Attachment 1

RESOLUTION No. 01-2011

FOR THE PURPOSE OF AMENDING THE FY2010-2014 REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM AND AIR QUALITY CONFORMITY DEMONSTRATION

WHEREAS, the Community Planning Association has been designated by the Governor of Idaho as the Metropolitan Planning Organization responsible for transportation planning in Northern Ada County and the Nampa Urbanized Area;

WHEREAS, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act – a Legacy for Users and 23 United States Code Section 134 require Metropolitan Planning Organizations to develop and approve a Transportation Improvement Program;

WHEREAS, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act – a Legacy for Users and 23 United States Code Section 134 requires projects contained in the Transportation Improvement Program to be financially constrained;

WHEREAS, a public comment period was held from July 23 through August 23, 2010 in conjunction with the FY2011-2015 Update;

WHEREAS, an amendment to the Air Quality Conformity Demonstration in Northern Ada County was developed;

WHEREAS, the Community Planning Association desires to take timely action to insure the availability of Federal Funds;

WHEREAS, the Community Planning Association has developed this amendment to the FY2010-2014 Regional Transportation Improvement Program in compliance with all applicable State and Federal regulations; and

WHEREAS, the attached table dated September 7, 2010, details the amendments to the FY2010-2014 Regional Transportation Improvement Program.

NOW, THEREFORE, BE IT RESOLVED, that the Community Planning Association Board of Directors approves this amendment to the FY2010-2014 Regional Transportation Improvement Program.

Dated this 13th day of October 2010.

APPROVED:

By: _____
Dave Bieter, Chair
Community Planning Association Board

ATTEST:

By: _____
Matthew J. Stoll, Executive Director
Community Planning Association

FY10\900 Operations\990 Direct Operations-Maintenance\Board\2011 Resolutions\Resolution 01-2011.doc

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THIS DOCUMENT IS SUBMITTED TO THE U.S. DEPARTMENT OF TRANSPORTATION IN FULFILLMENT OF THE REQUIREMENTS OF THE 1990 CLEAN AIR ACT AMENDMENTS, THE FEDERAL TRANSPORTATION AIR QUALITY CONFORMITY RULES (40CFR93), AND THE STATE OF IDAHO ADMINISTRATIVE CODE ON TRANSPORTATION CONFORMITY (IDAPA 58-01.01.563-574).

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FOREWORD

The federal government mandates that any transportation projects using federal funds or deemed to be "regionally significant" in nonattainment and maintenance areas cannot contribute to a degradation of air quality (40CFR93). Thus, transportation plans must "conform" to air quality plans. Transportation conformity is demonstrated in a nonattainment or maintenance area when it can be shown, within the applicable guidelines and regulations, that planned transportation projects listed in a transportation program or plan will not cause or contribute to exceedances of the U.S. Environmental Protection Agency's (EPA's) health based air quality standards. A finding of nonconformity would prevent the implementation of certain federally funded and/or regionally significant transportation projects.

Only EPA's criteria pollutants[1] are subject to conformity analyses. One of two tests is used in a conformity demonstration:

> Build/No Build: Conceptually, this process is rather simple; estimate the amount of a given pollutant emitted in a region before the programmed projects are built (No Build Scenario) and after construction (Build Scenario). If the emissions from the Build Scenario are equal to or less than the emissions from the No Build Scenario, conformity has been demonstrated. This test is used for nonattainment or maintenance areas where motor vehicle emissions budgets are not established.
>
> Budget: State air quality implementation or maintenance plans for nonattainment or maintenance areas will often have maximum limits on the amounts of pollutants that transportation related sources emit. These maximum emissions limits on transportation related sources are known as "budgets." A transportation conformity budget test consists of a comparison between regional emissions estimates that include the impacts associated with planned transportation projects to the established budget. If the budget is not exceeded by the emissions estimate, then conformity has been demonstrated.

This document contains the information and analyses necessary for the Federal Highway Administration and the Federal Transit Administration to make a transportation conformity finding for the amendment to the FY 2010 -2014 Regional Transportation Improvement Program.

The 30-day public comment period from July 23, 2010 to August 23, 2010 for the Conformity Demonstration for the update to *Communities in Motion* (CIM 2035) and draft FY 2011-2015 Regional Transportation Improvement Program included these projects and changes for the amendment to the FY 2010 -2014 Regional Transportation Improvement Program. No public comments pertaining to conformity were received.

[1] Particle pollution and ground-level ozone are the most widespread health threats. EPA calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels

SUMMARY

EPA's MOBILE6.2 emissions model and the Community Planning Association of Southwest Idaho's (COMPASS') most current and approved travel demand model were used to estimate pollutant emissions from the transportation system outlined in the *Communities in Motion* 2035 regional long-range transportation plan and amendment to the FY 2010-2014 Regional Transportation Improvement Program (TIP). A TIP is a short-range (5-year) capital improvement document for the transportation system in a given urbanized area. The Northern Ada County Interagency Consultation Committee on Transportation Conformity (ICC) approved the modeling methodologies and assumptions used in the regional emissions analyses including the applicable transportation model networks. Growth and demographic assumptions from the update to the region's long-range transportation plan, *Communities in Motion* 2035, are used in this demonstration.

The *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request* contains motor vehicle emissions budgets for three pollutants: coarse particulate matter (PM_{10}), oxides of nitrogen (NO_X), and volatile organic compounds (VOCs). Emissions budget tests, as required by 40CFR93.118, demonstrate conformity of the amendment to the FY 2010-2014 Regional Transportation Improvement Program.

The *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area* (Carbon Monoxide [CO] Limited Maintenance Plan) does not contain any motor vehicle emissions budgets. The EPA does not require areas under a "limited maintenance plan" to conduct regional emissions analysis to demonstrate conformity. However, COMPASS conducts a CO emissions analysis as requested by the Idaho Department of Environmental Quality (IDEQ) to aid in regional air quality planning. COMPASS is committed to working through the ICC to identify and implement mitigation measures that will counteract CO emissions increases resulting from anticipated improvements to the regional transportation system should they be requested by IDEQ.

I. INTRODUCTION

Community Planning Association

The Community Planning Association of Southwest Idaho (COMPASS) is an association of governments in Ada and Canyon Counties, Idaho. It provides transportation planning and a host of other planning and community services to its member agencies and the general public. Since 1977, COMPASS, formerly known as Ada Planning Association, has been designated as the Metropolitan Planning Organization (MPO) for Northern Ada County. In April 2003, COMPASS was designated as the MPO for the Nampa Urbanized Area, located in neighboring Canyon County. The agency's service area covers the cities of Boise, Caldwell, Eagle, Garden City, Kuna, Meridian, Middleton, Nampa, and Star.

Area's Designations

Coarse Particulate Matter (PM_{10})

Northern Ada County is designated as a maintenance area in attainment of the 24-hour PM_{10} National Ambient Air Quality Standard (NAAQS). Appendix A shows the extent of the maintenance area boundaries. The last non-agricultural based exceedance of the 24-hour PM_{10} NAAQS occurred in 1991. Prior to March 12, 1999, Northern Ada County was designated as a nonattainment area for PM_{10}. However, on that date the U.S. Environmental Protection Agency (EPA) Administrator signed a revocation of Northern Ada County's nonattainment designation based on changes made to the PM_{10} NAAQS. This ruling was challenged in the Ninth District Circuit Court. On January 31, 2001, the U.S. Department of Justice approved a settlement agreement for the Idaho Clean Air Force et al. v. EPA et al. lawsuit. A major component of the settlement agreement required the Idaho Department of Environmental Quality (IDEQ) to update Northern Ada County's PM_{10} State Implementation Plan (SIP). In September 2003, the EPA approved the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request*.

Commonly, past exceedances of the 24-hour PM_{10} NAAQS in Northern Ada County occurred during sever wintertime air stagnation events. These events, known as atmospheric inversions, are caused when cold, stagnant air is held close to the valley floor by warmer air aloft. During these events, particulates form in the atmosphere out of such gaseous pollutants as oxides of nitrogen (NO_X) and volatile organic compounds (VOCs). Thus, both NO_X and VOCs are considered precursors of PM_{10}. As a result, the PM_{10} maintenance plan contains approved PM_{10}, NO_X, and VOC motor vehicle emissions budgets.

Carbon Monoxide (CO)

Additionally, Northern Ada County is designated as a limited maintenance area in attainment of the carbon monoxide (CO) NAAQS. Northern Ada County has not experienced a violation of the CO NAAQS since 1987. The IDEQ submitted the *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area* to EPA in December 2001. EPA approved the Limited Maintenance Plan and subsequently redesignated the area in December 2002. Maintenance areas under a limited maintenance plan are not required to demonstrate their transportation programs or long-range transportation plans conform through a regional emissions analysis. Therefore, there are no applicable CO motor vehicle emissions budgets established for Northern Ada County.

Rules

As described previously, the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request* (PM_{10} Maintenance Plan) establishes motor vehicle emissions budgets for PM_{10}, NO_x, and VOCs. Therefore, to satisfy transportation conformity requirements established by 40CFR93.118, budget tests must be performed for the amendment to the FY 2010-2014 Regional Transportation Improvement Program (TIP). Budget tests are satisfied when regional emissions estimates based on the transportation systems outlined in a TIP or transportation plan are less than or equal to "budgets" established by SIPs and/or air quality maintenance plans.

EPA guidance related to "limited maintenance plans" eliminates this requirement with regard to CO for Northern Ada County's conformity demonstrations:

> *…in areas with approved limited maintenance plans, Federal actions requiring conformity determinations under the transportation conformity rule could be considered to satisfy the budget test required in section 93.118, 93.119, and 93.120 of the rule.* [2]

Therefore CO motor vehicle emissions budget tests are not federally required for Northern Ada County. However, IDEQ requires COMPASS conduct a build/no build analysis of its programs and long-range plans in order to facilitate good air quality planning. If the results of this analysis show an unacceptable increase in CO emissions, IDEQ may choose to require mitigation measures.

Interagency Consultation

Idaho Administrative Code (IDAPA 58.01.01.567) requires nonattainment and maintenance areas establish an interagency consultation committee on transportation conformity. The Northern Ada County Interagency Consultation Committee (ICC) approved the assumptions and methodologies employed in the development of the regional emissions analysis in this demonstration on May 5, 2010. The approved assumptions and methodologies are listed in Appendices B and C. The roadway project list was approved by the ICC on June 2, 2010. A complete listing of the ICC requirements can be found in Idaho Administrative Code (IDAPA 58.01.01.563-574).

Budget Test

A budget test is a comparison of emissions estimates to an established limit (or budget) for motor vehicles. As per 40CFR93.118(b), budget tests must be preformed:

> *…each year for which the applicable … implementation plan specifically establishes motor vehicle emissions budget(s), for the last year of the transportation plan's forecast period, and for any intermediate years as necessary so that the years for which consistency is demonstrated are no more than ten years apart…*

The Northern Ada County PM_{10} Maintenance Plan established motor vehicle emissions budgets for the years 1999, 2010, and 2015. Thus, budget tests were performed for:

- 2010 - Base year of the FY 2010-2014 TIP

[2] Page 42 of the *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area*

- 2014 - last year of the FY 2010-2014 TIP
- 2015 - Budget year and last year of the FY 2011-2015 TIP
- 2025 - Intermediate analysis year, as there can be no more than 10 years between analysis years
- 2035 – Long-range transportation plan (*Communities in Motion* Update) horizon year

Regionally Significant Projects
Regional emissions analyses, for the purposes of demonstrating transportation conformity of a TIP or long-range plan, must include all regionally significant and/or federally funded projects in the nonattainment or maintenance area.

40CFR93.101 defines a regionally significant project as:

> *… a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.*

Idaho Administrative Code (IDAPA 58.01.01.566) further defines a regionally significant project as:

> *A transportation project, other than an exempt project, that is on a facility which serves regional transportation needs… and would normally be included in the modeling of a metropolitan area's transportation network, including, at a minimum:*
>
> > *a. All principal arterial highways;*
> > *b. All fixed guideway transit facilities that offer an alternative to regional highway travel; and*
> > *c. Any other facilities determined to be regionally significant through Section 570, interagency consultation.*

The ICC maintains discretionary authority in interpreting and applying these definitions to the area's transportation programs, plans, and projects. For the purposes of this conformity determination, all applicable roadway projects, despite their significance, were included in the travel demand model networks.

Regionally Significant Roadway Project Definition
On January 30, 2002, the ICC developed the following definition of a "Regionally Significant" project:

> *A transportation project in Ada County, Idaho is designated "Regionally Significant" if:*
>
> > *(a) the project is for the improvement of either:*
> > > *(i) a principal arterial or higher functional classification; or*
> > > *(ii) a minor arterial which will have a twenty (20) year projected traffic volume of at least 45,000 vehicles a day after completion of the project; and*

(b) the project will add at least one new continuous vehicular lane which either:
(i) extends from one intersecting principal or minor arterial to another intersecting principal or minor arterial; or
(ii) in the case of an interstate, extends from the on ramp of one interstate interchange to a point beyond the off ramp of the next adjacent interstate interchange.

