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**COMPASS**  
COMMUNITY PLANNING ASSOCIATION  
of Southwest Idaho

## Final Conformity Demonstration of the FY2008-2012 Northern Ada County Transportation Improvement Program

Report No. 11-2007  
Adopted by the COMPASS Board on August 20, 2007  
Resolution 14-2007

RESOLUTION No. 14-2007

FOR THE PURPOSE OF APPROVING THE FY2008-2012 TRANSPORTATION  
IMPROVEMENT PROGRAM FOR NORTHERN ADA COUNTY AND THE ASSOCIATED  
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 1990 Clean Air Act Amendments require all transportation plans and programs in nonattainment areas demonstrate conformity to applicable state implementation plans for air quality improvements;

**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**, the public was invited to review the projects included in the documents and provided one month to comment on the Transportation Improvement Program;

**WHEREAS**, an open house was held to solicit public comments on the Transportation Improvement Program;

**WHEREAS**, the Community Planning Association desires to take timely action to ensure the availability of Federal funds; and

**WHEREAS**, the Community Planning Association has developed an FY2008-2012 Transportation Improvement Program for Northern Ada County in compliance with all applicable State and Federal regulations.

**NOW, THEREFORE, BE IT RESOLVED**, that the Community Planning Association Board of Directors adopts the FY2008-2012 Transportation Improvement Program for Northern Ada County and the associated Air Quality Conformity Demonstration.

**Dated this 20th day of August 2007.**

**APPROVED:**

By:   
Tom Dale, Chair  
Community Planning Association Board

**ATTEST:**

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



**COMPASS**  
COMMUNITY PLANNING ASSOCIATION  
of Southwest Idaho

**THIS DOCUMENT IS SUBMITTED TO THE U.S. DEPARTMENT OF TRANSPORTATION IN FULFILLMENT OF THE REQUIREMENTS OF THE 1990 CLEAN AIR ACT AMENDMENTS (CAAA), 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 when a nonattainment or maintenance area can show, 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 Environmental Protection Agency’s (EPA’s) health based air quality standards. A finding of nonconformance would prevent the implementation of certain federally funded and/or regionally significant transportation projects.

Only EPA’s criteria pollutants 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 when 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 (FHWA) and the Federal Transit Administration (FTA) to make a transportation conformity finding for the FY2008-2012 Northern Ada County Transportation Improvement Program (TIP).

## SUMMARY

EPA's MOBILE6.2 emissions model and COMPASS' most current and approved travel demand model were used to estimate pollutant emissions from the transportation system outlined in the Northern Ada County FY2008-2012 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 Communities in Motion, the region's long range transportation plan are used in this demonstration.

The Northern Ada County PM<sub>10</sub> SIP Maintenance Plan and Redesignation Request contains motor vehicle emissions budgets for three pollutants: coarse particulate matter (PM<sub>10</sub>), oxides of nitrogen (NO<sub>x</sub>), and volatile organic compounds (VOCs). Emissions budget tests, as required by 40CFR93.118, demonstrate conformity of the Northern Ada County FY2008-2012 TIP through the year 2030.

The Carbon Monoxide (CO) Limited Maintenance Plan (Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area) does not contain any motor vehicle emissions budgets. This is because, per the Environmental Protection Agency (EPA), areas under a "limited maintenance plan" are not required to conduct regional emissions analyses 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 of 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<sub>10</sub>)

Northern Ada County is designated as a maintenance area in attainment of the 24-hour PM<sub>10</sub> National Ambient Air Quality Standard (NAAQS) and an attainment area for the annual PM<sub>10</sub> standard. Appendix A shows the extents of the maintenance area boundaries. The last non-agricultural based exceedance of the 24-hour PM<sub>10</sub> NAAQS occurred in 1991. Prior to March 12, 1999, Northern Ada County was designated as a nonattainment area for PM<sub>10</sub>. However, on that date the EPA Administrator signed a revocation of Northern Ada County's nonattainment designation based on changes made to the PM<sub>10</sub> 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<sub>10</sub> State Implementation Plan (SIP). In September of 2003, the EPA approved the *Northern Ada County PM<sub>10</sub> SIP Maintenance Plan and Redesignation Request*.

Commonly, past exceedances of the 24-hour PM<sub>10</sub> NAAQS in Northern Ada County occur during severe 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 NO<sub>x</sub> and VOC. Thus, both NO<sub>x</sub> and VOC are considered precursors of PM<sub>10</sub>. As a result, the PM<sub>10</sub> maintenance plan contains approved PM<sub>10</sub>, NO<sub>x</sub>, and VOC motor vehicle emissions budgets.

### Carbon Monoxide (CO)

Additionally, Northern Ada County is designated as a maintenance area in attainment of the carbon monoxide (CO) NAAQS. This area 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<sub>10</sub> SIP Maintenance Plan and Redesignation Request* (PM<sub>10</sub> Maintenance Plan) establishes motor vehicle emissions budgets for PM<sub>10</sub>, NO<sub>x</sub> and VOC. Therefore, to satisfy transportation conformity requirements established by 40CFR93.118, budget tests must be performed for the Northern Ada County FY2008-2012 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." 1*

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

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<sup>1</sup> Page 42 of the *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area*

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 April 11, 2007. The approved assumptions and methodologies are listed in Appendices D and E. Final roadway project lists developed using the Northern Ada County FY2008-2012 TIP were approved by the ICC on May 31, 2007. 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 performed for:

“...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<sub>10</sub> Maintenance Plan established motor vehicle emissions budgets for the years 1999, 2010, and 2015. Thus, budget tests were performed for:

- 2008 - Base year of the FY2008-2012 TIP
- 2010 - Budget year
- 2012 - Last year of the TIP
- 2015 - Budget year
- 2025 - Intermediate analysis year, as there can be no more than 10 years between analysis years
- 2030 - Long range plan (*Communities in Motion*) 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.”*

The State of 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.”



### **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.

Despite these definitions, the ICC maintains discretionary authority in interpreting and applying them 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 Transit Project Definition**

On August 31, 2005, the Northern Ada County Interagency Consultation Committee on Air Quality Conformity 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 exempt if the ICC concludes them to 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<sub>10</sub> 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 Northern Ada County FY2008-2012 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 daily VMT forecasts; congested network speeds, and other data relevant to regional emissions analyses. COMPASS utilizes 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 of access anticipated. The ICC approves the used 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), a technical committee formed by the COMPASS Board of Directors. TMAC is made up of local experts, technical staff from COMPASS' member agencies, and local traffic engineers from both the public and private sectors. Along with COMPASS staff, TMAC works 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 C provides more information on COMPASS' travel demand model.

#### Demographic Data

The COMPASS Board adopts the official population and employment projections for the Treasure Valley based on a preferred growth scenario. COMPASS' Demographic Advisory Committee (DAC) is composed of demographers, developers, and representatives from local industries and governments. DAC develops the population and employment projections used by the travel demand model to generate ADT and VMT forecasts.

Demographic data for *Communities in Motion*, the region's long range transportation plan, were developed based on a COMPASS Board approved growth scenario. The scenario, "Community Choices" combines modest land use intensification/densification along transportation corridors with additional employment and population growth in outlying communities. Less suburban 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 2030 than the current development trend.

Data for the interim analysis years of 2010, 2015, and 2025 were developed using a 2005 base year estimate and the 2030 "Community Choices" growth scenario as endpoints. Professional judgment was then used to estimate and allocate the interim year growth to traffic analysis zones (TAZs). The DAC approved these interim year forecast and TAZ allocations on January 26, 2006. Forecasts for the years of 2008 and 2012 were interpolated from 2005 and 2030.

#### Roadway Network Assumptions

The projects used in the regional emissions analysis for the Northern Ada County FY2008-2012 TIP are derived from:

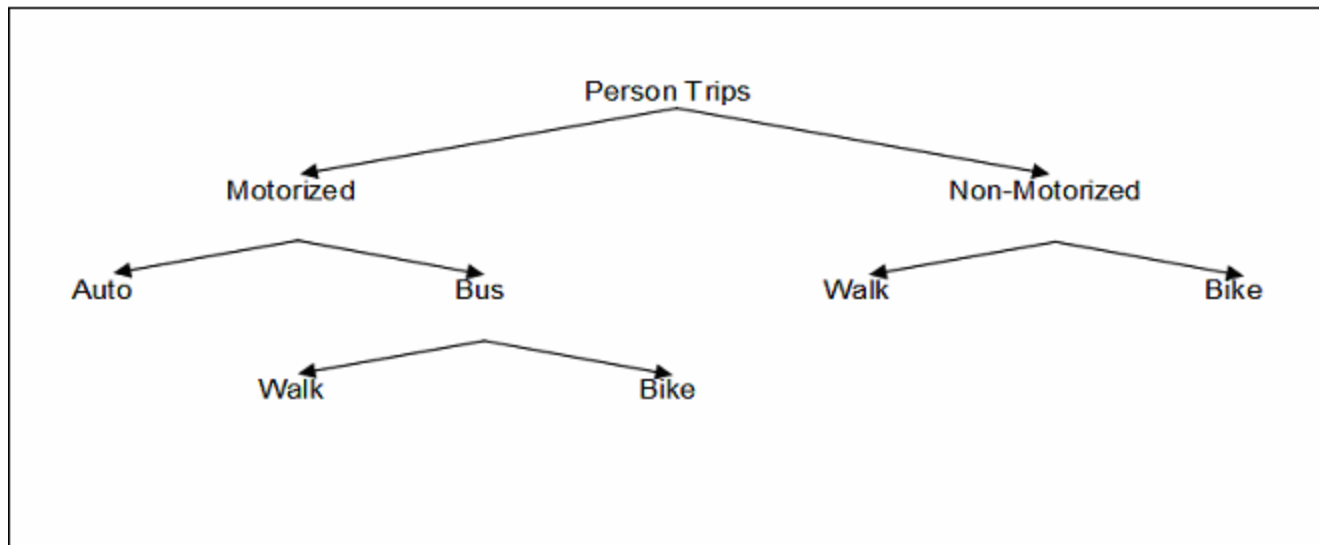
- The FY2008-2012 Northern Ada County TIP
- Ada County Highway District's (ACHD's) FY2006 Capital Improvement Plan (CIP) (FY2006-2027)
- ACHD's Five-Year Work Plan (FYWP) (FY2008-2012)
- *Communities in Motion* (CIM), the region's long range transportation plan
- Idaho Transportation Department's (ITD's) State Transportation Improvement Program (STIP) (FY2007-2011).

Roadway projects were placed into analysis (or budget) year networks based information contained in the above sources. In the event a project was given a construction date in multiple documents, the earliest date was assigned as given by the FYWP, followed by the TIP, STIP, CIP, and CIM. Most unfunded (UF) or preliminary development (PD) projects were treated as if they had an implied 2030 construction date attached.

## 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 planned for the region's transit system in either the Northern Ada County FY2008-2012 TIP or CIM. Therefore, only the transit system as it exists today is included in the analysis through 2030. The current system includes:

- 15 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.
- Three inter-county routes (between Ada and Canyon Counties) with 30-60 minute headways during the am/pm peak periods and 2-3 hour headways during off peak periods.

*Communities in Motion's* Chapter 3 contains more general information on the region's current transit system. For more specific info on the routes and schedules used to model the transit system, visit 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 the most current emissions model approved by the EPA. The MOBILE model uses data input about the area's climate, elevation and vehicle emissions testing program(s) along with information on roadway network speeds to develop emission factors for specified air pollutants. These emission factors are applied to VMT forecasts from the travel demand model to develop motor vehicle emission estimates for regional emissions analyses. Most of the methodologies and assumptions used in this demonstration are consistent with those used for the PM<sub>10</sub> Maintenance Plan Emissions Inventory. Thus, average weekday VMT were used to estimate PM<sub>10</sub> emissions and average daily VMT (i.e., average VMT of weekday and weekend traffic volumes) were used to estimate CO, NO<sub>x</sub>, and VOC emissions. Appendix D lists the MOBILE6.2 modeling assumption approved by ICC for use in this demonstration. Appendices F through J list the MOBILE6.2 model input and output files used to conduct the regional emissions analyses.

Specific emissions factors were developed to estimate the Canyon County vehicle contribution to Ada County's VMT. Emission factors for Canyon County vehicles are different than those for Ada County because of Ada's vehicle inspection

and maintenance program. According to COMPASS' 2002 Household Travel Survey<sup>2</sup>, 32.2% of Canyon County residents commute into Ada County for work. In order to accurately represent and forecast the emissions of the vehicle fleet that drives on Ada County roadways, total emissions were increased to account for the Canyon County vehicles. Appendix E demonstrates how this was accomplished.

## Road Dust

Paved road dust makes up the vast majority of PM<sub>10</sub> 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*<sup>3</sup>. 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 D demonstrates how the road dust emissions factors were calculated.

