Community
Planning
Association

Report No. 11-2005

Particulate Matter

Air Quality Conformity Demonstration of the FY 2006-2010 Northern Ada County TIP

Community Planning Association of Southwest Idaho

Matthew J. Stoll
Executive Director

September 2005

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 58-0101).

COMPASS
COMMUNITY PLANNING ASSOCIATION
of Southwest Idaho

RESOLUTION NO. 20-2005

FOR THE PURPOSE OF APPROVING (1) THE AIR QUALITY CONFORMITY DEMONSTRATION AND (2) THE FY2006-2010 NORTHERN ADA COUNTY TRANSPORTATION IMPROVEMENT PROGRAM

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

WHEREAS, the Transportation Equity Act for the 21st Century and Title 23 Part 450.322 of the Code of Federal Regulations require Metropolitan Planning Organizations to develop and approve a Transportation Improvement Program; and

WHEREAS, the 1990 Clean Air Act Amendment requires all transportation plans and programs in nonattainment areas demonstrate conformity to applicable state implementation plans for air quality improvements; and

WHEREAS, the final rule for Metropolitan Transportation Planning, under 23 CFR 450 and 49 CFR 613, requires projects contained in the Transportation Improvement Program to be financially constrained; and

WHEREAS, the Community Planning Association has adopted a public involvement process to provide adequate commenting opportunities for citizens, member agencies and other interested parties, in compliance with all applicable State and Federal rules; and

WHEREAS, the Community Planning Association has developed an FY2006-2010 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 approves the Air Quality Conformity Demonstration of the FY2006-2010 Northern Ada County Transportation Improvement Program; and

BE IT FURTHER RESOLVED, that the Community Planning Association Board of Directors approves the FY2006-2010 Northern Ada County Transportation Improvement Program and, hereby, directs staff to submit the FY2006-2010 Northern Ada County Transportation Improvement Program to the Idaho Transportation Board for inclusion in the Statewide Transportation Improvement Program.

Dated this 19th day of September 2005.

APPROVED:

By: _____
Bob Flowers, Chair
Community Planning Association Board

ATTEST:

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

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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 and the Federal Transit Administration to make a transportation conformity finding for the Northern Ada County FY2006-2010 Transportation Improvement Program.

SUMMARY

A transportation air quality conformity demonstration with budget tests was developed for the FY2006-2010 Northern Ada County Transportation Improvement Program (TIP) pursuant to 40CFR93. EPA's MOBILE6 emissions model and COMPASS' most current travel demand model were used to estimate pollutant emissions from transportation sources. The Northern Ada County Interagency Consultation Committee on Transportation Conformity (ICC) approved the modeling methodologies and assumptions for the regional emissions analyses as well as the lists of transportation (roadway) projects included in the travel demand model. Additionally, COMPASS' Transportation Model Advisory Committee approves travel demand model assumptions. Demographic assumptions and forecasts used in this demonstration were approved by COMPASS' Demographic Advisory Committee and Board of Directors.

The *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request* contains motor vehicle emissions budgets for three pollutants: coarse particulate matter (PM_{10}), oxides of nitrogen (NO_X), and volatile organic compounds (VOCs). Emissions budget tests, as required by 40CFR93.118, demonstrate conformity of the FY2006-2010 Northern Ada County TIP from 2006 to the year 2030.

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 as well as to the public. Since 1977, COMPASS, formerly known as Ada Planning Association, has been designated as the Metropolitan Planning Organization (MPO) for Northern Ada County. In addition, COMPASS was designated as the MPO for the Nampa Urbanized Area, located in neighboring Canyon County, in April 2003. The agency's service area covers the cities of Boise, Caldwell, Eagle, Garden City, Kuna, Meridian, Middleton, Nampa, and Star.

Area's Designations

Northern Ada County is designated as a maintenance area in attainment of the carbon monoxide (CO) National Ambient Air Quality Standard (NAAQS). Appendix A shows the extents of the maintenance area boundaries. This area has not experienced a violation of the CO NAAQS since 1987. The Idaho Department of Environmental Quality (IDEQ) submitted the *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County Carbon Monoxide Not-Classified Nonattainment Area* to the EPA in December 2001. The EPA approved the Limited Maintenance Plan and subsequently redesignated the area in December 2002.

Additionally, Northern Ada County is designated as a maintenance area in attainment of the 24-hour PM_{10} NAAQS and an attainment area for the annual PM_{10} standard. No violation of the 24-hour PM_{10} NAAQS has occurred since 1991. Prior to March 12, 1999, Northern Ada County was designated as a nonattainment area for PM_{10}. However, on that date the EPA Administrator signed a revocation of Northern Ada County's nonattainment designation based on changes made to the PM_{10} NAAQS. This ruling was challenged in the Ninth District Circuit Court. On January 31, 2001, the U.S. Department of Justice approved a settlement agreement for the Idaho Clean Air Force et al. v. EPA et al. lawsuit. A major component of the settlement agreement required the Idaho Department of Environmental Quality to update Northern Ada County's PM_{10} State Implementation Plan (SIP). In September of 2003, the EPA approved the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request*.

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

Means of Quantitative Analysis

This air quality conformity demonstration is based upon vehicle miles of travel (VMT) forecasts, produced using COMPASS' travel demand model. Regional emissions factors were generated using the latest version of EPA's MOBILE6 emissions model (MOBILE 6.2).

COMPASS' Travel Demand Model:
The travel demand model provides a forecast of average (week) day traffic (ADT) for each link of a given transportation network and demographic data set. COMPASS utilizes Citilab's Cube/Voyager software and TP+ scripting language to produce these forecasts. The model's transportation network includes interstates, principal arterials, minor arterials, most collectors, and select local roads in Ada and Canyon Counties. Demographic data are developed by COMPASS, approved by the COMPASS Board, and input at a traffic analysis zone (TAZ) level. Appendix C provides more information on COMPASS' travel demand model.

In addition to ADT, the travel demand model produces daily VMT forecasts; congested network speeds, and other data relevant to regional emissions analyses. 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. The Northern Ada County Interagency Consultation Committee on Transportation Conformity (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. The Committee is made up of local experts, technical staff from COMPASS' member agencies, and local traffic engineers from both the public and private sectors. TMAC, along with COMPASS staff, work 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.

In the travel demand model, person trips are converted to vehicle trips using auto occupancy rates. Northern Ada County's current long-range transportation plan (*Destination 2030Limited Plan Update: Long-Range Transportation Plan*) includes a 25% goal of person trips made using alternative modes of transportation (such as transit, vanpool, carpool, walk, and bike). This 25% goal is not unrealistic given the commuting patterns revealed by the 1990 and 2000 Census. Approximately 19% of work trips today are by non-single occupant vehicle (non-SOV), and non-work trips typically have a higher vehicle occupancy rate than work trips. The largest component of non-SOV commuting is carpooling, with public transportation amounting to less than 1% of non-SOV work trips. Based on current travel patterns, it can be assumed that modest increases in carpooling and the use of public transportation over the next 20 years may be adequate to achieve the goal. Therefore, the 2025 and 2030 analyses account for the transit goals via an auto occupancy rate reflective of 25% alternative mode trips.

Emissions Modeling:
COMPASS uses EPA's MOBILE6 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. EPA's MOBILE6 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. 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.

Road Dust:
Paved road dust makes up the vast majority of PM_{10} emissions from on-road transportation sources. Emissions

factors for both paved road and unpaved road dust were calculated using the methodology developed in the *Treasure Valley Road Dust Study: Final Report*[1]. This methodology uses the roadway 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.

Demographic Data:
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 projections made by the DAC are also endorsed and adopted by the COMPASS Board as the official population and employment projections for the Treasure Valley.

In March of 2004, the COMPASS Board approved countywide forecasted demographic control totals for 2005, 2010, 2015, 2025, and 2030. These control totals were then distributed to the model's TAZs according to a "trend" growth scenario. The "trend" growth scenario 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. With COMPASS' adoption of *Destination 2030Limited Plan Update: Long-Range Transportation Plan*, the "trend" growth scenario became the official demographic forecast for transportation planning purposes.

Rules

As described previously, the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request* (PM_{10} Maintenance Plan) establishes motor vehicle emissions budgets for PM_{10}, NO_x and VOC. Therefore, to satisfy transportation conformity requirements established by 40CFR93.118, budget tests must be performed with the regional emissions analyses for the FY2006-2010 Northern Ada County TIP. Budget tests are satisfied when regional emissions analyses estimate the air quality impacts of the TIP or transportation plan are less than or equal to the established "budgets".