Regionally Significant Transit Project Definition
On August 31, 2005, the ICC adopted the following definition of a "Regionally Significant" transit project:

A transit project in Ada County, Idaho is designated "Regionally Significant" if the transit project:

(a) Has the potential to change the vehicle demand of an existing roadway classified as a principal arterial or higher by 400 vehicles per hour, or 4,000 vehicles per weekday; and
(b) Is a transit service or facility that provides services to (or connects) at a minimum:
(i) Two counties and;
(ii) Three incorporated cities

Exempt Projects:
Pursuant to 40CFR93.126 (Exempt Projects), certain projects listed in a long-range transportation plan or TIP may proceed even in the absence of a conformity finding/demonstration. Exempt projects include highway safety or mass transit projects, landscaping projects, roadway rehabilitation and repair, transportation enhancement projects, and transportation planning activities that do not lead directly to construction. However, the exempt projects listed in 40CFR93.126 are not considered exempt if the ICC concludes that they may have an adverse impact on air quality.

In addition, 40CFR93.127 (Projects Exempt from Regional Emissions Analyses) considers projects, such as intersection signalization, changes in alignment, bus terminals, and transit transfer points, exempt from regional emissions analyses. However, these projects must demonstrate project-level conformity. As with the types of exempt projects listed in 40CFR93.126, the projects listed in 40CFR93.127 may not be considered exempted if the ICC concludes they may have an adverse impact on air quality.

Transportation Control Measures
As per 40CFR93.113(c), in order for a TIP or long-range transportation plan to be conforming, it cannot interfere with the implementation of any transportation control measures (TCMs). There are no TCMs requiring implementation in either the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request* or *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area*. Therefore, the FY 2011-2015 Regional TIP meets the requirements of 40CFR93.113(c).

II. EMISSIONS ESTIMATION

Emissions Analysis Assumptions and Tools

This air quality conformity demonstration is based upon estimates of vehicle miles of travel (VMT) produced using COMPASS' travel demand model. Emissions factors are generated using the latest version of EPA's on-road emissions model (MOBILE 6.2). A regional emission analysis was conducted as described below.

COMPASS' Travel Demand Model

The travel demand model provides estimates of average weekday travel demand for each link of a given transportation network based on current and future demographic/growth assumptions. In addition to travel demand, the model produces weekday VMT forecasts, congested network speeds, and other data relevant to regional emissions analyses. COMPASS uses Citilab's Cube Voyager software to run the regional model. COMPASS' travel demand model is regularly maintained and updated to include all completed roadway projects. Future-year model networks include anticipated widening and new roadway projects, regardless of significance or exemption status. Transportation network components include interstates, principal arterials, minor arterials, most collectors, and select local roads in Ada and Canyon Counties. For emissions analysis purposes only, future expressways are categorized as arterials or interstates, based on the amount and type of access anticipated. The ICC approves the use of the future-year model networks for inclusion in the regional emissions analyses.

COMPASS' travel demand modeling activities are performed under the review of the Transportation Model Advisory Committee (TMAC). TMAC is a technical committee formed by the COMPASS Board of Directors. The committee is made up of local experts, technical staff from COMPASS' member agencies, and local traffic engineers from both the public and private sectors. TMAC works with COMPASS staff to periodically calibrate and validate the travel demand model to reflect the actual travel patterns and behaviors in the Treasure Valley. COMPASS' current travel demand model is calibrated and validated to 2002 conditions. Appendix B provides more information on COMPASS' travel demand model. In 2008, COMPASS staff began a minor interim-year update to the travel demand model. This update included refinement of the roadway network and updating the existing 534 Traffic Analysis Zones (TAZs) to a new total of 2,062 TAZs. This update also used actual 2008 demographic estimates.

Demographic Data

The COMPASS Board adopts the official population and employment projections for the Treasure Valley based on a preferred growth scenario. COMPASS developed two growth scenarios for *Communities in Motion2035* (CIM 2035): Community Choices and Preservation. "Community Choices" combines modest land use intensification/densification along transportation corridors and in downtown cores with additional employment and population growth in outlying communities. Less suburban and rural residential development is anticipated in this growth scenario. With more infill development (and thus increased densities) along existing transportation corridors, this scenario consumes less land by 2035 than the current development trend. The "Preservation" scenario is the complete build-out of local land-use plans according to the land use types and densities identified in comprehensive plans and is not limited by any other restraint nor limited to a horizon year.

Population and employment allocations were calculated by an attraction-based land use consumption model, UPlan, and evaluated by the COMPASS' Demographic Advisory

Committee (DAC). The DAC is composed of demographers, developers, and representatives from local industries and governments and works with COMPASS staff to develop population and employment projections used in the travel demand model to generate average daily traffic and VMT forecasts.

Data for the analysis years of 2010, 2014, 2015, 2025 were developed using a 2008 base year estimate and the 2035 "Community Choices" growth scenario as endpoints. Professional judgment was then used to estimate and allocate the interim year growth to TAZs.

Roadway Network Assumptions

The projects used in the regional emissions analysis for the amendment to the FY 2010-2014 Regional TIP are derived from:

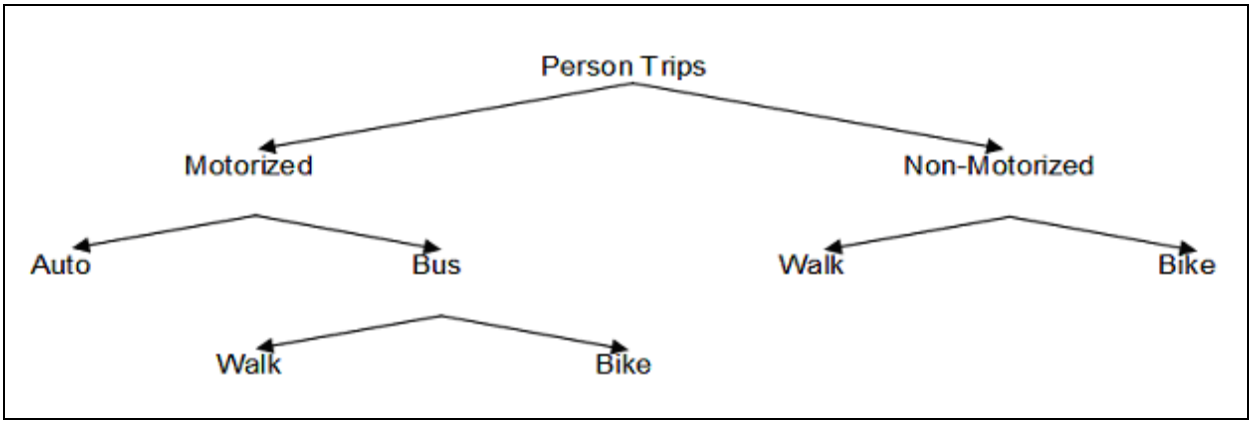
- COMPASS' FY 2010-2014 Regional TIP
- COMPASS' Draft FY 2011-2015 Regional TIP
- Ada County Highway District's (ACHD's) FY 2011-2015 Five-Year Work Plan
- Idaho Transportation Department's (ITD's) State Transportation Improvement Program (STIP) (FY 2011-2014) - Draft
- ACHD's FY 2009 Capital Improvement Plan (CIP) (FY 2009-2029)
- *Communities in Motion* 2035, the region's long-range transportation plan

Roadway projects were placed into analysis (or budget) year networks based on information contained in the above sources. In the event a project was given a construction date in multiple documents, the anticipated completion date was used to place the project in the appropriate network year. Preliminary development projects were placed in the roadway network year based on information contained in ACHD's CIP. Other future roadway projects listed on the funded list of both CIM 2035 and ACHD's CIP were placed in roadway network year based on information contained in ACHD's CIP. Roadway projects listed as unfunded in CIM 2035 **and** right-of- way only/unfunded in ACHD's CIP were not included in the roadway networks.

Transit Service Assumptions

Regional impacts from access to the area's transit system were included in the emissions analysis. This was done within COMPASS' travel demand model using a "mode choice" model. A "mode choice" model is the third step in a traditional 4-step travel demand model, such as the one maintained by COMPASS. It takes estimates of person trips and tries to predict the mode of travel the trip will use. Figure 1 shows the motorized modes available to the travel demand model for assignment. Transit trips are assigned to a transit network input into the travel demand model. Non-motorized trips are not assigned to a network.

Figure 1: COMPASS Model Travel Modes



Currently, no major system expansion is funded for the region's transit system in either the amendment to the FY 2010-2014 Regional TIP or CIM 2035. Therefore, only the transit system as it exists today is included in the analysis through 2035. The current system includes:

- Fifteen routes and approximately 688 stops with headways between 30-60 minutes in the Boise/Garden City service area.
- Four Nampa and Caldwell routes with headways varying between 30 and 60 minutes.
- Four inter-county routes (between Ada and Canyon Counties) with 30-60 minute headways during the morning/afternoon peak periods and 2-3 hour headways during off peak periods.

Communities in Motion's 2035 Chapter 6 contains more general information on the region's current transit system. Specific information on the routes and schedules used to model the transit system can be found at Valley Regional Transit's website: http://www.valleyride.org/BUSSERVICES/tabid/116/Default.aspx

Emissions Modeling

COMPASS uses EPA's MOBILE emissions model to estimate the air quality impacts associated with current and future roadway networks. MOBILE (version 6.2) is still valid for emissions modeling; however, a new emissions model, Motor Vehicle Emissions Estimator (MoVES) was recently approved by the EPA. Areas have until March 2012 to convert to the new software (more information about MoVES can be found at http://www.epa.gov/otaq/models/moves/index.htm). The MOBILE model uses local data inputs for climate, elevation, Northern Ada County's vehicle emissions testing program, and travel demand model forecasted roadway speeds to develop emission factors for specified air pollutants. Appendix B lists the MOBILE6.2 modeling assumptions approved by the ICC for use in this demonstration. These emission factors are applied to VMT forecasts from the travel demand model to develop motor vehicle emission estimates for regional emissions analyses. Appendix C shows the approved methodologies employed for the regional emissions analysis.

In the past, specific emissions factors were developed to estimate the Canyon County vehicle contribution to Ada County's VMT. Emission factors for Canyon County vehicles were different than those for Ada County because Ada County had a vehicle inspection maintenance program and Canyon County did not. In June 2010, a vehicle inspection maintenance program was implemented in Canyon County. Therefore, this process is no longer necessary. Both counties have similar vehicle inspection and maintenance programs using biennial testing and a four year exemption for new vehicles. Appendix F lists the MOBILE6.2 model input and output files used to conduct the regional emissions analyses. All of these updates were presented to the ICC for review and approval.

Road Dust

Paved road dust makes up the vast majority of PM_{10} emissions from on-road transportation sources. Emissions factors for both paved road and unpaved road dust were calculated using the methodology developed in the *Treasure Valley Road Dust Study: Final Report*[3]*.* This methodology uses the roadway's setting (i.e., urban vs. rural), speed, and the time of year to develop an emissions factor. Emissions were calculated for each roadway link in COMPASS' travel demand model network. Appendix C demonstrates how the road dust emissions factors were calculated.

[3] Etyemezian et. all, Desert Research Institute; February 15, 2002

2010 Baseline Scenario

The 2010 scenario uses current-year population and employment estimates with the 2010 roadway network and the projects given in Table 1 *(Note: The numbers in the "No." column are for reference only)*.

Table 1: Projects Included in the 2010 Network for the 2010 Scenario

No.	Project	Location[1]	Lanes	Regionally Significant?	Federal Aid?	Exempt?	Key No.[2]
1.	Meridian Rd & Main St (Ph 1 of split corridor)	I-84 - Franklin Rd	3	Yes	No	No	RD205-06
2.	ParkCenter East Bridge	ParkCenter Blvd - Warm Springs Ave	4	Yes	No	No	MA203-02
3.	Deer Flat Rd	Ten Mile Rd - SH 69	3	No	No	Yes - Safety (40CFR93.126)	RD125
4.	I-84	Garrity IC - Meridian IC	6	Yes	Yes - GARVEE	No	11489
5.	Orchard IC	Reconstruct - add new ramps and lanes	NA	Yes	Yes - GARVEE	Yes - (40CFR93.127)	9817
6.	Ten Mile Rd	Franklin Rd - Cherry Ln	5	No	No	No	RD309
7.	Vista IC	Reconstruct - add new ramps and lanes	NA	Yes	Yes -ARRA	Yes - (40CFR93.127)	9818

[1]IC = Interchange
[2]Key No: ITD Key Numbers are from the Transportation Improvement Program and the STIP and are strictly numeric (i.e., 6299). ACHD GIS Numbers are alphanumeric identification numbers (i.e., RD169).

Table 2 shows estimated weekday VMT and PM_{10} emissions from the 2010 scenario. Emissions estimates were developed using emissions factors from MOBILE6.2 and the *Treasure Valley Road Dust Study: Final Report*. The MOBILE6.2 input and output files for 2010 are listed in Appendix F. Table 3 and Table 4 display the VOC and NO_x emissions estimates respectively. VOC emissions factors were adjusted so that refueling emissions are not included in the estimated emissions. This is consistent with the methodology used to establish the VOC emissions budgets.

