Air Quality Memorandum

REPORT NO. 32 - *[DRAFT]*

DATE May 28, 2015

SUBJECT CONFORMITY ANALYSIS FOR THE WFRC 2015-2040 REGIONAL TRANSPORTATION PLAN.

ABSTRACT The Moving Ahead for Progress in the 21st Century (MAP-21) and the Clean Air Act Amendments (CAAA) require that all regionally significant highway and transit projects in air quality non-attainment and maintenance areas be derived from a "conforming" Regional Transportation Plan and Transportation Improvement Program. A conforming Plan or Program is one that has been analyzed for emissions of controlled air pollutants and found to be within emission limits established in the State Implementation Plan (SIP) or within guidelines established by the Environmental Protection Agency (EPA) until such time that a SIP is approved. This conformity analysis is made by the Wasatch Front Regional Council (WFRC), as the Metropolitan Planning Organization for the Salt Lake-West Valley and Ogden-Layton urbanized areas, and submitted to the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) for their concurrence. This conformity analysis is being prepared according to the transportation conformity rulemakings promulgated by the EPA as of March 2010 and according to FHWA final rulemakings found in the MAP-21 legislation. The EPA approved MOVES model for estimating vehicle emissions was used for this conformity analysis.

This conformity analysis addresses the emissions impact of the 2015-2040 RTP. The projected vehicle activity is based on Version 8.0 of the WFRC travel demand model and the 2012 Household Travel Survey of trip making activity. For a detailed description of projects included in the new 2040 RTP, see http://www.wfrc.org/new_wfrc/index.php/projects/project-lists and select the link for "Highway Projects List" or "Transit Projects List". Refer to Appendices 2 and 3 of this document for projects in Box Elder and Tooele Counties.

Based on the analysis presented in this document, the WFRC 2015-2040 RTP conforms to the State Implementation Plan or the Environmental Protection Agency interim conformity guidelines for all pollutants in applicable non-attainment or maintenance areas. Therefore, all transportation projects in Box Elder, Weber, Davis, Salt Lake, and Tooele Counties included in the 2015-2040 RTP are found to conform.

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A. Conformity Requirements

Conformity Process

Since the commencement of the federal planning requirements in the late 1960s, further requirements (most recently the 2012 Moving Ahead for Progress in the 21st Century (MAP-21) and the 1990 Clean Air Act Amendments) have added to the responsibilities and the decision making powers of local governments through the Metropolitan Planning Organization. The Wasatch Front Regional Council (WFRC) is the Metropolitan Planning Organization for the Salt Lake/West Valley and Ogden / Layton Urbanized Areas. This report summarizes WFRC's conformity analysis of the 2015-2040 RTP with the Division of Air Quality's State Implementation Plan (SIP) and the Environmental Protection Agency's interim conformity guidelines. This conformity analysis is subject to public and agency review, and requires the concurrence of the Federal Highway Administration and Federal Transit Administration.

In November, 1993, the Environmental Protection Agency and the U.S. Department of Transportation issued rules establishing the procedures to be used to show that transportation plans and programs conform to the SIP. The conformity rules establish that federal funds may not be used for transportation projects that add capacity in areas designated as "non-attainment (or maintenance) with respect to the National Ambient Air Quality Standards", until and unless a regional emissions analysis of the Plan and TIP demonstrates that the projects conform to the SIP. This restriction also applies to "regionally significant" transportation projects sponsored by recipients of federal funds even if the regionally significant transportation project uses local funds exclusively.

Davis, and Salt Lake Counties, Salt Lake City, Ogden City and portions of Weber, Box Elder and Tooele Counties are designated as non-attainment (or maintenance) for one or more air pollutants. Specifically, there are four areas in the Wasatch Front region for which the conformity rules apply. These areas are listed in Table 1 below.

Table 1
Wasatch Front Region Non-attainment Designations

Area	Designation	Pollutant
Salt Lake City	Maintenance Area	Carbon Monoxide (CO)
Ogden City	Maintenance Area	Carbon Monoxide (CO)
	Moderate Non-Attainment Area	Particulate Matter (PM_{10})
Salt Lake County	Moderate Non-Attainment Area	Particulate Matter (PM_{10})
Salt Lake (including Davis, Salt Lake, and portions of Weber, Box Elder, and Tooele Counties)	Moderate Non-Attainment Area	Particulate Matter ($PM_{2.5}$)

The CAAA established requirements for conformity. These requirements are outlined in 40 CFR 93.109 and include the following:

- Latest planning assumptions
- Transportation Control Measures (TCM)
- Emissions budget
- Project from a conforming plan and TIP
- PM_{10} control measures
- Latest emissions model
- Consultation
- Currently conforming plan and TIP
- CO and PM_{10} "hot spots"

Each of these requirements will be discussed in the following paragraphs.

Latest Planning Assumptions

Current travel models are based on socioeconomic data and forecasts from local building permits, the Utah Division of Workforce Services, and the Governor's Office of Management and Budget (GOMB). Base year socioeconomic data are for calendar year 2011. Forecasts of population and employment by traffic analysis zone were developed by WFRC in 2013 and are controlled to county-level forecasts published by GOMB in October, 2012.

Latest Emissions Model

The conformity analysis presented in this document is based on EPA mobile source emissions models: MOVES2014 for tailpipe emissions and AP-42 section 13.2.1 for paved road dust emissions. The application of these models will be discussed in greater detail in the Emissions Model section of this document.

