CONFORMITY DETERMINATION REPORT

MOUNTAINLAND MPO

TransPlan50

2050 Regional Transportation Plan

MAG

Expert Resources. Enriching Lives.

June 1, 2023

Mountainland MPO

586 East 800 North
Orem, Utah 84097-4146

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	Transportation Demand Management
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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#2023-06-01-01

A resolution of the MAG MPO Board adopting
MAG 2023 TransPlan50 and the 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 June 1, 2023

MPO BOARD CHAIR, Mayor Michelle Kaufusi

ATTEST: YMH

CONFORMITY DETERMINATION REPORT

MAG TransPlan50

SUMMARY

This report is the new Conformity Determination for MAG TransPlan50

As the MPO, MAG is responsible to develop, produce and adopt 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 **conform** 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 MAG MPO Board approves the Conformity Determination Report. Federal Highway Administration (FHWA) and Federal Transit Authority (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."

TRANSPORTATION CONFORMITY

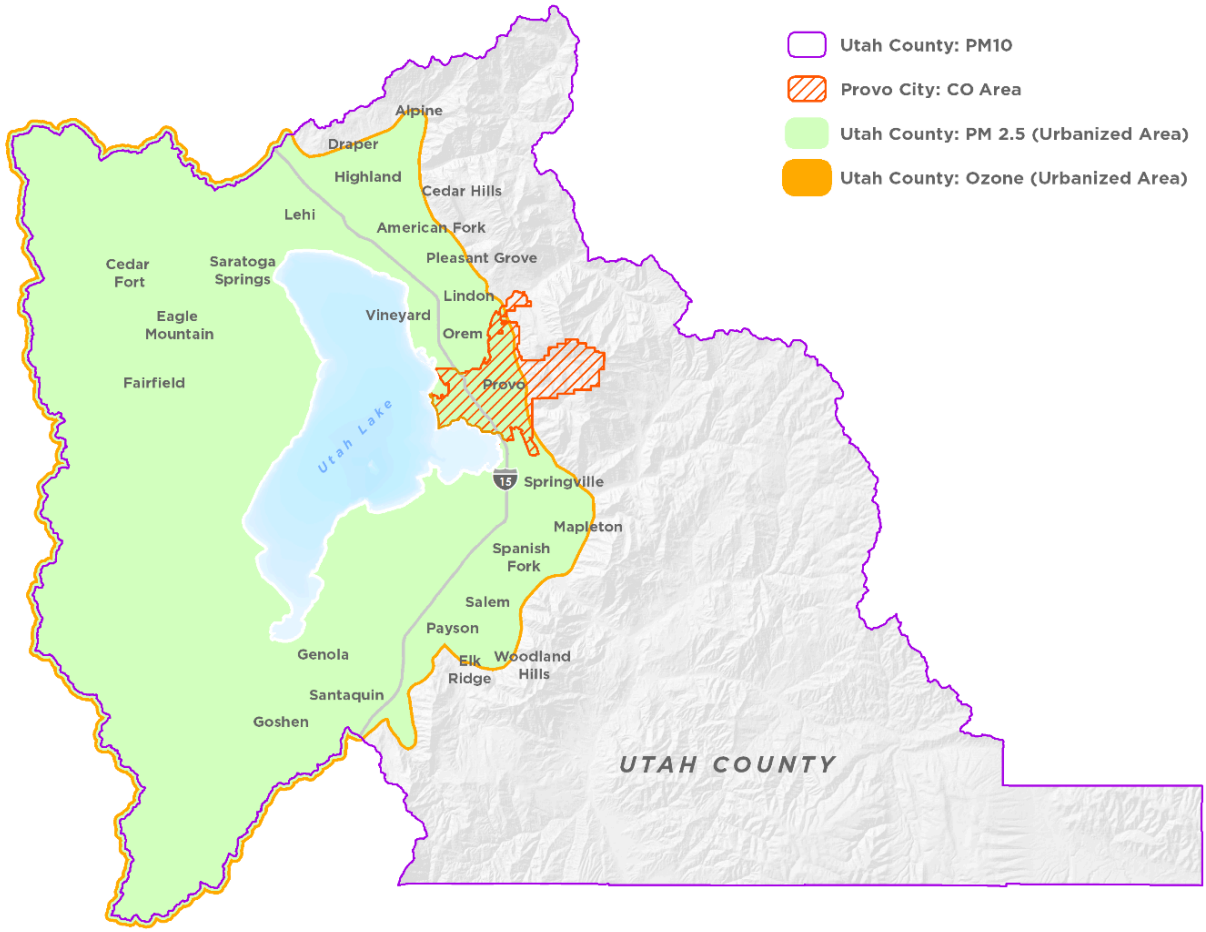
A Basic Guide for State and Local Officials United States Department of Transportation (US-DOT)

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 allow the policies, programs, and projects to be implemented using Federal Funding.

All assumptions used in this determination report were found consistent with the 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 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**.**

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 area or maintenance area pollutant in the MAG area.

Effective March 27, 2020, Utah County was redesignated 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 transportation conformity aspects, 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. The State, in collaboration with stakeholders, is required to prepare a PM2.5 Maintenance Plan. Until the plan is approved by the EPA, the MPO is required to perform interim conformity tests for the 2006 PM2.5 non-attainment area. The EPA proposed an approval of Utah's PM2.5 SIP with associated Maintenance Plan and 2034 emissions budgets in the Federal Register on November 6, 2020, but 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 the August 3, 2021, 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.

CONFORMITY ANALYSIS TESTS

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 at the time of the conformity determination process. The planning assumptions relate to the socio-economic forecasts, transit operating policies, transit capital program policies, 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, 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 mid-March 2023. A few projects on the fiscally constrained list changed phases after the March model runs, but because they were included in the underbudget needs-based emissions results, MAG did not re-run the model with the altered fiscally constrained network. To do so every time a project is altered would be impractical when the needs-based runs demonstrate conformity.

HORIZON YEARS

Conformity must be determined for the TransPlan50 that 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 horizon years chosen according to the criteria found in under Section 93.118. The following rules have been followed to define the horizon years in the MAG study area:

- Any year for which the implementation plan establishes Motor Vehicle Emission Budget – for PM10 2030 is a budget year under the new maintenance plan. For 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 in the time span of the transportation plan – 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 year of analysis.
- For Ozone – the baseline year is 2017
- For Ozone – The first horizon year must be no more than 5 years from the year of analysis 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 Horizon Years Table summarizes the proposed horizon years for the three non-attainment areas in the MAG modeling area.

