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Air Quality Conformity Determination and Documentation 8-Hour Ozone

FY 2024 - 2027 Transportation
Improvement Program and Related
Amendments to Connected 2050,
the Transportation Plan for the
St. Louis Region



EAST-WEST GATEWAY
Council of Governments

Creating Solutions Across Jurisdictional Boundaries

St. Louis Metropolitan Area

Board Approved
August 2023



FY 2024 – 2027 Transportation Improvement Program and Related Amendments to Connected 2050: Long-Range Transportation Plan for the St. Louis Region

Air Quality Conformity Determination and Documentation for Eight-Hour Ozone

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Executive Summary

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Executive Summary

The expectation of a clean and healthy environment is one of the regional goals specified in Connected 2050: Long-Range Transportation Plan for the St. Louis Region (Connected 2050). Effective July 2012, EPA classified the eight-county St. Louis region as a “marginal” non-attainment area under the new, more protective 2008 eight-hour ozone standard. Jersey County, Illinois has been designated by EPA as being in attainment of the 2008 ozone standard. EPA designated the three Illinois counties as having attained this standard on March 1, 2018 and the Missouri counties on September 20, 2018 (considered to be maintenance). Effective August 3, 2018, EPA designated the following counties as a “marginal” non-attainment area for the 2015 eight-hour ozone standard: St. Charles and St. Louis Counties, the City of St. Louis and Boles Township in Franklin County in Missouri; and Madison and St. Clair Counties in Illinois. EPA reclassified Jefferson County Missouri and Monroe County Illinois from attainment to marginal non-attainment in July 2021. Effective November 7, 2022 EPA reclassified the St. Louis nonattainment area from “marginal” to “moderate” nonattainment. In January 2005, EPA designated the eight-county St. Louis region and Baldwin Township in Randolph County, Illinois as being in non-attainment of the 1997 annual fine particulate matter (PM_{2.5}) standard. Effective October 2, 2018, EPA designated the Missouri counties to be in attainment of the PM_{2.5} standard. Effective May 28, 2019, EPA also redesignated the Illinois counties and Baldwin Township to be in attainment of the 1997 annual PM_{2.5} standard.

A major objective of the East-West Gateway Council of Governments transportation planning process is to ensure that the projects and policies set out in FY 2024 – 2027 Transportation Improvement Program and Related Amendments to Connected 2050 (FY 2024 – 2027 TIP) help to reduce and minimize air quality impacts of transportation projects in accordance with federal, state, and local air quality standards, regulations, and priorities. The specific procedures for reaching this objective are established under Federal law for ensuring conformity between transportation plans and air quality improvement plans. The conformity process is intended to ensure that the programs and activities proposed in the long-range transportation plans (LRTPs) and associated TIPs conform to the purpose of air quality State Implementation Plans, which set out benchmarks against which progress is measured in meeting national goals for cleaner and healthier air.

Under the Federal Regulations, the Council, as the region’s Metropolitan Planning Organization (MPO), is the agency responsible for conducting this determination of conformity. The transportation conformity finding relates to those precursor pollutants produced by automobiles and other on-road transportation, generally described as “mobile source emissions.” The pollutant of most concern in this region is ozone and its precursors, oxides of nitrogen (NO_x) and volatile organic compounds (VOCs).

Ground-level ozone is not directly produced, but is formed when hydrocarbons, also known as VOCs, and NO_x from vehicle and truck exhaust and other industrial processes chemically react, or “cook,” with oxygen in the lower atmosphere in the presence of strong sunlight and high temperatures. High levels of ozone can cause headaches; fatigue; and eye, nose, and respiratory tract irritation. Prolonged exposure to ozone can aggravate chronic heart disease and chronic respiratory ailments.

The primary purpose of the conformity process is to demonstrate that predicted future emissions from motor vehicles fall within criteria specified in air quality implementation plans (Federal or State). Future levels of mobile-source emissions are influenced by a number of factors, each of which is accounted for in the forecasting process.

Executive Summary

1. All forms of pollution are affected by the number of people living in the region and the strength of the regional economy. Projections developed for Connected 2050 serve as a basis for the air quality analysis of the LRTP and TIP. Forecast levels of population growth and economic activity are a major determinant of how much travel is generated, which directly influences the amount of mobile source emissions.
2. Estimates of future travel are made using the Council's travel demand modeling procedures. These procedures document a range of factors that affect personal and commercial travel. These include the composition and income of households, trends in trip making, use of transit, vehicle occupancy, and various algorithms that replicate trip length and route choice. The result of this inventory of procedures is a model of predicted future travel patterns. The primary determinants of pollution from vehicle exhaust are the number of vehicles, how far they travel, and the speed at which they travel. The last is important because the amount of pollution generated by a given amount of travel is very much higher under "stop-and-go" conditions than if traffic is flowing smoothly, although vehicle emissions tend to rise as vehicle speeds exceed 60 mph. The travel demand model is used to develop predictions of vehicle miles of travel (VMT) and vehicle speed.
3. There is a strong correlation between VMT, travel speeds, and emission levels. These relationships are modified by local characteristics of the vehicle fleet (such as the age of vehicles), the effect of vehicle emissions testing and other programs designed to reduce emissions (such as the use of reformulated gasoline), and assumptions about predicted changes in vehicle technology. These travel characteristics are used as inputs into the EPA's MOTO Vehicle Emissions Simulator (MOVES) model. This model is used to predict regional mobile source emission levels.

It should be noted that many current trends such as the growth in regional population, employment, and travel would have the effect of increasing emissions if not for the offsets created by improvement in vehicle technology, more extensive vehicle emissions testing regimens and the introduction of reformulated gasoline. Slow to moderate growth in travel has been more than offset by the general introduction of newer pollution-reducing technology. This trend is expected to continue into the future.

Based on the conformity analysis, the projects and programs included in the FY 2024 – 2027 TIP have met all applicable budget tests as required by the regional emissions analysis and, therefore, are found to be in conformity with the requirements of the Clean Air Act Amendments of 1990, the relevant sections of the Final Conformity Rule 40 CFR Part 93, and the Missouri State Conformity Regulations 10 CSR 10-5.480.

Table of Contents

	<u>Page</u>
Overview of the Air Quality Transportation Conformity Process	
1.0 Air Quality Conformity Finding	1
2.0 Background	1
3.0 Conformity Guidelines	2
3.1 Background	2
3.2 Ozone Standard	3
3.2.1 1979 One Hour Ozone Standard	3
3.2.2 1997 Eight-Hour Ozone Standard	3
3.2.3 2008 Eight-Hour Ozone Standard	3
3.2.4 2015 Eight-Hour Ozone Standard	4
3.2.5 Jersey County and the 1997 Eight-Hour Ozone Standard	6
3.3 1997 and 2012 Fine Particulate Matter (PM _{2.5}) Standard	7
3.3.1 Project Level Hot-Spot PM Conformity Determination – Not Required	8
3.4 Carbon Monoxide (CO) Standard	8
3.5 Transportation Conformity Rule	9
4.0 Conformity Determination Process	9
4.1 1997 Eight-Hour Ozone Standard	9
4.2 2008 and 2015 Eight-Hour Ozone Standards	11
4.2.1 State Implementation Plans	11
4.2.2 Regional Emissions Analysis: Budget Tests	12
4.2.2.1 Missouri	12
4.2.2.2 Illinois	14
4.2.3 Conformity Tests: Analysis Years	16
4.2.4 Conformity Tests: Summary	16
4.2.5 Transportation Control Measures	18
4.2.6 Conformity Determination Technical Methodology	18
5.0 Consultation and Public Participation	22
5.1 Consultation Conformity Procedures	22
5.2 When Conformity Analysis Begins	23
5.3 Public Participation	23
 Declaration of Conformity for Eight-Hour Ozone	 26

Table of Contents

<u>Appendix</u>	Appendix	<u>Page</u>
A.	Transportation Planning Projects	A - 1
B.	Population and Employment Forecasts	B - 1
C.	Travel Demand Modeling Procedures, Assumptions and Forecasts	C - 1
D.	MOtor Vehicle Emissions Simulator (MOVES3) Mobile Source Emissions Modeling and Forecasts	D - 1
E.	2008 and 2015 Eight-Hour Ozone Standards Air Quality Conformity Determination	E - 1
F.	MOVES Documentation (Separate Document)	

<u>Table</u>	List of Tables	<u>Page</u>
1.	Motor Vehicle Emissions Budgets – Missouri	14
2.	Motor Vehicle Emissions Budgets - Illinois	15
3.	Conformity Tests for Volatile Organic Compounds and Oxides of Nitrogen (for 2008 Eight-Hour Ozone) - Missouri	19
4.	Conformity Tests for Volatile Organic Compounds and Oxides of Nitrogen (for 2008 Eight-Hour Ozone) - Illinois	19
5.	Conformity Tests for Volatile Organic Compounds and Oxides of Nitrogen (for 2015 Eight-Hour Ozone) - Missouri	20
6.	Conformity Tests for Volatile Organic Compounds and Oxides of Nitrogen (for 2015 Eight-Hour Ozone) - Illinois	20

<u>Figure</u>	List of Figures	<u>Page</u>
1.	St. Louis Non-Attainment Area - 2015 Ozone Standard as of August 2018	4
2.	St. Louis Non-Attainment Area – 2015 Ozone Standard as of July 2021	5

Conformity Process

1.0 Air Quality Conformity Finding

FY 2024 – 2027 Transportation Improvement Program and Related Amendments to Connected 2050 (FY 2024 – 2027 TIP) has been prepared by the East-West Gateway Council of Governments (EWG) which is the designated Metropolitan Planning Organization (MPO) for the St. Louis region. In accordance with the Clean Air Act Amendments (CAAA) of 1990 and related federal regulations, both the Long-Range Transportation Plan (LRTP) and Transportation Improvement Program must be found to be in conformity with the requirements of those regulations and with all applicable State Implementation Plans (SIPs) before the LRTP may be approved by the MPO. The analysis described in this document has resulted in a Determination that the projects and programs included in the FY 2024 – 2027 TIP conform to the relevant sections of the Federal Conformity Rule and to the applicable sections of the Missouri and Illinois SIPs for air quality. This report makes the determination that the region's transportation plan and program satisfy all applicable criteria and procedures in the conformity regulations.

The transportation *Air Quality Conformity Determination and Documentation (8-Hour Ozone) for the FY 2024 – 2027 Transportation Improvement Program* documentation is the subject of a public comment period running from June 30, 2023 through August 2, 2023. Upon close of the public comment period the EWG Board will recognize, consider, and respond to all comments received.

2.0 Background

This report describes the Transportation Air Quality Conformity Determination conducted as part of the development of the FY 2024 – 2027 TIP as related to the 2008 and 2015 eight-hour ozone National Ambient Air Quality Standards (NAAQS or standard). The FY 2024 – 2027 TIP and related Air Quality Conformity Determination are to be acted on by the East-West Gateway Council of Governments (EWG) on August 30, 2023 and, if approved, subsequently reviewed by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Transportation (DOT) for compliance with Transportation Conformity rules and regulations.

The EWG finds that the FY 2024 – 2027 TIP conforms to the State Implementation Plans (SIPs) adopted by the Missouri Department of Natural Resources (MoDNR) and Illinois Environmental Protection Agency (Illinois EPA) for the 2008 and 2015 eight-hour ozone standards based on the results of this conformity analysis.

For the 2008 and 2015 eight-hour ozone standards, the Conformity Determination addresses those ozone-forming pollutants (volatile organic compounds or VOC and oxides of nitrogen or NO_x) produced by automobiles and other on-road transportation, generally described as "mobile source emissions". While this chapter outlines the evaluation process involved in the Conformity Determination, a more detailed description of the complex technical analysis is provided in the Appendices. Appendix A lists all of the projects considered as part of the Regional Travel Demand Model, which are included in the regional emissions analysis. Appendices B, C and D describe the planning assumptions and methods used to forecast vehicle travel and resulting emissions. Appendix E summarizes the calculations supporting the Conformity Determination for the 2008 and 2015 eight-hour ozone standards. In a separate document Appendix F contains the

Conformity Process

input and output files documentation for the MOtor Vehicle Emissions Simulator (MOVES) mobile source emissions model.

3.0 Conformity Guidelines

3.1 Background

The expectation of "a clean and healthy environment" was first set out as a regional goal in *Transportation Redefined*, the St. Louis region's long-range transportation plan established in 1992. Since then each subsequent LRTP has reaffirmed this goal with Connected 2050 establishing a regional guiding principle of a "healthy and sustainable environment." To that end, the Council has set out the following objective for the transportation planning process:

"To reduce transportation related air pollution..... in accordance with federal, state, and local health standards and priorities."

The specific procedures for reaching that objective are those established under Federal law for ensuring conformity between transportation plans and air quality improvement plans. The Conformity Determination process is intended to ensure that the programs and activities proposed in the Transportation Plan, the TIP and TIP amendments, conform to the purpose of the CAAA of 1990 and the SIPs. As stated in the CAAA of 1990, this means *"...conformity to the (implementation) plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards..."*. The provisions of the CAAA of 1990 in relation to conformity are amplified in the U.S. Environmental Protection Agency (EPA) Final Rule, 40 CFR Part 93, as amended July 1, 2004, May 6, 2005 and January 2008, March 2010 and March 2012. The July 2004 revisions amended the current Conformity rule to: provide conformity procedures under the new eight-hour ozone and PM_{2.5} air quality standards; incorporate existing federal guidance into the Conformity rule consistent with the March 2, 1999 U.S. Court of Appeals decisions; and streamline and improve the rule. With the May 2005 revision, the following transportation-related potential precursors of PM_{2.5} have been added to the Conformity regulation: oxides of nitrogen (NO_x), volatile organic compounds (VOC), sulfur oxides (SO_x) and ammonia (NH₃). The regulation also specified when each of these precursors must be considered in Conformity Determinations in PM_{2.5} non-attainment and maintenance areas before and after the submission of State Implementation Plans (SIPs). The January 2008 amendments were made so the rule was consistent with the Clean Air Act section 176(c) as amended by the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) including: changes to the regulations to reflect that the Clean Air Act now provides more time for state and local governments to meet conformity requirements; provides a one-year grace period before the consequences of not meeting certain conformity requirements apply; and allows the option of shortening the conformity determination timeframe. Other conformity provisions were streamlined. This Conformity Determination also meets the new timelines and procedures as set out in SAFETEA-LU. The March 2010 amendment primarily affects the implementation of conformity in the PM_{2.5} (24-hour) and PM₁₀ non-attainment and maintenance areas. In March 2012 the Conformity rule was restructured so that existing rule requirements clearly apply to areas designated for future new or revised NAAQS. Revision also allows PM_{2.5} areas with clean

Conformity Process

air quality data to take advantage of conformity flexibilities that are currently only available to ozone areas.

3.2 Ozone Standard

3.2.1 1979 One Hour Ozone Standard

Based on 2000-2002 air quality monitoring data, the St. Louis region was found to meet the one-hour ozone standard. On May 12, 2003, EPA approved the redesignation to attainment requests and Maintenance Plans prepared by MoDNR and Illinois EPA. The entire eight-county St. Louis region is now classified as a maintenance area for the one-hour ozone standard.

3.2.2 1997 Eight-Hour Ozone Standard

In 2004, EPA designated the St. Louis area as a “moderate” non-attainment area for the 1997 eight-hour ozone standard. The non-attainment area included: Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis in Missouri; and Jersey, Madison, Monroe and St. Clair Counties in Illinois. EWG, as the MPO, had until June 15, 2005 to perform a Conformity Determination under this eight-hour ozone standard. In March 2005 EWG conducted a Conformity Determination for *Legacy 2030*, The Transportation Plan for the St. Louis Region, which satisfied the June 15 statutory deadline requirement. On June 12, 2012, EPA approved the following items: the request by Illinois to redesignate the Illinois counties to attainment of the 1997 eight-hour ozone standard; and the Maintenance Plan for the Metro-East St. Louis Ozone Nonattainment Area for the 1997 8-Hour Ozone National Ambient Air Quality Standard (IL 8-Hour Ozone Maintenance Plan for the 1997 standard) containing 2008 and 2025 motor vehicle emissions budgets. On February 20, 2015, EPA approved Missouri’s request to redesignate the Missouri counties as being in attainment of the 1997 eight-hour ozone standard and approved the associated maintenance plan. Effective April 6, 2015, EPA revoked the 1997 eight-hour ozone standard in all areas.

3.2.3 2008 Eight-Hour Ozone Standard

Effective July 2012, the St. Louis area was designated by EPA as a “marginal” non-attainment area for the 2008 eight-hour ozone standard. The non-attainment area included: Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis in Missouri; and Madison, Monroe and St. Clair Counties in Illinois. EWG, as the MPO, had until July 19, 2013 to perform a Conformity Determination under this eight-hour ozone standard. The January 30, 2013 Conformity Determination for the Amendment to the FY 2013-2016 TIP and related amendments to the *Regional Transportation Plan 2040* was performed with the Conformity procedure as relates to the 2008 eight-hour ozone standard. This Conformity Determination satisfied all requirements under the new “marginal” non-attainment area classification. In the March 1, 2018 Federal Register, EPA issued a final rule, effective March 1, 2018, redesignating Madison, Monroe and St. Clair Counties in Illinois as being in attainment of the 2008 eight-hour ozone standard, approving the Maintenance Plan for the Metro East St. Louis Ozone Nonattainment Area for the 2008 Ozone National Ambient Air Quality Standard (IL 8-Hour Maintenance Plan for 2008 standard) and finding the 2030 motor vehicle emissions budgets adequate for use in Conformity Determination. In the September 20, 2018 Federal Register, EPA issued a final rule

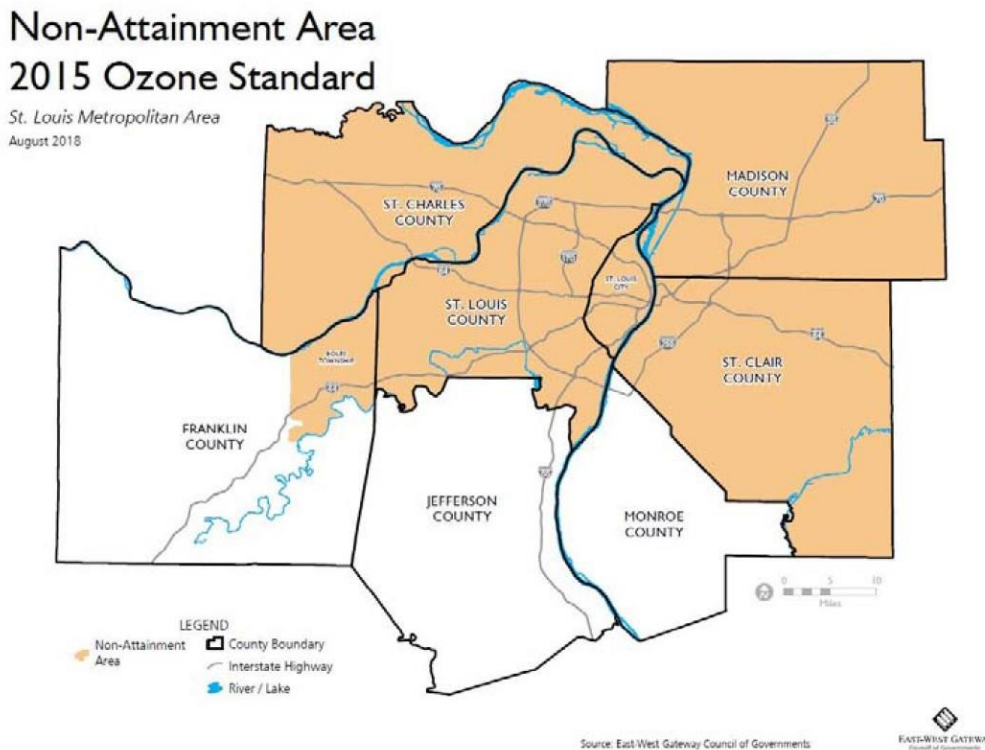
Conformity Process

approving the request by MoDNR to redesignate Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis to attainment for the 2008 ozone standard. EPA also approved Missouri's Maintenance Plan and the 2030 motor vehicle emission budgets for VOC and NO_x. As EPA has not revoked the 2008 ozone standard, Conformity Determination will continue to be performed for the eight-county maintenance area.

3.2.4 2015 Eight-Hour Ozone Standard

On April 30, 2018, EPA designated the St. Louis area as a "marginal" non-attainment area for the 2015 eight-hour ozone standard (effective August 3, 2018). The non-attainment area includes: in Missouri, St. Charles and St. Louis Counties, the City of St. Louis and Boles Township in Franklin County; and Madison and St. Clair Counties in Illinois. (See Figure 1) EWG, as the MPO, had until August 3, 2019 to perform a Conformity Determination under this eight-hour ozone standard. The June 2019 Conformity Determination for the Update to *Connected2045*: Long-Range Transportation Plan for the St. Louis Region (*Connected2045* Update) satisfied the 2015 eight-hour ozone standard conformity determination statutory deadline requirement.

Figure 1 – St. Louis Non-Attainment Area - 2015 Ozone Standard as of August 2018



In a July 10, 2020 decision, the District of Columbia Circuit Court remanded to EPA for further consideration, but did not vacate, EPA's April 30, 2018, 2015 ozone standard attainment designations made for 16 counties associated with nine nonattainment areas located in seven states. St. Louis (MO-IL) is one of the non-attainment areas and Jefferson County Missouri and

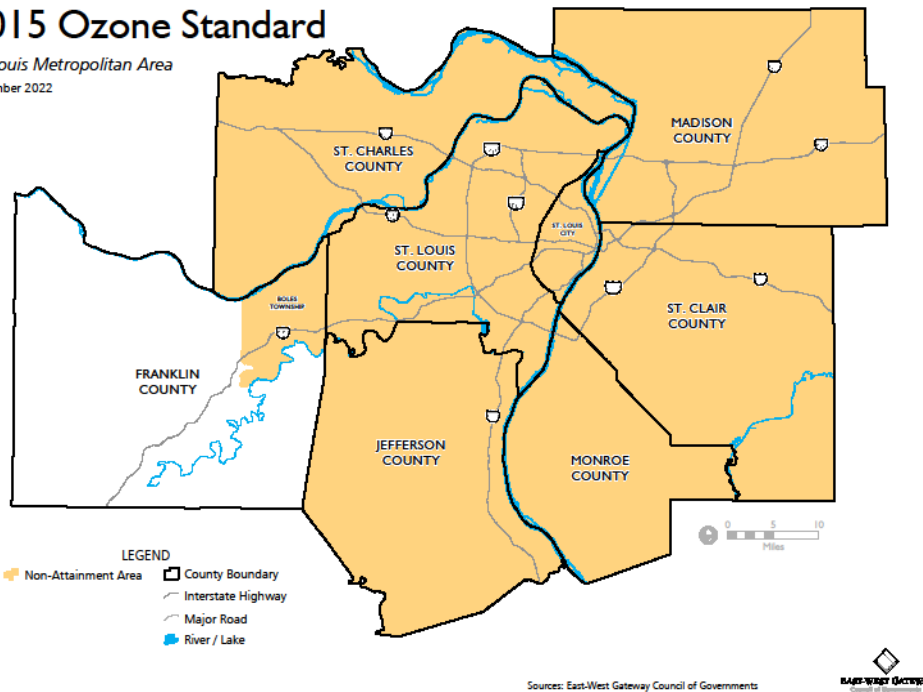
Conformity Process

Monroe County Illinois are included in the 16 counties. As a result of the court decision, EPA has re-evaluated the designations for the remanded counties and associated non-attainment areas using only data and information available at the time of the original designations. On June 14, 2021 EPA published a final rule (effective July 14, 2021) revising the designations for 13 counties associated with six of the affected non-attainment areas from attainment of the 2015 ozone standard to non-attainment and reaffirming the 2018 attainment designation for one county associated with a non-attainment area in Michigan. Jefferson County and Monroe County are now designated as non-attainment for the 2015 ozone standard. (See Figure 2) EWG, as the MPO, had until July 14, 2022 to perform a Conformity Determination for Jefferson and Monroe Counties for the 2015 eight-hour ozone standard. The October 2021 Conformity Determination for the FY 2023-2026 Transportation Improvement Program and related amendments to *Connected2045* Update satisfied the 2015 eight-hour ozone standard conformity determination statutory deadline requirement.

Figure 2 – St. Louis Non-Attainment Area for 2015 Ozone Standard as of July 2021

Non-Attainment Area 2015 Ozone Standard

St. Louis Metropolitan Area
November 2022



Effective November 7, 2022 EPA reclassified the St. Louis nonattainment area from “marginal” to “moderate” nonattainment with an attainment date of August 3, 2024 and 2023 as the attainment year. For the regional emissions analysis for the 2015 ozone standard, 2023 was added as an analysis year.