Consultation Process

Section 105 of 40 CFR Part 93 (Conformity Rule) requires, among other things, interagency consultation in the development of conformity determinations. To satisfy this requirement, the State Division of Air Quality (DAQ) prepared a Conformity SIP to outline the consultation procedures to be used in air quality and transportation planning. The Conformity SIP also defines the membership of the Interagency Consultation Team (ICT) as representatives from DAQ, WFRC, Mountainland Association of Governments, Utah Department of Transportation, Utah Transit Authority, EPA, FHWA, and the FTA. The Conformity SIP has been approved by EPA. WFRC followed the consultation procedures as outlined in the Conformity SIP in the preparation of this conformity analysis. As part of the consultation procedures defined in the Conformity SIP, WFRC presented this report to the Transportation Committee (or TransCom) for review and comment. This committee includes a member of the Utah Air Quality Board as well as representatives of UDOT, UTA, and FHWA. In addition, management level staff members from the Utah Division of Air Quality are notified of meetings and agendas of the above committees. The Utah Division of Air Quality and other members of the ICT were also provided with a copy of this report during the public comment period for the 2015-2040 RTP.

This Conformity Analysis for the 2015-2040 RTP was made available for public inspection and comment for a 30-day period in accordance with EPA conformity regulations. This analysis was also posted on the WFRC website during the comment period. Notification of the comment period was sent by electronic mail to interested stakeholders. In addition, public comment was taken during various committee meetings of the Wasatch Front Regional Council.

TCM Implementation
A conformity analysis for the 2015-2040 RTP must certify that the RTP does not interfere with the implementation of any Transportation Control Measure (TCM) identified in the applicable State Implementation Plan (SIP). There is one TCM from the original SIP section for the 1-hour ozone standard which has been carried forward to the current ozone maintenance plan, even though the 1-hour ozone standard has been revoked. This TCM, the employer-based trip reduction program, applies to local, state, and federal government employers. The program emphasizes measures to reduce the drive-alone rate such as subsidized bus passes, carpooling, telecommuting, and flexible work schedules. UTA has in place the ECO pass discount for a number of large employers including the University of Utah and Weber State University. Ridesharing, telecommuting, and flexible work schedules are programs currently managed, promoted, or operated by UTA Rideshare and the UDOT Travelwise program. Congestion Mitigation and Air Quality (CMAQ) funds and other transportation funds are used to support these ongoing programs.

Emissions Budget
A comparison of mobile source emission estimates to emission budgets defined in the SIP is outlined in this document in Section D - Conformity Determination.

Currently Conforming Plan and TIP
The existing 2040 RTP for the Wasatch Front Area conforms to State air quality goals and objectives as noted in a letter from FHWA and FTA dated September 8, 2014. The existing 2015-2020 TIP for the Wasatch Front Area was also found to conform and this was noted in a letter from FHWA and FTA dated September 29, 2014.

Projects from a Conforming Plan and TIP
TIP Time Frame - All projects which must be started no later than 2020 in order to achieve the transportation system envisioned by the 2015-2040 RTP are included in the 2015-2020 TIP. The TIP is fiscally constrained, meaning that only those projects with an identified source of funds are included in the TIP. Estimated funding availability is based on current funding levels and reasonable assumptions that these funds will continue to be available. Conformity for the 2015-2020 TIP is addressed separately in Air Quality Memorandum 31a.

Regionally Significant
All regionally significant projects, regardless of funding source (federal, state, or local) are included in the RTP. All regionally significant projects are also included in the regional emissions analysis of the RTP. Regionally significant projects are identified as those projects functionally classified as a principal arterial or higher order facility, and certain minor arterials as identified through the interagency consultation process (see Appendix 1 for a complete definition of regionally significant projects). The latest Utah Department of Transportation Functional Classification map is used to identify functional classification. Interstate highways, freeways, expressways, principal arterials, certain minor arterials, light rail, and commuter rail are treated as regionally significant projects.

Because of their relative impact on air quality, all regionally significant projects regardless of funding source must be included in the regional emissions analysis, and any significant change in the

design or scope of a regionally significant project must also be reflected in the analysis. All regionally significant projects have been included in the regional emissions analysis, and the modeling parameters used for these projects are consistent with the design and scope of these projects as defined in the RTP. In order to improve the quality of the travel model, minor arterials and collectors, as well as transit service, are also included in the regional travel model (and thus the regional emissions analysis) but these facilities are not considered regionally significant since they do not serve regional transportation needs as defined by EPA. For a list of projects included in this conformity analysis, see *http://www.wfrc.org/new_wfrc/index.php/projects/project-lists* and select the link for "Highway Projects List" or "Transit Projects List". Refer to Appendices 2 and 3 of this document for projects in Box Elder and Tooele Counties.

CO, PM_{10} and $PM_{2.5}$ "Hot Spot" Analysis

In addition to the regional emissions conformity analysis presented in this document, specific projects within carbon monoxide (CO) and particulate matter (PM_{10} and $PM_{2.5}$) non-attainment areas are required to prepare a "hot spot" analysis of emissions. The "hot spot" analysis serves to verify whether localized emissions from a specific project will meet air quality standards. This requirement is addressed during the NEPA phase of project development before FHWA or FTA can issue final project approval.

FHWA has issued guidance on quantitative PM_{10} and $PM_{2.5}$ "hot spot" analysis to be used for the NEPA process. This guidance can be found at:
http://www.epa.gov/otaq/stateresources/transconf/projectlevel-hotspot.htm.

PM_{10} Control Measures

Construction-related Fugitive Dust - Construction-related dust is not identified in the Utah SIP as a contributor to the PM_{10} non-attainment area. Therefore, there is no conformity requirement for construction dust. Section 93.122(d) (1) of 40 CFR reads as follows:

> "For areas in which the implementation plan does not identify construction-related fugitive PM10 as a contributor to the non-attainment problem, the fugitive PM10 emissions associated with highway and transit project construction are not required to be considered in the regional emissions analysis."

In the Utah PM_{10} SIP, construction-related PM_{10} is not included in the inventory, nor is it included in the attainment demonstration or control strategies. Control of construction-related PM_{10} emissions are mentioned in qualitative terms in Section IX.A.7 of the SIP as a maintenance measure to preserve attainment of the PM_{10} standard achieved by application of the control strategies identified in the SIP. Section IX.A.7.d of the SIP requires UDOT and local planning agencies to cooperate and review all proposed construction projects for impacts on the PM_{10} standard. This SIP requirement is satisfied through the Utah State Air Quality Rules. R307-309-4 requires that sponsors of any construction activity file a dust control plan with the State Division of Air Quality.