Conformity Horizon Years

Area	Pollutant	Horizon Year(s)
Utah County	PM10	2030 2040 2050
Utah County	PM2.5	2028 2035 2044 2050
Utah County	Ozone	2024 2034 2044 2050

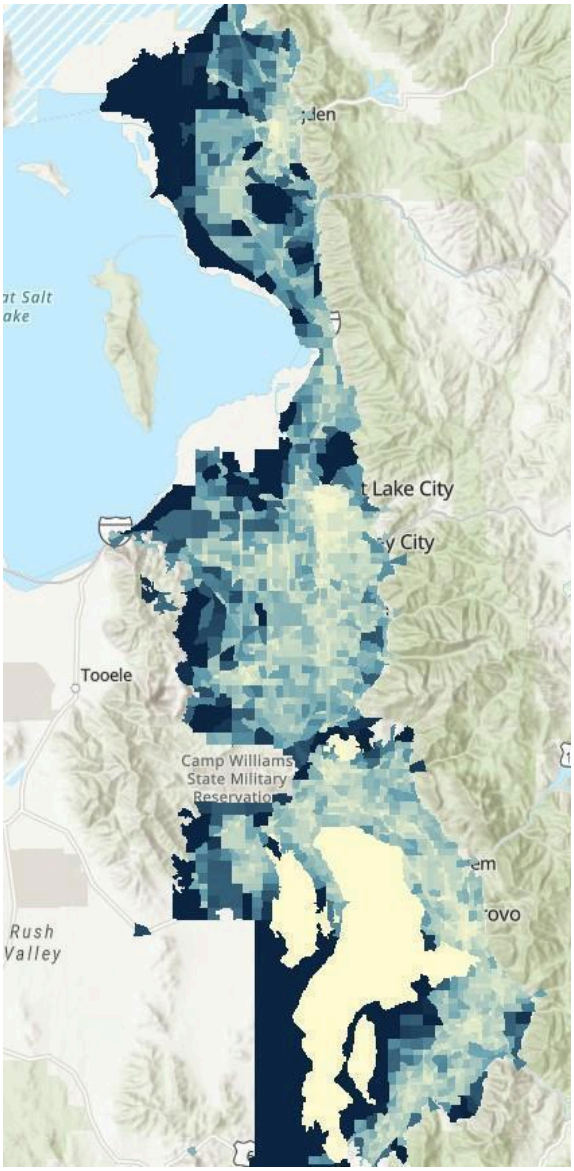
SOCIO-ECONOMIC FORECASTS

Perhaps the single greatest influence on the magnitude of pollutant emissions resulting from the transportation system is the rate of growth of persons, 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 data 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 data with the 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.



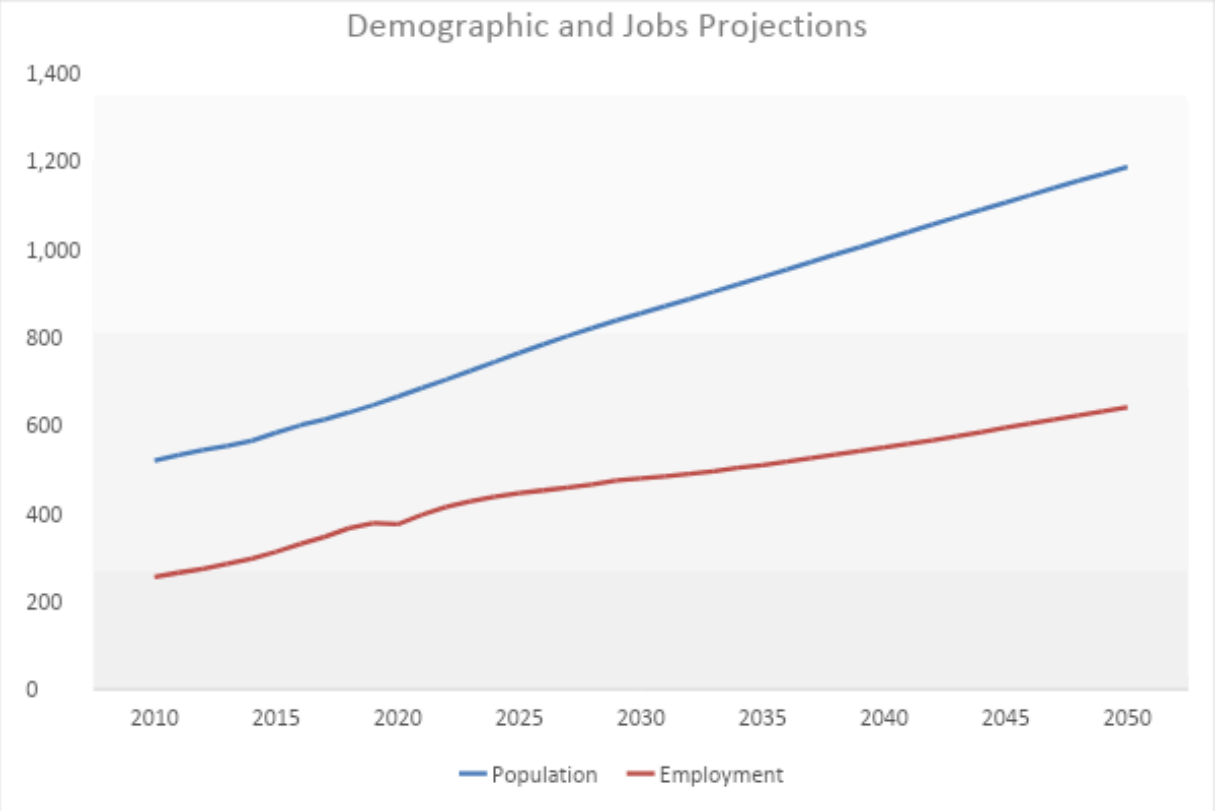
ZONAL DATA

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 to be used for this effort is 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. Zones are not bisected by census tract boundaries, thus each of the area's census tracts contains one or more TAZ.

POPULATION & EMPLOYMENT

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

Each MPO allocates the population, households, and employment to the TAZ. The allocation to zones is done on the basis of local master plans and in conjunction with local planners. Detailed projections are made for 2020, 2030, 2040, and 2050 and beginning in 2015. Estimates for intermediate years are not post-processed but do exist as raw land use model output. Household data has been stratified by (1) the number of persons per household and (2) by 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 PLAN

All the projects identified in the TransPlan50 are included in the regional emissions analysis. The plan is fiscally constrained – containing only projects that are 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): means a transportation project (other than an exempt project) that is on a facility which 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, sport complexes, etc., or transportation terminals) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guide way transit facilities that offer an alternative to regional highway travel."

