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COMPASS

COMMUNITY PLANNING ASSOCIATION
of Southwest Idaho

Draft Conformity Demonstration of FY2015-2019 Regional Transportation Improvement Program

Report No. 12-2014
Adopted by the COMPASS Board on **TBD**
Resolution No. **TBD**

Date: **TBD**

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

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LIST OF ACRONYMS

| | |
|------------------|---|
| ACHD | Ada County Highway District |
| ATR | Automatic Traffic Recorder |
| AVFT | Alternative Vehicle Fuels and Technology |
| CFR | Code of Federal Regulations |
| CIM | <i>Communities in Motion</i> |
| CIM 2040 | <i>Communities in Motion 2040</i> |
| CIP | ACHD's Capital Improvement Plan |
| CNG | Compressed Natural Gas |
| CO | Carbon Monoxide |
| COMPASS | Community Planning Association of Southwest Idaho |
| DEQ | Idaho Department of Environmental Quality |
| E10 | 10% ethanol in gasoline |
| EPA | US. Environmental Protection Agency |
| IC | Interchange |
| ICC | Interagency Consultation Committee |
| ITD | Idaho Transportation Department |
| MOVES | Motor Vehicle Emission Simulator |
| MPO | Metropolitan Planning Organization |
| NAAQS | National Ambient Air Quality Standards |
| NO _x | Oxides of Nitrogen |
| OBD | On-board Diagnostics |
| PM ₁₀ | Particulate Matter with a Diameter Less than 10 Micrometers (i.e. 1x10 ⁻⁶) (Coarse Particulate Matter) |
| RPM | Revolutions Per Minute |
| SH | State Highway |
| SIP | State Implementation Plan |
| TIP | Transportation Improvement Program |
| TMAC | Transportation Modeling Advisory Committee |
| TPD | Tons per Day |
| VIN | Vehicle Identification Number |
| VOC | Volatile Organic Compounds |

FOREWORD

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

Only EPA's criteria pollutants¹ are subject to conformity analyses. One of two tests is used in a conformity demonstration:

Budget: State air quality implementation and maintenance plans for nonattainment and 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.

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 a build scenario are equal to or less than the emissions from a no build scenario, conformity has been demonstrated. This test is used for nonattainment or maintenance areas where motor vehicle emissions budgets are not established.

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 **draft** FY2015-2019 Regional Transportation Improvement Program, covering northern Ada County and the Nampa Urbanized Area.

¹ EPA sets air quality standards for six common pollutants, referred to as "["criteria" air pollutants](#)". These standards are developed based on human health and/or environmental criteria (science-based guidelines). Of the six criteria pollutants, particulate pollution and ground-level ozone are the two most widespread health threats.

SUMMARY

The U.S Environmental Protection Agency's Motor Vehicle Emission Simulator (MOVES) and the Community Planning Association of Southwest Idaho's (COMPASS') most current and approved travel demand model were used to estimate pollutant emissions from the transportation projects contained in *Communities in Motion 2040* and the draft FY2015-2019 Regional Transportation Improvement Program (TIP). A TIP is a short-range (five-year) capital improvement budget for the transportation system in a given urbanized area. The Interagency Consultation Committee approved the modeling methodologies and assumptions used in the regional emissions analyses including the applicable transportation model networks. Growth and demographic assumptions from the region's *Communities in Motion 2040* Vision are used in this demonstration.

The *Northern Ada County PM₁₀ State Implementation Plan, Maintenance Plan: Ten-Year Update*² contains motor vehicle emissions budgets for three pollutants: coarse particulate matter, oxides of nitrogen, and volatile organic compounds. Emissions budget tests, as required by 40CFR93.118, demonstrate conformity of draft FY2015-2019 TIP. The *Northern Ada County Air Quality Maintenance Area Second 10-Year Carbon Monoxide Limited Maintenance Plan*³ does not contain any motor vehicle emissions budgets. However, COMPASS conducts a carbon monoxide emissions analysis as requested by the Idaho Department of Environmental Quality to aid in regional air quality planning.