Table 2: 2010 Paved Road PM_{10} Estimated Emissions

Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM_{10} Emitted
	[VMT/day]	*[Tons/day]*	*[Tons/day]*	*[Tons/day]*
Interstate	2,425,777	16.69	0.11	16.80
Ramps	139,491	1.17	0.01	1.18
Principal Arterial	3,582,979	29.39	0.16	29.55
Minor Arterial	2,062,063	17.61	0.09	17.70
Collector	398,576	3.89	0.02	3.91
Local	99,277	1.62	0.00	1.62
Centroid Connectors	407,164	3.52	0.02	3.54
Totals	9,115,325	73.89	0.41	74.30

Table 3: 2010 VOC Estimated Emissions			
Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Estimated VOC Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	2,183,199	0.56	1.35
Ramps	125,542	0.65	0.09
Principal Arterials	3,224,681	0.60	2.13
Minor Arterials	1,855,857	0.61	1.24
Collectors	358,718	0.65	0.26
Local	89,349	0.64	0.06
Centroid Connectors	366,447	0.85	0.34
Totals	8,203,793	NA	5.47

[1] A conversion factor of 907,184.74 grams per ton was used.

Table 4: 2010 NO_X Estimated Emissions			
Road Type	Average Daily VMT	Ada County Vehicle NO_X Emissions Factor	Estimated NO_X Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	2,183,199	1.28	3.08
Ramps	125,542	1.20	0.17
Principal Arterials	3,224,681	1.13	4.00
Minor Arterials	1,855,857	1.12	2.30
Collectors	358,718	1.14	0.45
Local	89,349	1.00	0.10
Centroid Connectors	366,447	1.35	0.54
Totals	8,203,793	NA	10.63

[1] A conversion factor of 907,184.74 grams per ton was used.

2014 Scenario

The 2014 scenario uses 2014 population and employment forecasts with the 2010 roadway network and the projects given in Table 9 *(Note: The numbers in the "No." column are for reference only)*. The 2014 demographic projections and allocation to TAZs represent the growth scenario for *Communities in Motion* 2035 (CIM 2035).

Table 5: Projects Added to the 2010 Network for the 2014 Scenario

No.	Project	Location	Lanes	Regionally Significant?	Federal Aid?	Exempt?	Key No.[1]
1.	30th St (new road)	Fairview Ave - State St	5	No	No	No	RD202-09
2.	Eagle Rd	Victory Rd - Ridenbaugh Canal	5	Yes	No	No	RD203-07
3.	Five Mile Rd	Franklin Rd - Fairview Ave	5	No	Yes	No	F038/ 11582
4.	Franklin Rd	Touchmark Way (~1000' east of Eagle Rd) - Five Mile Rd	5	Yes	Yes	No	RD282/ 77737/12 062
5.	Franklin Rd	Ten Mile Rd - Linder Rd	5	Yes	No	No	RC0165
6.	Hill Rd Extension	State St - Horseshoe Bend Rd	3	No	No	No	RD308
7.	I-84	Garrity IC - Meridian IC	8	Yes	Yes - GARVEE	No	11489
8.	I-84	Cole / Overland IC - Broadway IC	8	Yes	Yes - GARVEE	No	09819/ 09820/ 09823
9.	Meridian Rd & Main St (Phase 2 of split corridor)	Franklin - Fairview Ave	5	Yes	No	No	RD205-07
10.	Overland Rd	Ten Mile Rd - Linder Rd	5	Yes	No	No	
11.	SH 16 River Crossing	Connect SH 16 from SH 44 to US 20/26	4	Yes	Yes - GARVEE	No	11236
12.	Ten Mile Rd IC	New Interchange at I-84 and Ten Mile Rd between New Overland Rd – Franklin Rd	NA	Yes	Yes – GARVEE/ local	No	9815/RD0 210-01
13.	Ustick Rd	Duane Dr (1/4 mile east of Eagle Rd– Five Mile Rd)	5	No	No	No	RD202/RD 205-04

[1]Key No: ITD Key Numbers are from the Transportation Improvement Program and the STIP and are strictly numeric (i.e., 6299).ACHD GIS Numbers are alphanumeric identification numbers (i.e., RD169). Blanks indicate an ITD Key or ACHD GIS number has yet to be assigned.

Table 10 shows estimated weekday VMT and PM_{10} emissions for the 2014 scenario. Emissions estimates were developed using emissions factors from MOBILE6.2 and the *Treasure Valley Road Dust Study: Final Report*. The MOBILE6.2 input and output files for 2014are listed in the Appendix F. Table 11 and Table 12 display the VOC and NO_x emissions estimates respectively. VOC emissions factors were adjusted so that refueling emissions are not included in the estimated emissions. This is consistent with the methodology used to establish the VOC emissions budgets.

Table 6: 2014 Paved Road PM_{10} Estimated Emissions				
Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM_{10} Emitted
	[VMT/day]	*[Tons/day]*	*[Tons/day]*	*[Tons/day]*
Interstate	2,596,541	17.74	0.09	17.83
Ramps	141,922	1.19	0.01	1.20
Principal Arterial	3,864,004	31.57	0.14	31.71
Minor Arterial	2,333,142	19.85	0.09	19.94
Collector	456,509	4.42	0.02	4.44
Local	125,380	2.06	1.21	3.27
Centroid Connectors	458,635	3.93	0.02	3.95
Totals	9,976,134	80.76	1.57	82.33

Table 7: 2014 VOC Estimated Emissions			
Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Estimated VOC Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	2,336,887	0.44	1.06
Ramps	127,730	0.62	0.07
Principal Arterials	3,477,604	0.67	1.67
Minor Arterials	2,099,828	0.66	0.99
Collectors	410,858	0.46	0.21
Local	112,842	0.46	1.09
Centroid Connectors	412,772	0.41	0.28
Totals	8,978,521	NA	5.37

[1] A conversion factor of 907,184.74 grams per ton was used.

Table 8: 2014 NO_X Estimated Emissions			
Road Type	Average Daily VMT	Ada County Vehicle NO_X Emissions Factor	Estimated NO_X Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	2,336,887	0.68	2.01
Ramps	127,730	0.82	0.11
Principal Arterials	3,477,604	0.86	2.70
Minor Arterials	2,099,828	0.74	1.59
Collectors	410,858	0.73	0.30
Local	112,842	0.70	1.09
Centroid Connectors	412,772	0.77	0.38
Totals	8,978,521	NA	8.17

[1] A conversion factor of 907,184.74 grams per ton was used.

2015 Scenario

The 2015 scenario uses 2015 population and employment forecasts with the 2011 roadway network and the projects given in Table 9 *(Note: The numbers in the "No." column are for reference only)*. The 2015 demographic projections and allocation to TAZs represent the growth scenario for the update to *Communities in Motion* (CIM 2035).

Table 9: Projects Added to the 2014 Network for the 2015 Scenario

No.	Project	Location	Lanes	Regionally Significant?	Federal Aid?	Exempt?	Key No.[1]
14.	Five Mile Rd	Fairview Ave - Ustick Rd	5	No	No	No	RD195A
15.	I-84	Franklin Blvd - Garrity IC	6	Yes	Yes - GARVEE	No	10916
16.	Ten Mile Rd	Cherry Ln - Ustick Rd	5	No	No	No	RD188
17.	Ustick Rd	Meridian Rd – Locust Grove Rd	5	Yes	No	No	RD202-37
18.	Ustick Rd	Locust Grove Rd – Leslie Dr	5	Yes	No	No	RD205-05

[1]Key No: ITD Key Numbers are from the Transportation Improvement Program and the STIP and are strictly numeric (i.e., 6299).ACHD GIS Numbers are alphanumeric identification numbers (i.e., RD169). Blanks indicate an ITD Key or ACHD GIS number has yet to be assigned.

Table 10 shows estimated weekday VMT and PM_{10} emissions for the 2015 scenario. Emissions estimates were developed using emissions factors from MOBILE6.2 and the *Treasure Valley Road Dust Study: Final Report*. The MOBILE6.2 input and output files for 2015 are listed in the Appendix F. Table 11 and Table 12 display the VOC and NO_x emissions estimates respectively. VOC emissions factors were adjusted so that refueling emissions are not included in the estimated emissions. This is consistent with the methodology used to establish the VOC emissions budgets.

Table 10: 2015 Paved Road PM_{10} Estimated Emissions				
Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM_{10} Emitted
	[VMT/day]	*[Tons/day]*	*[Tons/day]*	*[Tons/day]*
Interstate	2,777,586	19.87	0.10	19.97
Ramps	149,283	1.25	0.01	1.26
Principal Arterial	3,711,992	31.28	0.13	31.41
Minor Arterial	2,143,150	18.95	0.08	19.03
Collector	415,615	4.10	0.01	4.11
Local	115,264	1.88	0.00	1.88
Centroid Connectors	471,376	4.11	0.02	4.13
Totals	9,784,265	81.44	0.35	81.79

Table 11: 2015 VOC Estimated Emissions			
Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Estimated VOC Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	2,499,827	0.39	1.06
Ramps	134,355	0.44	0.07
Principal Arterials	3,340,793	0.41	1.52
Minor Arterials	1,928,835	0.42	0.89
Collectors	374,053	0.45	0.19
Local	103,737	0.44	0.05
Centroid Connectors	424,239	0.59	0.28
Totals	8,805,839	NA	4.05

[1] A conversion factor of 907,184.74 grams per ton was used.

Table 12: 2015 NO_X Estimated Emissions			
Road Type	Average Daily VMT	Ada County Vehicle NO_X Emissions Factor	Estimated NO_X Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	2,499,827	0.75	2.07
Ramps	134,355	0.66	0.10
Principal Arterials	3,340,793	0.63	2.33
Minor Arterials	1,928,835	0.62	1.33
Collectors	374,053	0.64	0.26
Local	103,737	0.64	0.06
Centroid Connectors	424,239	0.74	0.35
Totals	8,805,839	NA	6.50

[1] A conversion factor of 907,184.74 grams per ton was used.

2025 Scenario

The 2025 scenario uses 2025 population and employment estimates with the 2015 roadway network and the projects given in Table 13 *(Note: The numbers in the "No." column are for reference only)*. The 2025 demographic projections and allocation to TAZs represent the growth scenario for the update to *Communities in Motion* (CIM 2035).

Table 13: Projects Added to the 2015 network for the 2025 Scenario

No.	Project	Location	Lanes	Regionally Significant?	Federal Aid?[1*]	Exempt?	Key No.[2]
19.	36th St	Hill Rd - Cartwright Rd	3	No	No	No	
20.	Adams St	Improved connection 36th to 37th St (Clay St)	3	No	No	Yes	RD208-08
21.	Avalon Rd (Kuna Rd)	Linder Rd - Orchard St	5	No	TBD	No	
22.	Cloverdale Rd	Ustick Rd – Chinden Blvd	5	No	No	No	RD207-13 /RC0092
23.	Cloverdale Rd	Franklin Rd – Ustick Rd	5	No	No	No	RD202-14 / RC0087
24.	Cloverdale Rd	Overland Rd - Franklin Rd	5	No	No	No	
25.	Cloverdale Rd	Amity Rd – Overland Rd	5	No	No	No	
26.	Cloverdale Rd	Lake Hazel Rd – Amity Rd	5	No	No	No	
27.	Cloverdale Rd	Columbia Rd – Lake Hazel Rd	5	No	No	No	
28.	Cole Rd	I-84 Ramps – Franklin Rd	5	Yes	No	No	RD207-16
29.	Cole Rd	Lake Hazel Rd - Victory Rd	5	Yes	No	No	
30.	Fairview Ave	Meridian Rd - Locust Grove Rd	7	Yes	No	No	RC0135
31.	Fairview Ave	Locust Grove Rd – Eagle Rd	7	Yes	No	No	RC0133
32.	Fairview Ave	Eagle Rd – Cloverdale Rd	7	Yes	No	No	RC0130
33.	Fairview Ave	Cloverdale Rd - Five Mile Rd	7	Yes	No	No	RC0127
34.	Fairview Ave	Five Mile Rd - Maple Grove Rd	7	Yes	No	No	RC0131
35.	Fairview Ave	Maple Grove Rd - Cole Rd	7	Yes	No	No	RD207-17
36.	Fairview Ave	Cole Rd - Orchard St (or east of Curtis Rd)	7	Yes	No	No	
37.	Franklin Rd	Black Cat Rd – Ten Mile Rd	5	Yes	Yes	No	RC0152
38.	Franklin Rd	McDermott Rd - Black Cat Rd	5	Yes	No	No	
39.	Maple Grove Rd	Lake Hazel – Victory Rd	5	No	No	Yes - Safety (40CFR93.126)	
40.	Lake Hazel Rd Extension	Cole Rd - Pleasant Valley Rd	5	Yes	No	No	
41.	Lake Hazel Rd	Locust Grove Rd – Cole Rd	5	Yes	No	No	
42.	Linder Rd	Franklin Rd - Ustick Rd	5	No	No	No	RD077

43.	Linder Rd	Ustick Rd to Chinden Blvd	5	No	No	No	
44.	McMillan Rd	Locust Grove Rd - Eagle Rd	5	No	No	No	RC0240
45.	Pine St	Eagle Rd - Cloverdale Rd	5	No	No	No	
46.	Ten Mile Rd	Victory Rd – Overland Rd	5	Yes	TBD	No	RC0299
47.	Ten Mile Rd	Ustick Rd - Chinden Blvd	5	No	TBD	No	
48.	Ustick Rd	Black Cat Rd – Ten Mile Rd	5	Yes	TBD	No	
49.	Victory Rd	Maple Grove Rd - Cole Rd	5	No	TBD	No	

[1] The fiscal constraints of a long-range plan are more flexible than those of a TIP. Therefore, TBD means To Be Determined, as a funding source has not been identified.
[2]Key No: ITD Key Numbers are from the Transportation Improvement Program and the STIP and are strictly numeric (i.e., 6299). ACHD GIS Numbers are alphanumeric identification numbers (i.e., RD169). Blanks indicate an ITD Key or ACHD GIS number has yet to be assigned.