Interagency Consultation:
Idaho Administrative Code (IDAPA 58.01.01.567) requires nonattainment and maintenance areas establish an interagency consultation committee on transportation conformity. The assumptions and methodologies employed in the development of the FY2006-2010 Northern Ada County TIP regional emissions analysis were approved by the ICC on May 26, 2005. The approved assumptions and methodologies are listed in Appendices D and E. Final project lists for the regional emissions analyses were approved by the ICC on May 26, 2005. A complete listing of the ICC requirements can be found in Idaho Administrative Code (IDAPA 58.01.01.563-574).

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

1 Etyemezian et. all, Desert Research Institute; February 15, 2002

The Northern Ada County PM_{10} Maintenance Plan established motor vehicle emissions budgets for the years 1999, 2010, and 2015. In addition to PM_{10}, budgets were also established for and the PM_{10} precursor pollutants NO_X and VOC. Thus, budget tests were preformed for:

- 2006 - The base year of the FY2006-2010 TIP
- 2010 - The last year of the TIP and budget year
- 2015 - Budget year
- 2025 - An intermediate analysis year, as there can be no more than 10 year between analysis years
- 2030 - The horizon of the *Destination 2030 Limited Plan Update*

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

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

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 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."

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.

Transportation Control Measures:
As per 40CFR93.113(c), in order for a TIP to be conforming, it cannot interfere with the implementation of any transportation control measures (TCMs). There are no TCMs requiring implementation in the *Northern Ada County PM_{10} SIP Maintenance Plan and Redesignation Request*. Therefore, the FY2006-2010 Northern Ada County TIP meets the requirements of 40CFR93.113(c).

II. EMISSIONS ESTIMATION

The projects used in the regional emissions analysis for the FY2006-2010 Northern Ada County TIP are derived from those listed in *Destination 2030Limited Plan Update: Long-Range Transportation Plan*, Ada County Highway District's Capital Improvement Program and Five Year Work Program, and the Idaho Transportation Department's FY2005-2009 State Transportation Improvement Program (STIP). A regional emission analysis including these project lists and the approved "trend" growth scenario was developed to perform the required budget tests.

Regional emissions were estimated using the methodologies and assumptions given in Appendix D. Most of the methodologies and assumptions used in this demonstration are consistent with those used for the PM_{10} Maintenance Plan Emissions Inventory. Thus, average weekday VMT were used to estimate PM_{10} emissions and average daily VMT (i.e., average VMT of weekday and weekend traffic volumes) were used to estimate NO_x and VOC emissions.

Specific emissions factors were developed to estimate the Canyon County vehicle contribution to Ada County's VMT. MOBILE6 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[2], 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.

2006 Baseline Scenario

The baseline scenario uses 2006 demographics with the anticipated 2006 roadway network (the currently built roadway network and those applicable roadway projects expected to be open to the motoring public by December 31, 2006). 2006 demographics were interpolated using the growth anticipated between 2005 and 2010. The 2005 and 2010 population "control totals" for Ada County were adopted on March 15, 2004. Allocation of these demographic forecasts represents the "trend" growth scenario developed by COMPASS' Demographic Advisory Committee. Table II-1 provides a list of applicable roadway projects used in the 2006 baseline model network to estimate PM_{10}, NO_x, and VOC emissions. *Note: The numbers in the "No." column are for reference only.*

[2] *2002 Treasure Valley Transportation Survey, Final Report*, February 2003. Compass Report #2003-2, Page 16, Figure 2.

Table II-1: Projects in 2006 Baseline Scenario							
No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?	Exempt?	Key No.*
1.	Locust Grove Rd	Franklin Rd – Fairview Ave	5	No	No	No	RD054
2.	Locust Grove Rd Overpass	Overland Rd – Franklin Rd	5	No	Yes	No	F201-01/ 8048
3.	Maple Grove Rd	Franklin Rd - Fairview Ave	5	No	Yes	No	F040/ 7192
4.	Maple Grove Rd Extension	McMillan Rd – Chinden Blvd	5	No	No	No	RD066
5.	Overland Rd	Cloverdale Rd – Five Mile Rd	5	Yes - +45K ADT	No	No	RD036/RD202-53
6.	Overland Rd	Topaz Rd (1/2 mi. east of Eagle Rd) – Cloverdale Rd	5	No	No	No	RD072
7.	SH 55 (Eagle Rd)	I-84 westbound off-ramp – Franklin Rd	7	Yes - Principal Arterial	Yes	No	8815

*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 II-2 shows the estimated VMT and PM_{10} emissions from the 2006 baseline 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 the 2006 scenario are listed in Appendix F.

Table II – 2: 2006 Paved Road PM_{10} Estimated Emissions Data				
Road Type	Paved Average Weekday VMT *[VMT/day]*	Paved Road Dust Emissions *[Tons/day]*	Tailpipe, Tire, and Brakewear Emissions *[Tons/day]*	Total Paved Road PM_{10} Emitted *[Tons/day]*
Interstate	1,995,956	13.53	0.12	13.65
Ramps	103,536	0.94	0.01	0.95
Principal Arterial	2,439,364	19.86	0.15	20.01
Minor Arterial	1,833,324	14.96	0.11	15.07
Collector	589,027	5.16	0.04	5.20
Local	13,983	0.23	0.00	0.23
Centroid Connectors	610,138	5.13	0.04	5.17
Totals	7,585,328	59.81	0.46	60.27

Table II-3 shows the 2006 average daily VMT and VOC emissions estimates developed using MOBILE 6.2 generated emissions factors. VOC emissions factors were adjusted so that evaporative and refueling emissions are not included in the estimated emissions. This is consistent with the methodology used to establish the VOC emissions budgets. Estimates of NO_X emissions are given in Table II-4.

Table II – 3: 2006 VOC Estimated Emissions Data

Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	Canyon County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	Estimated VOC Emitted[1] *[Tons/day]*
Interstate	1,796,361	0.51	0.63	7.02	1.02
Ramps	93,182	0.64	0.80		0.07
Principal Arterials	2,195,428	0.53	0.66		1.30
Minor Arterials	1,649,991	0.53	0.67		0.98
Collectors	530,124	0.54	0.69		0.32
Local	12,584	0.53	0.68		0.01
Centroid Connectors	549,124	0.73	0.94		0.45
Totals	6,826,795	NA	NA	7.02	4.14

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

Table II-4: 2006 NO_X Estimated Emissions Data

Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle NO_X Emissions Factor *[g/mile]*	Canyon County Vehicle NO_X Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	NO_X Emitted[1] *[Tons/day]*
Interstate	1,796,361	2.17	2.30	7.02	4.31
Ramps	93,182	1.88	2.02		0.19
Principal Arterials	2,195,428	1.76	1.89		4.29
Minor Arterials	1,649,991	1.75	1.88		3.21
Collectors	530,124	1.74	1.87		1.02
Local	12,584	1.51	1.62		0.02
Centroid Connectors	549,124	2.08	2.23		1.27
Totals	6,826,795	NA	NA	7.02	14.31

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

2010 Scenario

The 2010 scenario uses 2010 demographics with the 2006 roadway network and the projects given in Table II-5 *(Note: The numbers in the "No." column are for reference only)*. The 2010 forecasted population "control totals" for Ada County was adopted on March 15, 2004. The allocation of the forecast represents the "trend" growth scenario developed by the Demographic Advisory Committee.

Table II-5: Projects Added to the 2006 network for the 2010 Scenario

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?	Exempt?	Key No.*
8.	30th St (new road)	Main St – Rose St	5	No	No	No	RD202-09
9.	36th St	Hill Rd - Cartwright Rd	3	No	No	Yes – Safety (40CFR93.126)	RD307
10.	Cloverdale Rd	Franklin Rd – Fairview Ave	5	No	No	No	RD202-14
11.	Eagle Rd	Victory Rd – Ridenbaugh Canal	5	No	No	No	RD203-07
12.	Five Mile Rd	Franklin Rd - Fairview Ave	5	Yes - Principal Arterial	Yes	No	F038/ 7238
13.	Five Mile Rd	Fairview Ave - Ustick Rd	5	No	No	No	RD195A
14.	Floating Feather Rd	Eagle Rd - Edgewood Dr	3	No	No	Yes – Safety (40CFR93.126)	RD257
15.	Franklin Rd	Ten Mile Rd - Linder Rd	5	No	Yes	No	RC0165/ 9504
16.	Franklin Rd	Touchmark Rd (east of Eagle Rd) - Five Mile Rd	5	Yes - Principal Arterial	Yes	No	RD282/86 98
17.	Hill Rd Extension	State St - Horseshoe Bend Rd	3	No	No	No	RD308
18.	Linder Rd	Franklin Rd to Ustick Rd	5	No	No	No	RD077
19.	Maple Grove Rd	Fairview – Goddard	3	No	Yes	Yes – Safety (40CFR93.126)	RD222-01
20.	McMillan Rd	Boise Sports Complex – Eagle Rd	5	No	TBD	No	RD285
21.	Overland Rd	Linder Rd – Meridian Rd	5	No	No	No	RD290
22.	Overland Rd	Vista Ave – Federal Way	3	No	TBD	Yes – Safety (40CFR93.126)	RD169
23.	Ten Mile Rd	Franklin Rd – Cherry Ln	5	No	No	No	RD309
24.	Ten Mile Rd	Cherry Ln – Ustick Rd	5	No	No	No	RD188
25.	Ustick Rd	Five Mile Rd – Cole Rd	5	No	No	No	RD222

*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 II-6 shows the estimated weekday VMT and PM_{10} emissions from the 2010 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 2010 are listed in Appendix G. Tables II-7 and II-8 display

the VOC and NO_x emissions estimates respectively. VOC emissions factors were adjusted so that evaporative and refueling emissions are not included in the estimated emissions. This is consistent with the methodology used to establish the VOC emissions budgets.

