MAG MPO
TransPlan50 Amendment 2
Emissions Analysis Report

December 9, 2024

Public Comment Period Dec 13, 2025 - Jan 12, 2025
Pending MPO Board Approval

MAG

Expert Resources. Enriching Lives.

TERMS AND ABBREVIATIONS

CAA	Clean Air Act
CFR	Code of Federal Regulations
CMAQ	Congestion Mitigation and Air Quality
CO	Carbon Monoxide
BIL Act	Bipartisan Infrastructure Investment and Jobs Act of 2021
GPI	Kem C. Gardner Policy Institute
HDDV	Heavy Duty Diesel Vehicle (8501 lbs. and heavier gross vehicle weight)
HOV	High Occupancy Vehicle
HPMS	Highway Performance Monitoring System
I/M	Inspection and Maintenance
LDGV	Light Duty Gas Vehicle (0-6000 lbs. gross vehicle weight)
LDGT1	Light Duty Gas Truck 1 (0-6,000 lbs. Gross vehicle weight)
LDGT2	Light Duty Gas Truck 2 (6,001-8,500 lbs. Gross vehicle weight)
LEV	Low Emission Vehicle
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
RTP	Regional Transportation Plan
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOx	Oxides of Nitrogen
OBD	On Board Diagnostics
O_3	OZONE
PM10	Particulate matter smaller than or equal to 10 microns
PM2.5	Particulate matter smaller than or equal to 2.5 microns
REMM	Real Estate Market Model
RFG	Reformulated Gasoline
RVP	Reid Vapor Pressure
SIP	State Implementation Plan
STIP	State Transportation Improvement Program
TCM	Transportation Control Measures
TDM	Travel Demand Model
TIP	Transportation Improvement Program
VMT	Vehicle Miles Traveled

AGENCIES

MAG	Mountainland Association of Governments
DAQ	Division of Air Quality
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
UDOT	Utah Department of Transportation
UTA	Utah Transit Authority
WFRC	Wasatch Front Regional Council
CMPO	Cache MPO
DWS	Department of Workforce Services

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MAG MPO Board resolution adopting MAG TransPlan50 Amendment 2 and Conformity Determination Report

WHEREAS, Mountainland Association of Governments (MAG) is the designated Metropolitan Planning Organization (MPO) for transportation planning in the Urbanized Area of Utah County; and

WHEREAS, the Bipartisan Infrastructure Investment and Jobs Act (BIL) of 2021 and the Clean Air Act Amendments (CAA) require the MPO to develop TransPlan50 - Regional Transportation Plans (RTP) and short-range Transportation Improvement Programs (TIP) that conform with the applicable State Implementation Plan (SIP) for air quality; and

WHEREAS, MAG TransPlan50 was developed to meet the requirements of the CAA and the BIL Act, and to address the short- and long-term transportation needs of the Region, and

WHEREAS, MAG TransPlan50 has been developed in compliance with 23 CFR 450.322, Metropolitan Transportation Planning Process through appropriate technical and review processes, and

WHEREAS, the Conformity Determination Report covering the TransPlan50 has been developed to meet the requirements of 40 CFR 93 and the emission limits set for SIP for the State of Utah, and

WHEREAS, MAG TransPlan50 in its entirety was developed in cooperation with the MPO's planning partners and reflects local commitment for project implementation.

NOW, THEREFORE, BE IT RESOLVED that MAG MPO Board adopts the MAG TransPlan50 and the Conformity Determination Report in its entirety.

BE IT FURTHER RESOLVED that MAG MPO Board authorizes staff, with approval of the Chairman of the Committee, to make non-substantive technical corrections to the final document as necessary.

APPROVED AND PASSED THIS 9th Day of January, 2025

Bill Wright

MPO BOARD CHAIR, MAYOR Bill Wright

ATTEST:

U.S. Department of Transportation
Federal Highway Administration

Federal Highway Administration
2520 West 4700 South, Suite 9A
Salt Lake City, Utah 84129-1847
(801) 955-3500
Facsimile (801) 955-3539

Federal Transit Administration
1961 Stout Street, Suite 13301
Denver, CO 80294-3007
(303) 362-2400

SENT ELECTRONICALLY

January 22, 2025

In Reply Refer To:
HDA-UT

Shauna Mecham
Air Quality Program Manager
Mountain Land Association of Governments
586 East 800 North
Orem, Utah 84097

SUBJECT: Emissions Analysis Report for the MAG MPO Transplan50 Amendment #2
2023 Regional Transportation Plan for the Utah Valley Urbanized Area

Shauna,

This is in reference to your letter of January 21, 2025, requesting concurrence of the conformity determination in the amendment and emissions analysis report (magutah.gov/rtp-amendment-2) for the Mountainland Association of Governments (MAG) Metropolitan Planning Organization (MPO) regional transportation plan, referred as TransPlan50, Amendment #2 for the Utah Valley urbanized areas. Public availability occurred between December 13, 2024 to January 12, 2025, and the Interagency Consultation Team was given an overview of the proposed amendment and analysis on December 11, 2024. This conformity determination was approved by the MAG Board on January 9, 2025.

It is acknowledged that the analysis dated December 9, 2024, as presented in the document, MAG MPO TransPlan50 Amendment #2 Emissions Analysis Report demonstrates that Amendment #2 conforms to the air quality requirements of the State Implementation Plan (SIP) and the Environmental Protection Agency (EPA) budget and interim emissions tests for all pollutants in non-attainment or maintenance areas in accordance with applicable regulations [Citation: 49 CFR 93.118 and 40 CFR 119].

If you have any questions, please contact me at (801) 955-3524 or Peter Hadley, FTA, at (303) 362-2393.

Sincerely,

Edward Woolford

Edward T. Woolford, FHWA
Environmental Program Manager

cc: Peter Hadley, FTA/Region 8
Naomi Kisen, UDOT
Kip Billings, WFRC
Rick McKeague, UDAQ
Greg Lohrke, U.S. EPA
Shawn Eliot, MAG
Trisha Sharma, FHWA

EXECUTIVE SUMMARY

This report is a new emissions analysis for MAG TransPlan50 Amendment 2.

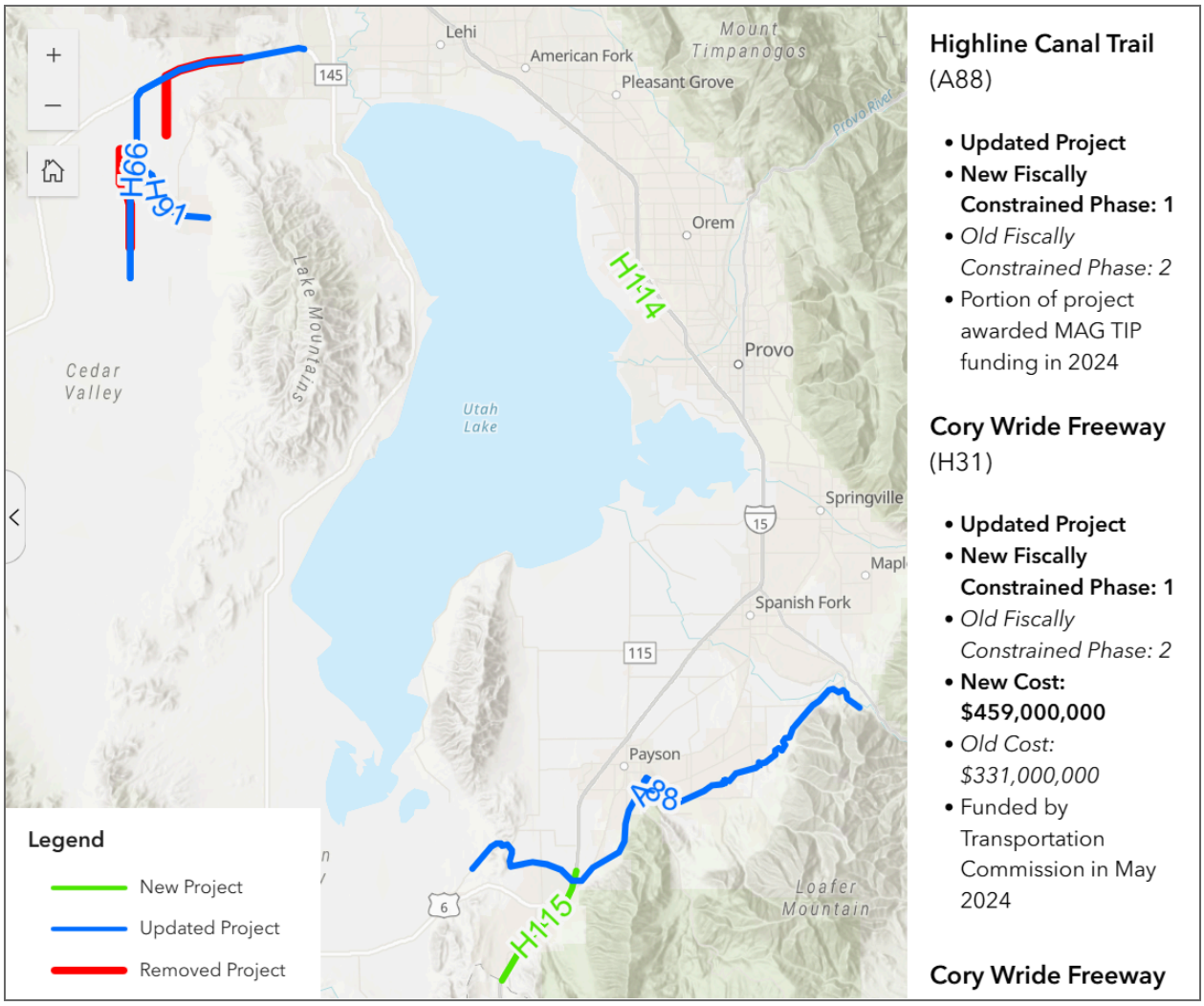
As the MPO, MAG is responsible for developing, producing, and adopting the Metropolitan Transportation Plan (MTP), TIP, and the Unified Planning Work Program (UPWP). MAG has the responsibility to ensure that the MAG TransPlan50 for the Utah Valley urbanized area **conforms** to the air quality requirements of the State Implementation Plan (SIP) and the Environmental Protection Agency (EPA) budget and interim emissions tests for all pollutants in non-attainment or maintenance areas (40 CFR 93.118 and 40 CFR 93.119). This responsibility will be fulfilled when the MAG MPO Board approves the Conformity Determination Report. Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) review this document in consultation with the EPA to ensure that all relevant planning regulations have been adequately addressed.

"Under 23 CFR Part 450 and the BIL Act, federally funded projects cannot be approved, funded, advanced through the planning process, or implemented unless those projects are in a Fiscally Constrained and Conforming Transportation Plan and Transportation Improvement Program."

Summary Of Amendment
MAG is proposing adding and changing 10 RTP projects. These amendments result from recommendations made by the Utah Transportation Commission in May 2024, updates from the Cedar Valley Highway Study, TIP reconciliation, and legislative funding. The result is moving a trail project from Fiscally Constrained (FC) Phase 2 to FC Phase 1, realigning 9 road projects, and making numerous phase and cost changes.