Table 14 shows estimated weekday VMT and PM_{10} emissions for the 2025 scenario. Emissions estimates were developed using MOBILE6.2 generated emissions factors and the *Treasure Valley Road Dust Study: Final Report*. The MOBILE6.2 input and output files are listed in the Appendix E. Table 15 and Table 16 display the VOC and NO_x emissions estimates respectively.

Table 14: 2025 Paved Road PM_{10} Estimated Emissions

Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM_{10} Emitted
	[VMT/day]	*[Tons/day]*	*[Tons/day]*	*[Tons/day]*
Interstate	3,761,647	26.14	0.12	26.26
Ramps	178,782	1.50	0.01	1.51
Principal Arterial	5,366,156	44.92	0.17	45.09
Minor Arterial	3,370,752	29.28	0.10	29.38
Collector	632,292	6.00	0.02	6.02
Local	226,869	3.94	0.01	3.95
Centroid Connectors	616,315	5.21	0.02	5.23
Totals	14,152,812	116.99	0.44	117.43

Table 15: 2025 VOC Estimated Emissions

Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Estimated VOC Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	3,385,483	0.24	0.91
Ramps	160,903	0.27	0.05
Principal Arterials	4,829,540	0.27	1.42
Minor Arterials	3,033,676	0.27	0.90
Collectors	569,063	0.28	0.18
Local	204,182	0.28	0.06
Centroid Connectors	554,683	0.40	0.24
Totals	12,737,530	NA	3.77

[1] A conversion factor of 907,184.74 grams per ton was used.

Table 16: 2025 NO_X Estimated Emissions			
Road Type	Average Daily VMT	Ada County Vehicle NO_X Emissions Factor	NO_X Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	3,385,483	0.30	1.11
Ramps	160,903	0.31	0.06
Principal Arterials	4,829,540	0.28	1.48
Minor Arterials	3,033,676	0.28	0.93
Collectors	569,063	0.28	0.18
Local	204,182	0.24	0.05
Centroid Connectors	554,683	0.33	0.20
Totals	12,737,530	NA	4.02

[1] A conversion factor of 907,184.74 grams per ton was used.

2035 Scenario

The 2035 growth scenario was developed as part of the update to *Communities in Motion* (CIM 2035). These forecasts were reviewed and recommended for approval by the DAC on February 4, 2010, and approved by the COMPASS Board March 15, 2010. The population and employment forecasts were analyzed with a 2035 roadway network. The 2035 network is comprised of the 2025 travel demand model network and the projects listed in Table 17. *(Note: The numbers in the "No." column are for reference only)*.

Table 17: Projects Added to the 2025 Network for the 2035 Scenario

No.	Project	Location	Lanes	Regionally Significant?	Federal Aid?[1]	Exempt?	Key No.[2]
50.	36th St	Extend 36th St from existing to Cartwright Rd and Bogus Basin Rd	3	No	No	Yes - Safety (40CFR93.126)	RD307
51.	Amity Rd	McDermott Rd -Meridian Rd	3	Yes	TBD	No	
52.	Amity Rd	Meridian Rd - Eagle Rd	5	No	TBD	No	
53.	Emerald St	Curtis Rd -Orchard St	5	No	TBD	No	
54.	Executive St / Presidential	3 lane couplet with Presidential	N.A.	No	No	No	
55.	Federal Way	South of SH 21 - Isaac Canyon IC	5	No	Developer Funded	No	
56.	Overland Rd New Extension	Black Cat Rd – Ten Mile Rd	5	Yes	TBD	No	
57.	State St	Glenwood St – 36th St	7	Yes	TBD	No	
58.	Ten Mile Rd	Lake Hazel - Victory Rd	5	Yes	TBD	No	
59.	Ustick Rd	Star Rd – Black Cat Rd	5	Yes	TBD	No	
60.	Ustick Rd	Ten Mile Rd – Meridian Rd	5	Yes	TBD	No	

[1] The fiscal constraints of a long-range plan are more flexible than those of a TIP. Therefore, TBD means To Be Determined, as a funding source has not been identified.

[2]Key No: ITD Key Numbers are from the Transportation Improvement Program and the STIP and are strictly numeric (i.e., 6299). ACHD GIS Numbers are alphanumeric identification numbers (i.e., RD169). Blanks indicate an ITD Key or ACHD GIS number has yet to be assigned.

Table 18 shows estimated weekday VMT and PM_{10} emissions for the 2035 "Community Choices" scenario. Emissions estimates were developed using MOBILE6.2 generated emissions factors and the *Treasure Valley Road Dust Study: Final Report*. The MOBILE6.2 input and output files for 2035 are listed in the Appendix F. Table 19 and Table 20 display the VOC and NO_x emissions estimates respectively.

Table 18: 2035 Paved Road PM_{10} Estimated Emissions				
Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM_{10} Emitted
	[VMT/day]	*[Tons/day]*	*[Tons/day]*	*[Tons/day]*
Interstate	4,568,576	31.40	0.14	31.54
Ramps	202,427	1.70	0.01	1.71
Principal Arterial	6,816,393	56.85	0.21	57.06
Minor Arterial	4,367,649	37.89	0.13	38.02
Collector	843,185	7.89	0.03	7.92
Local	323,397	5.60	0.01	5.61
Centroid Connectors	760,715	6.38	0.02	6.40
Totals	17,882,342	147.71	0.54	148.25

Table 19: 2035 VOC Estimated Emissions			
Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Estimated VOC Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	4,111,719	0.24	1.07
Ramps	182,184	0.26	0.05
Principal Arterials	6,134,754	0.27	1.81
Minor Arterials	3,930,884	0.26	1.14
Collectors	758,866	0.27	0.23
Local	291,057	0.27	0.09
Centroid Connectors	684,644	0.38	0.29
Totals	16,094,108	NA	4.68

[1] A conversion factor of 907,184.74 grams per ton was used.

Table 20: 2035 NO_x Estimated Emissions			
Road Type	Average Daily VMT	Ada County Vehicle NO_X Emissions Factor	NO_X Emitted[1]
	[VMT/day]	*[g/mile]*	*[Tons/day]*
Interstate	4,111,719	0.23	1.03
Ramps	182,184	0.25	0.05
Principal Arterials	6,134,754	0.22	1.50
Minor Arterials	3,930,884	0.22	0.96
Collectors	758,866	0.22	0.19
Local	291,057	0.18	0.06
Centroid Connectors	684,644	0.26	0.20
Totals	16,094,108	NA	3.98

[1] A conversion factor of 907,184.74 grams per ton was used.

Unpaved Road Dust

Unpaved roads are not included in any of COMPASS' model networks therefore the *Treasure Valley Road Dust Study: Final Report* assumed unpaved roadways are traveled at an average speed of 25 miles per hour. This assumption results in a constant emissions factor of approximately 0.315 pounds road dust emissions per vehicle mile traveled on unpaved roadways. Table 21 displays the information used to estimate the PM_{10} emissions from unpaved roads. Average daily trips on unpaved roadways in Ada County were assumed, as in past demonstrations, to be 120 vehicles per day.

Table 21: Unpaved Road Dust PM_{10} Emissions

Analysis Year[1]	Average Daily Traffic	Unpaved Roads *[Miles]*	Unpaved VMT *[VMT/day]*	Unpaved Road Dust Emissions *[Tons/day]*
2010	120	73.76	8,851	1.30
2014	120	67.52	8,102	1.19
2015	120	65.96	7,915	1.16
2025	120	50.36	6,043	0.89
2035	120	34.76	4,171	0.61

Note: In 1999, the Total Unpaved Roads=106.38 miles, including 65.07 miles of roads and 41.31 miles of alleys. Assume 120 trips/day on unpaved roads (ICF Kaiser PM_{10} Report 10/97)

Future unpaved road inventory decreases due to ACHD commitment to an ongoing program of paving unpaved roads.

[1] *2005 Unpaved Road =80.0 miles, based on information from ACHD staff Summer2004. Future Year Unpaved Roads based on interpolated road paving rate of 1.95% per year from 2005.*

Carbon Monoxide Emissions

To satisfy IDEQ requirements, a regional CO emissions analysis was conducted using EPA's MOBILE emissions factor model and the COMPASS travel demand model. Specific information on the models and their inputs can be found in previous sections of this document. "Build" emissions were estimated and compared to "no build" emissions estimates. A "build" scenario estimates emissions for a given analysis year assuming the appropriate programmed/planned roadway/transit projects have been constructed. Conversely, a "no build" scenario estimates emissions for a given analysis year using the transportation system as it exists in the base year (e.g. before programmed or planned projects are built). Both the "build" and "no build" scenarios are based on the CIM 2035 growth assumptions. This comparison provides the CO emissions impacts to the region from the planned transportation system.

As a supplement to the "build/no build" analysis, CO "build" emissions are compared to emissions forecasts published in both the *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area* and the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request*. This information is intended to aid air quality planning efforts when determining the need for CO mitigation measures.

Build Scenarios

The "build" scenarios use transportation networks and demographic assumption specific to the analysis year. These are the same scenarios used to estimate PM_{10}, NO_X, and VOC emissions. Table 1, Table 9, Table 13, and Table 17 provide more detailed information on the roadway projects used to develop the "build" scenario networks. Table 22 shows the "build" CO emissions estimates for 2010, 2014, 2015, 2025, and 2035.

Table 22: "Build" Scenario Average Daily VMT and CO Emissions

	Year				
	2010	2014	2015	2025	2035
Average Daily "Build" VMT	8,203,793	8,978,521	8,805,839	12,737,530	16,094,108
"Build" CO Emissions (*Ton/day)*	104.89	97.92	96.40	118.18	145.29

No Build Scenarios

The "no build" scenarios use the 2010 (baseline) transportation network with the demographic assumption specific to the analysis year. Table 1 provides more detailed information on the roadway projects included in the 2010 transportation network. Table 23 gives the "no build" CO emissions estimates for 2015, 2025, and 2035.

Table 23: "No Build" Scenario Average Daily VMT and CO Emissions

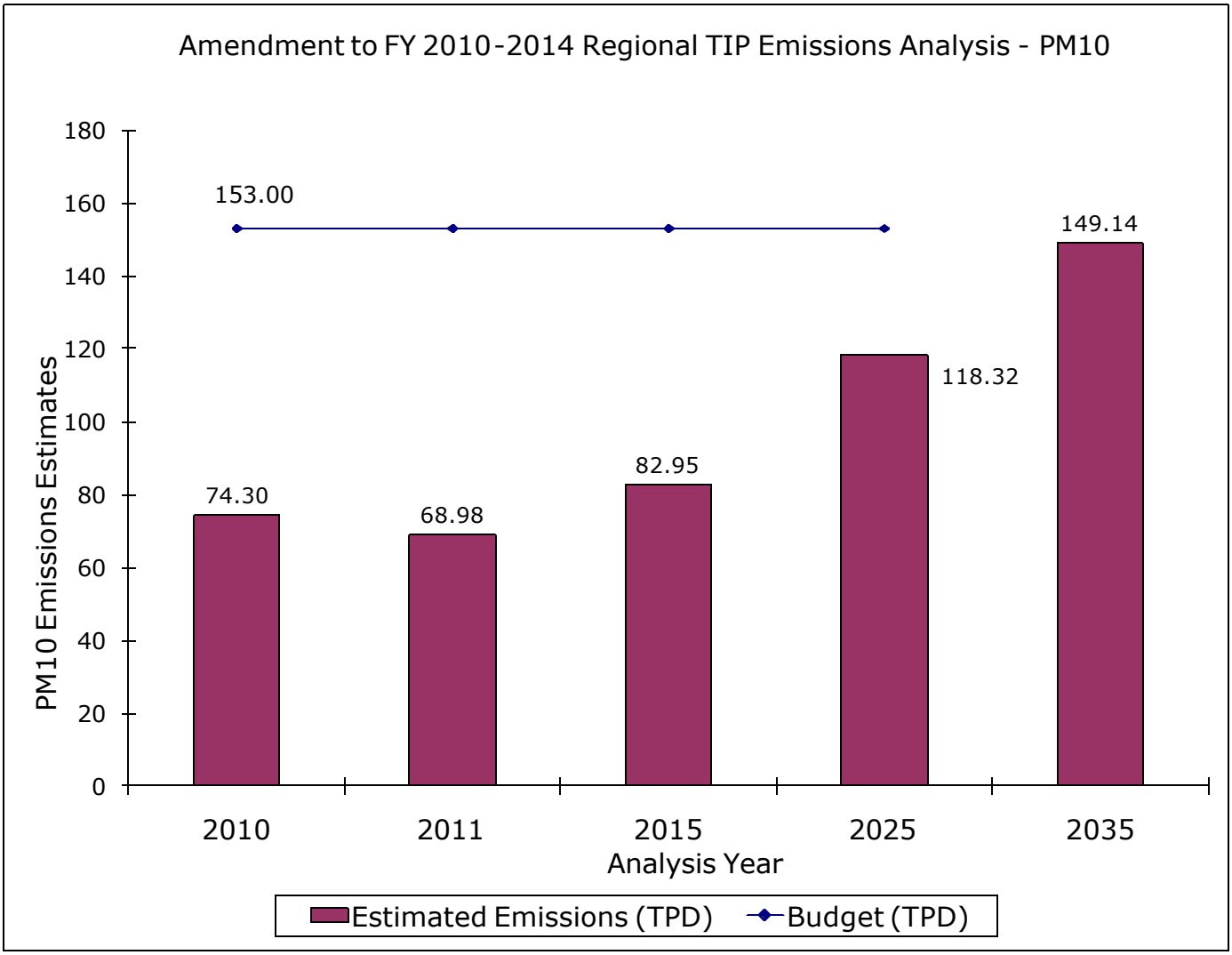
	Year			
	2014	2015	2025	2035
Average Daily "No Build" VMT	8,985,617	8,865,222	12,840,347	16,274,636
"No Build" CO Emissions (*Ton/day)*	99.41	96.36	118.84	147.13

III. CONCLUSIONS

PM_{10} Budget Test

Figure 2 shows the results of the PM_{10} budget test for the amendment to the FY 2010-2014 Regional TIP.