The regional emissions analysis provisions in 40 CFR 93.109 (e)(2)(iii) of the Conformity Rule are to be followed. The ozone regional emissions analysis for the 2008 and 2015 ozone standards in the Missouri maintenance and non-attainment counties will use 2015 motor vehicle emissions

Conformity Process

budgets for VOC and NO_x from the Early Progress Plan for the Missouri Portion of the St. Louis Nonattainment Area for the 2008 8-Hour Ground Level Ozone National Ambient Air Quality Standard (MO Early Progress Plan). These budgets were developed using MOVES2010 and were found adequate by EPA (letter to MoDNR dated October 28, 2013). In the January 14, 2016 Federal Register, EPA issued a final rule approving the MO Early Progress Plan (effective March 14, 2016). The ozone regional emissions analysis for the Missouri counties will also use 2030 motor vehicle emissions budgets for VOC and NO_x from the February 2018 Technical Correction to the Re-designation Request and Maintenance Plan for the St. Louis (Missouri) 2008 Ozone Standard (MO Maintenance Plan). These budgets were developed using MOVES2014a and were found adequate by EPA (letter to MoDNR dated May 15, 2018). In the June 8, 2018 Federal Register, EPA issued a final rule approving the motor vehicle emissions budgets from the MO Maintenance Plan for use in Conformity Determination process (effective June 22, 2018). The MO Maintenance Plan was approved by EPA on September 20, 2018.

The ozone regional emissions analysis for the Illinois maintenance and non-attainment areas for the 2008 and 2015 ozone standards will utilize the 2025 VOC and NO_x motor vehicle emissions budgets from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard. The ozone regional emissions analysis for the 2015 ozone standard for the Illinois nonattainment area will use the 2008 VOC and NO_x motor vehicle emissions budgets from this SIP. EPA has found these MOVES2010-derived budgets adequate for Conformity Determination purposes and approved this Maintenance Plan in June 2012. The 2030 motor vehicle emissions budgets for VOC and NO_x from the IL 8-Hour Ozone Maintenance Plan for 2008 standard will also be used in this Conformity Determination. These budgets were developed using MOVES2014a and were found adequate by EPA (September 26, 2017 letter to Illinois EPA). In the December 11, 2017 Federal Register, a final rule (effective December 26, 2017) was issued by EPA finding the 2030 budgets adequate for conformity purposes. In the March 1, 2018 Federal Register, EPA issued a final rule, effective March 1, 2018, finding the 2030 motor vehicle emissions budgets adequate for use in Conformity Determination.

3.2.5 Jersey County Illinois and the 1997 Eight-Hour Ozone Standard

Jersey County Illinois was designated by EPA as a maintenance area for the 1997 ozone standard. In 2012, this county was designated by EPA as being in attainment of the 2008 ozone standard. In the July 2012 Transportation Conformity Guidance for 2008 Ozone Nonattainment Areas, EPA stated that transportation conformity requirements for counties like Jersey cease to apply on July 20, 2013 and that no further conformity determinations for the 1997 ozone standard are required on or after that date. As the 1997 ozone standard has been revoked by EPA (March 6, 2015), no further conformity determinations for this ozone standard were required.

On February 16, 2018, the U.S. Court of Appeals for the District of Columbia issued a ruling in the South Coast Air Quality Management District vs. EPA case challenging EPA's final rule for implementing the 2008 ozone National Ambient Air Quality Standard (NAAQS), or 2008 ozone NAAQS State Implementation Plan (SIP) requirements rule. The court vacated portions of this rule but upheld EPA's revocation of the 1997 ozone standard in 2015. In its decision, the court used the term "orphan areas" to describe those 1997 ozone standard non-attainment or maintenance areas which EPA then had designated as being in attainment of the 2008 ozone standard. This court decision was reviewed by EPA, the Federal Highway Administration (FHWA)

Conformity Process

and the Federal Transit Administration (FTA). FHWA and FTA released interim guidance in April and October 2018 delineating the conformity process for the 1997 ozone standard for the 82 orphan areas. The eight-county St. Louis (MO-IL) region and Jersey County Illinois was identified as an orphan area. The interim guidance was used to prepare the Conformity Determination for the FY 2019-2022 TIP and related Amendments to *Connected2045*. Only regionally significant projects located in Jersey County were affected by the interim guidance.

In April 2018 EPA requested a rehearing by the court of certain aspects of the February decision. On September 14, 2018 the court agreed to stay its vacatur of the portion of the EPA rule “that exempts orphan areas from transportation conformity” until February 16, 2019 and denied the other aspects of rehearing request. EPA then issued guidance in November 2018 describing how transportation conformity determination can be made in the total or partial orphan areas which were either in non-attainment or maintenance for the 1997 ozone standard at the time it was revoked in March 2015.

According to the EPA guidance, a partial orphan maintenance area: has attained the 1997 ozone standard and is maintaining the standard as of March 6, 2015; and is not included in the smaller 2008 ozone nonattainment area. The eight-county St. Louis (MO-IL) region and Jersey County Illinois were identified as a partial orphan maintenance area. Jersey County is considered to be the orphan area because EPA found it to be: in maintenance for the 1997 ozone standard; and in attainment for the 2008 and 2015 ozone standards. Transportation conformity for the revoked 1997 ozone standard is to be performed using EPA’s November 2018 guidance for orphan areas containing regionally significant projects, such as Jersey County.

3.3 1997 and 2012 Fine Particulate Matter (PM_{2.5}) Standards

In 2005, EPA designated the eight-county St. Louis region as being in non-attainment of the 1997 annual PM_{2.5} standard. The non-attainment area included: Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis in Missouri; and Madison, Monroe and St. Clair Counties in Illinois. Baldwin Township in Randolph County, Illinois was also part of the non-attainment area. EWG, as the MPO, was required to demonstrate Conformity with the current LRTP and TIP for the PM_{2.5} standard by April 5, 2006. In February 2006 EWG conducted a Conformity Determination on the FY 2006-2009 TIP and related amendments to *Legacy 2030*, The Transportation Plan for the St. Louis Region, which satisfied this statutory deadline requirement. Effective October 2, 2018, EPA redesignated the Missouri counties to attainment for this standard (considered a maintenance area). Effective May 28, 2019, EPA redesignated Madison, Monroe and St. Clair Counties and Baldwin Township in Randolph County, Illinois to attainment for the 1997 annual PM_{2.5} standard (considered a maintenance area). Based on EPA’s 2016 Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements: Final Rule, when an area is redesignated to attainment for the 1997 standard, the 1997 standard is revoked and conformity requirements no longer apply. These areas are identified as “maintenance (standard revoked)”. An air quality Conformity Determination for the 1997 annual PM_{2.5} standard is no longer needed for the long-range transportation plan, TIP or at the project-level.

In December 2014 (effective April 15, 2015), EPA found that it could not determine, based on available data, whether the eight-county St. Louis region and Baldwin Township in Randolph

Conformity Process

County, Illinois met the 2012 annual PM_{2.5} standard or was contributing to a nearby violation. This area was identified as “unclassifiable”. The issues leading to EPA’s decision at that time have been resolved. Effective January 28, 2019, EPA approved the request by Illinois to designate the entire state as in attainment for the 2012 standard. Effective July 29, 2019, EPA approved Missouri’s request that the five Missouri counties making up the St. Louis region be classified as attainment for the 2012 standard. Since the area is in attainment of the 2012 annual PM_{2.5} standard, an air quality Conformity Determination for this standard is not needed for the long-range transportation plan, TIP or at the project-level.

3.3.1 Project Level Hot-Spot PM Conformity Determination – Not Required

Within PM non-attainment or maintenance areas, a transportation project sponsor has to determine, during the NEPA process, if a proposed major transportation project would be considered to be a “project of air quality concern.” A project of air quality concern usually involves either large traffic volumes and/or significant diesel traffic (i.e., bridge, bus or rail terminals). If a project met this definition, a project-level PM hot-spot Conformity Determination would be required which would be the responsibility of the project sponsor. For example, in 2006 a qualitative PM hot-spot analysis was done by IDOT for the New Mississippi River Bridge project.

Project-level PM hot-spot air quality Conformity Determination for the 1997 annual PM_{2.5} standard is not required as this standard has been revoked by EPA for the eight-county St. Louis region and Baldwin Township in Randolph County Illinois. In addition, since all of Illinois and the Missouri counties making up the St. Louis region have been designated by EPA as in attainment of the 2012 annual PM_{2.5} standard, project-level PM hot-spot air quality Conformity Determination for this standard is not required.

3.4 Carbon Monoxide (CO) Standard

Part of the region, consisting of the City of St. Louis and that portion of St. Louis County within the I-270 loop, is classified as a limited maintenance area for carbon monoxide (CO). On June 17, 1997 the MoDNR submitted the first ten-year maintenance plan, The Missouri State Implementation Plan for Carbon Monoxide - St. Louis Metropolitan Area: Maintenance Provisions and Re-designation Request, October 1996, to EPA. The redesignation to attainment request was approved by EPA on March 31, 1999. MoDNR submitted their second ten-year CO maintenance plan, Revision to the Limited Maintenance Plan for the St. Louis Nonclassifiable Maintenance Area for the 8-Hour Carbon Monoxide National Ambient Air Quality Standard to EPA on April 3, 2014. This maintenance plan adequately demonstrated that the area will maintain the CO standard through 2022 and EPA plan approval was published in the October 2, 2015 Federal Register. As a result, the Limited Carbon Monoxide Maintenance Plan option allows plan conformity without a technical analysis. As of March 29, 2019, the end of the 20-year maintenance period has been reached.

3.5 Transportation Conformity Rule

Under the provisions of the CAAA of 1990, EWG, as the MPO for the region, is the agency responsible for making the Conformity Determination. The Conformity Determination described in this document was performed in accordance with DOT and EPA guidance and procedures.

Conformity Process

Procedures were implemented in accordance with all applicable provisions of 40 CFR Part 93, specific sections 93.109, 113 and 118 and relevant guidelines and documentation issued by DOT and EPA².

In 2007, MoDNR prepared a St. Louis Transportation Conformity Rule and in 2010 MoDNR proposed changes to the 2007 Transportation Conformity Rule. These rule changes were submitted to the Missouri Air Conservation Commission (MACC). In October 2010, the MACC approved the changes to the St. Louis Transportation Conformity Rule based on the January 2009 “Guidance for Developing Transportation Conformity State Implementation Plans (SIPs)” by EPA. The updated rule was effective February 28, 2011. Final approval of this rule by EPA took place on October 28, 2013. As the Illinois Transportation Conformity SIP is still under review by EPA, the Illinois part of the region remains subject to the provisions of the Federal Transportation Conformity Rule.

4.0 Conformity Determination Process

4.1 1997 Eight-Hour Ozone Standard

On February 16, 2018, the U.S. Court of Appeals for the District of Columbia circuit issued a decision in the South Coast Air Quality Management District vs. EPA case challenging EPA’s final rule for implementing the 2008 ozone National Ambient Air Quality Standard (NAAQS) or 2008 ozone NAAQS State Implementation Plan (SIP) Requirements rule. The court vacated portions of this rule but upheld EPA’s revocation of the 1997 ozone standard on March 6, 2015. In its decision, the court used the term “orphan areas” to describe those 1997 ozone standard non-attainment or maintenance areas which EPA had designated as being in attainment of the 2008 ozone standard. This decision was reviewed by EPA, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). FHWA and FTA released interim guidance in April and October 2018 which delineated the conformity process for the 1997 ozone standard for the 82 orphan areas. The eight county St. Louis (MO-IL) region and Jersey County Illinois were identified as an orphan area. EWG used this interim guidance to prepare the Conformity Determination for the FY 2019-2022 Transportation Improvement Program (TIP) and Related Amendments to *Connected2045*. Only regionally significant projects located in Jersey County were affected by this interim guidance.

In April 2018 EPA requested a rehearing by the court of certain aspects of the February decision. On September 14, 2018, the court agreed to stay its vacatur of the portion of the EPA rule “that exempts orphan areas from transportation conformity” until February 16, 2019 and denied the

² EPA, *Transportation Conformity Regulations as of April 2012*, April 2012; EPA, *Transportation Conformity Guidance for 2008 Ozone NAAQS Nonattainment Areas*, July 2012; EPA, *MOVES2010b User Guide*, July 2012; EPA, *Policy Guidance for Use of MOVES2010 and Subsequent Minor Revisions for State Implementation Plan Development, Transportation Conformity, and Other Purposes*, April 2012; EPA, *Guidance for Transportation Conformity Implementation in Multi-jurisdictional Nonattainment and Maintenance Areas*, July 2012; EPA, *Volume IV: Mobile Sources, Procedures for Emission Inventory Preparation*, EPA-450/4-81-026d (revised), July 1992; FHWA, *Transportation Conformity Guide: A Basic Guide for State and Local Officials*, revised 2010.

Conformity Process

other aspects of the rehearing request. Transportation conformity for the revoked 1997 ozone standard is to be performed for orphan areas starting February 16, 2019. EPA then issued guidance in November 2018 describing how transportation conformity determinations can be made in the total or partial orphan areas which were either in nonattainment or maintenance for the 1997 ozone standard at the time that standard was revoked in 2015. A partial orphan maintenance area is considered to be an area which was in maintenance (had attained) for the 1997 ozone standard as of March 6, 2015 but for which the non-attainment area for the 2008 ozone standard is smaller.

The eight-county St. Louis (MO-IL) region and Jersey County Illinois were identified as a partial orphan maintenance area. Jersey County is considered the orphan area because EPA found it to be in: maintenance for the 1997 ozone standard; and attainment for both the 2008 and 2015 ozone standards. Regionally significant projects located in Jersey County have to be part of the Conformity Determination process.

The current transportation conformity regulation states that a regional emissions analysis is required starting one year after a non-attainment designation for a particular standard and continues until the effective date of the revocation of that standard by EPA. As the February 2018 South Coast court decision upheld EPA's revocation of the 1997 ozone standard, a conformity determination for the 1997 ozone standard in orphan areas does not require a regional emissions analysis using the latest emissions model and either the emissions budget test or the interim test. For an orphan area which has a regionally significant project, the determination of conformity for the 1997 ozone standard is to be demonstrated by showing the following criteria delineated in the Final Conformity Rule 40 CFR Part 93 have been met: 1) use of latest planning assumptions for Transportation Control Measures (TCMs) in approved State Implementation Plan (SIP) if TCMs are in that SIP; 2) consultation requirements; 3) timely implementation of any approved SIP TCMs if TCMs are in that SIP; and 4) fiscal constraint.

Through the current Inter Agency Consultation process, the Illinois Department of Transportation (IDOT) indicated that at this time there are no new regionally significant projects in Jersey County which would require a conformity determination to be performed in relation to the 1997 ozone standard as part of the Conformity Determination for the FY 2024 – 2027 TIP.

Conformity Process

4.2 2008 and 2015 Eight-Hour Ozone Standards

4.2.1 State Implementation Plans

An ozone control strategy SIP contains measures and policies for reducing ozone-forming emissions of VOC and NO_x. A Maintenance Plan demonstrates how an area that has attained an air quality standard will continue to attain the relevant standard for a minimum ten-year period. The plan also contains strategies that can be implemented in the event the region's air quality subsequently violates the applicable standard. Mobile sources, essentially road-based transportation, are one of several broad categories of pollution sources. The Maintenance Plan SIP contains estimates of attainment year emissions from all source categories and projects future year emissions. Future year emissions estimates must be lower than the emissions estimated for the attainment year. In addition, the total emissions projected for on-road mobile sources in specific future years are established as motor vehicle emissions budgets for the purposes of conducting transportation conformity. Preparation of the SIP is the responsibility of the State. A SIP must be submitted to EPA in accordance with a schedule delineated in Federal regulation. EPA approval is required for all SIPs. Motor vehicle emissions budgets contained in a submitted SIP may be used as a basis for Conformity Determination findings before the SIP is formally approved, provided EPA has issued a specific Finding of Adequacy.

The process EPA uses to determine the adequacy of submitted SIP budgets for conformity is contained in a May 14, 1999 Memorandum from EPA entitled "*Conformity Guidance on Implementation of the March 2, 1999 Conformity Court Decision*" and the July 2004 Conformity rule revision.

The Missouri maintenance area for the 2008 ozone standard consists of: Franklin, Jefferson, St. Charles and St. Louis Counties; and the City of St. Louis. For this area the Conformity Determination is made in relation to the 2015 motor vehicle emissions budgets from the Missouri Early Progress Plan for the 2008 standard. These budgets were established with the MOVES2010 model. In a letter to MoDNR dated October 28, 2013, EPA found these budgets adequate for Conformity Determination purposes. In the March 5, 2014 Federal Register, EPA issued a notice of adequacy for the 2015 budgets for Conformity purposes (effective March 19, 2014). In the January 14, 2016 Federal Register, EPA issued a final rule approving the MO Early Progress Plan (effective March 14, 2016). The Conformity Determination is also made in relation to the 2030 motor vehicle emissions budgets from the February 2018 technical correction MO Maintenance Plan for the 2008 standard. These budgets were established with the MOVES2014a model. In a letter to MoDNR dated May 15, 2018, EPA found these budgets adequate for Conformity Determination purposes. In the June 8, 2018 Federal Register, EPA issued a notice of adequacy for the 2030 budgets for Conformity purposes (effective June 22, 2018). In the September 20, 2018 Federal Register EPA issued a final rule approving the request by MoDNR and redesignated Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis as being in attainment of the 2008 ozone standard. EPA also approved Missouri's Maintenance Plan and the 2030 motor vehicle emission budgets for VOC and NO_x.

The non-attainment area for the 2015 eight-hour ozone standard in Missouri consists of: Jefferson, St. Charles and St. Louis Counties, the City of St. Louis and Boles Township in Franklin County. (See Figure 2) The Conformity Determination is made in relation to the 2015

Conformity Process

motor vehicle emissions budgets from the Missouri Early Progress Plan for the 2008 standard. The Conformity Determination is also made in relation to the 2030 motor vehicle emissions budgets from the February 2018 technical correction MO Maintenance Plan for the 2008 standard.

At this time, Missouri does not have EPA-approved motor vehicle emissions budgets or budgets which EPA has found to be adequate for conformity purposes for the 2015 eight-hour ozone standard. Approved or adequate motor vehicle emissions budgets from an applicable SIP or SIP submission for another (previous) ozone standard can be used in the regional emissions analysis. Since the Missouri non-attainment area for the 2015 eight-hour ozone standard has a smaller geographic area than what was established for the 2008 eight-hour ozone standard, EPA's Transportation Conformity Regulation sets out the option to either use the corresponding portion of the previous budgets which matches the 2015 non-attainment area in the regional emissions analysis or to use the existing budgets as is. EWG, after inter agency consultation, decided to use the existing motor vehicle emissions budgets from the Missouri SIPs as is.

For the Illinois 2008 eight-hour ozone standard maintenance area (Madison, Monroe and St. Clair Counties), the Conformity Determination is made in relation to the 2025 motor vehicle emissions budgets contained in the IL 8-Hour Ozone Maintenance Plan for the 1997 standard. These budgets were developed using the MOVES2010 model. On December 22, 2011, EPA found the 2008 and 2025 budgets in this Maintenance Plan adequate for Conformity Determination purposes. On June 12, 2012, EPA approved the IL 8-Hour Ozone Maintenance Plan for the 1997 standard and the 2008 and 2025 motor vehicle emissions budgets. For the remaining analysis years, the Conformity Determination is made in relation to the 2030 motor vehicle emissions budgets from the IL 8-Hour Maintenance Plan for 2008 standard. These budgets were developed using MOVES2014a and were found adequate by EPA (September 26, 2017 letter to Illinois EPA). In the December 11, 2017 Federal Register, EPA issued a final rule approving these 2030 budgets which was effective December 26, 2017. In the March 1, 2018 Federal Register, EPA issued a final rule, effective March 1, 2018, redesignating Madison, Monroe and St. Clair Counties in Illinois as being in attainment of the 2008 eight-hour ozone standard, approving the Maintenance Plan for the Metro East St. Louis Ozone Nonattainment Area for the 2008 Ozone National Ambient Air Quality Standard (IL 8-Hour Maintenance Plan for 2008 standard) and finding the 2030 motor vehicle emissions budgets adequate for use in Conformity Determination.

For the Illinois 2015 eight-hour ozone standard non-attainment area of Madison, Monroe and St. Clair Counties (see Figure 2), the Conformity Determination is made in relation to the 2008 and 2025 motor vehicle emissions budgets contained in the IL 8-Hour Ozone Maintenance Plan for the 1997 standard and the 2030 motor vehicle emissions budgets from the IL 8-Hour Maintenance Plan for the 2015 standard.

At this time, Illinois does not have EPA-approved motor vehicle emissions budgets or budgets which EPA has found to be adequate for conformity purposes for the 2015 eight-hour ozone standard. Approved or adequate motor vehicle emissions budgets from an applicable SIP or SIP submission for another (previous) ozone standard can be used in the regional emissions analysis.

Conformity Process

4.2.2 Regional Emissions Analysis: Emissions Budget Tests

The principal step toward making a Conformity Determination for the 2008 eight-hour ozone standard for the analysis years 2025, 2030, 2035, 2045 and 2050 is to demonstrate that the anticipated emission levels of ozone precursor pollutants which will result from planned and programmed transportation projects (the "Action" scenario) will be less than the level defined in the motor vehicle emissions budgets from the MO Early Progress Plan for the 2008 standard, the MO Maintenance Plan for the 2008 standard, the IL 8-Hour Ozone Maintenance Plan for the 1997 standard and the IL 8-Hour Ozone Maintenance Plan for the 2008 standard. The SIP motor vehicle emissions budgets from the MO Early Progress Plan for the 2008 standard and the IL 8-Hour Ozone Maintenance Plan for the 1997 standard were established using the MOVES2010 model for the two sets of pollutants which are precursors of ozone formation, VOC, primarily hydrocarbons, and NO_x. The VOC and NO_x motor vehicle emissions budgets from the MO Maintenance Plan for the 2008 standard and the IL 8-Hour Ozone Maintenance Plan for the 2008 standard were established using the MOVES2014a model.

The principal step toward making a Conformity Determination for the 2015 eight-hour ozone standard for the analysis years 2023, 2025, 2030, 2035, 2045 and 2050 is to demonstrate that the anticipated emission levels of ozone precursor pollutants which will result from planned and programmed transportation projects (the "Action" scenario) will be less than the level defined in the motor vehicle emissions budgets from the MO Early Progress Plan for the 2008 standard, the MO Maintenance Plan for the 2008 standard, the IL 8-Hour Ozone Maintenance Plan for the 1997 standard and the IL 8-Hour Ozone Maintenance Plan for the 2008 standard. The SIP motor vehicle emissions budgets from the MO Early Progress Plan for the 2008 standard and the IL 8-Hour Ozone Maintenance Plan for the 1997 standard were established using the MOVES2010 model for the two sets of pollutants which are precursors of ozone formation, VOC, primarily hydrocarbons, and NO_x. The VOC and NO_x motor vehicle emissions budgets from the MO Maintenance Plan for the 2008 standard and the IL 8-Hour Ozone Maintenance Plan for the 2008 standard were established using the MOVES2014a model.

4.2.2.1 Missouri

To conduct a Conformity Determination for the 2008 eight-hour ozone standard for the 2025 analysis year, it is necessary to demonstrate that the anticipated emission levels of precursor pollutants of ozone formation (VOC, primarily hydrocarbons, and NO_x) which will result from the "Action" scenario will be less than the 2015 motor vehicle emissions budgets (Table 1) from the MO Early Progress Plan for the 2008 standard. These budgets were developed with the MOVES2010 model. In a letter to MoDNR dated October 28, 2013, EPA issued an adequacy finding for the 2015 VOC and NO_x motor vehicle emissions budgets. In the March 5, 2014 Federal Register, EPA issued a notice of adequacy for the 2015 budgets for Conformity purposes (effective March 19, 2014). These budgets can be used in the Conformity Determination process. In the January 14, 2016 Federal Register, EPA issued a final rule approving the MO Early Progress Plan (effective March 14, 2016). To conduct a Conformity Determination for the analysis years of 2030, 2035, 2045 and 2050, it is necessary to demonstrate that the anticipated emission levels VOC and NO_x which will result from the "Action" scenario will be less than the 2030 motor vehicle emissions budgets from the MO Maintenance Plan for the 2008 standard. These budgets were developed with the MOVES2014a model. In a letter to MoDNR dated May

Conformity Process

15, 2018, EPA issued an adequacy finding for the 2030 VOC and NO_x motor vehicle emissions budgets. In the June 8, 2018 Federal Register, EPA issued a notice of adequacy for the 2015 budgets for Conformity purposes (effective June 22, 2018). These budgets can be used in the Conformity Determination process. In the September 20, 2018 Federal Register EPA issued a final rule approving the request by MoDNR and redesignated Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis as being in attainment of the 2008 ozone standard. EPA also approved Missouri's Maintenance Plan and the 2030 motor vehicle emission budgets for VOC and NO_x.