Table II-6: 2010 Paved Road PM_{10} Estimated Emissions

Road Type	Paved Average Weekday VMT *[VMT/day]*	Paved Road Dust Emissions *[Tons/day]*	Tailpipe, Tire, and Brakewear Emissions *[Tons/day]*	Total Paved Road PM_{10} Emitted *[Tons/day]*
Interstate	2,127,172	14.37	0.10	14.47
Ramps	106,873	0.97	0.01	0.98
Principal Arterial	2,705,970	23.00	0.13	23.13
Minor Arterial	2,175,393	18.03	0.10	18.13
Collector	662,821	5.87	0.03	5.90
Local	16,722	0.28	<0.01	0.28
Centroid Connectors	679,180	5.83	0.03	5.86
Totals	8,474,131	68.35	0.40	68.75

Table II –7: 2010 VOC Estimated Emissions Data

Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	Canyon County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	Estimated VOC Emitted[1] *[Tons/day]*
Interstate	1,914,455	0.31	0.43	6.82	0.68
Ramps	96,186	0.38	0.52		0.04
Principal Arterials	2,435,373	0.32	0.45		0.89
Minor Arterials	1,957,854	0.33	0.45		0.72
Collectors	596,539	0.33	0.46		0.22
Local	15,050	0.33	0.46		0.01
Centroid Connectors	611,262	0.45	0.63		0.31
Totals	7,626,718	NA	NA	6.82	2.87

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

Table II-8: 2010 NO_X Estimated Emissions Data

Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle NO_X Emissions Factor *[g/mile]*	Canyon County Vehicle NO_X Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	NO_X Emitted[1] *[Tons/day]*
Interstate	1,914,455	1.35	1.49	6.82	2.87
Ramps	96,186	1.18	1.34		0.13
Principal Arterials	2,435,373	1.12	1.26		3.03
Minor Arterials	1,957,854	1.12	1.26		2.43
Collectors	596,539	1.11	1.25		0.73
Local	15,050	0.98	1.10		0.02
Centroid Connectors	611,262	1.33	1.49		0.90
Totals	7,626,718	NA	NA	6.82	10.10

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

2015 Scenario

The 2015 scenario uses 2015 demographics with the 2010 roadway network and the projects given in Table II-9 *(Note: The numbers in the "No." column are for reference only).* The 2015 forecasted population "control totals" for Ada County was adopted on March 15, 2004. The allocation of the forecast represents the "trend" growth scenario developed by the Demographic Advisory Committee.

Table II-9: Projects Added to the 2010 network for the 2015 Scenario

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid? **	Exempt?	Key No.*
26.	36th St	State St – Taft St	4-7	No	TBD	No	
27.	Amity Rd	Federal Way – Surprise Wy	2-3	No	No	No	RC0087
28.	Cloverdale Rd	Amity Rd - Victory Rd	3-5	No	TBD	No	
29.	Cloverdale Rd	Victory Rd – Overland Rd	3-5	No	TBD	No	
30.	Cloverdale Rd	Fairview Ave – Ustick Rd	5	No	No	No	
31.	Cloverdale Rd	Ustick Rd – McMillan Rd	3	No	TBD	Yes – Safety (40CFR93.126)	RD077
32.	Eagle Rd	Amity Rd – Victory Rd	3	No	TBD	Yes – Safety (40CFR93.126)	
33.	Lake Hazel Rd	Maple Grove Rd – Pleasant Valley Rd	3	No	TBD	Yes – Safety (40CFR93.126)	
34.	Linder Rd	Victory Rd – Overland Rd	2-3	No	TBD	Yes – Safety (40CFR93.126)	
35.	Maple Grove Rd	Desert Ave – Amity Rd	3	No	TBD	Yes – Safety (40CFR93.126)	
36.	McMillan Rd	Meridian – Locust Grove Rd	3	No	TBD	Yes – Safety (40CFR93.126)	RC0087
37.	McMillan Rd	Locust Grove Rd – Boise Sports Complex	5	No	TBD	No	
38.	McMillan Rd	Five Mile Rd – Maple Grove Rd	3	No	TBD	Yes – Safety (40CFR93.126)	
39.	Orchard Rd	Gowen Rd – Victory Rd	3	No	TBD	Yes – Safety (40CFR93.126)	
40.	ParkCenter East Bridge	ParkCenter Blvd - Warm Springs Ave	4	Yes - Principal Arterial	No	No	MA203-02
41.	Pine St – new	Locust Grove Rd - Eagle Rd (Developer Funded)	3	No	TBD	No	
42.	Ten Mile Rd	Overland Rd – Franklin Rd	5	No	TBD	No	RD057
43.	Ustick Rd	Meridian - Locust Grove Rd	5	No	TBD	No	
44.	Ustick Rd	Locust Grove Rd - Eagle Rd	5	No	TBD	No	
45.	Ustick Rd	Eagle Rd - Cloverdale Rd	5	No	TBD	No	
46.	Ustick Rd	Cloverdale Rd – Five Mile Rd	5	No	No	No	RD220
47.	Victory Rd	Eagle Rd – Cloverdale Rd	3	No	TBD	Yes – Safety (40CFR93.126)	

*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 II-10 shows the estimated weekday VMT and PM_{10} 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 H. Tables II-11 and II-12 display the VOC and NO_x emissions estimates respectively. VOC emissions factors were adjusted so that evaporative and refueling emissions are not included in the estimated emissions. This is consistent with the methodology used to establish the VOC emissions budgets.

Table II-10: 2015 Paved Road PM_{10} Estimated Emissions

Road Type	Paved Average Weekday VMT *[VMT/day]*	Paved Road Dust Emissions *[Tons/day]*	Tailpipe, Tire, and Brakewear Emissions *[Tons/day]*	Total Paved Road PM_{10} Emitted *[Tons/day]*
Interstate	2,297,323	15.73	0.08	15.81
Ramps	112,526	1.02	<0.01	1.02
Principal Arterial	2,987,238	25.78	0.11	25.89
Minor Arterial	2,803,034	24.24	0.10	24.34
Collector	817,663	7.30	0.03	7.33
Local	26,285	0.48	<0.01	0.48
Centroid Connectors	788,847	6.72	0.03	6.75
Totals	9,832,916	81.27	0.35	81.62

Table II –11: 2015 VOC Estimated Emissions Data					
Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	Canyon County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	Estimated VOC Emitted[1] *[Tons/day]*
Interstate	2,067,591	0.21	0.32	6.60	0.50
Ramps	101,274	0.24	0.37		0.03
Principal Arterials	2,688,514	0.21	0.33		0.66
Minor Arterials	2,522,731	0.21	0.33		0.61
Collectors	735,897	0.21	0.34		0.18
Local	23,656	0.21	0.33		0.01
Centroid Connectors	709,962	0.29	0.46		0.24
Totals	8,849,624	NA	NA	6.60	2.22

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

Table II-12: 2015 NO_X Estimated Emissions Data					
Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle NO_X Emissions Factor *[g/mile]*	Canyon County Vehicle NO_X Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	NO_X Emitted[1] *[Tons/day*
Interstate	2,067,591	0.71	0.87	6.60	1.65
Ramps	101,274	0.64	0.82		0.07
Principal Arterials	2,688,514	0.60	0.76		1.82
Minor Arterials	2,522,731	0.61	0.76		1.71
Collectors	735,897	0.60	0.75		0.49
Local	23,656	0.52	0.65		0.01
Centroid Connectors	709,962	0.72	0.90		0.57
Totals	8,849,624	NA	NA	6.60	6.33

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

2025 Scenario

The 2025 scenario uses 2025 demographics with the 2015 roadway network and the projects given in Table II-13 *(Note: The numbers in the "No." column are for reference only)*. The 2025 forecasted population "control totals" for Ada County was adopted on March 15, 2004. The allocation of the forecast represents the "trend" growth scenario developed by the Demographic Advisory Committee.

