N/A
17-404	Highland Avenue Resurfacing & Sidewalk Project	US-11 (SR-2) to Carding Machine Rd	City of Loudon	City of Loudon	0.6	Resurface roadway and improve sidewalks	17-2017-002	2024	Exempt	N/A
17-407	US 11 at Industrial Park Drive Intersection Improvement	Intersection of US 11 at Industrial Park Dr	Lenoir City	Lenoir City	0.2	Intersection improvements including turn lanes and new traffic signal		2024	Exempt	N/A
17-802	Loudon Intelligent Transportation System	Signalized intersections within city limits on U.S. Hwy 11 and State Route 72. U.S. 11 from SR 72 to Blair Bend Rd (2.7 miles) and SR 72 from Stekee St to Carding Machine Rd (1.3 miles).	City of Loudon	City of Loudon	4	Replace four signals to include vehicle detection and outfit seven intersections with signal system communication and coordination infrastructure. Provide signal timing improvements within the city.	17-2014-079	2024	Exempt	N/A
17-406	Harrison Road at Norwood Dr Intersection Improvement	Intersection of Harrison Rd at Norwood Dr	Lenoir City	Lenoir City	0.1	Intersection improvements to add turn lane and increase sight distance		2024	Exempt	N/A
17-401	Blair Bend Dr/Williamson Dr Resurfacing	Blair Bend Road from U.S. Hwy 11 (SR-2) to Blair Bend Road	City of Loudon	City of Loudon	1.9	Resurface roadway	17-2014-083	2024	Exempt	N/A
17-415	Tellico Parkway (SR-444) Safety Improvement Project	Coyatee Dr to Tugaloo Rd (north of Chota Rd)	Loudon County	Loudon County	0.6	Addition of left turn lanes at Coyatee Drive, Tugaloo Road and Ritchey Road		2024	Exempt	N/A
13-402	Queener Road Reconstruction	SR-72 to River Rd.	City of Loudon	City of Loudon	0.7	Reconstruct 2-lane roadway	17-2014-009	2024	Exempt	N/A
17-416	Muddy Creek Road Intersection Realignment	Intersection of Muddy Creek Rd at Virtue Rd	Loudon County	Loudon County	0.1	Realign intersection and add turn lanes		2024	Exempt	N/A
17-414	Prospect Church Rd Resurfacing	Hwy 72 South to Hwy 72 North	Loudon County	Loudon County	3	Resurface roadway	17-2017-016	2024	Exempt	N/A
17-412	Martel Road Resurfacing	Oak St to Knox County Line	Loudon County	Loudon County	4.3	Resurface roadway	17-2017-016	2024	Exempt	N/A
17-413	Northshore Drive Resurfacing	Beals Chapel Rd to Knox County Line	Loudon County	Loudon County	2.2	Resurface roadway	17-2017-016	2024	Exempt	N/A
17-411	Buttermilk Road Resurfacing	White Wing Rd to Knox County Line	Loudon County	Loudon County	5.2	Resurface roadway	17-2014-076	2024	Exempt	N/A
09-410	US-321 (SR-73) at US-11 (SR-2) Intersection Improvements	US-321 (SR-73) at US-11 (SR-2) Intersection	Lenoir City	TDOT	0	Intersection Improvements	17-2014-034	2024	Exempt	N/A
09-423	US-321 (SR-73) Widening	E. Simpson Rd to north of SR-2 (US-11) in Lenoir City	Lenoir City	TDOT	1.4	Widen from 4 to 6 lanes	17-2014-074	2024	Non-Exempt	Regionally Significant

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18-400	I-75 Exit 81 Interchange Lighting	I-75 at Exit 81 (SR-73/US-321)	Lenoir City	TDOT	0	Add high mast lighting to Interstate 75 at Exit 81 to improve safety conditions at night and during fog events.	17-2017-041	2024	Exempt	N/A
17-410	Kingston Street Realignment Project	Kirk Ave to Wilson St	Lenoir City	Lenoir City	0.1	Relocate approximately 650' of Kingston Street 75' to the north to eliminate a horizontal curve.		2030	Exempt	N/A
17-409	Kingston Street at Rock Springs Road Intersection Improvement	Intersection of Kingston St at Rock Springs Rd	Lenoir City	Lenoir City	0.1	Intersection improvements and addition of sidewalk		2030	Exempt	N/A
09-416	US 11 (SR-2) Realignment & Widening	Oak St to Kingston Pk (US-70/SR-1)	Loudon County	TDOT	5.1	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities		2030	Exempt	N/A
17-402	Carding Machine Road Resurfacing	Highland Ave to SR-72	City of Loudon	City of Loudon	1.4	Resurface roadway		2030	Exempt	N/A
17-403	Grove Street Resurfacing	US-11 to SR-72	City of Loudon	City of Loudon	1.3	Resurface roadway and add left turn lane on Hwy 72		2030	Exempt	N/A
Sevier County Projects										
09-508	Chapman Hwy (US-441/SR-71) Widening	Boyds Creek Hwy (SR-338) to Macon Ln	Sevier County	TDOT	1.2	Add center turn lane	17-2014-033	2024	Non-Exempt	Regionally Significant