To conduct a Conformity Determination for the 2015 eight-hour ozone standard for the 2023 and 2025 analysis years, it is necessary to demonstrate that the anticipated emission levels of precursor pollutants of ozone formation (VOC, primarily hydrocarbons, and NO_x) which will result from the "Action" scenario will be less than the 2015 motor vehicle emissions budgets (Table 1) from the MO Early Progress Plan for the 2008 standard. To conduct a Conformity Determination for the analysis years of 2030, 2035, 2045 and 2050, it is necessary to demonstrate that the anticipated emission levels VOC and NO_x which will result from the "Action" scenario will be less than the 2030 motor vehicle emissions budgets from the MO Maintenance Plan for the 2008 standard.

The 2015 and 2030 Missouri motor vehicle emissions budgets are summarized in Table 1.

Table 1 Missouri Motor Vehicle Emissions Budgets (US tons per day)		
Pollutant	2015 MO Early Progress Plan	2030 MO Maintenance Plan
Volatile Organic Compounds (VOC)	32.70	22.00
Oxides of Nitrogen (NO _x)	76.70	40.00

4.2.2.2 Illinois

To conduct a Conformity Determination for the 2008 eight-hour ozone standard for the 2025 analysis year it is necessary to demonstrate that the anticipated emission levels of atmospheric pollutants which will result from planned and programmed transportation projects (the "Action" scenario) will be less than the level defined in the 2025 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard. The SIP motor vehicle emissions budgets were established using the MOVES2010 model for the two sets of pollutants which are precursors of ozone formation, VOC, primarily hydrocarbons, and NO_x. A finding of adequacy for the 2025 budgets was issued by EPA and published in the December 22, 2011 Federal Register. On June 12, 2012, EPA approved the IL 8-Hour Ozone Maintenance Plan for the 1997 standard. To conduct a Conformity Determination for the 2008 eight-hour ozone standards for the analysis years of 2030, 2035, 2045 and 2050 it is necessary to demonstrate that the anticipated emission levels of atmospheric pollutants which will result from the "Action" scenario will be less than the

Conformity Process

level defined in the 2030 motor vehicle emissions budgets from the IL 8-Hour Ozone Maintenance Plan for the 2008 standard. The SIP motor vehicle emissions budgets for VOC and NO_x were established using the MOVES2014a model. A finding of adequacy for the 2030 budgets was issued by EPA and published in the December 11, 2017 Federal Register and to be effective December 26, 2017. On March 1, 2018, EPA approved the IL 8-Hour Ozone Maintenance Plan for the 2008 standard including the 2030 budgets.

To conduct a Conformity Determination for the 2015 eight-hour ozone standard for the analysis year 2023 it is necessary to demonstrate that the anticipated emission levels of atmospheric pollutants which will result from planned and programmed transportation projects (the “Action” scenario) will be less than the level defined in the 2008 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard. To conduct a Conformity Determination for the analysis year 2025, it is necessary to demonstrate the anticipated emission levels of atmospheric pollutants which will result from planned and programmed transportation projects (the “Action” scenario) will be less than the level defined in the 2025 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard. The 2008 and 2025 SIP motor vehicle emissions budgets were established using the MOVES2010 model for the two sets of pollutants which are precursors of ozone formation, VOC, primarily hydrocarbons, and NO_x. A finding of adequacy for the 2008 and 2025 budgets was issued by EPA and published in the December 22, 2011 Federal Register. On June 12, 2012, EPA approved the IL 8-Hour Ozone Maintenance Plan for the 1997 standard. For the analysis years of 2030, 2035, 2045 and 2050, it is necessary to demonstrate that the anticipated emission levels of atmospheric pollutants which will result from the “Action” scenario will be less than the level defined in the 2030 motor vehicle emissions budgets from the IL 8-Hour Ozone Maintenance Plan for the 2008 standard. The SIP motor vehicle emissions budgets for VOC and NO_x were established using the MOVES2014a model. A finding of adequacy for the 2030 budgets was issued by EPA and published in the December 11, 2017 Federal Register and to be effective December 26, 2017. On March 1, 2018, EPA approved the IL 8-Hour Ozone Maintenance Plan for the 2008 standard including the 2030 budgets.

The 2008, 2025 and 2030 Illinois motor vehicle emissions budgets are summarized in Table 2.

Pollutant	2008 Illinois 8-Hour Ozone Maintenance Plan for 1997 Standard	2025 Illinois 8-Hour Ozone Maintenance Plan for 1997 Standard	2030 Illinois 8-Hour Ozone Maintenance Plan for 2008 Standard
Volatile Organic Compounds (VOC)	17.27	5.68	9.05
Oxides of Nitrogen (NO _x)	52.57	15.22	16.68

Conformity Process

4.2.3 Conformity Tests: Analysis Years

For the FY 2024 – 2027 TIP, the tests detailed in Sections 4.2.2 addressing the 2008 and 2015 eight-hour ozone standards have to be satisfied for those transportation projects and programs expected to be operational by the analysis year of 2050 (horizon year of the regional transportation plan) and for the analysis years 2025, 2030, 2035 and 2045. An analysis year of 2023 was added to the regional emissions analysis for the 2015 eight-hour ozone standard as it is the attainment year for moderate ozone nonattainment areas.

4.2.4 Conformity Tests for the FY 2024 – 2027 TIP - Summary - Missouri and Illinois

In accordance with current EPA guidance, and in consultation with the Inter Agency Consultation Group (IACG), EWG is utilizing the following mobile source emissions tests for determining conformity on the LRTP and TIP. This Conformity Determination has been prepared in relation to the budgets and tests applicable as of March 28, 2023 and on the most current planning assumptions as agreed to by the IACG. The MOVES3 model was utilized in completing the conformity budgets tests for Missouri and Illinois.

Pollutants

Missouri and Illinois

Volatile Organic Compounds (VOC)

Oxides of Nitrogen (NO_x)

2008 Eight-Hour Ozone Standard

Missouri Maintenance Area – Franklin, Jefferson, St. Charles and St. Louis Counties and City of St. Louis

Illinois Maintenance Area – Madison, Monroe and St. Clair Counties

Analysis Years

2025 – First analysis year (IL 8-Hour Ozone Maintenance Plan for the 1997 standard has 2025 budgets)

2030 – Intermediate analysis year (MO Maintenance Plan and IL Maintenance Plan for the 2008 standard both have 2030 budgets)

2035 - Intermediate analysis year

2045 – Intermediate analysis year

2050 – Horizon year for Connected 2050

Tests of Conformity

Missouri

“Action” scenario compared with the 2015 motor vehicle emissions budget from the MO Early Progress Plan for 2008 standard for VOC for 2025

“Action” scenario compared with the 2015 motor vehicle emissions budget from the MO Early Progress Plan for 2008 standard for NO_x for 2025

Conformity Process

“Action” scenario compared with the 2030 motor vehicle emissions budget from the MO Maintenance Plan for 2008 standard for VOC for 2030, 2035, 2045 and 2050

“Action” scenario compared with the 2030 motor vehicle emissions budget from the MO Maintenance Plan for 2008 standard for NO_x for 2030, 2035, 2045 and 2050

Illinois

“Action” scenario compared with the 2025 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard for VOC for 2025

“Action” scenario compared with the 2025 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard for NO_x for 2025

“Action” scenario compared with the 2030 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 2008 standard for VOC for 2030, 2035, 2045 and 2050

“Action” scenario compared with the 2030 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 2008 standard, for NO_x for 2030, 2035, 2045 and 2050

2015 Eight-Hour Ozone Standard

Missouri Non-Attainment Area – Jefferson, St. Charles and St. Louis Counties, City of St. Louis and Boles Township in Franklin County

Illinois Non-Attainment Area – Madison, Monroe and St. Clair Counties

Analysis Years

2023 – Attainment year for those areas designated as moderate nonattainment for the 2015 ozone standard

2025 – Intermediate analysis year (IL 8-Hour Ozone Maintenance Plan for the 1997 standard has 2025 budgets)

2030 – Intermediate analysis year (MO Maintenance Plan and IL Maintenance Plan for the 2008 standard both have 2030 budgets)

2035 - Intermediate analysis year

2045 – Intermediate analysis year

2050 - Horizon year for Connected 2050

Tests of Conformity – 2015 Eight-Hour Ozone Standard

Missouri

“Action” scenario compared with the 2015 motor vehicle emissions budget from the MO Early Progress Plan for 2008 standard for VOC for 2023 and 2025

“Action” scenario compared with the 2015 motor vehicle emissions budget from the MO Early Progress Plan for 2008 standard for NO_x for 2023 and 2025

“Action” scenario compared with the 2030 motor vehicle emissions budget from the MO Maintenance Plan for 2008 standard for VOC for 2030, 2035, 2045 and 2050

“Action” scenario compared with the 2030 motor vehicle emissions budget from the MO Maintenance Plan for 2008 standard for NO_x for 2030, 2035, 2045 and 2050

Conformity Process

Illinois

- “Action” scenario compared with the 2008 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard for VOC for 2023
- “Action” scenario compared with the 2008 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard for NO_x for 2023
- “Action” scenario compared with the 2025 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard for VOC for 2025
- “Action” scenario compared with the 2025 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 1997 standard for NO_x for 2025
- “Action” scenario compared with the 2030 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 2008 standard for VOC for 2030, 2035, 2045 and 2050
- “Action” scenario compared with the 2030 motor vehicle emissions budget from the IL 8-Hour Ozone Maintenance Plan for the 2008 standard, for NO_x for 2030, 2035, 2045 and 2050

4.2.5 Transportation Control Measures

Another element of a Conformity Determination is an assessment of progress in implementing Transportation Control Measures (TCMs). These measures are intended to reduce emissions or concentrations of pollutants from transportation sources by reducing vehicle use or otherwise reducing vehicle emissions. For the St. Louis region, the 15 Percent Rate-of-Progress ozone SIPs included categories of TCMs, together with estimates of the anticipated emissions benefits. The 1997 report *Transportation Control Measures in the St. Louis Region: Completion Report* documented the implementation of TCMs by general SIP category of control measures. Currently the States do not have any TCMs in their SIPs and therefore no TCMs are part of the Regional Emissions Analysis. However, the Congestion Mitigation Air Quality (CMAQ) program is ongoing and has produced emission reduction projects that EWG monitors. EWG maintains a database of CMAQ projects and their related emission reduction benefits.

4.2.6 Conformity Determination Technical Methodology

The calculation of VOC and NO_x mobile source emissions is a two-step process for each analysis year. First, all regionally significant transportation facilities are included in EWG’s regional travel demand model. This includes all projects from the FY 2024 – 2027 TIP. Appendix A lists the projects capable of being included in the regional emissions analysis. Utilizing the project list from Appendix A, the travel demand model is used to forecast vehicle miles of travel in the region. The underlying assumptions regarding population and employment changes in the region are set out for reference in Appendix B. The travel demand modeling assumptions and procedures are discussed in Appendix C.

Second, the MOVES3 emissions model was used to develop emissions factors that indicate how much of each pollutant is produced per vehicle mile of travel. The MOVES model utilizes a number of input files. For this conformity determination changes have been made to the inputs describing the geographic extent of the Missouri vehicle emissions inspection and maintenance (I/M) program. Since 1984 an I/M program has been a part of the State of Missouri’s emissions control strategies to address air pollution in the St. Louis area and improve air quality. In 2007 the

Conformity Process

decentralized Gateway Vehicle Inspection Program (GVIP) began which covered Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis.

As of July 1, 2022, vehicles registered in Franklin County are exempt from being subject to the GVIP due to the January 2022 amendment of Missouri 10 CSR 10-5.381, Onboard Diagnostic Motor Vehicle Emissions Inspection. The MOVES I/M program inputs for Missouri have been revised to exclude Franklin County. Missouri Senate Bill 243 (SB243) was introduced in the 2023 legislative session. If it had passed, SB243 would repeal section 643.310 of the Revised Statutes of Missouri and enact a new section in its place to exclude Franklin, Jefferson and St. Charles Counties from GVIP. This bill had its first reading on January 4, 2023 and the second on February 9. It was then referred to the Senate Transportation, Infrastructure and Public Safety Committee. Since then there was no further legislative action. No changes were made to the Missouri I/M inputs.

The emissions factors from the MOVES model are applied to the forecasts from the travel demand model to derive a modeled total of vehicle emissions for each of the two pollutants in each of the five analysis periods for the 2008 standard and the six analysis period for the 2015 standard. These procedures are discussed, and the results summarized, in Appendix D and Appendix E. Appendix F contains documentation of input and output files associated with the MOVES3 model.

In all, emissions have to be estimated for both pollutants (i.e. VOC and NO_x) related to three time periods (a.m. peak, p.m. peak and off-peak), for both states in the Plan's analysis years as well as for the geographic extent of the Maintenance and Nonattainment areas, and for the inspection and maintenance (I/M) test area and non I/M test area in both Missouri and Illinois, giving multiple sets of emissions calculations. The predicted emissions that result from these modeling procedures are then subject to each of the tests of conformity outlined above. The results are shown in Tables 3 through 6 below and also in Appendix E.

Conformity Process

Table 3 Regional Emissions Analysis Conformity Tests – MISSOURI Based on Conformity Requirements for 2008 Eight Hour Ozone Standard Maintenance Area (US tons per day)				
Analysis Years	Volatile Organic Compounds		Oxides of Nitrogen	
	Action	2015 Budget	Action	2015 Budget
2025	8.90	32.70	26.18	76.70
Analysis Years	2030 Budget		2030 Budget	
	Action	2030 Budget	Action	2030 Budget
2030	7.09	22.00	21.39	40.00
2035	6.03	22.00	19.45	40.00
2045	5.33	22.00	18.90	40.00
2050	5.29	22.00	18.97	40.00
All tests have been passed for all years.				

Table 4 Regional Emissions Analysis: Conformity Tests – ILLINOIS Based on Conformity Requirements for 2008 Eight-Hour Ozone Standard Maintenance Area (US tons per day)				
Analysis Year	Volatile Organic Compounds		Oxides of Nitrogen	
	Action	2025 Budget	Action	2025 Budget
2025	4.04	5.68	9.47	15.22
Analysis Year	2030 Budget		2030 Budget	
	Action	2030 Budget	Action	2030 Budget
2030	2.96	9.05	6.94	16.68
2035	2.51	9.05	6.05	16.68
2045	2.15	9.05	5.82	16.68
2050	2.09	9.05	5.88	16.68
All tests have been passed for all years.				

Conformity Process

Table 5 Regional Emissions Analysis: Conformity Tests - MISSOURI Based on Conformity Requirements for 2015 Eight-Hour Ozone Standard 4 County and 1 Township Non-Attainment Area				
Analysis Year	Volatile Organic Compounds		Oxides of Nitrogen	
	Action	2015 Budget	Action	2015 Budget
2023	9.23	32.70	27.86	76.70
2025	8.34	32.70	24.36	76.70
	Action	2030 Budget	Action	2030 Budget
2030	6.64	22.00	19.87	40.00
2035	5.64	22.00	18.03	40.00
2045	4.98	22.00	17.47	40.00
2050	4.93	22.00	17.52	40.00
All tests have been passed for all years.				

Table 6 Regional Emissions Analysis: Conformity Tests – ILLINOIS Based on Conformity Requirements for 2015 Eight-Hour Ozone Standard 3 County Non-Attainment Area				
Analysis Year	Volatile Organic Compounds		Oxides of Nitrogen	
	Action	2008 Budget	Action	2008 Budget
2023	4.87	17.27	11.42	52.57
	Action	2025 Budget	Action	2025 Budget
2025	4.04	5.68	9.47	15.22
	Action	2030 Budget	Action	2030 Budget
2030	2.96	9.05	6.94	16.68
2035	2.51	9.05	6.05	16.68
2045	2.15	9.05	5.82	16.68
2050	2.09	9.05	5.88	16.68
All tests have been passed for all years.				

Consultation and Public Participation

5.0 Consultation and Public Participation

5.1 Consultation: Conformity Procedures

Federal regulation requires that Conformity Determinations must be made:

- Each time a new RTP or TIP is adopted
- Each time a new RTP or TIP is amended, unless the amendment merely adds or deletes exempt projects
- Within 24 months of the effective date of a EPA finding that motor vehicle emissions budgets from an initially submitted control strategy SIP or maintenance plan are adequate for Conformity Determination purposes
- Within 24 months of the effective date of a EPA approval of a control strategy SIP revision or maintenance plan which establishes or revises a motor vehicle emissions budget if that budget has not yet been used in a conformity determination prior to approval
- Within 24 months of the effective date of a EPA promulgation of an implementation plan which establishes or revises a motor vehicle emissions budget
- Not less frequently than every four years
- Within 12 months of a newly designated non-attainment area

MPOs responsible for making conformity determinations must follow procedures for inter-agency and public consultation and review as described in DOT and EPA regulations. These include by reference the requirements of the Missouri state conformity regulations (10CSR-5.480), as adopted by the Missouri Air Conservation Commission in August 1996, effective in December 1996. In October 2010, the Missouri Air Conservation Commission approved changes to the state's Transportation Conformity Rule based on the January 2009 "Guidance for Developing Transportation Conformity State Implementation Plans (SIPs)" by EPA. The updated rule was effective February 28, 2011. Final approval of this rule by EPA took place on October 28, 2013. Federal Highway Administration (FHWA), EPA, MoDNR and Illinois EPA may comment on Conformity Determinations.

The principal forum for the discussion of technical issues relating to conformity is the Inter Agency Consultation Group (IACG). The role of this group in the conformity process is defined in both the Missouri and the Illinois Conformity Regulations. Membership in this group is shown below.

Consultation and Public Participation

Inter Agency Consultation Group	
East-West Gateway Council of Governments	Federal Highway Administration, Missouri Division
Illinois Department of Transportation	Federal Highway Administration, Illinois Division
Illinois Environmental Protection Agency	Federal Transit Administration, Region VII
Missouri Department of Natural Resources	U.S. Environmental Protection Agency, Region 5
Missouri Department of Transportation	U.S. Environmental Protection Agency, Region 7
Metro	Madison County Transit District
St. Louis County Department of Health	Madison County Highway Department
St. Louis County Department of Highways and Traffic	St. Clair County Transit District
City of St. Louis Department of Health	St. Clair County Department of Roads and Bridges

During the preparation of the Conformity Determination for the FY 2024 – 2027 TIP, the IACG met on January 24, 2023, March 28, 2023, May 30, 2023, and June 27, 2023 to determine the best course of action. The general approach to the Conformity Determination, the procedures used and all of the major assumptions have been subject to discussion, review and, where appropriate, consensus approval by this group. In addition, many other agencies are involved in the process leading to a Conformity Determination through their involvement in EWG’s Air Quality Advisory Committee and Executive Advisory Committee.

5.2 When Conformity Analysis Begins

At the February 2009 meeting, the IACG reached consensus that the start of the Conformity Analysis would be defined as the date of the initiation of the operation of the travel demand model for Conformity Determination purposes. For this Determination, that date is March 28, 2023.

5.3 Public Participation for the FY 2024 – 2027 TIP and Conformity Determination and Documentation (8-Hour Ozone)

Federal legislation and the metropolitan transportation planning regulations require MPOs to have an enhanced public participation process. Citizen interest in transportation planning has continued to grow as EWG has taken actions to increase public awareness of the transportation decision-making process.

EWG uses a variety of methods to achieve greater public participation. Among these are the extensive use of all types of media to explain the planning process, face-to-face meetings with citizens' groups, and easy-to-understand publications that are distributed via mail, email and on the EWG web site. In addition, the use of a virtual meeting platform is an option. The underlying premise of the public participation process is that more citizens will participate in the planning process if they understand the factors that influence transportation decisions.

The *Public Involvement Plan*, adopted by the EWG Board in May 2019 establishes the mechanisms by which EWG reaches out to its many stakeholders and the public.

The EWG web site, www.ewgateway.org, includes information about EWG, its planning partners, MPO activities and opportunities for citizens to learn and participate in transportation decisions. Meetings of all EWG committees, task forces and other groups, as well as notes from

Consultation and Public Participation

past meetings are regularly posted on the site. The Web site also includes links to many other transportation resources. The FY 2024 – 2027 TIP materials are accessible through the site.

Information about the comment period and meeting schedule will be made available on the Council's website, Facebook, Twitter, in the Council's Local Government Briefings electronic newsletter and in local newspapers (St. Louis Post-Dispatch, etc.). Additionally, all implementing agencies have citizen participation mechanisms that allow public input throughout the transportation planning process.

Additionally, all implementing agencies have citizen participation mechanisms that allow public input throughout the transportation planning process.

The draft Air Quality Conformity Determination and Documentation (8-Hour Ozone) for the FY 2024 - 2027 TIP will be made available for public review and comment between June 30, 2023 and August 2, 2023 (totaling 34 days). Public review of the FY 2024 - 2027 TIP and related amendments to Connected 2050 and Air Quality Conformity Determination and Documentation (8-Hour Ozone) will take place through several different means, in person and online. Five public open-house-style meetings are to take place in July. Persons requiring special accommodations should notify EWG's Title VI Coordinator at least 48 hours prior to an open house at 314-421-4220 or 618-274-2750 or email at titlevi@ewgateway.org.

At the public open houses, copies of the FY 2024 - 2027 TIP and Air Quality Conformity Determination and Documentation (8-Hour Ozone), as well as supplemental materials will be available for review, discussion, and comment. These same materials will be available on the Council's website. Citizens and members of organizations are invited to attend the public open house meeting that is most convenient for them.

The schedule for the public open-house style meetings is shown below. Information about the comment period and meeting schedule can be found on the Council's website, Facebook, Twitter, in the Council's Local Government Briefings electronic newsletter and in local newspapers (St. Louis Post-Dispatch, etc.).

Tuesday, July 6, 2023: 4:30 pm – 6:30 pm – Wentzville City Hall, 1001 Schroeder Creek Boulevard, Wentzville MO

Thursday, July 11, 2023: 4:30 pm – 6:30 pm – Pacific City Hall, 300 Hoven Drive, Pacific MO

Thursday, July 20, 2023: 4:30 pm – 6:30 pm – Arnold Rec Center, 1695 Missouri State Road, Arnold, MO

Tuesday, July 25, 2023: 4:30 pm – 6:30 pm – IDOT District 8 (Regional Room), 1102 Eastport Plaza Drive, Collinsville, IL

Thursday, July 27, 2023: 4:30 pm – 6:30 pm – Creve Coeur City Hall (Multipurpose Room), 300 North New Ballas Road, Creve Coeur MO

Consultation and Public Participation

Comment forms will be available at the public open houses or comments could be submitted by email or mail. Comments on the draft air quality Conformity Determination document must be received or postmarked by Wednesday, August 2, 2023. Comments can be sent to TIP@ewgateway.org or East-West Gateway Council of Governments, Attn: TIP or Conformity Determination at One S. Memorial Drive, Suite 1600, St. Louis, Missouri 63102.

The draft Air Quality Conformity Determination and Documentation (8-Hour Ozone) and draft FY 2024-2027 TIP were made available for public review between June 30, 2023 and August 2, 2023 (totaling 33 days). A total of 27 people participated in the five public open house meetings. In all, staff received seven comments on the FY 2024 – 2027 TIP and one on the Conformity Determination from individuals or groups through the online comment form, open house public comment form, email, and mail. Staff has assembled a separate Summary of Public Comments document that contains all of the comments received during the public comment period. Some editorial or stylistic changes were made to clarify the document however, no substantive changes to the analysis or the finding of Conformity were made to the Air Quality Conformity Determination and Documentation (8-Hour Ozone) for the FY 2024 – 2027 TIP and related amendments to Connected 2050.

Consultation and Public Participation

Declaration of Conformity for 2008 Eight-Hour Ozone

Based on the analysis, the projects and programs included in FY 2024 – 2027 Transportation Improvement Program and Related Amendments to Connected 2050: Long-Range Transportation Plan for the St. Louis Region are found to be in conformity with the requirements of the Clean Air Act Amendments of 1990, the relevant sections of the Final Conformity Rule 40 CFR Part 93 and the procedures set forth in the Missouri State Conformity Regulations 10 CSR 10-5.480 for the 2008 eight-hour ozone standard. This Conformity Determination covers the St. Louis 2008 eight-hour ozone maintenance area: Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis in Missouri; and Madison, Monroe and St. Clair Counties in Illinois.

Declaration of Conformity for 2015 Eight-Hour Ozone

Based on the analysis, the projects and programs included in FY 2024 – 2027 Transportation Improvement Program and Related Amendments to Connected 2050: Long-Range Transportation Plan for the St. Louis Region are found to be in conformity with the requirements of the Clean Air Act Amendments of 1990, the relevant sections of the Final Conformity Rule 40 CFR Part 93 and the procedures set forth in the Missouri State Conformity Regulations 10 CSR 10-5.480 for the 2015 eight-hour ozone standard. This Conformity Determination covers the St. Louis 2015 eight-hour ozone non-attainment area: Jefferson, St. Charles and St. Louis Counties, the City of St. Louis and Boles Township in Franklin County in Missouri; and Madison, Monroe and St. Clair Counties in Illinois.