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

No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?**	Exempt?	Key No.*
48.	Five Mile Rd	Lake Hazel Rd – Amity Rd	3	No	TBD	Yes – Safety (40CFR93.126)	
49.	Five Mile Rd	Amity Rd – Victory Rd	5	No	TBD	No	
50.	Five Mile Rd Overpass	Overland Rd – Franklin Rd	4-5	Yes- Principal Arterial	TBD	No	
51.	Hill Rd	Outlook Ave – Collister Dr	3	No	TBD	Yes – Safety (40CFR93.126)	
52.	Hill Rd	Collister Dr – 36th St	3	No	TBD	Yes – Safety (40CFR93.126)	
53.	Linder Rd Overpass	Extend over I-84	2-3	No	TBD	No	
54.	Locust Grove Rd	Victory Rd - Overland Rd	5	No	TBD	No	
55.	Maple Grove Rd	Amity Rd – Victory Rd	3-5	No	TBD	No	
56.	Maple Grove Rd	Victory Rd - Overland Rd	3	No	TBD	Yes – Safety (40CFR93.126)	
57.	Meridian Rd / E. 1st St, 1 way pair	I-84 - Fairview Ave	2-3	No	TBD	No	
58.	Rose Hill St	Hubble Dr – Roosevelt St	3	No	TBD	Yes – Safety (40CFR93.126)	
59.	Victory Rd	Cloverdale Rd – Five Mile Rd	3-5	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 II-14 shows the estimated weekday VMT and PM_{10} emissions for the 2025 scenario. Emissions estimates were developed using MOBILE6.2 generated emissions factors and the *Treasure Valley Road Dust Study: Final Report*. The MOBILE 6.2 input and output files for 2025 are listed in the Appendix I. Tables II-15 and II-16 display the VOC and NO_x emissions estimates respectively.

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

Road Type	Paved Average Weekday VMT *[VMT/day]*	Paved Road Dust Emissions *[Tons/day]*	Tailpipe, Tire, and Brakewear Emissions *[Tons/day]*	Total Paved Road PM_{10} Emitted *[Tons/day]*
Interstate	3,072,923	21.30	0.10	21.40
Ramps	141,873	1.29	<0.01	1.29
Principal Arterial	3,627,750	30.68	0.11	30.79
Minor Arterial	3,772,969	32.18	0.12	32.30
Collector	1,166,499	10.27	0.04	10.31
Local	44,451	0.86	<0.01	0.86
Centroid Connectors	1,029,215	8.86	0.03	8.89
Totals	12,855,680	105.44	0.41	105.85

Table II –15: 2025 VOC Estimated Emissions Data

Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	Canyon County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	Estimated VOC Emitted[1] *[Tons/day]*
Interstate	2,765,631	0.14	0.25	6.27	0.44
Ramps	127,686	0.15	0.29		0.02
Principal Arterials	3,264,975	0.14	0.26		0.53
Minor Arterials	3,395,672	0.14	0.26		0.55
Collectors	1,049,849	0.14	0.27		0.17
Local	40,006	0.14	0.25		0.01
Centroid Connectors	926,294	0.19	0.36		0.21
Totals	11,570,112	NA	NA	6.27	1.94

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

Table II-16: 2025 NO_X Estimated Emissions Data					
Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle NO_X Emissions Factor *[g/mile]*	Canyon County Vehicle NO_X Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	NO_X Emitted[1] *[Tons/day]*
Interstate	2,765,631	0.28	0.45	6.27	0.89
Ramps	127,686	0.29	0.48		0.04
Principal Arterials	3,264,975	0.26	0.42		0.96
Minor Arterials	3,395,672	0.26	0.42		1.00
Collectors	1,049,849	0.26	0.42		0.31
Local	40,006	0.22	0.35		0.01
Centroid Connectors	926,294	0.31	0.50		0.33
Totals	11,570,112	NA	NA	6.27	3.54

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

2030 Scenario

The 2030 scenario is composed of a 2030 demographic forecast with the 2025 travel demand model network and the projects listed in Table II-17. The 2030 forecasted population "control totals" for Ada County was adopted on March 15, 2004. The allocation of the forecast represents the "trend" growth scenario developed by the Demographic Advisory Committee.

Table II-17: Projects Added to the 2025 network for the 2030 Scenario							
No.	Project	Location	Number of Lanes	Regionally Significant?	Federal Aid?**	Exempt?	Key No.*
60.	36th St	Extend 36th St from existing to Cartwright Rd and Bogus Basin Rd	2-3	No	No	No	RD202-04
61.	Broadway IC	Reconstruct – add new ramps and lanes	N.A.	Yes - Interstate	TBD	Yes - (40CFR93.127)	
62.	Cole Rd	Desert Ave – Victory Rd	5	No	No	No	RC0094
63.	Cole Rd	Overland Rd – Franklin Rd	5	Yes – Principal Arterial	TBD	No	
64.	Emerald St	Five Mile Rd – Orchard St	5	Yes - +45K ADT	TBD	No	
65.	Fairview Ave	Meridian Rd – Locust Grove Rd	7	Yes – Principal Arterial	TBD	No	RC0135
66.	Fairview Ave	Locust Grove Rd – Eagle Rd	7	Yes – Principal Arterial	TBD	No	RC0133
67.	Fairview Ave	Eagle Rd – Cloverdale Rd	7	Yes – Principal Arterial	TBD	No	RC0130
68.	Fairview Ave	Cloverdale Rd – Five Mile Rd	7	Yes – Principal Arterial	No	No	RC0127
69.	Fairview Ave	Five Mile Rd – Maple Grove Rd	7	Yes – Principal Arterial	TBD	No	RC0131
70.	Federal Way	Isaac Canyon IC – S/o SH 21	5	No	TBD	No	
71.	Franklin Rd	Black Cat Rd – Ten Mile Rd	5	No	Yes	No	RC0152/ 9637
72.	Glenwood St	US 20/26 (Chinden Blvd) - State St	7	Yes - Principal Arterial	TBD	No	
73.	Glenwood St / Cole Rd couplet	Two way couplet to Mountain View Dr	3	Yes - Principal Arterial	TBD	No	
74.	Gowen IC	Reconstruct	N.A.	Yes - Interstate	TBD		
75.	I-84	Ada Co. Line – Ten Mile Rd IC	6	Yes - Interstate	Yes	No	
76.	I-84	Ten Mile Rd – Meridian Rd	8	Yes - Interstate	Yes	No	
77.	I-84	Orchard IC – Gowen IC	8	Yes - Interstate	Yes	No	

78.	Kuna Mora Rd	Connect SH 69 to I-84 at Blacks Creek IC	2-3	Yes - Principal Arterial	TBD	No	
79.	Meridian Rd IC	Improvement: cloverleaf ramp for WB I-84 - SB SH 69 (Kuna-Meridian Rd)	N.A.	Yes - Interstate	TBD	Yes - (40CFR93.127)	
80.	Orchard IC	Reconstruct - add new ramps and lanes	N.A.	Yes - Interstate	TBD	Yes - (40CFR93.127)	
81.	SH 16 (Emmett Hwy) river crossing	Connect SH 16 to US 20/26	2-5	Yes – Principal Arterial	Yes	No	
82.	SH 16	SH 44 – Ada Co. Line	5	Yes – Principal Arterial	Yes	No	
83.	SH 44	Ada Co. Line – SH 16	5	Yes – Principal Arterial	Yes	No	
84.	SH 44	SH 16 – Ballantyne	5	Yes – Principal Arterial	Yes	No	
85.	SH 44	Horseshoe Bend Rd – Glenwood (section is already 5 lanes)	5	Yes – Principal Arterial	TBD	No	
86.	SH 55	Beacon Light Rd – Ada Co. Line	5	Yes – Principal Arterial	TBD	No	
87.	State St	Gary Ln - Collister Dr	7	Yes – Principal Arterial	TBD	No	
88.	State St	Collister Dr – 28th St	7	Yes – Principal Arterial	TBD	No	
89.	Technology Way - new road	S/o Micron to Isaac's Canyon IC	5	No	No	No	
90.	Ten Mile Rd	Victory Rd – Overland Rd	5	No	TBD	No	
91.	Ten Mile Rd IC	New Interchange at I-84 and Ten Mile Rd	N.A.	Yes - Interstate	Yes	No	
92.	Three City's River Crossing (new road)	Chinden Blvd - State St	5	Yes – Principal Arterial	Yes	No	9189
93.	US 20/26	Ada Co. Line – McDermott	5	Yes – Principal Arterial	TBD	No	
94.	US 20/26	McDermott – Eagle Rd	5	Yes – Principal Arterial	TBD	No	
95.	Vista IC	Reconstruct - add new ramps and lanes	N.A.	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 II-18 shows the estimated weekday VMT and PM_{10} emissions for the 2030 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 2030 are listed in the Appendix J. Tables II-19 and II-20 display the VOC and NO_x emissions estimates respectively.