For more information on the amended projects, see magutah.gov/rtp-amendment-2

Amended RTP Projects Map



Transportation Conformity

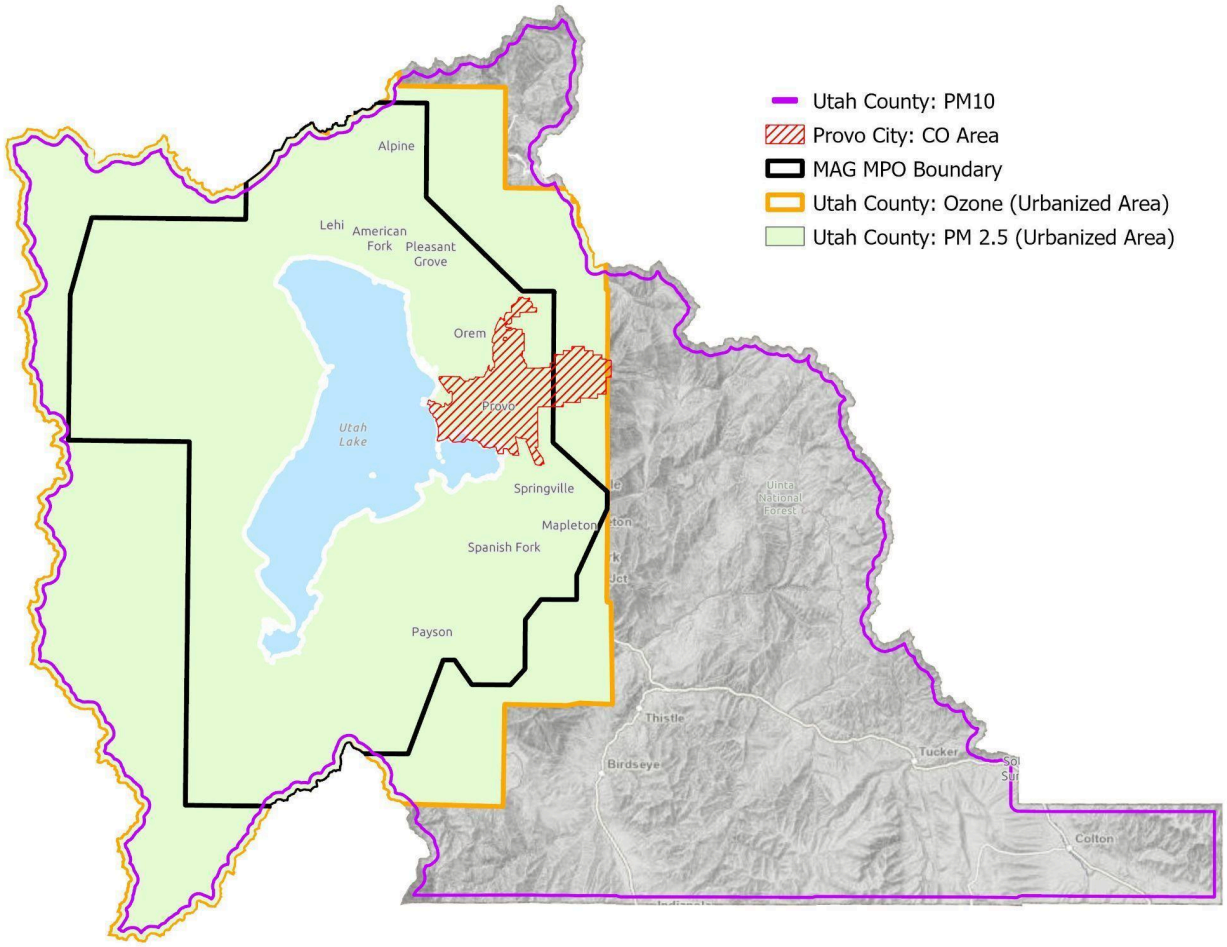
A Basic Guide for State and Local Officials United States Department of Transportation (US-DOT)

This report updates the conformity analysis and describes the changes made to the travel model transportation networks.

Approval of these documents by FHWA and FTA allows the policies, programs, and projects to be implemented using Federal Funding.

All assumptions used in this determination report were found to be consistent with federal regulations at various stages of the development of MAG TransPlan50.

Utah County Non-Attainment and Maintenance Areas Map



Provo City is designated as a Maintenance Area for Carbon Monoxide. Utah County is designated as a maintenance area for PM10, and the Urbanized area of Utah County is a non-attainment area for 2006 PM2.5 (pending the EPA's approval of the Maintenance Plan) and marginal non-attainment for 2015 Ozone. The MAG TDM includes the entirety of Utah County, not just the MPO, and models the non-attainment areas within the MPO boundary and the donut areas for Ozone, PM2.5, and PM10, respectively.

CONFORMITY TESTS

Conformity Analysis Tests Table summarizes the specific quantitative conformity tests required by the conformity rules based on the SIP for each non-attainment or maintenance area pollutant in the MAG area.

Effective March 27, 2020, Utah County was redesigned as a maintenance area for PM10 with the associated Maintenance Plan and 2030 NOx and PM10 Motor Vehicle Emissions Budgets.

Effective July 13, 2020, Provo City entered its 2nd 10-year Carbon Monoxide (CO) maintenance plan. This plan follows the provisions/requirements of the CO Limited Maintenance Plan (LMP) Policy. The CO LMP does not require a regional emissions test for a conformity determination. Other aspects of transportation conformity, such as consultation, fiscal constraint, and hot spot analysis, still apply. According to the EPA, "… it is unreasonable to expect that an LMP area will experience so much growth in that period that a violation of the CO NAAQS would result. Therefore, for the Provo CO maintenance area, all actions that require conformity determinations for CO under our conformity rule provisions are considered to have already satisfied the regional emissions analysis and "budget test" requirements in 40 CFR 93.118."

Effective May 10, 2019, Utah County was declared a Clean Data PM2.5 non-attainment area. In collaboration with stakeholders, the State is required to prepare a PM2.5 Maintenance Plan. Until the EPA approves the plan, the MPO must perform interim conformity tests for the 2006 PM2.5 non-attainment area. The EPA proposed approval of Utah's PM2.5 SIP with the associated Maintenance Plan and 2034 emissions budgets in the Federal Register on November 6, 2020. Still, these have yet to be formally approved by the EPA. MAG will continue to use the interim emissions tests until the SIP and associated mobile emissions budget are approved.

Effective August 3, 2018, Utah County was declared a Marginal OZONE non-attainment area with the requirement to perform an interim conformity test for the 2015 Ozone non-attainment area. Effective November 7, 2022, EPA determined that the Southern Wasatch Front marginal area (MAG) attained the standards by August 3, 2021, the applicable attainment date. After the State submits a Limited Maintenance Plan for the Southern Wasatch Front, MAG will only be required to complete a qualitative conformity assessment for ozone. MAG will continue to use the interim emissions tests until the SIP and associated mobile emissions budget are approved. The TDM excludes portions of the county not in the Ozone Non-Attainment area.

Conformity Analysis Tests Table

Area	Non-attainment and SIP Status	Pollutants	Test Period	Quantitative Tests
Provo CO	Approved Maintenance SIP	CO	Limited Maintenance Plan	None
Utah County PM 10	Approved Maintenance SIP	NOX precursor Direct PM10	Maintenance Plan	Emissions Budget
Utah County Ozone	Attained in 2021 (Limited Maintenance SIP Pending)	NOX precursor VOC precursor	Interim Test	Build ≤ 2017
Utah County PM 2.5	2006 PM2.5 Non-Attainment (Maintenance SIP Pending)	NOX precursor VOC precursor Direct PM2.5	Interim Test	Build < No Build or Build ≤ 2008

The conformity rules outline specific analysis requirements that non-attainment areas must follow depending on the severity of the non-attainment problem and the time frame established by the Clean Air Act to maintain National Ambient Air Quality Standards.

The following list describes the appropriate subsections of 40 CFR Part 93 the plan must meet:

- 93.110 – Latest Planning Assumptions
- 93.111 – Latest Emission Model
- 93.112 – Consultation

TransPlan50 and TIP:

- 93.113(b) – Transportation Control Measures (RTP)
- 93.113(c) – Transportation Control Measures (TIP)
- 93.118 or 93.119 – Emission Budget(s) or Emission Reduction

93.110 - LATEST PLANNING ASSUMPTIONS

Section 93.110 of the transportation conformity rule defines the requirements for the most recent planning assumptions that must be in place during the conformity determination process. The planning assumptions relate to the socio-economic forecasts, transit operating policies, transit capital program policies, and transit fare policies that impact the travel demand modeling. All planning assumptions have been reviewed and agreed to through the interagency consultation process at various stages of the TransPlan50 development.

MAG initially ran MOVES for 2019, 2028, 2032, 2042, and 2050 with all needs-based projects. The results were within established budgets. The emissions shown in this document are based on the fiscally constrained project list as of April 2024.

Analysis Years

Conformity must be determined for TransPlan50, which includes the TIP in the non-attainment and/or maintenance areas. While other requirements of the Metropolitan Transportation Planning Process dictate the financial feasibility and related programming and planning procedures, conformity is based largely on analyzing specific years chosen according to the criteria found under Section 93.118. The following rules have been followed to define the analysis years in the MAG study area:

- Any year for which the implementation plan establishes a Motor Vehicle Emission Budget—PM10 2030 is a budget year under the new maintenance plan. For the CO maintenance plan, 2015 was a budget year, though quantitative analysis is no longer required.
- The first horizon year must be no more than 10 years from the first year of the plan (2023)
- If the attainment year (2003 for PM10, 2014 for CO, 2021 for Ozone) is within the transportation plan's time span, it must be a horizon year.
- For PM2.5, until a SIP budget is established – the baseline year is 2008
- For PM2.5, until a SIP budget is established - The first horizon year must be no more than 5 years from the analysis year.
- For Ozone – the baseline year is 2017
- For Ozone – The first horizon year must be no more than 5 years from the analysis year until the LMP is approved.
- Horizon years may be no more than 10 years apart.
- The final horizon year must be the last year of the transportation plan, and 2050 applies to all analyses.

Conformity Analysis Years Table summarizes the proposed analysis years for the three

non-attainment areas in the MAG modeling area.

Conformity Analysis Years

Area	Pollutant	Analysis Year(s)
Utah County	PM10	2030 2040 2050
Utah County	PM2.5	2028 2035 2042 2050
Utah County	Ozone	2028 2032 2042 2050

Socio-Economic Forecasts

Perhaps the greatest influence on the magnitude of pollutant emissions resulting from the transportation system is the growth rate of people, jobs, households, and related socio-economic measures. The conformity rules require that the socio-economic inputs used in the analysis represent the latest available estimates. Added socio-economic variables for dwelling units, automobile ownership, and stratified household size are also forecast by MAG down to the individual traffic zone level. Due to difficulties with 2020 census data, MAG used the county assessor's and American Community Survey data for the residential base year. For the employment base year, MAG used building square foot data from the county assessor's and Department of Workforce Services (DWS) employment data.

Land Use Allocations

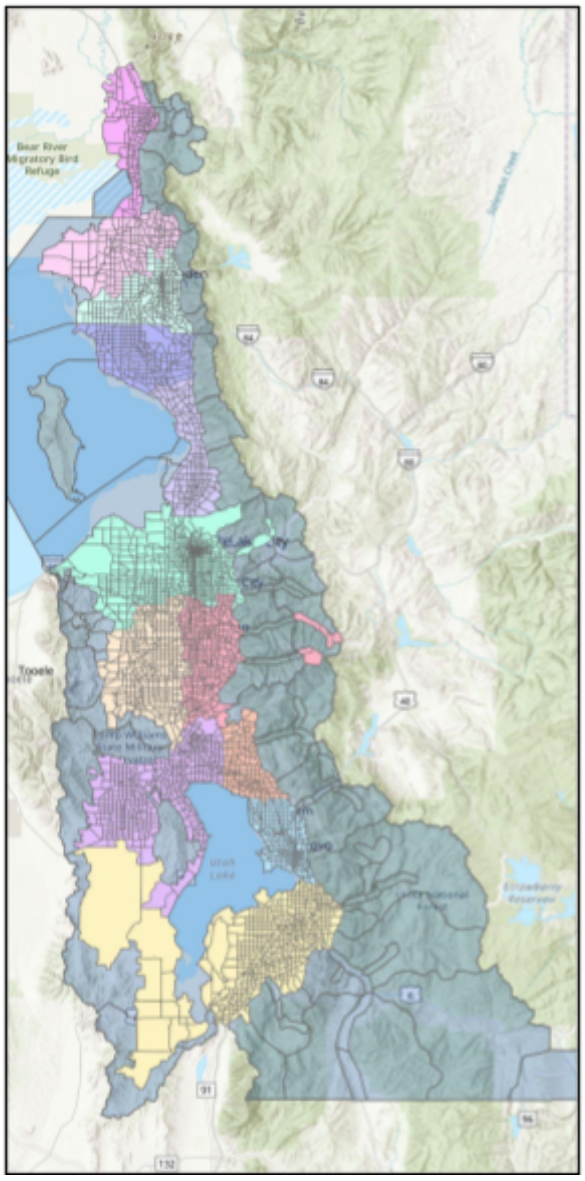
In addition to review by local municipalities, land use allocations feeding into the model were reviewed by a group of stakeholders, including developers, environmentalists, and other concerned and interested citizens.