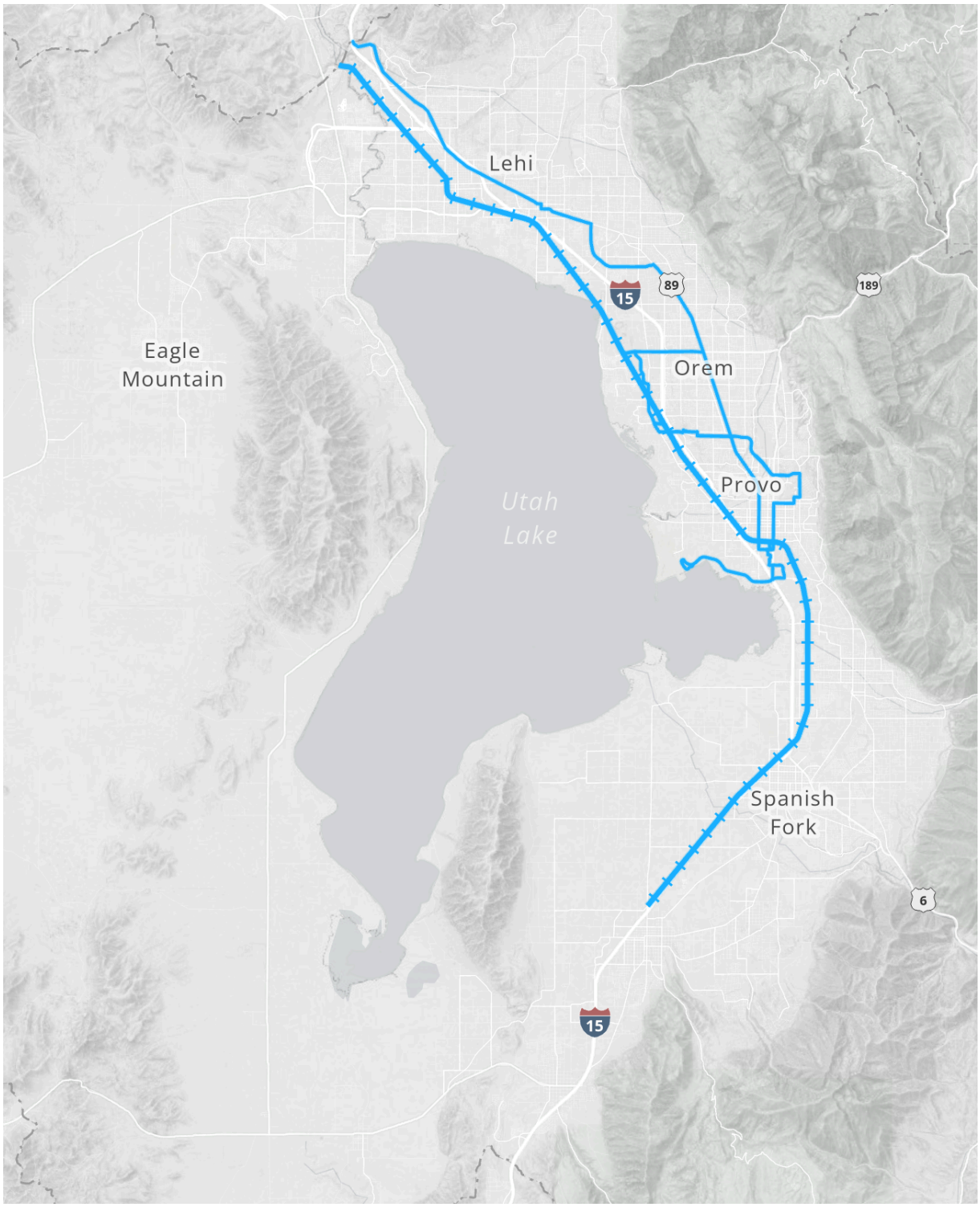
MAG's definition applied in the highway networks meets the EPA definition. All principal arterial projects and passenger rail projects are included in the regional travel model. Also, projects on minor arterial, collector and local transit service are included – therefore included in the emission analysis, even though they do not serve regional transportation needs as defined by EPA.

For a complete list of the projects included in this conformity analysis, see https://mountainland.org/rtp2023/.

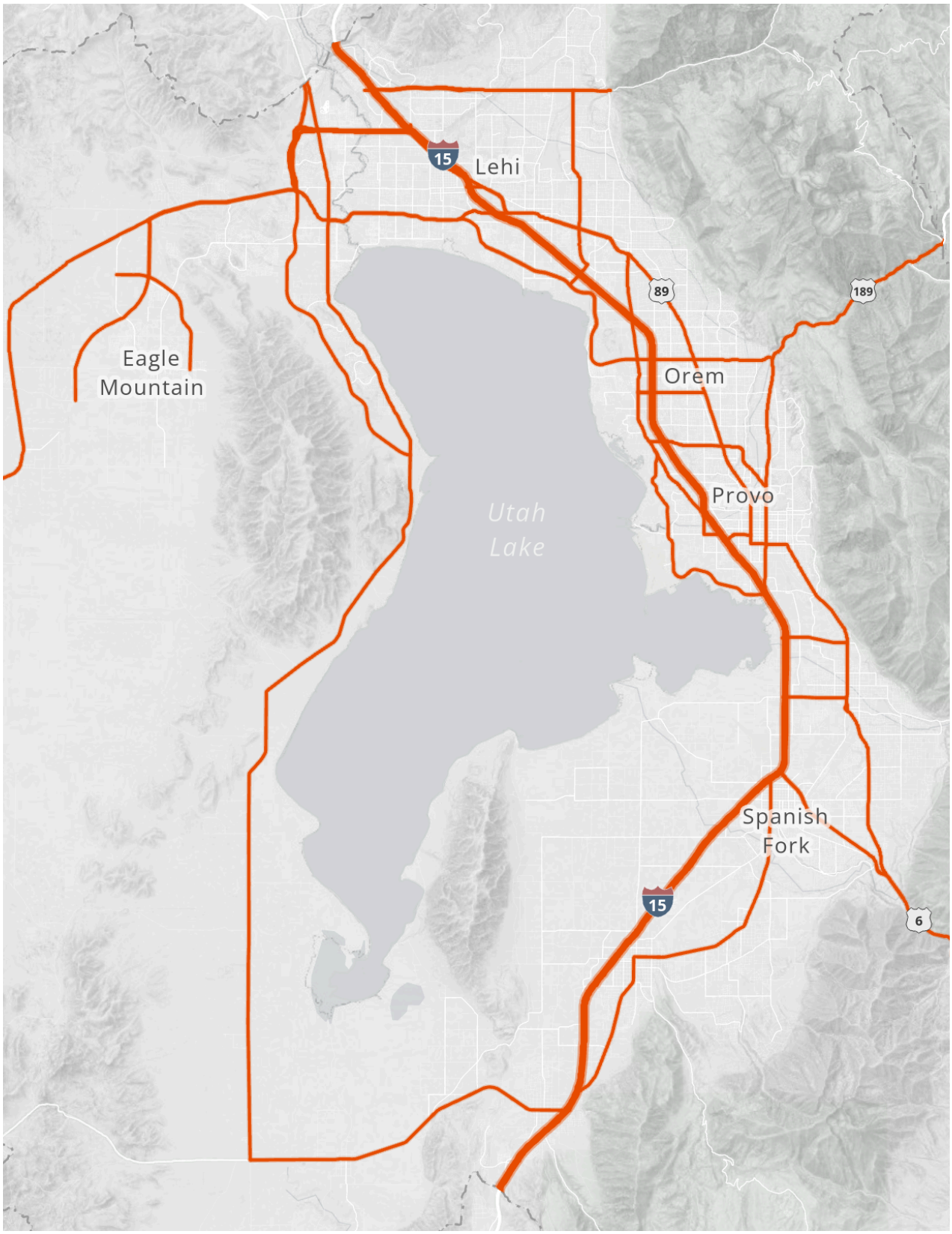
Regionally significant projects may not proceed under a conformity lapse. This conformity analysis finds that the transportation plan conforms.

UTAH COUNTY - REGIONALLY SIGNIFICANT CORRIDORS MAP

TRANSIT



Highways


15
Lehi
89
189
Eagle
Mountain
Orem
Provo
Utah
Lake
Spanish
Fork
15
6

FUTURE YEARS TRAVEL DEMAND MODEL NETWORK

All projects included in the TransPlan50 were modeled to determine their impacts on air quality including baseline projects. 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 is included in the appendix. Maps of the transportation networks used for the emissions analysis are provided 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 –2024, 2030, 2034, 2035, 2040 and 2044 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 has not changed significantly from the design and scope identified in the plan.

