**Note to preparer:**

* Text in **purple** is meant to be replaced or edited by the MPO preparing this document.
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|  |  |
| --- | --- |
| Parameter | User Input |
| Name of MPO | [**MPO Name]** |
| Name of region | **[Region name]** |
| RTP/MTP | **[Name of RTP/MTP]** |
| TIP | **[Name of TIP]** |
| Conformity year | **[Conformity Year]** |
| Analysis base year | **[Base Year]**  |
| MOVES version | **[MOVES version]** |

* Text that is not colored should be left unchanged.
* The preparer must include a title page for this conformity analysis.

**Update Log:**

This table documents the updates to this template since the last release.

|  |  |
| --- | --- |
| Date | Update(s) |
| 11/12/2024 | * Autofilled certain elements in the document from the first page. The user can now select the MPO, region, conformity year, etc. on the front page and populate document accordingly.
* Added this update log. This ensures working group members can easily recognize updates to the template.
* Changed Tables 4-5 and 4-6. Updated the tables to reflect MOVES4 updates (including electricity fuel type, etc.).
* In Section 5.1, added the option to change the MOVES version and description based on comments from the working group. This ensures future versions of MOVES can be inserted easily.
 |
| 1/23/2025 | * Incorporated feedback from working group members.
 |
|  |  |

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# List of Abbreviations

AADT Average Annual Daily Traffic

AERR Air Emissions Reporting Requirements

ANSWT Average Non-summer Weekday Traffic

APU Auxiliary Power Unit

ATR Automated Traffic Recorder

AVFT Alternate Vehicle Fuel Technology

BD Biodiesel

CAAA Clean Air Act Amendments of 1990

CFR Code of Federal Regulations

CG Conventional Gasoline

CMAQ Congestion Mitigation and Air Quality Improvement Program

CNG Compressed Natural Gas

CO Carbon Monoxide

DFW Dallas-Fort Worth

DOE Department of Energy

DOT Department of Transportation

E200 Lower Volatility Percentage

E300 Upper Volatility Percentage

EI Emissions Inventory

EPA Environmental Protection Agency

ETBE Ethyl Tert-Butyl Ether

ETOH Ethanol

FHWA Federal Highway Administration

FTA Federal Transit Administration

GVWR Gross Vehicle Weight Rating

HC Hydrocarbon

HPMS Highway Performance Monitoring System

I/M Inspection and Maintenance

MoSERS Mobile Source Emission Reduction Strategies

MOVES Motor Vehicle Emission Simulator

MPA Metropolitan Planning Area

MPO Metropolitan Planning Organization

MTBE Methyl Tert-Butyl Ether

MTP Metropolitan Transportation Plan

MVEB Motor Vehicle Emissions Budget

NAAQS National Ambient Air Quality Standards

NOx Nitrogen Oxides

OBD Onboard Diagnostics

OD Origin-Destination

ONI Off-Network Idling

PACP Pre-analysis Consensus Plan

PAH Polycyclic Aromatic Hydrocarbons

PC Passenger Car

PM Particulate Matter

RIF Road Idle Fraction

RTP Regional Transportation Plan

RVP Reid Vapor Pressure

SHEI Source Hours Extended Idling

SHI Source Hours Idling

SHO Source Hours Operating

SHP Source Hours Parked

SIP State Implementation Plan

SUT Source Use Type

T50 Temperature at which 50% of the fuel has evaporated

T90 Temperature at which 90% of the fuel has evaporated

TAME Tert-Amyl Methyl Ether

TAZ Traffic Analysis Zone

TCEQ Texas Commission on Environmental Quality

TCM Transportation Control Measure

TDM Travel Demand Model

TERM Transportation Emission Reduction Measure

TIP Transportation Improvement Program

TTI Texas A&M Transportation Institute

TxDMV Texas Department of Motor Vehicles

TxDOT Texas Department of Transportation

USC U.S. Code

VHT Vehicle Hours of Travel

VMT Vehicle Miles of Travel

VOC Volatile Organic Compound

VPGF Vehicle Type of Population Growth Factor

[Abb.] [Add more abbreviations if needed]

# Executive Summary

## Conformity Overview

The Clean Air Act Amendments of 1990 (CAAA) require transportation plans, programs, and projects in nonattainment and maintenance areas, funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA), to conform to the motor vehicle emissions budgets (MVEBs) established in the state implementation plan (SIP) and deemed adequate or approved by the U.S. Environmental Protection Agency (EPA). Nonattainment areas with no MVEBs must demonstrate conformity by satisfying interim emissions test(s). Satisfying MVEBs or interim emissions tests ensures that transportation plans, programs, and projects do not produce new air quality violations, worsen existing violations, or delay the timely attainment of National Ambient Air Quality Standards (NAAQS). Section 176(c)(4) of the CAAA requires metropolitan planning organizations (MPOs), for areas designated as nonattainment and/or maintenance for a NAAQS, to conduct an air quality conformity analysis to demonstrate that metropolitan transportation plans (MTPs)/regional transportation plans (RTPs) and/or transportation improvement programs (TIPs) are consistent with the region’s air quality goals.

Check only one box and then complete as applicable.

[ ]  For nonattainment or maintenance areas with adequate or approved SIP MVEB(s)

This conformity analysis requires MVEB test(s) that must demonstrate that the total emissions for the nonattainment or maintenance area is less than or equal to the applicable SIP MVEB(s), which establish emissions ceilings for the regional transportation network.

As the **[Region name]**regional MPO, [**MPO Name]** is responsible for conducting the air quality conformity analysis to address the [**name of NAAQS** (e.g., 2015 ozone, PM10, etc.)].

[ ]  For moderate and above ozone nonattainment areas without an adequate or approved SIP MVEB(s)

This conformity analysis must satisfy both the build/no-build and the less-than-baseline interim emissions tests. For the build/no-build test, the regional transportation network build (or action scenario) emissions for each analysis year must be less than the no-build (or baseline scenario) emissions for the analysis year. For the less-than-baseline test, the build (or action scenario) emissions for each analysis year must be less than the baseline-year[[1]](#footnote-2) emissions.

As the **[Region name]**MPO, [**MPO Name]** is responsible for conducting the air quality conformity analysis to address the [**name of NAAQS** (e.g., 2015 Ozone NAAQS, etc.)**]**.

## Air Quality and Nonattainment Area

### Air Pollution

Pollutant(s) covered in this conformity analysis include the following.

Check all that apply.

[ ]  **Precursors to ozone:** Volatile organic compounds (VOCs) and nitrogen oxides (NOx): “Ground-level ozone is a colorless compound formed when NOx and VOC chemically react in the presence of sunlight. It is not directly emitted into the air. Ground level ozone is known to trigger a variety of health problems and is particularly harmful to children, older adults, and people of all ages who have lung diseases, such as asthma” (source: EPA).

[ ]  **Carbon monoxide (CO):** “CO is a colorless, odorless gas that can be harmful when inhaled in large amounts. CO is released when something is burned. The greatest sources of CO to outdoor air are cars, trucks and other vehicles or machinery that burn fossil fuels. Breathing air with a high concentration of CO reduces the amount of oxygen that can be transported in the blood stream to critical organs like the heart and brain. At very high levels, CO can cause dizziness, confusion, unconsciousness, and death” (source: EPA).

[ ]  **Particulate matter that is 10 micrometers in diameter or less (PM10):** “PM-10 are inhalable particles, with diameters that are generally 10 micrometers and smaller. PM-10 are either emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires, or formed in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides, which are pollutants emitted from power plants, industries and automobiles. PM-10 can get deep into the lungs, and some may even get into the bloodstream” (source: EPA).

[ ]  **Particulate matter that is 2.5 micrometers in diameter or less (PM2.5):** “PM 2.5 are inhalable particles, with diameters that are generally 2.5 micrometers and smaller. PM 2.5 are either emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires, or formed in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides, which are pollutants emitted from power plants, industries and automobiles. PM 2.5 pose the greatest risk to health among particulate matter” (source: EPA).

### Nonattainment Area

Figure 1‑1 shows the [**MPO Name]** boundary map along with boundaries for the **[name of NAAQS** (e.g., 2015 ozone NAAQS, etc.)**].**



SAMPLE

Figure 1‑1. [Region name]Nonattainment and Maintenance Boundaries

**For the 2015 8-hour ozone standard designations:** Effective August 3, 2018, the nine-county Dallas-Fort Worth (DFW) area, encompassing Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Tarrant, and Wise Counties, received a classification as marginal nonattainment for the 2015 8-hour ozone NAAQS. The DFW marginal nonattainment area had an attainment date set for August 3, 2021, referencing the 2020 attainment year. However, on October 7, 2022, EPA reclassified the nine-county DFW area from marginal to moderate nonattainment. The new attainment date for moderate nonattainment areas is now August 3, 2024, with a 2023 attainment year.[[2]](#footnote-3)

**For the 2008 8-hour ozone standard designations:** Effective July 20, 2012, the 10-county DFW area, encompassing Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties, was designated as nonattainment and classified as moderate under the 2008 8-hour ozone NAAQS. Subsequently, on August 23, 2019, EPA elevated the classification of the 10-county DFW area from moderate to serious nonattainment. The attainment date for serious nonattainment areas was set for July 20, 2021, referencing the 2020 attainment year. More recently, on October 7, 2022, EPA further reclassified the 10-county DFW area from serious to severe nonattainment, extending the attainment date for severe nonattainment areas to July 20, 2027, with a 2026 attainment year.[[3]](#footnote-4)

## RTP/MTP and TIP

This conformity determination is being prepared to ensure that the **[Name of RTP/MTP]** and **[Name of TIP]** meet the conformity-related requirements of the CAAA, SIP, and final conformity rule (Title 40 of the Code of Federal Regulations [CFR], Parts 51 and 93).

Per 23 CFR 450.324, all projects are constrained by the financial resources estimated to be reasonably available within the transportation plan time frame. A list of the projects in the **[Name of RTP/MTP]** and **[Name of TIP]** that affect this conformity analysis is included in Appendix B—RTP/MTP of this conformity report.

## Analysis

This emissions analysis for determining conformity was performed under 40 CFR 93.109(c)(2)(ii)(B):

**The analysis years for this conformity are** (e.g.) 2023 (the potential attainment year when the area is reclassified to moderate under the 2015 8-hour ozone NAAQS), 2026 (the potential attainment year when the area is reclassified to severe under the 2008 8-hour ozone NAAQS), 2036, and 2045 (the MTP horizon year).