While areas with maintenance plans approved under the limited maintenance plan option are not subject to the budget test, the areas remain subject to other transportation conformity requirements of 40CFR93, subpart A. Thus, the metropolitan planning organization (MPO) in the area or the state must document and ensure that:

- a. *Transportation plans and projects provide for timely implementation of SIP transportation control measures in accordance with 40CFR93.113;*
- b. *Transportation plans and projects comply with the fiscal constraint element per 40CFR93.108;*
- c. *The MPO's interagency consultation procedures meet applicable requirements of 40CFR93.105;*
- d. *Conformity of transportation plans is determined no less frequently than every four years, and conformity of plan amendments and transportation projects is demonstrated in accordance with the timing requirements specified in 40CFR93.104;*
- e. *The latest planning assumptions and emissions model are used as set forth in 40CFR93.110 and 40CFR93.111;*
- f. *Projects do not cause or contribute to any new localized carbon monoxide or particulate matter violations, in accordance with procedures specified in 40CFR93.123; and*
- g. *Project sponsors and/or operators provide written commitments as specified in 40CFR93.125. [40CFR93, subpart A]*

² http://www.deq.idaho.gov/media/971222-ada_county_pm1_0_sip_0213.pdf

³ <http://www.deq.idaho.gov/media/909866-ada-county-co-maintenance-plan-2011.pdf>

I. INTRODUCTION

Community Planning Association of Southwest Idaho

The Community Planning Association of Southwest Idaho (COMPASS) is an association of local 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 the Ada Planning Association, has been designated as the metropolitan planning organization (MPO) for northern Ada County. In April 2003, COMPASS was designated as the MPO for the Nampa Urbanized Area, located in neighboring Canyon County. The agency's service area covers Ada and Canyon Counties.

Clean Air Act Designations

The federal government sets health-based air quality standards for air pollutants, called the National Ambient Air Quality Standards, or NAAQS. Areas that have violated (not attained) the NAAQS are referred to as "nonattainment areas"; areas that were nonattainment areas in the past, but have re-attained the standard, are termed "maintenance areas." Northern Ada County is a maintenance area for two air pollutants – coarse particulate matter (PM₁₀) and carbon monoxide (CO). Northern Ada County violated the NAAQS for these pollutants in the 1980s and early 1990s, and has been in compliance ever since.

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

Coarse Particulate Matter (PM₁₀)

Northern Ada County is designated as a maintenance area in attainment of the 24-hour PM₁₀ NAAQS. Appendix A shows the extent of the maintenance area boundaries. While exceedances of the 24-hour PM₁₀ NAAQS have occurred due to wind-blown dust events, no violations of the 24-hour PM₁₀ NAAQS have occurred since the area was designated as a maintenance area in attainment of the standard. Prior to March 12, 1999, Northern Ada County was designated as a nonattainment area for PM₁₀. However, on that date, the U.S. Environmental Protection Agency (EPA) Administrator signed a revocation of Northern Ada County's nonattainment designation based on changes made to the PM₁₀ NAAQS ([64FR12257](#)). 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 (DEQ) to update Northern Ada County's PM₁₀ State Implementation Plan (SIP). In September 2003, the EPA approved the *Northern Ada County PM₁₀ SIP Maintenance Plan and Redesignation Request*. In March 2013, the *Northern Ada County PM₁₀ State Implementation Plan, Maintenance Plan: Ten-Year Update*⁴ (PM₁₀ maintenance plan) was submitted to EPA. On May 17, 2013, EPA announced receipt of the "maintenance plan" and issued determination of adequacy of the motor vehicle emission budgets for transportation conformity purposes.

⁴http://www.deq.idaho.gov/media/971222-ada_county_pm10_sip_0213.pdf

Commonly, past exceedances of the 24-hour PM₁₀ NAAQS in Northern Ada County occurred 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 gaseous pollutants such as oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). Thus, both NO_x and VOCs are considered precursors of PM₁₀. As a result, the PM₁₀ maintenance plan contains approved PM₁₀, NO_x, and VOC motor vehicle emissions budgets.

Carbon Monoxide (CO)

Additionally, Northern Ada County is designated as an attainment area with an approved limited maintenance plan of the CO NAAQS. Northern Ada County has not experienced a violation of the CO NAAQS since 1987. DEQ 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. The *Northern Ada County Air Quality Maintenance Area Second 10-Year Carbon Monoxide Limited Maintenance Plan* (CO maintenance plan) was approved by EPA September 2012. 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 PM₁₀ maintenance plan established motor vehicle emissions budgets for PM₁₀, NO_x, and VOCs. Therefore, to satisfy transportation conformity requirements established by 40CFR93.118, budget tests must be performed for **draft** FY2015-2019 Regional Transportation Improvement Program (TIP). Budget tests are satisfied when regional emissions estimates based on the transportation projects outlined in a Regional Transportation Improvement Program (TIP) or transportation plan are less than or equal to "budgets" established by SIPs and/or air quality maintenance plans.