FY 2024 – 2027 Transportation Improvement Program and Related Amendments to Connected 2050: Long-Range Transportation Plan for the St. Louis Region

Air Quality Conformity Determination and Documentation for Eight-Hour Ozone Appendices

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Appendix A

Transportation Planning Projects

The project descriptions described below were used for the purposes of travel demand modeling and air quality analysis, and form the basis of the Air Quality Conformity Determination for the FY 2024-2027 Transportation Improvement Program and Related Amendments to Connected 2050 (FY 2024 – 2027 TIP). Included in the list are all the regionally significant projects capable of being modeled from the FY 2024-2027 TIP. In addition to the projects identified in the long-range transportation plan and TIP the list includes any non-federally funded projects staff is aware of at this time. Information is listed on the route, the location and/or limits of the project, the description of the project or planning assumptions made for the purposes of analysis, and the analysis year in which the project is expected to be complete.

The definition of "regional significance" is that contained in the *St. Louis Transportation Conformity SIP*, as amplified through the inter-agency consultation procedures established in that document and in 40 CFR Part 93 §93.101, "...*Regionally significant project* means a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel." The February 28, 2012 Regionally Significant Screening Criteria document was utilized to delineate the air quality classification of projects.

The list includes only the regionally significant projects that involve changes to the capacity or performance of the highway or transit system in ways that potentially affect mobile source emissions. Certain types of projects, such as interchange improvements, may be deemed non-exempt but are not regionally significant. In such cases, these projects have been included in the regionally significant projects listing for tracking and informational purposes. In addition, the list may include the planning assumptions made with regard to Major Transportation Investment Analyses (MTIAs) and other corridor studies. County maps displaying these projects and a more detailed description of the projects can be found in the FY 2024 – 2027 TIP and Related Amendments to Connected 2050. The tables in Appendix A list the projects with the Air Quality classification of Regionally Significant.

Table A-1 includes projects that are classified as regionally significant. This table is included for reference. The full list of proposed projects, which also includes exempt and not regionally significant projects, can be found in Appendix B – Project Listing of the FY 2024 – 2027 TIP document which contains information on all projects by county, multi-county by each state and multi-state.

As noted in the Overview, air quality analyses have been performed for each of the following analysis years: for the 2008 eight-hour ozone standard in the St. Louis eight-county maintenance area (Missouri and Illinois) the years are 2025, 2030, 2035, 2045 and 2050; and for the 2015 eight-hour ozone standard non-attainment area (Jefferson, St. Louis and St. Charles Counties, City of St. Louis and Boles Township in Franklin County, Missouri and Madison, Monroe, and St. Clair Counties, Illinois) the analysis years are 2023, 2025, 2030, 2035, 2045 and 2050.

Appendix A Transportation Planning Projects

Table A-1 Regionally Significant Projects Considered As Part of the Regional Travel Demand Model (TDM)								
Air Quality	Status	Sponsor / TIP#/ County	Project - Description	Investment Type	Functional Class	Horizon Year	TDM	Comment
Regionally Significant	Non-federally Funded Project	St. Peters/ 7025I-21/ St. Charles	Spencer Road Extension - Salt River Rd To Lakeside Park Dr New Road	New Road/Bridge	Major Collector	2025	Yes	
Regionally Significant	Non-federally Funded Project	Wentzville/ 7025D-21/ St. Charles	Wentzville Parkway South, Phase 2 - Veterans Memorial Pkwy To Interstate Dr New 2 Lane Road - Bridge Over Rr	New Road/Bridge	Major Collector	2025	Yes	
Regionally Significant	Non-federally Funded Project	Wentzville/ 7025E-23/ St. Charles	David Hoekel Pkwy, Phase 2D - Goodfellow Rd To West Meyer Rd New Two Lane Road	New Road/Bridge	Minor Arterial	2025	Yes	
Regionally Significant	Non-federally Funded Project	Wentzville/ 7025F-24/ St. Charles	Great Oaks Blvd Extension - Bobcat Ct To Burnt Oak Ct New Two Lane Road	New Road/Bridge	Urban Minor Collector	2025	Yes	
Regionally Significant	FY 2024-2027 TIP - Scoping	MoDOT/ 6992H-20/ Jefferson	I-55 - 0.5 Mi N/O MO Z To 1 Mi S/O US 67 Corridor Improvements	Adding Through Lanes To Existing Roads	Interstate	2025	Yes	
Regionally Significant	FY 2024-2027 TIP - Scoping	MoDOT/ 7218A-23/ Franklin	MO 47 - Missouri River To St. Clair (Phase I) Potential Design Build Safety And Capacity Improvements	Adding Through Lanes To Existing Roads	Principal Arterial	2030	Yes	
Regionally Significant	FY 2024-2027 TIP - Scoping	MoDOT/ 7219D-22/ St. Charles	MO N - MO Z To Hawks Ridge Trail Scoping To Add Lanes And Build New Lanes	Adding Through Lanes To Existing Roads	Minor Arterial	2030	Yes	
Regionally Significant	FY 2024-2027 TIP - Scoping	MoDOT/ 7220O-22/ St. Charles	US 61 - At MO W - Replace At-Grade Xing W Interchange - Outer Rds Close Crossovers At N Point Prairie Rd/Farris Rd	Traffic Operations	Expressway	2025	Yes	
Regionally Significant	FY 2024-2027 TIP - Scoping	MoDOT/ 7230W-23/ St. Charles	MO 79 - Dyer Road To Tr Hughes Boulevard Scoping For Capacity Improvements	Adding Through Lanes To Existing Roads	Minor Arterial	2030	Yes	
Regionally Significant	FY 2024-2027 TIP - Scoping	MoDOT/ 7230X-23/ St. Charles	I-70 - Wentzville Pkwy To Warren Co Line Capacity & Operational Improvements	Adding Through Lanes To Existing Roads	Interstate	2030	Yes	
Regionally Significant	FY 2024-2027 TIP - New	MoDOT/ 7320A-23/ St. Charles	I-70 North Outer Rd - MO 94 to Zumbuhl Rd - Interchange Improvements/Outer Road	Traffic Operations	Planned Major Collector	2030	Yes	

Appendix A Transportation Planning Projects

Table A-1 Regionally Significant Projects Considered As Part of the Regional Travel Demand Model (TDM)								
Air Quality	Status	Sponsor / TIP#/ County	Project - Description	Investment Type	Functional Class	Horizon Year	TDM	Comment
Regionally Significant	FY 2024-2027 TIP – New	St. Charles County/ 7303F-24/ St. Charles	County Wide Automated Traffic Signal Performance Measures – Along Various Routes (Arterials/Collectors)	Intelligent Transportaton Systems	Minor Arterial	2030	Yes	
Regionally Significant	FY 2024-2027 TIP – New	St. Charles County/ 7303G-26/ St. Charles	I-70 North Outer Rd – MO 94 to Zumbahl Rd – Interchange Improvements/Outer Road	Traffic Operations	Planned Major Collector	2030	Yes	
Regionally Significant	FY 2024-2027 TIP – New	St. Louis/ 7304E-24/ St. Louis City	Traffic Management Enhancements, Phase 6 – MLK Blvd: Hodiamont to Grand – Signal Control Upgrades, Fiber	Intelligent Transportaton Systems	Minor Arterial	2030	Yes	
Regionally Significant	FY 2024-2027 TIP - New	MoDOT/ 7229Z-23/ St. Charles	US 61 - Lincoln County To I-64 (Phase I) Safety And Operation Improvements	Traffic Operations	Expressway	2030	Yes	
Regionally Significant	FY 2024-2027 TIP	Dardenne Prairie/ 7203-22/ St. Charles	Dardenne Prairie Signal Interconnect - Along Feise Rd, Town Square Ave And Hanley Rd Fiber Interconnection - Upgrade Traffic Controllers	Traffic Operations	Major Collector	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	Dupo/ 4593-08/ St. Clair	Davis St. Ferry Road - At I-255 - New Interchange Safetea-Lu Earmark - Sec. 1702 # 26	New Road/Bridge/Inte rchange	Major Collector	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	Great Rivers Greenway/ 7224-24/ St. Louis City	Brickline Greenway - North Segment, Phase 1 - Grand: Natl Bridge-Cass; Cass: Grand-Spring; Spring Cass-Page - Shared Use Path - Ln Reduce 4 To 2 W/Twtl	Traffic Operations	Principal Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	IDOT/ TIP# 6988E-20/ St. Clair	IL 158 Relocated – IL 177 to IL 161 – New Road	New Road/Bridge/Inte rchange	Principal Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	IDOT/ 7262C-24/ St. Clair	IL 159 Signal - Ludwig Dr/Salem Pl To Longacre Dr/Ashland Ave Advanced Traffic Management System	Traffic Operations	Principal Arterial	2025	Yes	

Appendix A

Transportation Planning Projects

Table A-1								
Regionally Significant Projects Considered As Part of the Regional Travel Demand Model (TDM)								
Air Quality	Status	Sponsor / TIP#/ County	Project - Description	Investment Type	Functional Class	Horizon Year	TDM	Comment
Regionally Significant	FY 2024-2027 TIP	MoDOT/ 5905-13/ St. Charles	I-70 - Wentzville Pkwy To W/O I-64/US 61 Road Realignment - Add Lanes	Adding Through Lanes To Existing Roads	Interstate	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	MoDOT/ 7134-23/ Multi-County-M	Signal Optimization - 2023 - MO 231: Hoffmeister To US 67; US 67: MO 231 To I-55	Traffic Operations	Principal Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	MoDOT/ 7171D-21/ St. Louis	I-270 - Lilac Ave To MO H Add Lanes And Bridge Replacement	Adding Through Lanes To Existing Roads	Interstate	2030	Yes	
Regionally Significant	FY 2024-2027 TIP	MoDOT/ 7208-24/ St. Louis	Signal Optimization - 2024 - MO 141: I-64 To Gravois Bluffs	Traffic Operations	Expressway	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	MoDOT/ 7208A-24/ St. Louis	Signal Optimization - 2024 - MO 141: I-64 To Gravois Bluffs	Traffic Operations	Expressway	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	MoDOT/ 7220M-22/ St. Charles	I-64 - I-70 To MO K Capacity Improvements	Adding Through Lanes To Existing Roads	Interstate	2030	Yes	
Regionally Significant	FY 2024-2027 TIP	MoDOT/ 7263-25/ St. Louis	MO 180 Signal Optimization - Pennridge Dr To Ogden Ave Optimize 38 Signals Along Corridor	Traffic Operations	Principal Arterial	2030	Yes	
Regionally Significant	FY 2024-2027 TIP	St. Charles County/ 7258A-23/ St. Charles	Jungermann/Salt Lick/Spencer Atspm - Jungermann: MO 364 To Boone H; Salt Lick I-70 To Span Trl Spencer: Premier Pkwy To Willott Rd	Traffic Operations	Principal Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	St. Charles County/ 7258B-23/ St. Charles	Main Street (O'Fallon) Atspm - MO P To Pitman St Signal Optimization	Traffic Operations	Principal Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	St. Charles County/ 7258C-23/ St. Charles	Zumbel/Elm/Fifth/Kings hwy Atspm - Zum - I-70- Hawks Nest; Elm: Mueller-Elm Pt Kingshwy: Clay-Elm; Fifth: Boones-Jeff	Traffic Operations	Principal Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	St. Clair County/ 7064B-16	N. Green Mount Rd – IL 161 to Lebanon Ave – Widen Two to Four Lanes, Add Two Way Turn Lane	Adding Through Lanes To Existing Roads	Minor Arterial	2030	Yes	

Appendix A

Transportation Planning Projects

Table A-1								
Regionally Significant Projects Considered As Part of the Regional Travel Demand Model (TDM)								
Air Quality	Status	Sponsor / TIP#/ County	Project - Description	Investment Type	Functional Class	Horizon Year	TDM	Comment
Regionally Significant	FY 2024-2027 TIP	St. Clair County/ 6575P-25 & 6575PP-26 / St. Clair	North Green Mount Road - S/O Frank Scott Pkwy To N/O Lebanon Ave Preliminary Engineering - Widening	Adding Through Lanes To Existing Roads	Minor Arterial	2030	Yes	
Regionally Significant	FY 2024-2027 TIP	St. Louis/ 7138-23/ St. Louis City	Cortex/Tower Grove Connector – Cycle Track: Tower Grove to Vandeventer; Signal Optimization: Tower Grove to Laclede	Traffic Operations	Minor Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	St. Louis/ 7246B-23/ St. Louis City	Traffic Management Enhancements, Phase 5 - Delmar: Debaliviere To Vandeventer Fiber - Sidewalk - Ptz Cameras - Interconnection	Traffic Operations	Minor Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	St. Peters/ 6964C-22 & 6964D-22/ St. Charles	MO 370, Phase 2 - At Salt River Rd New Interchange - Eb Off Ramp To Wb Salt River	New Road/Bridge/Interchange	Expressway	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	St. Peters/ 7259-23/ St. Charles	Harvester Road - At Queensbrooke Blvd - Replace Signal - Fiber Sidewalk - Queensbrooke To Sugarwood	Traffic Operations	Minor Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	Wentzville/ 7150A-22/ St. Charles	MO Z - Interstate Dr to Perry Cate Blvd - Widen 2 To 4 Lanes, Widen Bridge, Shared Use Path - Interstate Dr to Perdue Hills	Adding Through Lanes To Existing Road	Minor Arterial	2025	Yes	
Regionally Significant	FY 2024-2027 TIP	Union/ 7125A-23/ Franklin	Union Expressway: MO 47/US 50 to MO 47/Old Country Farm – New Road	New Road/Bridge	Planned Minor Arterial	2025	Yes	
Regionally Significant	Connected 2050	Bi-State-Development/Metro/ St. Louis City	Northside/Southside MetroLink Ext – Grand to Chippewa	New Transit Line	N/A	2030	Yes	
Regionally Significant	Connected 2050	IDOT/ St. Clair	IL 3 Connector – Collinsville Rd to IL 203	New Road/Bridge	Planned Minor Arterial	2030	Yes	
Regionally Significant	Connected 2050	IDOT/ Madison	US 40 – Formosa Rd to Bethany Dr – add lanes	Adding Through Lanes To Existing Road	Principal Arterial	2030	Yes	

Appendix A

Transportation Planning Projects

Table A-1								
Regionally Significant Projects Considered As Part of the Regional Travel Demand Model (TDM)								
Air Quality	Status	Sponsor / TIP#/ County	Project - Description	Investment Type	Functional Class	Horizon Year	TDM	Comment
Regionally Significant	Connected 2050	IDOT/ St. Clair	IL 3 – Riverpark Dr to Monsanto Ave – Relocate, 4 lane road	New Road/Bridge	Principal Arterial	2030	Yes	
Regionally Significant	Connected 2050	IDOT/ Madison	I-270 – IL 157 to Mississippi R – 3 lanes each direction	Adding Through Lanes To Existing Road	Interstate	2030/2040	Yes	
Regionally Significant	Connected 2050	MoDOT/ St Charles	I-70 - Wentzville Pkwy To Warren County Add Capacity And Rehabilitate Pavement	Adding Through Lanes To Existing Road	Interstate	2040	Yes	
Regionally Significant	Connected 2050	MoDOT/ St. Charles	MO N – I-64 to Hopewell Rd – Add lanes	Adding Through Lanes To Existing Road	Minor Arterial	2040/2050	Yes	
Regionally Significant	Connected 2050	IDOT & MoDOT/	MLK Bridge Replacement	Adding Through Lanes To Existing Road	Principal Arterial	2040/2050	Yes	
Regionally Significant	Connected 2050	IDOT/ Madison	I-255 to I-270 – Add Lanes	Adding Through Lanes To Existing Road	Interstate	2040/2050	Yes	

Appendix B

Population and Employment Forecasts

B-1. Background

Population and employment projections are a key input into this air quality analysis. These projections are used to determine future travel demand and travel patterns and the effect these will have on mobile source emissions. The population and employment projections used in this analysis are based upon census data and a variety of economic data sources. The projections extend out in five-year increments to the year 2050, which is the horizon year of Connected 2050: Long-Range Transportation Plan for the St. Louis Region (Connected 2050).

B-2. 2020 Base Year

The base year for this analysis is 2020. The baseline for population-incorporated population counts is from the 2020 Decennial Census. Employment baselines were created using a blending of sources, including Dun and Bradstreet, the Longitudinal Employer-Household Dynamics (LEHD) data set, as well as county and regional employment estimates from the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis.

B-3. Projection Methodology

Population and employment projections were developed at regional, county, and small-area scales. The regional population projection was based on a cohort-survival model. Forecasts were then compared with local plans and county forecasts prepared by state government agencies, with input from local planners.

County-level employment and population projections were allocated to the transportation analysis zone level, which is the disaggregate level of geography used in travel demand forecasting. Assumptions guiding the allocation model included zonal development attractiveness or probability values, the influence of existing development patterns and development trends, and zonal holding capacity. Aggregate development attractiveness values were derived for each zone via a spatial analysis process which considered distances of 0.25 mi² cells from various spatial interaction factors. The factors considered during this process included employment location, interstate highway interchanges, major highway intersections, bus service, MetroLink service and free-standing communities.

Population and employment projections through 2050 are shown in Tables B-1 and B-2.

Appendix B

Population and Employment Forecasts

Table B-1							
Population Projections by County: 2020-2050							
Jurisdiction	2020	2025	2030	2035	2040	2045	2050
Missouri							
Franklin	104,682	107,074	109,465	109,896	110,327	110,664	111,000
Jefferson	226,739	232,231	237,467	238,446	239,426	239,948	240,470
St. Charles	405,262	425,262	445,262	455,262	465,262	470,262	475,262
St. Louis	1,004,125	1,005,031	1,005,933	1,006,096	1,006,258	1,005,888	1,005,517
St. Louis City	301,578	295,469	289,623	285,997	282,370	282,269	282,168
Illinois							
Madison	265,859	267,488	269,117	269,411	269,704	269,035	268,365
Monroe	34,962	36,215	37,469	37,694	37,920	37,960	38,000
St. Clair	257,400	254,749	252,097	250,696	249,295	248,399	247,503
Region	2,600,607	2,623,519	2,646,433	2,653,498	2,660,562	2,664,425	2,668,285

Source: East-West Gateway Council of Governments

Table B-2							
Employment Projections by County: 2020-2050							
Jurisdiction	2020	2025	2030	2035	2040	2045	2050
Missouri							
Franklin	52,929	53,214	53,313	53,352	53,377	53,391	53,397
Jefferson	71,003	71,646	71,762	71,834	71,876	71,939	71,942
St. Charles	204,875	207,750	209,096	209,802	210,226	210,475	210,542
St. Louis	762,404	767,362	770,160	771,467	772,315	772,915	773,420
St. Louis City	273,675	278,939	281,216	282,920	283,441	283,666	283,844
Illinois							
Madison	130,131	131,547	131,889	132,089	132,197	132,256	132,304
Monroe	12,499	12,613	12,687	12,716	12,738	12,763	12,786
St. Clair	119,812	121,173	121,664	121,923	122,040	122,042	122,041
Region	1,627,328	1,644,244	1,651,787	1,656,103	1,658,210	1,659,447	1,660,276

Source: East-West Gateway Council of Government

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

C-1. Overview

The current FY 2024 – 2027 Transportation Improvement Program and Related Amendments to Connected 2050 (FY 2024 – 2027 TIP) conformity analysis meets the specific latest planning requirements as outlined in 40 CFR §93.110 and further clarified in the joint memorandum issued by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Transportation (DOT) on January 18, 2001. Section 176(c)(1)(B)(iii) of the Clean Air Act (CAA) states that "...[t]he determination of conformity shall be based on the most recent estimates of emissions, and such estimates shall be determined from the most recent population, employment, travel, and congestion estimates as determined by the MPO or other agency authorized to make such estimates."

C-2. Latest Planning Assumptions

Several areas have been highlighted by EPA and US DOT that fall under the use of latest planning assumptions:

1. Travel Demand Model
2. Land Use, Population and Employment Assumptions
3. Transit Service Policy Changes, Toll Changes
4. Travel and Congestion Estimates
5. Interagency Consultation

C-2.1 Travel Demand Model

The outputs from the East West Gateway (EWG) Travel Demand Model (TDM) are being used in this conformity analysis. The base year for this model is 2013. EWG has developed an accurate base year network, and is continuously making updates to highway and transit networks to accurately represent the future analysis year networks. The analysis years for the ozone pollutant and both states have been discussed in more detail in the main Air Quality Determination document.

C-2.1.1 Introduction

Among EWG's responsibilities is the development and maintenance of a regional travel demand model. The St. Louis regional travel demand model, known as "TransEVAL", has been developed for use in regional transportation planning and corridor planning. It provides multi-modal travel demand forecasts for motorized and non-motorized modes for the entire

Appendix C

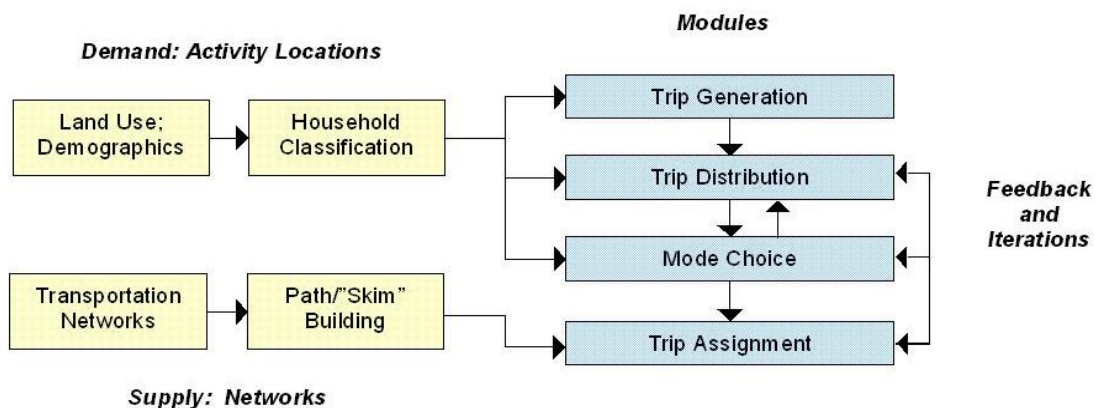
Travel Demand Modeling Procedures, Assumptions and Forecasts

East-West Gateway planning area. This documentation is intended to provide an overview of the model and its validation.

As the first step for any travel model development, local travel patterns are surveyed and documented. The 2002 St. Louis Home Interview Survey was re-expanded to represent 2013 conditions. This dataset contains a total of 5,094 households and represented a sample of about 0.5 percent of the modeled area. As a part of this study, the weighting and expansion factors for the households, persons and trips were re-calculated based on observed data from the 2010 census, Longitudinal Employer-Household Dynamics (LEHD) data set and American Community Survey (ACS) data. In 2013, EWG conducted an on-board transit passenger survey to observe and document transit travel patterns. This survey included 18,129 responses, and an additional 9,260 trips were gathered from respondents' reverse trips, for a total of 27,389 observed trips, for about 25% of the overall ridership on an average weekday. These local travel patterns and conditions form the basis for model updates and recalibration. Latest planning assumptions and land use information was applied, as well as making use of American Community Survey data.

TransEval is a traditional four-step trip-based model, as shown in Figure C-1, that is implemented for the entire region, including the City of St. Louis, the Missouri counties of St. Louis, St. Charles, Franklin, Jefferson and the Illinois counties of Madison, St. Clair and Monroe. Figure C-2 shows the entire EWG planning area included in the model.