Check only one box and then describe as applicable.

[ ]  For nonattainment or maintenance areas with adequate or approved SIP MVEB(s)

**Description and approval/justification of the MVEB used.** (e.g.) The 2017 MVEBs[[4]](#footnote-5) for the North Central Texas 10-county nonattainment area will be used. Since the 2015 8-hour ozone nonattainment area covers a smaller geographic area within the 2008 8-hour ozone nonattainment area, the approved 2017 attainment demonstration SIP MVEBs may be used to determine conformity for the 2015 8-hour ozone NAAQS.

[ ]  For moderate and above ozone nonattainment areas without an adequate or approved SIP MVEB(s)

**Description of interim emissions tests used**. (e.g.) Analysis-year build emissions do not exceed analysis-year no-build emissions and do not exceed baseline year emissions.

## Findings

The [**pollutant(s)** (e.g., PM10, etc.)] vehicle [**period** (e.g., summer weekday)] emission results shown in Table 1-1 below demonstrate that the **[Region name]**nonattainment region meets the regional air quality conformity requirements [**name of NAAQS** (e.g., 2015 ozone, PM10, etc.)].

[ ]  Table 1‑1. For nonattainment or maintenance areas with adequate or approved SIP MVEB(s)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Analysis Year | Total Vehicle Miles of Travel | NOx Budget (Tons/Day) | NOx Emissions (Tons/Day) | VOC Budget (Tons/Day) | VOC Emissions (Tons/Day) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

[ ]  Table 1-1. For moderate and above ozone nonattainment areas without an adequate or approved SIP MVEB(s)

| Analysis Year | Total Vehicle Miles of Travel | NOx Build (Action) Including CMAQ (Tons/Day) | NOx No-Build (Baseline) (Tons/Day) | VOC Build (Action) Including CMAQ (Tons/Day) | VOC No-Build (Baseline) (Tons/Day) |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

The results of the conformity determination demonstrate that **[Name of RTP/MTP]** and **[Name of TIP]** meet the requirements of the air quality SIP for the **[Region name]** nonattainment area and are per the CAAA (Title 42 U.S. Code [USC], Parts 7504, 7506 [c], and 7506 [d]), as amended on November 15, 1990, and the final conformity rule (40 CFR 51 and 93).

# Transportation Conformity Requirements

## What Is Transportation Conformity?

As mandated under CAAA Section 176(c), transportation conformity ensures that federally supported transportation activities align with and conform to the objectives outlined in a state’s SIP. An SIP serves as the state air quality blueprint for meeting the NAAQS. The SIP consists of a compilation of legally enforceable rules and regulations crafted by a state or local air quality agency. The governor of the state submits this plan to EPA for approval. The primary goal of a SIP is to enhance air quality by achieving, progressing toward, or maintaining compliance with the NAAQS. Each SIP specifies emissions reductions for every pollutant or precursor, categorized by source type, including on-road motor vehicles, non-road equipment and vehicles, stationary sources, and area sources.

Before an RTP/MTP or TIP can be adopted, approved, or accepted in nonattainment areas, MPOs and the U.S. Department of Transportation (DOT) must make conformity determinations on these documents. As described in Section 176(c)(1) of the CAAA, transportation conformity is granted when the following conditions are met:

1. Conformity to an 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.
2. That such activities will not:
3. Cause or contribute to any new violation of any standards in any area;
4. Increase the frequency or severity of any existing violation of any standard in any area; or
5. Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

A new conformity determination must be performed any time an RTP/MTP is amended in a significant manner, when a region or state’s air quality goals change, and/or every 4 years.

## Conformity Requirements

The CAAA requires transportation plans, programs, and projects in nonattainment and maintenance areas, which are funded or approved by FHWA or FTA, to conform to the MVEBs established in the SIP, or to satisfy applicable interim emissions tests, absent MVEBs. A regional emissions analysis is the key analytic component of the transportation conformity process. It is conducted to demonstrate that:

* Regional emissions from on-road sources do not exceed the established MVEB or satisfy interim emissions test(s), absent an MVEB.
* Regional emissions from on-road sources do not cause or contribute to violations of EPA’s NAAQS.
* Transportation activities are consistent with air quality goals identified in the SIP.

As stipulated by the CAAA, requirements for conformity analysis include:

* Use of the latest planning assumptions ([40 CFR 93.110](https://www.law.cornell.edu/cfr/text/40/93.110)).
* Analysis based on the latest emission estimation model available ([40 CFR 93.111](https://www.law.cornell.edu/cfr/text/40/93.111)).
* Interagency consultation and a public involvement process, which must be conducted during the analysis ([40 CFR 93.112](https://www.law.cornell.edu/cfr/text/40/93.112)).
* Timely implementation of transportation control measures (TCMs) ([40 CFR 93.113](https://www.law.cornell.edu/cfr/text/40/93.113)).
* A transportation plan and TIP that are consistent with the MVEBs established in the applicable SIP (if there is an adequate or approved SIP budget) ([40 CFR 93.118](https://www.law.cornell.edu/cfr/text/40/93.118)).
* Inclusion of all regionally significant projects expected in the nonattainment and maintenance area in the transportation plan and/or TIP ([40 CFR 93.114](https://www.law.cornell.edu/cfr/text/40/93.114) and [93.115](https://www.law.cornell.edu/cfr/text/40/93.115)).

The determination of the analysis is a two-step process in metropolitan areas. The first step is for the MPO to make the initial transportation conformity determination at the local level. For the **[Region name]**region, the [**MPO Name]** policy body makes this decision. The second step is for FHWA and FTA to make a joint transportation conformity determination at the federal level. Upon federal approval, a 4-year window begins during which projects, programs, and policies identified in the RTP/MTP and TIP may move toward implementation.

## Emissions Analysis

A regional emissions analysis is the key analytic component of the transportation conformity process. The emissions analysis is conducted to demonstrate that:

* Regional emissions from on-road sources do not exceed the established MVEBs (or, if no MVEB exists for the area, analysis-year build emissions do not exceed analysis-year no-build emissions and do not exceed baseline-year emissions).
* Regional emissions from on-road sources do not cause or contribute to violations of the EPA NAAQS.
* Transportation activities are consistent with air quality goals identified in the SIP.

### Regional Inventory

This conformity analysis of the **[Region name]** nonattainment area accounts for emissions resulting from the nonattainment area’s **[Name of RTP/MTP]**, which includes all regionally significant projects located within the **[Region name]** nonattainment area, and the effects of emission control programs adopted by an enforcing jurisdiction.

### Emissions Tests

Conformity determinations must demonstrate consistency between expected emissions from implementing the RTP/MTP and TIP with the MVEBs in the applicable implementation plan.

Check only one box and then populate as applicable.

[ ]  For nonattainment or maintenance areas with adequate or approved SIP MVEB(s)

This conformity analysis requires MVEB test(s) that must demonstrate that the total emissions for the nonattainment or maintenance area is less than or equal to the applicable SIP MVEB(s), which establish emissions ceilings for the regional transportation network.

As the **[Region name]** nonattainment area’s MPO, the [**MPO Name]** is responsible for conducting the air quality conformity analysis to address the [**name of NAAQS** (e.g., 2015 ozone, PM10, etc.)]. The MVEB for the **[Region name]** region is summarized in Table 2‑1.

Table 2‑1. NAAQS and MVEB (Tons/Day)

|  |  |  |
| --- | --- | --- |
| **NAAQS** | **Pollutant** | **MVEB (Tons/Day)** |
| 2008 8-hour ozone | VOC | 64.91 |
| 2008 8-hour ozone | NOx | 130.77 |

[ ]  For moderate and above ozone nonattainment areas without an adequate or approved SIP MVEB(s)

This conformity analysis must satisfy both the build/no-build and the less-than-baseline interim emissions tests. For the build/no-build test, the regional transportation network build (or action scenario) emissions for each analysis year must be less than the no-build (or baseline scenario) emissions for the analysis year. For the less-than-baseline test, the build (or action scenario) emissions for each analysis year must be less than the baseline-year[[5]](#footnote-6) emissions.

As the **[Region name]** nonattainment area’s MPO, [**MPO Name]** is responsible for conducting the air quality conformity analysis to address the [**name of NAAQS** (e.g., 2015 ozone, PM10, etc.)], as listed in Table 2-1.

Table 2-1. NAAQS and Pollutant

|  |  |
| --- | --- |
| **NAAQS** | **Pollutant** |
| 2008 8-hour ozone | VOC |
| 2008 8-hour ozone | NOx |

### Analysis Years

For the emission budget test, according to the conformity rule, [40 CFR 93.106](https://www.govinfo.gov/app/details/CFR-1999-title40-vol14/CFR-1999-title40-vol14-sec93-106), the regional emission analysis years should be selected according to the following:

* Any years within the time frame of the transportation plan, provided they are not more than 10 years apart.
* Any year with an emission analysis budget.
* The attainment year.
* The transportation plan horizon year.

Table 2‑2 shows the conformity analysis years and describes their corresponding requirements for calculations.

Table 2‑2. Conformity Analysis Years

|  |  |
| --- | --- |
| **Requirements** | **Years** |
|  |  |
|  |  |
|  |  |
|  |  |

## Checklist

Table 2‑3 shows the checklist detailing information relevant to this conformity document.