Other Conformity Requirements

Transit Fares - Transit fares have increased periodically and will continue to increase in response to rising operating costs. The RTP assumes that transit fare box revenues will cover a constant percentage of all transit operating cost, so future fare increases are consistent with the Plan. With any price increase some market reaction is expected. While there have been some short term fluctuations in transit patronage in response to fare increases, the implementation of light rail service and other transit improvements has retained and increased transit patronage consistent with the levels anticipated by the RTP.

Plans to expand light rail service, to increase and enhance bus service, and to extend commuter rail operations are moving forward. These transit projects are envisioned in the Plan and the steps necessary to implement these projects are moving forward including various voter approved sales tax increases for transit funding.

B. Transportation Modeling

Improvement to the WFRC travel demand model practice and procedure is an ongoing process. This conformity analysis is based on the latest version (8.0) of the travel demand model. Version 8.0 of the travel demand model updates the former 2007 base year with socio-economic data and transportation networks for the new 2011 base year. The new model also incorporates the results of the 2012 Household Travel Survey conducted by WFRC. Version 8.0 of the model adds more traffic analysis zones, and the transit mode choice portion of the model has been enhanced. Details of Version 8.0 of the travel model are documented in a report titled "WFRC/MAG Version 8.0 Travel Demand Model Documentation" which is available upon request.

Planning Process

Federal funding for transportation improvements in urban areas requires that these improvements be developed through a comprehensive, coordinated, and continuous planning process involving all affected local governments and transportation planning agencies. The planning process is certified annually by the Regional Council and reported to the Federal Highway Administration and Federal Transit Administration. Every four years FHWA and FTA conduct a comprehensive certification review. The certification review of August 2013 found that the WFRC planning process meets federal requirements. Recommendations were made to improve WFRC's planning process and these are being addressed.

The documentation of the planning process includes at a minimum, a twenty-year Regional Transportation Plan updated at least every four years; and a four-year Transportation Improvement Program (capital improvement program) updated and adopted at least every four years. The planning process includes the involvement of local elected officials, state agencies, and the general public.

Travel Characteristics

The WFRC travel model is used to estimate and forecast highway Vehicle Miles Traveled (VMT) and vehicle speeds for Weber, Davis, and Salt Lake Counties. A separate travel model is used to

estimate VMT and speed in Tooele County. For VMT and speed estimates in Box Elder County, WFRC relied on forecasts provided by the Utah Department of Transportation. The WFRC travel demand model is based on the latest available planning assumptions and a computerized representation of the transportation network of highways and transit service. The base data for the travel demand model is reviewed regularly for accuracy and updates. The travel model files used for this conformity analysis are available upon request on compact disc.

Shown below in Table 2 is a summary of weekday VMT for the cities and counties in designated non-attainment areas. Totals for VMT are given for various air quality analysis years from 2015 to 2040. Note that the VMT values for Box Elder, and Tooele Counties are not for the entire county but only that portion of the county designated as non-attainment for a criteria pollutant.

Table 2
Vehicle Miles Traveled
(Average Winter Weekday, Corrected to HPMS Data)

	2015	2024	2034	2040
Salt Lake City	6,583,384	7,378,300	8,291,619	8,792,043
Ogden City	1,465,638	1,636,334	1,916,452	2,067,968
Salt Lake County	28,495,411	33,975,712	39,079,454	42,347,044
Davis County	7,565,570	8,766,100	9,846,906	10,524,425
Weber County*	4,985,904	5,970,759	7,021,606	7,639,812
Box Elder County*	2,370,372	2,846,983	3,378,619	3,738,885
Tooele County*	2,107,733	2,621,722	3,379,647	4,158,310

**non-attainment portion of the county*

Peak and Off-Peak Trip Distribution

The modeled VMT and the modeled vehicle speed depend on the number of vehicle trips assigned for each time period (AM, midday, PM, and evening) defined in the travel demand model. The percentage of trips by purpose varies for each time period. The percentages in Table 3 and Table 4 below are based on data from the 2012 Household Travel Survey.

Table 3
Percent of Trips by Time of Day

Trip Purpose	AM	Mid Day	PM	Evening	Grand Total
Home Based - Other	11%	27%	24%	37%	100%
Home Based - Personal Business	9%	50%	25%	16%	100%
Home Based - School	40%	29%	26%	5%	100%
Home Based - Shopping	2%	43%	26%	29%	100%
Home Based - Work	35%	18%	28%	19%	100%
Non-home Based - Non-work	6%	46%	25%	23%	100%
Non-home Based - Work	13%	49%	29%	9%	100%
Grand Total	**15%**	**34%**	**26%**	**25%**	**100%**

Table 4
Percent of Trips by Purpose

Trip Purpose	AM	Mid Day	PM	Evening	Grand Total
Home Based - Other	25%	26%	31%	50%	33%
Home Based - Personal Business	3%	8%	5%	4%	5%
Home Based - School	19%	6%	7%	1%	7%
Home Based - Shopping	1%	13%	10%	12%	10%
Home Based - Work	37%	8%	17%	12%	16%
Non-home Based - Non-work	7%	25%	18%	18%	19%
Non-home Based - Work	8%	13%	11%	3%	9%
Grand Total	**100%**	**100%**	**100%**	**100%**	**100%**

Comparison of Modeled Speeds with Observed Data

WFRC continues to adjust modeled speeds to improve consistency with samples of observed speeds. Observed speed data were collected in 2013 through a FHWA program known as "Here Data" that uses cell phone signals to track vehicle movements. The observed speeds for freeways and arterials during AM and PM periods of congestion were compared to speeds estimated using the WFRC travel demand model for the 2011 base year. A review of median speeds for the three-county WFRC planning area is shown in Table 5. WFRC area modeled speeds are within -3.2% to 3.1% of observed Here Data speeds.