Zonal Data

Travel models create a unique spatial framework for describing travel demand. The study area is subdivided into small geographic units called Traffic Analysis Zones (TAZ).

The zonal systems for this effort are a 1,311-zone system for the Salt Lake Area, a 428-zone system for the Ogden Area, and a 1,316-zone system for the Utah County Area. Census tract boundaries do not bisect zones; thus, each area's census tract contains one or more TAZ.

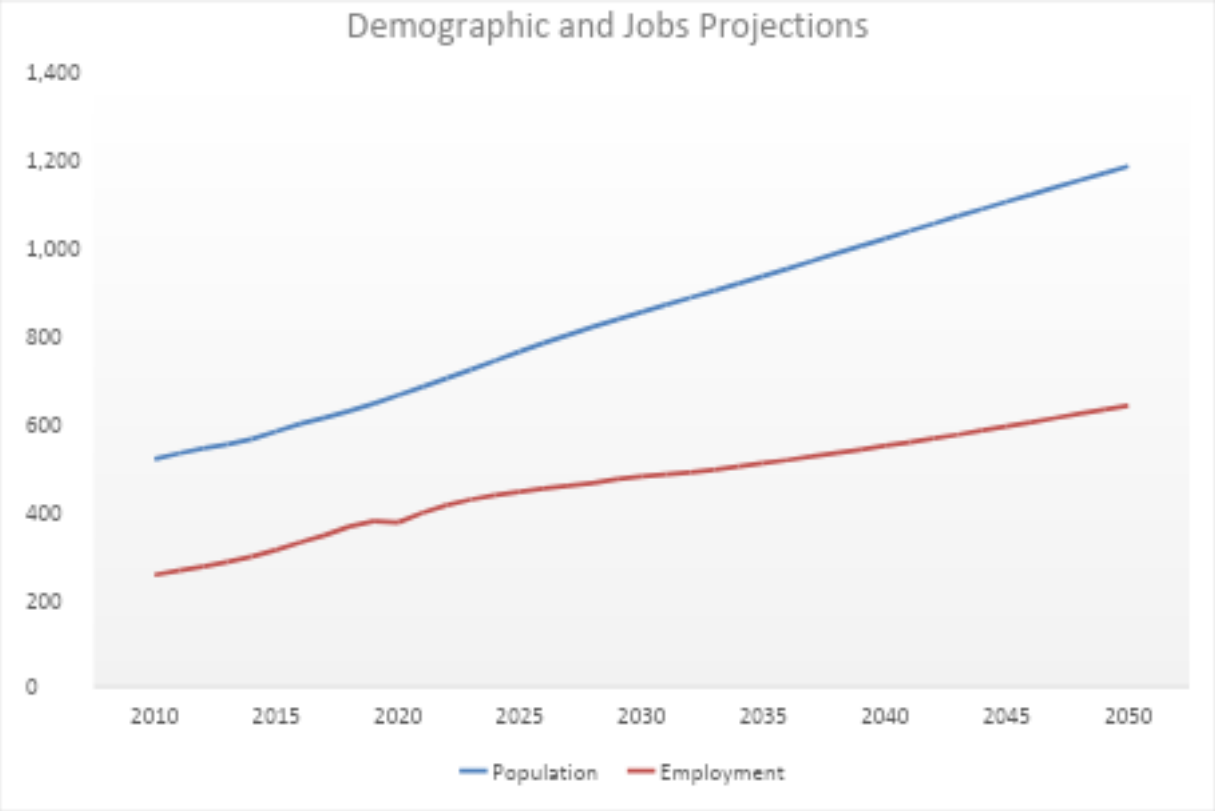
Wasatch Front Travel Model TAZ Zone Map



Population & Employment

MAG and the Wasatch Front Regional Council (WFRC) estimate TAZ's economic and demographic data using information provided by GPI and employment data provided by the DWS. Future-year projections of socio-economic data begin with control totals provided by the Center. These are the state's official demographic estimates and forecasts, which are published for each county in the state.

Each MPO allocates the population, households, and employment to the TAZ. The zone allocation is done based on local master plans and with local planners. Detailed projections are made for 2020, 2030, 2040, and 2050, beginning in 2015. Estimates for intermediate years are not post-processed but exist as raw land use model output. Household data has been stratified by (1) the number of persons per household and (2) the number of vehicles used by the household. The model applies a set of equations to this data to calculate the expected number of person-trips for each household based on *household size/number of vehicles* combination totals for each TAZ.



Projects In The TIP and Regional Transportation Plan
All the projects identified in TransPlan50 are included in the regional emissions analysis. The plan is fiscally constrained – containing only projects with an identified funding source. Estimated funding levels are based on current funding levels and reasonable assumptions that these funds will be continued in the future.

Regionally Significant Projects (40 CFR 93.101): a transportation project (other than an exempt project) on a facility that serves regional transportation needs. This includes 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 would normally be included in modeling a metropolitan area's transportation network, including at minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel."

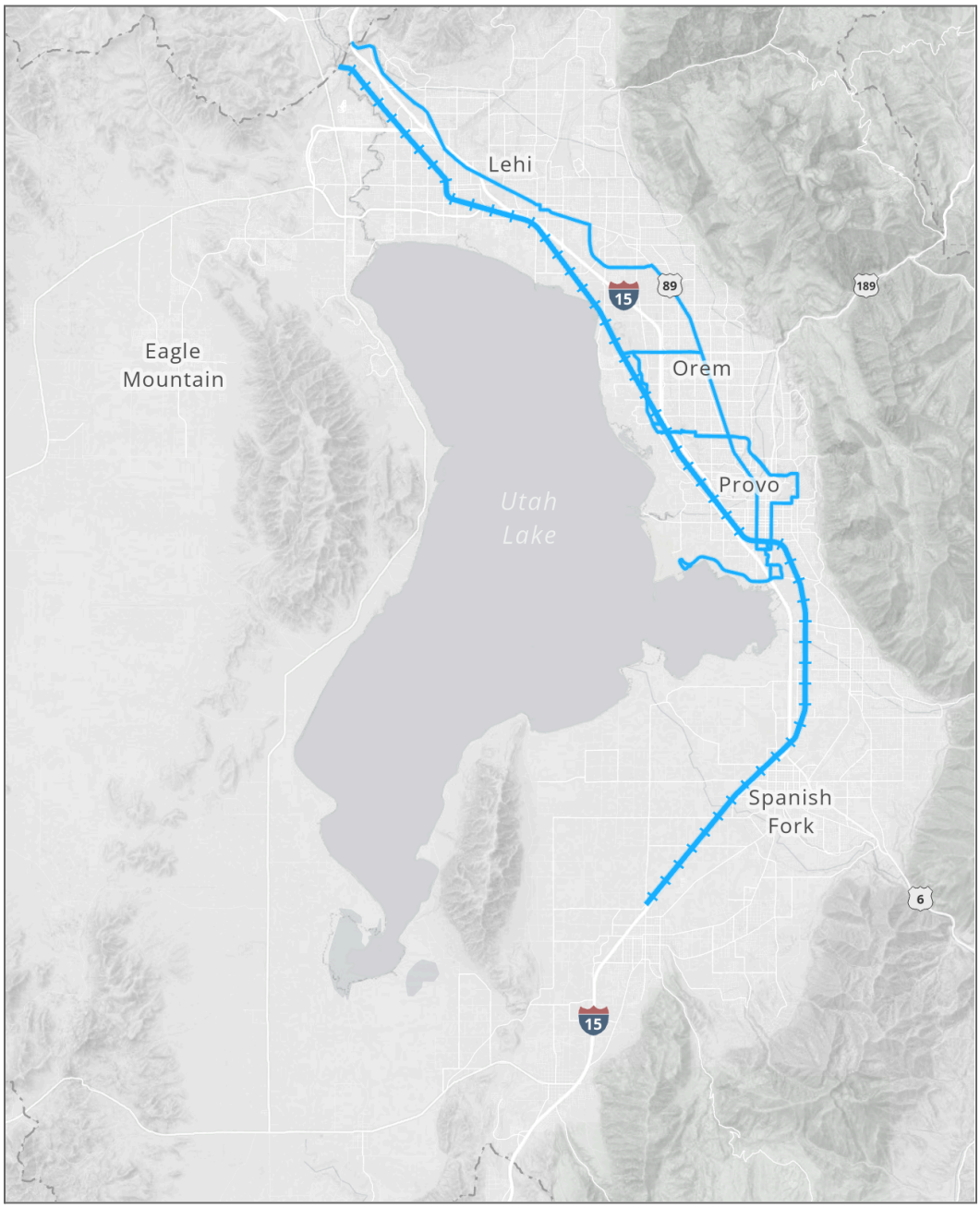
MAG's definition of highway networks meets the EPA's. The regional travel model includes all principal arterial and passenger rail projects. Also, projects on minor arterials, collectors, and local transit services are included—therefore, they are included in the emission analysis—even though they do not serve regional transportation needs as defined by the EPA.