Table 2‑3. Checklist of Items Required in This Conformity Review

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Regulation Referenced** | **Item Format** | **Location within Report** |
| **[Name of RTP/MTP]** | Part 93 Subpart A | Independent self-supporting document (electronic file) | Link as listed in Appendix B—RTP/MTP |
| **[Name of TIP]** | Part 93 Subpart A | Independent self-supporting document (electronic file) | Link as listed in Appendix B—RTP/MTP |
| **[Conformity document name]** | Part 93 Subpart A | Independent self-supporting document (electronic file) | This document |
| Description of version of MOVES model being used | 40 CFR 93.111 | Discussion contained in conformity document | Chapter 5.1 |
| MOVES input and output files |  | Electronic (ASCII or txt file format) | Appendix Section D.1 MOVES Input and Output |
| MOVES emission factors |  | Electronic (ASCII or txt file format) | Appendix Section D.2 MOVES Emission Factors |
| MOVES activity |  | Electronic (ASCII or txt file format) | Appendix Section D.3 Activities |
| MOVES external reference files |  | Electronic (ASCII or txt file format) | Appendix Section D.1 MOVES Input and Output |
| MOVES utilities |  | Electronic (ASCII or txt file format) | Appendix Section D.4 Emissions Modeling Utilities |
| MoSERS methodology andcalculation descriptions |  | Electronic file | Appendix Section E.1 MoSERS Methodology/Calculation Descriptions |
| MoSERS project listing |  | Electronic file | Appendix Section E.2 MoSERS Project Listing |
| Highway Performance Monitoring System adjustment(s), factors, and approach | 40 CFR 93.122(b)(3) | Discussion contained in conformity document | Chapter 4.4 |
| Description of TDM validation, including validation year | 40 CFR 93.106(a)(1)(ii) | Discussion contained in conformity document | Chapter 4.1 and Appendix Section C.1 Travel Model Validation |
| Vehicle miles of travel |  | Electronic file | Appendix Section D.5 VMT, Speed, and Emissions Summaries |
| Average loaded speeds |  | Electronic file | Chapter 4.6.3 |
| Centerline mile summaries for each analysis year |  | Electronic file | Appendix Section C.2 Links, Miles, Centerline, and Lane Miles Summaries |
| Definition of regionally significant roadway system |  | Discussion contained in conformity document | Chapter 3.3 |
| Network link listing for each analysis year |  | Discussion contained in conformity document (electronic file) (electronic files should include TransCAD files, SHAPE files, and spreadsheet files) | Chapter 4.5 and Appendix Section C.3 Link Listing and Capacity  |
| Files containing hourly distribution by county, roadway type, and vehicle type forvehicle miles of travel,vehicle hours,average operational speed,vehicle population,NOx emissions, andVOC emissions |  | Electronic files in tab-delimited summary tables | Appendix Section D.5 VMT, Speed, and Emissions Summaries |
| TCMs in SIP, including emission reductions, methodologies, implementation dates, etc. |  | Electronic file | Chapter 6.2.2.1 |
| Timely implementation of TCMs | 40 CFR 93.113 | Discussion contained in conformity document | Chapter 6.2.2.1 |
| Congestion Mitigation and Air Quality Improvement Program (CMAQ) projects containing emission benefits, methodologies, and implementation dates |  | Identified in TIP: independent self-supporting document (electronic file) | Link as listed in Appendix B—RTP/MTP |
| Roadway system (capacity staging) |  | Electronic file | Appendix Section C.2 Links, Miles, Centerline, and Lane Miles Summaries |
| List of non-federal projects | In response to March 2, 1999, court ruling | Identified in TIP: independent self-supporting document (electronic file) | Link as listed in Appendix B—RTP/MTP |
| List of exempt projects | 40 CFR 93.105(c)40 CFR 93.12640 CFR 93.12740 CFR 93.128 | Identified in TIP: independent self-supporting document (electronic file) | Link as listed in Appendix B—RTP/MTP |
| Evidence of fiscal constraint | 40 CFR 93.108 | Identified in TIP: independent self-supporting document (electronic file) | Link as listed in Appendix B—RTP/MTP |
| Evidence of RTP/MTP specifically describing the transportation system envisioned for each analysis year | 40 CFR 93.106(a) | Identified in TIP: independent self-supporting document (electronic file) | Link as listed in Appendix B—RTP/MTP |
| Evidence of public participation and response to comments | 40 CFR 93.105 | Electronic file | Appendix Section G.1 Meeting I |
| Endorsements and/or resolutions |  | Electronic file | Appendix A—Resolution of Adoption |
| Memorandum of agreements |  | Electronic file | Appendix A—Resolution of Adoption |
| Applicable *Federal Register* notices and related documents |  | Discussion contained in conformity document | Throughout the conformity document and appendices |
| Interagency consultation |  | Electronic file | Appendix F—Interagency Consultation Process |

# RTP/MTP and TIP

## [Name of RTP/MTP] and [Name of TIP]

### Overview

[**MPO Name]** serves [**X number of counties in the YYY metropolitan area**]. This region includes the [**areas under nonattainment** (e.g., 2008 8-hour ozone 10-county nonattainment area], which covers [**XX, YY, and ZZ county(s)**].

On [**approval date**], **[Name of RTP/MTP]** and the **[Name of TIP]** were considered for approval by the [**MPO Name]** Policy Board. The **[Name of RTP/MTP]** update covers a planning period of [**beginning year**] through [**end year**] and contains a list of projects fiscally constrained by estimates of reasonably available revenues. This update reflects the priorities for transportation investments within the [**MPO Name]** metropolitan planning area (MPA). A complete listing of fiscally constrained projects, as proposed under this conformity determination, is provided in Appendix Section B.1 Project Listings. This listing denotes projects that are regionally significant or otherwise subject to transportation conformity and those projects that are exempt from transportation conformity, are exempt from regional emissions analysis, or have been determined to be not regionally significant.

### Submittal Frequency

Consistent with the requirements of [23 USC 134](https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title23-section134&num=0&edition=prelim#:~:text=%2DThe%20Secretary%20may%20not%20permit,Clean%20Air%20Act%20(42%20U.S.C.), the transportation plan and/or TIP are required to be updated every 4 years. Since **[Region name]** is a non-attainment area for the [**Name of NAAQS** (e.g., 2015 ozone, PM10, etc.)], every amendment or update to the transportation plan and/or TIP must show conformity to the air quality budgets coming from the latest revisions to the SIP. If more than 4 years elapse after DOT’s transportation conformity determination for a plan update, a 12-month grace period shall be in force. At the end of this 12‑month grace period, DOT’s existing transportation conformity determination will lapse.

A conformity determination for a transportation plan must be based on the transportation plan and all amendments. According to [40 CFR 93.104](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.104), each new transportation plan and/or TIP update or amendment must be demonstrated to conform before amendments are approved by the [**MPO Name]** Policy Board or accepted by DOT unless the amendment merely adds or deletes exempt projects listed in [40 CFR 93.126](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.126), [93.127](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.127), or [993.128](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.128).

According to [42 USC 7506 I(2)(E)](https://www.law.cornell.edu/uscode/text/42/7506), the MPO must redetermine the conformity of existing transportation plans and programs not later than 2 years after the date on which the administrator:

* 1. Finds a motor vehicle emissions budget to be adequate per [40 CFR 93.118(e)(4)](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.118) (as in effect on October 1, 2004);
	2. Approves an implementation plan that establishes a motor vehicle emissions budget if that budget has not yet been determined to be adequate per clause (i); or
	3. Promulgates an implementation plan that establishes or revises a MVEB.

### Fiscal Constraints

All transportation plans prepared by the MPO are required to be fiscally constrained. Fiscal constraint is demonstrated by a financial plan that outlines reasonably available future revenues to implement the projects listed in the transportation plan. The constraints are:

* **Long-range financial constraint:** The transportation plans’ financial element must identify all sources of funds reasonably expected to be available and any innovative financial strategies that may be necessary to implement the transportation plans. The **[Name of RTP/MTP]** update estimates [**dollar amount, $**] of revenue to be reasonably available to implement the recommendations. The **[Name of RTP/MTP]** update’s total expenditure is estimated to be approximately [**dollar amount, $**].
* **Short-range financial constraint**: Financial constraint is also required for a conforming TIP, with funds programmed being equal to the total funds available. The TIP comprises the first 4 years of transportation activities in the transportation plan. The **[Name of TIP]** amendment estimates [**dollar amount, $**] of revenue to be reasonably available to implement the recommendations. The **[Name of TIP]** amendment’s total expenditure is estimated to be approximately [**dollar amount, $**].

## Regional Significant Control Program

Each SIP submitted by a state under Section 110 of the CAAA shall include enforceable emission limitations and other control measures, means, or techniques, as well as schedules and timetables for compliance to meet the applicable requirements of the act. No MPO designated under [23 USC 134](https://www.law.cornell.edu/uscode/text/23/134) shall give its approval to any project, program, or plan that does not conform to an implementation plan. The following are the provisions written in the SIPs for the nonattainment pollutants dealing with transportation-related measures:

1. [Title of program]—[description of program].

## Regionally Significant Travel Projects/Programs

Per [40 CFR 93.101](https://www.law.cornell.edu/cfr/text/40/93.101), regionally significant projects are transportation projects (other than an exempt project) that are on a facility that serves regional transportation needs (e.g., 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 and most terminals themselves). Regionally significant projects 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.

Regionally significant roadways include:

* **Insert the MPO’s regionally significant roadways definition.**

Figure 3‑1 shows roadway systems that meet the definition of regionally significant. These roads are subjected to transportation and project-level determinations.



SAMPLE

Figure 3‑1. Regionally Significant Roads in the MPO MPA

## Other Projects/Programs

### Non-federal Projects/Programs

Non-federal projects funded by sources such as local governments and local transportation authorities, such as signal improvements, intersection improvements, and local roadway widening, may be of insufficient scale or scope to require inclusion within a transportation conformity regional emissions analysis. These non-regionally significant projects that do not require any federal project approval actions (e.g., environmental clearance or permit approvals) are not individually listed within the transportation plan and/or TIP.

### Exempt Projects/Programs

The regulation [40 CFR 93.126](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.126) identifies several project types that are exempt from the requirement of a conformity determination. When a conforming transportation plan or TIP is revised to add or remove an exempt project, a new conformity determination is not required. Some of the exempt projects listed under [40 CFR 93.126](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.126) include the continuation of ridesharing and vanpooling promotion activities at current levels, bicycle and pedestrian facilities, railroad/highway crossings, fencing, shoulder improvements, the purchase of replacement transit vehicles, and road landscaping.

Additionally, [40 CFR 93.127](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.127) identifies project types that are exempt from a regional emissions analysis but may still require project-level conformity. These include intersection channelization projects, intersection signalization projects at individual intersections, interchange reconfiguration projects, changes in vertical and horizontal alignment, truck size and weight inspection stations, and bus terminals and transfer points.

Finally, [40 CFR 93.128](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.128) exempts traffic signal synchronization projects; however, regionally significant traffic signal synchronization projects must be included in subsequent regional emissions analyses.