Figure 2: Results of PM_{10} Budget Test

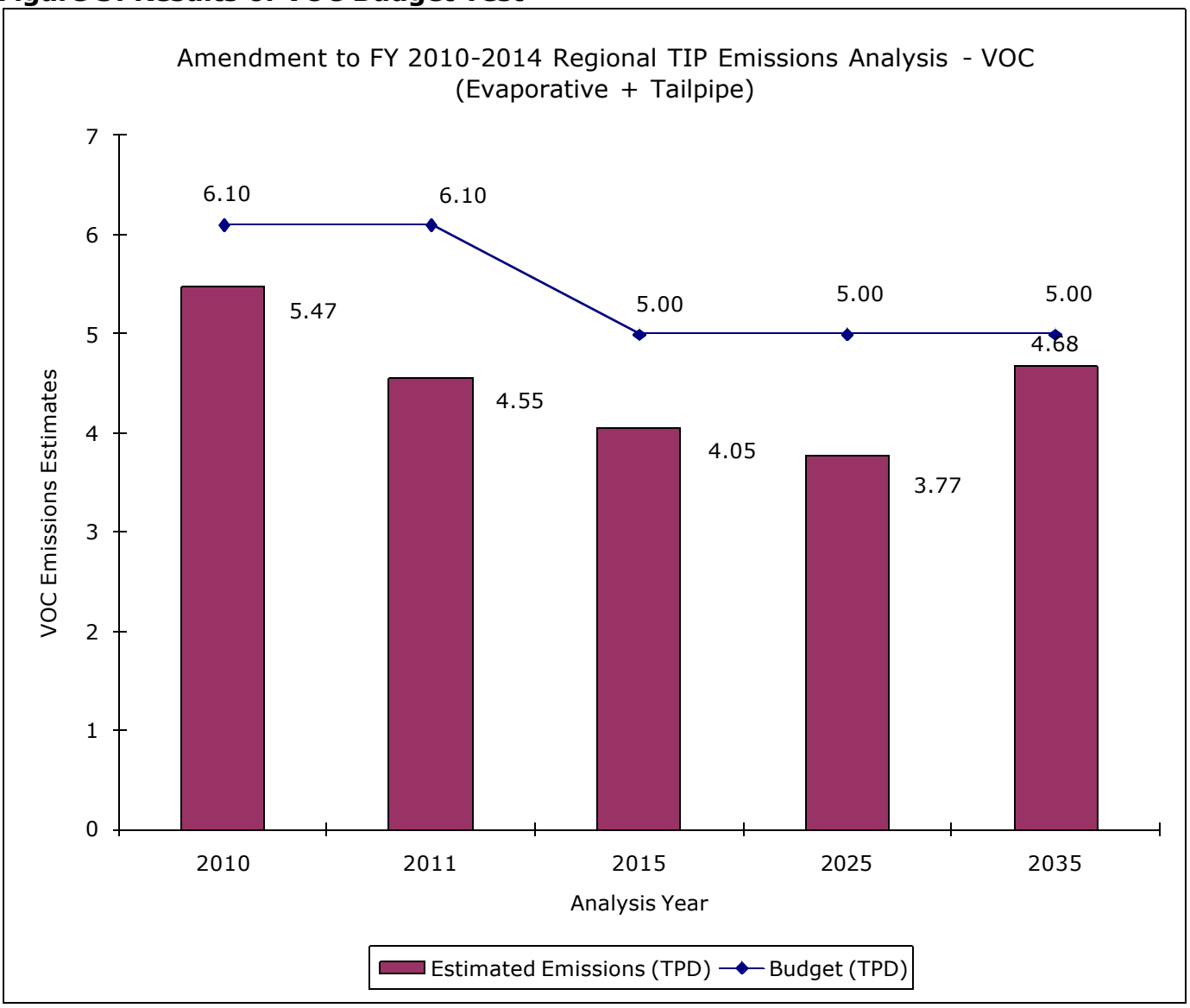


The results of the budget test show that the emissions impacts associated with the planned improvements to the Northern Ada County transportation system (projects listed in Table 1, Table 9, Table 13, and Table 17) will not exceed the PM_{10} emissions budgets established by the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request*.

VOC Budget Test

Figure 3 shows the results of the VOC budget test for the amendment to the FY 2010-2014 Regional TIP.

Figure 3: Results of VOC Budget Test

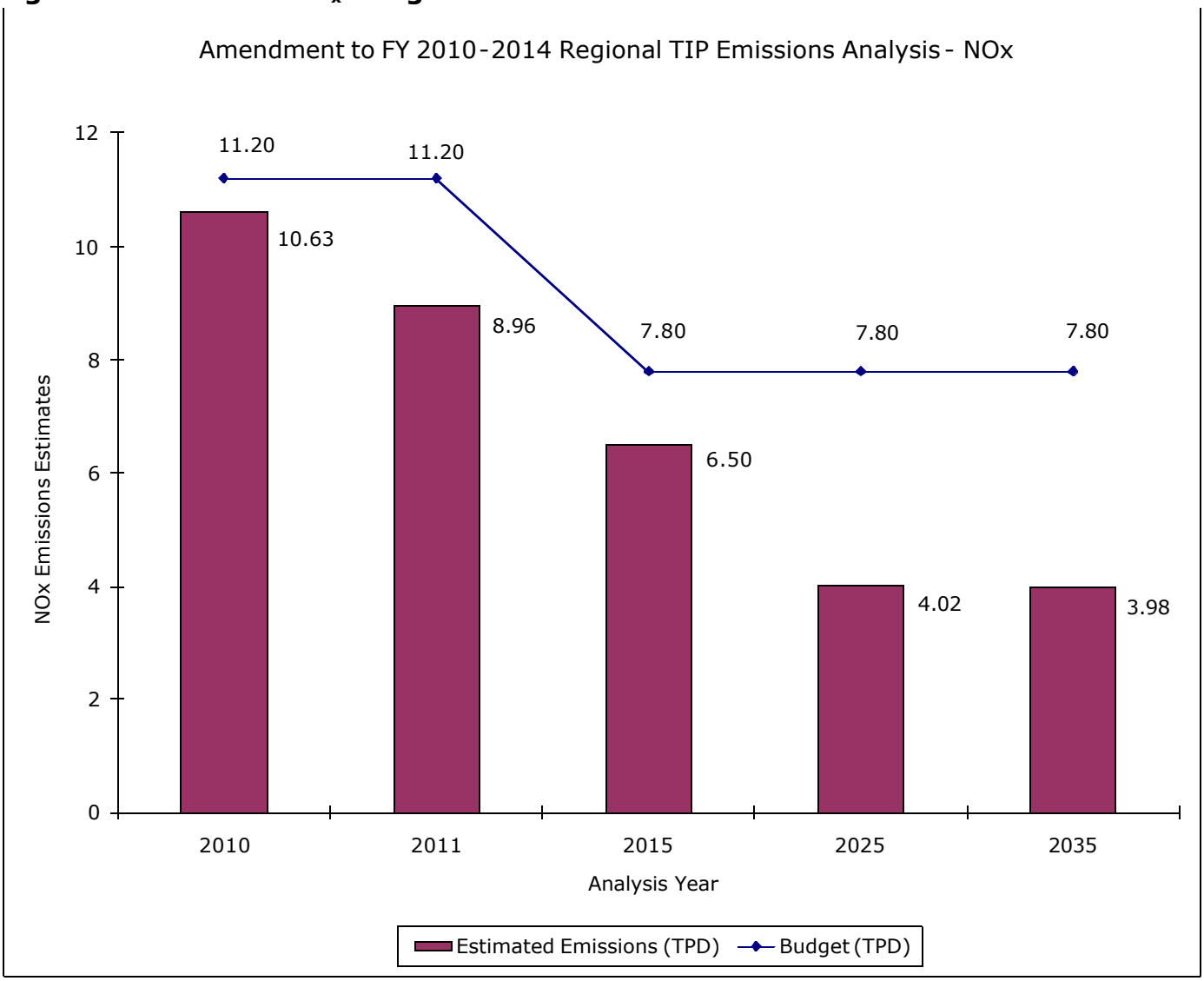


The results of the budget test shows that the emissions impacts associated with the planned improvements to the Northern Ada County transportation system (projects listed in Table 1, Table 9, Table 13, and Table 17) will not exceed the VOC emissions budgets established by the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request*.

NO_x Budget Test

Figure 4 shows the results of the NO_X budget test for the to the amendment to FY 2010-2014 Regional TIP.

Figure 4: Results of NO_x Budget Test

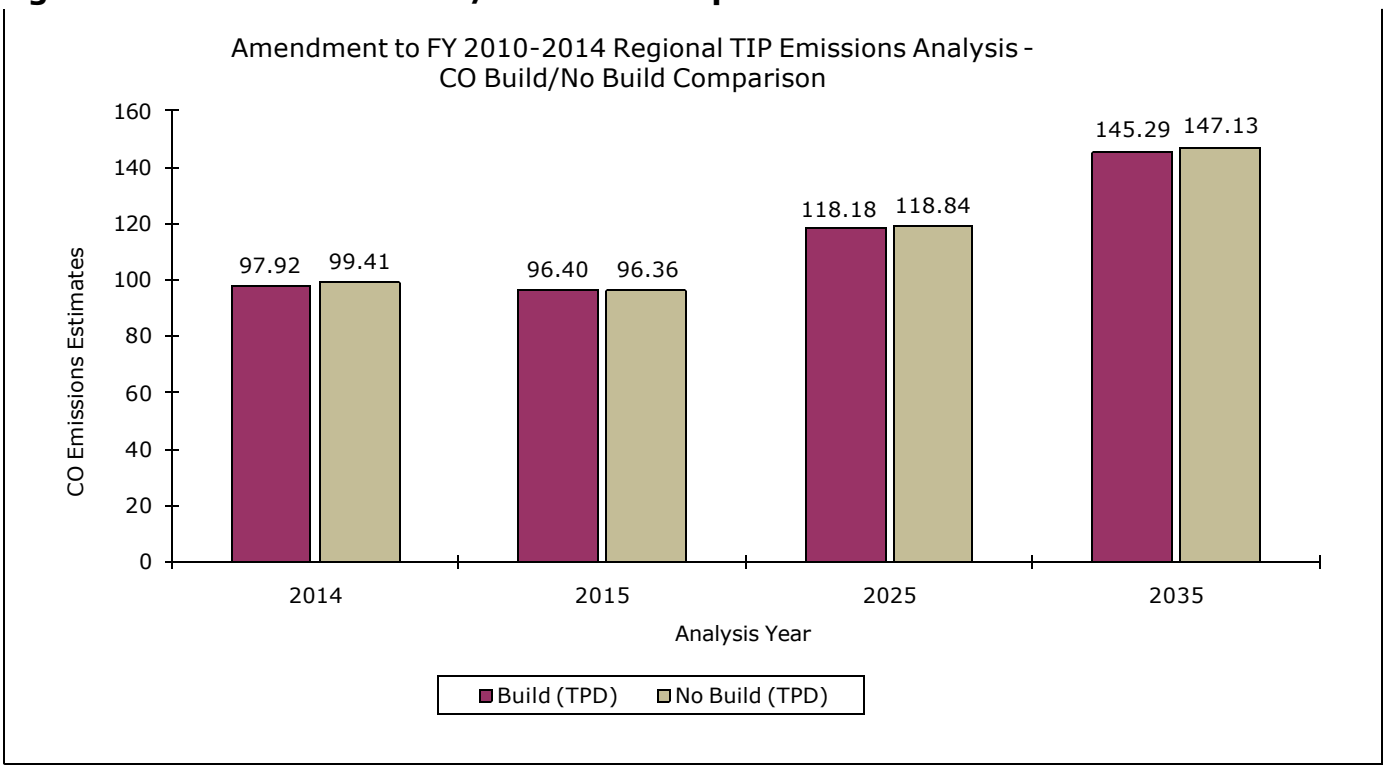


The results of the budget test shows that the emissions impacts associated with the planned improvements to the Northern Ada County transpo rtation system (projects listed in Table 1,, Table 9, Table 13, and Table 17) will not exceed the NO_X emissions budgets established by the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request*.