For a complete list of the projects included in this conformity analysis, see

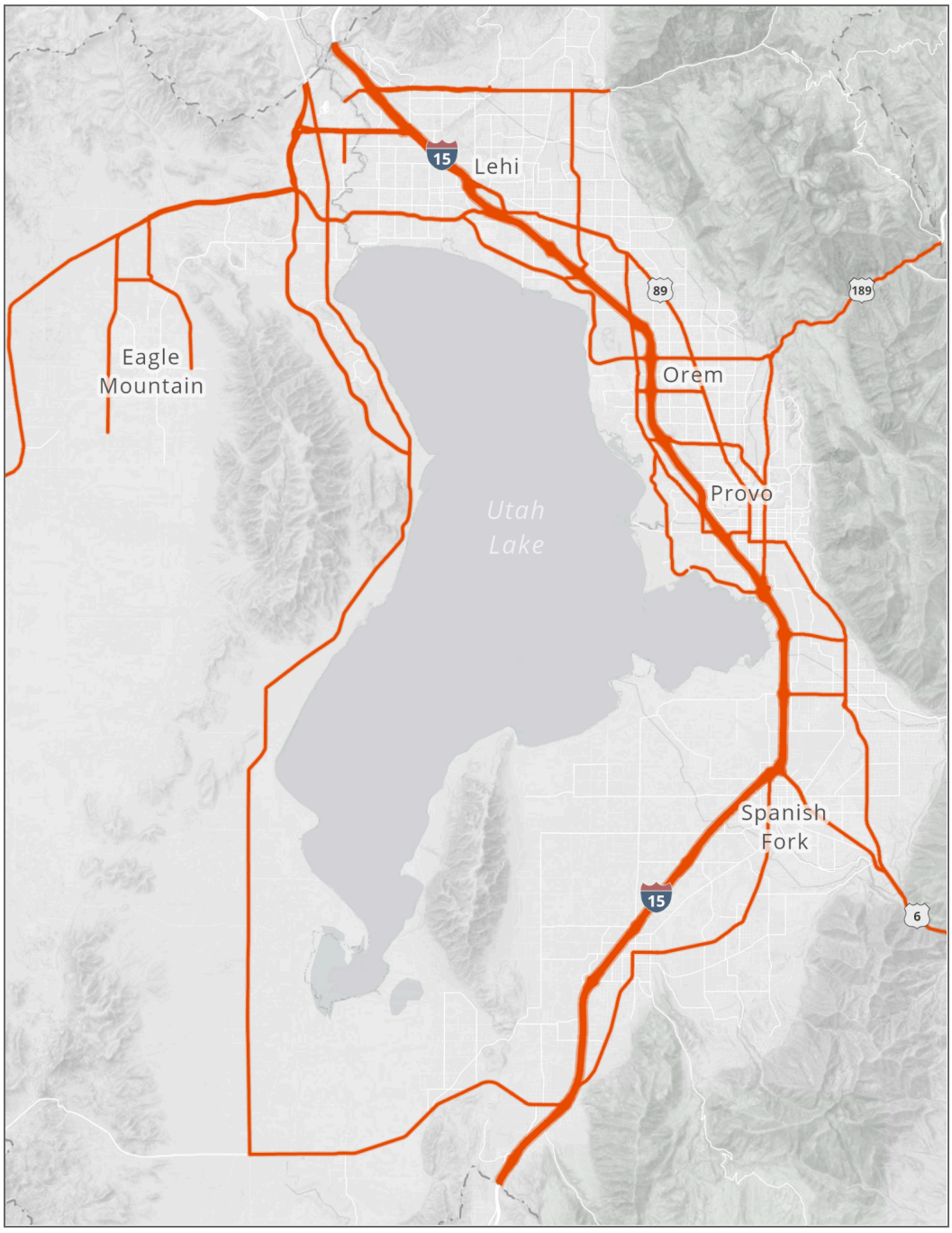
https://magutah.gov/rtp2023/.

Regionally significant projects may not proceed under a conformity lapse, but this conformity analysis finds that the transportation plan conforms.

Utah County - Regionally Significant Corridors Transit Map



Utah County - Regionally Significant Corridors Highway Map



Future Years Travel Demand Model Network

All projects included in the TransPlan50, including baseline projects, were modeled to determine their impact on air quality. This approach models conformity for the entire plan, but in the case of failure to demonstrate conformity, only exempt projects may proceed.

To remain consistent with past modeling practices, MAG included the analysis of all planned transportation capacity increase projects on facilities functionally classified as Collector, Minor Arterial, and Principal Arterial streets.

The highway projects list from TransPlan50 and maps of the transportation networks used for the emissions analysis are included in the appendix. The following "Build" model runs reflect the Plan.

Baseline = Includes existing network as of 2019
2028 = Includes project on current TIP and existing
2032 = Includes projects up to and including year
2042 = Includes projects up to and including year
2050 = Includes projects up to and including year

In addition to the TransPlan50 networks mentioned above, additional years were interpolated – 2030, 2035, and 2040 to provide transportation data needed to assess the air quality impacts on the PM_{10} Ozone and $PM_{2.5}$ analysis years.

> ***Concept and Scope:*** The design concept and scope of all regionally significant capacity-increasing projects in the TIP have not changed significantly from those identified in the plan.

The Regional Travel Demand Model

The Wasatch Front Regional Travel Demand Model (TDM) is an integrated land-use, transportation, and air quality model for various analyses. The MAG MPO and the Wasatch Front Regional Council share the model, covering all four Wasatch Front urban counties (Davis, Salt Lake, Utah, Weber). It includes several advanced features that place it on the cutting edge of improved modeling methods required to meet the BIL Act and the Clean Air Act. In addition, several features recommended by the Travel Model Improvement Program of the US-DOT, FHWA, FTA, and the EPA are incorporated into the model.

Some of the most useful model outputs include:

- Origin-Destination flows
- Directional link vehicle volumes
- Vehicular travel times and speeds
- Transit ridership numbers
- The model produces forecasts four times of day:
  - AM Peak: 6-8:59 AM
  - Midday: 9 AM – 2:59 PM
  - PM Peak: 3-5:59 PM

- Evening/Off-peak: 6 PM – 5:59 AM

Model Coverage

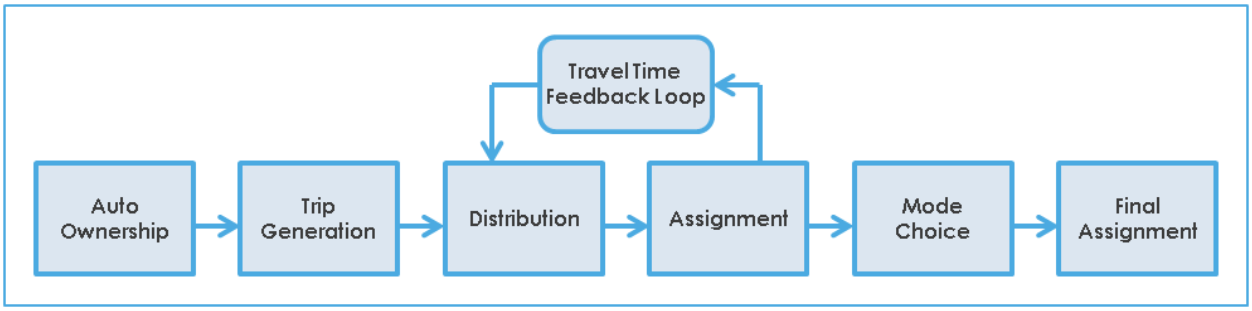
The model covers Utah, Salt Lake, Davis, western Weber, and a portion of Box Elder counties**.** Significant commuting is from Summit County (Park City) and Tooele County. In both cases, the population centers are separated by more than 15 miles from the urban portions of Salt Lake County. The issue of how to treat these growing travel flows may need to be dealt with in the future. Currently, the commuting levels are not of a magnitude that treating the flows as an external-internal flow compromises the urban models significantly.

Model Structure

System-wide transportation planning models are typically based on a four-step modeling process: trip generation, trip distribution, mode split, and trip assignment. The regional model incorporates these steps and adds an auto ownership model sensitive to urban design variables.

The model has a feedback loop between trip distribution and traffic assignment, which ensures consistency between travel congestion and times that *influence* trip distribution patterns and are also an *outcome* of trip assignment. Travel time, or, more generally speaking, *accessibility*, is calculated based on outputs from the assignment model but is also an important determinant of trip distribution and mode split. Therefore, it is customary to iterate these three models to reach a convergent solution.

Conceptual Overview Of The WFRC/MAG Model



At the start of a full model run, the auto ownership model estimates household auto ownership levels, and then the trip generation model uses land use data and auto ownership to calculate trip ends at the TAZ level. The distribution model pairs these trip ends into origins and destinations. In the mode split model, a mode of travel is selected for each trip. Vehicle trips are assigned to the highway network in the assignment model. The travel time feedback loop in the model is accomplished before mode choice by converting person trips to vehicle trips based on observed data.

Model Components

Although considered a five-step process, as stated above, the model comprises several steps, and each step is programmed or scripted separately. These steps include, but are not limited to:

- *A land use allocation model (REMM)* allocates future land use (e.g., housing and jobs) based on accessibility, land availability (through physical constraints and zoning), and the location of existing land uses.

- *The auto ownership model* estimates the likelihood of each household in the region owning 0, 1, 2, or 3+ cars. Auto ownership is a function of the household's characteristics and where the household lives. Auto ownership and availability are strong predictors of trip-making and mode-choice behavior.

- *The trip generation model* calculates the number of person trips generated within each TAZ. The parameters are developed from the WFRC/MAG 2012 Household Travel Survey. The number of trips to and from a place is a function of the amount and types of land-use activity within the zone.

- *The trip distribution model* pairs the origins and destinations for each zone for each trip purpose. Trip generation estimates the number of trips to or from each TAZ, and trip distribution completes the trip by describing which trip origins are linked with which trip destinations. The result is a person trip matrix for each trip type. Trip distribution links trip-ends of the same type based primarily on the spatial separation of different land uses and observed sensitivities to trip length. One output of trip distribution is the person trip table for home-to-work that can be compared to the “Journey- to-Work” data provided by the Bureau of the Census.

- *The highway/transit skim builder* finds the best available travel path via each explicitly modeled travel mode. Several modes are explicitly modeled, including auto, transit modes (local bus, bus rapid transit, light rail, commuter rail), and non-motorized modes. Skims are reasonable approximations of the travel time and cost between all pairs of TAZs, and skims are described for each travel mode. The path-finding algorithms are calibrated based on observed travel paths and observed relationships between volumes and congested speeds.

- *The mode split model* calculates which mode people will likely take based on availability and mode-specific parameters (e.g., time, cost, transit frequency). It provides a breakdown of person trips by mode for captive riders (people without automobiles) and the total population. The mode split model is developed based on observed data on mode preferences and what those preferences imply about

sensitivities to mode attributes.

- *The vehicle assignment model* locates the “best” routes between each origin/destination pair and assigns the vehicle trips to the highway network. Important outputs of this module include the number of vehicles on each roadway segment by time period and turning movements at intersections. Several other pieces of data can be extracted, including operating speeds, travel times, VMT, VHT, and V/C on links and at intersections. In addition, one can configure the vehicle assignment to save all the vehicle trips that use a single link in either direction (select link analysis) or all the vehicle trips that originate or are destined for a zone (select zone analysis).

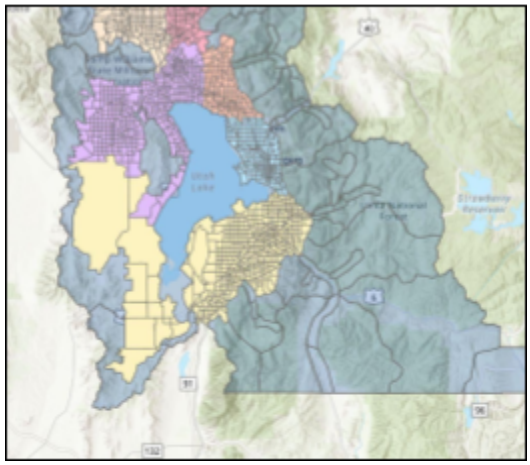
- *Transit assignment* uses the transit trip table output from mode split and assigns person trips using transit to the appropriate transit route. This provides a means of viewing transit ridership graphically and understanding the relative effectiveness of different transit network segments.

- *The model automat*ically summarizes its output, including regional statistics (e.g., VMT, VHT, transit shares, and trip lengths), corridor and segment performance statistics (e.g., delay, volume, and ridership), district and county-level trip flows, MOVE emissions model inputs, and calibration statistics.

Traffic Analysis Zone Structure

There are 1,316 TAZs in Utah County, summarizing travel between the TAZs, land use, and socioeconomic data.

MAG MPO Model Geography/TAZ Structure Map



Network Structure

The road network includes all facilities functionally designated as collectors or above for modeling purposes. It has approximately 50,000 road links.

Model Calibration

The model is calibrated to reasonably represent 2019 “base year” travel conditions and patterns, a process in which model output is checked or "validated" against real-world data. Trip rates, transit ridership and highway volumes are examples of types of model outputs that are validated. When the model results do not match the base-year values within an acceptable tolerance, parameters are adjusted until the model is acceptable. For future forecast years, the model output is reviewed for "reasonableness" to validate model results, and model sensitivities can be assessed.