# Vehicle Activity Estimation

## Overview of the Travel Model

The [**MPO Name]** TDM serves as the source for forecasting vehicle miles of travel (VMT) and other travel characteristics for [counties covered by the model]. The TDM is executed in the [**environment** (e.g., TransCAD environment)]. The model base year is **[Base Year]** , and the forecasted years are [**forecasted years**]. The trip characteristics forecasted include the number of trips, trip origins-destinations (ODs), and travel mode. The model assigns all vehicle trips to the roadway network and produces VMT at the link level. The assigned roadway network with forecasted VMT is then processed by the emissions model for mobile emission analysis.

## Transportation Modeling Process

The forecasting technique is based on a four-step sequential process designed to model travel behavior and predict the level of travel demand at regional, sub-area, or small-area levels. These four steps are trip generation, trip distribution, mode choice, and roadway assignment.

### Trip Generation Model

The basic geographic unit for the travel demand modes is the traffic analysis zone (TAZ). Trip generation was performed using the [**trip generation model**]. The travel model covers [**study area** (sq mi)] square miles and [**number of counties**] counties (including **[counties included]**), and contains [**number of TAZs**] TAZs, of which [**number of internal zones**] are internal zones and [**number of external zones or stations**] are external zones or stations.

For this conformity analysis, the defined base year for the forecast is **[Base Year]** . The demographic estimates and forecasts were developed by [**how the demographic estimates and forecasts were estimated**; includes data source and year].

### Trip Distribution Model

The trip distribution model determines the interaction between each zone within the study area. The model connects trip ends estimated in the trip generation model, creating OD TAZ pairs and resulting in OD trip tables. This step is performed using the [**trip distribution model**].

Trips were allocated based on [**trip allocation methodology or procedures**]. Then, a reasonableness check was performed to ensure that the modeled trip information was consistent with [**checking mechanism**].

### Mode Choice Model

The mode choice model subsequently determines the mode of travel selected by travelers. This determination is performed using [**mode choice model**]. These decisions are based on the characteristics of:

* The trip maker (income and auto sufficiency).
* The trip (purpose, length, and orientation).
* The availability and utility of the competing transportation modes.

Table 4‑1 shows the mode choices included.

Table 4‑1. Example of Mode Choices Modeled Table

|  |  |
| --- | --- |
| Number | Mode Choice |
| 1 | Drive alone |
| 2 | Shared ride |

### Roadway Assignment Model

The Roadway Assignment Model loads the travel demand (trips) to the roadway network, calculates delay for congested links, and reassigns as necessary to achieve network equilibrium. This step is performed using [**Roadway Assignment Model**].

## Speed Estimation Procedure

As part of the TDM calibration process, speeds for each roadway facility type are estimated and further categorized by area type. These input speeds reflect the average daily travel speeds.

[**Include brief information on the approach and speed model used.**]

## Local Street VMT

The roadway network of the regional TDM does not contain the details of local (residential) streets. However, a VMT estimate is possible based on data provided by the travel model. Local street VMT is calculated for each county by multiplying the number of intrazonal trips by the intrazonal trip length and then adding the VMT from the zone centroid connectors. The temporal distribution is assumed to be the same as for non-local streets.

## Model VMT Adjustments

An adjustment factor based on the Texas Department of Transportation’s (TxDOT’s) Highway Performance Monitoring System (HPMS) was applied to the TDM’s VMT to ensure consistent reporting across the state. The HPMS adjustment factor is applied to the model estimated time-of-day VMT before the estimation of time-of-day speed. In this way, the time-of-day speeds used in the estimation of emissions are based on HPMS-adjusted VMT. This methodology is consistent with the procedures used by the Texas A&M Transportation Institute (TTI) in developing model adjustment factors for the rest of Texas.

### HPMS Adjustments

The HPMS adjustment factor is applied to the model estimated time-of-day VMT prior to the estimation of time-of-day speed. In this way, the time-of-day speeds used in the estimation of emissions are based on the HPMS-adjusted VMT. The factor used to reconcile model-estimated regional VMT to HPMS-estimated regional VMT is calculated by dividing the HPMS-estimated average non-summer weekday VMT:

$$HPMS ANSWT=HPMS AADT ×AADT\\_to\\_ANSWT factor $$

$$HPMS factor=HPMS ANSWT/Model\\_estimated\\_ANSWT$$

Where:

*HPMS ANSWT* = HPMS-based average non-summer weekday travel.

As Table 4‑2 shows, the HPMS adjustment factor was calculated based on these calculations.

Table 4‑2. [TDM Validation Year] HPMS Factor

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **HPMS AADT VMT1** | **AADT-to-ANSWT Factor** | **HPMS-Based ANSWT VMT** | **TDM VMT\*** | **HPMS Factor\*\*** |
|  |  |  |  |  |

\* Total counties included. Counties included were [**list counties included**].

\*\* Applied to all analysis years and areas in the TDM.

### Seasonal and Daily Adjustments

Seasonal adjustment factors are used to adjust the TDM’s VMT to summer weekday VMT. Historical-year vehicle population estimates are based on the Texas Department of Motor Vehicles’ (TxDMV’s) mid-year registrations corresponding to the historical year, and the most recent mid-year registration data are used for the future year. The seasonal, daily, and hourly adjustment factors were developed using the [**base data**] automated traffic recorder (ATR) data over the years [**years** (e.g., 2005–2014)]. To adjust the representative seasonal weekday traffic VMT from TDM to the specified day types in the summer season, ratios were calculated by dividing the average day-of-week (weekday) count for the summer (June–August) and/or winter (December–February) episodes by the ANSWT count. Table 4‑3 shows the seasonal adjustment factors.

Table 4‑3. Seasonal Adjustment Factors

|  |  |  |
| --- | --- | --- |
| Season | Counties | Adjustment Factor |
| Summer weekday | **[Counties]** | **[Summer adjustment factor]** |
| Winter weekday | **[Counties]** | **[Winter adjustment factor]** |

### Hourly Adjustments

The hourly factors in Table 4‑4 are used to convert the TDM output into hourly VMT. The hourly factors were calculated using [**ATR data year**] ATR data.

Table 4‑4. Example of Summer Weekday Hourly VMT Distribution

| Period | Hour | [Season] 24-hour | [Season] 4-Period |
| --- | --- | --- | --- |
| [**Time period** (e.g., overnight)] | 12:00 a.m. to 01:00 a.m. |  |  |
| [**Time period** (e.g., overnight)] | 01:00 a.m. to 02:00 a.m. |  |  |
| [**Time period** (e.g., overnight)] | 02:00 a.m. to 03:00 a.m. |  |  |
| [**Time period** (e.g., overnight)] | 03:00 a.m. to 04:00 a.m. |  |  |
| [**Time period** (e.g., overnight)] | 04:00 a.m. to 05:00 a.m. |  |  |
| [**Time period** (e.g., overnight)] | 05:00 a.m. to 06:00 a.m. |  |  |
| [**Time period** (e.g., AM peak)] | 06:00 a.m. to 07:00 a.m. |  |  |
| [**Time period** (e.g., AM peak)] | 07:00 a.m. to 08:00 a.m. |  |  |
| [**Time period** (e.g., AM peak)] | 08:00 a.m. to 09:00 a.m. |  |  |
| [**Time period** (e.g., midday)] | 09:00 a.m. to 10:00 a.m. |  |  |
| [**Time period** (e.g., midday)] | 10:00 a.m. to 11:00 a.m. |  |  |
| [**Time period** (e.g., midday)] | 11:00 a.m. to 12:00 p.m. |  |  |
| [**Time period** (e.g., midday)] | 12:00 p.m. to 01:00 p.m. |  |  |
| [**Time period** (e.g., midday)] | 01:00 p.m. to 02:00 p.m. |  |  |
| [**Time period** (e.g., midday)] | 02:00 p.m. to 03:00 p.m. |  |  |
| [**Time period** (e.g., PM peak)] | 03:00 p.m. to 04:00 p.m. |  |  |
| [**Time period** (e.g., PM peak)] | 04:00 p.m. to 05:00 p.m. |  |  |
| [**Time period** (e.g., PM peak)] | 05:00 p.m. to 06:00 p.m. |  |  |
| [**Time period** (e.g., PM peak)] | 06:00 p.m. to 07:00 p.m. |  |  |
| [**Time period** (e.g., overnight)] | 07:00 p.m. to 08:00 p.m. |  |  |
| [**Time period** (e.g., overnight)] | 08:00 p.m. to 09:00 p.m. |  |  |
| [**Time period** (e.g., overnight)] | 09:00 p.m. to 10:00 p.m. |  |  |
| [**Time period** (e.g., overnight)] | 11:00 p.m. to 12:00 a.m. |  |  |

### Nonrecurring Congestion

Is nonrecurring congestion a factor?

[ ]  Yes

[**Explanation on how nonrecurring congestion is applied.**]

[ ]  No

Regional travel demand model does not model for nonrecurring congestion, and this emission model does not use any adjustment factor developed to account for nonrecurring congestion.

## Estimation of On-Network Activity

### Transit Systems

Is transit VMT applicable?

[ ]  Applicable

[**Transit county, coverage area (in square miles), and transit VMT** (e.g., TRANSIT\_NAME serves XX, YY, and ZZ Counties. Its service area covers 9,999 miles. The summer weekday daily regional transit VMT for analysis years 2023, 2026, 2036, and 2045 is ####, ####, ####, and ####, respectively.]

[ ]  Not applicable

The transit trips are excluded from the highway assignment and do not contribute to roadway VMT.

### Roadway VMT

Roadway VMT is provided by hour, county, road type and area type. Appendix Section D.5 VMT, Speed, and Emissions Summaries contains all the network years with the final VMT estimates.

### Average Loaded Speeds

Average loaded speeds are provided by hour, county, road type, and area type. The final average loaded speeds are listed in Appendix Section D.5 VMT, Speed, and Emissions Summaries.

### Centerline and Lane Miles.

Centerline miles and lane miles are provided by functional class and area type for each analysis year and are listed in Appendix Section C.2 Links, Miles, Centerline, and Lane Miles Summaries.

## Estimation of Off-Network Activity

County-level, hourly estimates of the source hours parked (SHP) and starts activity were required for each vehicle type to estimate the off-network (or parked vehicle) emissions. Source hours extended idling (SHEI) and auxiliary power unit (APU) hours estimates were needed for combination long-haul trucks. For the estimation of the SHP and vehicle starts, vehicle population estimates were also needed.

The vehicle population and hourly SHP, starts, source hours idling (SHI), and APU hours are available in Appendix Section D.3 Activities.