Figure C-1: TransEval—Four Step Trip Based Model



Primary inputs for TransEval model include regional land use and demographic data as well as the highway and transit networks. For forecasting purposes, the St. Louis region is disaggregated into 3,500 traffic analysis zones (TAZ) aggregated into either a 35 district or 17 super-district systems. Land use, population, and economic activities in each TAZ are estimated for each forecast year. Highway networks are directionally coded for divided highways and arterials and include any roadway functionally classified as a collector or

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

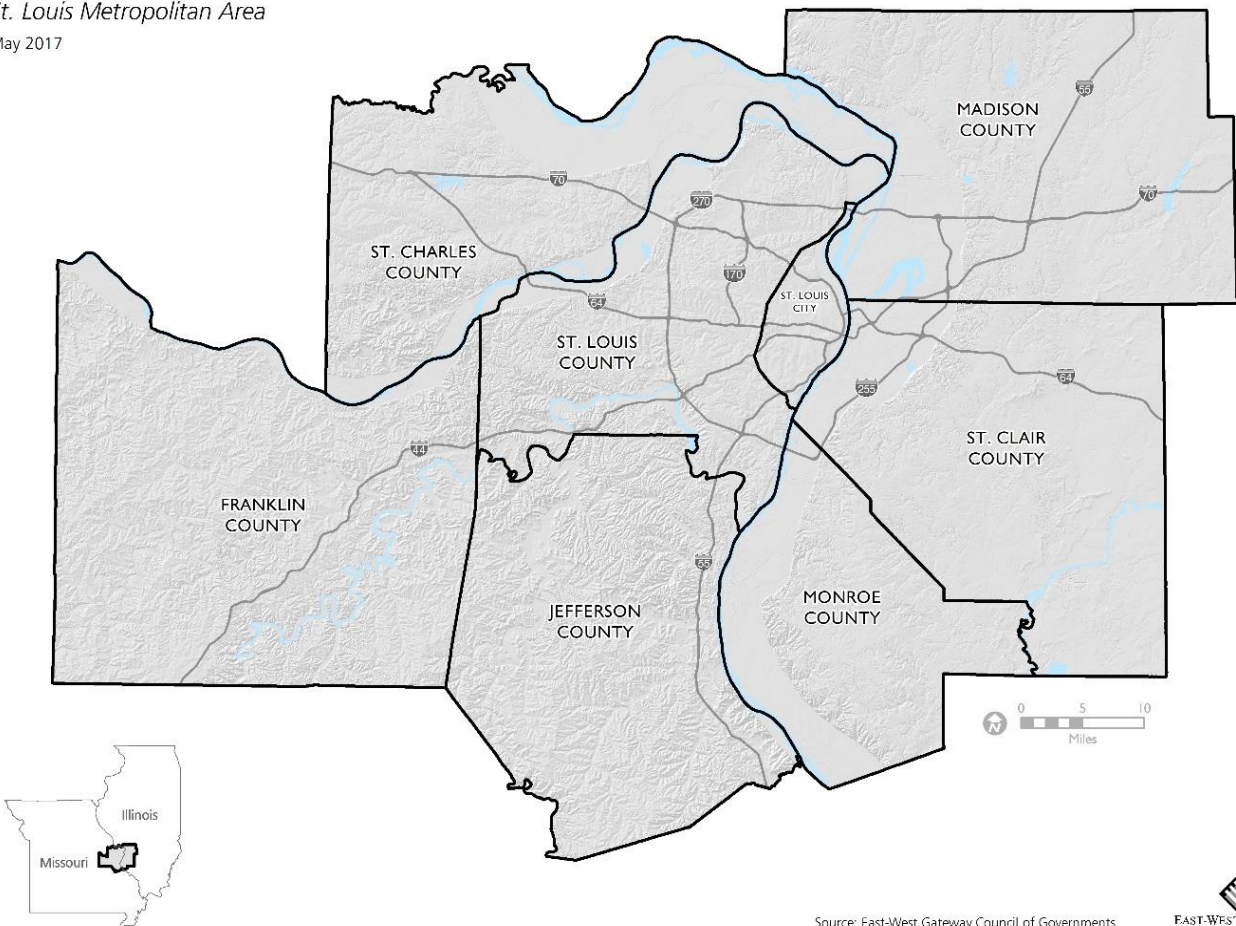
higher. Transit networks include bus and light rail systems owned and operated by Metro, St. Clair County Transit District and Madison County Transit District and include park and ride lots as well.

Figure C-2: EWG Planning Area

East-West Gateway Planning Area

St. Louis Metropolitan Area

May 2017



Source: East-West Gateway Council of Governments



Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

C-2.1.2 Model Summary

Population and Land-Use Forecasts

Population and employment projections are a key input to the travel demand model. These projections are used to determine future travel demand and travel patterns and the effect this demand will have on the various travel options available.

The base year for this analysis is 2020. The baseline for population-incorporated population counts is from the 2020 Decennial Census. Employment baselines were created using a blending of sources, including Dun and Bradstreet, the Longitudinal Employer-Household Dynamics (LEHD) data set, as well as county and regional employment estimates from the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis. For more details, please refer to Appendix B: “Population and Employment Forecasts”.

Traffic Analysis Zones

In TransEval, the eight county St. Louis region is disaggregated into 3,500 traffic analysis zones (TAZ), with land use, population, and economic activities in each TAZ estimated for each forecast year. The size for each TAZ is related to the land use, for areas that have dense land use, either in terms of population or economic activity, the TAZ size is smaller. The TAZs are aggregated into 35 districts for the purpose of summarizing model outputs and conducting reasonableness checks. The model has six area types—rural, suburban, urban, core, business and entertainment, and central business district—that are used for calibration and highway link capacity calculations.

Highway Network

The highway network encompasses the eight county planning area. As is typical for regional models, the network generally goes down to the collector level, although it contains a few smaller roads to accommodate the transit network. Also a limited number of local roads are included in the highway network. The highway network also has 68 external stations.

The network includes posted speed limits, number of lanes, distance, functional class, and average annual daily traffic (AADT) for 2013. The distances for all centroid connectors for a zone represent the average distance required for a person to travel in or out of a zone. The free-flow speed is equal to the posted speed limit. The model estimates lane capacity using design criteria from the 2000 edition of the Highway Capacity Manual. Capacity estimates are based on functional class, area type, posted speed, and number of lanes.

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

Transit Network

The St. Louis area transit network currently comprises three modes: local buses, express buses, and MetroLink light rail. TransEval includes a detailed network of the transit facilities including all local and express bus routes, MetroLink rail lines, walk access and egress routes are also generated. Bus routes follow the highway links and their speeds are a function of highway link speed adjusted for dwell time at stops. MetroLink rail speed is schedule based, the base year model has 2013 schedules coded in. Besides walk to transit, kiss and ride (KNR), drive to transit or travel to Park and Ride Lots are also modeled.

The network has two transit networks; for morning peak travel (6 to 9 a.m.) and for off-peak travel (9 a.m. to 2 p.m.). Transit fares are also used in mode selection. For the base year the corresponding 2013 fares are used.

Trip Generation

The model uses a cross-classification trip production technique that calculates productions using household size and automobile availability. There are a total of 17 trip purposes, with home based work, home based other, non-home based, and home based shopping being the ones that generate the most trips. In determining the auto ownership, transit accessibility is taken into account as well. For home-based work trips, the model also uses the number of workers in a household and household income group. In addition to the core calculations of productions, several sub-models are employed to provide information necessary to support the trip production calculations. These sub-models are shown in Figure C-3:

- Area type
- Automobile ownership
- Household size distribution
- Household worker distribution
- Household income distribution
- Joint distribution

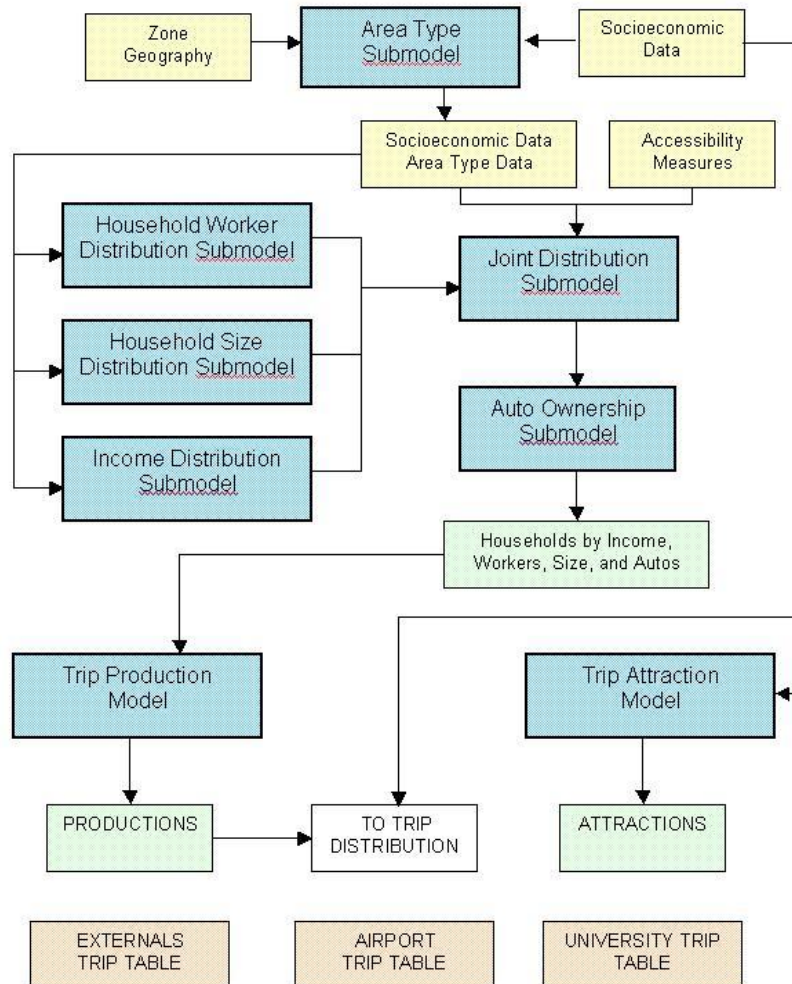
The trip attraction model is based on a set of linear equations using aggregated zone-based socioeconomic data, which generate independent estimates of attractions. Employment and household data are used as attractor variables.

There are also three asserted models: airport trips, university trips and a truck model. External trips are fixed percentages for truck trips, through-traffic trips, work trips, and non-work-based trips, based off of an external station volume forecast.

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

Figure C-3: TransEval—Four Step Trip Based Model



Trip Distribution

The destination choice (trip distribution) and mode choice modules are the second and third major program steps within the 4-step model process. In TransEval application, both the mode choice and the destination choice steps are computed jointly by production zone. The logsum from mode choice is used as the primary variable to determine impedance.

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

The destination choice model estimates the probability of selecting a particular attraction zone for a given zone of production, as defined by the regional network and zone system. The model is a “destination choice” type because it is based on behavioral data describing individual choice behavior and uses a logit-based formulation to estimate the probability of a traveler selecting a particular attraction zone. The home-based work trip purposes are now doubly-constrained to both productions and attractions.

The model also uses a series of standard gravity distribution models to estimate the distribution of special-purpose trips, including airport trips, truck trips, on-campus university trips, and external trips. A gravity model assigns larger numbers of trips between zones with a lot of development and that are close together, and fewer trips between smaller zones with a small amount of development and that are farther apart.

To better predict destination choice behavior, the model includes a distance variable and transformations of the distance variable (2nd and 3rd power, natural log). Other variables in the distribution model are dummy variables and associated constants for intra-zonal trips, river crossings, intercounty movements, inter-state travel, and movements between specific destination and production area types. The destination choice model includes the following variables:

- Relative attractions based on employment
- Mode choice logsums
- Distance impedance
- Area type at production and attraction ends
- Intra-zonal factors
- Illinois-Missouri crossing
- County crossing
- Income group (for home-based work trips)

Mode Choice

Using the 2013 transit survey data, the mode choice model was updated to better reflect the current transit usage. Important updates to the mode choice model includes the addition of a station-choice/station capacity restraint model which presents choice probabilities for four alternative drive-access paths for light rail transit (LRT), Express and bus rapid transit/commuter rail (for future options) (BRT/CR) modes, in addition to KNR path. The mode choice model uses a nested logit structure comprising 13 mode alternatives and a future-mode alternative, as well as a joint mode choice/destination choice algorithm. Productions are distributed simultaneously to zones and are split into modes. Mode choice variables include:

- Trip purpose

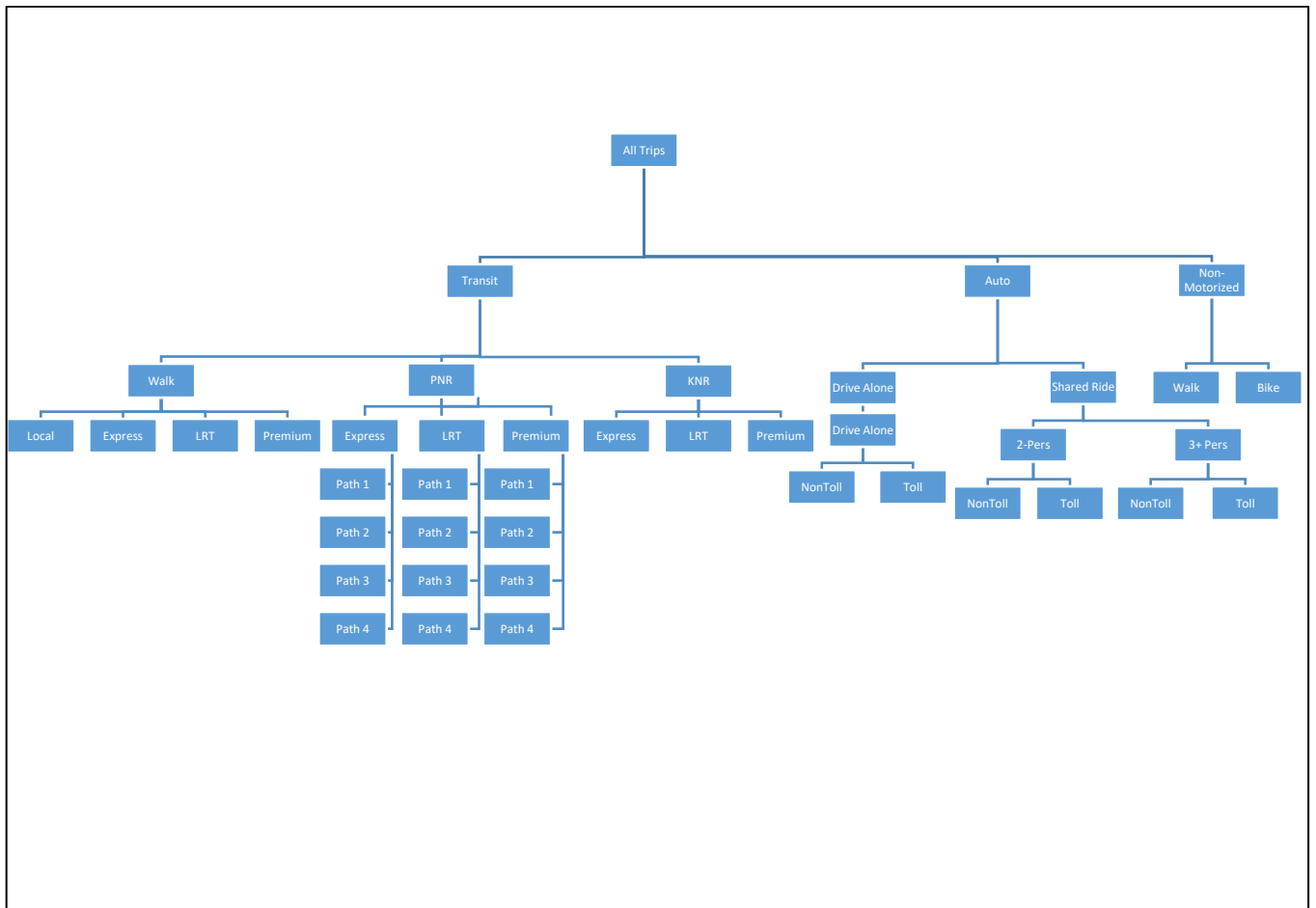
Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

- Income
- In-vehicle time (transit and autos)
- Egress and access times
- Transfer time
- Wait time
- Transit fare (stratified by income)
- Auto operating cost (stratified by income)
- Parking cost (stratified by income)
- Area Type

The mode choice nesting structure is shown in Figure C-4.

Figure C-4: Mode Choice Nested Logit Structure



Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

Where:

2-Pers = 2 Persons in car

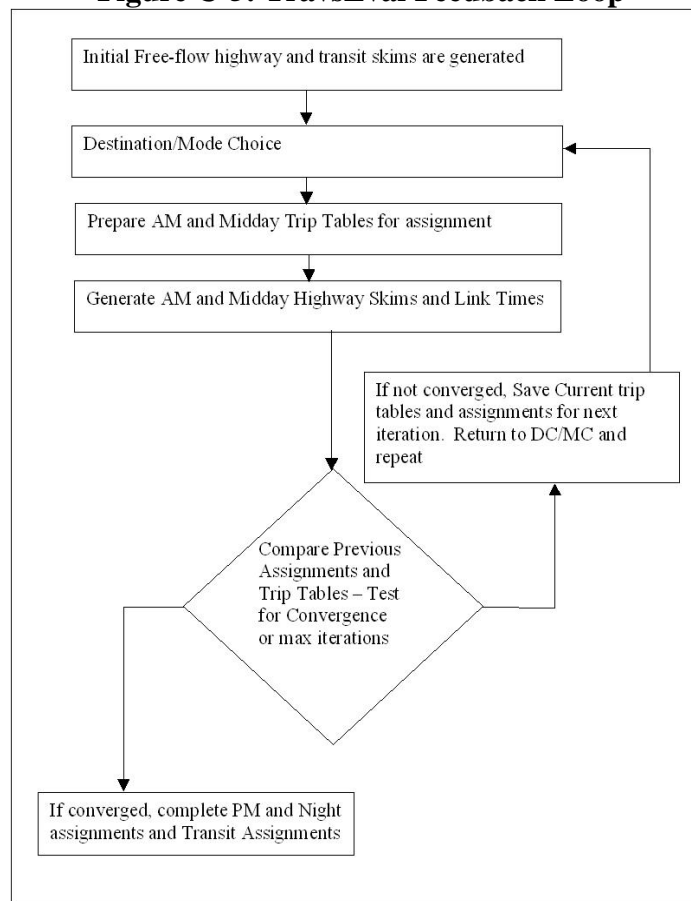
3+ Pers = 3 or more Persons in Car

Feedback Loop

In TransEval there is a feedback loop from assignment to trip distribution step, with a tight convergence criteria. This step feeds back the congested travel time, both highways and transit, into the distribution step as zone to zone congested travel time skims to ensure equilibration between travel times going into the destination choice model and what is coming out of the same step to ensure that there is stability in the choice of mode and destination.

In TransEval there are both highway and transit skims, for peak congested conditions as well as for off-peak conditions, that are fed back to the distributions step. This is to ensure that the model is sensitive to changes in travel time, cost, and other factors affecting travel choices in the different time periods of the day and by mode. Figure C-5 shows the feedback loop.

Figure C-5: TravsEval Feedback Loop



Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

Time of Day

The time of day model is applied before the traffic assignment step. Inputs include all of the purpose-specific person-trip tables and both the hourly and directional factors by trip purpose. The resulting output is tables by time period prepared for assignment, both for highways and transit networks.

The time periods estimated by the model include:

- AM: 6:00am – 9:00am
- Midday: 9:00am – 2:00pm
- PM: 2:00pm – 7:00pm
- Night: 7:00pm – 6:00am

In addition to the diurnal factors, another set of factors is used to estimate the peak hour share of each period. The peak hour factors are:

- AM Peak: 0.423 (3 hour period)
- Midday Peak: 0.224 (5 hour period)
- PM Peak: 0.237 (5 hour period)
- Night Peak: 0.273 (11 hour period)

The actual shares were based on “trips in motion” which uses the number of trips reported in motion during any given hour, which is consistent with the way in which trips are assigned in the model.

Assignment

Highway and transit assignments are carried out separately. For highways, the 24 hour day is divided into 4 time periods, each period is assigned separately. Within each period, the peak hour flows are also calculated. To assign trips to the highway network, TransEval employs the user equilibrium process. The user equilibrium process assigns the trips between each origin and each destination zone in such a way that, at the end of the process, no trip can reduce its travel time by changing its path. In other words, taking into account the congestion produced by all other trips in the region, each trip is taking the shortest path.

The highway assignment uses a multi-class assignment approach, with the following vehicle classes:

- 1. SOV non-toll auto
- 2. HOV non-toll/non-HOV facility auto

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

- 3. Truck
- 4. SOV toll auto
- 5. HOV toll or HOV facility use auto

Highway route choice also takes into account any tolls costs involved. Volume for each user class is tracked and saved. Highway assignment uses the Conical Volume Delay functions for calculating the congested travel times, with the parameters being calibrated to the locally observed speed-delay data.

Transit assignment is performed at the daily level as well, using both the peak and off-peak. Transit assignment uses the all-or-nothing algorithm, where the path is selected based on the minimum cost. Route selection includes the option of driving to a park and ride lot then transferring to a transit line.

Calibration and Validation

A travel demand model needs to be reflective of the recent changes in trip making behavior, economy and other societal shifts. The calibration and validation process is an on-going, systematic analysis of each model step as that step was being developed. This is important since errors in initial steps will be propagated to subsequent model steps due to the sequential nature of the modeling process. Therefore, available observed data has been used to compare trip generation, distribution and mode choice results, in addition to comparing assigned highway volumes against observed counts.

The calibration and validation of the TransEval model involves the comparison of base year 2013 model results with observed data from home interview and transit on-board surveys and traffic counts. The goal is to match, with reasonable accuracy, the model-estimated results with those observed from survey data while maintaining a logical and defensible model design. Ultimately, an additional comparison is made with observed traffic counts and transit boardings. This is achieved through systematic and justifiable adjustments to model parameters, including trip rates, distribution impedance parameters, mode choice coefficients and volume-delay functions.

An important aspect of calibration and validation is the development and use of observed target values. Observed traffic counts, transit ridership and screen line comparisons were used in the validation process.

The conformity regulation 40 CFR §§ 93.122 (b) (3) states that Highway Performance Monitoring System (HPMS) estimates of vehicle miles traveled (VMT) shall be considered the primary measure of VMT for the classes of roadways included in HPMS. The regulation also allows the use of locally developed count-based programs. EWGCOG used both these sources as a part of calibration and validation.

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

For areas with network-based travel models, a factor (or factors) may be developed to reconcile and calibrate the network-based travel model estimates of VMT in the base year of its validation to the HPMS estimates for the same period.

Excerpt from 40 CFR §§ 93.122 (b) (3)

Based on the 2010 Census, the urban area boundary for the EWG planning area was redefined. Starting 2015, the state count programs report the HPMS urban and rural VMT based on this updated urban area boundary. Since 2015 is the first year when such data were provided, this year is being used for developing the factors for reconciling the travel model estimates of VMT to the HPMS estimates. The adjustment factors are developed by county and by functional class. These are then applied consistently for all future analysis years and scenarios.

C-3.2 Land Use, Population and Employment Assumptions

Section §93.110 of the Federal Conformity Regulations outlines that the most recent planning assumptions in place at the time of conformity determination must be used. These assumptions should be based on the latest estimates of existing and future population, households and employment developed by the MPO. Details on these assumptions and the forecasts are provided in Appendix B: “Population and Employment Forecasts”, accompanying the main Air Quality document.

C-3.3 Transit Service Policy, Toll Changes

The principal transit agency for the St. Louis metropolitan area is Metro (Bi-State Development Agency). The agency operates MetroLink, the regional light rail line, and bus service in the City of St. Louis and St. Louis County with limited service in St. Charles County. Metro also operates bus service in St. Clair and Monroe Counties under an agreement with the St. Clair County Transit District. The annual ridership on the Metro system is shown in Figure C-6. Since 1985, the Madison County Transit District has assumed an expanding role in the provision of bus service in that County, and now provides all scheduled bus service within and between Madison County and other areas. There is no fixed route transit service in either Franklin or Jefferson Counties.

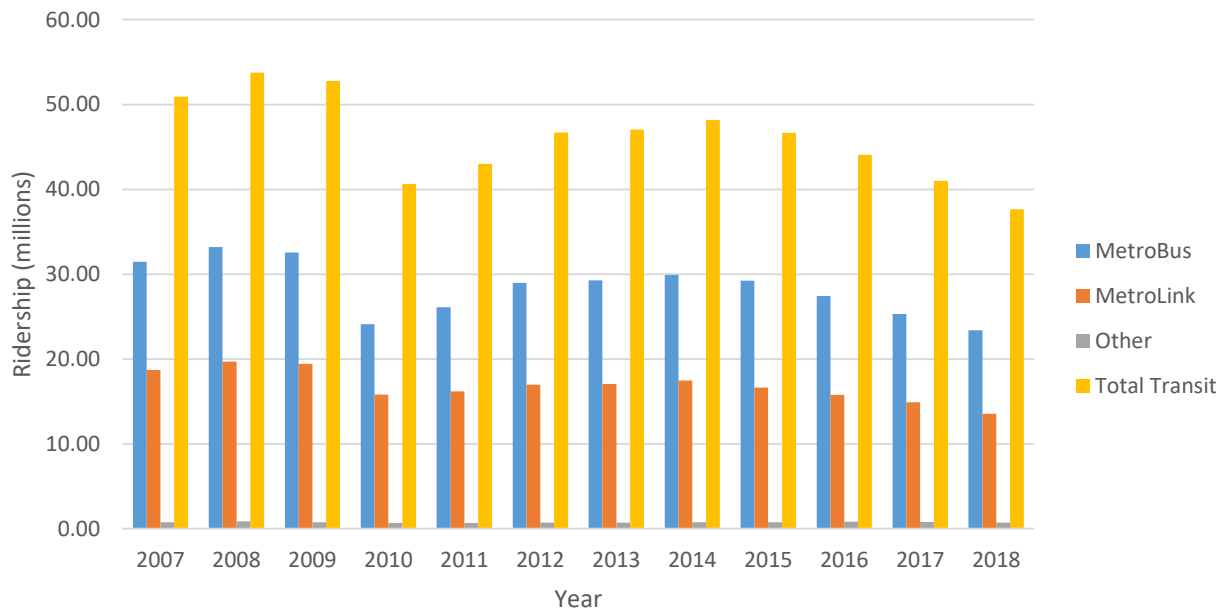
AMTRAK provides inter-city rail service to downtown St. Louis as well as to Alton, Illinois and Kirkwood and Washington, Missouri. There is no commuter rail service in the region.