As noted above, 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.⁵

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

⁵ Page 8 of the *Northern Ada County Air Quality Maintenance Area Second 10-Year Carbon Monoxide Limited Maintenance Plan* <http://www.deq.idaho.gov/media/909866-ada-county-co-maintenance-plan-2011.pdf>

Interagency Consultation

Idaho Administrative Code (IDAPA 58.01.01.567) requires nonattainment and maintenance areas establish an Interagency Consultation Committee (ICC) on transportation conformity. The Northern Ada County ICC approved the assumptions and methodologies employed in the development of the regional emissions analyses in this demonstration on April 15, 2014. The approved assumptions and methodologies are listed in Appendices B and C. The roadway project list was also approved by the ICC on April 15, 2014. 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:

...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 PM₁₀ maintenance plan established motor vehicle emissions budgets. Budget tests were performed for:

- 2015 - Base year of the **draft** FY2015-2019 TIP
- 2019 - Last year of the **draft** FY2015-2019 TIP
- 2025 - Intermediate analysis year, no more than 10 years between analysis years
- 2035 - Intermediate analysis year, no more than 10 years between analysis years
- 2040 - Long-range transportation plan (*Communities in Motion 2040* [CIM 2040]) horizon year

Projects for the five scenarios are shown in Table 1, Table 3, Table 5, and Table 7 and the results for these five scenarios are shown in Table 2, Table 4, Table 6, Table 8, and Table 9.

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.

40CFR93.101⁶ 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.

⁶ [Code of Federal Regulations Title 40: Protection of Environment](#)

Idaho Administrative Code (IDAPA 58.01.01.566)⁷ further defines a regionally significant project as:

A transportation project, other than an exempt project, that is on a facility which serves regional transportation needs... and would normally be included in the modeling of a metropolitan area's transportation network, including, at a minimum:

- a. All principal arterial highways;*
- b. All fixed guideway transit facilities that offer an alternative to regional highway travel; and*
- c. Any other facilities determined to be regionally significant through Section 570, interagency consultation.*

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

Regionally Significant Roadway Project Definition

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

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

- (a) the project is for the improvement of either:
 - (i) a principal arterial or higher functional classification; or*
 - (ii) a minor arterial which will have a twenty (20) year projected traffic volume of at least 45,000 vehicles a day after completion of the project; and**
- (b) the project will add at least one new continuous vehicular lane which either:
 - (i) extends from one intersecting principal or minor arterial to another intersecting principal or minor arterial; or*
 - (ii) in the case of an interstate, extends from the on ramp of one interstate interchange to a point beyond the off ramp of the next adjacent interstate interchange.**

Regionally Significant Transit Project Definition

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

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

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

⁷ [Idaho Administrative Code Rules for the Control of Air Pollution in Idaho](#)

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 projects, 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 they may have an adverse impact on air quality.

Transportation Control Measures

As per 40CFR93.113(c), in order for a TIP or long-range transportation plan to be conforming, it cannot interfere with the implementation of any transportation control measures. There are no transportation control measures requiring implementation in either the PM₁₀ maintenance plan or the CO maintenance plan. Therefore, the **draft** FY2015-2019 TIP meets the requirements of 40CFR93.113(c).

II. EMISSIONS ESTIMATION

Emissions Analysis Assumptions and Tools

This air quality conformity demonstration is based upon average speed distributions for each roadway type by 16 speed "bins." The regional travel demand model's average daily estimates or forecasts for each roadway segment provide the necessary data for this input. Emissions factors are generated using the latest version of EPA's motor vehicle emissions model (Motor Vehicle Emission Simulator, or MOVES2010b). A regional emission analysis was conducted as described below.

COMPASS' Travel Demand Model

The COMPASS travel demand model provides estimates of average weekday and peak hour travel demand for each link of a given transportation network based on current and future growth assumptions. In addition to travel demand, the model produces weekday vehicle miles of travel forecasts, congested network speeds, and other data relevant to regional emissions analyses. The 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, collectors, and select local roads in Ada and Canyon Counties.