### Vehicle Populations

Vehicle population data were used to estimate SHP and vehicle starts off-network activity. The vehicle population estimates were derived from the end of year [**year of data**], county-specific vehicle registration data provided by TxDMV, TxDOT district-level VMT mix data, and HPMS-reported county-level VMT totals.

The following steps were used to disaggregate the TxDMV vehicle registration data to vehicle population data by vehicle type:

1. VMT mix data were used to calculate the proportional representation of each MOVES vehicle type within each TxDMV aggregation class (first column of Table 4‑5).

Table 4‑5. Vehicle Registration Aggregations and Vehicle Types

|  |  |
| --- | --- |
| **Vehicle Registration\* Aggregation** | **Associated Vehicle Type\*\*** |
| Motorcycles | MC\_Gas |
| Passenger cars  | PC\_Gas; PC\_Diesel; PC\_Electricity |
| Trucks ≤ 8.5 K gross vehicle weight rating (GVWR) (pounds) | PT\_Gas; PT\_Diesel; PT\_ElectricityLCT\_Gas; LCT\_Diesel; LCT\_Electricity |
| Trucks > 8.5 and ≤ 19.5 K GVWR | RT\_Gas; RT\_Diesel; RT\_ElectricitySUShT\_Gas; SUShT\_Diesel; SUShT\_ElectricityMH\_Gas; MH\_Diesel; MH\_ElectricityObus\_Gas; Obus\_Diesel; Obus\_ElectricityTBus\_Gas; TBus\_Diesel; TBus\_ElectricitySBus\_Gas; SBus\_Diesel; SBus\_Electricity |
| Trucks > 19.5 K GVWR | CShT\_Gas; CShT\_Diesel; CShT\_Electricity |
| NA\* | SULhT\_Gas; SULhT\_Diesel; SULhT\_ElectricityCLhT\_Gas; CLhT\_Diesel; CShT\_Electricity |

\* The four long-haul source use type (SUT)/fuel type populations are estimated using a long-haul-to-short-haul weekday SUT VMT mix ratio applied to the short-haul SUT population estimate.

\*\*The year-end TxDMV county registrations data extracts were used (i.e., the three-file dataset consisting of light-duty cars, trucks, and motorcycles; heavy-duty diesel trucks; and heavy-duty gasoline trucks) for estimating the vehicle populations.

1. The proportional fractions calculated in step 1 were multiplied by the total number of vehicles reported in each TxDMV vehicle registration category to obtain the estimated number of vehicles (populations) for each modeled MOVES vehicle type.

Analysis-year vehicle type populations were then calculated by applying a vehicle type of population growth factor (VPGF). The VPGF was calculated using county-level HPMS-reported total VMT for the registration data year ([**registration data year**]) and each analysis year.

### Off-Network Idling Hours

Off-network idling (ONI) is an idling activity that occurs while a vehicle is idling in a parking lot, drive-through, or driveway while waiting to pick up passengers or loading/unloading cargo. ONI applies to all MOVES source types.

TTI estimates ONI hours activity (i.e., SHI off-network) for each hour of the day using the following formula:

$$ONI Hours=(SHO\_{network} × TIF-SHI\_{network})/(1-TIF)$$

Where:

* $SHO\_{network}$ is the source hours operating (SHO) on each link. This is calculated by dividing the VMT associated with each link by the link’s congested speed.
* $SHI\_{network}$ is the total SHI that occurs on the network (idling that occurs as a component of drive cycles) and is calculated by multiplying *SHOnetwork* by a road idle fraction (RIF). RIF is the proportion of idling (in units of time) that occurs within a drive cycle at a specified operational speed. Default values for RIF were used as defined in the MOVES data table roadidlefraction.
* $TIF$ is the total idle fraction or total idling time on- and off-network divided by total SHO on- and off-network: TIF = (SHInetwork + ONI) / (SHOnetwork + ONI). Default values for *TIF* were used as defined in the MOVES data table totalidlefraction.

### Source Hours Parked

The first activity measure needed to estimate the off-network emissions is county-level estimates of SHP by hour and vehicle type. The SHP was estimated as a function of total hours (hours a vehicle exists) minus its hours of operation on roads (SHO is the same as vehicle hours of travel [VHT]).

The vehicle-type SHP estimates were calculated for each hour of the day based on the link VMT and speeds, the VMT mix used in the link-based emissions analysis, and the vehicle population estimates.

The VMT mix was applied to the link VMT to produce VMT estimates by vehicle type. Link VMT was divided by the link speed to produce SHO estimates. SHO was aggregated across links and then subtracted from source hours (equal to the vehicle population since source hours equal the number of hours in the period), resulting in SHP estimates by vehicle type. This was performed for each analysis year, county, and hour of day.

### Starts

Vehicle starts were estimated using county-level vehicle-type populations and data from MOVES representing the average number of starts per vehicle type per hour. The starts per vehicle were calculated using MOVES with data on the age distribution and fuel fractions of the local fleet.

The starts per vehicle were calculated using MOVES with data on the age distribution and fuel fractions of the local fleet. TTI used local age distributions and fuel fractions inputs to MOVES combined with MOVES default parameters (startsageadjustment, startsmonthadjust [June through August average], and startspervehicle) to produce hourly starts per vehicle output representative of the June through August summer period. The output was then post-processed to produce the scenario-specific starts per vehicle for the summer (or non-school) period defined by the study scope.

MOVES was used to calculate starts per vehicle (i.e., the average number of starts per vehicle type per hour) for the weekday day type for the June through August summer period. To produce the scenario-specific non-school period (June 10 through August 10), the MOVES output summer period starts per vehicle were multiplied by conversion factors based on period weighted-average MOVES default startsmonthadjust data. Using the startsmonthadjust default data, the non-school conversion factor is the ratio of the non-school period to the average June through August summer period.

The local vehicle start activity estimates were calculated as the product of national default starts per vehicle and the local vehicle-type population estimates. The weekday vehicle start estimates for each vehicle type were calculated by county, analysis year, and hour of the day.

### Hoteling: Source Hours Extended Idling and Auxiliary Power Unit Hours

Hoteling hours were calculated for heavy-duty, long-haul trucks only (i.e., SUT 62) in several steps. First, total hoteling hours were calculated using information from a Texas Commission on Environmental Quality (TCEQ) extended idling study.[[6]](#footnote-7) Scaling factors were then used to convert these base hoteling hours to those relevant to each analysis year, which were then allocated to each hour of the day. Estimations were then made of the proportions of hoteling hours that occur in each of the four hoteling categories: idling using the main engine (SHEI), diesel APU operation, electric APU operation, or main engine off and no auxiliary power.[[7]](#footnote-8)

#### Estimating 24-Hour Hoteling

County-level hoteling scaling factors were developed to transform base **[Base Year]** winter weekday total daily hoteling hours to daily hoteling hours for each conformity analysis-year scenario. Scaling factors were calculated using the ratio of heavy-duty long-haul VMT for each scenario relative to heavy-duty long-haul VMT for a **[Base Year]** winter weekday (scenario SUT 62 VMT divided by 2017 winter weekday SUT 62 VMT).

Total daily hoteling for each county and scenario was calculated by multiplying the appropriate scaling factor by the total daily hoteling hours contained in the **[Base Year]** winter weekday total daily hoteling hours study.

#### Hoteling by Hour Estimation

Daily hoteling hours were allocated to each hour of the day as a function of the inverse of activity scenario hourly VHT fractions for SUT 62. The hourly VHT fractions were calculated using the hourly VHT from the SHP estimation process (VHT = SHO). The inverses of these hourly VHT fractions were calculated and then normalized across all hours to produce the county-level, hoteling hours hourly distribution.

If the hourly hoteling hours were greater than the SHP (for SUT 62), the final hoteling hours estimate was set to the SHP.

#### SHEI and APU

County, analysis year, and summer weekday hoteling hours were first estimated using 24-hour weekday hoteling hour estimates for a [**2017 baseline year** (from the most recent TCEQ extended idling study)]; baseline and analysis year scenario VMT, speeds, and VMT mix; and analysis-year scenario SHP estimation data.

The baseline-year county hoteling hours estimates for a 24-hour weekday from the TCEQ study were scaled to each analysis scenario using the ratio of analysis-scenario-to-baseline combination long-haul truck 24-hour VMT (as truck VMT increases, so does hoteling activity).

The 24-hour hoteling estimates were then distributed to each hour of the day using the hoteling hours hourly distribution calculated for the analysis scenario as the inverse of the hourly distribution of VHT (or SHO, from the SHP calculation process) for combination long-haul trucks. Within each hour, SHP and hoteling hours were compared, and if hoteling hours exceeded the SHP, hoteling hours were set equal to the SHP.

SHEI and APU hours components of hoteling hours were then estimated for each hour using the hourly hoteling hours estimates, combination long-haul truck travel fractions (calculated from local age distributions and MOVES default relative mileage accumulation rates), and hoteling activity distributions for each model year.

The SHEI and APU hours activity distribution fractions (see Table 4‑6) were each first multiplied by the travel distribution (model-year operating mode activity fraction multiplied by the associated mode-year travel fraction). The products of the SHEI fractions and travel fractions were then summed to produce the total SHEI fraction, and the same process was performed for APU hours to produce the total APU hours fraction. (The sum of the SHEI and APU hours fractions subtracted from 1.0 results in the fraction of hoteling hours with electric power or no power in use.)

Table 4‑6. Hoteling Activity Distribution by Model Year

| First Model Year | Last Model Year | 200Extended Idling | 201Hoteling Diesel Auxiliary | 203Hoteling Battery AC | 204Hoteling APU Off |
| --- | --- | --- | --- | --- | --- |
| 2 | 1960 | 2009 | 0.80 | 0.00 | 0.00 |
| 2 | 2010 | 2020 | 0.73 | 0.07 | 0.00 |
| 2 | 2021 | 2023 | 0.48 | 0.24 | 0.00 |
| 2 | 2024 | 2026 | 0.40 | 0.32 | 0.00 |
| 2 | 2027 | 2060 | 0.36 | 0.32 | 0.00 |
| 3 | 1960 | 2020 | 0.80 | 0.00 | 0.00 |
| 3 | 2021 | 2026 | 0.72 | 0.00 | 0.00 |
| 3 | 2027 | 2060 | 0.68 | 0.00 | 0.00 |
| 9 | 1960 | 2060 | 0.00 | 0.00 | 0.80 |

The total SHEI and APU hours fractions were then each multiplied by the hoteling hours for each hour of the day to produce the SHEI and APU hours estimates for each hour. This was performed for each analysis scenario (analysis-year summer weekday).