THE REGIONAL TRAVEL DEMAND MODEL

MODEL OVERVIEW

The Regional model is an integrated land-use, transportation, and air quality model designed to perform a wide range of analyses. The model 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, and
- Transit ridership numbers.
- The model produces forecasts for 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 the developable area of Utah, Salt Lake, Davis, Weber, and a portion of Box Elder counties except for the canyons and the mountains to the east of the urbanized areas**.** In these cases, the population in the areas that are outside of the travel model coverage is relatively small and is separated from the urban area by some distance.

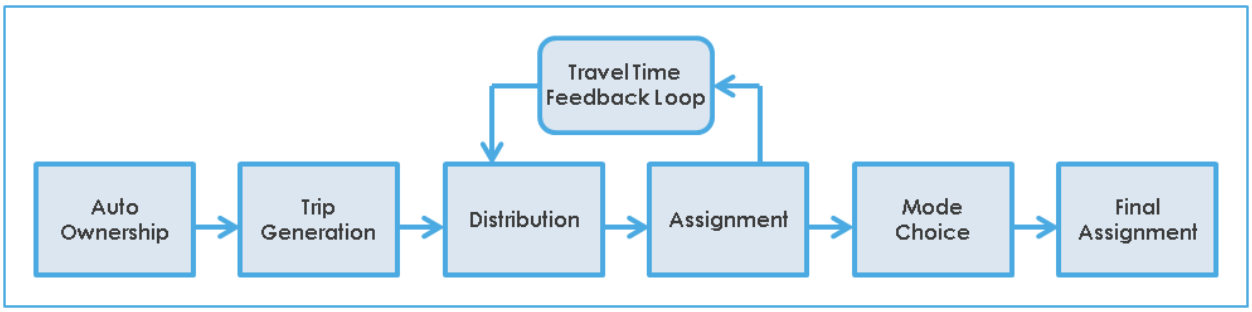
There is significant commuting from both Summit County (Park City) and Tooele County. In both cases the population centers are separated by distances of more than 15 miles from the urban portions of Salt Lake County. The issue of how to treat these growing travel flows may need to be dealt with in the future. Currently the commuting levels are not of a magnitude that treating the flows as an external-internal flow compromises the urban models to a significant degree.

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 that is sensitive to urban design variables.

The model has a feedback loop between trip distribution and traffic assignment, which is a process that 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 also is an important determinant of trip distribution and mode split. Therefore, it is customary to

iterate these three models in order 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. These trip ends are then paired into origins and destinations in the distribution model. 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 prior to 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 is comprised of several steps and each step is programmed or scripted separately. These steps include, but are not limited to:

- *Land use allocation model (REMM)* allocates future land use (i.e., housing and jobs) based on accessibility, availability of land (through physical constraints and zoning), and location of existing land uses.
- *Auto ownership model* estimates the likelihood of each household in the region owning 0, 1, 2, 3+ cars. Auto ownership is a function of characteristics of the household and where the household lives. Auto ownership and availability is a strong predictor of trip making and mode choice behavior.
- *The trip generation model* calculates the number of person trips generated within each TAZ. The trip generation model 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.

- *Trip distribution model* pairs the origins and destinations for each zone for each of the trip purposes. 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 of this 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.

- *Highway/transit skim builder* finds the best available travel path via each of the travel modes explicitly modeled. 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.

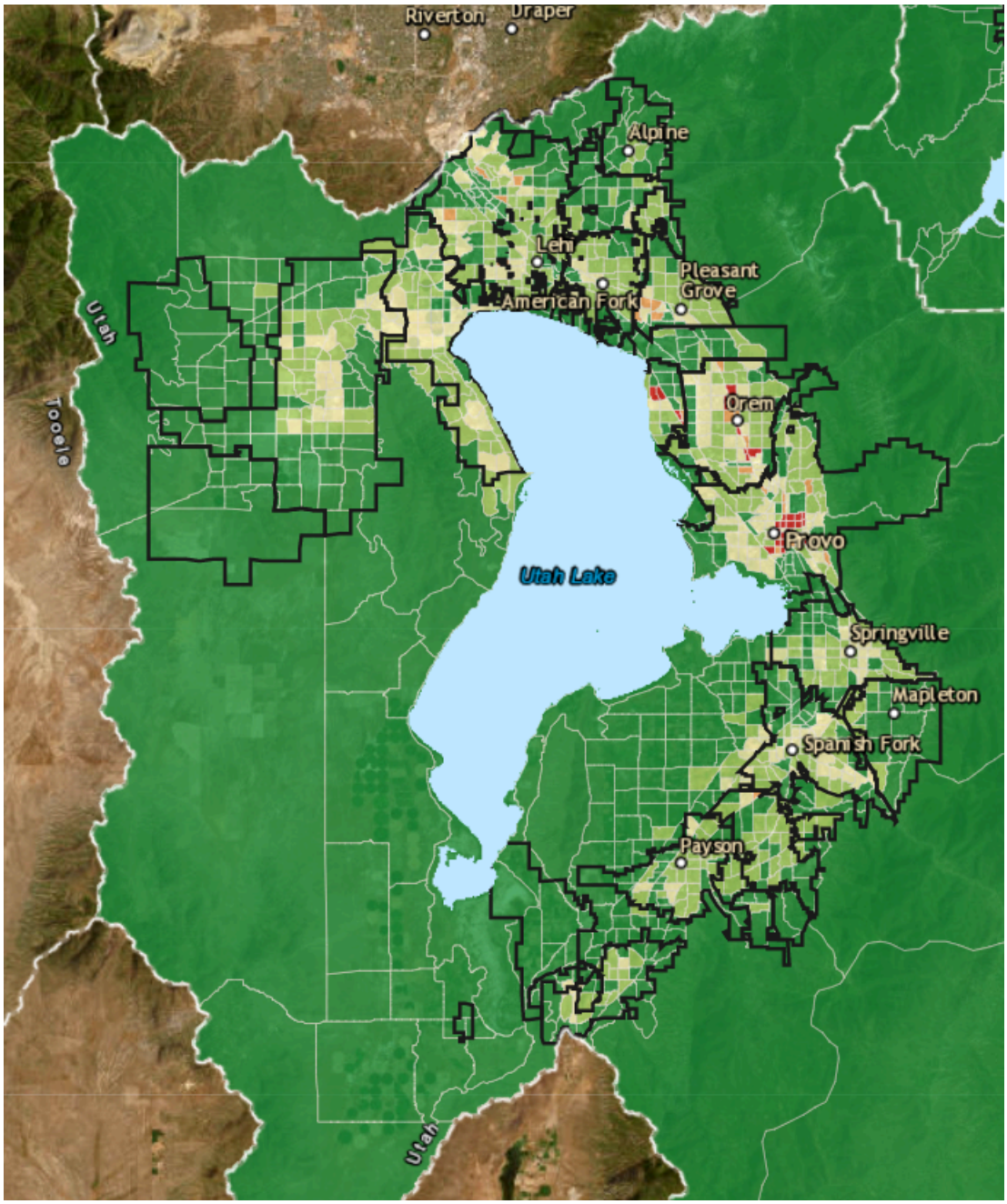
- *The mode split model* calculates which mode the person trips are likely to take based on availability and mode-specific parameters (e.g., time, cost, transit frequency). Mode split provides a breakdown of person trips by mode both for captive riders (people without automobiles) and for the total population.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

- *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 segments of the transit network.
- *Model output* is summarized automatically by the model, 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.