COMPASS' travel demand modeling activities are performed under the review of the Transportation Model Advisory Committee (TMAC). TMAC is a technical committee formed by the COMPASS Board of Directors. The committee is made up of local experts, technical staff from COMPASS member agencies, and local traffic engineers from both the public and private sectors. TMAC works with COMPASS staff to periodically calibrate and validate the travel demand model to reflect the actual travel patterns and behaviors in the Ada and Canyon Counties. COMPASS' current travel demand model is calibrated and validated to 2008 conditions. To learn more about the travel demand model visit <http://www.compassidaho.org/prodserv/traveldemand.htm>.

Demographic Data

The COMPASS Board approves the official population and employment forecast control totals for the Treasure Valley. Between September 2011 and October 2012, COMPASS, its member agencies, stakeholders, and the general public participated in the development of a preferred growth scenario for the year 2040 – the *Communities in Motion 2040* Vision. This preferred growth scenario, used for the CIM 2040 plan, was based on approved population and employment forecasts and was adopted by the COMPASS Board in October 2012. To learn more about the process and growth allocations visit http://www.compassidaho.org/prodserv/cim2040_scenarioplanning.htm.

Demographic data for the analysis years of 2015 and 2019 were developed using data from the 2010 Census and 2015 and 2020 demographic forecasts, which were accepted by the COMPASS Demographic Advisory Committee on November 28, 2012.

Roadway Network Assumptions

The projects used in the regional emissions analysis for the **draft** FY2015-2019 TIP are derived from:

- COMPASS' **draft** FY2015-2019 TIP
- Ada County Highway District's (ACHD's) FY2014-2018 Integrated Five-Year Work Plan
- Idaho Transportation Investment Program for FY2015-2019
- ACHD's FY2012 Capital Improvement Plan (CIP) (FY2012-2031)
- CIM 2040, the regional long-range transportation plan for Ada and Canyon Counties

Roadway projects were placed into analysis (or budget) year networks based on information contained in the above sources. The anticipated project completion date is used to place the transportation project in the appropriate network year. Projects in preliminary development were placed in the roadway network year based on information contained in ACHD's CIP. Other future roadway projects listed on the funded list of both *Communities in Motion 2040* and ACHD's CIP were placed in a roadway network year based on information contained in ACHD's CIP. Roadway projects listed as unfunded in CIM 2040 **and** right-of-way only/unfunded in ACHD's CIP were not included in the roadway networks. These "unfunded" projects could not be considered funded or go to construction without an accompanying emissions analysis.

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 four-step travel demand model, such as the one maintained by COMPASS. It takes estimates of "person trips" and predicts the mode of travel the trip will use.

Figure 1 shows the motorized modes available to the travel demand model for assignment. Transit trips are assigned to a transit network input into the travel demand model. Non-motorized trips are not assigned to a network.