Table 5
WFRC Planning Area Modeled Speeds Compared to Observed Speeds

	Arterial		Freeway	
	AM Peak	PM Peak	AM Peak	PM Peak
2011 Modeled Speeds (mph)	33	30	66	63
2013 Observed Speeds (mph)	32	31	64	64
Percent Difference	**3.1%**	**-3.2%**	**3.1%**	**-1.6%**

C. Emission Modeling

I/M Programs
Assumptions for the input files for EPA's MOVES vehicle emissions model include I/M programs in Salt Lake, Davis, and Weber Counties. Box Elder and Tooele Counties do not presently have I/M programs.

VMT Mix
The VMT mix describes how much a particular vehicle type is used in the transportation network. While no longer a required input for the MOVES model as it was for MOBILE6.2, VMT mix is used in several instances to generate the input files required to run the MOVES model. The national default VMT mix found in the MOVES database was used to disaggregate local vehicle type data collected in 2008. The local vehicle type data is collected by UDOT as part of the federal HPMS data collection system and is based on automated counters which classify vehicles based on axle spacing. The UDOT classification is used to calculate control percentages for light duty (LD) vehicles and heavy duty (HD) vehicles for each facility type. The EPA default VMT mix is then applied to disaggregate the two UDOT control percentages into detailed percentages for the thirteen vehicle classes used in MOVES.

Vehicle Weights
Facility specific VMT mix data described above was also used to estimate the average vehicle weight on each facility type. Since vehicle weight affects the rate of re-entrained road dust emissions estimated using the AP-42 method, vehicle weight variations on different facilities will affect the amount of fugitive dust created. The VMT mix for each facility type was used to estimate an average vehicle weight for each facility type with the following results:

Facility	Average Vehicle Weight
Urban - Freeway	6,500 lbs, or 3.25 tons
Urban - Arterial	6,100 lbs, or 3.05 tons
Urban - Local	3,900 lbs, or 1.95 tons

Post Model Adjustments

For conformity analyses prior to 2000, the WFRC applied post model adjustments to vehicle emission estimates. Emission credits for work trips were modeled for reductions in single occupant vehicle rates based primarily on increased investments in transit service and rideshare programs, and the projected increase in telecommuting. Other less significant post model adjustments were also estimated for incident management, pavement re-striping, and signal coordination. Additional emission reducing programs and projects supported by CMAQ funds such as park and ride lots, bicycle facilities, transit vehicles, intelligent transportation systems (ITS), and intersection improvements have also been implemented.

WFRC believes that these programs have a positive effect in reducing vehicle emissions. In practice, however, WFRC has found that documenting the air quality benefits of these programs can be challenging. WFRC will continue to support these emission reduction programs, but credits from these programs have not been included in this conformity analysis.

MOVES Inputs

The MOVES model is a very data intensive computer program based on the MySQL database software. Through the interagency consultation process the required MOVES inputs reflecting local conditions have been established.

Data files defining local conditions by county and year are required inputs to the MOVES model including vehicle population, emission testing programs, fuel supply, fuel formulation, meteorological conditions, and vehicle age.

Vehicle activity input files for the MOVES model are generated by the WFRC travel demand model using a customized in-house program for this purpose. The MOVES input files required include data for ramp fractions, road distribution, speed distribution, and VMT by vehicle type for each county (Box Elder, Davis, Salt Lake, Tooele, and Weber) and analysis year (base year 2011, 2019, 2024, 2034, and 2040) as required for operating the MOVES model.

The input files listed above are read into the MOVES program as database files. The input database folders in Table 6 below contain the database files used for each county and year modeled using MOVES2014 for this conformity analysis. The results of the MOVES model are stored in the output database "Conf15_out".

Table 6
MOVES Data – Input Database Folders

Box Elder	Weber	Davis	Salt Lake	Tooele
conf15_beW2011_in	conf15_weW2011_in	conf15_daW2011_in	conf15_slW2011_in	conf15_toW2011_in
conf15_beW2019_in	conf15_weW2019_in	conf15_daW2019_in	conf15_slW2019_in	conf15_toW2019_in
conf15_beW2024_in	conf15_weW2024_in	conf15_daW2024_in	conf15_slW2024_in	conf15_toW2024_in
conf15_beW2034_in	conf15_weW2034_in	conf15_daW2034_in	conf15_slW2034_in	conf15_toW2034_in
conf15_beW2040_in	conf15_weW2040_in	conf15_daW2040_in	conf15_slW2040_in	conf15_toW2040_in

Road Dust Estimates

In January 2011, the EPA released new guidance for estimating dust emissions from paved roads. These guidelines are published in Chapter 13.2.1 of the AP-42 document. The new formula is

$$E = k\,(sL)^{0.91} \times (W)^{1.02}$$

where: E = particulate emission factor (grams/mile),
k = particle size multiplier for particle size range and units of interest (for PM_{10}, k=1.0 and for $PM_{2.5}$ k=0.25),
sL = road surface silt loading (grams per square meter - g/m^2), and
W = average weight (tons) of the vehicles traveling the road.

Based on vehicle type counts on roads in the WFRC region, average vehicle weights for local roads, arterials, and freeways are 1.95, 3.05, and 3.25 tons respectively. The silt load (sL) factor varies by highway functional class and by traffic volume. The default silt load factors found in Table 13.2.1-2 of the AP-42 document are summarized below.

Traffic Volume	Functional Class	Silt Load (grams/meter^2)
500-5,000	local roads	0.200
5,000-10,000	arterial roads	0.060
limited access	freeways	0.015

A precipitation reduction factor is also applied to the above equation using the following expression:

$$(1 - P/4N)$$

Where: *P* = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and
N = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

The AP-42 guidance recommends a value of 90 precipitation days per year for the Wasatch Front region. Using these values, the precipitation reduction factor yields a value of 0.9384. Combined with the basic road dust emission rate, the net $PM_{2.5}$ and PM_{10} road dust factors by highway functional class are as follows:

Functional Class	PM_{10} Road Dust Rate (grams/mile)	$PM_{2.5}$ Road Dust Rate (grams/mile)
local roads	0.429	0.107
arterials	0.226	0.057
freeways	0.068	0.017

D. Conformity Determination

The following conformity findings for the 2015-2040 Regional Transportation Plan for the Wasatch Front are based on the transportation systems and planning assumptions described in this report and the EPA approved vehicle emissions model (MOVES2014).