MODEL GEOGRAPHY & UTAH COUNTY TAZ STRUCTURE MAP



TAZ STRUCTURE

The Utah County traffic model consists of 1,316 internal TAZs and 14 external TAZs and-use and socioeconomic data are summarized within this spatial framework and travel is estimated between the TAZs

NETWORK STRUCTURE

For modeling purposes, the road network includes all facilities functionally designated as collector or above. There are approximately 50,000 road links in the network.

MODEL CALIBRATION

The model is calibrated to reasonably represent 2015 “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 reliability of the model. 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- these help in checking 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 correct county and city tag.
- Check that link speeds and volumes are within reasonable ranges.
- Numerous other network detail checks.

TRANSPORTATION MODELING

UTAH COUNTY REGIONAL TRAVEL CHARACTERISTICS

The Travel Characteristics table provides a summary of AAWDT VMT estimates resulting from the transportation system in the various horizon years.

UDOT AADT		Networks AAWDT				
Base Year	**2019**	**2019**	2028	2032	2042	2050
Arterial	5,680,241	7,225,212	8,736,886	9,613,832	11,173,137	12,596,021
Freeway	5,875,649	5,563,340	6,712,093	7,608,727	8,692,025	10,205,229
Local	2,390,541	895,015	1,143,397	1,236,903	1,466,759	1,675,217
Total	13,946,431	13,683,567	16,592,376	18,459,462	21,331,921	24,476,467

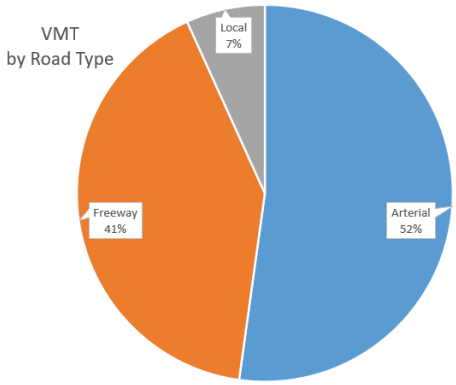
UTAH COUNTY 2019 AADT ADJUSTMENT FACTORS

FACILITY TYPE	MODEL AWKDT VMT	HPMS AADT VMT	MODEL TO AADT FACTORS
Freeways	5,563,340	5,680,241	1.021
Arterials	7,225,212	5,875,649	0.813
Local Roads	895,015	2,390,541	2.671

Since PM and CO emission analysis for Utah County is related to winter episodes, the VMT data is adjusted to the winter season. The winter factor applied to the adjusted model VMT is 0.974 for Utah County VMT as per seasonal traffic engineering area counts. Ozone emissions analysis is related to summer episodes,

the VMY data is adjusted to the summer season. The summer factor applied to the adjusted model VMT is 1.07

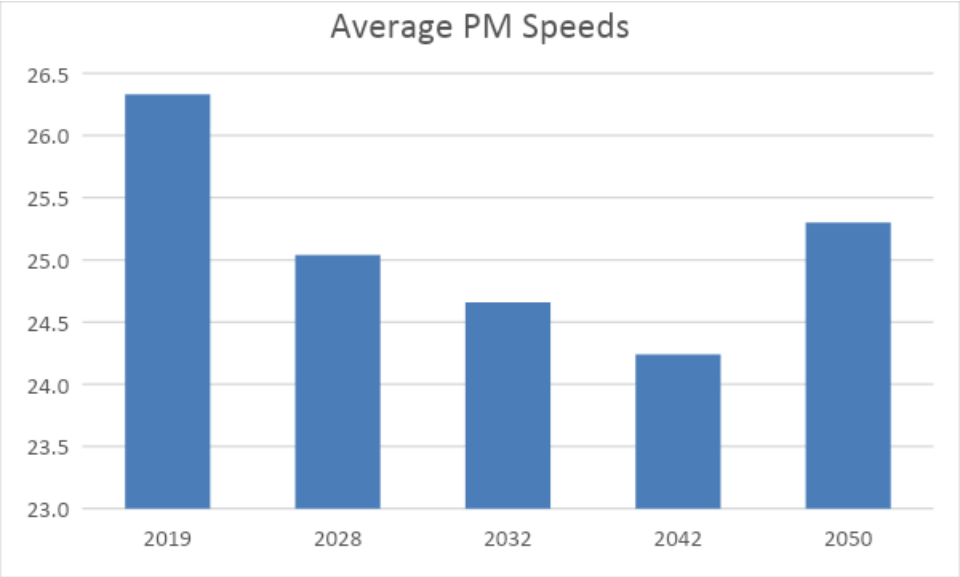
UTAH COUNTY TRAVEL CHARACTERISTICS



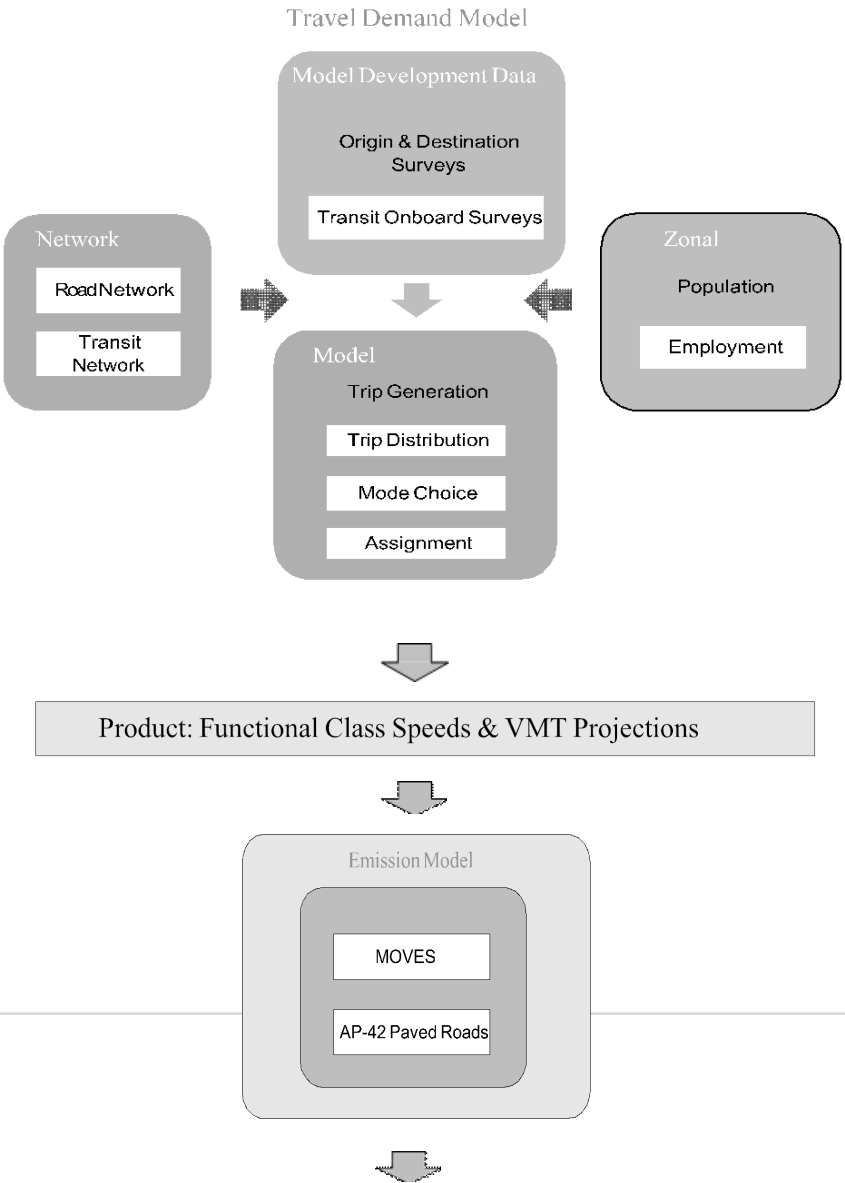
Activity by Time of Day and Facility Type					
Arterial	Base Year 2019	2028	2032	2042	2050
AM	17.1%	17.5%	17.6%	17.5%	17.7%
Mid	30.8%	32.0%	31.5%	31.5%	31.3%
PM	25.2%	26.0%	27.0%	27.1%	27.3%
Eve	23.7%	24.4%	23.9%	23.9%	23.7%
Freeway					
AM	19.2%	19.0%	19.3%	19.1%	19.0%
Mid	31.8%	32.2%	32.3%	32.9%	33.1%
PM	25.0%	24.5%	24.0%	23.2%	23.2%
Eve	24.0%	24.2%	24.3%	24.8%	24.6%
Local roads					
AM	16.0%	15.8%	15.8%	15.7%	15.7%
Mid	33.7%	33.8%	33.7%	33.9%	33.9%
PM	25.2%	25.1%	25.2%	25.1%	25.2%
Eve	1.6%	25.3%	25.3%	25.3%	25.2%
Total Network					
AM	18.2%	18.0%	18.2%	18.0%	18.1%
Mid	32.0%	32.3%	32.0%	32.3%	32.3%