Quality Control And Monitoring

Due to the vast amount of data required as input to the modeling process, numerous quality control tools have been developed to help ensure the integrity of that data, which in turn enhances the model's reliability. These automated features include the following:

- Summaries of key demographic data – these are used to compare magnitudes and trends and to check for accuracy.
- Summaries of county-to-county flow magnitudes and trends help check for accuracy and reasonableness.
- Cross-checks to detect conflicting network data.
- Visual inspection of differences between the highway networks.
- Screen line summaries to compare general traffic volumes.
- Check links for the correct county and city tag.
- Check that link speeds and volumes are within reasonable ranges.
- Numerous other network detail checks.

Transportation Modeling

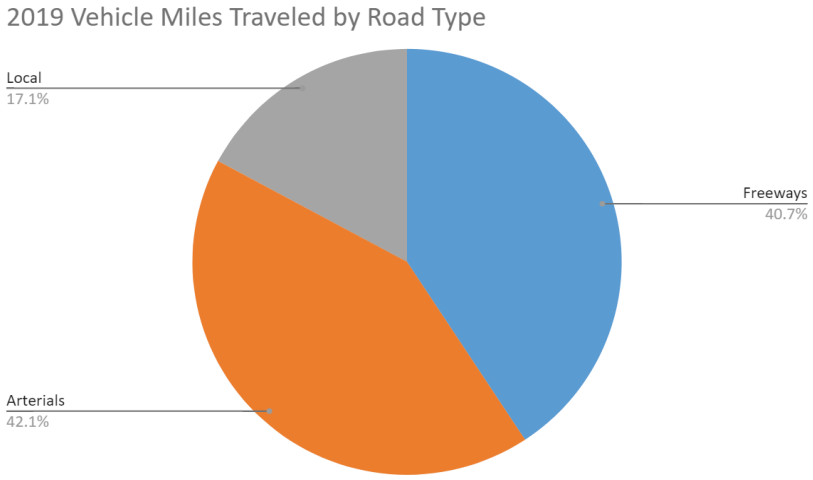
Utah County 2019 AADT Adjustment Factors

Facility Type	Model AADT VMT	HPMS AADT VMT	TDM Model to AADT Factors
Freeways	5,500,075	5,680,241	1.033
Arterials	6,550,962	5,875,649	0.897
Local Roads	863,796	2,390,541	2.767

AADT: Average Annual Daily Traffic | VMT: Vehicle Miles Traveled

HPMS: Highway Performance Management System (UDOT traffic counts)

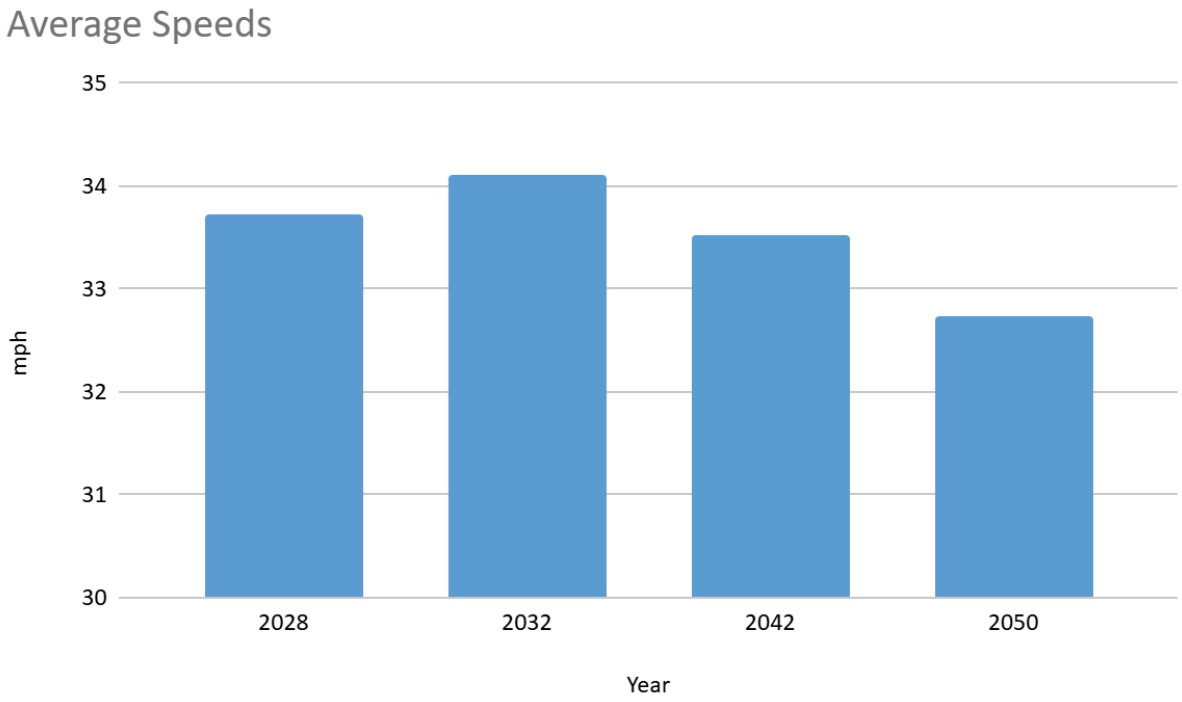
Each road segment in the TDM has an associated monthly adjustment factor. The default winter factor is 0.974, and summer is 1.07 for road segments without a factor.


2019 Vehicle Miles Traveled by Road Type
Local
17.1%
Freeways
40.7%
Arterials
42.1%

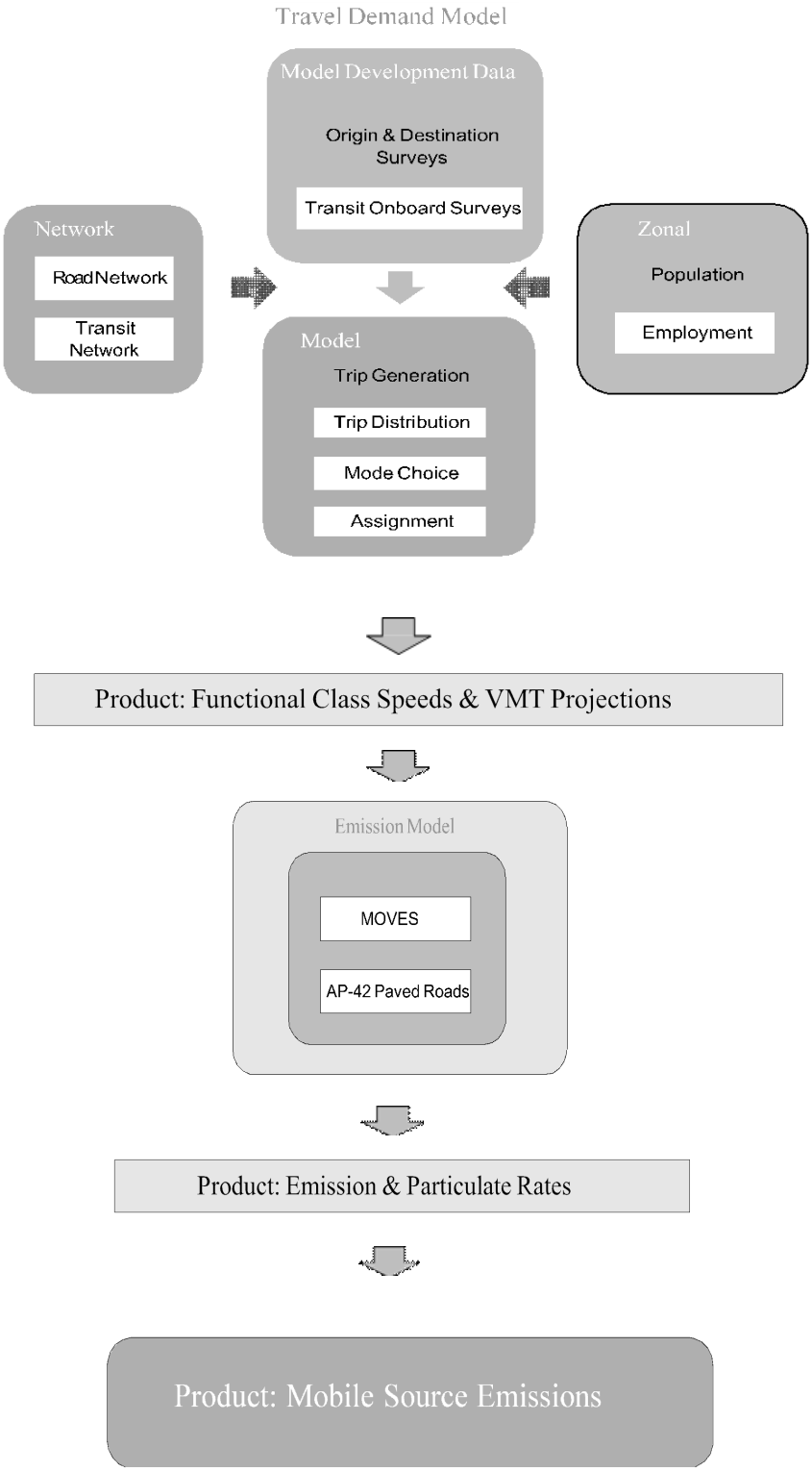
Utah County Travel Characteristics

Activity by Time of Day and Facility Type					
	Base Year 2019	**2028**	**2032**	**2042**	**2050**
Freeway					
AM	19.0%	19.2%	19.0%	18.8%	18.8%
MID	32.1%	32.4%	31.8%	32.3%	32.4%
PM	24.0%	23.8%	25.4%	25.1%	24.6%
EVE	24.9%	24.6%	23.8%	23.9%	24.2%
Arterial					
AM	17.4%	17.2%	17.1%	17.2%	17.3%
MID	32.1%	32.3%	31.7%	31.7%	31.8%
PM	26.4%	26.1%	27.2%	27.2%	27.3%
EVE	24.1%	24.4%	24.0%	23.8%	23.7%
Local					
AM	16.7%	15.5%	16.0%	16.2%	18.0%
MID	32.4%	34.5%	35.9%	27.9%	27.9%
PM	25.7%	27.0%	27.8%	39.8%	35.9%
EVE	25.2%	23.0%	20.3%	16.1%	18.1%
Total Network					
AM	17.8%	17.7%	17.8%	17.8%	17.8%
MID	32.2%	32.4%	32.2%	32.3%	32.4%
PM	25.5%	25.4%	25.7%	25.7%	25.6%
EVE	24.4%	24.5%	24.2%	24.2%	24.2%

Average Speeds by Time of Day and Facility Type					
	Base Year 2019	**2028**	**2032**	**2042**	**2050**
Freeway					
AM	63.9	65.7	65.3	63.6	64.7
PM	58.4	56.5	62.1	60.1	60.7
Eve	68.4	71.6	68.7	67.9	68.4
Arterial					
AM	32.4	33.7	33.5	32.6	32.5
PM	30.9	32.3	31.9	30.8	30.7
Eve	33.3	34.5	34.4	33.7	33.4
Local					
AM	23.5	24.3	22.7	18.1	21.3
PM	23.5	23.8	22.7	17.9	21.0
Eve	23.5	24.6	22.7	18.1	21.4



Travel Model and Mobile Emission Model Interaction Diagram



Modeling Domain For PM10 and Co Maintenance Areas, as well as PM2.5 and Ozone Non-Attainment Areas

MAG's modeled area covers the entire county.

PM10, PM2.5, and ozone conformity must be found for all designated non-attainment areas. CO conformity must be found for the Provo City boundary, though only a qualitative analysis is required per the LMP.