Salt Lake City CO Conformity
The carbon monoxide maintenance plan for Salt Lake City was approved by EPA effective September 30, 2005 as recorded in the Federal Register (Vol. 70, No. 146, August 1, 2005). The maintenance plan defines a motor vehicle emission budget for the years 2005 and 2019 of 278.62 tons/day. Table 7 below demonstrates that projected mobile source emissions are within the emission budget defined in the maintenance plan for the 2019 budget year. The other years listed in Table 7 are in accordance with requirements of the Conformity Rule (40 CFR Part 93) as noted in the table.

From this demonstration it is concluded that the Amended RTP conforms to the applicable controls and goals of the State Implementation Plan (Maintenance Plan) for Carbon Monoxide in Salt Lake City.

Table 7

Salt Lake City - CO
Conformity Determination

	b	*b*	*c*	*c*
Year	**2019**	**2024**	**2034**	**2040**
Budget# (tons/day)	278.62	278.62	278.62	278.62
emission rate (grams/mile)	*5.29*	*4.08*	*2.35*	*1.90*
seasonal VMT	*6,958,685*	*7,378,300*	*8,291,619*	*8,792,043*
Projection* (tons/day)	40.59	33.17	21.50	18.38
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

 # Federal Register Vol. 70 No. 146, August 1, 2005, Table V-2.

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Ogden CO Conformity
The carbon monoxide maintenance plan for Ogden City was approved by EPA effective November 14, 2005 as recorded in the Federal Register (Vol. 70, No. 177, September 14, 2005). The maintenance plan defines a motor vehicle emission budget for the years 2005 and 2021 of 75.36 and 73.02 tons/day respectively. Table 8 below demonstrates that projected mobile source emissions are within the emission budget defined in the maintenance plan for the 2021 budget year. The other years listed in Table 8 are in accordance with requirements of the Conformity Rule (40 CFR Part 93) as noted in the table.

From this demonstration it is concluded that the 2015-2040 RTP conforms to the applicable controls and goals of the State Implementation Plan (Maintenance Plan) for Carbon Monoxide in Ogden City.

Table 8

Ogden City - CO
Conformity Determination

	c	b	c	c	e
Year	**2019**	**2021**	**2024**	**2034**	**2040**
Budget (tons/day)	75.36	73.02	73.02	73.02	73.02
emission rate (grams/mile)	*6.58*	*5.94*	*5.06*	*2.73*	*2.14*
seasonal VMT	*1,524,886*	*1,569,465*	*1,636,334*	*1,916,452*	*2,067,968*
Projection* (tons/day)	11.06	10.28	9.12	5.77	4.88
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

 # Federal Register Vol. 70 No. 177, September 14, 2005, Table V-2.

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Ogden PM10 Conformity

Ogden City was designated as a PM_{10} non-attainment area in August of 1995 based on PM_{10} violations in 1993 or earlier. Since a PM_{10} SIP for Ogden has not yet been approved by EPA, it must be demonstrated that Ogden PM_{10} emissions are either less than 1990 emissions or less than "no-build" emissions. The analysis years 2019, 2024, 2034, and 2040 were selected in accordance with the requirements of 40 CFR Section 93.119(e).

PM_{10} emissions are present in two varieties referred to as primary and secondary PM_{10}. Primary PM_{10} consists mostly of fugitive road dust but also includes particles from brake wear and tire wear and some "soot" particles emitted directly from the vehicle tailpipe. The methods defined in the January 2011 version of the EPA publication known as "AP-42" were used to estimate dust from paved roads. Secondary PM_{10} consists of gaseous tailpipe emissions that take on a particulate form through subsequent chemical reactions in the atmosphere. Nitrogen oxides are the main component of secondary PM_{10} emissions with sulfur oxides a distant second.

As summarized in Tables 9a and 9b, emission estimates for the 2015-2040 RTP satisfy the "Build < 1990" test for secondary PM_{10} (NOx precursors) and primary PM_{10} (direct tailpipe particulates, brake wear, tire wear, and road dust) in Ogden City. The 1990 emission estimates based on the Mobile6.2 vehicle emissions model for the 2003 conformity analysis have been updated for this conformity analysis using the MOVES model and the January 2011 AP-42 road dust methodology for consistency with current emission modeling requirements. Specifically, the NOx precursor budget (1990 emission estimate) changes from 4.57 tons/day to 6.92 tons/day, and the direct PM10

budget (1990 estimate) changes from 2.28 tons/day to 1.28 tons/day. The 1990 primary PM_{10} estimate for Ogden City includes emissions from the unpaved access road to the Ogden landfill which was closed in 1998.

For projections of primary PM_{10} emissions, no credit was taken for a number of programs adopted since Ogden City last violated the PM_{10} standard. These particulate reducing programs include covered load ordinances, increased frequency of street sweeping, and reduced application of deicing and skid resistant materials (salt and sand). Documentation of these programs has been provided by Ogden City but the actual benefits of these programs are not included in the emission projections below. Other areas that have estimated the benefit of these programs have found a silt load reduction of over 30% for effective street sweeping programs and a 5% silt load reduction when limiting the amount of sand and salt applied to the roads. Ogden City has also implemented a number of specific projects that have a positive effect in reducing particulate emissions including park and ride lots, storm water improvements, shoulder widening and edge striping, and addition of curb and gutter on several projects.

From this demonstration it is concluded that the 2015-2040 RTP conforms under the Emission Reductions Criteria for areas without motor vehicle emissions budgets for PM_{10} in Ogden City.