## Particulate Matter (PM<sub>10</sub>), Oxides of Nitrogen (NO<sub>x</sub>), and Volatile Organic Compounds (VOC)

### 2008 Baseline Scenario

The baseline scenario uses 2008 population and employment estimates with the anticipated 2008 roadway network (the currently built roadway network and those applicable roadway projects expected to be open to the motoring public by December 31, 2008). 2008 demographics were interpolated from the 2006 estimates used in *Communities in Motion*. The 2006 estimates were developed from census data, building permit data (from 2000 to 2005), preliminary plat data for both counties (as of April 2005), and 2005 employment estimates. Table 1 provides a list of applicable roadway projects used in the 2008 baseline model network to estimate PM<sub>10</sub>, NO<sub>x</sub>, and VOC emissions. *Note: The numbers in the "No." column are for reference only.*

**Table 1: Projects in 2008 Baseline Scenario**

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?	Exempt?	Key No.*
1.	Deer Flat Rd	Ten Mile Rd - SH 69	3	No	No	Yes - Safety (40CFR93.126)	RD125
2.	Eagle Rd	Victory Rd - Ridenbaugh Canal	5	Yes - Principal Arterial	No	No	RD203-07
3.	Eagle Rd Interchange Ramp	Extend the I-84 westbound off-ramp	N.A.	No	Yes - GARVE E	No	9980
4.	Floating Feather Rd	Eagle Rd - Edgewood Dr	3	No	No	Yes - Safety (40CFR93.126)	RD257
5.	I-84	Garrity IC - Meridian IC	6	Yes - Interstate	Yes - GARVE E	No	9815
6.	Maple Grove Rd	Franklin Rd - Fairview Ave	5	No	Yes	No	
7.	Maple Grove Rd	Fairview Ave - Goddard St	3	No	Yes	Yes - Safety (40CFR93.126)	RD222-01
8.	Overland Rd	Linder Rd - Meridian Rd	5	Yes*	No	No	RD290
9.	Ten Mile Rd	Franklin Rd - Cherry Ln	5	No	No	No	RD309
10.	Ustick Rd	Five Mile Rd - Cole Rd	5	No	No	No	RD222
11.	US 20/26	Cloverdale Rd - HP Main Entrance	5	Yes	Yes	No	7148

\*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 the estimated VMT and PM<sub>10</sub> emissions from the 2008 baseline 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

<sup>2</sup> 2002 Treasure Valley Transportation Survey, Final Report, February 2003. Compass Report #2003-2, Page 16, Figure 2.

<sup>3</sup> Etyemezian et. all, Desert Research Institute; February 15, 2002

output files for the 2008 scenario are listed in Appendix F.

<b>Table 2: 2008 Paved Road PM<sub>10</sub> Estimated Emissions</b>				
Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM <sub>10</sub> Emitted
	[VMT/day]	[Tons/day]	[Tons/day]	[Tons/day]
Interstate	2,225,705	15.00	0.12	15.12
Ramps	110,845	1.00	0.01	1.01
Principal Arterial	3,209,115	26.45	0.17	26.62
Minor Arterial	1,816,000	15.53	0.10	15.63
Collector	415,509	4.00	0.02	4.02
Local	14,791	0.24	0.00	0.24
Centroid Connectors	649,997	5.58	0.03	5.61
<b>Totals</b>	<b>8,441,963</b>	<b>67.80</b>	<b>0.45</b>	<b>68.25</b>

Table 3 shows the 2008 average daily VMT and VOC emissions estimates developed using MOBILE6.2 generated emissions factors. VOC emissions factors were adjusted so that refueling emissions are not included in the estimated emissions. This seems consistent with the methodology used to establish the VOC emissions budgets. Estimates of NO<sub>x</sub> emissions are given in Table 4.

<b>Table 3: 2008 VOC Estimated Emissions</b>					
Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Canyon County Vehicle VOC Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	Estimated VOC Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	2,003,135	0.69	0.82	7.37	1.55
Ramps	99,761	1.00	1.19		0.11
Principal Arterials	2,888,204	1.08	1.29		3.50
Minor Arterials	1,634,400	1.05	1.24		1.92
Collectors	373,958	0.78	0.92		0.32
Local	13,312	0.83	0.98		0.01
Centroid Connectors	584,997	0.64	0.76		0.42
<b>Totals</b>	<b>7,597,767</b>	<b>NA</b>	<b>NA</b>	<b>7.37</b>	<b>7.84</b>

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

Road Type	Average Daily VMT	Ada County Vehicle NO <sub>x</sub> Emissions Factor	Canyon County Vehicle NO <sub>x</sub> Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	NO <sub>x</sub> Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	2,003,135	1.72	1.86	7.37	3.82
Ramps	99,761	1.48	1.63		0.16
Principal Arterials	2,888,204	1.41	1.54		4.51
Minor Arterials	1,634,400	1.39	1.53		2.53
Collectors	373,958	1.40	1.54		0.58
Local	13,312	1.22	1.33		0.02
Centroid Connectors	584,997	1.66	1.81		1.08
<b>Totals</b>	7,597,767	NA	NA	7.37	12.70

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

### 2010 Scenario

The 2010 scenario uses 2010 population and employment estimates with the 2008 roadway network and the projects given in Table 5 (Note: The numbers in the “No.” column are for reference only). 2010 demographic projections and allocation to TAZs represents the “Community Choices” growth scenario in *Communities in Motion* endorsed by the COMPASS Board on December 19, 2005. COMPASS’ DAC approved the 2010 demographic forecasts and allocations on January 26, 2006.

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?	Exempt?	Key No.*
12.	36 <sup>th</sup> St	Hill Rd - Cartwright Rd	3	No	No	Yes - Safety (40CFR93.126)	RD307
13.	Franklin Rd	Eagle Rd - Five Mile Rd	5	Yes - Principal Arterial	Yes	No	RD282/8698
14.	Hill Rd Extension	State St - Horseshoe Bend Rd	3	No	No	No	RD308
15.	I-84	Cole IC - Vista IC	6	Yes - Interstate	Yes - GARVE E	No	9819
16.	Meridian Rd & Main St (Ph 1 of split corridor)	I-84 - Franklin	5	Yes*	No	No	RD205-06
17.	Orchard IC	Reconstruct - add new ramps and lanes	NA	Yes - Interstate	Yes - GARVE E	Yes - (40CFR93.127)	9817
18.	ParkCenter East Bridge	ParkCenter Blvd - Warm Springs Ave	4	Yes - Principal Arterial	No	No	MA203-02
19.	Ten Mile Rd	Cherry Ln - Ustick Rd	5	No	No	No	RD188

\*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 6 shows estimated weekday VMT and PM<sub>10</sub> 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 G. Table 7 and Table 8 display the VOC and NO<sub>x</sub> emissions estimates respectively. VOC emissions factors were adjusted so that refueling emissions are not included in the estimated emissions. This seems consistent with the methodology used to establish the VOC emissions budgets.

<b>Table 6: 2010 Paved Road PM<sub>10</sub> Estimated Emissions</b>				
Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM <sub>10</sub> Emitted
	[VMT/day]	[Tons/day]	[Tons/day]	[Tons/day]
Interstate	2,338,882	15.76	0.11	15.87
Ramps	115,282	1.04	0.01	1.05
Principal Arterial	3,245,210	26.71	0.15	26.86
Minor Arterial	2,089,900	17.74	0.10	17.84
Collector	447,333	4.24	0.02	4.26
Local	17,730	0.30	0.00	0.30
Centroid Connectors	684,959	5.87	0.03	5.90
<b>Totals</b>	<b>8,939,294</b>	<b>71.66</b>	<b>0.43</b>	<b>72.09</b>

<b>Table 7: 2010 VOC Estimated Emissions</b>					
Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Canyon County Vehicle VOC Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	Estimated VOC Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	2,104,993	0.55	0.66	7.47	1.29
Ramps	103,754	0.65	0.79		0.08
Principal Arterials	2,920,689	0.59	0.71		1.92
Minor Arterials	1,880,910	0.59	0.72		1.25
Collectors	402,599	0.63	0.77		0.28
Local	15,957	0.62	0.75		0.01
Centroid Connectors	616,463	0.84	1.02		0.58
<b>Totals</b>	<b>8,045,365</b>	<b>NA</b>	<b>NA</b>	<b>7.47</b>	<b>5.42</b>

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

Road Type	Average Daily VMT	Ada County Vehicle NO <sub>x</sub> Emissions Factor	Canyon County Vehicle NO <sub>x</sub> Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	NO <sub>x</sub> Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	2,104,993	1.38	1.52	7.47	3.22
Ramps	103,754	1.19	1.35		0.14
Principal Arterials	2,920,689	1.13	1.27		3.68
Minor Arterials	1,880,910	1.12	1.27		2.35
Collectors	402,599	1.13	1.27		0.50
Local	15,957	0.99	1.10		0.02
Centroid Connectors	616,463	1.34	1.50		0.92
<b>Totals</b>	<b>8,045,365</b>	<b>NA</b>	<b>NA</b>		<b>7.47</b>

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

### 2012 Scenario

The 2012 scenario uses 2012 population and employment estimates with the 2010 roadway network and the projects given in Table 9 (Note: The numbers in the "No." column are for reference only). Demographic forecasts for 2010 were interpolated from the 2010 estimates used in *Communities in Motion*. COMPASS' DAC approved the 2010 demographic forecasts and allocations on January 26, 2006.

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?	Exempt?	Key No.*
20.	Cloverdale Rd	Fairview Ave - Ustick Rd	5	No	No	No	RD202-09
21.	Fairview Ave	Cloverdale Rd - Five Mile Rd	7	Yes - Principal Arterial	No	No	RD202-14
22.	Fairview Ave	Five Mile Rd - Maple Grove Rd	7	Yes - Principal Arterial	No	No	RC0087
23.	Franklin Rd	Ten Mile Rd - Linder Rd	5	Yes*	Yes	No	RC0127
24.	Five Mile Rd	Franklin Rd - Fairview Ave	5	No	Yes	No	RC0131
25.	I-84	Garrity IC - Meridian IC	8	Yes - Interstate	Yes	No	RC0165/9504
26.	I-84	Cole / Overland IC - Broadway IC	8	Yes - Interstate	Yes	No	F038/7238
27.	Meridian Rd & Main St (Ph 2 of split corridor)	Franklin - Fairview Ave	5	Yes*	TBD	No	
28.	SH 16 River Crossing	Connect SH 16 - US 20/26 (ICs at Ustick, US 20/26, SH 44, Beacon Light, Chapparal)	4	Yes - Principal Arterial	Yes - GARVEE	No	
29.	Ten Mile Rd IC	New Interchange at I-84 and Ten Mile Rd	NA	Yes - Interstate	Yes - GARVEE	No	RD205-07
30.	Vista IC	Reconstruct - add new ramps and lanes	NA	Yes - Interstate	Yes - GARVEE	Yes - (40CFR93.127)	
31.	Cloverdale Rd	Fairview Ave - Ustick Rd	5	No	No	No	9815
32.	Fairview Ave	Cloverdale Rd - Five Mile Rd	7	Yes - Principal Arterial	No	No	9818

\*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 10 shows estimated weekday VMT and PM<sub>10</sub> emissions from the 2012 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 2012 are listed in Appendix H. Table 11 and Table 12 display the VOC and NO<sub>x</sub> emissions estimates respectively. VOC emissions factors were adjusted so that refueling emissions are not included in the estimated emissions. This seems consistent with the methodology used to establish the VOC emissions budgets.

<b>Table 10: Table II-10: 2012 Paved Road PM<sub>10</sub> Estimated Emissions</b>				
Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM <sub>10</sub> Emitted
	[VMT/day]	[Tons/day]	[Tons/day]	[Tons/day]
Interstate	2,643,399	17.76	0.11	17.87
Ramps	125,060	1.13	0.01	1.14
Principal Arterial	3,518,131	28.75	0.14	28.89
Minor Arterial	2,284,710	19.25	0.09	19.34
Collector	468,655	4.42	0.02	4.44
Local	18,597	0.31	0.00	0.31
Centroid Connectors	739,731	6.32	0.03	6.35
<b>Totals</b>	<b>9,798,283</b>	<b>77.94</b>	<b>0.40</b>	<b>78.34</b>

<b>Table 11: 2012 VOC Estimated Emissions</b>					
Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Canyon County Vehicle VOC Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	Estimated VOC Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	2,379,059	0.46	0.57	7.57	1.24
Ramps	112,554	0.54	0.67		0.07
Principal Arterials	3,166,318	0.49	0.61		1.75
Minor Arterials	2,056,239	0.50	0.62		1.15
Collectors	421,790	0.52	0.65		0.25
Local	16,737	0.52	0.64		0.01
Centroid Connectors	665,758	0.70	0.87		0.52
<b>Totals</b>	<b>8,818,455</b>	<b>NA</b>	<b>NA</b>	<b>7.57</b>	<b>4.98</b>

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

**Table 12: 2012 NO<sub>x</sub> Estimated Emissions**

Road Type	Average Daily VMT	Ada County Vehicle NO <sub>x</sub> Emissions Factor	Canyon County Vehicle NO <sub>x</sub> Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	NO <sub>x</sub> Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	2,379,059	1.06	1.21	7.57	2.82
Ramps	112,554	0.93	1.10		0.12
Principal Arterials	3,166,318	0.89	1.03		3.13
Minor Arterials	2,056,239	0.88	1.03		2.02
Collectors	421,790	0.88	1.03		0.41
Local	16,737	0.77	0.90		0.01
Centroid Connectors	665,758	1.04	1.21		0.78
<b>Totals</b>	<b>8,818,455</b>	<b>NA</b>	<b>NA</b>		<b>7.57</b>

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

### 2015 Scenario

The 2015 scenario uses 2015 population and employment estimates with the 2012 roadway network and the projects given in Table 13 (Note: The numbers in the "No." column are for reference only). 2015 demographic projections and allocation to TAZs represents the "Community Choices" growth scenario in *Communities in Motion* endorsed by the COMPASS Board on December 19, 2005. COMPASS' DAC approved the 2015 demographic forecasts and allocations on January 26, 2006.