Table II-18: 2030 Paved Road PM_{10} Estimated Emissions

Road Type	Paved Average Weekday VMT *[VMT/day]*	Paved Road Dust Emissions *[Tons/day]*	Tailpipe, Tire, and Brakewear Emissions *[Tons/day]*	Total Paved Road PM_{10} Emitted *[Tons/day]*
Interstate	3,318,480	22.53	0.10	22.63
Ramps	152,518	1.39	<0.01	1.39
Principal Arterial	4,262,723	35.80	0.13	35.93
Minor Arterial	4,258,894	36.30	0.13	36.43
Collector	1,353,853	11.73	0.04	11.77
Local	46,053	0.86	<0.01	0.86
Centroid Connectors	1,152,886	9.89	0.04	9.93
Totals	14,545,407	118.50	0.45	118.95

Table II–19: 2030 VOC Estimated Emissions Data					
Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	Canyon County Vehicle Adjusted VOC Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	Estimated VOC Emitted[1] *[Tons/day]*
Interstate	2,986,632	0.13	0.24	6.16	0.45
Ramps	137,266	0.14	0.27		0.02
Principal Arterials	3,836,450	0.13	0.25		0.58
Minor Arterials	3,833,005	0.13	0.25		0.58
Collectors	1,218,468	0.13	0.25		0.19
Local	41,448	0.13	0.24		0.01
Centroid Connectors	1,037,598	0.18	0.34		0.22
Totals	13,090,867	NA	NA	6.16	2.04

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

Table II-20: 2030 NO_X Estimated Emissions Data					
Road Type	Average Daily VMT *[VMT/day]*	Ada County Vehicle NO_X Emissions Factor *[g/mile]*	Canyon County Vehicle NO_X Emissions Factor *[g/mile]*	% Of Ada VMT by Canyon County Vehicles[2]	NO_X Emitted[1] *[Tons/day]*
Interstate	2,986,632	0.22	0.39	6.16	0.76
Ramps	137,266	0.24	0.43		0.04
Principal Arterials	3,836,450	0.21	0.37		0.91
Minor Arterials	3,833,005	0.21	0.37		0.91
Collectors	1,218,468	0.21	0.37		0.29
Local	41,448	0.17	0.30		0.01
Centroid Connectors	1,037,598	0.25	0.44		0.30
Totals	13,090,867	NA	NA	6.16	3.23

[1] A conversion factor of 907,184.74 grams per ton was used.
[2] Refer to Appendix E for specific estimation methodologies.

Unpaved Roads

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 for unpaved roadways. Table II-21 displays the information used to estimate the PM_{10} emissions from unpaved roads. Average daily trips on unpaved roadways in Ada County were assumed, as in past demonstrations, to be 120 vehicles per day.

Table II-21: Unpaved Road Dust PM_{10} Emissions

Analysis Year*	ADT	Unpaved Roads *[Miles]*	Unpaved VMT *[VMT/day]*	Unpaved Road Dust Emissions *[Tons/day]*
2006	120	78.44	9,413	1.48
2010	120	73.76	8,851	1.39
2015	120	65.96	7,915	1.24
2025	120	50.36	6,043	0.95
2030	120	42.56	5,107	0.80

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.*

III. CONCLUSIONS

PM_{10} Budget Test

Table III-1 gives the results of the PM_{10} Budget Test for the FY2006-2010 Northern Ada County TIP.

Table III-1: Results of PM_{10} Budget Test

	Year				
	2006 *[Tons/day]*	2010 *[Tons/day]*	2015 *[Tons/day]*	2025 *[Tons/day]*	2030 *[Tons/day]*
Estimated Emissions	61.75	70.14	82.86	106.79	119.75
Budget	153.00	153.00	153.00	153.00	153.00
Results	-91.25	-82.86	-70.14	-46.21	-33.25

The results of the budget test shows that implementing the projects listed in Tables II-1, II-5, II-9, II-13, and II-17 will not exceed the PM_{10} emissions budgets established by the *Northern Ada County PM_{10} SIP Maintenance Plan*.

VOC Budget Test

Table III-2 gives the results of the VOC Budget Test for the FY2006-2010 Northern Ada County TIP.

Table III-2: Results of VOC Budget Test

	Year				
	2006 *[Tons/day]*	2010 *[Tons/day]*	2015 *[Tons/day]*	2025 *[Tons/day]*	2030 *[Tons/day]*
Estimated Emissions	4.14	2.87	2.22	1.94	2.04
Budget	10.40	6.10	5.00	5.00	5.00
Results	-6.26	-3.23	-2.78	-3.06	-2.96

The results of the budget test shows that implementing the projects in Tables II-1, II-5, II-9, II-13, and II-17 will not exceed the VOC emissions budgets established by the *Northern Ada County PM_{10} SIP Maintenance Plan*.

NO_X Budget Test

Table III-3 gives the results of the NO_X Budget Test for the FY2006-2010 Northern Ada County TIP.

Table III-3: Results of NO_X Budget Test					
	Year				
	2006 *[Tons/day]*	2010 *[Tons/day]*	2015 *[Tons/day]*	2025 *[Tons/day]*	2030 *[Tons/day]*
Estimated Emissions	14.31	10.10	6.33	3.54	3.23
Budget	21.00	11.20	7.80	7.80	7.80
Results	-6.69	-1.10	-1.47	-4.26	-4.57

The results of the budget test shows that implementing the projects in Tables II-1, II-5, II-9, II-13, and II-17 will not exceed the NO_X emissions budgets established by the *Northern Ada County PM_{10} SIP Maintenance Plan.*

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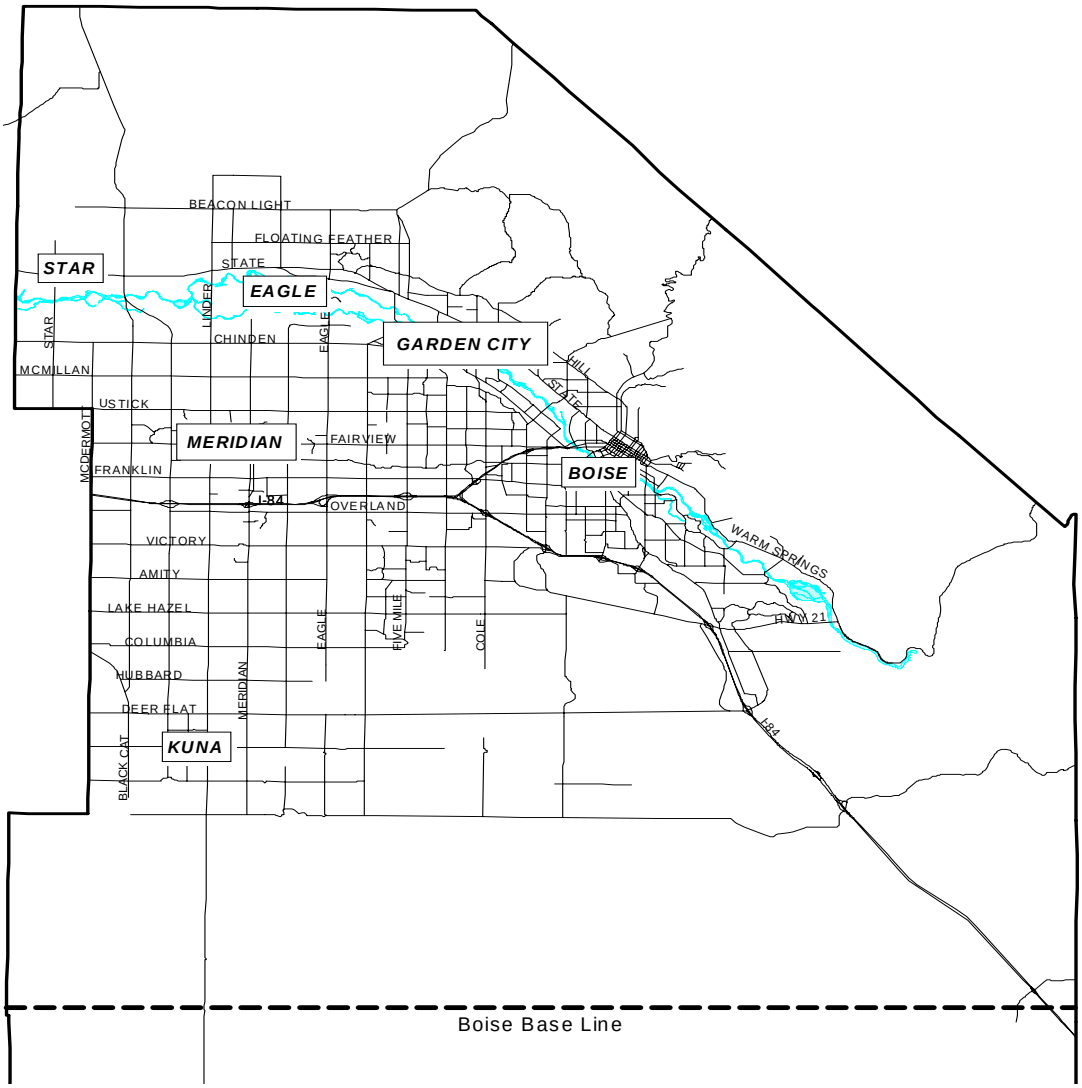
APPENDICES