CO Planning Analyses

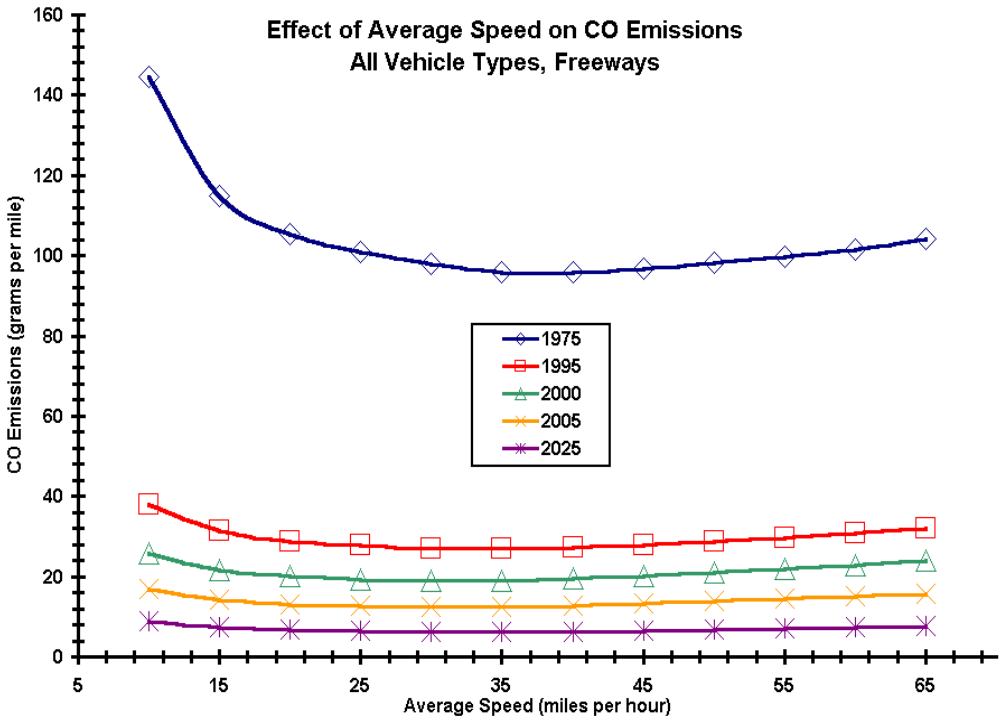
Build/No Build Emissions Comparison:
Figure 5 shows the comparison between the "build" and "no build" emissions scenarios for each analysis year. Again, the purpose of these comparisons is not to demonstrate conformity to the CO Limited Maintenance Plan, but rather to facilitate good air quality planning in Northern Ada County.

Figure 5: Results of CO Build/No Build Comparison



The comparisons show an increase in CO emissions for the "build" scenario in 2015 but slight decreases for 2014, 2025 and 2035. These increases in CO emission estimates are due to a reduction in roadway congestion, which increased network speeds in the COMPASS model. CO emissions factors are very sensitive to speed. As Figure 6 shows, MOBILE6.2 CO emissions factors decreases as speed increases until approximately 35 miles per hour. However, when speeds increase above 40 miles per hour, MOBILE6.2 CO emissions factors begin to increase.

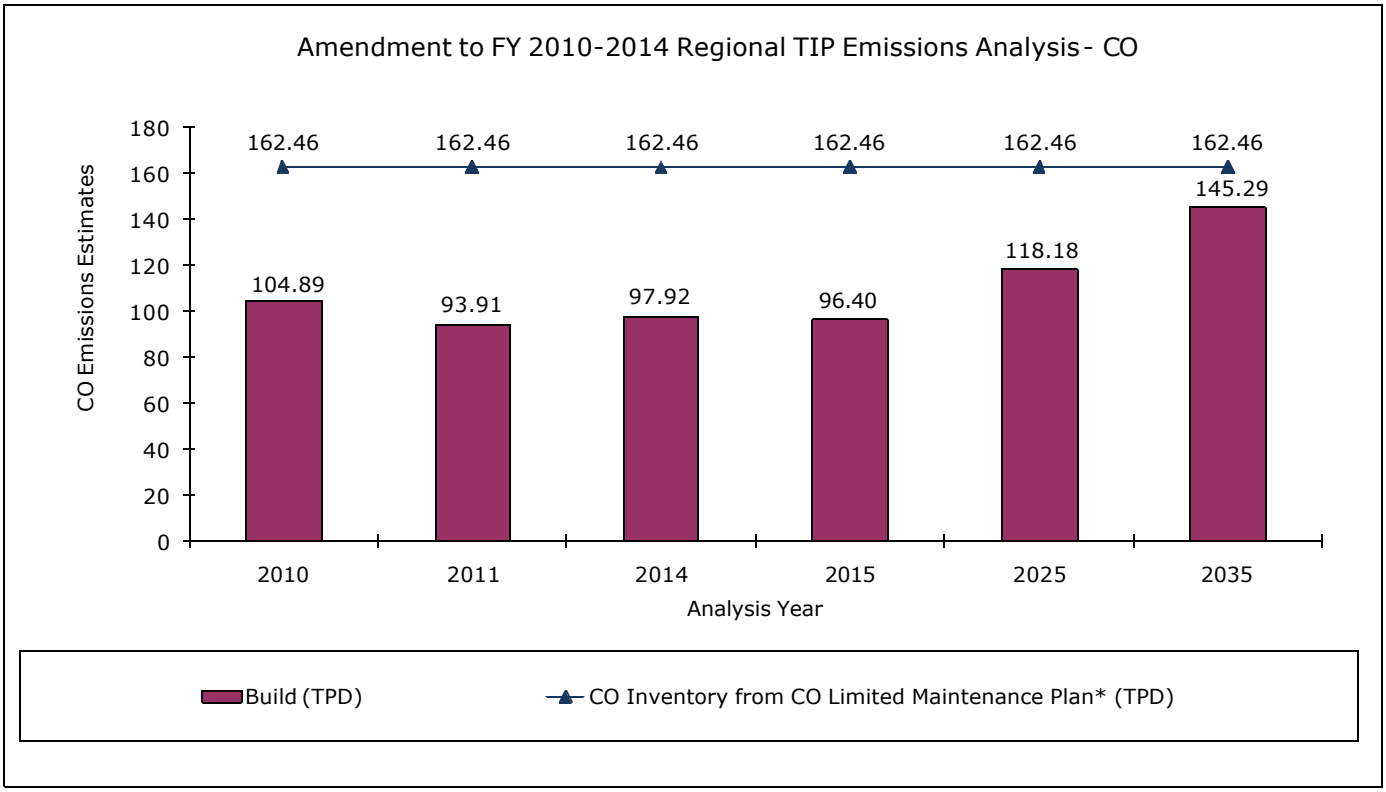
Figure 6: Effect of Average Speed on CO Emissions for Freeway Facility Types
(Adapted from Figure 28 of EPA's Sensitivity Analysis of MOBILE6, EPA420-R-02-035, December 2002).



As a result of this analysis, IDEQ could require CO mitigation measures. However, COMPASS' past work with several local governments to mitigate open burning impacts may be considered more than adequate to offset the CO emissions increases forecasted in "build" scenarios.

Emissions Inventory Comparisons:
To aid in the evaluation of the CO impacts related to the amendment to FY 2010-2014 Regional l TIP, "build" emissions are compared to the on-road mobile portions of two relevant IDEQ emissions inventories in Figure 7. On-road mobile CO emissions estimates were developed by IDEQ for both the *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area* and the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request*.

Figure 7: Comparison of the CO "Build" Scenario to the CO and PM_{10} Inventories



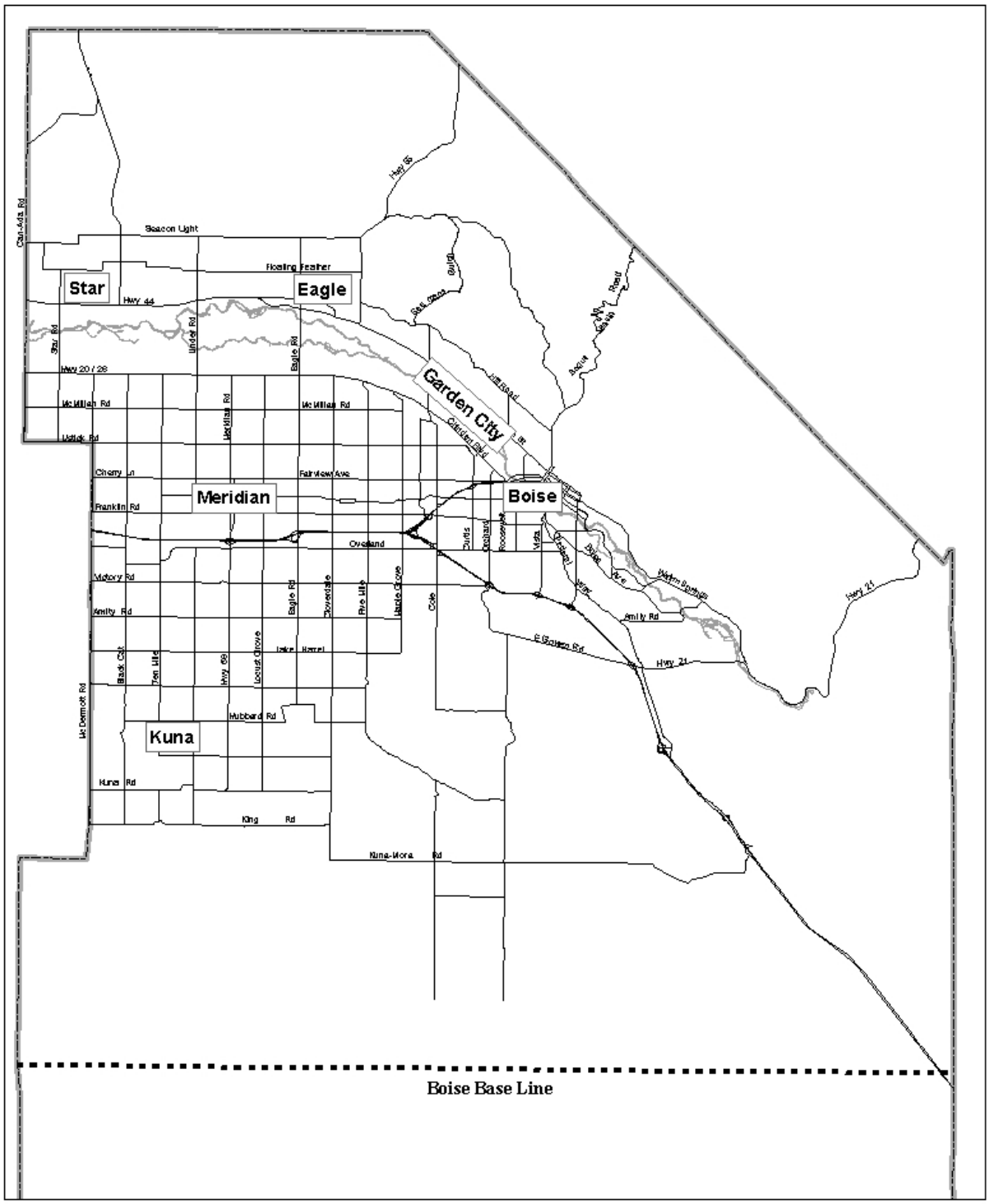
*From Table VI.H-4 in Appendix A of the *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area*. Inventory forecasts for 2010 are compared to 2014, 2015, 2025, and 2035 emissions estimates.

Glossary of Acronyms

ACHD		Ada County Highway District
CALTrans		California Department of Transportation
CIM		*Communities in Motion*
CIP		ACHD's Capital Improvement Plan
CO		Carbon Monoxide
COMPASS		Community Planning Association of Southwest Idaho
DAC		Demographic Advisory Committee
EPA		US. Environmental Protection Agency
g		Grams
IC		Interchange
ICC		Northern Ada County Interagency Consultation Committee on Transportation Conformity
IDEQ		Idaho Department of Environmental Quality
ITD		Idaho Transportation Department
kg		Kilograms
MOBILE 6.2		EPA's on-road emissions model
mph		Miles Per Hour
MPO		Metropolitan Planning Organization
mps		Meters Per Second
NAAQS		National Ambient Air Quality Standards
NO_x		Oxides of Nitrogen
PM_{10}		Particulate Matter with a diameter less than 10 micrometers (i.e. $1x10^{-6}$) (Coarse particulate matter)
SH		State Highway
SIP		State Implementation Plan
STIP		State Transportation Improvement Program
TAZ		Traffic Analysis Zone
TCM		Transportation Control Measure
TIP		Transportation Improvement Program
TMAC		Transportation Modeling Advisory Committee
TPD		Tons Per Day
VKT		Vehicle Kilometers of Travel
VMT		Vehicle Miles of Travel
VOC		Volatile Organic Compounds

APPENDICES

Appendix A: Northern Ada County PM_{10} and CO Maintenance Area



Legal Description for Ada County CO Nonattainment Area

The legal description of the area boundaries is as follows:

- Beginning at a point in the center of the channel of the Boise River where the section line between Sections 15 and 16 of Township 3 North, Range 4 East, crosses the Boise River.

Northern Boundary

- Thence down the center of the channel of the Boise River to a point opposite the mouth of Mores Creek.
- Thence in a straight-line going 44 degrees north and 38 minutes west until said line intersects the north line of Township 5 North in Range 1 East.
- Thence west to the northwest corner of Section 6, Township 5 North, Range 1 West.