**Table 13: Projects Added to the 2012 Network for the 2015 Scenario**

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid? **	Exempt?	Key No.*
33.	Cloverdale Rd	Columbia Rd - Franklin Rd	5	No	TBD	No	No
34.	Cloverdale Rd	Ustick Rd - US 20/26	5	No	TBD	No	No
35.	Cole Rd	Lake Hazel Rd - Victory Rd	5	Yes - Principal Arterial	TBD	No	Yes - Principal Arterial
36.	Cole Rd	I-84 WB ramps - Franklin Rd	5	Yes - Principal Arterial	TBD	No	Yes - Principal Arterial
37.	Fairview Ave	Maple Grove Rd - Cole Rd	7	Yes - Principal Arterial	No	No	Yes - Principal Arterial
38.	Five Mile Rd	Fairview Ave - Ustick Rd	5	No	No	No	No
39.	Franklin Rd	Black Cat Rd - Ten Mile Rd	5	Yes*	Yes	No	Yes*
40.	Glenwood St / Cole Rd couplet	Two way couplet - Mountain View Dr	3	Yes - Principal Arterial	TBD	No	Yes - Principal Arterial
41.	Linder Rd	Victory Rd - Overland Rd	5	No	TBD	Yes - Safety (40CFR93.126)	No
42.	Linder Rd	Cherry Ln - Ustick Rd	5	No	No	No	No
43.	Linder Rd	Ustick Rd - State St (4 lane bridge)	5	No	TBD	No	No
44.	Maple Grove Rd	Lake Hazel - Overland Rd	5	No	TBD	Yes - Safety (40CFR93.126)	No
45.	McMillan Rd	Locust Grove Rd - Eagle Rd	5	No	TBD	No	No

**Table 13: Projects Added to the 2012 Network for the 2015 Scenario**

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid? **	Exempt?	Key No.*
46.	Orchard St	Gowen Rd - I-84 EB on ramp	5	Yes - Principal Arterial	TBD	No	Yes - Principal Arterial
47.	Overland Rd	Ten Mile Rd - Linder Rd	5	Yes - Principal Arterial	TBD	No	Yes - Principal Arterial
48.	Pine St – new	Locust Grove Rd - Eagle Rd (Developer Funded)	5	No	TBD	No	No
49.	Pine St	Eagle Rd - Colverdale Rd	5	No	TBD	No	No
50.	Ten Mile Rd	Victory Rd - Franklin Rd	5	Yes - Principal Arterial	TBD	No	Yes - Principal Arterial
51.	Ten Mile Rd	Ustick Rd - Chinden Blvd	5	No	TBD	No	No
52.	Ustick Rd	Meridian Rd - Eagle Rd	5	Yes*	TBD	No	Yes*
53.	Ustick Rd	Eagle Rd - Cloverdale Rd	5	No	TBD	No	No
54.	Ustick Rd	Cloverdale Rd - Five Mile Rd	5	No	No	No	No
55.	Ustick Rd	Cole Rd - Curtis Rd	5	No	TBD	No	No

\*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.

\*\* The fiscal constraints of a long-range plan are more flexible than those of a TIP. Therefore, TBD means To Be Determined, as a specific funding source (or sources) has not been identified.

Table 14 shows estimated weekday VMT and PM<sub>10</sub> emissions for the 2015 scenario. Emissions estimates were developed using emissions factors from MOBILE 6.2 and the *Treasure Valley Road Dust Study: Final Report*. The MOBILE 6.2 input and output files for 2015 are listed in the Appendix I. Table 15 and Table 16 display the VOC and NO<sub>x</sub> emissions estimates respectively. VOC emissions factors were adjusted so that refueling emissions are not included in the estimated emissions. This seems consistent with the methodology used to establish the VOC emissions budgets.

**Table 14: 2015 Paved Road PM<sub>10</sub> Estimated Emissions**

Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM <sub>10</sub> Emitted
	[VMT/day]	[Tons/day]	[Tons/day]	[Tons/day]
Interstate	2,741,823	18.84	0.10	18.94
Ramps	129,805	1.17	0.00	1.17
Principal Arterial	3,936,104	33.20	0.14	33.34
Minor Arterial	2,400,322	20.99	0.08	21.07
Collector	465,858	4.50	0.02	4.52
Local	21,180	0.37	0.00	0.37
Centroid Connectors	791,290	6.73	0.03	6.76
<b>Totals</b>	<b>10,486,382</b>	<b>85.80</b>	<b>0.37</b>	<b>86.17</b>

<b>Table 15: 2015 VOC Estimated Emissions</b>					
Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Canyon County Vehicle VOC Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	Estimated VOC Emitted <sup>1</sup>
	<i>[VMT/day]</i>	<i>[g/mile]</i>	<i>[g/mile]</i>		<i>[Tons/day]</i>
Interstate	2,467,641	0.38	0.49	7.58	1.05
Ramps	116,825	0.43	0.56		0.06
Principal Arterial	3,542,494	0.40	0.52		1.60
Minor Arterial	2,160,290	0.40	0.52		0.98
Collector	419,272	0.43	0.55		0.20
Local	19,062	0.42	0.55		0.01
Centroid Connectors	712,161	0.57	0.73		0.46
<b>Totals</b>	9,437,744	NA	NA	7.58	4.35

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

<b>Table 16: 2015 NO<sub>x</sub> Estimated Emissions</b>					
Road Type	Average Daily VMT	Ada County Vehicle NO <sub>x</sub> Emissions Factor	Canyon County Vehicle NO <sub>x</sub> Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	NO <sub>x</sub> Emitted <sup>1</sup>
	<i>[VMT/day]</i>	<i>[g/mile]</i>	<i>[g/mile]</i>		<i>[Tons/day]</i>
Interstate	2,467,641	0.72	0.88	7.58	2.00
Ramps	116,825	0.64	0.82		0.08
Principal Arterial	3,542,494	0.61	0.76		2.43
Minor Arterial	2,160,290	0.61	0.76		1.47
Collector	419,272	0.61	0.77		0.29
Local	19,062	0.61	0.65		0.01
Centroid Connectors	712,161	0.72	0.90		0.58
<b>Totals</b>	9,437,744	NA	NA	7.58	6.86

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

## 2025 Scenario

The 2025 scenario uses 2025 population and employment estimates with the 2015 roadway network and the projects given in Table 17 (*Note: The numbers in the "No." column are for reference only*). 2025 demographic projections and allocation to TAZs represents the "Community Choices" growth scenario in Communities in Motion endorsed by the COMPASS Board on December 19, 2005. COMPASS' DAC approved the 2025 demographic forecasts and allocations on January 26, 2006.

**Table 17: Projects Added to the 2015 network for the 2025 Scenario**

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?*	Exempt?	Key No.*
56.	36th St	Extend 36 <sup>th</sup> St from existing to Cartwright Rd and Bogus Basin Rd	3	No	No	No	RD202-04
57.	Fairview Ave	Meridian Rd or Main St - Eagle Rd	7	Yes - Principal Arterial	TBD	No	RC0135
58.	Fairview Ave	Eagle Rd - Cloverdale Rd	7	Yes - Principal Arterial	TBD	No	RC0130
59.	Five Mile Rd	Lake Hazel Rd - Victory Rd	5	No	TBD	No	
60.	Five Mile Rd Overpass	Overland Rd - Franklin Rd	5	No*	TBD	No	
61.	Hill Rd	Castle Dr - 36 <sup>th</sup> St	3	No	TBD	Yes - Safety (40CFR93.126)	
62.	Linder Rd	Overland Rd - Franklin Rd (includes overpass)	5	No	TBD	No	
63.	Linder Rd	Franklin Rd - Cherry Ln	5	No	No	No	RD077
64.	Meridian Rd IC	Improvement: cloverleaf ramp for WB I-84 - SB SH 69 (Kuna-Meridian Rd)	NA	Yes - Interstate	Yes	Yes - Safety (40CFR 93.126)	
65.	SH 16 Expressway	Ada Co. Line - I-84 (Urban ICs at Chaparral, Beacon Light, SH 44, US 20/26, and Ustick)	4	Yes - Principal Arterial	Yes	No	
66.	SH 16 IC	I-84 - Vicinity of McDermott		Yes - Interstate	Yes	No	

\*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.

\*\* 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.

Table 18 shows estimated weekday VMT and PM<sub>10</sub> 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 MOBILE 6.2 input and output files for 2025 are listed in the Appendix J. Table 19 and Table 20 display the VOC and NO<sub>x</sub> emissions estimates respectively.

<b>Table 18: 2025 Paved Road PM<sub>10</sub> Estimated Emissions</b>				
Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM <sub>10</sub> Emitted
	[VMT/day]	[Tons/day]	[Tons/day]	[Tons/day]
Interstate	3,659,146	24.69	0.11	24.80
Ramps	186,808	1.59	0.01	1.60
Principal Arterial	4,615,998	39.24	0.14	39.38
Minor Arterial	3,446,408	29.40	0.11	29.51
Collector	615,215	5.82	0.02	5.84
Local	36,074	0.68	0.00	0.68
Centroid Connectors	933,691	7.88	0.03	7.91
<b>Totals</b>	<b>13,493,339</b>	<b>109.30</b>	<b>0.42</b>	<b>109.72</b>

<b>Table 19: 2025 VOC Estimated Emissions</b>					
Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Canyon County Vehicle VOC Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	Estimated VOC Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	3,293,231	0.23	0.35	7.92	0.89
Ramps	168,127	0.26	0.39		0.05
Principal Arterials	4,154,398	0.25	0.37		1.20
Minor Arterials	3,101,767	0.25	0.37		0.88
Collectors	553,693	0.27	0.39		0.17
Local	32,467	0.25	0.37		0.01
Centroid Connectors	840,322	0.37	0.53		0.36
<b>Totals</b>	<b>12,144,005</b>	<b>NA</b>	<b>NA</b>		<b>7.92</b>

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

<b>Table 20: 2025 NO<sub>x</sub> Estimated Emissions</b>					
Road Type	Average Daily VMT	Ada County Vehicle NO <sub>x</sub> Emissions Factor	Canyon County Vehicle NO <sub>x</sub> Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	NO <sub>x</sub> Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	3,293,231	0.27	0.44	7.92	1.04
Ramps	168,127	0.29	0.48		0.06
Principal Arterials	4,154,398	0.26	0.42		1.24
Minor Arterials	3,101,767	0.26	0.42		0.92
Collectors	553,693	0.26	0.43		0.17
Local	32,467	0.22	0.35		0.01
Centroid Connectors	840,322	0.31	0.50		0.30
<b>Totals</b>	<b>12,144,005</b>	<b>NA</b>	<b>NA</b>		<b>7.92</b>

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

## 2030 Scenario

The 2030 growth scenario, "Community Choices," was developed as part of *Communities in Motion* and endorsed by the COMPASS Board December 19, 2005. The population and employment estimates developed as part of the "Community Choices" growth scenario were analyzed with a 2030 roadway network. The 2030 network is comprised of the 2025 travel demand model network and the projects listed in Table 21.