APPENDIX A

Northern Ada County PM_{10} 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
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		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_x		Oxides of Nitrogen
NRS		Not Regionally Significant
PM_{10}		Particulate Matter with a diameter less than 10 micrometers (i.e. $1x10^{-6}$)
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

INTRODUCTION TO TRAVEL FORECAST MODELING

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 is produced using demographic, land use, and roadway network data. Forecasted conditions include 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 recently updated, calibrated and validated. 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 mode and time-of-day from more than 2,600 Treasure Valley households. It was validated with traffic count data for 2002. TMAC approved the use of the current travel demand model on June 29, 2004.

How the Model Works

COMPASS' travel demand model simulates traffic patters for the region based on where trips are likely to start and end. This is done using a four-step modeling process (see Figure C-1). The simulation is 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 and the model forecasts produced.

COMPASS' travel demand model is developed using:

- Past and Present Traffic Count Data -Traffic counts are collected from the Idaho Transportation Department, Ada County Highway District, and various Canyon County transportation agencies. Traffic count data are used to validate the model for a "base year".

- 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.

- Roadway Network – In order to forecast traffic, a digital network of the functionally classified roads and their current characteristics (number of lanes, traffic counts, etc.) are built for each analysis year. The functionally classified streets input into the model network are: 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.

- Roadway Capacities - The capacity of a roadway is defined as the number of vehicles a particular road can manage before congestion occurs. Capacities are based on the functional classification of the facility and its location.

- Travel Speed – Posted speed limits are put into COMPASS' travel demand model as the maximum travel speed. Travel speeds may be adjusted during the model validation process to account for delay or route attractiveness not adequately considered by the other model inputs.

- Trip Types - The current travel demand forecast model uses six 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.

- Alternative Transportation Modes (Mode Choice) - Based on census and household travel survey data, the fraction of single occupant vehicles, non-single occupant vehicles, and non-motorized travel modes can be determined. However, COMPASS' model currently does not forecast changes in travel mode fraction. Therefore, forecasted traffic volumes assume a pro-rated reduction in single occupant travel over a given planning horizon to represent an increasing use of alternatives transportation modes. The current assumption is 25% of all travel by the year 2025 will involve non-single occupant vehicles.

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.

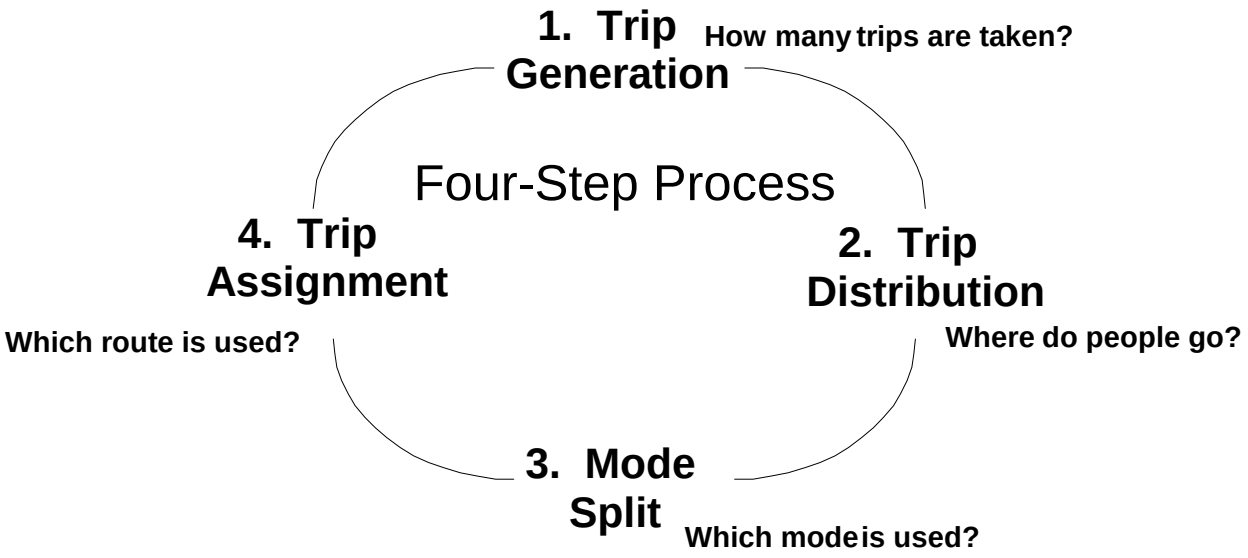
- Roadway Network Deficiency Analyses - These highlight potential future roadway inefficiencies and/or needs as a result of additional growth or other network modifications.

- Air Quality Conformity Analyses – Transportation conformity analyses are required to demonstrate planned transportation projects will conform to the state implementation plans in nonattainment and/or maintenance areas.

Peak-Hour Model

COMPASS' peak-hour model estimates travel demand during the afternoon rush hour (5 to 6 p.m.). It operates identical to and uses the same types of data inputs as COMPASS' 24-hour travel demand model. It was calibrated in September 2004. 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.

Figure C-1:
The Four-Step Model



INPUTS:

Census and/or Home Interviews (Surveys)

Traffic Counts

Roadway Characteristics

Demographic/Land Use Data

MODEL USED TO FORECAST:

Travel Demand Estimation

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

Development Impacts

How will a proposed development impact the existing roads?

Roadway Deficiencies

Which roads may be overloaded and by how much?

Air Quality Conformity Determinations

Will air quality improve or worsen?

Decision Support

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

Appendix D

Approved Modeling Assumptions and Emissions Estimation Methodologies

Table D-1: FY2006-2010 MOBILE Model Input Assumptions

Parameter:	FY2006-2010:	2030 Update/FY05-09 TIP Modeled at:	Note:
Fleet Mix	Local fleet mix data acquired as part of COMPASS' B20 Biodiesel (Remote Sensing) Study for LDV classes. MOBILE default for HDV classes.	EPA MOBILE 6.2 Default. Based on national fleet mix data	Local LDV data and default HDV data were combined and normalized for input into the MOBILE model.
I/M Program	Two distinct Annual programs: One is a test only 2500 RPM for pre 1996 vehicles, the other is a On board diagnostic test (OBD 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 3-16-2005.
Anti-Tamper Program	Annual check for gasoline vehicles. Program started in 1984. 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	
Min/Max Temp.	Winter = 31.25 / 48.20 F Summer = 46.77/ 73.22	Same	These temperatures are the ones used in the PM10 Maintenance Plan. ITD's PLAQ uses different temps for project screening purposes.
Fuel 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 PM10 Maintenance Plan Methodology (see Attachment 2)
Fuel Program	3 = Conventional Gasoline West	Same	Applies one of two phase-in schedules for the Tier 2 sulfur fuel standards for years after 1999.
Absolute Humidity	Winter = 24.87grain/lb Summer = 43.05 grain/lb	Same	Per PM10 Maintenance Plan – Annual Values
Seasonal Evaluation	Average of Winter and Summer emissions factors.	Same	Winter emissions will be for years 2007, 2011, 2016, 2026, 2031. This will allow us to take credit for some fleet turnover in November and December.

Summary of FY2006-2010 TIP Regional Emissions Analysis Methodologies

Budget Tests: A Budget Test will be used to demonstrate conformity of the FY2006-2010 TIP for NO_x, VOC, and PM_{10}. The test will use the PM_{10} Maintenance Plan's annual emissions estimation methodology. This method developed an annual average emissions factor by averaging summer and winter emissions factors for each pollutant. These annual average emissions factors will then be used with forecasted VMT from the travel demand model to calculate annual average emissions in tons per day (TPD).

VOC Emissions Adjustment: Refueling and evaporative VOC emissions will not be included in the regional emissions analysis, as per PM_{10} Maintenance Plan emissions inventory methodology.