Western Boundary

- Thence south to the northwest corner of Section 6, Township 3 North, Range 1 West.
- Thence east to the northeast corner of Section 5, Township3 North, Range 1 West.
- Thence south to the southeast corner of Section 32, Township 2 North, Range 1 West.
- Thence west to the northwest corner of Section 6, Township 1 North, Range 1 West.
- Thence south to the southwest corner of Section 31, Township 1 North, Range 1 West.

Southern Boundary

- Thence east to the southeast corner of Section 33, Township 1 North, Range 4 East.

Eastern Boundary

- Thence north to the point of beginning.

Appendix B: Approved Modeling Assumptions

Table 24: FY 2010-2014 Regional TIP MOBILE Model Input Assumptions

Parameter:	Proposed FY 2010-2014 TIP:	Previously Presented:	Note:
Fleet Mix	EPA MOBILE6.2 defaults, based on national fleet mix data.	Same	
UPDATED Inspection and Maintenance Program	Two annual programs: 1) Two speed test (idle and 2500 RPM) for pre 1996 vehicles only. Waiver Rates (pre 1981 & 1981 or newer) = 1.0% and 1.0%; Stringency (pre 1981 only) = 27.0%. 2) OBDII test for 1996 and newer vehicles. Waiver Rates = 0.0% and 1.0%. 3) Compliance rate for both programs = 98.0%. 4) 4-year grace period for new vehicles – effective January 1, 2010. 5) Biennial testing – effective January 1, 2010.	4 and 5 are new	Data acquired from Department of Environmental Quality and confirmed by Dennis Turner, Air Quality Board, on April 13, 2010.
Anti-Tamper Program	Annual check for gasoline vehicles. Model years 1981 and newer are checked for tampering with: air pump, catalyst, fuel inlet restrictor, exhaust gas recirculation and the gas cap. Compliance rate is 98.0%.	Same	Data acquired from/confirmed by Dennis Turner, Air Quality Board, on 3-1-2007.
Min/Max Temperature	Winter = 28.95 / 47.46 F Summer = 49.29 / 78.18 F	Same	Although these temperatures are different from the ones used in the PM_{10} Maintenance Plan, they have been used for conformity since at least 2004. ITD's Project Level Air Quality screening document uses different temperatures for project screening purposes.
Fuel Reid Vapor Pressure	Winter = 15.0 Summer = 8.6	Same	
Diesel Fuel Sulfur Content	500 ppm until 2010 15 ppm after 2010	Same	Diesel fuel sulfur content will be reduced to 15 ppm by 2010 as per federal fuel standards.
Facility Speeds	Based on the weighted average model speeds for interstates, interstate ramps, principle arterials, minor arterials, collectors, local roads, and centroid connectors.	Same	Per PM_{10} Maintenance Plan Methodology (see Attachment 2).
Fuel Program	3 = Conventional Gasoline West	Same	Applies one of two phase-in schedules for the Tier 2 sulfur fuel standards for years after 1999.
Absolute Humidity	Winter = 24.87% Summer = 43.05%	Same	Although these values are different from the ones used in the PM_{10} Maintenance Plan, they have been used for conformity since at least 2004.
Seasonal Evaluation	Average of winter and summer emissions factors	Same	Winter emissions will be for years 2010, 2011, 2014, 2016, 2026, and 2031. This will allow us to take credit for some fleet turnover in November and December.

Appendix C: Summary of the Approved Regional Emissions Analysis Methodologies

Budget Tests: A Budget Test was used to demonstrate conformity of the FY 2011-2015 Regional TIP for NO_x, VOC, and PM_{10}. The test used the PM_{10} Maintenance Plan's annual emissions estimation methodology. This method developed an annual average emissions factor by averaging summer and winter emissions factors for each pollutant. These annual average emissions factors were then used with forecasted VMT from the travel demand model to calculate annual average emissions in tons per day.

CO Analysis: "Build" and "no build" emissions were estimated using winter emissions factors for CO and average daily VMT as per the emissions inventory in the CO Limited Maintenance Plan.

VOC Emissions Adjustment: Refueling emissions were not included in the VOC analyses. The supporting on-road emissions inventory calculations for the PM_{10} Maintenance Plan removed more than refueling emissions from VOC estimates. However, this was done inconsistently and COMPASS staff is unable to determine exactly how VOC emissions were calculated. Therefore, all evaporative VOC emissions, excluding refueling emissions, were included in the VOC emissions estimates. This was done by calculating the seasonal VOC emissions factors using MOBILE6.2 and the following equation:

$$EF_{adj} = \sum_{X=1}^{27} \{(EF_X - RE_X) * F_x\}$$

Where:
EF_{adj} = Adjusted VOC emissions factor (in grams VOC/mile) for a given roadway type
X = MOBILE6.2 vehicle classification (27 classifications based on gross vehicle weight and fuel type)
EF_x = Total VOC emission factor (tailpipe + evaporative, in grams VOC/mile) for a specific vehicle class on a given roadway type
RE_X = Refueling VOC emissions factor for a specific vehicle class (in grams VOC/mile)
F_x = Fraction of vehicle class X in total fleet

The adjusted emissions factors were then used to produce the VOC emissions estimates.

PM Emissions: PM_{10} emissions were calculated using average weekday VMT, not average daily VMT, per the Northern Ada County PM_{10} Maintenance Plan.

CO Planning Analysis: A "build/no build" test was conducted using winter emissions factors for CO instead of annual average. Average daily VMT was used to calculate CO emissions. In addition, CO emissions estimates were compared to those in the CO Limited Maintenance Plan emissions inventory and the PM_{10} Maintenance Plan. A CO planning analysis is not required by the Federal Highway Administration, but is a requirement of the CO Limited Maintenance Plan.

Methodology for Determining MOBILE Model Facility Speeds:Speeds for each link in the travel demand model are VMT weighted by multiplying the congested speed of the link by its corresponding distance and daily volume:

$$SW_L = S_L * VMT_L$$

Where:

SW_L = VMT weights containing speed for each link (miles^2/ hour)

S_L = Congested speed of the link (miles/hour)

VMT_L = Weekday VMT for the link (miles)

The daily VMT and the VMT weights containing speed are then summed for each of the 7 modeled facility types:

$$SW_T = \sum_1^n SW_L$$

$$VMT_T = \sum_1^n VMT_L$$

Where:

SW_T = Total VMT weights containing speed for a given facility type (miles^2/ hour)

VMT_T = Total weekday VMT of a given facility type (miles)

n = number of links for a given facility type

To arrive at a final speed for each travel demand model facility, the total VMT weight containing speed for each facility type is divided by the total VMT of a given facility type:

$$S_M = \frac{SW_T}{VMT_T}$$

Where:

S_M = Speed used in MOBLIE 6.2 for a given facility type (miles/hour)

This was the methodology used to develop the on-road portion of the PM_{10} Maintenance Plan's emission inventory and motor vehicle emissions budgets.

<u>MOBILE6.2 Modeling of Facility Types:</u>

Travel Demand Model Interstate = MOBILE6.2 Freeways

Travel Demand Model Principal Arterials = MOBILE6.2 Arterial

Travel Demand Model Minor Arterials = MOBILE6.2 Arterial

Travel Demand Model Collectors = MOBILE6.2 Arterial

Travel Demand Model Local Roads: For local facility types MOBILE6.2 assigns a speed of 12.9 mph. However travel demand model speeds of local roads are well above 12.9 mph. Therefore emissions factors for local roads are calculated using the ratios of three MOBILE6.2 generated emissions factors:

$$EF_{local} = EF_{AS} \times \frac{EF_L}{EF_{AL}}$$

Where:

EF_{Local} = Emissions factor for local roads (grams/mile)

EF_{AS} = The MOBILE6.2 emissions factor for local roads modeled as an arterial (grams/mile)

EF_L = The MOBILE6.2 emissions factor for local roads modeled as a local road (grams/mile)

EF_{AL} = The MOBILE6.2 emissions factor for local roads modeled as an arterial at a speed of 12.9 mph (grams/mile)

Travel Demand Model Ramps: For freeway ramps, MOBILE6.2 assigns a speed of 34.6 mph. This was accepted and used for the PM_{10} Maintenance Plan's emissions inventory.

Travel Demand Model Centroid Connectors = MOBILE6.2 Arterial. Note: Centroid connectors are more representative of a MOBILE6.2 local roadway than a MOBILE6.2 arterial. The travel demand model speeds of most centroid connectors are close to 15 mph, while the speeds of local roadways are closer to those found on minor arterials and collectors. However, an analysis conducted as part of the FY2004-2008 Northern Ada County TIP regional emissions analysis showed changing the emissions estimation methodology to have an insignificant impact on the analysis.

Road Dust Emissions

In February 2002, Desert Research Institute (DRI) completed a study of fugitive road dust emissions from paved and unpaved roadways in Ada and Canyon Counties (*Treasure Valley Road Dust Study: Final Report*, Etyemezian et. all, DRI; February 15, 2002). It was included in Appendix F of the PM_{10} Maintenance Plan and used to establish the PM_{10} motor vehicle emissions budget for Ada County. Section 5 of the report yielded a more current and area specific emissions estimation methodology. It estimates emissions using roadway speeds and an empirically derived emissions potentials:

Unpaved Roads:

$$b = C_{C,S,T} \times s^{-x}$$

Where:

b = Roadway emissions potential (grams PM_{10}/VKT/mps)

$C_{C,S,T}$ = Constant assumed to be 8.58 grams PM_{10}/VKT/mps for dry unpaved roads in Ada County (Section 5.2 of the *Treasure Valley Road Dust Study: Final Report)*

s^{-x} = Dry emissions multiplier used to account for snow cover and precipitation on unpaved roads in Ada County (Table 5-11 of the *Treasure Valley Road Dust Study: Final Report*)

Because unpaved roads are not included in COMPASS' model networks, the *Treasure Valley Road Dust Study: Final Report* assumed unpaved roadway speeds to be 25 miles per hour (11.2 mps). The result is a constant emissions factor of 0.31 pounds road dust per mile traveled for unpaved roadways. Average daily trips on unpaved roadways in Ada County can

be assumed, as in past regional emissions analyses, to be 120 vehicles per day. Paving is assumed to occur in Ada County at a rate of 1.95% a year, based on data from ACHD.

Table 5-11 of the *Treasure Valley Road Dust Study: Final Report* yields a winter dry emissions multiplier (s^{-x}) of 0.77 and a summer value equal to 0.90. In the past it appears that incorrect winter and summer multipliers of 0.91 and 0.94 were used in this calculation. These values result if paved road emissions multipliers from Table 5-4 are mistakenly used.

Paved Roads:

$$b = C_{C,S,T} \times s^{-x}$$

Where:
b = Roadway emissions potential (grams PM_{10}/VKT/mps)
$C_{C,S,T}$ = Constant dependant on county, setting, and season (grams PM_{10}/VKT/mps)
S = Posted speed of the roadway (mps)
x = Empirically derived exponent dependant on county, setting, and season (1/mps)

Table 5-1 in the Treasure Valley Road Dust Study contains values used in the equation above. DRI found $C_{C,S,T}$ for paved residential/local roadways to be independent of speed (x = 0). However, paved residential roadway emissions potentials were still seasonally dependant.

In order to calculate road dust emissions, emissions factors were calculated for Ada County's paved urban rural roadways during both summer and winter seasons:

$$EF_{S,T} = b_{S,T} \times s$$

Where:
$EF_{S,T}$ = Roadway PM_{10} emissions factor per setting and season (grams PM_{10}/VKT)
$b_{S,T}$ = Roadway emissions potential per setting and season (grams PM_{10}/VKT/mps)
S = Posted speed of the roadway (mps)

Individual link speeds and DRI's urban/rural setting designations were used to calculate paved road emissions factors for each roadway link in COMPASS' travel demand model network. Posted speed, in miles per hour (mph), are converted to meters per second (mps) using a conversion factor of 0.447.

Because paved road dust emissions factors change with the seasons, two emissions factors were calculated for each link: a winter factor and a summer factor. Each of these seasonal emissions factors was then adjusted to account for precipitation effects (7% reduction in the summer and 9% reduction in the winter). The seasonal emissions factors adjusted for precipitation effects were then combined, using 0.25 as the fraction of the year the winter scenario applies and 0.75 as the fraction of the year that is summer. This results in one composite emissions factor per roadway link.

PM_{10} emissions for each link were then calculated by applying the emissions factor to average weekday vehicle kilometers traveled (VKT) of the link:

$$E_{PM10,L} = EF_{C,L} \times VKT_L$$

Where:

$E_{PM10,L}$ = PM_{10} emissions for a given link (grams PM_{10}/day)

$EF_{C,L}$ = Composite PM_{10} emissions factor for a given link (grams PM_{10}/VKT)

VKT_L = Average weekday vehicle kilometers traveled for the link (VKT)

Conversion factors of 1.6 kilometers/mile and 907,184.74 grams/ton were applied to get a result in ton PM_{10}/day.

Appendix D: COMPASS' Travel Demand Forecast Model

Introduction

Regional transportation planning is a complicated process that requires looking 20 years into the future. The Community Planning Association (COMPASS) uses a computer model to forecast traffic conditions and identify transportation system impacts for specific years in the future. The model uses forecasted conditions including the planned improvements to the roadway network as well as land-use assumptions about where growth will occur.