**Table 21: Projects Added to the 2025 network for the 2030 Scenario**

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?*	Exempt?	Key No.*
67.	Adams St	Chinden Blvd - Veteran's Memorial Parkway includes new connection 36 <sup>th</sup> to 37 <sup>th</sup> St	3	No	No	Yes	
68.	Amity Rd	McDermott Rd -Meridian Rd	3	Yes - Principal Arterial	TBD	No	
69.	Amity Rd	Meridian Rd - Eagle Rd	5	No	TBD	No	
70.	Amity Rd	Federal Way - Holcomb Rd	5	No	No	No	RD202-11
71.	Avalon Rd (Kuna Rd)	Linder Rd - Orchard St	5	No	TBD	No	
72.	Beacon Light Rd	Extend Beacon Light Rd from Ada Co. Line - SH 16	2	No	TBD	No	
73.	Beacon Light Rd	SH 16 - Park Ln	5	No	TBD	No	
74.	Beacon Light Rd	Park Ln - Eagle Rd	3	No	TBD	No	
75.	Black Cat Rd	Amity Rd - Cherry Ln	3	No	TBD	No	
76.	Black Cat Rd	Cherry Ln - Chinden Blvd	5	No	TBD	No	
77.	Broadway IC	Reconstruct - add new ramps and lanes	N.A.	Yes - Interstate	Yes	Yes - (40CFR93.127)	9821
78.	Cherry Ln	McDermott Rd - Black Cat Rd	5	Yes*	TBD	No	
79.	Cherry Ln	Linder Rd - Meridian Rd	7	Yes - Principal Arterial	TBD	No	
80.	Eagle Rd	Lake Hazel Rd - Victory Rd	5	Yes - Principal Arterial	TBD	Yes - Safety (40CFR93.126)	
81.	Emerald St	Five Mile Rd - Orchard St	5	Yes - +45K ADT	TBD	No	
82.	Executive St / Presidential	Cloverdale Rd - Five Mile Rd (3 ln couplet with Presidential)	5	No	TBD	No	
83.	Fairview Ave	Cole Rd - Orchard St (or e/o Curtis Rd)	7	Yes - Principal Arterial	No	No	
84.	Federal Way	S/o SH 21 - Isaac Canyon IC	5	No	Develop per Funded	No	
85.	Five Mile Rd	Ustick Rd - McMillan Rd	5	No	TBD	No	
86.	Franklin Rd	McDermott Rd - Black Cat Rd	5	Yes*	TBD	No	RC0161
87.	Franklin Rd	Eagle Rd - Milwaukee St	7	Yes - Principal Arterial	TBD	No	
88.	Gowen IC	Reconstruct	NA	Yes - Interstate	Yes	Yes - (40CFR93.127)	9822
89.	I-84	Broadway IC - Isaacs Canyon IC	8	Yes - Interstate	Yes	No	K307/ K301
90.	Lake Hazel Rd	McDermott Rd - SH 69	5	Yes*	TBD	No	
91.	Lake Hazel Rd	SH 69 - Cole Rd	5	Yes*	TBD	No	
92.	Lake Hazel Rd Extension	Cole Rd - Pleasant Valley Rd	5	Yes*	TBD	No	

**Table 21: Projects Added to the 2025 network for the 2030 Scenario**

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?*	Exempt?	Key No.*
93.	Lake Hazel Rd (Gowen Rd Realignment)	Gowen Rd - Eisenman Rd	4-5	Yes*	TBD	No	
94.	Linder Rd	Kuna Mora Rd - Victory Rd	5	No	TBD	No	
95.	Linder Rd	State St - Beacon Light Rd	5	No	TBD	No	
96.	Locust Grove Rd	Fairview Ave - McMillan Rd	5	No	TBD	No	
97.	Maple Grove Rd	Fairview Ave - McMillan Rd	5	No	TBD	No	
98.	McDermott Rd	Lake Hazel Rd - I84	5	Yes - Principal Arterial	TBD	No	
99.	McMillan Rd	McDermott Rd - Locust Grove Rd	3	No	TBD	Yes - Safety (40CFR93.126)	
100.	McMillan Rd	Cloverdale Rd - Five Mile Rd	5	No	TBD	No	
101.	McMillan Rd	Five Mile Rd - Maple Grove Rd	3	No	TBD	Yes - Safety (40CFR93.126)	
102.	Meridian Rd	Cherry Ln -Chinden Blvd	5	No	TBD	No	
103.	Overland Rd	Meridian Rd - Maple Grove Rd	7	Yes - Principal Arterial	TBD	No	
104.	Overland Rd	Vista Ave - Federal Way	3	No	TBD	Yes - Safety (40CFR93.126)	
105.	SH 44	Ada Co. Line - Ballantyne Rd	4	Yes - Principal Arterial	Yes	No	
106.	SH 55	Beacon Light Rd - Brookside Ln	4	Yes - Principal Arterial	TBD	No	
107.	SH 69 Connection	Kuna Mora Rd - Kuna Rd	2	No	TBD	No	
108.	State St	Glenwood St - 27 <sup>th</sup> St	7	Yes - Principal	TBD	No	
109.	Ten Mile Rd	Lake Hazel - Victory Rd	5	Yes*	TBD	No	
110.	Ten Mile Rd	Victory Rd - US 20/26	5	No	TBD	No	
111.	Three City's River Crossing (new road & bridge)	Chinden Blvd - State St	5	Yes - Principal Arterial	Yes	No	9189
112.	US 20/26 Expressway	Can Ada Rd - Eagle Rd	4	Yes - Principal Arterial	Yes	No	
113.	Ustick Rd	Star Rd - Meridian Rd	5	Yes*	TBD	No	
114.	Victory Rd	Eagle Rd - Cloverdale Rd	3	No	TBD	Yes - Safety (40CFR93.126)	
115.	Victory Rd	Cloverdale Rd - Cole Rd	5	No	TBD	No	

\*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.

\*\* 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.

Table 22 shows estimated weekday VMT and PM<sub>10</sub> emissions for the 2030 "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 2030 are listed in the Appendix K. Table 23 and Table 24 display the VOC and NO<sub>x</sub> emissions estimates respectively.



Road Type	Paved Average Weekday VMT	Paved Road Dust Emissions	Tailpipe, Tire, and Brakewear Emissions	Total Paved Road PM <sub>10</sub> Emitted
	[VMT/day]	[Tons/day]	[Tons/day]	[Tons/day]
Interstate	3,849,052	25.84	0.12	25.96
Ramps	191,836	1.62	0.01	1.63
Principal Arterial	5,397,603	45.49	0.16	45.65
Minor Arterial	3,291,078	28.46	0.10	28.56
Collector	575,774	5.50	0.02	5.52
Local	24,732	0.42	0.00	0.42
Centroid Connectors	975,084	8.46	0.03	8.49
<b>Totals</b>	<b>14,305,159</b>	<b>115.79</b>	<b>0.43</b>	<b>116.22</b>

Road Type	Average Daily VMT	Ada County Vehicle VOC Emissions Factor	Canyon County Vehicle VOC Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	Estimated VOC Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	3,464,147	0.22	0.33	7.90	0.88
Ramps	172,652	0.25	0.38		0.05
Principal Arterials	4,857,843	0.24	0.35		1.31
Minor Arterials	2,961,970	0.24	0.35		0.80
Collectors	518,196	0.26	0.38		0.15
Local	22,259	0.26	0.38		0.01
Centroid Connectors	877,576	0.36	0.52		0.36
<b>Totals</b>	<b>12,874,643</b>	<b>NA</b>	<b>NA</b>		<b>7.90</b>

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

Road Type	Average Daily VMT	Ada County Vehicle NO <sub>x</sub> Emissions Factor	Canyon County Vehicle NO <sub>x</sub> Emissions Factor	% Of Ada VMT by Canyon County Vehicles <sup>2</sup>	NO <sub>x</sub> Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Tons/day]
Interstate	3,464,147	0.23	0.39	7.90	0.92
Ramps	172,652	0.24	0.43		0.05
Principal Arterials	4,857,843	0.21	0.37		1.19
Minor Arterials	2,961,970	0.21	0.37		0.72
Collectors	518,196	0.21	0.38		0.13
Local	22,259	0.18	0.31		0.00
Centroid Connectors	877,576	0.25	0.44		0.26
<b>Totals</b>	<b>12,874,643</b>	<b>NA</b>	<b>NA</b>		<b>7.90</b>

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> Refer to Appendix E for specific estimation methodologies.

## “Community Choices” vs. “Trend” Growth Scenarios

The 2030 transportation system outlined in *Communities in Motion* was tested with a “Trend” growth scenario to determine what role growth assumptions would play in regional emissions analyses of Northern Ada County. “Trend” growth follows common patterns of historical and current residential densities, much of which is low-density suburban-style housing, resulting in growth extending well beyond all areas of impact. “Trend” is based on the amount of vacant land, community redevelopment assumptions, current comprehensive plans, and existing densities. Overall, the “Trend” growth scenario represents a continuation of the current land use, employment, and population trends.

Table 25 shows the changes in the regional emissions analysis resulting from the use of the “Community Choices” growth scenario versus the “Trend” for the same 2030 transportation system. Higher density developments along existing transportation corridors tend to reduce trip lengths and promote alternative modes of travel. Thus, the VMT estimates for a “Community Choices” growth scenario are lower than those for a “Trend” scenario. A reduction in VMT results in a reduction of emissions.

Roadway Type	PM <sub>10</sub> [tons/day]		NO <sub>x</sub> [tons/day]		VOC [tons/day]	
	Trend	Community Choices	Trend	Community Choices	Trend	Community Choices
Interstate	26.58	25.96	0.92	0.92	0.90	0.88
Ramps	1.80	1.63	0.05	0.05	0.05	0.05
Principal Arterials	49.36	45.65	1.26	1.19	1.42	1.31
Minor Arterials	35.97	28.56	0.91	0.72	1.02	0.80
Collectors	6.68	5.52	0.16	0.13	0.18	0.15
Local Roads	0.48	0.42	0.01	0.00	0.01	0.01
Centroid Connectors	10.47	8.49	0.32	0.26	0.45	0.36
<b>Total</b>	<b>131.33</b>	<b>116.22</b>	<b>3.63</b>	<b>3.26</b>	<b>4.04</b>	<b>3.56</b>

## Unpaved Road Dust

Because unpaved roads are not included in any of COMPASS’ model networks, 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 26 displays the information used to estimate the PM<sub>10</sub> 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.

Analysis Year*	ADT	Unpaved Roads [Miles]	Unpaved VMT [VMT/day]	Unpaved Road Dust Emissions [Tons/day]
2008	120	76.88	9,226	1.36
2010	120	73.76	8,851	1.30
2012	120	70.64	8,477	1.25
2015	120	65.96	7,915	1.16
2025	120	50.36	6,043	0.89
2030	120	42.56	5,107	0.75

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.

\* 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 “Community Choices” 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<sub>10</sub> SIP Maintenance Plan and Redesignation Request*. This information is intended to aid air quality planning efforts when determining the need for CO mitigation measures.

### 2008 (Baseline) Scenario

The same baseline scenario used to estimate PM<sub>10</sub>, NO<sub>x</sub>, and VOC emissions was also used to estimate CO emissions. It includes 2008 population and employment estimates with an anticipated 2008 roadway network. Table 1 provides a list of applicable roadway projects used in the 2008 baseline model network. Table 27 shows estimated VMT and CO emissions from the 2008 baseline scenario. Appendix F lists the MOBILE6.2 input and output files for the 2008 scenario.

Road Type	Average Daily VMT	Ada County Composite Vehicle CO Emissions Factor <sup>2</sup>	Canyon County Composite Vehicle CO Emissions Factor <sup>2</sup>	% Of Canyon County Vehicles VMT in Ada <sup>3</sup>	Estimated CO Emitted <sup>1</sup>
	[VMT/day]	[g/mile]	[g/mile]		[Ton/day]
Interstate	2,003,135	14.75	17.90	7.37	33.08
Ramps	99,761	17.32	20.74		1.93
Principal Arterials	2,888,204	13.60	16.46		43.97
Minor Arterials	1,634,400	13.41	16.22		24.53
Collector	373,958	13.32	16.14		5.58
Local	13,312	11.74	14.23		0.17
Centroid Connectors	584,997	14.84	18.44		9.74
<b>Total</b>	7,597,767	NA	NA	7.37	119.01

<sup>1</sup> A conversion factor of 907,184.74 grams per ton was used.

<sup>2</sup> CO emissions factors used are 2007-winter. Refer to the PM<sub>10</sub> Maintenance Plan, Appendix A, pg 4-5.

<sup>3</sup> Refer to Appendix E for specific estimation methodologies.

### 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<sub>10</sub>, NO<sub>x</sub>, and VOC emissions. Table 1, Table 5, Table 9, Table 13, Table 17 and Table 21 provide more detailed information on the roadway projects used to develop the “build” scenario networks. Table 28 gives the “build” CO emissions estimates for 2010, 2012, 2015, 2025, and 2030.

<b>Table 28: “Build” Scenario Average Daily VMT and CO Emissions</b>					
	Year				
	2010	2012	2015	2025	2030
Average Daily “Build” VMT	8,045,365	8,818,455	9,437,744	12,144,005	12,874,643
“Build” CO Emissions ( <i>Ton/day</i> )	111.86	110.96	106.78	115.16	120.81

### No Build Scenarios

The “no build” scenarios use the 2008 (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 2008 transportation network. Table 29 gives the “no build” CO emissions estimates for 2010, 2012, 2015, 2025, and 2030.