PM Emissions: PM_{10} emissions will be calculated using average weekday VMT, not average daily VMT. This is due to how road dust emissions were calculated in the PM_{10} Maintenance Plan.

CO Planning Analysis: A Build/No Build Test will be conducted using winter emissions factors for CO instead of annual average. Average daily VMT will be used to calculate CO emissions. In addition, CO emissions estimates will be compared to those in the CO Limited Maintenance Plan emissions inventory and the PM_{10} Maintenance Plan. A CO regional emissions 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 (Equation D-1):

$$SW_L = S_L * VMT_L \qquad \text{(Equation D-1)}$$

Where:

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

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

VMT_L = Weekday VMT for the link (in miles)

Then, for each of the 7 modeled facility types, the daily VMT (Equation D-3) and the VMT weights containing speed (Equation D-2) are summed:

$$SW_T = \sum_1^n SW_L \qquad \text{(Equation D-2)}$$

$$VMT_T = \sum_1^n VMT_L \qquad \text{(Equation D-3)}$$

Where:

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

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

n = number of links for a given facility type

To arrive at a final speed for each travel demand model facility, the total VMT weight containing speed for each facility type is divided by the total VMT of a given facility type (Equation D-4):

$$S_M = \frac{SW_T}{VMT_T} \qquad \text{(Equation D-4)}$$

Where:

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

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

MOBILE 6.2 Modeling of Facility Types:

Travel Demand Model Interstate = MOBILE 6.2 Freeways

Travel Demand Model Principal Arterials = MOBILE 6.2 Arterial

Travel Demand Model Minor Arterials = MOBILE 6.2 Arterial

Travel Demand Model Collectors = MOBILE 6.2 Arterial

Travel Demand Model Local Roads: For local facility types MOBILE 6.2 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 MOBILE 6.2 generated emissions factors (Equation D-5):

$$EF_{local} = EF_{AS} \times \frac{EF_L}{EF_{AL}} \qquad \text{(Equation D-5)}$$

Where:

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

EF_{AS} = The MOBILE 6.2 emissions factor for local roads modeled as an arterial (grams/mile)

EF_L = The MOBILE 6.2 emissions factor for local roads modeled as a local road (grams/mile)

EF_{AL} = The MOBILE 6.2 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, MOBILE 6.2 assigns a speed of 34.6 mph. This was accepted and used for the PM_{10} Maintenance Plan's emissions inventory.

Travel Demand Model Centroid Connectors = MOBILE 6.2 Arterial. Note: Centroid connectors are more representative of a MOBILE 6.2 local roadway than a MOBILE 6.2 arterial. The travel demand model speeds of most centroid connectors are 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 be insignificant.

Paved Road Dust Methodologies

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_{10} Maintenance Plan and used to establish the PM_{10} motor vehicle emissions budget for Ada County. Section 5 of the report yielded a more current and area specific emissions estimation methodology that estimates emissions using roadway speeds and an empirically derived emissions potentials:

$$b = C_{C,S,T} \times s^{-x} \quad \text{(Equation D-6)}$$

Where:

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

$C_{C,S,T}$ = Constant dependant on County, setting, and season (grams PM_{10}/VKT/mps).

S = Posted speed of the roadway (mph).

X = empirically derived exponent dependant on County, setting, and season.

Table 5-1 *Treasure Valley Road Dust Study* contains the values used in equation D-6. Since transportation conformity only applies to Ada County and, given that the emissions potentials are roadway specific and not vehicle specific, only Ada County emissions potentials needed to be estimated for Transportation Conformity Purposes. 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 unpaved roadways, paved urban roadways, and paved rural roadways during both summer and winter seasons:

$$EF_{S,T} = b_{S,T} \times s \quad \text{(Equation D-7)}$$

Where:

$EF_{S,T}$ = Roadway PM_{10} emissions factor per setting and season (grams PM_{10}/VKT)

$b_{S,T}$ = Roadway emissions potential per setting and season (grams PM_{10}/VKT/mps).

S = Posted speed of the roadway (mps).

Individual link speeds and DRI's urban/rural setting designations were used to calculate paved road emissions factors for each roadway link in COMPASS' travel demand model network. Posted speeds, in miles per hour (mph), are converted to meters per second (mps) using a conversion factor of 0.447. Because COMPASS' travel demand model network does not include unpaved roadways, link based speeds were not available. Additionally, DRI was unable to empirically derive emissions potentials for unpaved roadways. Therefore, DRI used an average speed of 11.2 mps (25 mph) and a single, dry emissions potential of 8.58 grams PM_{10}/VKT/mps to calculate an unpaved roadway emissions factor for all settings and seasons.

Because paved road dust emissions factors change with the seasons, two emissions factors were calculated for each link: a winter factor and a "summer" factor. Each of these seasonal emissions

factors was then adjusted to account for precipitation effects (7% reduction in the "summer" and 9% reduction in the winter). The seasonal emissions factors adjusted for precipitation effects were then combined, using 0.25 as the fraction of the year the winter scenario applies and 0.75 as the fraction of the year that is "summer". This results in one composite emissions factor per roadway link.

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

$$E_{PM10,L} = EF_{C,L} \times VKT_L \quad \text{(Equation D-8)}$$

Where:

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

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

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

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

Equation D-6 Example: Emissions Potentials (b)
For an Ada county urban TDM link with a distance of 0.5 miles (0.805 km), a posted speed of 55mph, and a modeled average weekday traffic volume of 20,000:

Summer Emissions Potential (b) = $0.93 \times (45 \times 55^{-1.39}) = 0.159$ grams/VKT/mps

Winter Emissions Potential (b) = $0.91 \times (72 \times 55^{-1.38}) = 0.260$ grams/VKT/mps

Equation D-7 Example: Emissions Factor (EF)
For an Ada county urban TDM link with a distance of 0.5 miles (0.805 km), a posted speed of 55mph, and a modeled average weekday traffic volume of 20,000:

Summer Emissions Factor (EF) = 0.159 grams/VKT/mps × (55 mph × 0.447mps/mph) = 3.91 grams/VKT

Winter Emissions Factor (EF) = 0.260 grams/VKT/mps × (55 mph × 0.447mps/mph) = 6.39 grams/VKT

Equation D-8 Example: Emissions
For an Ada county urban TDM link with a distance of 0.5 miles (0.805 km), a posted speed of 55mph, and a modeled average weekday traffic volume of 20,000:

Summer Emissions = (3.91 grams/VKT× 0.805 km × 20,000 vehicles/day) ÷ 907,184.74 grams/Ton = 0.069 Ton/day

Winter Emissions = (6.39 grams/VKT× 0.805 km × 20,000 vehicles/day) ÷ 907,184.74 grams/Ton = 0.113 Ton/day

Ada County On-Road Fleet Mix Estimation Method

On March 5, 2004 Desert Research Institute (DRI) used a digital camera to photograph vehicles on the Franklin Road and I-184 eastbound on-ramp as part of COMPASS' B20 Biodiesel Emissions Study. License plate images were then transcribed by staff and matched with registration records on file at the Idaho Transportation Department (ITD). Over 2,000 vehicle identification numbers (VINs), supplied by ITD and the Ada County Air Quality Board, were subsequently decoded and linked to their appropriate MOBILE6.2 vehicle classification (Table D-2).

Heavy-duty tractor-trailers have license plates that were often located outside the camera's field of view. However, DRI's license plate transcription software allowed staff the ability to flag vehicles that appeared to have gross vehicle weight ratios (GVWRs) greater than 12,000 lbs (i.e. heavy –duty trucks larger than dual wheeled pickups). The Northern Ada County Interagency Consultation Committee (ICC) assessed the limitations of this sampling technique and directed COMPASS to continue using MOBILE6.2 default fleet mix data for heavy-duty vehicles. However, the ICC approved the use of the observed light-duty vehicle fleet mix data from the B20 Biodiesel Emissions Study for the FY2006-2010 TIP regional emissions analysis.

The observed data from the 2004 B20 Biodiesel Emissions Study were forecasted to 2005 (FP_{2005} observed) using the second equation (FO_y). Equation D-9 was used to normalize the light-duty observed and heavy-duty default VMT fractions as required for input to MOBILE6.2:

$$FO_{2005} = FP_{2005} / FP_s \qquad \text{(Equation D-9)}$$

Where:

FO_{2005} = VMT fraction used for the base year regional emissions analysis
FP_{2005} = observed (LDV-LDT4, MC) or default (HDV2b-HDBT) VMT fraction for 2005
s = sum of the preliminary observed (LDV-LDT4, MC) and default (HDV2b-HDBT) VMT fractions for 2005

These VMT fractions were forecasted to coincide with the analysis years for the regional emissions analysis. MOBILE6.2 default future year distributions were used to forecast the VMT fractions according to Equation D-10:

$$FO_y = FO_{2005} \times (FD_y / FD_{2005}) \qquad \text{(Equation D-10)}$$

Where:

FO_y = VMT fraction for forecast year "y"
FO_{2005} = VMT fraction in 2005
FD_y = MOBILE6.2 default VMT fraction for year "y"
FD_{2005} = MOBILE6.2 default VMT fraction for 2005

Table D-3 shows the resultant VMT fractions used to estimate emissions for years 2006, 2010, 2015, 2025, and 2030.