COMPASS' Transportation Model Advisory Committee (TMAC) guides COMPASS staff in the research, development, and review of the model as well as recommends improvements and/or enhancements to the model and its input data. TMAC is made up of representatives from COMPASS' many member agencies and appointed transportation/land use/air quality professionals who serve on a voluntary basis.

COMPASS' current travel demand forecast model was calibrated and validated for 2002 conditions. It was calibrated with data from a household travel characteristics study performed and completed in 2002. This survey obtained information about the number of trips, travel time, and trip purpose by travel mode and time-of-day from more than 2,600 Treasure Valley households. It was validated with traffic count data for 2002/2003. TMAC approved the use of the 2002 calibrated travel demand model on June 29, 2004.

Shortly after the 2002 model was developed, COMPASS began developing a mode choice model for inclusion into the overall four-step travel demand model. The main purpose for the development of this tool was to support the transit planning component for long-range transportation plans. The 2002 model, with the inclusion of the mode choice tool, was approved for use by TMAC on May 2, 2006.

A minor update to the regional travel demand model began in 2008; it used actual 2008 demographics and refined the traffic analysis zones (TAZs) roadway and transit networks. These refinements and were reviewed by TMAC throughout 2009 and early 2010. The update to the daily model was accepted by TMAC on February 2, 2010. The two peak hour models were accepted by TMAC on May 25, 2010.

How the Model Works

COMPASS' travel demand model estimates regional travel patterns based on where trips are likely to start and end. This is done using a four-step modeling process (see Figure D-1). Travel estimates are adjusted to account for roadway capacities, the availability of alternate routes, and changes in travel time due to congestion. When all routes have approximately the same travel time and there are no longer advantages associated with alternative routes, equilibrium is reached. Forecasts of traffic volumes, vehicle miles of travel, and travel speeds are produced.

Model Assumptions

Travel Characteristics:

COMPASS surveyed Treasure Valley residents' travel habits. This survey was part of a major effort to analyze the valley's present and future transportation needs. It began in August 2002 with the goal of gathering travel information from 2,400 households. The survey was completed in early 2003. Data were collected from 2,582 households, thus exceeding the initial goal. Final data sets from the survey were submitted to COMPASS and provided trip

rates (by trip type by household classification) for each county in the modeling domain, auto occupancy factors by trip type, and the number of trips per duration of time. The final household survey results can be accessed at http://www.compassidaho.org/prodserv/traveldemand.htm.

Trip Types:
The current travel demand forecast model uses six internal trip types. Five of these have one end of the round-trip at home. They are home-based work, home-based shopping, home-based social, home-based school, and home-based other. The sixth trip type does not involve travel either to or from home. Therefore, it is called a non-home-based trip. The characteristics for these trip types are developed from travel surveys completed by random households throughout the Treasure Valley as well as nationally developed data. The model also includes three external trip types: internal-to-external (IX), external-to-external (pass through) (X2X), and external-to-internal (XI). Through trip data were collected as part of a truck freight data collection study completed in October 2007. The external to external trip table was updated making use of these data.

Demographic Data Forecasts:
COMPASS' Demographic Advisory Committee develops area-wide demographic forecasts on population, households, and employment. Forecasts are first developed for large demographic areas of the Treasure Valley. Then the forecasts are allocated to individual Traffic Analysis Zones (TAZ). TAZ boundaries are based on a combination of census boundaries and local geographic features such as roads and waterways and range in size from a few blocks to one or more square miles. COMPASS' TAZ boundaries are reviewed every 10 years, based on the results of the U.S. Census. This process maintains the integrity of the previous years of data while updating the boundaries of the zones based on major changes such as new roads or significant changes in development.

Base year (or current year) demographics are estimated using the most recent U.S. Census data (2000 Census) and building permits data. Employment estimates are obtained for the Department of Labor and Commerce.

Horizon year demographics are developed as part of the long-range transportation planning process. A regional growth control total for the horizon year is used as the starting point. Population and employment adjustments are made to the various demographic areas in the region so that the control total is met, but not exceeded.

The update to *Communities in Motion*, the region's long-range transportation plan, has a horizon year of 2035. Interim year estimates of regional households and employment are interpolated using the base year estimate and the 2035 growth scenario as an endpoint. Professional judgment is used to allocate this growth to TAZs. For specific information on how many jobs and households were added to demographic areas and/or TAZs in the interim years visit http://www.compassidaho.org/prodserv/demo-forecasts.htm.

Roadway Networks:
In order to forecast travel demand, a representation of the functionally classified roadway network and transit system is input to the model for each analysis year. The functionally classified roadways represented in the model include interstates, principal arterials, minor arterials, and collectors. Some local roads are included in model roadway networks for the purposes of connectivity and model validation. However residential roadways are not

specifically considered in the model. Instead they are abstractly represented as centroid connectors. Centroid connectors are connections in the model made between classified roadways and TAZs. Future year roadway networks are developed using existing facilities with roadway projects planned for completion by a certain date.

The capacity of a roadway is defined as the number of vehicles a particular road can manage before congestion occurs. Capacities for model networks are based on a level of service "D" threshold and vary according to the functional classification of the roadway and its location (e.g. urban vs. rural).

Posted speed limits are put into COMPASS' travel demand model as the maximum travel speed on the network.

Mode Choice Model:
"Mode Choice" is the third step in a traditional 4-step travel demand model (see Figure C-1). It takes person trips estimated using the demographic input data and splits them into travel mode specific trips. It sorts trips into one of either two motorized (bus or auto) or two non-motorized (walk or bike) mode choices. Transit (bus) trips are assigned to the transit network, while vehicle trips are assigned to the roadway network. A mode choice model was added to the COMPASS travel demand model to support the analysis needs of long-range transportation plans. It is based on the mode choice model used by the Wasatch Front Regional Council in Salt Lake City, UT.

The transit network is entered independent of the roadway network. In addition to such characteristics as direction and speed, information on fares, transfers, "headways" (max time between transit vehicles), and stop locations need to be entered as network characteristics. The transit network used for conformity purposes is the "fixed stop" system being implemented by Valley Regional Transit. For more information on the transit system in Ada and Canyon Counties, visit http://www.valleyregionaltransit.org/.

Peak-Hour Model:
COMPASS' peak-hour model estimates travel demand during the afternoon rush hour (5 p.m. to 6 p.m.). It operates identical to COMPASS' 24-hour travel demand model and uses the same types of data inputs. Forecasted traffic volumes from peak hour models are primarily used in traffic studies to aid in the design of intersections. The peak-hour model was not used in this regional emissions analysis. With the minor model update in 2008, an additional peak hour model was developed covering 4 p.m. to 5 p.m.

Model Calibration and Validation:
The latest full calibration of COMPASS' two-county travel demand model was completed in April 2004 using the detailed travel data from the 2002 *Travel Characteristics Study* (*http://www.compassidaho.org/prodserv/traveldemand.htm*). The model was re-calibrated and validated to complete the 2008 update. Information pertaining to this process is available the TMAC packets available on the COMPASS website at http://www.compassidaho.org/people/tmac.htm.

As per federal guidance, the calibration of the COMPASS travel demand model was validated to traffic count data. Traffic count data for 2007, 2008, and 2009 were collected from the Idaho Transportation Department, Ada County Highway District, and various Canyon County transportation agencies. The guidance suggests a model is validated when predicted volumes

for the calibration year are within a certain percentage of the measured volumes. Federal validation guidelines are:

- Freeways/Interstates: Less than 7% deviation
- Principal Arterials: Less than 10% deviation
- Minor Arterials: Less than 15% deviation
- Collectors: Less than 25% deviation

Additionally, staff validated the COMPASS model to California Transportation Department (CALTrans) standards. CALTrans standards are more stringent the federal guidelines. The travel demand model was also put through a sensitivity analysis which involved testing the model's response to changes made to demographic and network changes. The results of this sensitivity analysis exercise met expectations. For more information on the calibration and validation of the COMPASS model, visit http://www.compassidaho.org/prodserv/traveldemand.htm.

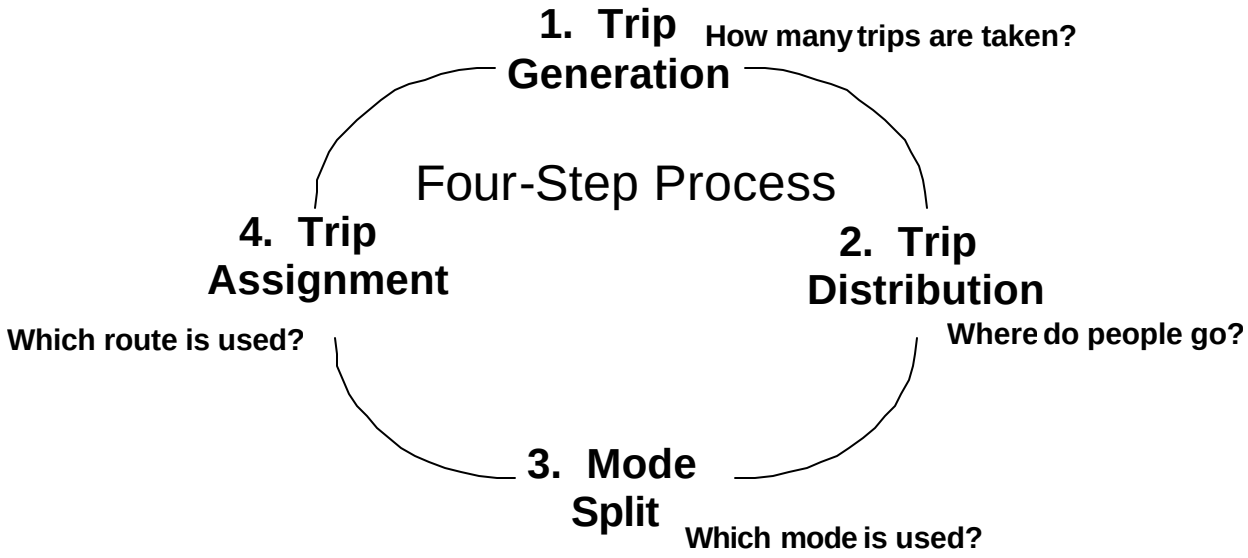
The mode choice model (transit system) could not be validated to the same level as the roadway network. This is due to the fact Valley Regional Transit made substantial changes to the system in 2008. However, modeled ridership was consistent on a regional basis with actual ridership data. Thus, the mode choice model was approved for use in the 2002 model by TMAC on May 2, 2006. A ridership survey is scheduled for September 2010 and staff is currently the recipient of a Federal Transit Administration technical assistance review by Cambridge Systematics. As funds permit, updates and refinements to the mode choice portion of the model will occur.

Model Data Uses

COMPASS' travel demand model produces forecasts of average weekday traffic volumes , average traffic speeds, vehicle miles of travel (VMT), and the level of service for each roadway in the model network. These forecasts are used for a variety of purposes, including:

- Traffic Impact Studies – These studies determine traffic impacts of new developments such as a new retail mall.
- Roadway Network Deficiency Analyses – These highlight potential future roadway inefficiencies and/or needs as a result of additional growth or other network modifications.
- Regional Emissions Analyses – These are required to demonstrate planned transportation projects will conform to the state implementation plans in nonattainment and/or maintenance areas as part of "transportation conformity."

Figure D-1: The Four-Step Model



INPUTS:

Census and/or Home Interviews (Surveys)

Traffic Counts

Roadway Characteristics

Demographic/Land Use Data

MODEL USED TO FORECAST:

Travel Demand Estimation

How many vehicles may travel a particular route in the future?

Development Impacts

How will a proposed development impact the existing roads?

Roadway Deficiencies

Which roads may be overloaded and by how much?

Air Quality Conformity Determinations

Will air quality improve or worsen?

Decision Support

Where do we invest to best serve the future community needs?

Appendix E: MOBILE6.2 Model Files

2010 Scenarios:

"Build" Scenario
Ada Vehicle Input File: A11Bas.IN
Ada Vehicle Output Files: A11Bas.OUT, A11Bas.PM, A11Bas.TAB

2014 Scenarios

"Build" Scenario
Ada Vehicle Input File: A14Act.IN
Ada Vehicle Output File: A14Act.OUT, A14Act.PM, A14Act.TAB

"No Build" Scenario
Ada Vehicle Input File: A14Bas.IN
Ada Vehicle Output Files: A14Bas.OUT, A14Bas.PM, A14Bas.TAB

2015 Scenarios

"Build" Scenario
Ada Vehicle Input File: A15Act.IN
Ada Vehicle Output File: A15Act.OUT, A15Act.PM, A15Act.TAB

"No Build" Scenario
Ada Vehicle Input File: A15Bas.IN
Ada Vehicle Output Files: A15Bas.OUT, A15Bas.PM, A15Bas.TAB

2025 Scenarios:

"Build" Scenario
Ada Vehicle Input File: A25Act.IN
Ada Vehicle Output Files: A25Act.OUT, A25Act.PM, A25Act.TAB

"No Build" Scenario
Ada Vehicle Input File: A25Bas.IN
Ada Vehicle Output Files: A25Bas.OUT, A25Bas.PM, A25Bas.TAB

2035 Scenarios:

"Build" Scenario
Ada Vehicle Input File: A35Act.IN
Ada Vehicle Output Files: A35Act.OUT, A35Act.PM, A35Act.TAB

"No Build" Scenario
Ada Vehicle Input File: A35Bas.IN
Ada Vehicle Output Files: A35Bas.OUT, A35Bas.PM, A35Bas.TAB