# Emissions Factor Estimation

A regional emissions analysis must be conducted for multiple analysis years to satisfy the requirements of 40 CFR 93.109 of the conformity rule for ozone nonattainment areas. Specifically, the regional emissions analysis is used to conduct the emission budget test (or interim emission tests) and to determine any contributions to emission reductions. The procedures for determining regional transportation-related emissions are described in [40 CFR 93.118](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.118) of the conformity rule. This section discusses the analysis years, and the modeling processes used to conduct the analysis.

## Emissions Factor Estimation Model

According to [40 CFR 93.111](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.111) of the conformity rule, the determination must be based on the latest emission estimation model. EPA released the new MOVES model, **[MOVES version],** that was released in [**latest MOVES version release date**], with an effective date of [**effective date of latest MOVES version]**. [**Description of grace period** (e.g., Even though the grace period to use MOVES3 for conformity analysis ends on September 12, 2025, the MOVES4 model will be used for this conformity analysis.[[8]](#footnote-9)]

As outlined in the pre-analysis consensus plan (PACP), included in Appendix Section F.1 Approved Pre-analysis Consensus Plan , the Interagency Consultation Partners approved the use of MOVES4 to develop [**analysis years**] vehicle emission factors. Emission factors are one component to determine [**pollutant(s)** (e.g., VOC, NOx, etc.)]emissions from the region’s on-road vehicles.

Table 5‑1 through Table 5‑8 listMOVES4 input parameters with the appropriate data source and/or methodology applied. The information listed applies to all counties and analysis years unless otherwise specified.

Table 5‑1. MOVES Input Parameters and Data Source

| Input Parameter | Description | Base Data Source | Notes |
| --- | --- | --- | --- |
| Vehicle population by source type | Input the number of vehicles in the geographic area to be modeled for each source type. | [**Example:** TxDMV data (year end 2021)] MOVES defaults for rate runs | * Local gasoline- and diesel-powered source-type populations by analysis year were estimated for use external to MOVES in the estimation of county-level vehicle starts and source hours parked, needed in the external emissions calculations, per TTI’s rates-per-activity, TDM-based method.
* Populations by SUT and fuel type are a function of TxDMV year-end vehicle registration data and VMT mix and, in the case of base and future years, population scaling factors.
 |
| Fleet age distribution by source type | Input data that provide the distribution of vehicle counts by age for each calendar year and vehicle type. TxDMV registration data were used to estimate the age distribution of vehicle types up to [**age distribution years** (e.g., 31)] years. | [**Example:** TxDMV data (year end 2021)] MOVES defaults for refuse trucks, motor homes, and buses | * Age distributions were developed using TxDMV registration data aggregated at the county level for all source types except for short-haul source types, which are region level; long-haul source types, which are statewide level; and buses, refuse trucks, and motor homes, which are MOVES defaults.
* The Age Distribution dataset was derived from the latest TxDMV Registration dataset and MOVES default values.
* The dataset contains five columns: RegionID, yearID, sourceTypeID, ageID (which ranges from [**age ID range** (e.g., 0 to 30, 0 to 40)]), and ageFractionID.
* The distribution of age fractions sums up to 1.0 for each source use type for each analysis year.
 |
| Fleet VMT by HPMS vehicle type | Distribute MOVES default VMT to five HPMS vehicle types. | MOVES defaults for rate runs | * Local activity estimates were applied in emissions calculations external to MOVES.
 |
| Road type VMT distributions | Input MOVES default VMT by road type. | MOVES defaults for rate runs | * Local activity estimates were applied in emissions calculations external to MOVES.
* The VMT fraction was distributed between the road type and must sum to 1.0 for each source type.
 |
| Average speed distribution | Input average speed data specific to vehicle type, road type, and hour of day/type of day into 16 speed bins. | MOVES defaults for rate runs | * Local activity estimates were applied in emissions calculations external to MOVES.
* The sum of speed distribution over all speed bins for each road type, vehicle type, and hour/day type is 1.0.
 |
| Fuel supply (Table 5‑2) | Input data to assign existing fuels to counties, months, and years, and to assign the associated market share for each fuel. | TCEQ’s Summer Fuel Field Study (latest year 2023) | * Fuel supply is based on the latest available survey data from the (2023) Summer Fuel Field Study, sponsored by TCEQ, and other information such as motor gasoline sales volume and transportation-sector consumption.
* Fuel supply information is uniform across each MOVES fuel region (there are six fuel regions in Texas: 132 western Texas counties [ID 300000000], 95 eastern Texas counties [ID 178010000], El Paso [ID 370010000], etc.).
* The exception would be the reformulated gasoline regions, where DFW and Houston-Galveston-Brazoria have separate fuel formulations.
* For each analysis year and season, the fuel supply consisted of one conventional gasoline formulation and one biodiesel formulation.
 |
| Fuel formulation (Table 5‑3) | Input Texas fuel region-specific fuel properties applicable to the county. | [**Example:** El Paso fuel survey data] Department of Energy (DOE) state-level biodiesel consumption estimates and MOVES defaults (for expected future-year values) for parameters | * [**Example**: Conventional gasoline (CG) formulations based on TCEQ’s summer 2017 and summer 2023 (latest available) fuel survey samples from El Paso County.
	+ The 2017 CG properties were actual 2017 averages (fuel grade averages weighted by relative sales volumes).
	+ Future years’ CG properties were the latest available actual 2020 averages except with Reid vapor pressure (RVP), average sulfur level, and average benzene content set to the expected values (MOVES3 defaults, consistent with the pertinent regulatory standards).
* The 2017 diesel sulfur level was the statewide average from TCEQ’s 2017 survey.
	+ Future years’ diesel sulfur was set to the current expected future-year value (6 ppm), which is conservative and consistent with the statewide diesel sulfur average from TCEQ’s latest (2020) survey.
	+ The biodiesel (BD) ester volume percentages for 2017 and future years were based on 2017 and the latest available (2021) DOE state-level transportation sector BD consumption estimates.
	+ Fuel subtype IDs 12 and 21 are 10% ethanol-blend gasoline and biodiesel, respectively].
 |
| Fuel engine fraction | Input fuel engine fractions (i.e., gasoline versus diesel versus flex-fuel engine types in the vehicle population) by model year for all vehicle types. | [**Example:** TxDMV year-end 2021 registration data] for diesel fractions; MOVES defaults for other source types | * Locality-specific/MOVES default.
* [**TTI or MPO**] developed the evaluation year-specific local diesel fractions for the MOVES single-unit and combination truck source use types using the latest TxDMV data, for all analysis years, aggregated to the statewide level. For all source types, compressed natural gas (CNG) and electricity fractions were set to zero, and the gasoline/diesel/flex-fuel fractions were normalized (sum to 1.0) for each source type and model year. Fuel usage for flex-fuel vehicles was set to 100% gasoline (in the fuel usage fraction input table).
* The alternate vehicle fuel technology (AVFT) table allows users to customize the distribution of vehicles capable of using various fuels and technologies for each model year, which includes defining the proportion of vehicles using diesel, gasoline, E-85, CNG, and electricity for each vehicle type and model year.
* TTI developed the AVFT table using the latest available (2021) TxDMV registration data, along with default MOVES AVFT data.
 |
| Meteorology(Table 5‑4) | Input county-specific data on temperature, humidity, and barometric pressure. | [Average hourly data from weather stations within the county] | * [**Example**: The summer and winter season temperature and humidity data were the same values used in the previous MOVES2014a-based Destino 2045 Amendment transportation conformity emissions analysis.]
* [These inputs were based on 2017 El Paso County weather station data, provided by TCEQ, and are consistent with TCEQ’s latest (2017) El Paso periodic emissions inventory submittal to EPA required under the AERR.]
 |
| Inspection and maintenance (I/M) coverage (Table 5‑6) | Input I/M coverage records for each combination of pollutants, process, county, fuel type, regulatory class, and model year specified using this input. | TCEQ provided I/M program statistics for calculating the compliance factor input. TTI developed these inputs essentially in consultation with TCEQ. | * The begin and end model years (X and Y) define the range of model years covered—where X and Y are calculated as YearID 24 and YearID 2, respectively.
* TTI calculated the I/M compliance factor estimates, using the MOVES I/M compliance factor equation; the El Paso I/M-program-specific I/M waiver rates and failure rates; and the statewide average I/M compliance rates; in combination with MOVES4 regulatory class coverage adjustments.
* The model processes/pollutants affected were starting and running exhaust hydrocarbon (HC), CO, NOx, and tank vapor venting HC; the fuel type is gasoline; the frequency is annual.
 |

Table 5‑2. Fuel Supply

|  |  |  |  |
| --- | --- | --- | --- |
| **Fuel Type** | **Fuel Formulation ID** | **Market Share** | **Market Share CV\*** |
| Gasoline | 17101, 17703, 18101, 18703 | 1.0 | N/A |
| Diesel | 30600, 30637 | 1.0 | N/A |

\*The market share CV is the coefficient variation of the market share. MOVES requires that market shares of all fuel types be included in order to run the model, including alternative fuel types of E85, CNG, and electricity.