PM	25.5%	25.3%	25.6%	25.3%	25.4%
Eve	24.4%	24.4%	24.2%	24.4%	24.2%

Average Speeds by Time of Day and Facility Type					
Arterial	Base Year 2019	2028	2032	2042	2050
AM	32.7	31.3	30.6	30.6	31.7
Mid	34.6	33.7	33.4	33.1	33.7
PM	30.1	27.8	26.8	26.0	27.1
Eve	36.2	35.9	35.7	35.4	35.8
Freeway					
AM	55.5	64.3	66.5	54.5	56.0
Mid	61.6	65.9	67.9	66.8	67.1
PM	52.8	62.7	61.8	53.3	46.4
Eve	62.9	66.5	68.9	68.6	70.4
Local roads					
AM	12.9	12.9	12.9	12.9	12.9
Mid	12.9	12.9	12.9	12.9	12.9
PM	12.9	12.9	12.9	12.9	12.9
Eve	12.9	12.9	12.9	12.9	12.9
Total Network					
AM	28.4	27.7	27.7	27.8	29.1
Mid	29.0	28.7	28.9	28.9	30.0
PM	26.3	25.0	24.7	24.2	25.3
Eve	30.1	30.2	30.5	30.5	31.4



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

The modeling area included in the MAG models covers the entire county.

PM10, PM2.5 and ozone conformity must be found for the entire 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 model 2014b and for determining Road Dust emission rates the AP-42 equation was used as summarized below:

Secondary PM10 Pollutants
MOVES - NOx

PM10 Pollutants - Direct
MOVES – Exhaust, Tire & Brake wear
AP-42– Chapter 13 - Road dust

2006 PM2.5 Precursor
MOVES – NOx, VOC

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

2015 Ozone Precursor
MOVES – NOx, VOC

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 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

EPA approved air quality model MOVES 2014b was used in preparation of the plan conformity. Although a more recent MOVES model, MOVES3, exists, MAG began using MOVES2014b for this amendment during the “grace period” of transition, which lasts until Jan 9, 2023. The ICT approved this use. MOVES3

substantially increases NOx quantities in counties like Utah County. MAG is working with the DAQ to modify the Motor Vehicle Emissions Budget to account for this modeling change.

I/M PROGRAMS

Up to 1996 Utah County's I/M program was a basic two-speed idle, classified as a Test & Repair program. 1996 and later-The Utah County's I/M program was approved by EPA 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. OBD testing is performed on all gasoline vehicles of model years 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 then 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 January 2003 requiring biennial emission testing on the newest 6 years car models.

MOVES INPUT FILES

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

A detailed discussion on MOVES procedures and proper use and an explanation of all command lines and external files used in the modeling is detailed in the EPA User's Guide to MOVES found on EPA's website.

PRIMARY PARTICULATE EMISSIONS – MOVES, AND AP-42 Chapter 13- PAVED ROADS

The conformity analysis for Particulate Matter10 (PM_{10}) was estimated by utilizing the MOVES model for Exhaust, Tire, and Brake Wear. Road Dust was estimated utilizing AP-42.

A detailed discussion of the methodology appears in the guidance documentation of the MOVES and Chapter 13 of the AP-42 fifth edition.

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

93.112 - CONSULTATION

Amendment	Type of Projects	New Regional Emissions Analysis	Concurrence FHWA/FTA (Conformity)
Level 1	• Exempt	no	no*
Level 2	• Not exempt • Not regionally significant • Regionally Significant, minor change in concept or scope	no	**YES**
Level 3	• Regionally significant • Significant change in concept or scope	**YES**	**YES**

** MAG may seek written confirmation anyway to avoid any misunderstanding.*

***WFRC / MAG Regional Transportation Model*:** MAG in collaboration with WFRC employs a state of the practice 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 development of the transportation control measures of the State Implementation plans required by the Clean Air Act." A New 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 on 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 representatives of FHWA, UDOT, DAQ, UTA, EPA, MAG, and the WFRC. These meetings have greatly improved the consultation process resulting in a successful plan consistent with the 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 that were 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	

93.113 - TRANSPORTATION CONTROL MEASURES

There are no mandatory Transportation Control Measures (TCM) identified in the PM10 SIP for Utah County nor in the Provo CO Maintenance Plan.

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

thirty- year horizon.

UTA is funded through portions of the sales tax used for both 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 the addition of 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 of voter approval of additional revenue for transit funding. Detailed discussion on Public Transit is included in the TransPlan50 document.

93.118 - EMISSION BUDGETS

UTAH COUNTY PM_{10} CONFORMITY DETERMINATION

The Utah County PM10 Maintenance Plan requires conformity determinations for both NOx and Primary PM (a combination of Direct PM10.and Dust). Construction related PM_{10} (§93.122(d) is not necessary because the PM10 SIP does not identify construction related dust as a contributor 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 potential surplus in its budget for Primary PM_{10}, to a potential short fall in its budget for NOX at a ratio of one-to-one.

MAG requested the State to expand this existing rule to Utah County as well. The new Rule addressing specifically 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 redesignated to attainment with a Motor Vehicle Emissions Budget for 2030.

UTAH COUNTY PM10 EMISSION MODELING RESULTS

The following tables summarize the emission applied in the form MOVES and AP-42 -Paved Roads respectively.