Table 9a

Ogden City - PM10 (NOx Precursor)
Conformity Determination

	d	*c*	*c*	*e*
Year	**2019**	**2024**	**2034**	**2040**
1990 Emissions (tons/day)	6.92	6.92	6.92	6.92
emission rate (grams/mile)	*0.81*	*0.51*	*0.26*	*0.23*
seasonal VMT	*1,524,886*	*1,636,334*	*1,916,452*	*2,067,968*
Projection* (tons/day)	1.36	0.92	0.56	0.53
Conformity (Projection < 1990 Emissions?)	**Pass**	**Pass**	**Pass**	**Pass**

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Table 9b

Ogden City - PM10 (Primary Particulates**)
Conformity Determination

	d	c	c	e
Year	**2019**	**2024**	**2034**	**2040**
1990 Emissions (tons/day)	1.28	1.28	1.28	1.28
emission rates (grams/mile)				
exhaust particulates - (Ec, Oc, SO4)	*0.0332*	*0.0204*	*0.0101*	*0.0091*
brake particulates	*0.0665*	*0.0670*	*0.0704*	*0.0729*
tire particulates	*0.0129*	*0.0130*	*0.0133*	*0.0134*
road dust particulates	*0.2618*	*0.2599*	*0.2596*	*0.2587*
seasonal VMT	*1,524,886*	*1,636,334*	*1,916,452*	*2,067,968*
Projection* (tons/day)	0.63	0.65	0.75	0.81
Conformity (Projection < 1990 Emissions?)	**Pass**	**Pass**	**Pass**	**Pass**

*** Includes road dust, elemental carbon, organic carbon, gasoline exhaust particulates, tire wear, and brake wear.*

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Salt Lake County PM10 Conformity

The PM_{10} SIP for Salt Lake County does not define a budget beyond the year 2003. Therefore, conformity tests are required only for analysis years which are identified in accordance with 40 CFR 93.118. All analysis years after 2003 must meet the 2003 budgets for primary particulates and secondary particulates (see the discussion above under Ogden PM_{10} Conformity for an explanation of primary and secondary PM_{10} emissions). The State air quality rule R307-310 allows a portion of the surplus primary PM_{10} budget to be applied to the secondary PM_{10} budget for conformity purposes. For the analysis years 2019, 2024, 2034, and 2040, no budget adjustments were necessary.

Table 10

Salt Lake County - PM10 Budgets
Direct (Dust) and Precursor (NOx) PM10 Emission Budgets

(tons/day)

Year	2019	2024	2034	2040
Total PM10 Budget#	72.60	72.60	72.60	72.60
Direct PM10 Budget to be Traded	*0.00*	*0.00*	*0.00*	*0.00*
Direct PM10 Budget	40.30	40.30	40.30	40.30
NOx Precursor PM10 Budget	32.30	32.30	32.30	32.30

Table 11a and Table 11b below demonstrate that projected mobile source emissions are within the emission budget defined in the SIP. The years listed in Table 10a and Table 10b are in accordance with requirements of the Conformity Rule (40 CFR Part 93) as noted in the tables.

From this demonstration it is concluded that the 2015-2040 RTP conforms to the applicable controls and goals of the State Implementation Plan for PM_{10} in Salt Lake County.

Table 11a

Salt Lake County - PM10 (NOx Precursor)
Conformity Determination

Year	2019 c	2024 c	2034 c	2040 e
Budget# (tons/day)	32.30	32.30	32.30	32.30
emission rate (grams/mile)	*0.52*	*0.33*	*0.18*	*0.16*
seasonal VMT	*31,323,413*	*33,975,712*	*39,079,454*	*42,347,044*
Projection* (tons/day)	18.07	12.51	7.91	7.49
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

 # WFRC Memo to Jeff Houk of EPA, April 15, 1994.

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Table 11b

Salt Lake County - PM10 (Primary Particulates**) Conformity Determination

Year	2019 (c)	2024 (c)	2034 (c)	2040 (e)
Budget# (tons/day)	40.30	40.30	40.30	40.30
emission rates (grams/mile)				
exhaust particulates - (Ec, Oc, SO4)	*0.0300*	*0.0184*	*0.0093*	*0.0082*
brake particulates	*0.0485*	*0.0491*	*0.0508*	*0.0493*
tire particulates	*0.0111*	*0.0112*	*0.0113*	*0.0112*
road dust particulates	*0.2101*	*0.2101*	*0.2041*	*0.1972*
seasonal VMT	*31,323,413*	*33,975,712*	*39,079,454*	*42,347,044*
Projection* (tons/day)	10.35	10.81	11.86	12.41
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

*** Includes road dust, elemental carbon, organic carbon, gasoline exhaust particulates, tire wear, and brake wear.*

 # WFRC Memo to Jeff Houk of EPA, April 15, 1994.

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Salt Lake $PM_{2.5}$ Conformity

Davis, Salt Lake, and portions of Weber, Tooele, and Box Elder Counties have been designated as a non-attainment area under the new $PM_{2.5}$ standard (35 $\mu g/m^3$) that was established in 2006. Work has begun on a $PM_{2.5}$ section of the State Implementation Plan which will establish a motor vehicle emission budget for emissions associated with $PM_{2.5}$. Until the $PM_{2.5}$ SIP is completed and approved by EPA, $PM_{2.5}$ interim conformity requirements apply. EPA interim conformity for $PM_{2.5}$ emissions requires that future NOx emissions (a precursor to $PM_{2.5}$) and primary particulate emissions not exceed 2008 levels.

Table 12a below demonstrates that projected mobile source emissions of NOx (a precursor to $PM_{2.5}$ emissions) in the five-county $PM_{2.5}$ non-attainment area are less than 2008 NOx emissions. Table 12b below demonstrates that direct particle emissions of $PM_{2.5}$ in the five-county $PM_{2.5}$ non-attainment area are also less than 2008 direct particle emissions. Direct particle emissions include exhaust emissions of elemental carbon, organic carbon, and sulfates (SO4); and mechanical emissions from brake wear and tire wear.