Table 5‑3. Fuel Properties

| Factor | Information |
| --- | --- |
| Fuel Type | Gasoline | Gasoline | Gasoline | Gasoline | Diesel | Diesel |
| Fuel Formulation ID | 17101 | 17703 | 18101 | 18703 | 30637 | 30600 |
| Fuel Subtype ID | 12 | 12 | 12 | 12 | 21 | 21 |
| Analysis Year | 2017 | 2017 | 2020+ | 2020+ | 2017 | 2020+ |
| Season | Winter | Summer | Winter | Summer | Summer and Winter | Summer and Winter |
| RVP | 11.36 | 6.94 | 11.36 | 7.00 | 0 | 0 |
| Sulfur Level | 19.39 | 19.56 | 10.00 | 10.00 | 6.37 | 6.00 |
| ETOH Volume | 10.00 | 9.6 | 10.00 | 9.50 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0.00 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0.00 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0.00 | 0 | 0 |
| Aromatic Content | 21.36 | 26.67 | 21.36 | 24.24 | 0 | 0 |
| Olefin Content | 6.66 | 5.50 | 6.66 | 5.94 | 0 | 0 |
| Benzene Content | 0.63 | 1.30 | 0.63 | 0.63 | 0 | 0 |
| e200 | 53.72 | 48.74 | 53.72 | 44.61 | 0 | 0 |
| e300 | 87.38 | 87.84 | 87.38 | 84.63 | 0 | 0 |
| Vol to Wt Percent Oxy | 0.3653 | 0.3653 | 0.3653 | 0.3653 | 0 | 0 |
| BioDieselEster Volume | N/A | N/A | N/A | N/A | 4.68 | 4.86 |
| Cetane Index | N/A | N/A | N/A | N/A | N/A | N/A |
| PAH Content | N/A | N/A | N/A | N/A | N/A | N/A |
| T50 | 192.22 | 206.12 | 192.22 | 220.24 | 0 | 0 |
| T90 | 309.50 | 306.72 | 309.50 | 317.73 | 0 | 0 |

Note: MOVES requires all on-road mobile fuel types to run, so MOVES default E85, CNG, and electricity fuel formulations were included in the input. N/A denotes not applicable.

Table 5‑4. Hourly Meteorological Data

|  |  |
| --- | --- |
| Factor | Information |
| County/Area(s) |  |  |  |  |
| Season | Summer | Winter |
| Hour | Temperature(°F) | Relative Humidity (%) | Temperature(°F) | Relative Humidity (%) |
| 00:00 a.m.–01:00 a.m. |  |  |  |  |
| 01:00 a.m.–02:00 a.m. |  |  |  |  |
| 02:00 a.m.–03:00 a.m. |  |  |  |  |
| 03:00 a.m.–04:00 a.m. |  |  |  |  |
| 04:00 a.m.–05:00 a.m. |  |  |  |  |
| 05:00 a.m.–06:00 a.m. |  |  |  |  |
| 06:00 a.m.–07:00 a.m. |  |  |  |  |
| 07:00 a.m.–08:00 a.m. |  |  |  |  |
| 08:00 a.m.–09:00 a.m. |  |  |  |  |
| 09:00 a.m.–10:00 a.m. |  |  |  |  |
| 10:00 a.m.–11:00 a.m. |  |  |  |  |
| 11:00 a.m.–12:00 p.m. |  |  |  |  |
| 12:00 p.m.–13:00 p.m. |  |  |  |  |
| 13:00 p.m.–14:00 p.m. |  |  |  |  |
| 14:00 p.m.–15:00 p.m. |  |  |  |  |
| 15:00 p.m.–16:00 p.m. |  |  |  |  |
| 16:00 p.m.–17:00 p.m. |  |  |  |  |
| 17:00 p.m.–18:00 p.m. |  |  |  |  |
| 18:00 p.m.–19:00 p.m. |  |  |  |  |
| 19:00 p.m.–20:00 p.m. |  |  |  |  |
| 20:00 p.m.–21:00 p.m. |  |  |  |  |
| 21:00 p.m.–22:00 p.m. |  |  |  |  |
| 22:00 p.m.–23:00 p.m. |  |  |  |  |
| 23:00 p.m.–24:00 p.m. |  |  |  |  |

Table 5‑5. Barometric Pressure

|  |  |
| --- | --- |
| **Period** | **Barometric Pressure (Inches of Mercury)** |
| 24-hr |  |

Table 5‑6. I/M Inputs

|  |  |
| --- | --- |
| Factor | I/M Information |
| Test standards description | Two-mode, 2500 RPM/idle test | Evaporative gascap check | Exhaustonboard diagnostics (OBD) check | Evaporative gascap and OBD check | Exhaust OBD check | Evaporative gascap and OBD check |
| Test Standards ID | 12 | 41 | 51 | 45 | 51 | 45 |
| Year ID | 2017–2019 | 2017–2019 | 2017–2019 | 2017–2019 | 2020–2050 | 2020–2050 |
| I/M program ID | N/A | N/A | N/A | N/A | N/A | N/A |
| Pollutant Process ID | N/A | N/A | N/A | N/A | N/A | N/A |
| Source use type\* | 21, 31, 32 | 21, 31, 32 | 21, 31, 32 | 21, 31, 32 | 21, 31, 32 | 21, 31, 32 |
| Begin model year | X | X | 1996 | 1996 | X | X |
| End model year | 1995 | 1995 | Y | Y | Y | Y |
| I/M sompliance | For 2017:21—95.20%31—93.30% 32—87.58%Future year: 21—94.50% 31—92.61%32—86.94% | For 2017: 21—95.20%31—93.30% 32—87.58%Future year: 21—94.50% 31—92.61%32—86.94% | For 2017: 21—95.20%31—93.30% 32—87.58%Future year: 21—94.50% 31—92.61%32—86.94% | For 2017: 21—95.20%31—93.30% 32—87.58%Future year: 21—94.50% 31—92.61%32—86.94% | For 2017: 21—95.20%31—93.30% 32—87.58%Future year: 21—94.50% 31—92.61%32—86.94% | For 2017: 21—95.20%31—93.30% 32—87.58%Future year: 21—94.50% 31—92.61%32—86.94% |

\* Source Use Type: 21—passenger car, 31—passenger truck, 32—light commercial truck.

N/A denotes not applicable.

Table 5‑7. MOVES Emissions Factor Post-processing to Be Performed by County and Year

|  |  |  |
| --- | --- | --- |
| **Strategy and Post-processing Result** | **Analysis Year** | **Counties** |
| Texas Low Emission Diesel (TxLED) | All analysis years | N/A |

Table 5‑8. Emission Controls Used for Conformity Credit

|  |  |  |
| --- | --- | --- |
| **Emission Reduction Strategy and Years Covered** | **Modeling or Post-processing Approach** | **Analysis Year** |
| Intersection improvements |  |  |
| Transit service |  |  |
| High-occupancy vehicle/managed lanes |  |  |
| Park-n-ride lots |  |  |
| Vanpools |  |  |
| Grade separations |  |  |
| Traffic signal improvements |  |  |
| Intelligent transportation systems |  |  |
| Clean vehicle commitments |  |  |
| Bicycle/pedestrian facilities |  |  |
| Employer trip reduction programs |  |  |
| Sustainable development |  |  |
| Public education/ozone season fare reduction |  |  |

## Modeled Emission Estimates

Modeled emission estimates are calculated using TTI emission inventory estimation utilities using MOVES: [**TTI utilities version** (e.g., MOVES2014bUtils)], developed by TTI for MOVES. This utility combines vehicle activity and emissions factors to create emission estimates at the link level.

### Vehicle Registration Distribution

Vehicle registration (age) distributions were developed using the latest available TxDMV analysis-year-specific county vehicle registration data. Data from [**year**] were used for the **[Base Year]** base year. The latest available data ([**latest available data year**]) were used for the future analysis years ([**future analysis years**]**)**. MOVES defaults were used where the required information was not available in the TxDMV data.

The input values for each vehicle class are [**age fraction** (e.g., 30)] age fractions representing the fraction of vehicles by age for that vehicle class as of December of the evaluation year. These age fractions start with the evaluation year as the first age fraction and work back in annual increments to end with the [**last age fraction** (e.g., 30th)] fraction, which represents the fraction of vehicles of age [**older vehicle age** (e.g., 30)] years and older. The fractions are calculated as the model-year-specific registrations in a class divided by the total vehicles registered in that class.

### Alternative Fuel Vehicle Technology

AVFT fractions were developed using the latest available TxDMV analysis-year-specific county vehicle registration data. Data from [**Data year**] were used for the **[Base Year]** base year. The latest available data ([**latest available data year**]) were used for the future analysis years ([**future analysis years**]). MOVES defaults were used where the required information was not available in the TxDMV data.

TTI developed the evaluation-year-specific local diesel fractions for the MOVES single-unit and combination truck source use types using the latest TxDMV data, for all analysis years, aggregated to the statewide level. For all source types, CNG and electricity fractions were set to zero and the gasoline/diesel/flex-fuel fractions were normalized (sum to 1.0) for each source type and model year. Fuel usage for flex-fuel vehicles was set to 100 percent gasoline (in the fuel usage fraction input table).

### VMT Mix

VMT mix (or fractions) is very important to be able to estimate link emissions. The VMT mix is applied to the emission factors in a post-process methodology. The VMT mix enables the assignment of emission factors by vehicle type to VMT to calculate emissions on a specified roadway facility or functional class. VMT mix is estimated for four MOVES roadway types: rural restricted (rural freeways), rural unrestricted (rural arterials and collectors), urban restricted (urban freeways), and urban unrestricted (urban arterials and collectors) for daily time periods for each of the modeled counties. Each county’s roadway sections are classified as rural or urban by the vehicle activity behavior and the demographics of the county. The VMT mix methodology uses data, assumptions, and procedures from the TxDOT, TTI, and **[Region name]**region TDM.

Consistent with the prior analysis, the VMT mixes were produced in 5-year increments and applied to analysis years as follows:

* 2015 VMT mix for 2013 through 2017 analysis years.
* 2020 VMT mix for 2018 through 2022 analysis years.
* 2025 VMT mix for 2023 through 2027 analysis years, etc.

Using the latest available vehicle classification counts ([**year range** (e.g., 2013–2021)]) and **[MOVES version]** defaults, TTI estimated the time-of-day (AM peak, midday, PM peak, and overnight) VMT mixes by the four MOVES road types. No seasonal adjustments were made for VMT mix.

# Regional Emissions Determination

To report final emission analysis results, it is necessary to account for modeled link-level emission inventories, emission factor adjustments, and MoSERS emission benefits.

## Modeled Emissions

Check only one box and then populate Table 6-1 as applicable.

[ ]  Table 6‑1. For nonattainment or maintenance areas with adequate or approved SIP MVEB(s)

|  |  |  |  |
| --- | --- | --- | --- |
| Analysis Year | VMT | NOx (Tons/Day) | VOC (Tons/Day) |
| MVEB | N/A | [MVEB] | [MVEB] |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

[ ]  Table 6-1. For moderate and above ozone nonattainment areas without an adequate or approved SIP MVEB(s)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Analysis Year | VMT | NOx Build (Action) (Tons/Day) | VOC Build (Action) (Tons/Day) | NOx No-Build (Baseline) (Tons/Day) | VOC No-Build (Baseline) (Tons/Day) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

## Impacts from Adjustments and MOSERS

### Adjustments to Emission Factors

Post-processing adjustments are applied to the emission factor post-process utility developed by TTI. These adjustments are applied either before or simultaneously with the emission calculation procedures to establish the model results. This process is listed in Chapter 5.