18-500	Boyds Creek Highway (SR 338) at Old Knoxville Highway Intersection Improvements	Boyds Creek Hwy (SR 338) at Old Knoxville Hwy Intersection	Sevierville	TDOT	0	Reconfigure existing intersection to improve safety and operations through geometric layout changes, addition of turn lanes, and installation of a new traffic signal.	17-2017-044	2024	Exempt	N/A
Transit Capital Projects										
13-861	Knoxville-Knox CAC Transit Capital Project	N/A	CAC	CAC		Purchase of demand response transit vehicles for fleet replacement	17-2014-204	2024	Exempt	N/A
13-862	CAC Volunteer Assisted Transportation	N/A	CAC	CAC		Purchase of vehicles for assisted demand response transit services		2024	Exempt	N/A
17-1002	ETHRA Transit Vehicle Replacement Project	N/A	ETHRA	ETHRA		Purchase of demand response transit vehicles for fleet replacement	17-2017-203	2024	Exempt	N/A
17-1005	KAT Purchase of ADA Paratransit Vans	N/A	KAT	KAT		Purchase of ADA Paratransit Vans for fleet replacement or minor expansion	17-2017-208	2024	Exempt	N/A
17-1006	KAT Express Transit Service Enhancement - Broadway Transit Signal Priority Implementation	N/A	KAT/Knoxville	KAT/Knoxville	6.5	Implementation of traffic signal and transit enhancements to create a new express BRT route along existing KAT Broadway Route 22. Features include installation of transit signal priority technology, new BRT stops equipped with passenger information systems and potential queue jump applications.	17-2017-028	2024	Exempt	N/A
17-1007	Purchase KAT Vehicles - Fixed Route Buses	N/A	KAT	KAT		Purchase of fixed-route buses for fleet replacement or minor expansion	17-2017-204	2024	Exempt	N/A
17-1008	Purchase KAT Vehicles - Fixed Route Trolley Buses	N/A	KAT	KAT		Purchase of fixed-route trolley buses for fleet replacement or minor expansion	17-2017-206	2024	Exempt	N/A

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17-1009	KAT Implementation of ITS Technologies	N/A	KAT	KAT		Technology upgrades including improved automated vehicle location (AVL), electronic passenger information systems, onboard WiFi, automated passenger counters, mobile fare payment, bus diagnostics, safety systems, traffic management and communication systems	17-2017-205	2024	Exempt	N/A
17-1010	Purchase KAT Vehicles - Neighborhood Service Buses	N/A	KAT	KAT		Purchase of neighborhood service buses for fleet replacement or minor expansion	17-2017-207	2024	Exempt	N/A
Regional Projects (In 1997 Ozone Area but Outside TPO Planning Area)										
J-STIP-1745015	SR-35 (US-411)	Intersection of SR-92/Dickey Road to Grapevine Hollow Road	Jefferson County	TDOT	2.6	Construct 5-lane on 4-lane Divided R-O-W	1745015	2024	Non-Exempt	Regionally Significant
J-STIP-1745010	I-40	Bridge over French Broad River, LM 14.70	Jefferson County	TDOT	1.05	Bridge Replacement (no additional lanes)	1745010	2024	Exempt	N/A
J-IA-01	Local and State Bridge Replacement Program	Various	Jefferson County	TDOT	N/A	Bridge Replacement (no additional lanes)		2024	Exempt	N/A
J-IA-02	I-81 Widening	I-40 to SR-341 (Roy Messer Hwy)	Jefferson County	TDOT	3.8	Widen from 4 to 6 lanes		2030	Non-Exempt	Regionally Significant
J-IA-03	SR-35 (US-411)	Near Sims Rd to Near SR-92 (Dickey Rd)	Jefferson/Sevier County	TDOT	3.8	Widen from 2-lanes to 5-lanes on existing and new alignment		2024	Non-Exempt	Regionally Significant
J-LAMTPO-17	Old AJ Hwy realignment/ SR92/ Overlook R d Extension	From SR92 at Old Andrew Johnson Hwy to US 11E/ W. Broadway Blvd	Jefferson City	Jefferson City	0.46	Construct new 2 lane road with curb and gutter, ADA compliant sidewalks, street signs, traffic signalizations, striping	3016	2024	Non-Exempt	Regionally Significant
J-LAMTPO-R	Resurfacing on Various Routes	Various	Jefferson County	Jefferson City	N/A	Resurfacing with STBG funds including milling, grading, repaving, sidewalk, striping, signage and ADA compliance as needed		2024	Exempt	N/A
J-LAMTPO-2090	Safety Projects around Jefferson County Schools	Various	Jefferson County	Jefferson County	N/A	Construction of various safety projects around Jefferson County Schools within LAMTPO Region	4000	2024	Exempt	N/A