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

Figure C-6: Metro Transit Ridership

Annual Metro Transit Ridership for St. Louis Region:
FY 2007 - 2018



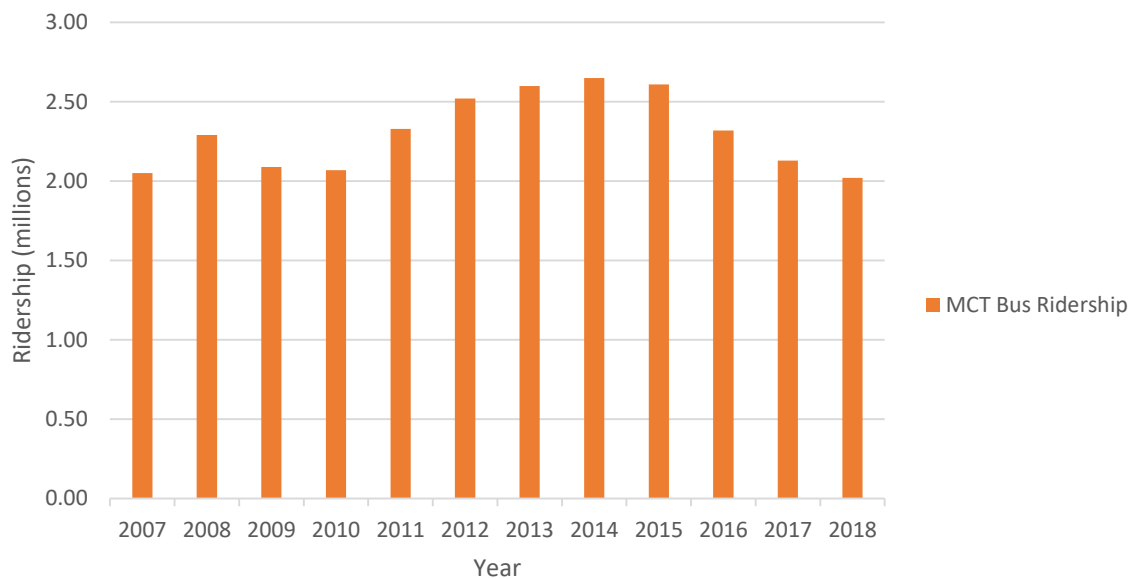
Madison County Transit (MCT) also provides bus service within the county, park and ride options and also express bus links to downtown St. Louis. The annual ridership on the MCT system is shown in Figure C-7.

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

Figure C-7: Madison County Transit Ridership

Annual MCT Bus Ridership for St. Louis Region:
FY 2007 - 2018



Since *Legacy 2035*, Metro’s service to the region has been considerably restructured. After the 2006 cross-county extension of MetroLink, Metro reduced service in 2009-2010 to the region following financial constraints. Subsequent approval of the half-cent tax by the St. Louis County has resulted in restoration of the bus and train services to the region. Metro outlines the agency’s goals and implementation plan in its first long range plan, *Moving Transit Forward*, released in spring 2010. The plan outlines the different phases of implementation that include:

- Immediate Action Steps
- Short Range (1-5 years)
- Mid Range (5-10 years)
- Long Range (10-30 years)

Some of the projects outlined in the Transit Plan are identified as corridor studies in East-West Gateway’s Long-Range Transportation Plan. However, the Light Rail line planned along the North Side- South Side corridor is included in the fiscally constrained Tier I project. This new rail extension will be supported by new feeder MetroBus lines that will increase access and

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

ridership for the rail line. Improvements were made for the North Side - South Side Rail Line starting horizon year of 2030.

The Eads Bridge was formerly a toll facility but after its rehabilitation and reopening in 2003, it is now toll-free. The only other toll facility in the region was the McKinley Bridge over the Mississippi River. It had been closed for rehabilitation and was reopened in December 2007. Now, it is also a toll-free facility.

C-3.4 Travel and Congestion Estimates

The development of a TDM highway network begins with the identification of type and location of the recommended "regionally significant", capacity modifying transportation projects selected for inclusion in the current TIP and the latest Long-Range Transportation Plan (LRTP) for the St. Louis Region, for each non-attainment area in each state. The projects included in the long-range plan were drawn from past long-range planning efforts, Major Transportation Investment Analysis (MTIA), other corridor and subarea planning studies, and an assessment of future network conditions. The definition of "regional significance" is that contained in the *St. Louis Transportation Conformity State Implementation Plan (SIP)* (MO 10 CSR 10-5.480), as amplified through the inter-agency consultation procedures established in that document and in 40 CFR Part 93 §93.101.

Projects are categorized by anticipated year of completion, and built into a network representing each of the analysis years. For the current FY 2024 -2027 Transportation Improvement Program and Related Amendments to Connected 2050 (FY 2024 – 2027 TIP) analysis, through Inter Agency Consultation Group (IACG) consultation it has been agreed to use the following years for regional emission analysis: 2023, 2025, 2030, 2035, 2045 and 2050. Appendix A identifies projects that are included in the network development. Each analysis year network forms the basis for the next future year network, ensuring that all projects in the prior years are captured as the starting point or base network for that year. This way the changes in the highway and transit network keep rolling forward in a compounding manner.

EPA's Office of Transportation and Air Quality (OTAQ) has developed the **MOtor Vehicle Emission Simulator (MOVES). This emission modeling system estimates emissions for mobile sources covering a broad range of pollutants and allows multiple scale analysis. For this emission analysis, the latest version, MOVES3.1.0, was used. MOVES3 currently estimates emissions for thirteen vehicles types including cars, trucks & motorcycles. Through interagency consultation the emissions modeling methodology has also been updated to reflect the current conditions and parameters used in running the updated EPA MOVES3 model. EWG has worked closely with EPA regional office and the both Missouri and Illinois State air agencies to ensure consistency between the inputs and assumptions for the emission analysis and SIP development efforts.**

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

C-3.5 Interagency Consultation

As required by the final rule under section §93.105, the transportation conformity process includes a significant level of cooperative interaction among the many regional, state, and federal agencies in the bi-state non-attainment area.

The East-West Gateway COG established the Air Quality Advisory Committee (AQAC) in 1992. The AQAC has an advisory role to the East-West Gateway Board of Directors and serves as a public forum for the dissemination of information and receipt of feedback about air quality issues. The Committee is also responsible for the coordination of air quality and transportation planning activities in the region. The AQAC includes members representing citizens and various agencies in the region. Member details can be found at: <https://www.ewgateway.org/community-planning/environmental/air-quality/committees-and-programs/>.

The East-West Gateway COG also formulated a peer group, the Inter Agency Consultation Group (IACG). This group involves peers from other State and local air quality planning agencies, local transportation agencies, EPA, and DOT with the intent of focusing on air quality conformity issues. In line with the requirements under section §93.105, IACG deliberates on issues such as air quality model and method selection, and assumptions to be used in hot spot and regional emissions analysis.

C-4. Estimates of Vehicle Miles of Travel

The assignment of vehicle trips to the roadway network can be summarized in terms of vehicle miles of travel (VMT), to present the general effect of changes in the roadway network in relation to the population and employment growth for each horizon year and an alternative network scenario. The base year 2013 roadway network represents, as best as possible, all the roads functionally classified as collectors or higher. The centroid connectors reflect an accurate estimate of time and distance for each intra-zonal trip and provide a reasonable reflection of intra-zonal activity, or local road travel, for emission estimation purposes.

Future year highway and transit networks for 2023, 2025, 2030, 2035, 2045 and 2050 networks were built by adding the regionally significant projects, SIP, TIP and LRTP projects to the base network, as well as any locally funded project that the IACG deemed as significant or staff considered as impacting the VMT or travel patterns. Appendix A lists these projects in Tables A-1, A-2 and A-3 by analysis year period, which were added to the corresponding year highway and/or transit network.

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

The production of exhaust emissions is actually highest during the colder months of the year. However, increased temperatures and sunlight contribute to increased photochemical production of ozone, with the result that ozone concentrations typically reach their peak in the summer. Since the travel demand model estimates an average weekday travel, the output of the model is adjusted to provide an estimate of the travel that takes place under typical summer conditions.

EWG uses the approach described under the conformity rule §93.122 (b)(3). This has been discussed in detail under the **Calibration and Validation** section. Table C-1 presents aggregate adjustment factors for the St. Louis Region based on 2015 HPMS daily data.

Table C-1			
Year 2015 Vehicle-Miles of Travel (Daily) Adjustments			
	Region	Missouri	Illinois
2015 HPMS VMT	67,160,400	50,572,800	16,587,600
2015 Modeled VMT	66,997,400	52,369,900	14,627,500
HPMS Adj Factor	1.002	0.966	1.134

Table C-2 presents annual VMT estimates for the eight county St. Louis Region obtained by using the average weekday VMT estimated from the travel demand model and the EPA AADVMT Converter Tool for MOVES3. This tool allows users to convert annual average weekday vehicle miles traveled into the equivalent annual VMT.

Table C-2			
Projected Annual Vehicle Miles of Travel			
Analysis Year	Missouri	Illinois	Region
	Regional Adjusted Annual VMT (Based on Summer Weekday VMT)		
2023	21,212,423,798	6,076,813,707	27,289,237,505
2025	21,409,578,821	6,112,344,158	27,521,922,979
2030	21,873,036,166	6,194,222,775	28,067,258,940
2035	22,128,713,944	6,304,605,881	28,433,319,825

Appendix C

Travel Demand Modeling Procedures, Assumptions and Forecasts

Table C-2			
Projected Annual Vehicle Miles of Travel			
	Missouri	Illinois	Region
Analysis Year	Regional Adjusted Annual VMT (Based on Summer Weekday VMT)		
2045	22,709,017,706	6,463,554,201	29,172,571,907
2050	22,992,880,423	6,654,756,537	29,647,636,960

Appendix D

MOVES3 Model

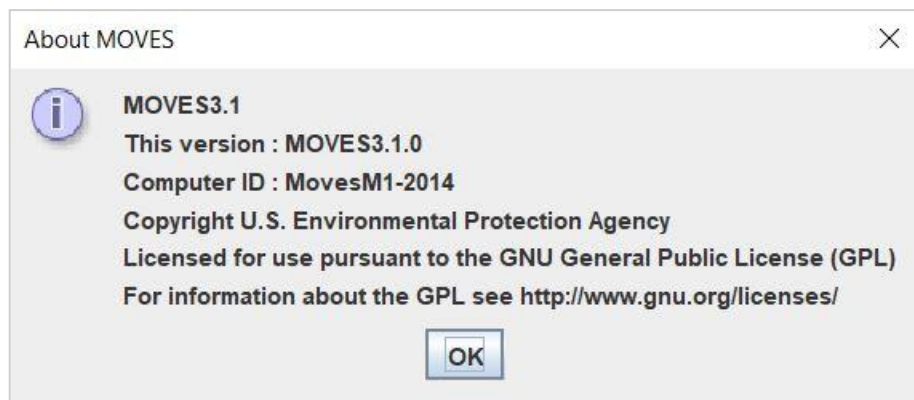
D-1 MOTor Vehicle Emissions Simulation (MOVES) model Emissions methodology

The U.S. Environmental Protection Agency's (EPA) Office of Transportation and Air Quality (OTAQ) developed the computer program MOTor Vehicle Emission Simulator (MOVES). This emission modeling system projects emissions for mobile sources covering a broad range of pollutants and allows multiple scale analysis. MOVES estimates running, project exhaust, and evaporative emissions as well as brake and tire wear emissions from all types of on-road vehicles.

Since 2012, East-West Gateway (EWGCOG) uses the latest available version of EPA approved air quality model MOVES in regional emissions analysis for transportation conformity determinations.

For the current ozone emissions analyses, EWGCOG uses the EPA moves model MOVES3 version 3.1.0. (Figure D-1)

Figure D-1: MOVES Version



D-1.1 Data requirements

Data sources derive from consultation with regional EPA offices, Illinois state Environmental Protection Agency (Illinois EPA), Missouri Department of Natural Resources (MoDNR), local agencies, and the State Implementation Plan (SIP) development agencies. The Inter Agency Consultation Group (IACG) is the platform for this consultation process.

D-1.1.2 Interfacing with Travel Demand Model (TDM)

MOVES software is based on a different platform and structured differently than the TDM. The traditional source type (refers to vehicle type), road type stratification typically used in the TDM may not provide enough information needed by MOVES. This poses the need for new equivalence files, and pre-MOVES and post-MOVES processing.

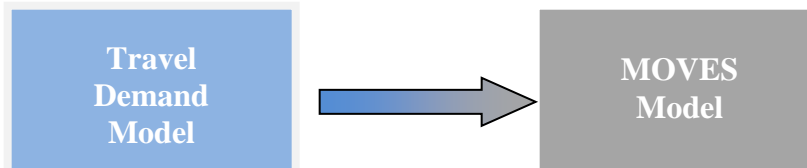
Appendix D

MOVES3 Model

D-2 Applying MOVES in Regional Emission Analysis

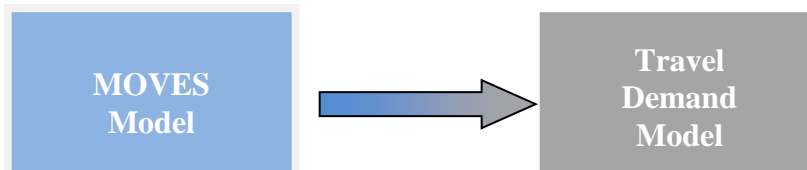
There are two main options available for applying MOVES in the regional emission analysis.

D-2.1 Option 1: Inventory Mode



MOVES can be run in inventory mode. In this mode, it requires the loaded TDM network, with the traffic projection as an input into MOVES. The disadvantage to this option is that this requires running MOVES for every modification to the TDM files. The advantage is the short run time and the outputs being summarized very easily.

D-2.2 Option 2: Emission Rates Mode



When run in the emission rates mode, MOVES produces stratified mobile source emission rate projections for each pollutant type and process. These emission rates are then applied to the projections of vehicle miles of travel generated by the regional TDM, using the same stratification. EWGCOG has used this approach in past regional emission analysis for the St. Louis planning region ozone analysis, based on consultation with EPA and various Metropolitan Planning Organizations (MPOs) regarding the use of MOVES. However, for the FY 2024 – 2027 TIP regional emission analysis, the inventory mode was used. The results are the same irrespective of the mode employed for running MOVES3.

D-3 Moves Run Specification Parameters

To use MOVES for determining emission rates or inventory, the first step is to prepare a Run Specification (RunSpec) file, to define the scale, location, time, vehicle, road, fuel, emission producing process, and pollutant parameters. These data are stored in a run specification (RunSpec) XML file.

The RunSpec file can be edited and executed directly or with the MOVES Graphical User Interface (GUI). The navigation panel in the GUI is simple and easy to use. The run spec files hold the parameters listed above, that define the run details for the various analysis years. Listed in Table D-1, are the parameters specified in the RunSpec files for various analysis years used in this analysis.

Appendix D

MOVES3 Model

Table D-1: Run Spec File Parameters

Parameter	Settings
Moves Version	MOVES3, v 3.1.0, Default database movesdb20220802
Scale	County
Calculation Type	Emission Inventory
Time Span	Time aggregation = Hour Daily Month of July for ozone All hours of day selected Weekday
Geographic Bounds	Zone and Link
On Road Vehicle Equipment	All Source Types and Fuel Combinations
Road Type	All road types, including off-road
Pollutant and Processes	For Ozone: NO _x , VOC, Total Gaseous Hydrocarbons, Non-Methane Hydrocarbons
General Output	Output database created Units; Mass units grams Energy units Joules Distance units miles Activity, distance traveled and source type population
Output Emissions Detail	Daily, pollutant, emission process, on road activity, source type, road type

The following screen shots capture the settings tabulated above. These settings are consistent across all analysis years.

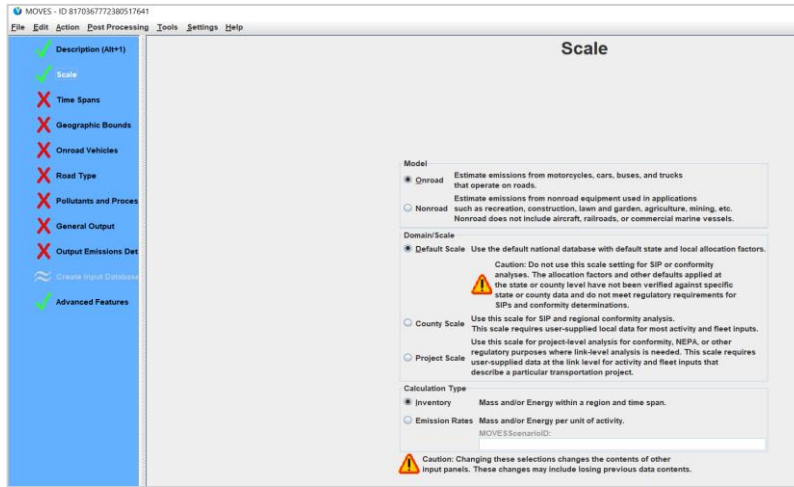
D-3.1 MOVES Navigator

Some important screen shots are shown below in order to clearly indicate the RunSpec file parameters.

D-3.1.1 Scale

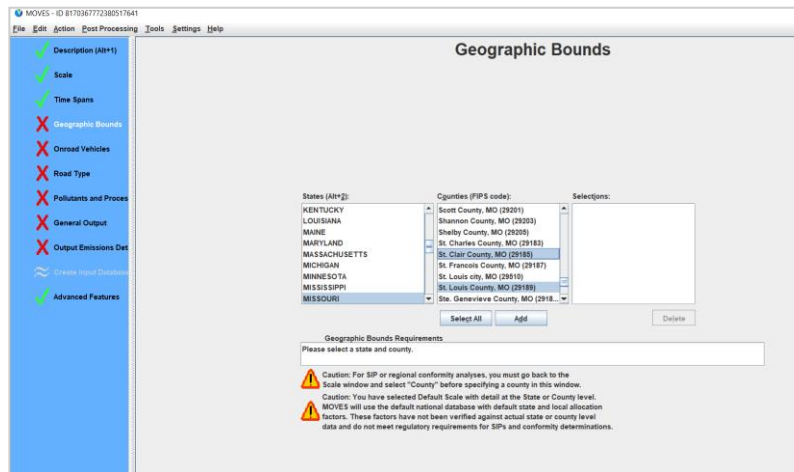
In this option, the Domain/Scale and calculation type is specified. The Domain specifies the level of default data needed to use for analysis and also the scale of the analysis. EWGCOG has used the county scale. The county scale requires user supplied local data for most inputs. We have selected “Emission Inventory” as the calculation type.

Appendix D MOVES3 Model



D-3.1.2 Geographic Bounds

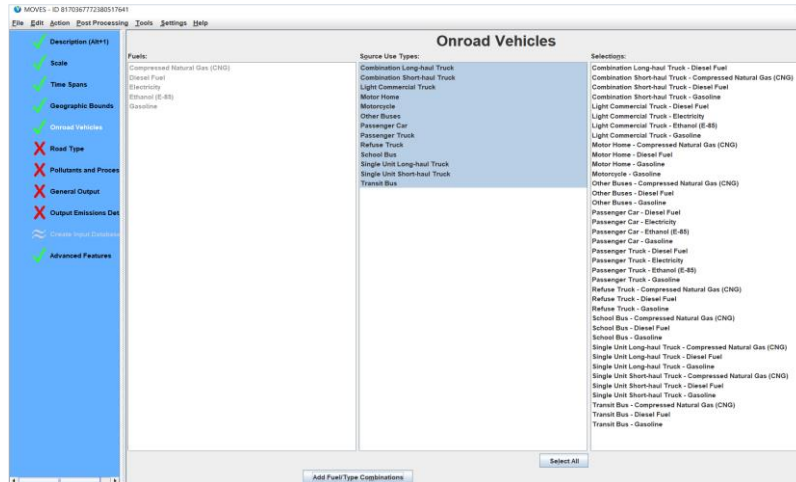
This is indicating that for Illinois, the representative county used, St. Clair in this analysis, and the region level selected, and the input database. For Missouri, St. Louis County was the representative county for St. Charles County, St. Louis County, Jefferson County and City of St. Louis (with I/M program) MOVES runs. Franklin County is run separately without I/M program.



Appendix D MOVES3 Model

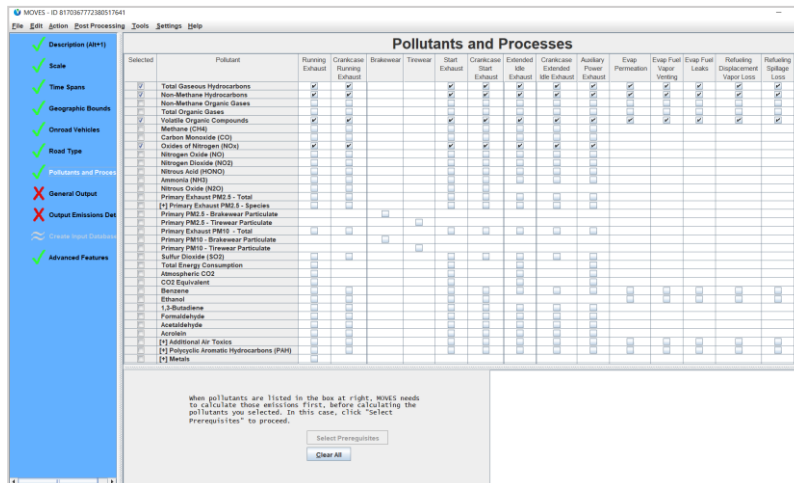
D-3.1.3 Vehicle Equipment

All Source Types and Gasoline, Diesel, Ethanol (E-85), and Electricity combinations were selected.



D-3.1.4 Pollutant and Processes

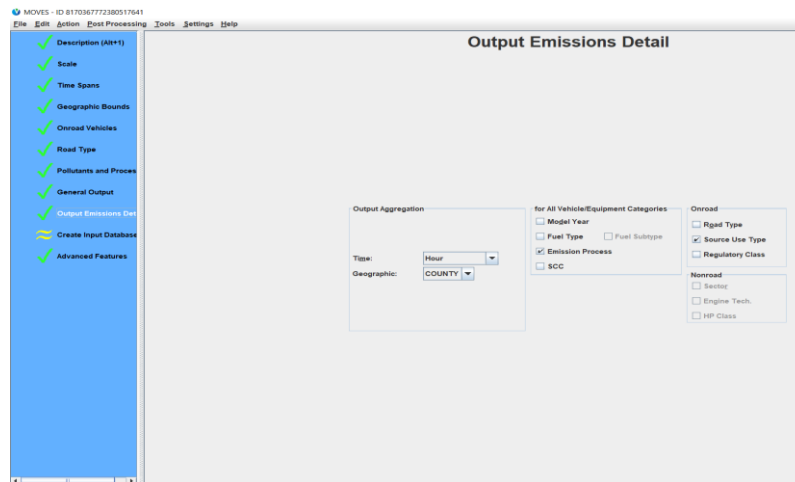
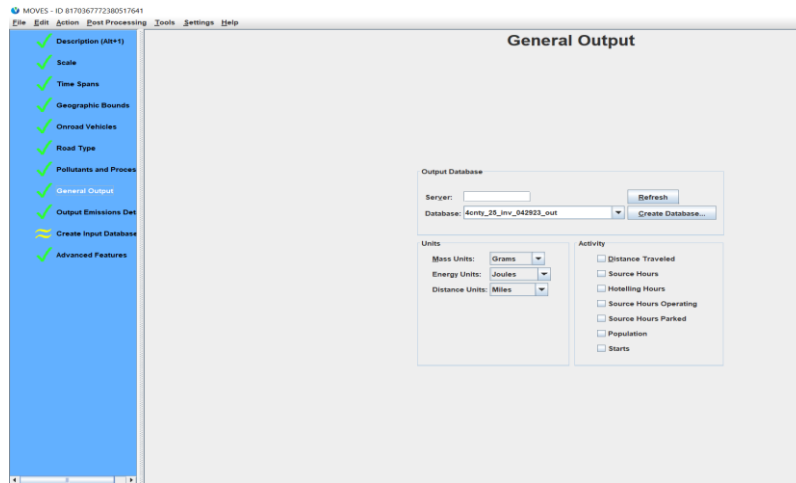
It is shown below that NO_x, VOC, Total Gaseous Hydrocarbons, Non-Methane Hydrocarbons were selected here for ozone.