### MoSERS Projects

MoSERS is a collection of transportation projects or related activities with identifiable emission reduction benefits. To meet the requirements of the SIP, nonattainment areas may make specific commitments in their SIP to implement MoSERS, called TCMs. Finally, a nonattainment area may include transportation emission reduction measures (TERMs) in transportation conformity analysis that are outside of commitments in its SIP.

#### TCM

TCMs are projects, programs, and related activities designed to achieve on-road mobile source emission reductions and are included as control measures in an applicable SIP. TCMs are strategies to reduce vehicle use or change traffic flow and/or congestion conditions to decrease vehicular emissions. TCMs are further defined in 40 CFR 93.101, as amended by *Federal Register* Volume 62, page 43780. The CAAA requires that TCMs be included in SIPs for regions designated as serious and above ozone nonattainment areas.

[Section 93.113](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-A/section-93.113) of the conformity rule requires MPOs to verify that the MTP and TIP provide for the timely implementation of TCMs in the applicable SIP. The MTP was reviewed to confirm that the goals, directives, recommendations, and projects do not contradict the specific requirements or commitments of the applicable SIP. The TIP was reviewed to confirm that implementation and expected implementation of projects through federal, state, and local funding sources are on schedule.

[**Describe how TCMs are included, if applicable.**]

#### TERM

TERMs are transportation projects and related activities that are designed to achieve on-road mobile source emission reductions but are not included as control measures in the SIP.

[**Describe how TERMs are included, if applicable.**]

#### CMAQ

The CMAQ is a major funding source for most MoSERS. Appendix Section E.3 CMAQ Project List provides a list of CMAQ projects eligible for inclusion.

#### MoSERS Emission Reduction

Table 6‑2 lists emission reduction from the sum of MoSERS.

Table 6‑2. Sum of MoSERS Benefits

|  |  |  |  |
| --- | --- | --- | --- |
| Analysis Year | VMT | NOx (Tons/Day) | VOC (Tons/Day) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## Final Analysis Results

Table 6-3 shows the final mobile emission results of this conformity analysis. These final emissions are below the maximum allowable level set forth by the MVEB for **[Name of Pollutant]** in the SIP.

Check only one box and then populate the applicable table.

[ ]  Table 6‑3. For nonattainment or maintenance areas with adequate or approved SIP MVEB(s)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Analysis Year | VMT | NOx Budget (Tons/Day) | NOx (Tons/Day) | VOC (Tons/Day) | VOC (Tons/Day) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

[ ]  Table 6-3. For moderate and above ozone nonattainment areas without an adequate or approved SIP MVEB(s)

| Analysis Year | VMT | NOx Build (Action) Including CMAQ (Tons/Day) | NOx No-Build (Baseline) (Tons/Day) | VOC Build (Action) Including CMAQ (Tons/Day) | VOC No-Build (Baseline) (Tons/Day) |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Determine the emissions reduction in each year by taking the difference between the action and baseline scenarios. In order to demonstrate conformity, the action scenario must be below the baseline scenario by a non-zero amount, which for the purposes of regional conformity is [**tons** (e.g., 0.01)] tons per day.

# Interagency Consultation

Regulation [40 CFR 93.112](https://www.law.cornell.edu/cfr/text/40/93.112#:~:text=CFR-,%C2%A7%2093.112%20Criteria%20and%20procedures%3A%20Consultation.,with%2023%20CFR%20part%20450.) of the conformity rule includes procedures for interagency consultation, resolution of conflict, and public consultation of the conformity analysis affecting the MTP and TIP. Local, state, and federal transportation and air quality agencies affected by this conformity analysis were consulted on the scope, methodologies, and products of the conformity finding. A conformity steering committee composed of representatives from [**MPO Name]**, TxDOT, TCEQ, TTI, FHWA, FTA,[[9]](#footnote-10) and EPA was consulted regularly during the conformity process. The purpose of this group is to ensure the modeling methodology used in this conformity analysis is consistent with the on-road modeling used in the SIP and that the most recent planning assumptions were used.

Appendix Section F.2 Consultation Review and Meeting Summary provides a comprehensive list of the steering committee’s meeting agenda and decisions.

# Public Involvement

Public participation is recognized as an integral part of the planning process. The public participation process for transportation conformity and other transportation plans, projects, and policies includes timely public notice, full public access to technical and policy information, opportunities for early and continuing involvement, and explicit consideration and response to public input.

Public participation strategies and procedures are designed to inform the public about transportation and air quality issues, provide opportunities to involve the public in the decision-making process, and seek public and stakeholder input. Additionally, this process builds support among the public who are stakeholders in transportation investments. Public views and opinions are included in the final RTP/MTP and TIP documents.

Generally, each meeting consisted of an overview presentation, a question-and-answer session, an open house for viewing exhibits and gathering more information, and various avenues for submitting public comments. All meetings began at [**time**] and were similar in content and format. The public meeting presentation was recorded and made available on the MPO’s website for public viewing and feedback. Table 8‑1 provides the public meeting dates, location addresses, and links to the meeting’s agenda/recording.

Table 8‑1. Public Involving Meeting Information

|  |  |  |  |
| --- | --- | --- | --- |
| Number | Meeting Date | Address | Link to Meeting Agenda/Recording |
| 1 |  | [**Online: if the meeting is online**] |  |
| 2 |  |  |  |

The public comment period began on [**day of week, mm/dd/yy**]and ended on [**day of week, mm/dd/yy**] at 5:00 p.m. Public inputs were collected via [**method(s) to receive public comments** (e.g., comment cards at public meetings, an online participation exercise, emails, letters, and speaking opportunities at technical committee and policy board meetings)]. In total, [**number of comments**] comments were received. Appendix Section G.1 Meeting I provides a full list of comments and the MPO’s responses, as well as presentations and outreach materials.

# Appendix A—Resolution of Adoption

# Appendix B—RTP/MTP

[**Include a link(s) to the RTP/MTP and TIP posted on the website.**]

## B.1 Project Listings

**Instruction:** This appendix contains the project listing files in PDF and a database-accessible format, such as CSV.

# Appendix C—Transportation Modeling System

## C.1 Travel Model Validation

## C.2 Links, Miles, Centerline, and Lane Miles Summaries

## C.3 Link Listing and Capacity Staging

**Instruction:** This appendix contains the capacity staging files in PDF and a database-accessible format, such as CSV.

## C.4 Roadway Network Files

**Instruction:** This appendix includes the travel model shapefiles.

# Appendix D—Emissions Modeling Information

## D.1 MOVES Input and Output

**Instruction:** This appendix includes the MOVES input county databases, MOVES RunSpec files input and output databases, and MOVES external modeling external files.

## D.2 MOVES Emission Factors

**Instruction:** Each analysis year may be listed as its own attachment, such as Appendix D.2.1, Appendix D.2.2, etc.

## D.3 Activities

**Instruction:** This includes VMT, extended idling, starts, etc.

## D.4 Emissions Modeling Utilities

## D.5 VMT, Speed, and Emissions Summaries

# Appendix E—Timely Implementation Documentation for TCM

## E.1 MoSERS Methodology/Calculation Descriptions

## E.2 MoSERS Project Listing

## E.3 CMAQ Project List

# Appendix F—Interagency Consultation Process

## F.1 Approved Pre-analysis Consensus Plan

## F.2 Consultation Review and Meeting Summary

# Appendix G—Public Involvement Process

## G.1 Meeting Information

# Appendix H—Supplemental Material—Optional

**Instruction:** This appendix contains all information that the MPO wishes to share but does not fit in Appendices A through G.

1. The less-than-baseline test’s baseline year (applicable to NAAQSs promulgated after 1997) is the most recent year for which EPA’s Air Emission Reporting Rule (Title 40 of the Code of Federal Regulations, Part 51, Subpart A) required submission of on-road mobile source emissions inventories, as of the effective date of nonattainment designation. For example, an area designated nonattainment in 2018 would have a baseline year of 2017, the most recent year of Texas’s triennial on-road mobile emission inventory (emissions inventory [EI] submittal to EPA under the Air Emissions Reporting Requirements [AERR]), at the time of designation. [↑](#footnote-ref-2)
2. Information on the 2015 8-hour ozone moderate nonattainment status, effective November 7, 2022, is available at <https://www.gpo.gov/fdsys/pkg/FR-2015-10-26/pdf/2015-26594.pdf>. [↑](#footnote-ref-3)
3. Information on the 2008 8-hour ozone severe nonattainment status, effective November 7, 2022, is available at <https://www.govinfo.gov/content/pkg/FR-2022-10-07/pdf/2022-20458.pdf>. [↑](#footnote-ref-4)
4. More information on *Federal Register* Volume 81, page 78591, is available at <https://www.federalregister.gov/documents/2016/11/08/2016-26957/adequacy-status-of-the-dallas-fort-worth-texas-attainment-demonstration-8-hour-ozone-motor-vehicle> (edit the link). [↑](#footnote-ref-5)
5. The less-than-baseline test’s baseline year (applicable to NAAQSs promulgated after 1997) is the most recent year for which EPA’s Air Emission Reporting Rule (40 CFR 51, Subpart A) required submission of on-road mobile source emissions inventories, as of the effective date of nonattainment designation. For example, an area designated nonattainment in 2018 would have a baseline year of 2017, the most recent year of Texas’s triennial on-road mobile inventory (EI submittal to EPA under the AERR), at the time of designation. [↑](#footnote-ref-6)
6. *Heavy-Duty Vehicle Idle Activity Study, Final Report*. Texas A&M Transportation Institute, Environment and Air Quality Division, July 2019. [↑](#footnote-ref-7)
7. Only SHEI and APU diesel hoteling generates emissions. The other fractions are calculated for completeness. [↑](#footnote-ref-8)
8. *Federal Register* Notice of Availability, <https://www.govinfo.gov/content/pkg/FR-2023-09-12/pdf/2023-19116.pdf>. [↑](#footnote-ref-9)
9. FHWA acts as the executive agent for FTA. [↑](#footnote-ref-10)