From this demonstration it is concluded that the RTP conforms under the interim conformity guidelines for $PM_{2.5}$ areas without an approved motor vehicle emissions budget for the Salt Lake $PM_{2.5}$ non-attainment area.

Table 12a

Salt Lake Area# - PM2.5 (NOx Precursor)

Conformity Determination

Year	2019 (c)	2024 (c)	2034 (c)	2040 (e)
2008 Emissions (tons/day)	89.35	89.35	89.35	89.35
emission rate (grams/mile)	*0.61*	*0.39*	*0.21*	*0.19*
seasonal VMT	*49,849,779*	*54,359,340*	*63,102,766*	*68,726,311*
Projection* (tons/day)	33.54	23.12	14.58	14.13
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

 # Salt Lake PM2.5 Non-Attainment Area includes: Davis, Salt Lake, and portions of Weber, Box Elder and Tooele Counties.

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Table 12b

Salt Lake Area# - PM2.5 (VOC Precursor)

Conformity Determination

Year	2019 (c)	2024 (c)	2034 (c)	2040 (e)
2008 Emissions (tons/day)	53.55	53.55	53.55	53.55
emission rate (grams/mile)	*0.52*	*0.39*	*0.27*	*0.25*
seasonal VMT	*49,849,779*	*54,359,340*	*63,102,766*	*68,726,311*
Projection* (tons/day)	28.73	23.67	18.86	18.68
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

 # Salt Lake PM2.5 Non-Attainment Area includes: Davis, Salt Lake, and portions of Weber, Box Elder and Tooele Counties.

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Table 12c

Salt Lake Area# - PM2.5 (Direct PM Emissions**)

Conformity Determination

		c	c	c	e
Year		**2019**	**2024**	**2034**	**2040**
2008 Emissions (tons/day)		7.06	7.06	7.06	7.06
emission rate (grams/mile)		*0.09*	*0.08*	*0.07*	*0.07*
seasonal VMT		*49,849,779*	*54,359,340*	*63,102,766*	*68,726,311*
Projection* (tons/day)		4.93	4.65	4.70	4.93
Conformity (Projection < Budget?)		**Pass**	**Pass**	**Pass**	**Pass**

 # Salt Lake PM2.5 Non-Attainment Area includes: Weber, Davis, Salt Lake, and portions of Box Elder and Tooele Counties.

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

*** Direct PM for interim conformity includes gasoline particulates, elemental carbon, organic carbon, SO4, brake wear, and tire wear.*

Salt Lake and Davis County Ozone Conformity

The 1-hour ozone standard was revoked on June 19, 2005. Therefore, a conformity analysis under the 1-hour ozone standard in Salt Lake and Davis Counties is no longer required.

The current 8-hour ozone standard is 75 ppb. All counties within the Wasatch Front area are in attainment of the current 8-hour ozone standard.

Appendix – 1
Definition of Regionally Significant Projects

Process for Determining Regionally Significant Facilities for Purposes of Regional Emissions Analysis (see CFR 93.105.2.c.1.ii)

Background: 40 FR 93.101 defines "regionally significant project" and associated facilities for the purpose of transportation conformity. The federal definition does not specifically include minor arterials. The following definitions and processes will be used by the Wasatch Front Regional Council (WFRC) and Mountainlands Association of Governments (MAG) in consultation with DAQ, UDOT, UTA, FHWA, FTA, and EPA to determine which facilities shall be considered regionally significant for purposes of regional emissions analysis. It is the practice of the MPO to include minor arterials and collectors in the travel model for the purpose of accurately modeling regional VMT and associated vehicle emissions. The inclusion of minor arterials and collectors in the travel model, however, does not identify these facilities as regionally significant.

1. Any new or existing facility with a functional classification of principal arterial or higher on the latest UDOT Functional Classification Map shall be considered regionally significant (see http://www.dot.utah.gov/index.php/m=c/tid=1228).

2. Any fixed guide-way transit service including light rail, commuter rail, or portions of bus rapid transit that involve exclusive right-of-way shall be considered regionally significant.

3. As traffic conditions change in the future, the MPO's - in consultation with DAQ, UDOT, FHWA, and EPA (and UTA and FTA in cases involving transit facilities) - will consider 1) the relative importance of minor arterials serving major activity centers, and 2) the absence of principal arterials in the vicinity to determine if any minor arterials in addition to those listed in Exhibit A should be considered as regionally significant for purposes of regional emissions analysis.

Exhibit A
Minor Arterials Determined to be Regionally Significant
for Purposes of Regional Emissions Analysis

40 FR 93.105(c)(ii), "Consultation – Interagency consultation procedures: Specific processes" specifies that Interagency Consultation shall include a process to identify which minor arterials should be considered as "regionally significant" for the purpose of regional emissions analysis. In consultation with DAQ, UDOT, FHWA, and EPA; and based on inspection and engineering judgment of current traffic conditions; and based on application of the "Process for Determining Regionally Significant Facilities for Purposes of Regional Emissions Analysis" agreed upon by the aforementioned agencies; the WFRC designated eight minor arterials as regionally significant.

Since 2015, all but one of the minor arterials referenced above have been reclassified with the functional type of principal arterial and are therefore by definition regionally significant. The remaining minor arterial to be considered as regionally significant for emissions analysis is listed below. It should also be noted that all collectors, minor arterials, and principal arterials are included in the highway network used in the WFRC travel demand model.

Davis County
none

Salt Lake County
none

Weber County
SR-79 (Hinckley Drive): SR-108 to I-15

Process for Determining Significant Change in Design Concept and Scope for Purposes of Regional Emissions Analysis (see CFR 93.105.2.c.1.ii)

Changes to regionally significant projects may or may not necessitate a new regional emissions analysis. The following definitions and processes will be used to determine what changes to project concept and scope are to be considered significant or not for purposes of regional emissions analysis.