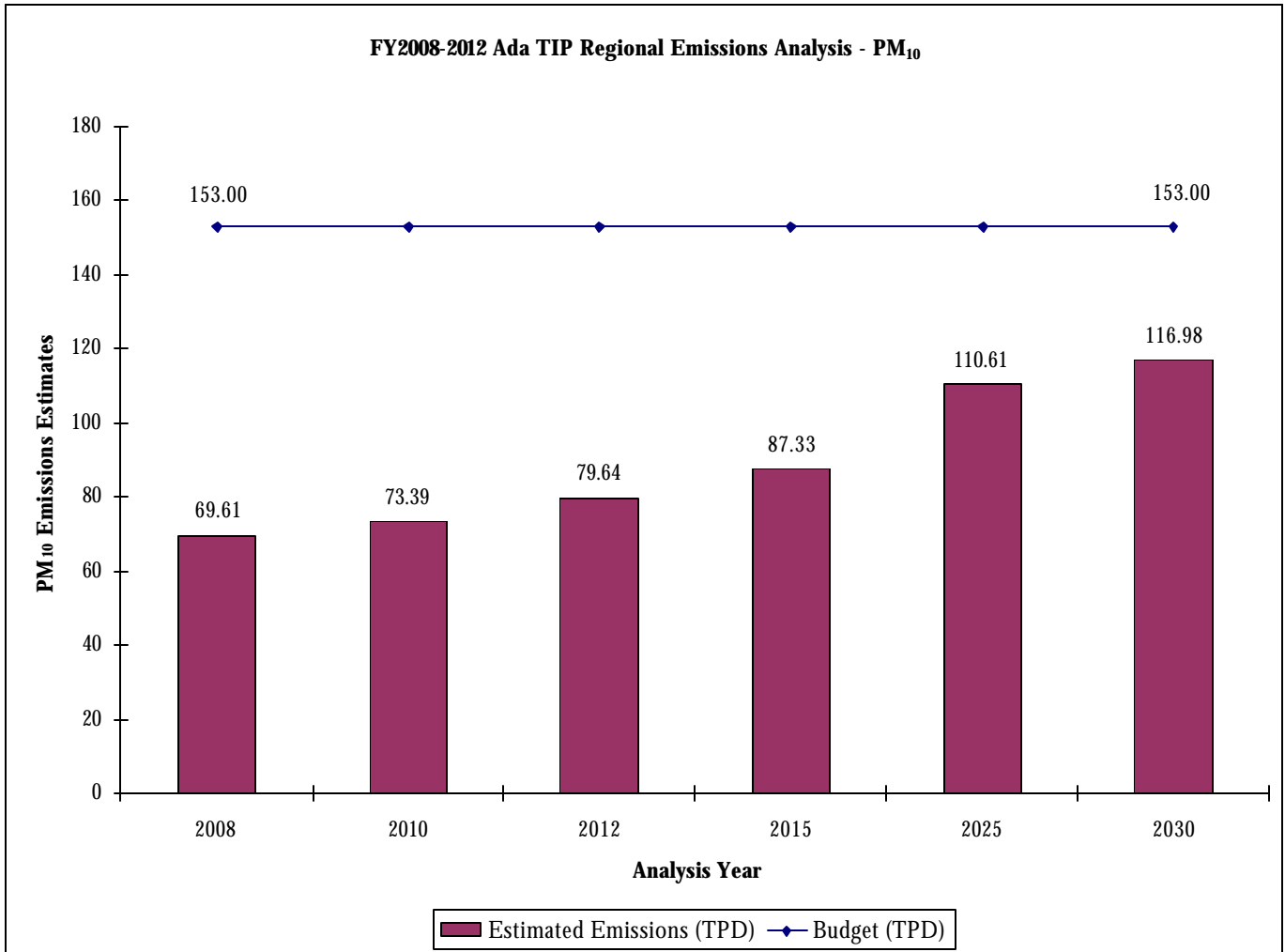
<b>Table 29: “No Build” Scenario Average Daily VMT and CO Emissions</b>					
	Year				
	2010	2012	2015	2025	2030
Average Daily “No Build” VMT	8,080,115	8,786,853	9,423,281	11,988,534	12,845,524
“No Build” CO Emissions ( <i>Ton/day</i> )	112.09	109.72	105.36	112.78	117.90

### III. CONCLUSIONS

#### PM<sub>10</sub> Budget Test

Figure 2 shows the results of the PM<sub>10</sub> budget test for the Northern Ada County FY2008-2012 TIP.

**Figure 2: Results of PM<sub>10</sub> Budget Test**

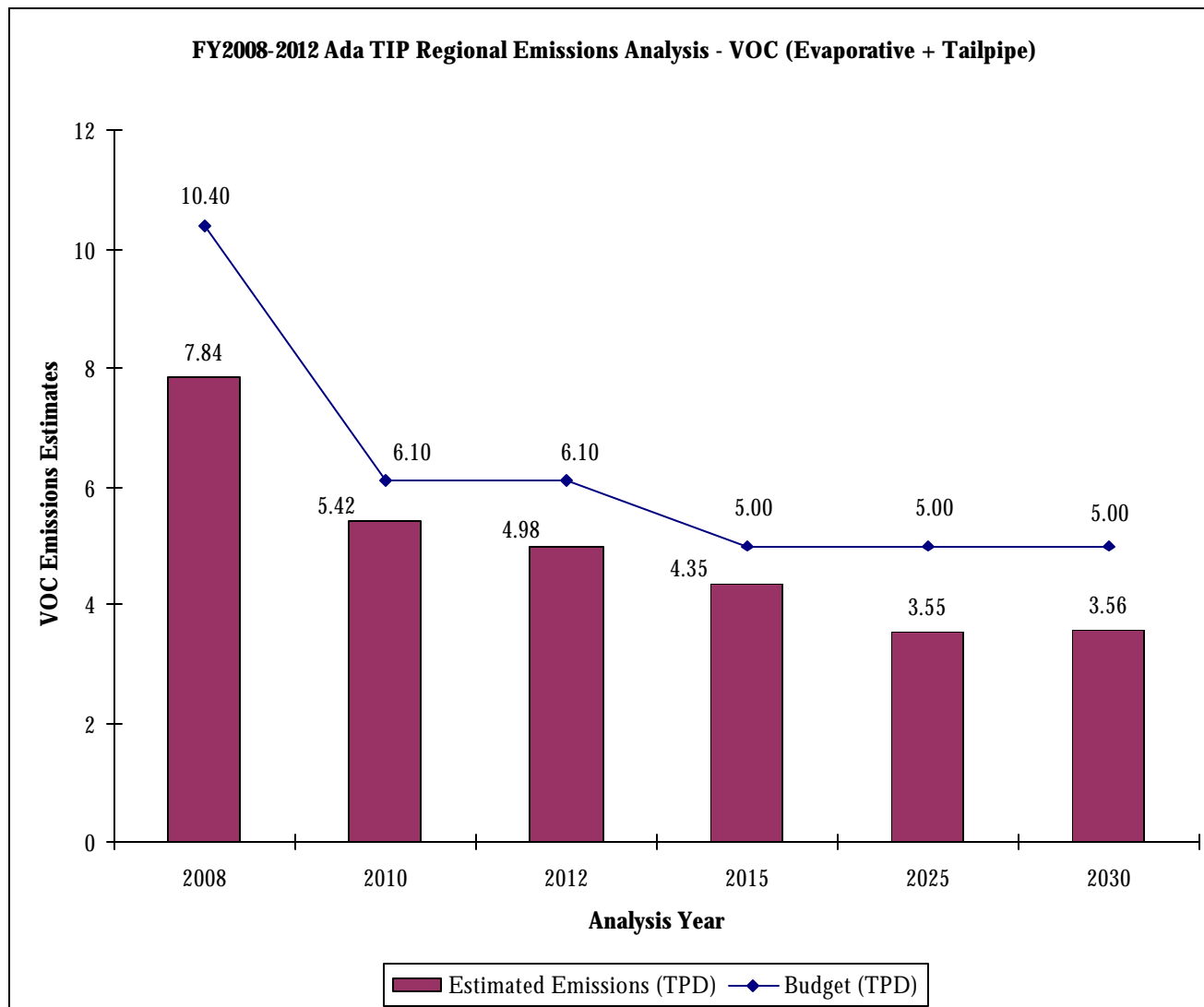


The results of the budget test show that the emissions impacts associated with the planned improvements to the Northern Ada County transportation system (projects listed in Table 1, Table 5, Table 9, Table 13, Table 17, and Table 21) will not exceed the PM<sub>10</sub> emissions budgets established by the Northern Ada County PM<sub>10</sub> SIP Maintenance Plan.

## VOC Budget Test

Figure 3 shows the results of the VOC budget test for the Northern Ada County FY2008-2012 TIP.

**Figure 3: Results of VOC Budget Test**

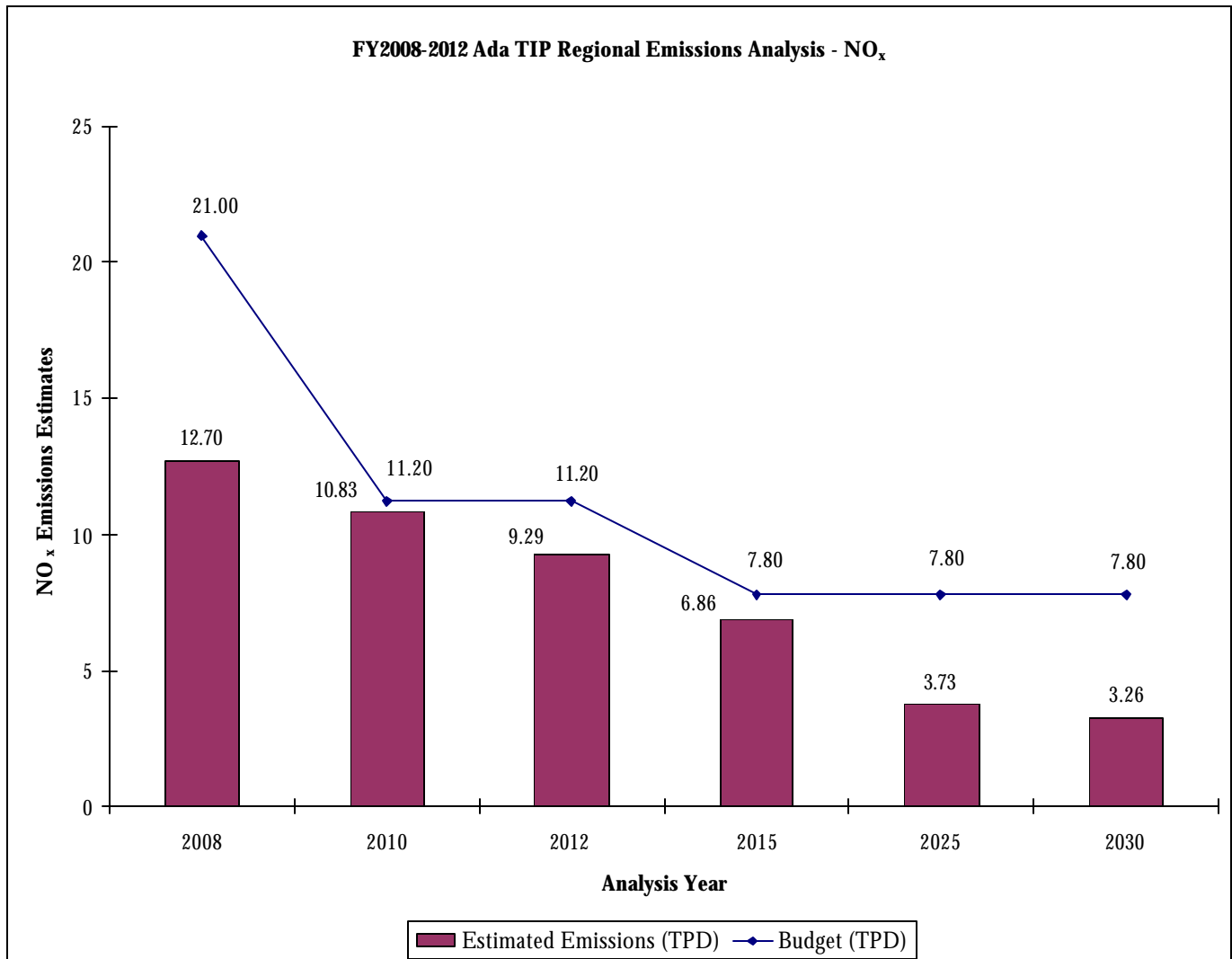


The results of the budget test shows that the emissions impacts associated with the planned improvements to the Northern Ada County transportation system (projects listed in Table 1, Table 5, Table 9, Table 13, Table 17, and Table 21) will not exceed the VOC emissions budgets established by the Northern Ada County PM<sub>10</sub> SIP Maintenance Plan.