Utah County - MOVES and AP-42 Rates (g/mile)						
			Direct PM10			
year	Distance	NOX	Exhaust Total	Brake	Tire	Dust
2030	17,715,879	0.2498	0.0114	0.0454	0.0117	0.1710
2040	20,992,257	0.1730	0.0073	0.0456	0.0117	0.1713
2050	24,803,925	0.1695	0.0078	0.0428	0.0115	0.1703

The table below summarizes the budget test associated with each required year of analysis for the precursor pollutant of 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 and tire wear and fugitive dust as results from the EPA AP-42, chapter 13- Paved Roads model. The TransPlan50 and the TIP conform to the emissions budget test for all PM10 pollutants.

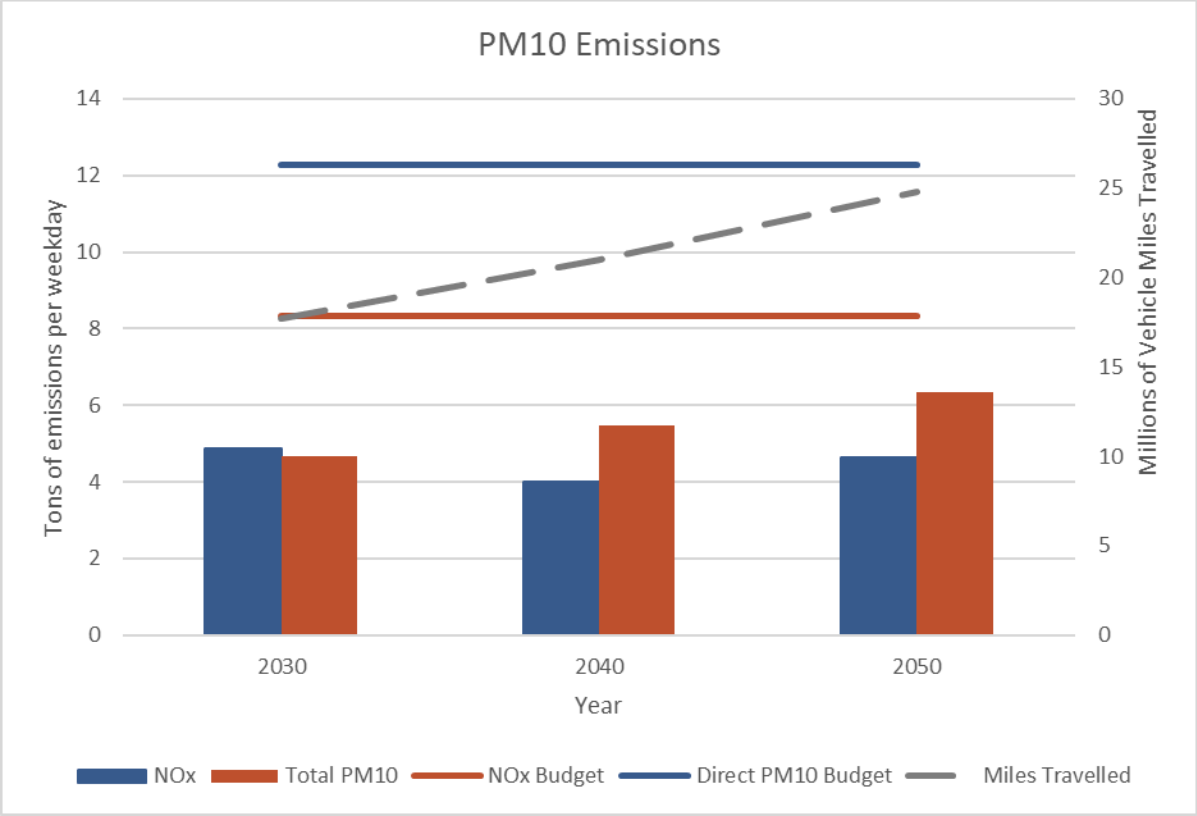
UTAH COUNTY PM_{10} CONFORMITY BUDGET TEST

PM10 Conformity Budget Test

Emissions from all road types and on-road vehicles (tons/winter day)

		Precursor Pollutant		Primary Pollutant			
Year	**Distance**	**NOx**	**Result**	**Direct PM10**	**Dust**	**Total PM10**	**Result**
Budget		**8.34**				**12.28**	
2030	**17,715,879**	**4.88**	**Pass**	**1.34**	**3.34**	**4.68**	**Pass**
2040	**20,992,257**	**4.00**	**Pass**	**1.50**	**3.96**	**5.46**	**Pass**
2050	**24,803,925**	**4.63**	**Pass**	**1.70**	**4.66**	**6.35**	**Pass**

Direct PM10 = Exhaust + Brakewear + Tirewear



UTAH COUNTY PM10 CONFORMITY DETERMINATION

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

UTAH COUNTY PM2.5 CONFORMITY DETERMINATION

Conformity determinations for PM2.5 is required for NOx, direct PM2.5 and VOC. Part of the reason for using MOVES2014b instead of the latest model, MOVES3, is that MOVES3 shows a 30% increase in NOx compared to MOVES2014b. MAG is working with DAQ to change the Motor Vehicle Emissions Budget to account for this modeling change.

UTAH COUNTY PM2.5 EMISSION MODELING RESULTS:

Utah County - PM 2.5 Interim Test - Rates
grams/winter day with all facilities and sources

year	Distance	NOX	VOC	Direct
2028	16,797,074	0.2915	0.3066	0.0222
2035	19,518,770	0.1985	0.2316	0.0164
2044	22,387,210	0.1745	0.2029	0.0148
2050	24,803,925	0.1695	0.1917	0.0140