1. Adding or extending freeway auxiliary lanes or weaving lanes between interchanges is not considered a significant change in concept and scope since these lanes are not normally included in the travel model.

2. Adding or extending freeway auxiliary/weaving lanes from one interchange to a point beyond the next interchange is considered a significant change in concept and scope.

3. A change to a regionally significant project defined in the Regional Transportation Plan that does not change how the project is defined in the travel model is not considered a significant change in concept and scope. These changes include but are not limited to lane or shoulder widening, cross section (other than the number of through lanes), alignment, interchange configuration, intersection traffic control, turn lanes, continuous or center turn lanes, and storage lanes.

4. A change to a regionally significant project defined in the Regional Transportation Plan that does alter the number of through lanes, lane capacity, or speed classification as defined in the travel model is considered a significant change in concept and scope.

5. Advancing or delaying the planned implementation of a regionally significant project that does not result in a change in the transportation network described in the travel model for any horizon year (as defined in CFR 93.101) is not considered a significant change in concept and scope.

6. Advancing or delaying the planned implementation of a regionally significant project that does result in a change in the transportation network described in the travel model for any horizon year (as defined in CFR 93.101) is considered a significant change in concept and scope.

7. Project changes not addressed in the above statements will be decided on a case by case basis through consultation by representatives from DAQ, WFRC, MAG, UDOT, UTA, FHWA, FTA, and EPA.

Appendix-2

Box Elder County
Highway and Transit Projects
2040 RTP

Box Elder County

Box Elder County
Regionally Significant Project List – January 2015

Line	Source	County	Need Phase	Constrained Phase	Capacity Need	Priority Score	Improvement Type	Project Name	Project Description	Cost 2014	Route	Begin	End
1	LRP	Box Elder/ Cache	STIP 2016	1	Before 2012	44	Passing Lane	SR-30 MP 97 to MP 101	Add one travel lane in each direction	$5,000,000	0030	97.00	101.34
9	LRP	Box Elder/ Cache	3	2	begin by Phase 1	27	Widening	SR□30 MP 95.1 to MP 102.3, SR□38 to SR□23	Add one travel lane in each direction	$32,040,000	0030	95.10	102.30
10	LRP	Box Elder	4	2		36	Passing Lane	I□84 Widen WB from MP 17.3 to MP 19.9	Add one travel lane in WB direction	$7,150,000	0084	17.30	19.90
11	LRP	Box Elder	4	2		43	Passing Lane	I□84 Widen EB from MP 6.8 to MP 17.7	Add one travel lane in EB direction	$29,975,000	0084	6.80	17.70
13	LRP	Box Elder	2	2	before 2012	28	Widening	SR□30 MP 90.7 to MP 95.1, I□15 to SR□38 (Collinston)	Add one travel lane in each direction	$19,580,000	0030	90.70	95.10
14	Model	Box Elder	3	3		25	Widening	I□15 Widen from MP 365.7 to MP 372.6, SR□13 to Honeyville (WFRC boundary from MP 365.7 to 368.3)	Add one travel lane in each direction	$22,145,000	0015	368.30	372.60
15	LRP	Box Elder	4	3		43	Passing Lane	I□84 Widen WB from MP 29.3 to MP 32.3	Add one travel lane in WB direction	$8,250,000	0084	29.30	32.30
16	LRP	Box Elder	4	3		37	Passing Lane	I□84 Widen EB from MP 25.3 to MP 29.7	Add one travel lane in EB direction	$12,100,000	0084	25.30	29.70
17	LRP	Box Elder	4	3		46	Passing Lane	I□84 Widen WB from MP 33.5 to MP 35.6	Add one travel lane in WB direction	$5,775,000	0084	33.50	35.60
22	Model	Box Elder	4	4		37	Widening	I□15 Widen from MP 372.6 to MP 379.5, Honeyville to Tremonton	Add one travel lane in each direction	$35,535,000	0015	372.60	379.50

Appendix-3

Highway and Transit Projects
2040 RTP

Tooele County

Tooele Valley RPO Long Range Plan Highway Projects
February 9, 2015

Phase 1 (To be built by 2025)

Main Street (SR-138) in Grantsville (West St – Center St, and Bowery St – SR-112)
Widen from 1 lane to 2 lanes per direction

SR-36 (Stockton Town – Skyline Drive)
Widen from 1 lane to 2 lanes per direction

Tooele Parkway (SR-112 – Droubay Road)
New collector, 1 lane per direction

Midvalley Highway (SR-138 – I-80)
New freeway, 2 lanes per direction

Midvalley Highway (SR-36 – Utah Avenue)
New principal arterial, 2 lanes per direction

SR-112 (Sheep Lane - Utah Ave)
Widen from 1 lane to 2 lanes per direction

Sheep Lane (SR-112 – SR-138)
Widen from 1 lane to 2 lanes per direction

SR-138 (SR-112 – Midvalley Highway)
Widen from 1 lane to 2 lanes per direction

I-80 (SR-36 – SR-201)
Widen from 2 lanes to 3 lanes per direction

SR-112 (SR-138 – Sheep Lane)
Widen from 1 lane to 2 lanes per direction

400 West (2000 North – Village Blvd)
New collector, 1 lane per direction

1000 North (SR-36 – Droubay Road)
Widen from 1 lane to 2 lanes per direction

Tooele Boulevard (SR-36 – Vine St)
New collector, 1 lane per direction

Bates Canyon Road (1200 West – 400 West)
New collector, 1 lane per direction

Village Boulevard (SR-138 – current western terminus)
New collector, 1 lane per direction

Phase 2 (To be built by 2040)

I-80 (Midvalley Highway - SR-36)
Widen from 2 lanes to 3 lanes per direction

Midvalley Highway (Utah Avenue – SR-138)
New freeway, 2 lanes per direction

1200 West (1000 North – SR-138)
New minor arterial, 1 lane per direction

2000 North (Sheep Lane – 400 West)
New collector, 1 lane per direction