Table D-2: MOBILE6 Vehicle Classifications for VMT Fractions (from EPA's *User's Guide to MOBILE6.1 and MOBILE 6.2*, 2003)

Abbreviation	Description
LDV	Light-Duty Vehicles (Passenger Cars)
LDT1	Light-Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3,750 lbs. LVW)
LDT2	Light-Duty Trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)
LDT3	Light-Duty Trucks 3 (6,001-8,500 lbs. GVWR, 0-5,750 lbs. ALVW*)
LDT4	Light-Duty Trucks 4 (6,001-8,500 lbs. GVWR, 5,751 lbs. and greater ALVW)
HDV2B	Class 2b Heavy-Duty Vehicles (8,501-10,000 lbs. GVWR)
HDV3	Class 3 Heavy-Duty Vehicles (10,001-14,000 lbs. GVWR)
HDV4	Class 4 Heavy-Duty Vehicles (14,001-16,000 lbs. GVWR)
HDV5	Class 5 Heavy-Duty Vehicles (16,001-19,500 lbs. GVWR)
HDV6	Class 6 Heavy-Duty Vehicles (19,501-26,000 lbs. GVWR)
HDV7	Class 7 Heavy-Duty Vehicles (26,001-33,000 lbs. GVWR)
HDV8A	Class 8a Heavy-Duty Vehicles (33,001-60,000 lbs. GVWR)
HDV8B	Class 8b Heavy-Duty Vehicles (>60,000 lbs. GVWR)
HDBS	School Buses
HDBT	Transit and Urban Buses
MC	Motorcycles (All)

* ALVW = Alternative Loaded Vehicle Weight: The adjusted loaded vehicle weight is the numerical average of the vehicle curb weight and the gross vehicle weight rating (GVWR)

Table D-3: VMT Factions (Projected using MOBILE6 defaults)

Vehicle Type	2005	2006	2010	2015	2025	2030
LDV	0.463	0.444	0.391	0.343	0.313	0.313
LDT1	0.029	0.030	0.034	0.037	0.039	0.039
LDT2	0.254	0.264	0.295	0.324	0.341	0.341
LDT3	0.104	0.108	0.121	0.132	0.139	0.139
LDT4	0.035	0.036	0.041	0.045	0.047	0.047
HDV2b	0.036	0.037	0.037	0.038	0.038	0.038
HDV3	0.004	0.004	0.004	0.004	0.004	0.004
HDV4	0.003	0.003	0.003	0.003	0.003	0.003
HDV5	0.002	0.002	0.002	0.002	0.002	0.002
HDV6	0.008	0.008	0.008	0.008	0.009	0.009
HDV7	0.010	0.010	0.010	0.010	0.010	0.010
HDV8a	0.010	0.011	0.011	0.011	0.011	0.011
HDV8b	0.037	0.038	0.038	0.038	0.039	0.039
HDBS	0.002	0.002	0.002	0.002	0.002	0.002
HDBT	0.001	0.001	0.001	0.001	0.001	0.001
MC	0.002	0.002	0.002	0.002	0.002	0.002
Sum	1.000	1.000	1.000	1.000	1.000	1.000

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 will be the impacts associated with an 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:

2006 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*

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.

2006	**Average Daily Canyon VMT (From COMPASS TDM)**
Interstate	847,197
P. Art	901,899
M. Art	693,205
Collector	422,354
Local	14,521
Ramp	33,277
Centroid Conn.	248,107
Total	3,160,559

15.17% x 3,160,559 VMT = 479,394 Estimated Canyon VMT that includes Ada travel, based on work trips.

479,394 VMT ÷ 6,826,795 Ada VMT = .0702

.0702 x 100 =

7.02% **Of Ada's 2006 VMT from Canyon Commuters**

2010 Percentage Ada VMT traveled by Canyon Vehicles:

2010	**Average Daily Canyon VMT (From COMPASS TDM)**
Interstate	921,980
P. Art	942,293
M. Art	737,487
Collector	504,439
Local	16,495
Ramp	40,956
Centroid Conn.	265,419
Total	3,429,070

15.17% x 3,429,070 VMT = 520,121 Estimated Canyon VMT that includes Ada travel, based on work trips.

520,121 VMT ÷ 7,626,718 Ada VMT = .0682

.0682 x 100 =

6.82% Of Ada's 2010 VMT from Canyon Commuters

2015 Percentage Ada VMT traveled by Canyon Vehicles:

2015	**Average Daily Canyon VMT (From COMPASS TDM)**
Interstate	999,934
P. Art	1,035,392
M. Art	851,268
Collector	608,052
Local	17,789
Ramp	42,390
Centroid Conn.	294,195
Total	3,849,019

15.17% x 3,849,019 VMT = 583,819 Estimated Canyon VMT that includes Ada travel, based on work trips.

583,819 VMT ÷ 8,849,624 Ada VMT = .0660

.0660 x 100 =

6.60% Of Ada's 2015 VMT from Canyon Commuters

2025 Percentage Ada VMT traveled by Canyon Vehicles:

2025	**Average Daily Canyon VMT (From COMPASS TDM)**
Interstate	1,271,141
P. Art	1,391,265
M. Art	974,347
Collector	714,516
Local	19,017
Ramp	56,059
Centroid Conn.	357,305
Total	4,783,650

15.17% x 4,783,650 VMT = 725,584 Estimated Canyon VMT that includes Ada travel, based on work trips.

725,584 VMT ÷ 11,570,112 Ada VMT = .0627

.0627 x 100 =

6.27% Of Ada's 2025 VMT from Canyon Commuters

2030 Percentage Ada VMT traveled by Canyon Vehicles:

2030	**Average Daily Canyon VMT (From COMPASS TDM)**
Interstate	1,355,113
P. Art	1,548,201
M. Art	1,105,418
Collector	835,940
Local	22,962
Ramp	61,213
Centroid Conn.	385,466
Total	5,314,314

15.17% x 5,314,314 VMT = 806,075 Estimated Canyon VMT that includes Ada travel, based on work trips.

806,075 VMT ÷ 13,090,867 Ada VMT = .0616

.0616 x 100 =

6.16% Of Ada's 2030 VMT from Canyon Commuters

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:

$$E_t = E_C(X) + (E_A(1\text{-}X)) \qquad \text{(Equation E-1)}$$

Where:

E_t = Total Ada County Emissions (in Tons/day)

E_C = Emissions resulting from a 100% Canyon County Fleet on Ada's Network (in Tons/day).

E_A = Emissions resulting from a 100% Ada County Fleet on Ada's Network (in Tons/day).

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

Example E-1:

2006 Interstate NOx Emission =

$$\left[\left(\frac{1{,}796{,}361\,VMT/day \times 2.301\,grams/mile}{907184.74\,grams/ton}\right)\times(0.0702)\right]+$$
$$\left[\left(\frac{1{,}796{,}361\,VMT/day \times 2.169\,grams/mile}{907184.74\,grams/ton}\right)\times(1-0.0702)\right] = 4.31\,TPD$$

Appendix F

2006 Baseline Scenario

MOBILE 6.2 Model Files

Ada Vehicle Input File: A06Bas.IN

Canyon Vehicle Input File: C06Bas.IN

Ada Vehicle Output Files: A06Bas.OUT, A06Bas.PM

Canyon Vehicle Output Files: C06Bas.OUT, C06Bas.PM

Appendix G

2010 Scenario

MOBILE 6.2 Model Files

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

Appendix H

2015 Scenario

MOBILE 6.2 Model Files

Ada Vehicle Input File: A15Act.IN

Canyon Vehicle Input File: C15Act.IN

Ada Vehicle Output Files: A15Act.OUT, A15Act.PM

Canyon Vehicle Output Files: C15Act.OUT, C15Act.PM

Appendix I

2025 Scenario

MOBILE 6.2 Model Files

Ada Vehicle Input File: A25Act.IN

Canyon Vehicle Input File: C25Act.IN

Ada Vehicle Output File: A25Act.OUT, A25Act.PM

Canyon Vehicle Output File: C25Act.OUT, C25Act.PM

Appendix J

2030 Scenario

MOBILE 6.2 Model Files

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

Appendix K

Public Comment and Responses

The 30-day public comment period began July 18, 2005 and ended August 16, 2005. No comments were received.