Direct= Exhaust + Brake + Tire

UTAH COUNTY PM2.5 CONFORMITY BUDGET TEST

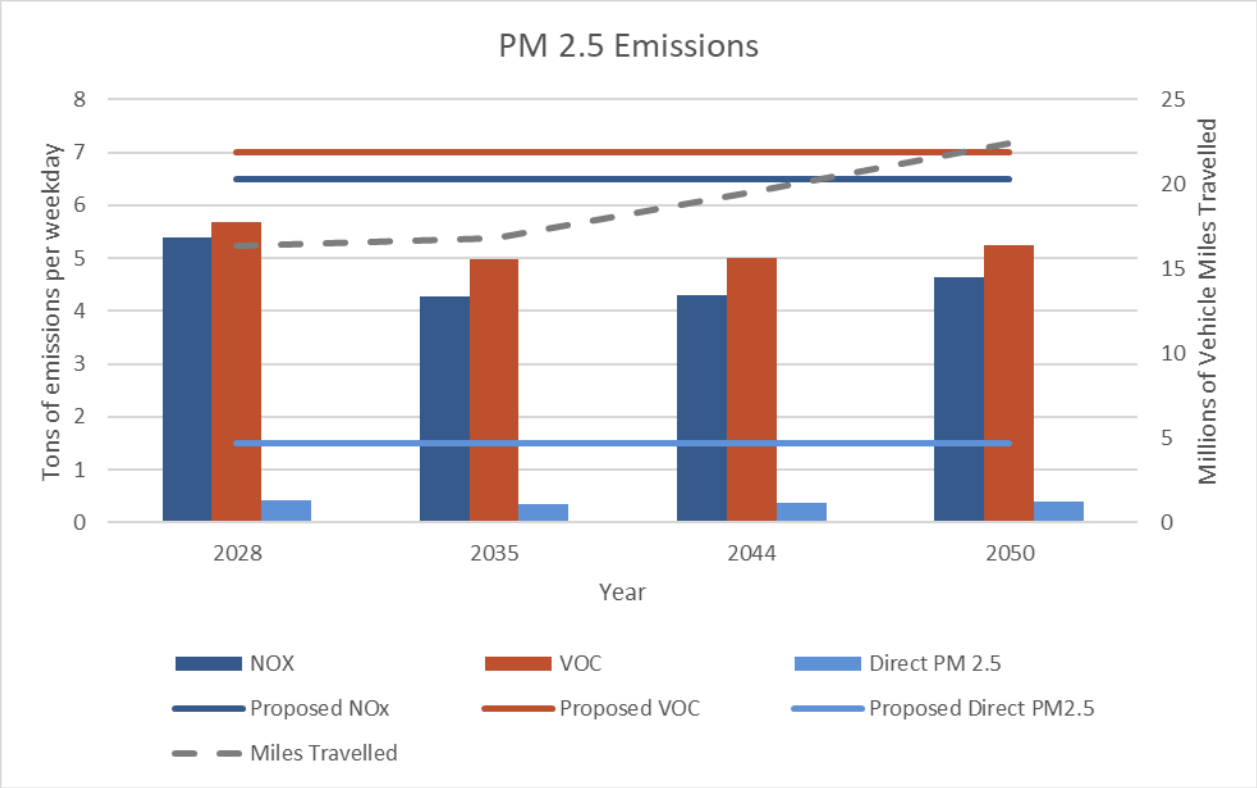
The table below summarizes the results of the interim test (analysis year ≤ 2008) associated with each required year of analysis for PM2.5 emissions for the precursor pollutant of NOx and Direct PM2.5. The EPA has proposed a Motor Vehicle Emissions Budgets, but until they are officially adopted by the EPA the interim test is used. We include the proposed budget here for reference.

Proposed (not yet official) Budgets

Pollutant	Tons per Day
Direct PM2.5	1.5
NOx	6.5
VOC	7.0

PM2.5 Conformity Interim test (emissions ≤ 2008 emissions) tons/winter weekday with all facilities and sources							
		Precursor Pollutants tons/wday				Direct PM2.5 tons/wday	
year	Distance	NOX	Result	VOC	Result	Direct	Result
2008		40.046	baseline	22.108	baseline	2.102	baseline
2028	16,797,074	5.398	Pass	5.676	Pass	0.411	Pass
2035	19,518,770	4.271	Pass	4.983	Pass	0.352	Pass
2044	22,387,210	4.307	Pass	5.008	Pass	0.364	Pass
2050	24,803,925	4.634	Pass	5.242	Pass	0.383	Pass

Direct PM2.5 = Exhaust + Brakewear + Tirewear



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

UTAH COUNTY $PM_{2.5}$ 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 LMP is approved by the EPA, conformity requires an analysis of TransPlan50 projects based on an interim test comparing the plan horizon years results to the Ozone Inventory of 2017 (as base year). The horizon years inventories should be **≤** (less or equal) to the base year. Since Ozone exceedances in Utah County were observed in the summer the VMTs are adjusted to reflect that season.

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

UTAH COUNTY OZONE EMISSION MODELING RESULTS

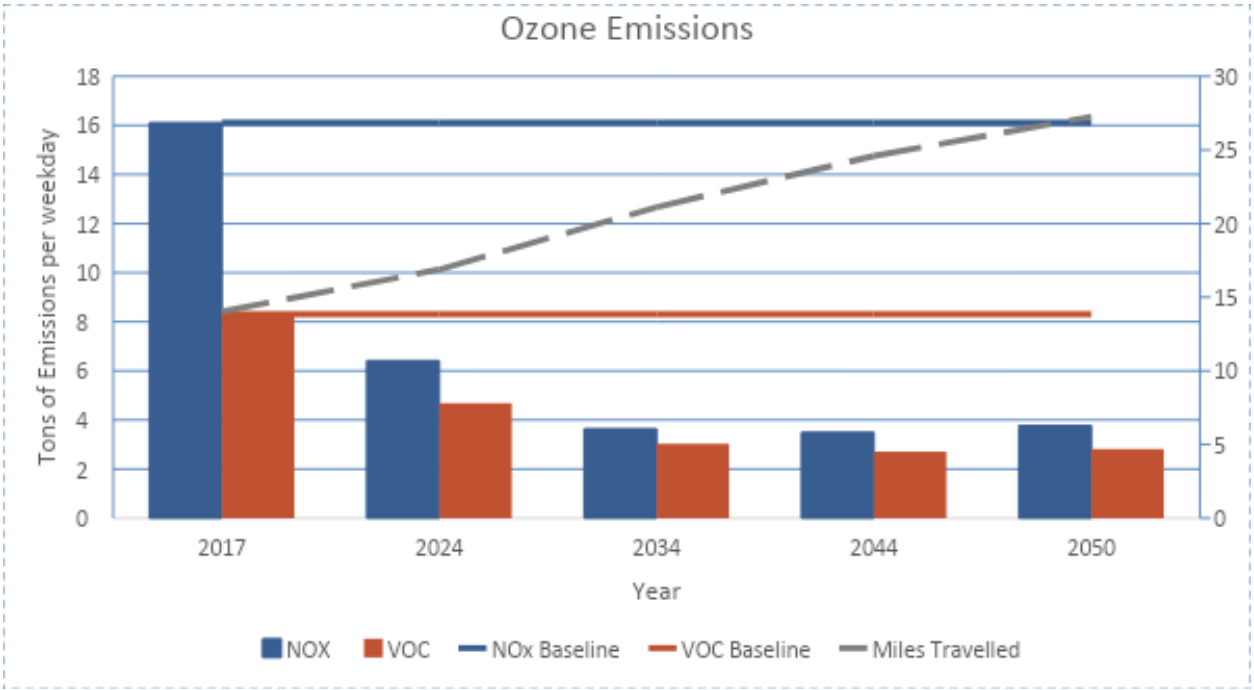
Utah County - Ozone Interim Test - Rates (g/mile) all facilities and all vehicles			
Year	**Distance**	**NOX**	**VOC**
2024	17,963,544	0.338	0.243
2034	21,073,948	0.1208	0.0891
2044	26,316,038	0.1198	0.0817
2050	29,923,806	0.2407	0.1708

UTAH COUNTY OZONE CONFORMITY Interim Budget Test

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

Ozone Conformity Interim test (emissions ≤ 2017 emissions)					
		Precursor Pollutants tons/Summer day | all facilities and sources			
year	**Distance**	**NOX**	**Result**	**VOC**	**Result**
2017	**14,022,941**	**16.110**	**Baseline**	**8.310**	**Baseline**
2024	**16,883,766**	**6.415**	**Pass**	**4.680**	**Pass**
2034	**21,118,858**	**3.639**	**Pass**	**3.029**	**Pass**
2044	**24,593,736**	**3.494**	**Pass**	**2.720**	**Pass**

2050	**27,248,624**	**3.771**	**Pass**	**2.806**	**Pass**



UTAH COUNTY OZONE 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 can be made for Carbon Monoxide based on the LMP Provisions described under the transportation conformity rule.

PROVO CITY CO 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://mountainland.org/rtp2023/

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