## NO<sub>x</sub> Budget Test

Figure 4 shows the results of the NO<sub>x</sub> budget test for the Northern Ada County FY2008-2012 TIP.

**Figure 4: Results of NO<sub>x</sub> Budget Test**



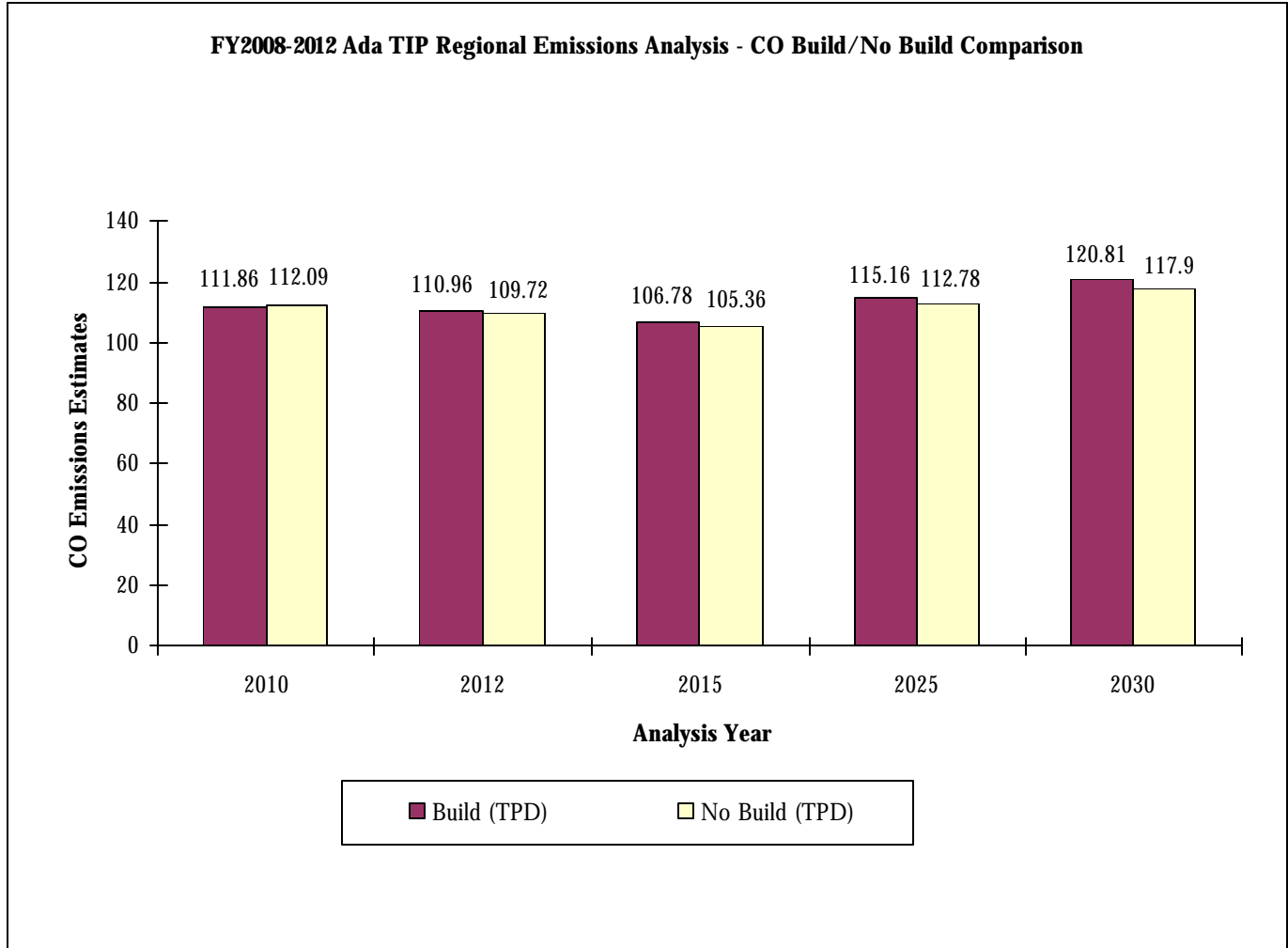
The results of the budget test shows that the emissions impacts associated with the planned improvements to the Northern Ada County transportation system (projects listed in Table 1, Table 5, Table 9, Table 13, Table 17, and Table 21) will not exceed the NO<sub>x</sub> emissions budgets established by the Northern Ada County PM<sub>10</sub> SIP Maintenance Plan.

## 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.

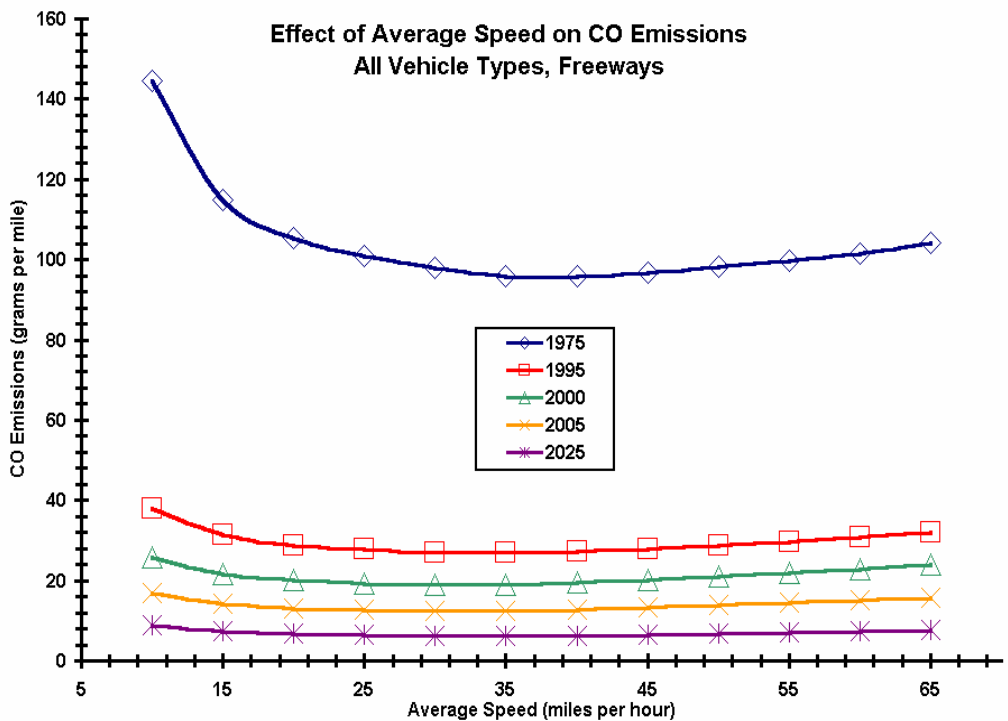
**Figure 5: Results of CO Build/No Build Comparison**



Every comparison, with the exception of 2010, shows an increase in CO emissions for the “build” scenarios. 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)

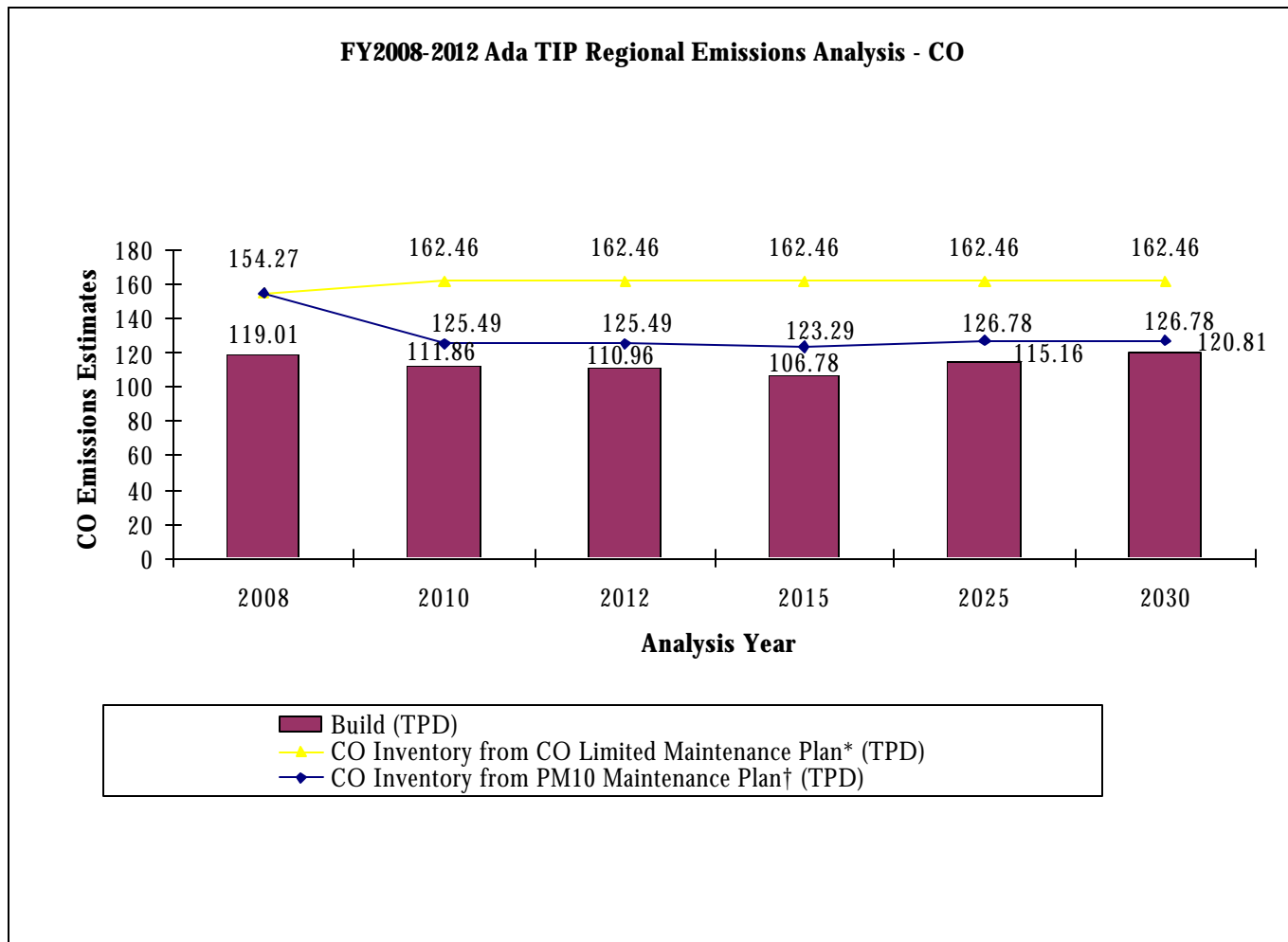


As a result of this analysis, IDEQ may choose to require CO mitigation measures. However, COMPASS' past work with several local governments to mitigate open burning impacts may be considered more than adequate to offset the CO emissions increases forecasted in "build" scenarios.

**Emissions Inventory Comparisons:**

To aid in the evaluation of the CO impacts related to the Northern Ada County FY2008-2012 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<sub>10</sub> SIP Maintenance Plan and Redesignation Request*.