D-3.1.5 Output

These screen shots indicate the general outputs and the units selected. They also show the output stratification used in this analysis.

Appendix D MOVES3 Model



D-4 County Data Manager

The County Data Manager (CDM) is used to simplify importing specific local data for the county or a user-defined custom domain without requiring direct interaction with the underlying MySQL database. Table D-2 lists input files for the CDM, and their data source.

Consensus on these files, occurred through discussion with the Inter Agency Consultation Group (IACG), the regional EPA offices and the MOVES technical guidance group. The regional TDM generates vehicle miles traveled (VMT) for conformity determination purposes for every analysis year required.

Appendix D

MOVES3 Model

Table D-2: MOVES input files

File Name	Source
IM Coverage	Illinois EPA/MoDNR
AVFT	MOVES defaults
Fuel Supply	Illinois EPA/MoDNR (default)
Fuel Formulation	Illinois EPA/MoDNR (default)
Fuel Usage Fraction	Illinois EPA/MoDNR (default)
Meteorological Data	Illinois EPA/MoDNR
Avg Speed Distribution	Illinois EPA/MoDNR (default)
Road Type Distribution	Illinois EPA/MoDNR (default)
HPMSvTypeYear	EPA Calculators and the TDM
Hour VMT Fraction	Illinois EPA/MoDNR (default)
Month VMT Fraction	Illinois EPA/MoDNR (default)
Day VMT Fraction	Illinois EPA/MoDNR (default)
Source Type Age Distribution	Illinois EPA/MoDNR
Source Type Population	Technical Guidance MOVES14a, Procedure Section 4.3

For Illinois, the 2008 ozone standard maintenance area and the 2015 ozone standard non-attainment area included all three counties; Monroe, St. Clair and Madison. For Illinois regional emissions analysis, it was agreed to use the “representative county approach”, that is to combine all the three Illinois counties and analyze them as one representative county. It was agreed to use St. Clair as the representative county, again this is in line with the SIP development process and was done in close collaboration with IACG and Illinois EPA. Illinois has a zip code based I/M program, Figure D-2 identifies these areas with I/M program.

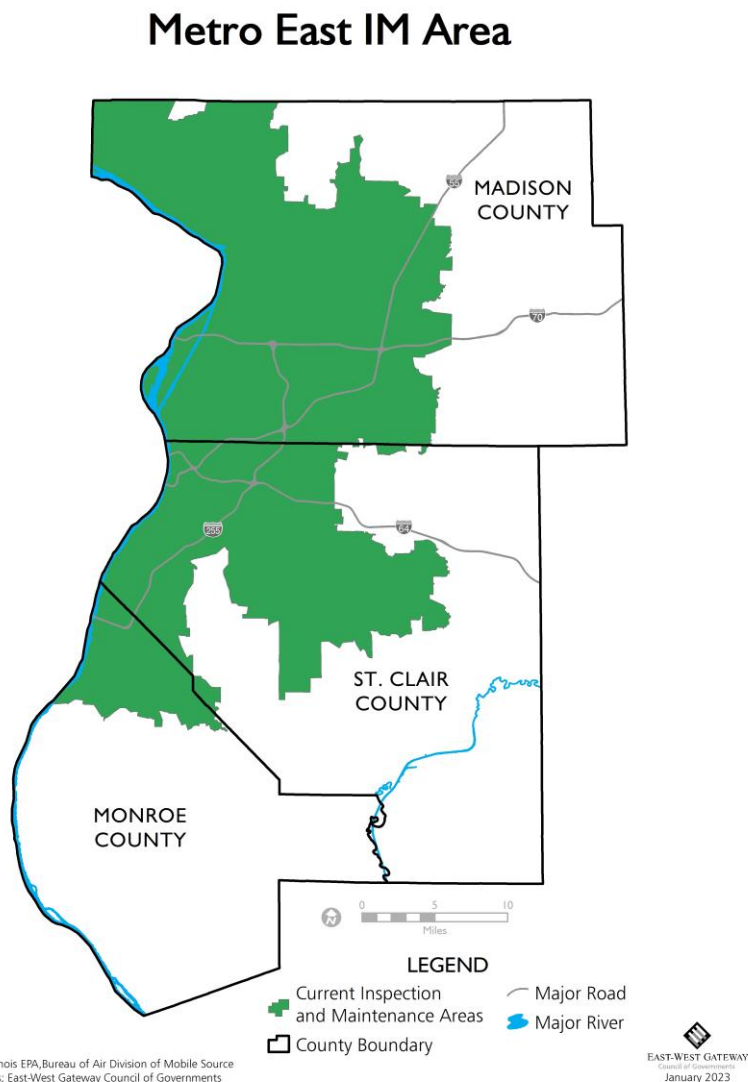
For Missouri, the 2008 ozone standard maintenance area is made up of all five Missouri counties in the EWG planning area; City of St. Louis and St. Louis, St. Charles, Jefferson and Franklin Counties. The non-attainment area for the 2015 ozone standard consists of Jefferson, St. Charles and St. Louis Counties, the City of St. Louis and Boles Township in Franklin County. Also, all counties except Franklin County have I/M in effect. For the Missouri regional emissions analysis it was agreed to also use the “representative county approach” for two sets of counties.

It was agreed that Franklin County would be run in MOVES3 with no I/M program. The remaining four counties would be run in MOVES3 with I/M program. It was agreed to use the “representative county approach” for these four counties also, with St. Louis County serving as the representative county.

Appendix D MOVES3 Model

As of July 1, 2022, vehicles registered in Franklin County are exempt from being subject to the Gateway Vehicle Inspection Program (GVIP) due to the January 2022 amendment of Missouri 10 CSR 10-5.381, Onboard Diagnostic Motor Vehicle Emissions Inspection. The MOVES I/M program inputs for Missouri have been revised to exclude Franklin County. Missouri Senate Bill 243 (SB243) was introduced in the 2023 legislative session. If passed, SB243 would repeal section 643.310 of the Revised Statutes of Missouri and enact a new section in its place to exclude Franklin, Jefferson and St. Charles Counties from GVIP. This bill had its first reading on January 4, 2023 and the second on February 9. It was then referred to the Senate Transportation, Infrastructure and Public Safety Committee. Since then there has been no further legislative action. No changes were made to the Missouri I/M inputs.

Figure D-2: Metro East I/M Program Coverage Area



Appendix D

MOVES3 Model

D-4.1 I/M Coverage

The I/M Importer allows the user to import data relating to inspection and maintenance programs. Illinois EPA provides input data, which is the I/M program in effect going forward. MoDNR provides input data on the Missouri I/M program for St. Louis, St. Charles and Jefferson Counties, and the City of St. Louis. Franklin County does not have any I/M program.

D-4.2 Fuel Supply, Fuel Formulation, and AVFT

Together use of Fuel Formulation, Fuel Supply, and alternative vehicle and fuels technology (AVFT) importers input appropriate fuel data in the correct MOVES format. Illinois EPA and MoDNR provided the fuel formulation files necessary files for conformity analysis.

D-4.3 Meteorological Data

In the Meteorological Data Importer, this dataset has data items such as month ID, Zone ID, hour ID, Temperature and Relative Humidity. Illinois EPA provides the 25-year average of meteorological data collected at Lambert International Airport for use in this conformity determination. For Missouri, the air agency MoDNR provided these data.

D-4.4 Average Speed Distribution

The CDM allows the user to input average speed data specific to road type, source type, time of day, and type of day combination. The MOVES3 model defines 16 speed bins which describe the average driving speed on each road type. Thus, for each combination of vehicle type, road type, and hour/day type, there is a corresponding fraction for each speed bin, these fractions together equal one. In line with EPA, Illinois EPA and MoDNR, the MOVES3 default files are used.

D-4.5 Road Type Distribution

The fraction of VMT by road type varies from area to area and can have a significant effect on overall emissions from on-road mobile sources. The VMT fractions by road type used in inventory modeling for SIPs and regional conformity analyses should be consistent with the most recent information used for transportation planning. For each source type, the Road Type Distribution table stores the distribution of VMT by road type (e.g., the fraction of passenger car VMT on each of the road types). Illinois EPA and MoDNR provided these data, after adjusting for available local data.

D-4.6 Vehicle Type VMT

EPA recommends the use of locally developed VMT projections for SIPs and regional conformity analyses. Travel demand forecasting models are often the source of information used by MPOs to project VMT. EWGCOG uses the approach described under the conformity rule §93.122 (b)(3). This allows areas with network-based travel models to develop factors, which reconcile and calibrate the network-based travel model projections of VMT in the base year of its validation to the Highway Performance Monitoring System (HPMS) projections for the same period. Section 3, “Developing Locality-Specific Inputs from Travel Demand Models,” of the EPA document, “Volume IV: Chapter 2, Use of Locality-Specific Transportation Data for the Development of Mobile Source Emission Inventories,” (September 1996), discusses the procedure followed to reconcile traffic demand model results with HPMS VMT projections.

MOVES requires VMT by source type, month, day, and hour VMT fractions. The TDM gives output as the average weekday traffic. In order to develop the detailed fractions required by MOVES,

Appendix D

MOVES3 Model

EWGCOG uses EPA created converters. In cases where detailed local data is not available, these converters are used. These converters allow users to input average weekday VMT from the TDM along with other local information such as monthly and weekend day adjustment factors. The output of these converters is the equivalent MOVES tables of VMT by HPMS class, VMT fractions by month, by day and by hour. MoDNR and Illinois EPA used local information, where available, to improve the outputs such that they better reflect local conditions. EWGCOG use these converters in this analysis to get the MOVES files in the right format.

D-4.7 Source Type Age Distribution

The age distribution of vehicle fleets can vary significantly from area to area. Fleets with a higher percentage of older vehicles will have higher emissions. For emission calculation, MOVES requires vehicle age distribution by source type. Vehicle age distribution is divided into 30 years based on vehicle model years. Surveys of registration data indicate considerable local variability in vehicle age distributions. For this reason, Illinois EPA and MoDNR used local vehicle registration information to develop a localized and updated version. MOVES requires a age distribution by source type, the same file is used for all analysis years as required by EPA, and is consistent with the file used in SIP development.

D-4.8 Source Type Population

MOVES uses source type population to calculate start and evaporative emissions. The Source Type Population Importer allows the user to input the number of vehicles in the geographic, for each vehicle type or source type selected for modeling in the Run Spec file. MOVES categorizes vehicles into 13 source types, which are subsets of five HPMS vehicle types. Detailed vehicle information was not available at the local level. Therefore, EWGCOG used the procedure described in MOVES Technical Guidance, Section 4.3. This involves basing population projections on the VMT projections for a particular source type and the ratio of MOVES default population to VMT by source type. Running MOVES at the national scale generates default populations and VMT for the city of St. Louis and the seven counties in consideration. Local VMT multiplied by the ratio of default population to default VMT, calculates a projection of local population based on local VMT. This was repeated for each analysis year, since projections differ for each year.

D-5 Inventory Rate Output

For transportation related ozone emissions, the sources include exhaust and evaporative emissions that occur while vehicles are on “real roads”, starts, extended idle, and evaporative emissions (with the exception of refueling) that occur while a vehicle is parked. The combined sum of all these emissions gives the total transportation related emissions.

When running MOVES in the inventory mode, there are scripts or code that summarizes the totals emissions output, by pollutant, based on the data provided for a particular scenario.

Appendix D MOVES3 Model

D-6 Travel Demand Model Output

The travel demand model provides the VMT by functional class and by urban and rural split, for each scenario year. For details regarding the TDM housed and maintained by EWGCOG, please refer to Appendix C.

D-7 Geography for Different Emission Standards

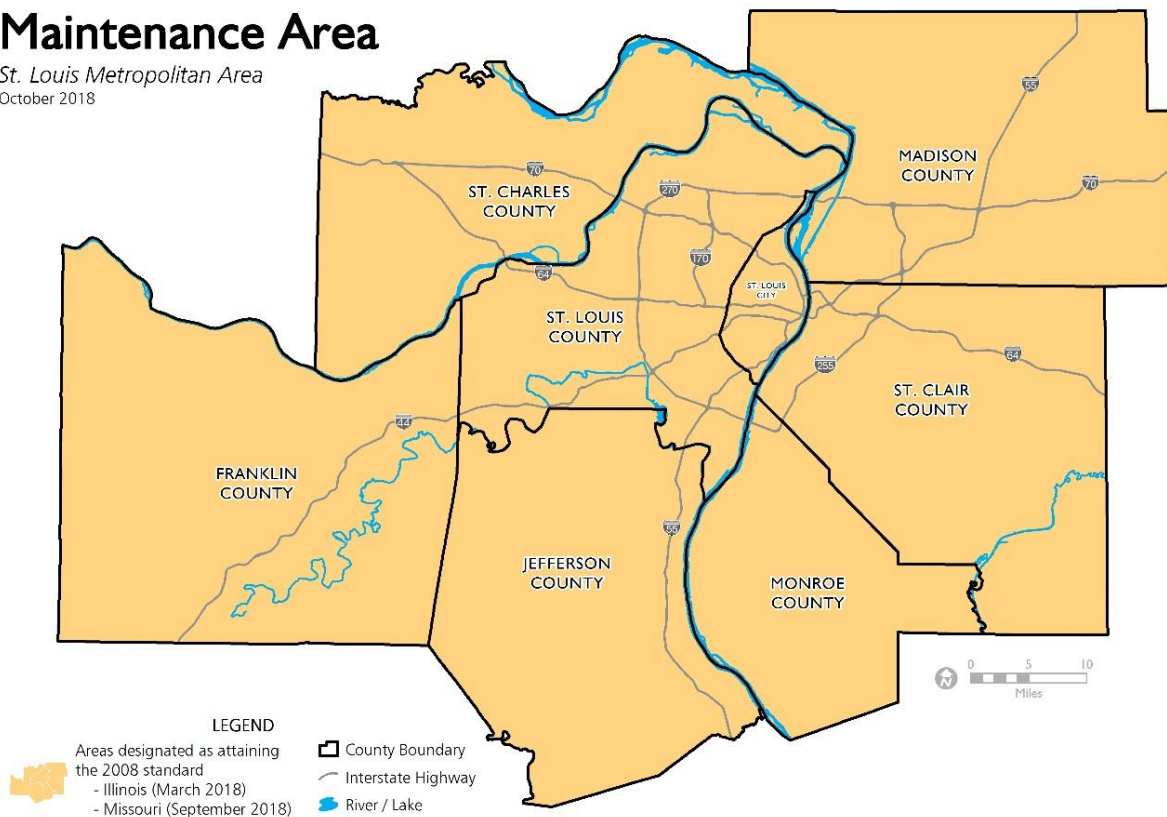
As discussed in section 4.2 of Overview of the Air Quality Transportation Conformity Process, two air quality standards needed to be met, each having different geography. Figures D-3 and D-4 highlight these geographies for the following standards:

- 2008 Ozone Standard
- 2015 Ozone Standard

Figure D-3: 2008 Ozone Standard Maintenance Area

2008 Ozone Standard Maintenance Area

St. Louis Metropolitan Area
October 2018



Source: East-West Gateway Council of Governments

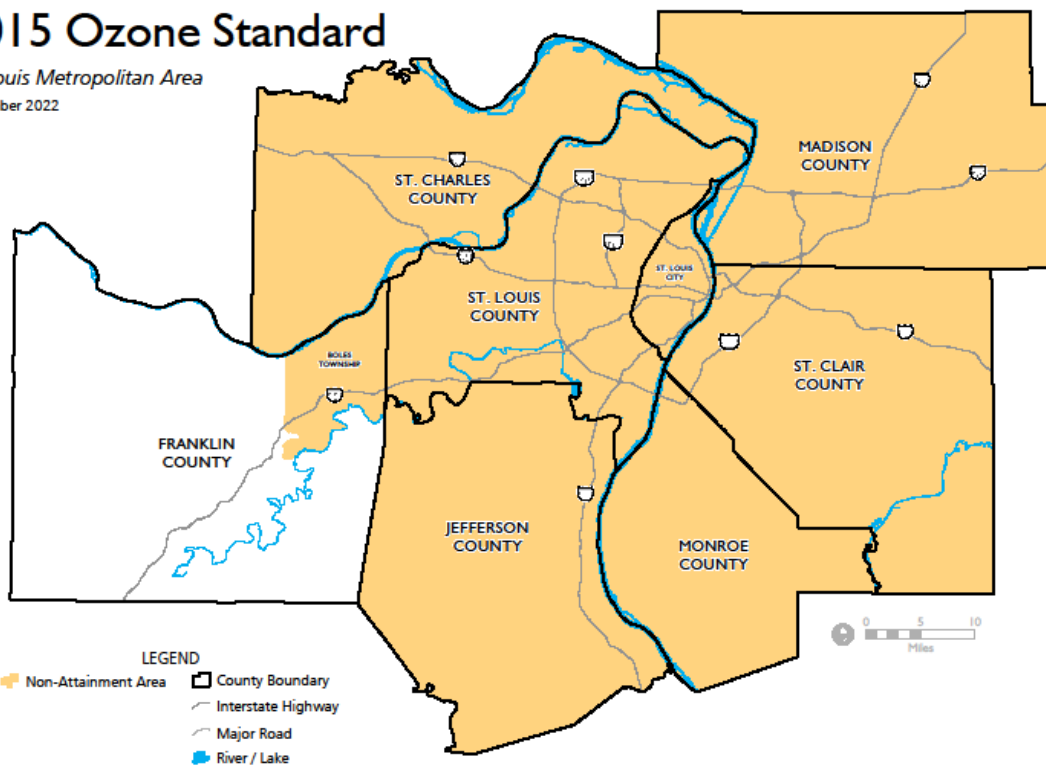


Appendix D MOVES3 Model

Figure D-4: 2015 Ozone Standard Non-Attainment Area

Non-Attainment Area 2015 Ozone Standard

St. Louis Metropolitan Area
November 2022



Sources: East-West Gateway Council of Governments



Appendix D

MOVES3 Model

D-8 Detailed Emission Tables

For all of the analysis years, the emissions calculated for the regional emissions analysis using the latest EPA approved MOVES3 model (version 3.1.0) fall below the budgets or appropriate test, in line with the EPA guidance and discussions.

Shown below, Tables D-3 - D-6 compare modeled emissions to EPA approved budgets followed by Figures D-5 – D-8 that chart total emissions for the various standards and relevant analysis years.

*For both Missouri and Illinois, units for ozone emission tables below are US tons per **day**.*

Appendix D MOVES3 Model

Table D-3: Missouri Ozone (2008 Eight-Hour Standard)

Missouri – Regional Emissions Analysis: Ozone Conformity Tests				
Based on Conformity Requirements for 2008 Eight-Hour Ozone Standard				
Maintenance Area				
(US tons per day)				
	Volatile Organic Compounds		Oxides of Nitrogen	
Analysis Year	Action	2015 Budget	Action	2015 Budget
2025	8.90	32.70	26.18	76.7
Analysis Year	Action	2030 Budget*	Action	2030 Budget*
2030	7.09	22.00	21.39	40.00
2035	6.03	22.00	19.45	40.00
2045	5.33	22.00	18.90	40.00
2050	5.29	22.00	18.97	40.00

* EPA stated in a May 15, 2018 letter to MoDNR that the 2030 budgets from the Technical Correction to the Redesignation Request and Maintenance Plan for the St. Louis (Missouri) 2008 Nonattainment Area (February 2018) were adequate for use in the Conformity Determination process.

Table D-4: Illinois Ozone (2008 Eight-Hour Standard)

Illinois – Regional Emissions Analysis: Ozone Conformity Tests				
Based on Conformity Requirements for 2008 Eight-Hour Ozone Standard				
Maintenance Area				
(US tons per day)				
	Volatile Organic Compounds		Oxides of Nitrogen	
Analysis Year	Action	2025 Budget	Action	2025 Budget
2025	4.04	5.68	9.47	15.22
Analysis Year	Action	2030 Budget	Action	2030 Budget
2030	2.96	9.05	6.94	16.68
2035	2.51	9.05	6.05	16.68
2045	2.15	9.05	5.82	16.68
2050	2.09	9.05	5.88	16.68

Appendix D MOVES3 Model

Table D-5: Missouri Ozone (2015 Standard)

Missouri – Regional Emissions Analysis: Ozone Conformity Tests				
Based on Conformity Requirements for 2015 Eight-Hour Ozone Standard				
4 County and 1 Township Non-Attainment Area				
(US tons per day)				
Analysis Year	Volatile Organic Compounds		Oxides of Nitrogen	
	Action	2015 Budget	Action	2015 Budget
2023	9.23	32.70	27.86	76.7
2025	8.34	32.70	24.36	76.7
Analysis Year	Action	2030 Budget	Action	2030 Budget
	2030	6.64	22.00	19.87
2035	5.64	22.00	18.03	40.00
2045	4.98	22.00	17.47	40.00
2050	4.93	22.00	17.52	40.00

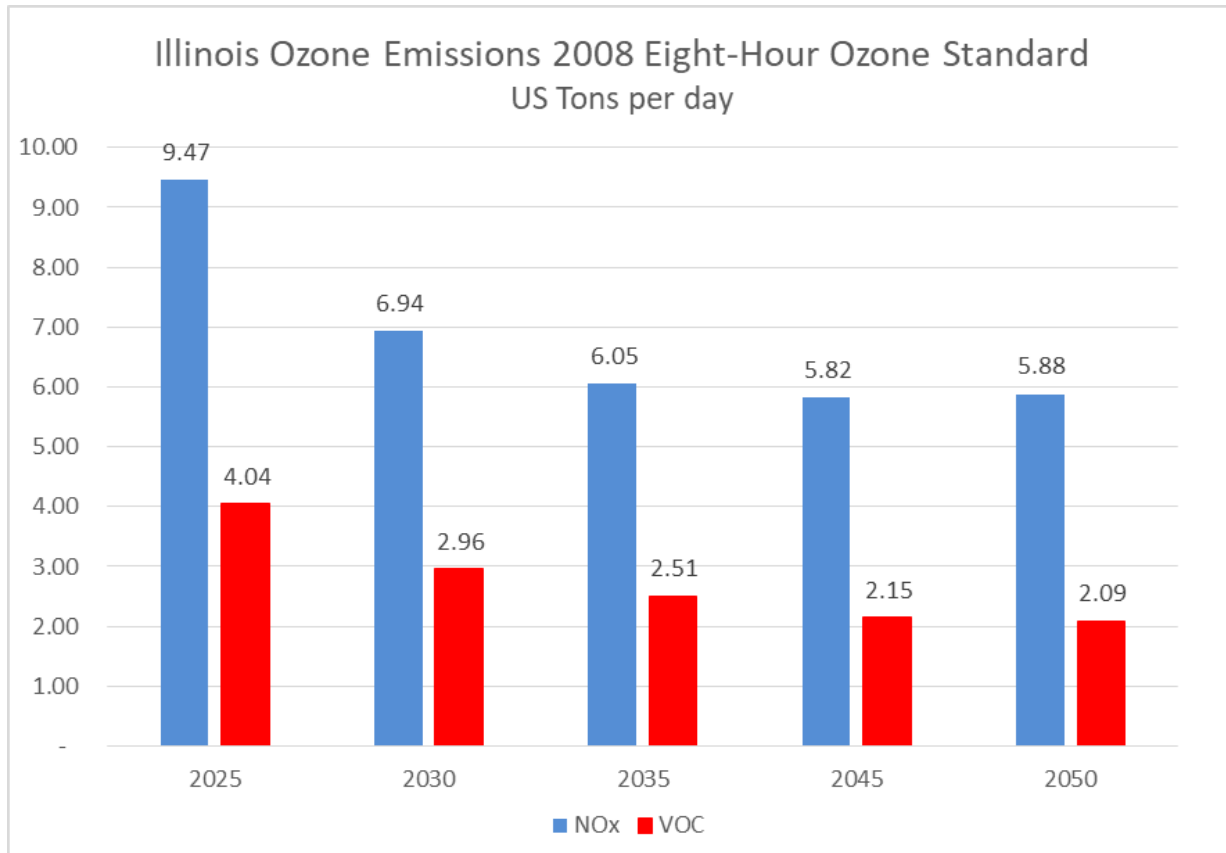
Table D-6: Illinois Ozone (2015 Standard)