J-LAMTPO-2056	SR-66 Relocated	North of I-81 at SR-341 in Jefferson County to SR-160 in Morristown	Jefferson/Hamblen County	TDOT	5.7	Paving (Completion of Widening and New Alignment Project for 4-laning of SR-66)	32050	2024	Non-Exempt	Regionally Significant
J-LAMTPO-	Chuky Pike at SR-34/US-11E Intersection	N. Chucky Pike at US-11E/SR-34	Jefferson City	TDOT	0	Intersection Improvements and additional turn lanes		2024	Exempt	N/A
J-LAMTPO-	Russell Ave at SR-34/US-11E Intersection Improvements	Russell Ave at US-11E/SR-34	Jefferson City	Jefferson City	0	Add right turn lanes on US-11E/SR-34, pedestrian signals and sidewalks on Russell Ave		2030	Exempt	N/A
J-LAMTPO-2044	George Ave at SR-34/US-11E Intersection Improvements	George Ave at US-11E/SR-35	Jefferson City	Jefferson City	1	Add right turn lanes on US-11E/SR-34, pedestrian signals and sidewalks on all approaches		2030	Exempt	N/A
J-LAMTPO-2051	US-11E/SR-34 Access Management and Intersection Improvements	Russell Ave to Odyssey Rd	Jefferson City	Jefferson City	1.9	Access management and intersection improvements along US-11E/SR-34 (Broadway Ave)		2030	Exempt	N/A
J-LAMTPO-2052	State Street (SR-32) at Main Street (SR-113) Intersection Improvements	SR-32 at SR-113	White Pine	TDOT	0	Add left turn lanes on State Street (SR-32) and a left turn lane on EB SR-113 approach		2030	Exempt	N/A
J-LAMTPO-6003	Roy Messer Hwy (SR-341) at Main St (SR-113) Intersection Improvements	SR-341 at SR-113	White Pine	TDOT	0	Signalize Intersection		2030	Exempt	N/A

Table D-1: Projects from 2040 Mobility Plan and Regional Area Subject to Conformity

KRMP ID	Project Name/Route	Termini	Jurisdiction	Lead Agency	Length (miles)	Project Description/Type of Improvement	FY17-20 TIP ID	Conformity Analysis Year	Exempt Status	Regional Significance
J-LAMTPO-2007	US-11E/SR-34 at E Old AJ Hwy Intersection Improvements	US-11E/SR-34 at E Old AJ Hwy Intersection	Jefferson City	Jefferson City	0	Signalize Intersection		2030	Exempt	N/A
J-LAMTPO-2009	E Old AJ Hwy at Municipal Dr Intersection Improvements	E Old AJ Hwy at Municipal Dr Intersection	Jefferson City	Jefferson City	0	Add turn lanes to Municipal Dr		2030	Exempt	N/A
J-LAMTPO-2012	E. Main Street at N. Chucky Pike Intersection Realignment	E. Main Street at N. Chucky Pike	Jefferson City	Jefferson City	0	Align E. Main Street at N. Chucky Pike		2040	Exempt	N/A
S-1778032	SR-73 (US-321)	Buckhorn Road to SR-416 (Phase 2)	Sevier County	TDOT	1.4	Widen 2-lanes to 4-lane Divided	1778032	2030	Non-Exempt	Regionally Significant
S-1778080	Veterans Blvd (SR-449) Extended	Veterans Blvd from SR-35 to Robert Henderson Rd	Sevierville	TDOT	0.4	Construct new 5-lane Facility	1778080	2024	Non-Exempt	Regionally Significant
S-1778085	Jake Thomas Connector	SR-73 (US-321/441) to SR-449 (Veterans Blvd)	Pigeon Forge	TDOT	2	Pavement Marking between SR-73 and Teaster Ln. Widen from 2-lane to 4-lane divided between Teaster Ln and New Ripkin Experience Ballpark. Construct new 5-lane from Ballpark to SR-449 (Veterans Blvd)	1778085	2024	Non-Exempt	Regionally Significant
S-1778179	SR-35	SR-448 (North Parkway) to Eastgate Road (Includes SR-449 Intersection in Sevierville)	Sevierville	TDOT	1.13	Capacity and Operational Improvements at the intersection of SR-35 and SR-449 with left turn lane restrictions between project limits	1778179	2024	Exempt	N/A
S-1778205	Sevier County Tourist Corridor ITS	41 signalized intersections along various routes	Sevierville/Pigeon Forge	Sevierville	N/A	Upgrade and Re-time 41 signalized intersections along tourist corridors	1778205	2024	Exempt	N/A
S-1778215	Sevierville and Pigeon Forge Traffic Signals	Various intersections including Dolly Parton Pkwy, Veterans Blvd and Parkway	Sevierville/Pigeon Forge	Sevierville	N/A	Upgrade and Re-time 43 signalized intersections in Sevierville and Pigeon Forge	1778215	2024	Exempt	N/A
S-1778330	Great Smoky Mountains National Park Clean Diesel Technologies Equipment Acquisition	N/A	GSMNP	GSMNP	N/A	Purchase of one Ford F-750 8-Yard Dump Truck	1778330	2024	Exempt	N/A
S-09-509	Veterans Blvd (SR-449) Extended Phase 2	Henderson Rd to SR-66 at Gists Creek Rd	Sevierville	TDOT	3.2	Construct new 4-lane Road		2030	Non-Exempt	Regionally Significant