**Figure 7: Comparison of the CO “Build” Scenario to the CO and PM<sub>10</sub> Inventories**



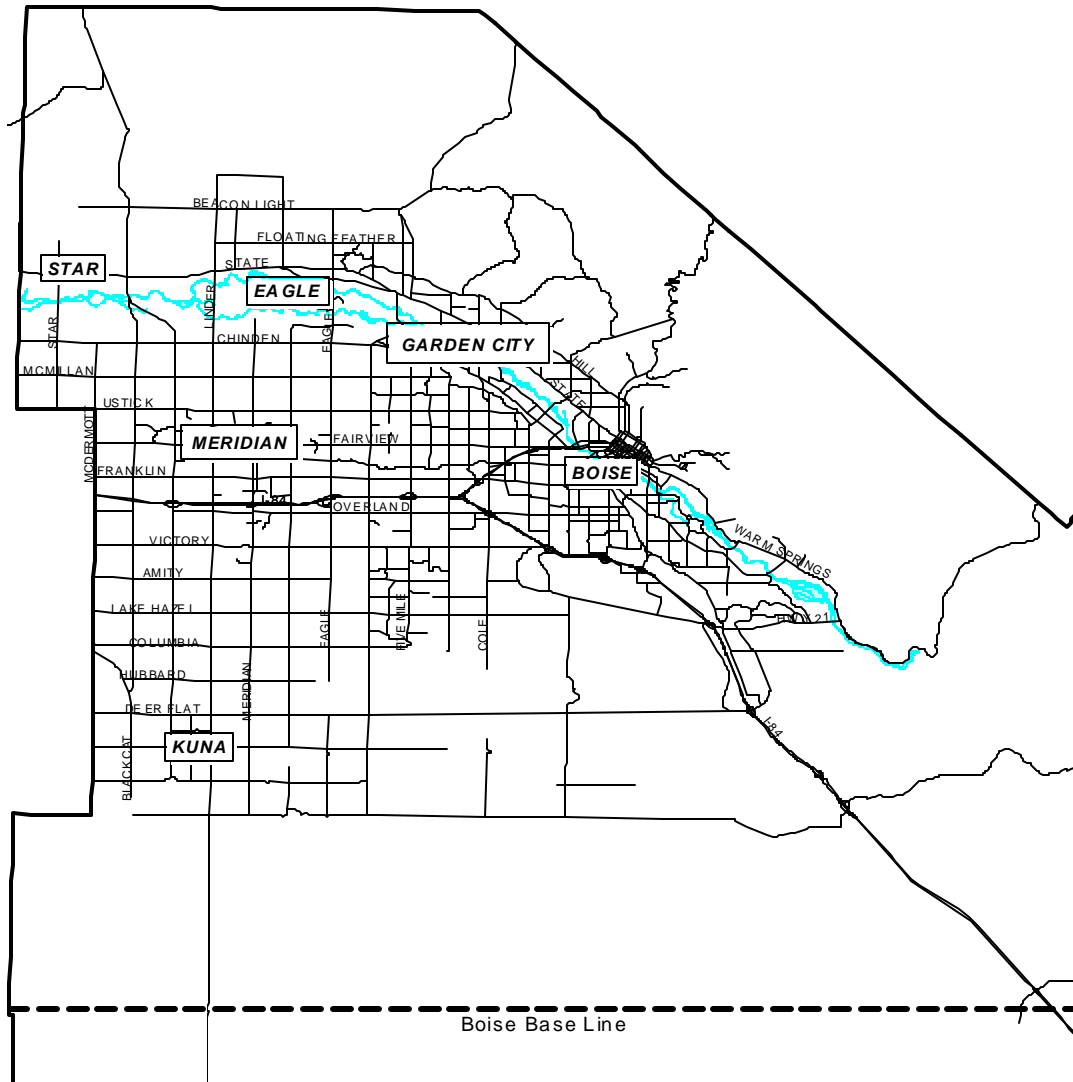
\*From Table VI.H-4 in Appendix A of the *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area*. Inventory forecasts for 2000 are used to compare to 2008. Inventory forecasts for 2010 are used to compare to 2012, 2015, 2025, and 2030.

†Emissions estimates from Tables 4-3, 9-1, 9-2, and 9-3 in Appendix A of the *Northern Ada County PM<sub>10</sub> SIP Maintenance Plan and Redesignation Request*. Inventory forecasts for 1999 are used to compare to 2008. Inventory forecasts for 2010 are used to compare to 2010 and 2012. Inventory forecasts for 2015 are used to compare to 2015. Inventory forecasts for 2020 are used to compare to 2025 and 2030.

These comparisons show that, despite the results of the build/no-build comparisons, the planned transportation system in Northern Ada County will not increase CO emissions above levels already anticipated by IDEQ.

# **APPENDICES**

# Appendix A: Northern Ada County PM<sub>10</sub> and CO Maintenance Area



## Appendix B: Glossary of Acronyms

ACHD	Ada County Highway District
ADT	Average Daily Traffic
AQB	Air Quality Board
CAAA	Clean Air Act Amendment
CIM	<i>Communities in Motion</i>
CMAQ	Congestion Mitigation and Air Quality, a federal funding source for air quality
CO	Carbon Monoxide
COMPASS	Community Planning Association of Southwest Idaho
DAC	Demographic Advisory Committee
DOT	US. Department of Transportation
EPA	US. Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
g	Grams
IDEQ	Idaho Department of Environmental Quality
I/M	(Vehicle) Inspection and Maintenance Program
ITD	Idaho Transportation Department
kg	Kilograms
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NHS	National Highway System
NO <sub>x</sub>	Oxides of Nitrogen
NRS	Not Regionally Significant
PM <sub>10</sub>	Particulate Matter with a diameter less than 10 micrometers (i.e. 1x10 <sup>-6</sup> )
SH	State Highway
SIP	State Implementation Plan
STIP	State Transportation Improvement Program
TCM	Transportation Control Measure
TDM	Travel Demand Model
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

## Appendix C: 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 recommending 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 of *Communities in Motion*, the new long range transportation plan for a six-county area including Ada and Canyon Counties. The 2002 model, with the inclusion of the mode choice tool was approved for use by TMAC on May 2, 2006.

### 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 C-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 of 2002 with the goal of gathering travel information from 2,400 households. The survey was completed in early 2003. Data was collected from 2,582 households. Final data sets from the survey were submitted to COMPASS that 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 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).

#### Demographic Data Forecasts:

COMPASS' Demographic Advisory Committee develops area-wide demographic forecasts on population, households and employment. Forecasts are first developed for large demographic sub 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.

*Communities in Motion*, the region's long range transportation plan, has a horizon year of 2030. Adjustments to the demographic areas (and the TAZs within those areas) were made to produce two distinct 2030 growth forecasts for the plan; a "Trend" growth scenario and "Community Choices" growth scenario. Both use the same two county (Ada and Canyon) population control total for 2030 of 825,000.

The goal of the "Trend" forecast was to allocate future growth based on prevailing residential patterns and densities using estimates of vacant and redevelopable land. Ada and Canyon County Assessors' files were used to develop an inventory of vacant and redevelopable land. Criteria for redevelopable land were created and reviewed with COMPASS' Demographic Advisory Committee.

In contrast, "Community Choices" combines modest land use intensification/densification along transportation corridors with additional employment and population growth in outlying communities. Less suburban residential development is anticipated in this growth scenario, as compared with the Trend. With more infill development (and thus increased densities) in the corridor areas, this scenario consumes less land than the "Trend."

Interim year estimates of regional households and employment are interpolated using the base year estimate and the 2030 "Community Choices" growth scenario as endpoints. 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 (LOS) "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 *Communities in Motion*. It is based on the mode choice model utilized by the Salt Lake City regional MPO (Wasatch Front Regional Council).

The transit network is input 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 location need to be input 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 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.

#### **Model Calibration and Validation:**

The latest calibration of COMPASS’ two-county travel demand model was completed in April of 2004. 2002 was chosen as the model’s demographic and land use “calibration year” to coincide with COMPASS’ most recent household travel survey. Parcel data from both counties were obtained and each parcel was identified with its current use, status (built, vacant, re-developable, or exempt) and comprehensive plan use. The U.S. census data was allocated and adjusted to 2002 using the parcel data for each of the cities and counties. Employment data was purchased from a third party vendor and input into the model for 2002. Existing roadway network characteristics (e.g. number of lanes, posted speed) were also verified. Roadway capacities in the model were evaluated and updated as appropriate per the Highway Capacity Manual – 2000 update.

As per federal guidance, the 2002 calibration of the COMPASS travel demand model was validated to traffic count data. Traffic count data for 2002/2003 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 2002 calibration of 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. This involves testing the model’s response to changes made to its inputs. The results of this validation exercise met expectations. TMAC reviewed the validation statistics and approved the use of the 2002 model calibration without the mode choice model in May of 2004. For more information on the calibration and validation of the COMPASS model, visit <http://www.compassidaho.org/prodserve/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 2004/2005. 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 May 2, 2006.

#### **Model Data Uses**

COMPASS’ travel demand model produces forecasts of average weekday traffic volumes (ADT), 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:

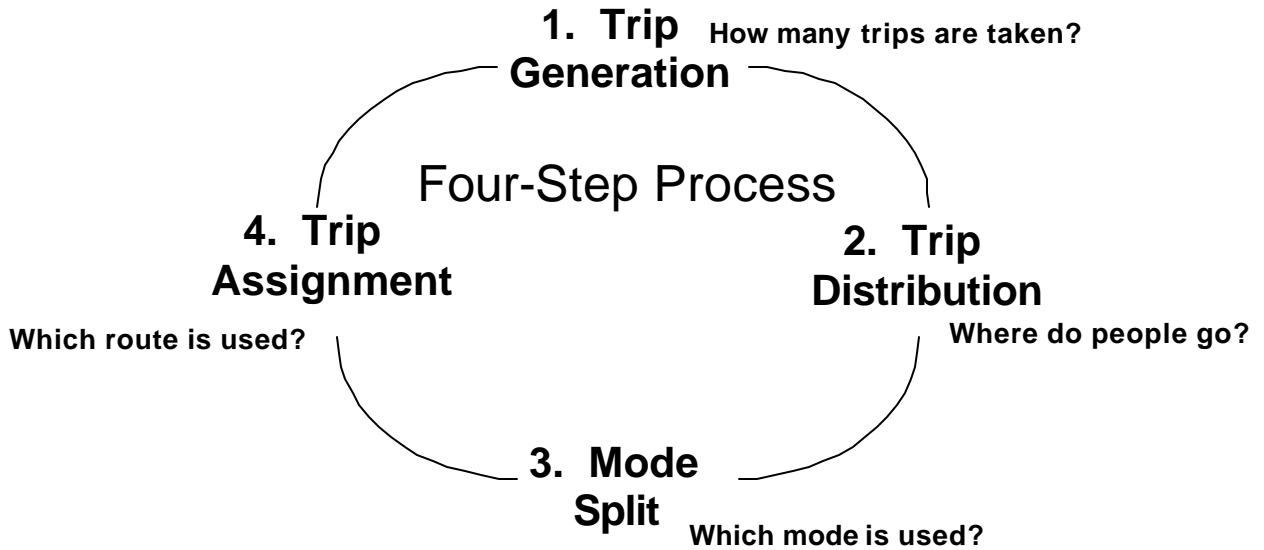
- Traffic Impact Studies – These studies determine traffic impacts of new developments such as a new retail mall.
- Roadway Network Deficiency Analyses - These highlight potential future roadway inefficiencies and/or



needs as a result of additional growth or other network modifications.

- Regional Emissions Analyses – Regional emissions analyses 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 8 : 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 D: Approved Modeling Assumptions and Emissions Estimation Methodologies

### Table 30: Northern Ada County FY2008-2012 TIP MOBILE Model Input Assumptions

Parameter	ICC Approved FY2008-2012 TIP	Previously Presented	Note
Fleet Mix	EPA MOBILE6.2 defaults. Based on national fleet mix data	Same	COMPASS will continue working with IDEQ and ITD develop local fleet characteristics for use in Treasure Valley emissions modeling.
I/M Program	Two Annual programs: One is a two speed test (idle and 2500 RPM) for only pre 1996 vehicles, the other is an OBDII Test for 1996 and newer vehicles. 2500 RPM: Waiver Rates = 1%, 1%; Stringency = 27%. OBD: Waiver Rates = 0.0% and 1%. Compliance Rate = 98% for both programs.	Same	Data acquired from/confirmed by Denis Turner, Air Quality Board, on 3-1-2007.
Anti-Tamper Program	Annual check for gasoline vehicles. Model years 1981 and newer are checked for tampering with: Air Pump, Catalyst, fuel inlet restrictor, EGR, and the gas cap. Compliance rate is 98%.	Same	Data acquired from/confirmed by Denis Turner, Air Quality Board, on 3-1-2007.
Min/Max Temp.	Winter = 28.95 / 47.46 F Summer = 49.29 / 78.18	Winter = 31.25 / 48.20 F Summer = 46.77 / 73.22	Although these temperatures are different from the ones used in the PM <sub>10</sub> Maintenance Plan, they have been used for conformity since at least 2004. ITD's PLAQ uses different temperatures for project screening purposes.
Fuel Reid Vapor Pressure (RVP)	Winter = 15; 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 and Minor Arterials, Collectors, Local Roads, and Centroid Connectors.	Same	Per PM <sub>10</sub> Maintenance Plan Methodology.
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%	Winter = 26.39% Summer = 37.62%	Although these values are different from the ones used in the PM <sub>10</sub> 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 2009, 2011, 2013, 2016, 2026, and 2031. This will allow us to take credit for some fleet turnover in November and December.

## Summary of the Northern Ada County Regional Emissions Analysis Methodologies

**Budget Tests:** A Budget Test was used to demonstrate conformity of the Northern Ada County FY2008-2012 TIP for NO<sub>x</sub>, VOC, and PM<sub>10</sub>. The test used the PM<sub>10</sub> 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 (TPD).

**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<sub>10</sub> 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<sub>adj</sub> = 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<sub>x</sub> = Total VOC emission factor (tailpipe + evaporative, in grams VOC/mile) for a specific vehicle class on a given roadway type

RE<sub>x</sub> = Refueling VOC emissions factor for a specific vehicle class (in grams VOC/mile)

F<sub>x</sub> = Fraction of vehicle class X in total fleet

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

**PM Emissions:** PM<sub>10</sub> emissions were calculated using average weekday VMT, not average daily VMT, per the Northern Ada County PM<sub>10</sub> 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<sub>10</sub> Maintenance Plan. A CO planning analysis is not required by FHWA, but is a requirement of the CO Limited Maintenance Plan.