93.111 - LATEST VEHICLE EMISSION MODEL

The Mobile Source emissions factor data is derived from employing two EPA models. For Oxides of Nitrogen emission factors and Particulates, MAG employed the approved MOVES 4.0.1 model. For determining Road Dust emission rates, the AP-42 equation was used as summarized below:

Secondary PM10 Pollutants
MOVES - NOx
AP-42– Chapter 13 - Road dust

2006 PM2.5 Precursor
MOVES – NOx, VOC

2015 Ozone Precursor
MOVES – NOx, VOC

PM10 Pollutants - Direct
MOVES – Exhaust, Tire & Brake wear

2006 PM2.5 Pollutants - Direct
MOVES Total PM2.5, Break and Tire Wear

Once the emission rates have been determined for each facility type, the corresponding rates (in grams/mile) are multiplied by the seasonal daily VMT for that facility for that calendar year. As per the following formula:

Emission Rate (gram/mile) x Vehicle Miles Traveled (miles/day) = Emissions (gram/day)
The total emissions for the County are determined by adding the rates of all 3 facility types (Freeways, Arterials, and Local roads)

Moves Air Quality Model
The EPA-approved air quality model MOVES 4.0.1 was used to prepare the plan for conformity.

I/M Programs
Until 1996, Utah County's I/M program was a basic two-speed idle, classified as a Test and Repair Program. In 1996 and later, the EPA approved Utah County's I/M Program for credit as a centralized test-only program with Technician Training credits.

Effective February 29, 2000, the Utah County I/M Program consists of a two-speed idle test on all gasoline vehicles of model years 1968 through 1995 and OBD testing on all gasoline vehicles of model year 1996 or newer. A vehicle that passes the OBD test will be given a certificate of compliance for registration purposes. If a vehicle fails the OBD test, it must pass the two-speed idle test to receive a certificate of compliance.

For modeling purposes, model years 1996 and above are tested under the OBD procedure. H.B.172 went into effect in January 2003, requiring biennial emission testing on the newest six-year-old car models.

Moves Input Files

The MOVES model is a data-intensive computer program based on the MYSQL database software. Input files utilized in the conformity analysis follow the agreed-upon procedures and data established through consultation with the DAQ and EPA to prepare SIPs and Maintenance Plans. The input files were adapted for the projection inventories to reflect changes in the local I/M programs, vehicle standards, and other parameters as they evolve – per the Interagency Consultation process that reflects the established local conditions. Vehicle activity input files are generated by the WFRC/MAG Regional Travel Demand Model.

The EPA User's Guide to MOVES found on the EPA's website, details MOVES procedures and proper use and explains all command lines and external files used in the modeling.

Input File	Source
Vehicle Population	DAQ
Age Distribution	DAQ
Inspection Programs	DAQ
Fuel Formulation & Usage	DAQ
Meteorology	State SIPs or DAQ/EPA
Vehicle Miles Traveled	TDM
Road Type Distribution	TDM
Speeds	TDM

Primary Particulate Emissions – Moves, and AP-42 Chapter 13 - Paved Roads

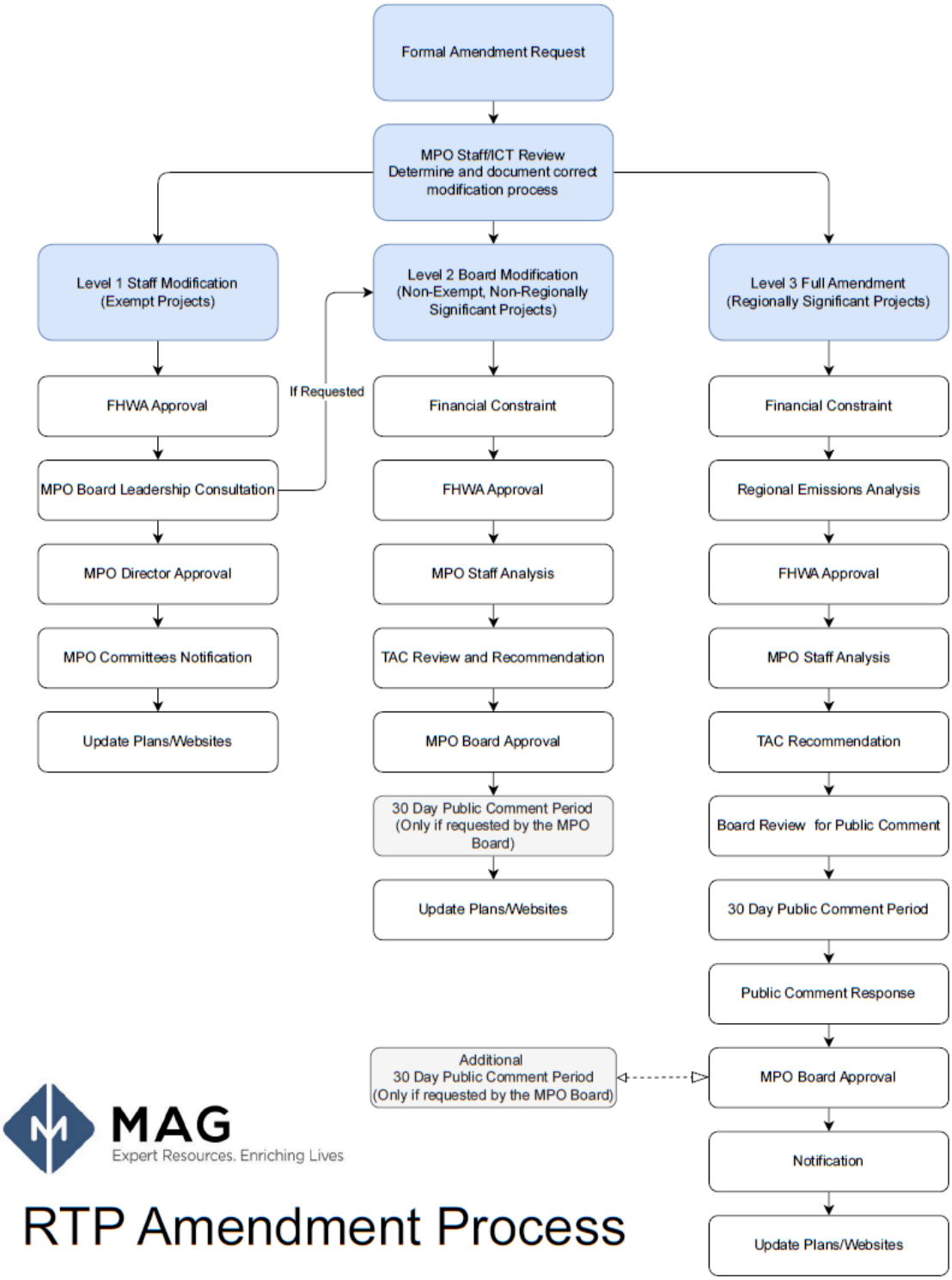
The conformity analysis for Particulate Matter 10 (PM10) was estimated using the MOVES model for Exhaust, Tire, and Brake Wear. Road Dust was estimated using AP-42.

The MOVES guidance documentation and Chapter 13 of the fifth edition of AP-42 provide detailed discussions of the methodology.

More information can be found at https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors.

93.112 - CONSULTATION

RTP Amendment process adopted in June 2024.



Each modification to the RTP must follow one of three procedures:

Level 1, Staff Modifications, requires MAG MPO Director approval in coordination with FHWA and the Interagency Consultation Team (ITC).

Level 2, Board Modifications for Non-Regionally Significant Projects, requires MPO Board approval, a conformity determination from FHWA, and review by the ITC, city planners, elected officials, the TAC, a possible 30-day public comment period.

Level 3, Full Amendment for Regionally Significant Projects, requires MPO Board approval, a new air quality conformity finding, a new regional emission analysis, and review by the ITC, city planners, elected officials, the TAC, and a 30-day public comment period.

***WFRC / MAG Regional Transportation Model*:** MAG, in collaboration with WFRC, employs a travel demand model using the traditional four-step travel demand process. The model is run using the Voyager program developed by Bentley Systems.

DAQ / MAG Emission Input Parameters: MAG, in collaboration with the DAQ has developed, through consultation, the environmental conditions (such as ambient temperature profile, altitude, and humidity) used in the MOVES model. These parameters were employed in the preparation of the State Maintenance Plans. A detailed discussion of the environmental conditions and parameters is included in the plan Technical Support Documents (TSDs) found in the SIPs.

Clean Air Agencies Consultation: As stated in the transportation bill, "In metropolitan areas which are non-attainment for ozone or carbon monoxide under the Clean Air Act, the metropolitan planning organization shall coordinate the development of a long-range plan with the process for the development of the transportation control measures of the State Implementation plans required by the Clean Air Act." A Consultation Procedures SIP was adopted by the State AQ Board and Approved by EPA in September 2009.

The presence of the DAQ on our MAG MPO Board and the MPO Technical Advisory Committee contributes to improved communications between Air Quality and Transportation Planning activities. In conjunction with the conformity determination, we have established an Interagency Coordination Committee that includes FHWA, UDOT, DAQ, UTA, EPA, MAG, and WFRC representatives. These meetings have greatly improved the consultation process, resulting in a successful plan consistent with federal planning regulations and the SIP.

Employing the Interagency Consultation process articulated in 40 CFR 93.105, MAG has

worked closely with the appropriate agencies to develop a process that established a set of transportation, land use, and air quality planning assumptions used in this conformity determination. The participants included staff representing the following agencies:

UDOT	UTA
FHWA/FTA	Utah County Government
DAQ	Utah County Cities
EPA/Region 8	WFRC
CMPO	

MAG presented its plans for RTP Amendment 1 to the ICT on 2.14.2024. The presentation for that amendment can be found at this link, and meeting minutes are available upon request.

Amendment 2 was presented to the ICT on December 11. ICT comments included clarifications on the absence of a PM10 Dust Budget in the State SIP, suggestions for improved formatting, and questions about dust rates and VOC totals for Ozone in 2026. Questions were answered and minor adjustments made to this document according to the comments. No comments necessitated re-modeling or changed any of the emissions quantities.

93.113 - TRANSPORTATION CONTROL MEASURES

The PM10 SIP for Utah County and the Provo CO Maintenance Plan do not identify mandatory Transportation Control Measures (TCM).

***Transit Improvements*:** The TransPlan50 identifies strategic options for the role of public transit in Utah County. This plan identifies mass transit needs and intercity travel between Utah County and the Salt Lake Valley with a thirty-year horizon.

UTA is funded through portions of the sales tax for operation and capital expenses. Additional revenue is received through fares paid and federal grants received annually for capital expenses. While there have been some short-term fluctuations in transit patronage in response to fare increases or pandemics, the implementation of commuter rail service and other transit improvements have increased transit patronage within the levels anticipated by the Plan.

Plans for expanding and increasing commuter rail service, extending Bus Rapid Transit to American Fork, and adding commuter rail in South Utah County are moving forward. These transit goals are featured in the Plan, and the steps necessary to achieve them are moving forward, including a proposal for voter approval of additional revenue for transit funding. A detailed discussion of public transit is included in the TransPlan50 document.

93.118 - EMISSION BUDGETS

Utah County PM10 Conformity Determination

The Utah County PM10 Maintenance Plan requires conformity determinations for NOx and Primary PM (a combination of Direct PM10 and Dust). Construction-related PM_{10} (§93.122(d) is unnecessary because the PM10 SIP does not identify construction-related dust as contributing to the PM_{10} non-attainment.

In 2005, the State introduced a Trading Rule for Salt Lake County (R307 – 110) that allows the WFRC MPO to apply a potential surplus in its budget for Primary PM_{10} to a potential shortfall in its budget for NOX at a one-to-one ratio.