Illinois – Regional Emissions Analysis: Ozone Conformity Tests				
Based on Conformity Requirements for 2015 Eight-Hour Ozone Standard				
3 County Non-Attainment Area				
(US tons per day)				
Analysis Year	Volatile Organic Compounds		Oxides of Nitrogen	
	Action	2008 Budget	Action	2008 Budget
2023	4.87	17.27	11.42	52.57
Analysis Year	Action	2025 Budget	Action	2025 Budget
	2025	4.04	5.68	9.47
Analysis Year	Action	2030 Budget	Action	2030 Budget
	2030	2.96	9.05	6.94
2035	2.51	9.05	6.05	16.68
2045	2.15	9.05	5.82	16.68
2050	2.09	9.05	5.88	16.68

Appendix D MOVES3 Model

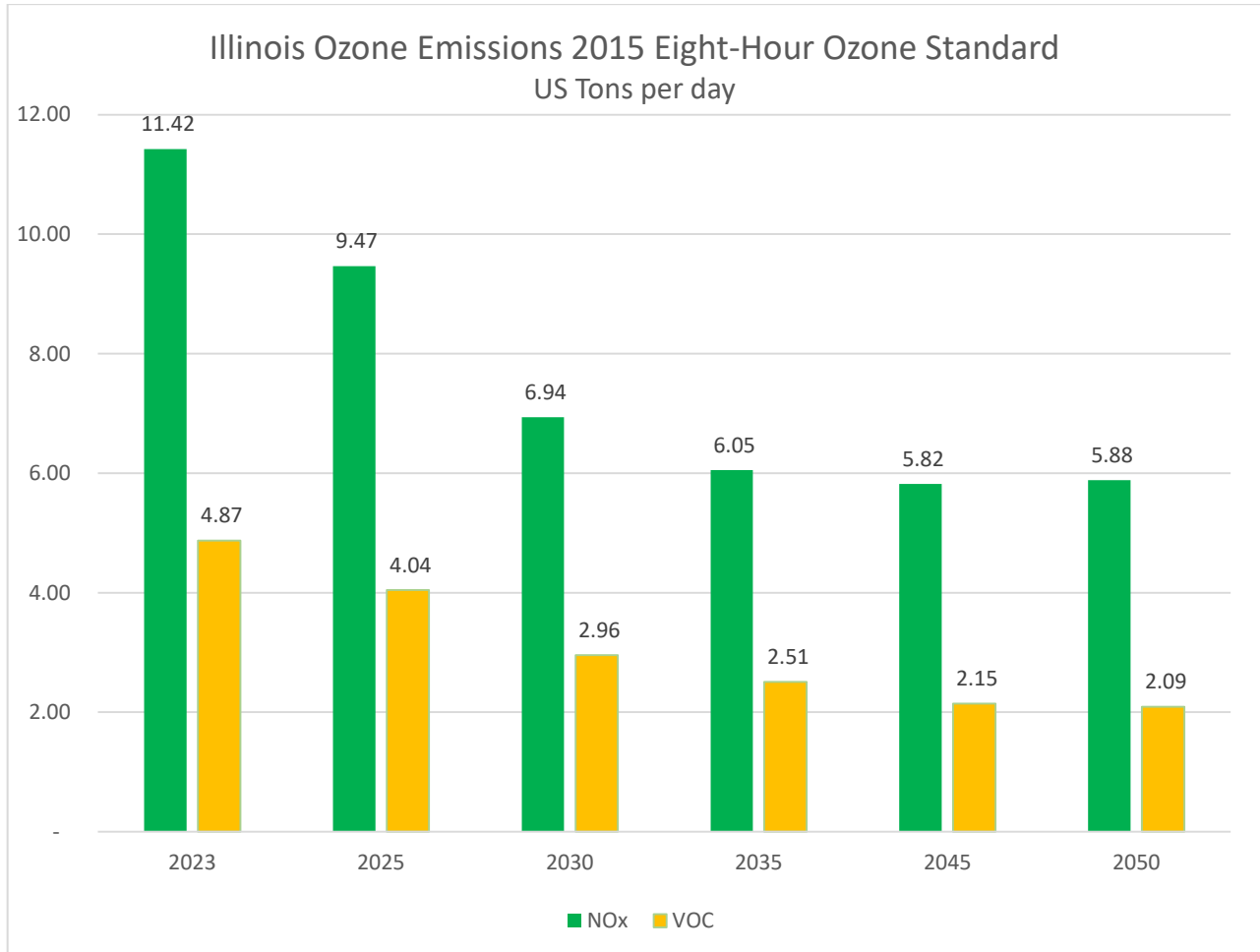
Illinois: Ozone

Figure D-5: Illinois Total VOC and NOx in U.S. Tons per day by analysis year, 2008 Standard



Appendix D MOVES3 Model

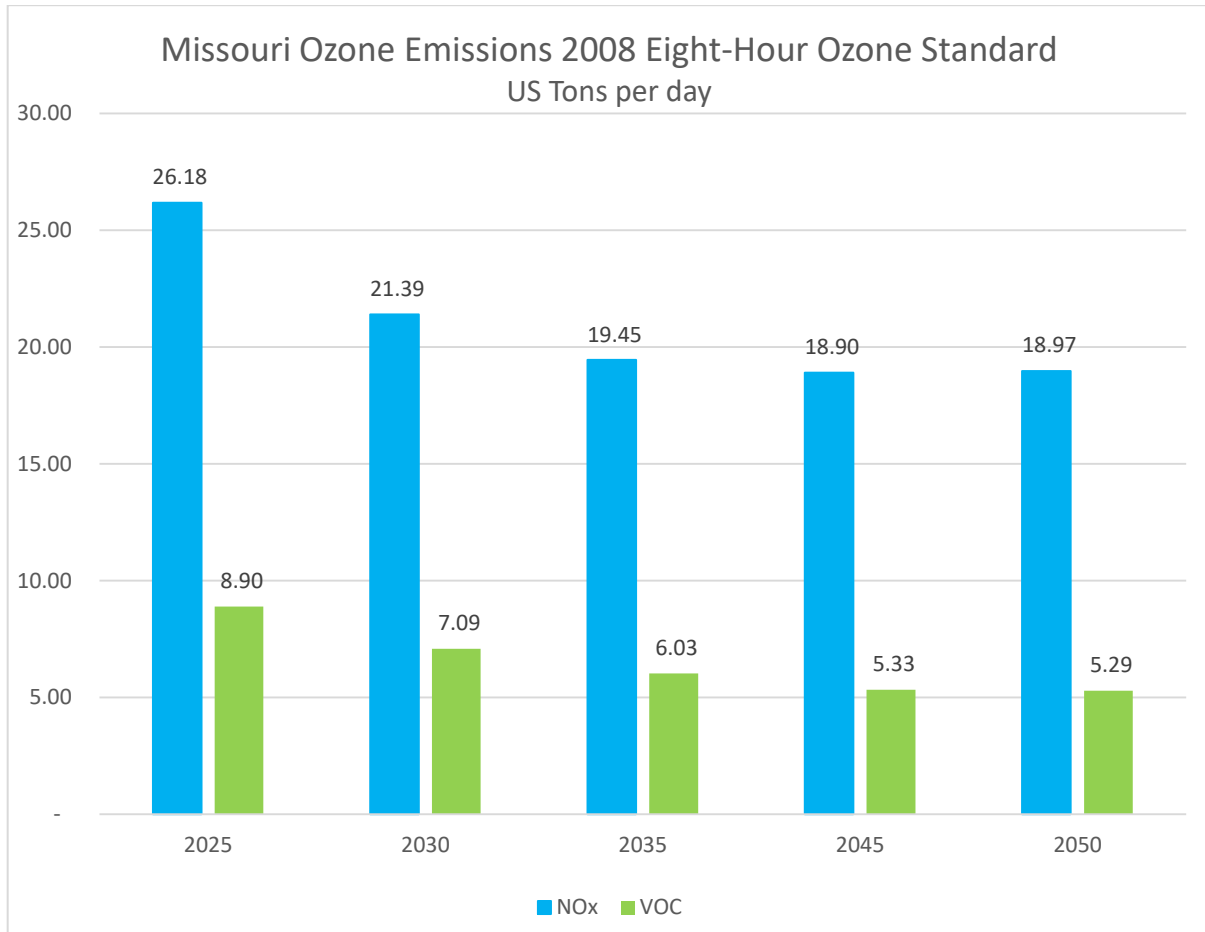
Figure D-6: Illinois Total VOC and NOx in U.S. Tons per day by analysis year, 2015 Standard



Appendix D MOVES3 Model

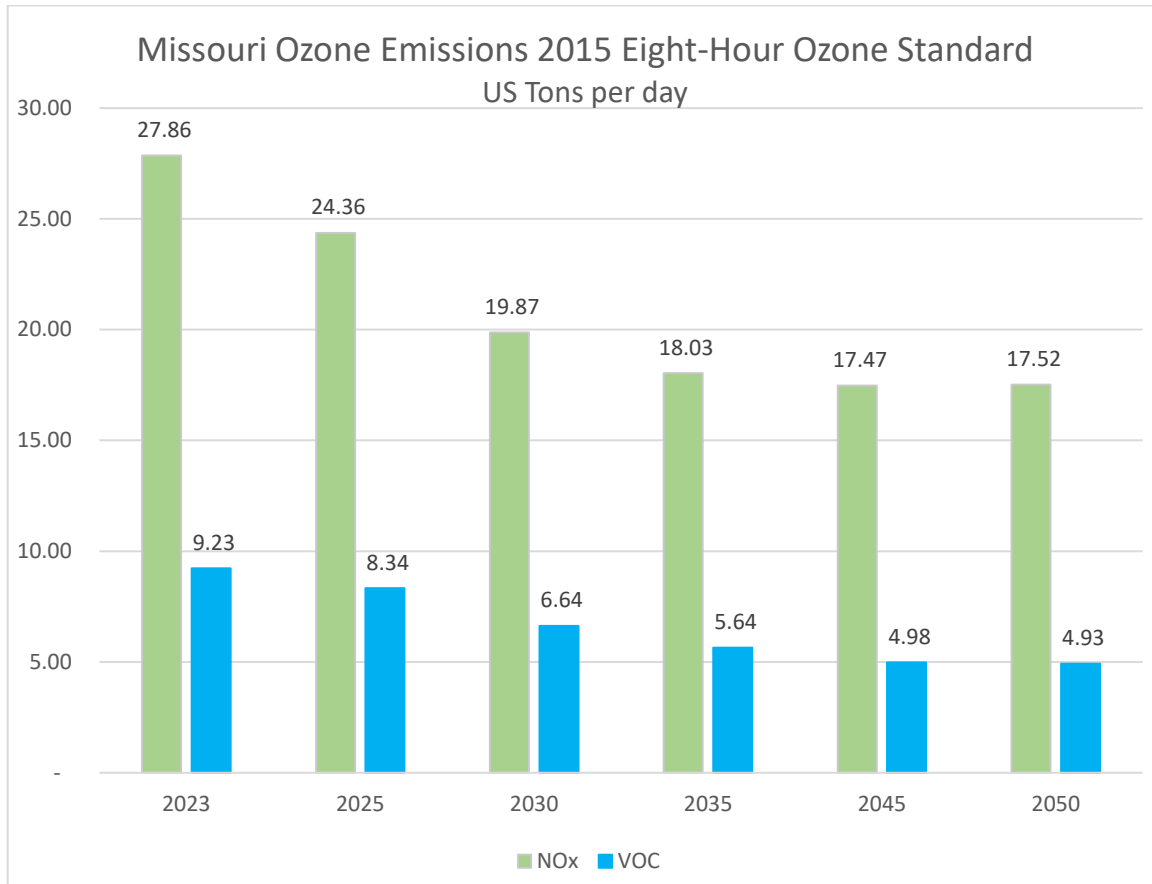
Missouri: Ozone

Figure D-7: Total VOC and NO_x in U.S. Tons per day by analysis year, 2008 Standard



Appendix D MOVES3 Model

Figure D-8: Total VOC and NO_x in U.S. Tons per day by analysis year, 2015 Standard



Appendix D MOVES3 Model

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Appendix E

2008 and 2015 Eight-Hour Ozone Standards

Air Quality Conformity Determination

E-1. Summary of Requirements for the Regional Emissions Analysis

The regional emissions analysis provisions found in 40 CFR 93.109 (e)(2)(iii) of the Conformity Rule are to be followed. The Missouri Department of Natural Resources (MoDNR) developed a 2008 eight-hour ozone standard Early Progress Plan containing 2015 motor vehicle emissions budgets. These budgets were established with the MOVES2010 model. In an October 28, 2013 letter to Missouri, the U.S. Environmental Protection Agency (EPA) found these budgets adequate for Conformity Determination purposes. In the January 14, 2016 Federal Register, EPA issued a final rule approving Missouri's Early Progress Plan (effective March 14, 2016). In February 2018, MoDNR submitted a Technical Correction to the Re-designation Request and Maintenance Plan for the St. Louis (Missouri) 2008 Ozone Standard (MO Maintenance Plan). The MO Maintenance Plan contained 2030 eight-hour ozone motor vehicle emissions budgets which were developed with MOVES2014. In a letter to MoDNR dated May 15, 2018, EPA found these budgets adequate for Conformity purposes. In the June 8, 2018 Federal Register, EPA issued a notice of adequacy for the 2030 budgets for Conformity purposes (effective June 22, 2018). In the September 20, 2018 Federal Register, EPA issued a final rule approving the request by MoDNR and re-designated Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis as being in attainment of the 2008 ozone standard. EPA also approved Missouri's Maintenance Plan and the 2030 VOC and NO_x motor vehicle emission budgets.

The Illinois Environmental Protection Agency (Illinois EPA) prepared the Maintenance Plan for the Metro-East St. Louis Ozone Nonattainment Area for the 1997 8-Hour Ozone National Ambient Air Quality Standard (IL 8-Hour Ozone Maintenance Plan for the 1997 standard). This Plan contained 2008 and 2025 eight-hour ozone motor vehicle emissions budgets (developed with MOVES2010) prepared for Madison, Monroe, St. Clair and Jersey Counties. EPA found these budgets to be adequate for use in Conformity Determination in December 2011 and approved the Maintenance Plan on June 12, 2012. The Illinois portion of the 2008 ozone non-attainment area included Madison, Monroe and St. Clair Counties. The Conformity Determination for Illinois is also made in relation to the 2030 motor vehicle emission budgets from the Maintenance Plan for the Metro East Area for the 2008 Ozone Standard (IL 8-Hour Maintenance Plan for 2008 standard). These budgets were developed using MOVES2014a and were found adequate by EPA (September 26, 2017 letter). In the December 11, 2017 Federal Register, EPA issued a final rule finding these budgets adequate with an effective date of December 26, 2017. In the March 1, 2018 Federal Register, EPA issued a final rule, effective on that date, redesignating Madison, Monroe and St. Clair Counties as in attainment of the 2008 ozone standard, approving the IL 8-Hour Maintenance Plan for 2008 standard and finding the 2030 motor vehicle emission budgets adequate.

Appendix E

2008 and 2015 Eight-Hour Ozone Standards

Air Quality Conformity Determination

E-2. Conformity Determination for 2008 Eight-Hour Ozone Standard

For the Missouri maintenance area (Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis), it is necessary to demonstrate that anticipated emission levels of VOC and NO_x resulting from implementation of FY 2024 – 2027 Transportation Improvement Program and Related Amendments to Connected 2050 (FY 2024 – 2027 TIP) for the 2025 analysis year will be less than the 2015 VOC and NO_x motor vehicle emissions budgets, as set out in Missouri’s 2008 eight-hour ozone Early Progress Plan (see Table E-1). For the analysis years 2030, 2035, 2045 and 2050 (horizon year for Connected 2050), it is necessary to demonstrate that anticipated emission levels of VOC and NO_x which are expected to result from implementation of FY 2024 – 2027 TIP will be less than the 2030 VOC and NO_x motor vehicle emissions budgets, as set out in the MO Maintenance Plan (see Table E-1).

Table E-1 Missouri Motor Vehicle Emissions Budgets (US tons per day)		
Pollutant	2015 Budget MO Early Progress Plan	2030 Budget MO Maintenance Plan
Volatile Organic Compounds (VOC)	32.70	22.00
Oxides of Nitrogen (NO _x)	76.70	40.00

For the Illinois maintenance area (Madison, Monroe and St Clair Counties), for the analysis year 2025, it is necessary to demonstrate that anticipated emission levels of VOC and NO_x resulting from implementation of FY 2024 – 2027 TIP for the 2025 analysis year will be less than the 2025 VOC and NO_x motor vehicle emissions budgets, as set out in the eight-hour ozone IL 8-Hour Ozone Maintenance Plan for the 1997 standard (see Table E-2). For the analysis years 2030, 2035, 2045 and 2050, it is necessary to demonstrate that anticipated emission levels of VOC and NO_x which are expected to result from implementation of the FY 2024 – 2027 TIP will be less than the 2030 VOC and NO_x motor vehicle emissions budgets, as set out in the IL 8-Hour Ozone Maintenance Plan for the 2008 standard (see Table E-2).

Appendix E

2008 and 2015 Eight-Hour Ozone Standards

Air Quality Conformity Determination

Table E-2 Illinois Motor Vehicle Emissions Budgets (US tons per day)			
Pollutant	2008 Budget Illinois 8-Hour Ozone Plan for the 1997 Standard	2025 Budget Illinois 8-Hour Ozone Plan for the 1997 Standard	2030 Budget Illinois 8-Hour Ozone Plan for 2008 Standard
Volatile Organic Compounds (VOC)	17.27	5.68	9.05
Oxides of Nitrogen (NO _x)	52.57	15.22	16.68

E-3. Conformity Determination for 2015 Eight-Hour Ozone Standard

For the Missouri non-attainment area (Jefferson, St. Charles and St. Louis Counties, the City of St. Louis and Boles Township in Franklin County), it is necessary to demonstrate that for the 2023 and 2025 analysis years, anticipated emission levels of VOC and NO_x resulting from implementation of FY 2024 – 2027 TIP will be less than the 2015 VOC and NO_x motor vehicle emissions budgets, as set out in Missouri’s 2008 eight-hour ozone Early Progress Plan (see Table E-1). For the analysis years 2030, 2035, 2045 and 2050, it is necessary to demonstrate that anticipated emission levels of VOC and NO_x which are expected to result from implementation of the FY 2024 – 2027 TIP will be less than the 2030 VOC and NO_x motor vehicle emissions budgets, as set out in the MO Maintenance Plan (see Table E-1).

For the Illinois non-attainment counties of Madison, Monroe and St. Clair, for the analysis year 2023, it is necessary to demonstrate that anticipated emission levels of VOC and NO_x resulting from implementation of the FY 2024 – 2027 TIP will be less than the 2008 VOC and NO_x motor vehicle emissions budgets for Illinois, as set out in the eight-hour ozone IL 8-Hour Ozone Maintenance Plan for the 1997 standard (see Table E-2). For the analysis year 2025, it is necessary to demonstrate that anticipated emission levels of VOC and NO_x resulting from implementation of FY 2024 – 2027 TIP will be less than the 2025 VOC and NO_x motor vehicle emissions budgets for Illinois, as set out in the same document (see Table E-2). For the remaining analysis years of 2030, 2035, 2045 and 2050, it is necessary to show that anticipated emission levels of VOC and NO_x resulting from implementation of the FY 2024 – 2027 TIP will be less than the 2030 VOC and NO_x motor vehicle emissions budgets as set out in the IL 8-Hour Ozone Maintenance Plan for the 2008 standard (see Table E-2).

At this time, neither Missouri nor Illinois have motor vehicle emissions budgets for the 2015 eight-hour ozone standard which have been approved or found adequate for conformity purposes by EPA. Approved or adequate motor vehicle emissions budgets from an applicable SIP or SIP submission for another (previous) ozone standard can be used in the

Appendix E

2008 and 2015 Eight-Hour Ozone Standards

Air Quality Conformity Determination

regional emissions analysis. Since the Missouri non-attainment area for the 2015 eight-hour ozone standard has a smaller geographic area than what was delineated for the 2008 eight-hour ozone standard, EPA's Transportation Conformity Regulation sets out the option to use in the regional emissions analysis either the corresponding portion of the previous budgets which matches the 2015 non-attainment area or to use the existing budget as is. EWG, after inter agency consultation, has decided to use the existing motor vehicle emission budgets from the Missouri SIP as is.

E-4. Carbon Monoxide

Part of the region, consisting of the City of St. Louis and that portion of St. Louis County within the I-270 loop, is classified as a limited maintenance area for carbon monoxide (CO). On June 17, 1997 the Missouri Department of Natural Resources (MoDNR) submitted The Missouri State Implementation Plan for Carbon Monoxide - St. Louis Metropolitan Area: Maintenance Provisions and Re-designation Request, October 1996 to EPA. The re-designation to attainment request was approved by EPA on March 29, 1999. MoDNR submitted their second CO maintenance plan, Revision to the Limited Maintenance Plan for St. Louis Nonclassifiable Maintenance Area for the 8-Hour Carbon Monoxide National Ambient Air Quality Standard to EPA on April 3, 2014. The plan adequately demonstrated that the area will maintain the CO standard through 2018. Plan approval by EPA was published in the October 2, 2015 Federal Register. The Limited Carbon Monoxide Maintenance Plan option allows plan conformity without a technical analysis. As of March 29, 2019, the end of the twenty-year limited maintenance period has been reached. Individual projects are not subject to the requirement for "hot spot" analysis by their project sponsors.

E-5. Summary of Results for the Regional Emissions Analysis

To establish conformity, the projected net mobile source emissions are then subject to each of the required tests. EWG will utilize the MOVES3 model for the ozone regional emissions analysis. The results are set out in Tables E- 3 - E- 6, which shows all the required tests are passed. This provides the basis for the Conformity Determination in respect of the projects and programs included in the FY 2024 – 2027 TIP.

Appendix E

2008 and 2015 Eight-Hour Ozone Standards

Air Quality Conformity Determination

Table E-3 Regional Emissions Analysis: Conformity Tests - MISSOURI Based on Conformity Requirements for 2008 Eight-Hour Ozone Standard Maintenance Area (US tons per day)				
Analysis Year	Volatile Organic Compounds		Nitrogen Oxides	
	Action	2015 Budget	Action	2015 Budget
2025	8.90	32.70	26.18	76.70
	Action	2030 Budget	Action	2030 Budget
2030	7.09	22.00	21.39	40.00
2035	6.03	22.00	19.45	40.00
2045	5.33	22.00	18.90	40.00
2050	5.29	22.00	18.97	40.00
All tests have been passed for all years.				

Table E-4 Regional Emissions Analysis: Conformity Tests – ILLINOIS Based on Conformity Requirements for 2008 Eight-Hour Ozone Standard Maintenance Area (US tons per day)				
Analysis Year	Volatile Organic Compounds		Nitrogen Oxides	
	Action	2025 Budget	Action	2025 Budget
2025	4.04	5.68	9.47	15.22
	Action	2030 Budget	Action	2030 Budget
2030	2.96	9.05	6.94	16.68
2035	2.51	9.05	6.05	16.68
2045	2.15	9.05	5.82	16.68
2050	2.09	9.05	5.88	16.68
All tests have been passed for all years.				

This Conformity Determination is made for the eight-hour ozone maintenance area: Franklin, Jefferson, St. Charles and St. Louis Counties and the City of St. Louis in Missouri; and Madison, Monroe and St. Clair Counties in Illinois.

Appendix E

2008 and 2015 Eight-Hour Ozone Standards

Air Quality Conformity Determination

Table E-5 Regional Emissions Analysis: Conformity Tests - MISSOURI Based on Conformity Requirements for 2015 Eight-Hour Ozone Standard 4 County and 1 Township Non-Attainment Area				
Analysis Year	Volatile Organic Compounds		Oxides of Nitrogen	
	Action	2015 Budget	Action	2015 Budget
2023	9.23	32.70	27.86	76.70
2025	8.34	32.70	24.36	76.70
	Action	2030 Budget	Action	2030 Budget
2030	6.64	22.00	19.87	40.00
2035	5.64	22.00	18.03	40.00
2045	4.98	22.00	17.47	40.00
2050	4.93	22.00	17.52	40.00
All tests have been passed for all years				

Table E-6 Regional Emissions Analysis: Conformity Tests – ILLINOIS Based on Conformity Requirements for 2015 Eight-Hour Ozone Standards 3 County Non-Attainment Area				
Analysis Year	Volatile Organic Compounds		Oxides of Nitrogen	
	Action	2008 Budget	Action	2008 Budget
2023	4.87	17.27	11.42	52.57
	Action	2025 Budget	Action	2025 Budget
2025	4.04	5.68	9.47	15.22
	Action	2030 Budget	Action	2030 Budget
2030	2.96	9.05	6.94	16.68
2035	2.51	9.05	6.05	16.68
2045	2.15	9.05	5.82	16.68
2050	2.09	9.05	5.88	16.68
All tests have been passed for all years.				

This Conformity Determination is made for: the 2015 eight-hour ozone standard non-attainment area: Jefferson, St. Charles and St. Louis Counties, the City of St. Louis and Boles Township in Franklin County in Missouri; and Madison, Monroe and St. Clair Counties in Illinois.