**Methodology for Determining MOBILE Model Facility Speeds:** First, 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<sub>L</sub> = VMT weights containing speed for each link (miles<sup>2</sup>/ hour)

S<sub>L</sub> = Congested speed of the link (miles/hour)

VMT<sub>L</sub> = 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<sup>2</sup>/ 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<sub>10</sub> Maintenance Plan's emission inventory and motor vehicle emissions budgets.

MOBILE6.2 Modeling of Facility Types:

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<sub>L</sub> = The MOBILE6.2 emissions factor for local roads modeled as a local road (grams/mile)

EF<sub>AL</sub> = 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<sub>10</sub> 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 of 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<sub>10</sub> Maintenance Plan and used to establish the PM<sub>10</sub> 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<sub>10</sub>/VKT/mps)

$C_{C,S,T}$  = Constant assumed to be 8.58 grams PM<sub>10</sub>/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.

Using 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<sub>10</sub>/VKT/mps)

$C_{C,S,T}$  = Constant dependant on County, setting, and season (grams PM<sub>10</sub>/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<sub>10</sub> emissions factor per setting and season (grams PM<sub>10</sub>/VKT)

$b_{S,T}$  = Roadway emissions potential per setting and season (grams PM<sub>10</sub>/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<sub>10</sub> 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<sub>10</sub> emissions for a given link (grams PM<sub>10</sub>/day)

$EF_{C,L}$  = Composite PM<sub>10</sub> emissions factor for a given link (grams PM<sub>10</sub>/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<sub>10</sub>/day.

## Appendix E: Emissions Adjustment Factors

Separate emissions factors were developed to account for the Canyon County resident portion of Ada County VMT. Estimates of the Canyon portion of Ada VMT were based on COMPASS' 2002 Household Travel Survey. The only difference between the Canyon County emissions factors and Ada County's are the impacts associated with the I/M program. According to the *2002 Household Travel Survey*, 32.2% of Canyon County residents commute to work in Ada County during the week. Therefore, to more accurately represent the emissions of the Canyon County vehicles commuting on Ada County roadways:

### **2008 Percentage Ada VMT traveled by Canyon Vehicles:**

% Canyon County Emissions in Ada:

32% Canyon Pop. That work in Ada from Table 28 of the *2002 Treasure Valley Transportation Survey*

33.70% Going Home trips from Table 35 of the *2002 Household Travel Survey*

8.30% Work Trips from Table 35 of the *2002 Household Travel Survey*

5.40% Work Related Trips from Table 35 of the *2002 Household Travel Survey*

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47.40% Sum of all Canyon work related trips per *2002 Household Travel Survey*

Therefore:

32% Canyon Commuting Pop. x

47.40% of Canyon Trips related to work =

15.17% Canyon Trips that involve Ada travel, based on work trips.

2008	Average Daily Canyon VMT (From COMPASS TDM)	15.17% x 3,693,053 VMT = 560,162	Estimated Canyon VMT that includes Ada travel, based on work trips.
Interstate	980,640		
P. Art	1,236,359	560,162 VMT ÷ 7,597,767 Ada VMT = .0737	
M. Art	809,003		
Collector	312,831		.0737 x 100 =
Local	15,865		
Ramp	45,896		
Centroid Conn.	292,459		
<b>Total</b>	<b>3,693,053</b>		<b>7.37% Of Ada's 2007 VMT from Canyon Commuters</b>



**2010 Percentage Ada VMT traveled by Canyon Vehicles:**

<b>2010</b>	<b>Average Daily Canyon VMT (From COMPASS TDM)</b>		
		$15.17\% \times 3,961,989 \text{ VMT} = 600,954$	Estimated Canyon VMT that includes Ada travel, based on work trips.
Interstate	1,025,415		
P. Art	1,309,883	$600,954 \text{ VMT} \div 8,045,365 \text{ Ada VMT} = .0747$	
M. Art	887,079		
Collector	359,933		$.0747 \times 100 =$
Local	18,111		
Ramp	47,916		<b>7.47%</b>
Centroid Conn.	313,651		<b>Of Ada's 2010 VMT from Canyon Commuters</b>
<b>Total</b>	<b>3,961,989</b>		

**2012 Percentage Ada VMT traveled by Canyon Vehicles:**

<b>2012</b>	<b>Average Daily Canyon VMT (From COMPASS TDM)</b>		
		$15.17\% \times 4,400,100 \text{ VMT} = 667,407$	Estimated Canyon VMT that includes Ada travel, based on work trips.
Interstate	1,159,039		
P. Art	1,435,034	$667,407 \text{ VMT} \div 8,818,455 \text{ Ada VMT} = .0757$	
M. Art	994,034		
Collector	398,693		$.0757 \times 100 =$
Local	20,000		
Ramp	50,866		<b>7.57%</b>
Centroid Conn.	342,434		<b>Of Ada's 2012 VMT from Canyon Commuters</b>
<b>Total</b>	<b>4,400,100</b>		

**2015 Percentage Ada VMT traveled by Canyon Vehicles:**

<b>2015</b>	<b>Average Daily Canyon VMT (From COMPASS TDM)</b>		
		$15.17\% \times 4,715,936 \text{ VMT} = 715,313$	Estimated Canyon VMT that includes Ada travel, based on work trips.
Interstate	1,220,597		
P. Art	1,553,677	$715,313 \text{ VMT} \div 9,437,744 \text{ Ada VMT} = .0758$	
M. Art	1,075,236		
Collector	424,394		$.0758 \times 100 =$
Local	20,806		
Ramp	54,105		<b>7.58%</b>
Centroid Conn.	367,120		<b>Of Ada's 2015 VMT from Canyon Commuters</b>
<b>Total</b>	<b>4,715,936</b>		

**2025 Percentage Ada VMT traveled by Canyon Vehicles:**

<b>2025</b>	<b>Average Daily Canyon VMT (From COMPASS TDM)</b>	15.17% x 6,337,641 VMT = 961,293	Estimated Canyon VMT that includes Ada travel, based on work trips.
Interstate	1,581,353		
P. Art	1,987,017	961,293 VMT ÷ 12,144,005 Ada VMT = .0795	
M. Art	1,506,643		
Collector	716,314		.0792 x 100 =
Local	30,356		
Ramp	68,071		<b>7.92% Of Ada's 2025 VMT from Canyon Commuters</b>
Centroid Conn.	447,888		
<b>Total</b>	<b>6,337,641</b>		

**2030 Percentage Ada VMT traveled by Canyon Vehicles:**

<b>2030</b>	<b>Average Daily Canyon VMT (From COMPASS TDM)</b>	15.17% x 6,706,324 VMT = 1,017,215	Estimated Canyon VMT that includes Ada travel, based on work trips.
Interstate	1,648,076		
P. Art	2,559,264	1,017,215 VMT ÷ 12,874,643 Ada VMT = .0790	
M. Art	1,336,781		
Collector	593,577		.0790 x 100 =
Local	22,126		
Ramp	75,243		<b>7.90% Of Ada's 2030 VMT from Canyon Commuters</b>
Centroid Conn.	471,257		
<b>Total</b>	<b>6,706,324</b>		

Once the percentage of Canyon vehicle travel on the Ada County’s roadway network was calculated for each analysis year, emissions were estimated using the Ada VMT and network speeds for a 100% Ada fleet and a 100% Canyon fleet. The total emissions for a given analysis were the sum of the portion of Canyon fleet emissions in Ada and the portion of Ada fleet emissions:

$$E_T = E_C(VMT_F) + (E_A(1 - VMT_F))$$

Where:

$E_T$  = Total Ada County Emissions (tons/day)

$E_C$  = Emissions resulting from a 100% Canyon County Fleet on Ada’s Network (tons/day).

$E_A$  = Emissions resulting from a 100% Ada County Fleet on Ada’s Network (tons/day).

$VMT_F$  = Fraction Ada VMT traveled by Canyon County vehicles (percentages derived above ÷ 100%).

Example:

2008 Interstate NOx Emissions =

$$\left[ \left( \frac{2,003,135 \text{ VMT/day} \times 1.72 \text{ grams/mile}}{90718474 \text{ grams/ton}} \right) \times (0.0737) \right] + \left[ \left( \frac{2,003,135 \text{ VMT/day} \times 1.86 \text{ grams/mile}}{90718474 \text{ grams/ton}} \right) \times (1 - 0.0737) \right] = 3.82 \text{ TPD}$$

## **Appendix F: 2008 Baseline Scenario, MOBILE6.2 Model Files**

**Ada Vehicle Input File: A08Bas.IN**  
**Canyon Vehicle Input File: C08Bas.IN**  
**Ada Vehicle Output Files: A08Bas.OUT, A08Bas.PM**  
**Canyon Vehicle Output Files: C08Bas.OUT, C08Bas.PM**

## **Appendix G: 2010 Scenario, MOBILE6.2 Model Files**

### **“Build” Scenario**

**Ada Vehicle Input File: A10Act.IN**

**Canyon Vehicle Input File: C10Act.IN**

**Ada Vehicle Output Files: A10Act.OUT, A10Act.PM**

**Canyon Vehicle Output Files: C10Act.OUT, C10Act.PM**

### **“No Build” Scenario**

**Ada Vehicle Input File: A10Bas.IN**

**Canyon Vehicle Input File: C10Bas.IN**

**Ada Vehicle Output Files: A10Bas.OUT, A10Bas.PM**

**Canyon Vehicle Output Files: C10Bas.OUT, C10Bas.PM**

## **Appendix H: 2012 Scenarios, MOBILE6.2 Model Files**

### **“Build” Scenario**

**Ada Vehicle Input File: A12Act.IN**

**Canyon Vehicle Input File: C12Act.IN**

**Ada Vehicle Output Files: A12Act.OUT, A12Act.PM**

**Canyon Vehicle Output Files: C12Act.OUT, C12Act.PM**

### **“No Build” Scenario**

**Ada Vehicle Input File: A12Bas.IN**

**Canyon Vehicle Input File: C12Bas.IN**

**Ada Vehicle Output Files: A12Bas.OUT, A12Bas.PM**

**Canyon Vehicle Output Files: C12Bas.OUT, C12Bas.PM**

## **Appendix I: 2015 Scenario, MOBILE6.2 Model Files**

### **“Build” Scenario**

**Ada Vehicle Input File: A15Act.IN**

**Canyon Vehicle Input File: C15Act.IN**

**Ada Vehicle Output File: A15Act.OUT, A15Act.PM**

**Canyon Vehicle Output File: C15Act.OUT, C15Act.PM**

### **“No Build” Scenario**

**Ada Vehicle Input File: A15Bas.IN**

**Canyon Vehicle Input File: C15Bas.IN**

**Ada Vehicle Output Files: A15Bas.OUT, A15Bas.PM**

**Canyon Vehicle Output Files: C15Bas.OUT, C15Bas.PM**

## **Appendix J: 2025 Scenario, MOBILE6.2 Model Files**

### **“Build” Scenario**

**Ada Vehicle Input File: A25Act.IN**

**Canyon Vehicle Input File: C25Act.IN**

**Ada Vehicle Output Files: A25Act.OUT, A25Act.PM**

**Canyon Vehicle Output Files: C25Act.OUT, C25Act.PM**

### **“No Build” Scenario**

**Ada Vehicle Input File: A25Bas.IN**

**Canyon Vehicle Input File: C25Bas.IN**

**Ada Vehicle Output Files: A25Bas.OUT, A25Bas.PM**

**Canyon Vehicle Output Files: C25Bas.OUT, C25Bas.PM**



## **Appendix K: 2030 Scenario, MOBILE6.2 Model Files**

### **“Build” Scenario**

**Ada Vehicle Input File: A30Act.IN**

**Canyon Vehicle Input File: C30Act.IN**

**Ada Vehicle Output Files: A30Act.OUT, A30Act.PM**

**Canyon Vehicle Output Files: C30Act.OUT, C30Act.PM**

### **“No Build” Scenario**

**Ada Vehicle Input File: A30Bas.IN**

**Canyon Vehicle Input File: C30Bas.IN**

**Ada Vehicle Output Files: A30Bas.OUT, A30Bas.PM**

**Canyon Vehicle Output Files: C30Bas.OUT, C30Bas.PM**

## **Appendix L: Public Comments and COMPASS Responses**

The 30-day public comment period began June 25, 2007 and ended on July 24, 2007 for the Conformity Demonstration of the FY2008-2012 Northern Ada County Transportation Improvement Program. This document was presented to the COMPASS Board on August 20, 2007. COMPASS did not receive any public comments regarding this document.