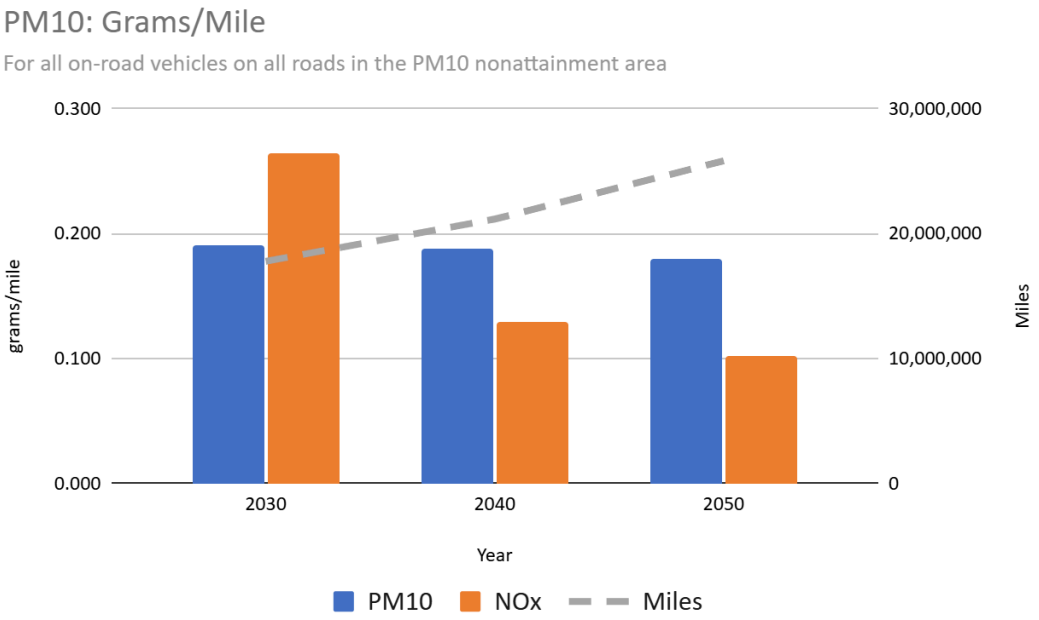
MAG also requested that the state expand this existing rule to Utah County. The new Rule addressing Utah County, R307 – 111, was incorporated into the state code and became effective March 5, 2015. The final Trading Rule for Utah County was published in the Federal Register on July 17, 2015.

In 2020, PM10 was redesigned to attainment with a Motor Vehicle Emissions Budget for 2030.

Utah County PM10 Emission Modeling Results

The following tables summarize the emissions from MOVES and EPA's Dust Calculation tool (AP-42 -Paved Roads).

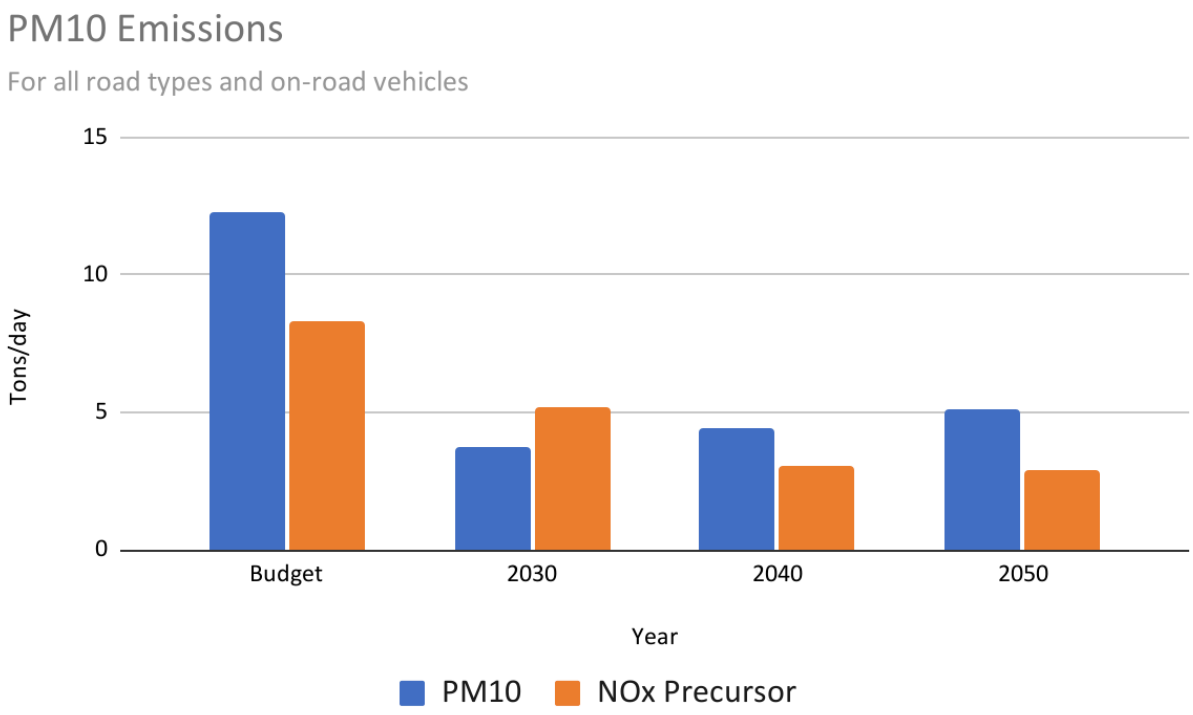
Emissions Rates grams/mile			
Year	**2030**	**2040**	**2050**
Miles	17,770,902	21,145,438	25,812,854
PM10	0.190	0.188	0.180
NOx	0.264	0.129	0.102
Dust	0.138	0.138	0.133
PM10-Exhaust	0.009	0.004	0.004
PM10-Brakewear	0.033	0.035	0.033
PM10-Tirewear	0.010	0.011	0.010
*PM10 = Dust + Direct PM10 (Exhaust+Brakewear+Tirewear)			



The table below summarizes the budget test associated with each required analysis year for the precursor pollutant NOx and Direct PM10. Direct PM10 is the sum of various component elements related to small particulates resulting from vehicle travel. These include exhaust, brake, tire wear, and fugitive dust, as the EPA AP-42, chapter 13—Paved Roads model results. TransPlan50 and the TIP conform to the emissions budget test for all PM10 pollutants.

Utah County PM10 Conformity Budget Test

PM10 Budget Conformity Test Emissions from all road types and on-road vehicles in tons/winter day				
	Budget (2030)	**2030**	**2040**	**2050**
PM10*	12.28	3.722	4.461	5.126
NOx Precursor	8.34	5.22	3.07	2.9
Dust		2.692	3.281	3.786
PM10-Exhaust		0.17	0.1	0.1
PM10-Brakewear		0.66	0.83	0.95
PM10-Tirewear		0.2	0.25	0.29
Result		**Pass**	**Pass**	**Pass**
*PM10 = Dust + Direct PM10 (Exhaust+Brakewear+Tirewear)				



Utah County PM10 Final Conformity Determination

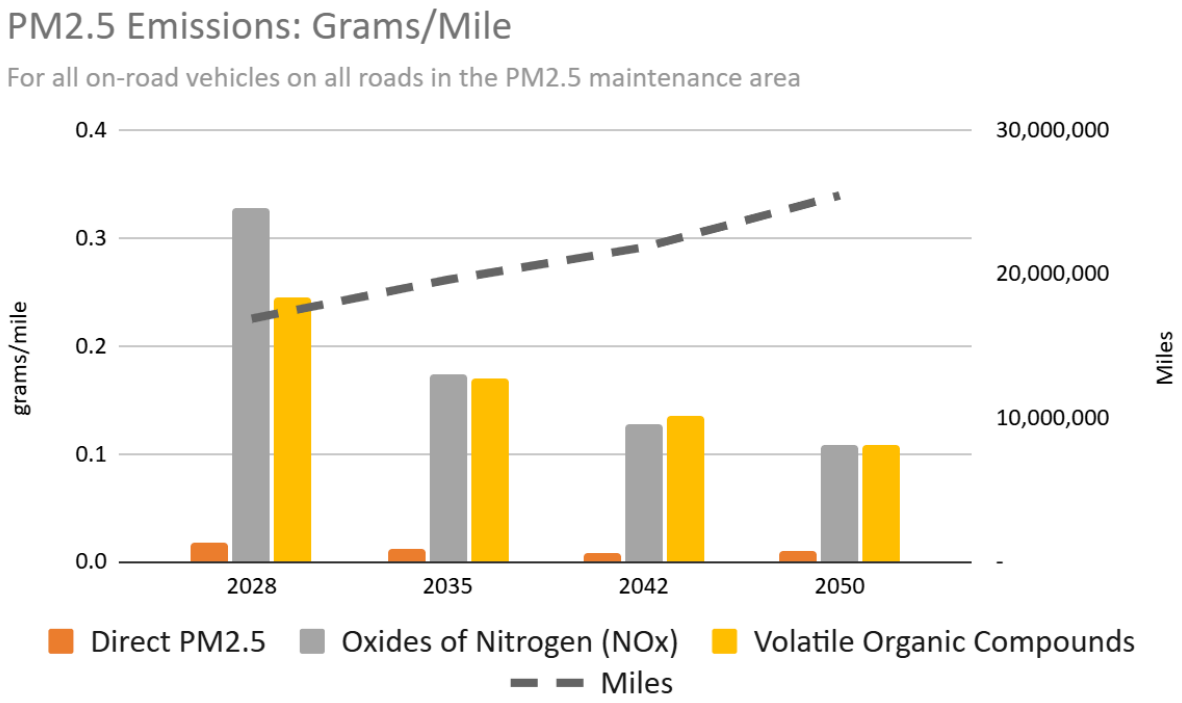
Based on this report's findings, a positive conformity determination for PM10 is made for the TransPlan50 and TIP.

Utah County PM2.5 Conformity Determination

A conformity determination for PM2.5 is required for NOx, direct PM2.5, and VOC.

Utah County PM2.5 Emission Modeling Results

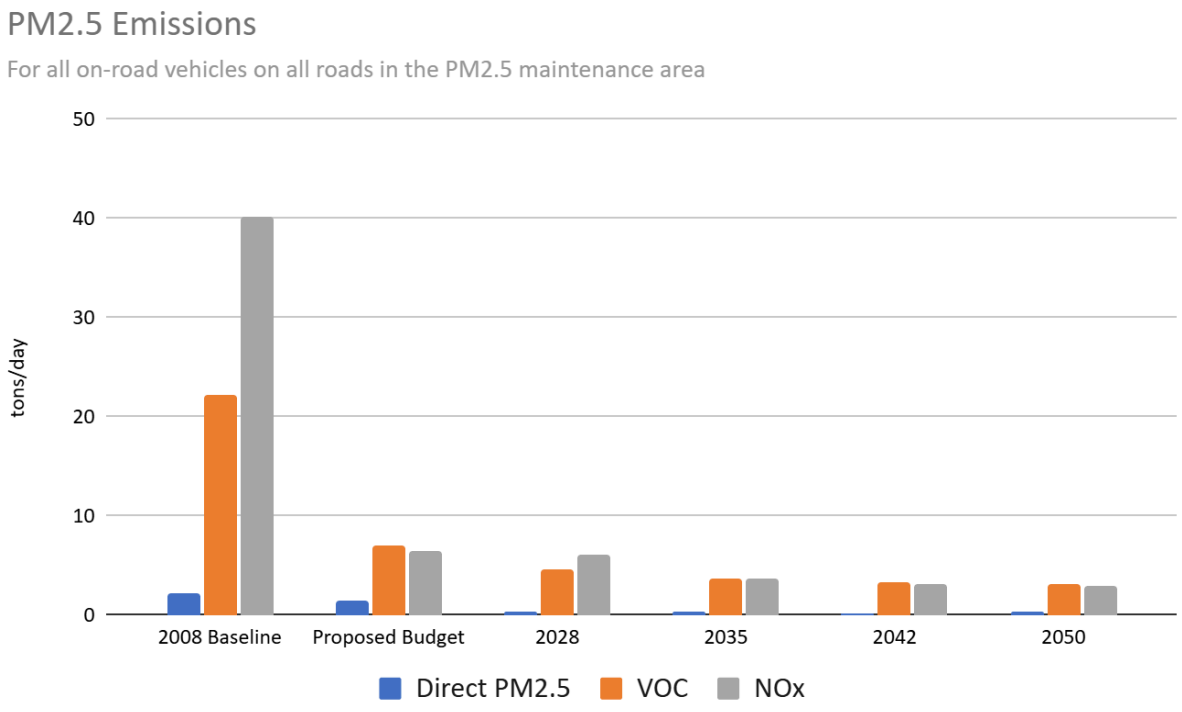
PM2.5 Grams/Mile For all on-road vehicles on all roads in the PM2.5 maintenance area				
	2028	**2035**	**2042**	**2050**
Miles	16,878,944	19,584,528	21,840,884	25,454,286
NOx	0.3273	0.1728	0.1275	0.1073
VOC	0.2451	0.17	0.1346	0.108
Direct PM2.5*	0.0177	0.0121	0.0075	0.01
PM2.5 - Exhaust	0.0118	0.0065	0.0012	0.0043
PM2.5 - Brakewear	0.0043	0.0042	0.0046	0.0043
PM2.5 - Tirewear	0.0016	0.0014	0.0017	0.0014
*Direct PM2.5 = Exhaust + Brakewear + Tirewear				



The table below summarizes the interim test results (analysis year ≤ 2008) associated with each required analysis year for PM2.5 emissions for the precursor pollutant of NOx and Direct PM2.5. The EPA has proposed Motor Vehicle Emissions Budgets applicable in 2035, but the interim test is used until the EPA publishes their adoption in the federal register. We include the proposed budget here for reference.

Proposed Budgets (not yet official)	
Pollutant	**Tons per Day**
Direct PM2.5	1.5
NOx	6.5
VOC	7.0

PM2.5 Emissions For all on-road vehicles on all roads in the PM2.5 maintenance area						
Pollutant	**2008 Baseline**	**Proposed Budget**	**2028**	**2035**	**2042**	**2050**
VOC	22.108	7	4.56	3.67	3.24	3.03
NOx	40.046	6.5	6.09	3.73	3.07	3.01
Direct PM2.5	2.102	1.5	0.33	0.26	0.18	0.28
Primary Exhaust PM2.5 - Total			0.22	0.14	0.03	0.12
Primary PM2.5 - Brakewear Particulate			0.08	0.09	0.11	0.12
Primary PM2.5 - Tirewear Particulate			0.03	0.03	0.04	0.04
Result			**Pass**	**Pass**	**Pass**	**Pass**
*Direct PM2.5 = Exhaust + Brakewear + Tirewear						



TransPlan50 and the TIP conform to the emissions interim test for the PM2.5 pollutants, and the proposed PM2.5 Budget is not yet published as a final rule in the Federal Register.

Utah County PM2.5 Final Conformity Determination

Based on the findings of this report, a positive conformity determination for PM2.5 is made for the TransPlan50 Plan and TIP.

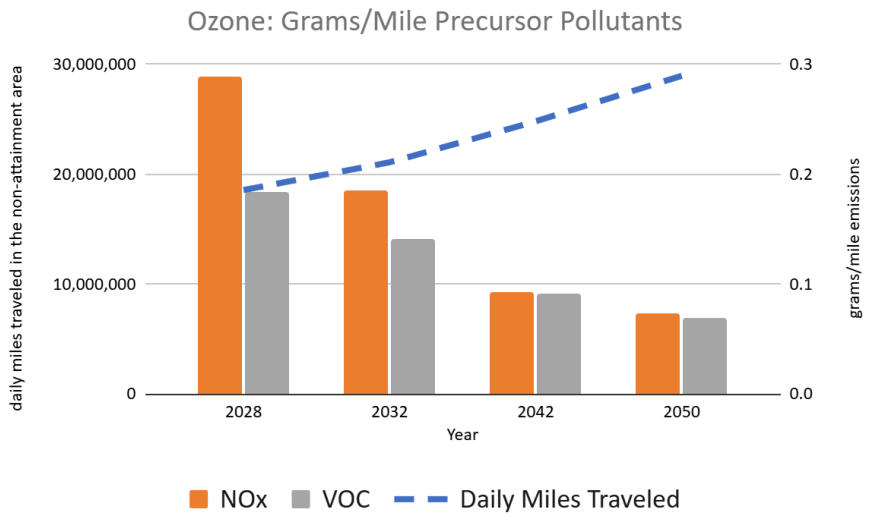
Utah County Ozone Conformity Determination

The Southern Wasatch Front Area, namely Utah County, was designated as a marginal non-attainment area for ozone by EPA effective December 2018. Utah County achieved the standard by the 2021 attainment date and is working with the State to submit a Limited Maintenance Plan (LMP), under which a qualitative conformity analysis is acceptable. Until the EPA approves the LMP, conformity requires an analysis of TransPlan50 projects based on an interim test comparing the plan analysis years to the Ozone Inventory of 2017 (as the base year). The analysis year inventories should be ≤ (less or equal) to the base year. Since ozone exceedances in Utah County were observed in the summer, the VMTs have been adjusted to reflect that season. The TDM analysis excludes areas of Utah County outside the Ozone Non-Attainment Area.

Conformity determinations are required for NOx and VOC, Ozone's precursor pollutants.

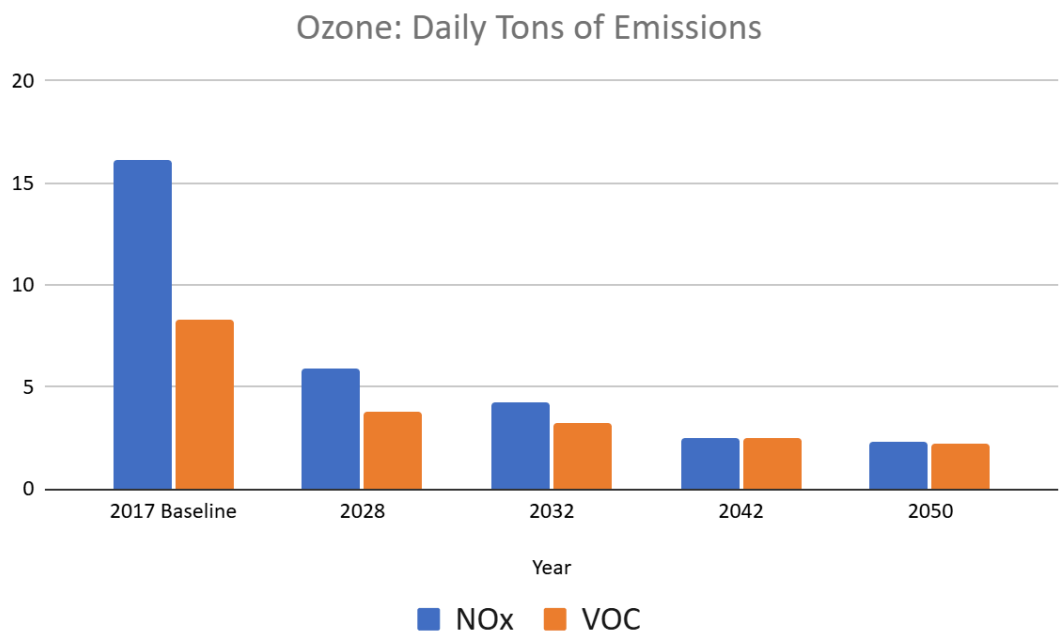
Utah County Ozone Emission Modeling Results

Ozone: Grams/Mile Precursor Pollutants For all on-road vehicles on all roads in the ozone non-attainment area				
Pollutant	**2028**	**2032**	**2042**	**2050**
NOx	0.2884	0.1846	0.0925	0.0736
VOC	0.1843	0.1407	0.0917	0.0692
Daily Miles	18,559,548	21,083,660	24,818,656	28,965,490



The following table summarizes the interim test results (analysis year ≤ 2017) associated with each required analysis year for OZONE emissions for the precursor pollutants NOx and VOC.

Ozone: Daily Tons of Emissions					
Pollutant	**2017** Baseline	**2028**	**2032**	**2042**	**2050**
NOx	16.11	5.9	4.29	2.53	2.35
VOC	8.31	3.77	3.27	2.51	2.21
Result		**Pass**	**Pass**	**Pass**	**Pass**



Utah County Ozone Final Conformity Determination
Based on the findings of this report, a positive conformity determination for OZONE is made for the TransPlan50 Plan and TIP.

Provo City CO Conformity Determination

Effective July 13, 2020, Provo City entered its 2nd 10-year Carbon Monoxide maintenance plan. This plan follows the provisions/requirements of the CO LMP Policy. The CO LMP does not require a regional emissions test for a conformity determination. According to the EPA, "… it is unreasonable to expect that an LMP area will experience so much growth in that period that a violation of the CO NAAQS would result. Therefore, for the

Provo CO maintenance area, all actions that require conformity determinations for CO under our conformity rule provisions are considered to have already satisfied the regional emissions analysis and “budget test” requirements in 40 CFR 93.118.”

Based on our analysis, a qualitative conformity determination for Provo City for carbon monoxide can be made based on the LMP Provisions described under the transportation conformity rule.

Provo City Co Final Conformity Determination
Based on an analysis consistent with these rules, a positive determination can be made for the TransPlan50 and TIP in the Provo City Carbon Monoxide maintenance area.

Additional Information

2024-2050 Highway Project List See https://magutah.gov/rtp/

2024 TransPlan50 Amendment website https://magutah.gov/rtp-amendments/

The MOVES models' input and output database files used in the analysis can be obtained upon request from MAG: 801.229.3800 or smecham@mountainland.org.

Appendix A: Public Comment Posting

Public notice was posted on the magutah.gov website, the State of Utah Public Notice website, in the MAG office, and on the MAG social media accounts on Facebook and Linkedin.

Website and Social Media Public Comment Writeup

Mountainland Association of Governments (MAG) invites the public to provide feedback on the draft of Amendment #2 to the 2023-2050 Regional Transportation Plan (RTP), also known as TransPlan50, and the Air Quality Conformity Report draft.

What is the Regional Transportation Plan?
The Regional Transportation Plan (RTP) is the regional long-term strategy for our Region's future transportation system from now to 2050. MAG develops the plan with transportation partners, local communities, organizations, stakeholders, and residents.

What is the Public Comment Period For?
Every four years, MAG prepares and adopts an RTP. MAG adopted the current TransPlan50 in June 2023. While the RTP receives considerable review before being formally adopted, circumstances may warrant a change after its initial adoption, including funding availability, changing local and state needs, the outcomes of environmental analyses and other planning studies, or updated timelines on the development of projects.

Amendment #2 includes changes to several roadway and active transportation projects developed in consultation with transportation partners and local communities throughout Utah County. Notable changes include the future Cory Wride Freeway, Cedar Valley Highway alignment, and Highline Canal Trail.

The public comment period for the Amendment #2 projects runs from December 13, 2024, to January 12, 2025. Changes to RTP projects and the Air Quality Conformity Report are available for review and comment here: https://magutah.gov/rtp-amendment-2/.

If you would like to give your comments or ask questions, you can do so by:
- Mail: PEP Comments, Attn. Kendall Willardson, 586 East 800 North, Orem, UT 84097
- Email: kwillardson@mountainland.org
- Website: www.magutah.gov/public
- Phone: 801-229-3800

Comments and Action

Comments received and actions taken will be listed here after the comment period has ended.

MAG

Expert Resources. Enriching Lives.

The MAG MPO TransPlan50 Amendment 2 is prepared by the MAG Metropolitan Planning Organization (MPO) as part of the Mountainland Association of Governments (MAG)

www.magutah.gov

586 East 800 North

Orem, UT 84097

801-229-3800