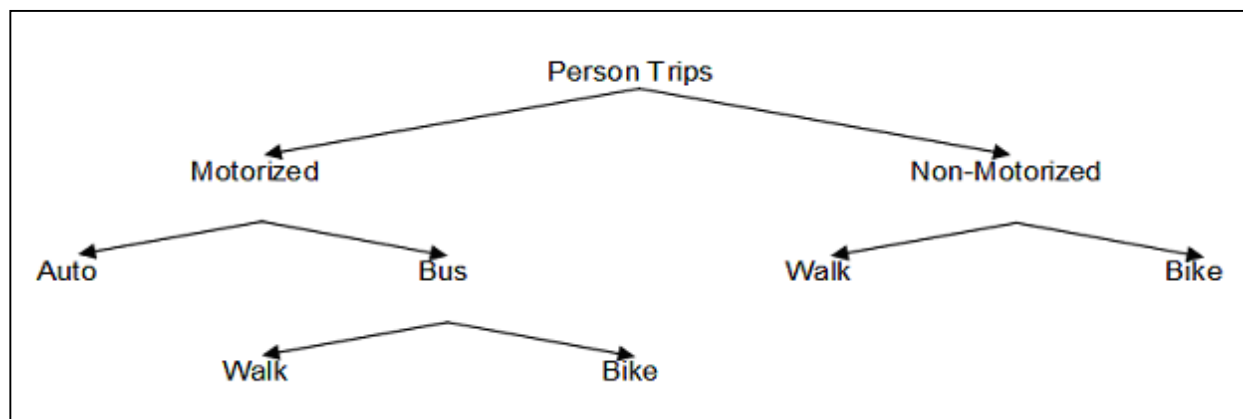


Figure 1: COMPASS Model Travel Modes

Currently, no major system expansion is funded for the region's transit system in either the **draft** FY2015-2019 TIP or CIM 2040. Therefore, only the transit system as it exists today is included in the analysis through 2040. The current system includes:

- Sixteen routes and approximately 717 stops with peak hour headways between 20-60 minutes in the Boise/Garden City service area.
- Five Nampa and Caldwell fixed routes with peak hour headways up to 60 minutes and one Nampa/Caldwell dial-a-ride service route.
- Five inter-county routes (between Ada and Canyon Counties) with up to 30 minute headways during the morning/afternoon peak periods and 2-3 hour headways during off peak periods.

Chapter 5 in CIM 2040⁸ contains more general information on the region's current transit system. Specific information on the routes and schedules used to model the transit system can be found at Valley Regional Transit's website: <http://www.valleyride.org/>.

Emissions Modeling

EPA's new emissions model, MOVES, was used to estimate the air quality impacts associated with current and future roadway networks.

The MOVES model uses local data inputs for climate, elevation, Northern Ada County's vehicle emissions testing program, and travel demand model forecasted roadway speeds to develop emission factors for specified air pollutants. Appendix B summarizes the MOVES modeling assumptions approved by the ICC for use in this demonstration. These model settings and inputs were reviewed during the interagency consultation process. Both the PM₁₀ and CO maintenance plans were updated by DEQ's Boise Regional Office. All of the methodologies, assumptions, processes, and results are documented in the updated maintenance plans. Both plans and associated appendices are available on DEQ's website, as listed below:

PM₁₀ Maintenance Plan

http://www.deq.idaho.gov/media/971222-ada_county_pm10_sip_0213.pdf

PM₁₀ Maintenance Plan appendices

http://www.deq.idaho.gov/media/971226-ada_county_pm10_sip_appendices_0213.pdf

CO Maintenance Plan

<http://www.deq.idaho.gov/media/909866-ada-county-co-maintenance-plan-2011.pdf>

CO Maintenance Plan appendices

<http://www.deq.idaho.gov/media/909870-ada-county-co-maintenance-plan-2011-appendices.pdf>

EPA's model Motor Vehicle Emissions Estimator (MOVES)

<http://www.epa.gov/otaq/models/moves/index.htm>.

As described on page 10, PM₁₀, VOC, and NO_x budget tests were performed under the five scenario years: 2015, 2019, 2025, 2035, and 2040. Results are shown in Table 2, 4, 6, 8, and 9.

⁸ <http://www.compassidaho.org/prodserv/cim2040.htm#Plan>

2015 Baseline Scenario

The 2015 baseline scenario uses near-term population and employment estimates with the 2015 roadway network which includes the projects listed in Table 1. (Note: The numbers in the "No." column are for reference only).

| Table 1: Projects Included in the 2015 Network for the 2015 Baseline Scenario | | | | | | | |
|--|-------------------------|---|-------|-------------------------|--------------|---------------------------------|---------------------------------|
| No. | Project | Location | Lanes | Regionally Significant? | Federal Aid? | Exempt from Regional Conformity | Identification No. ¹ |
| 1. | Broadway Ave IC | Reconstruct interchange | NA | Yes | Yes | Yes - (40CFR 93.127) | 09821 |
| 2. | Lake Hazel Rd Extension | Connect existing Lake Hazel Rd to Cole Rd | 2 | Yes | No | No | RD213-17 |
| 3. | Five Mile Rd | Fairview Ave - Ustick Rd | 5 | No | No | Yes | RD195a/ RD2012-57 |
| 4. | Gowen Rd IC | Reconstruct interchange | NA | Yes | Yes | Yes - (40CFR 93.127) | 09822 |
| 5. | Hill Rd Extension | State St - Horseshoe Bend Rd | 3 | No | No | Yes | RD308 |
| 6. | I-84 | Broadway Ave IC to Gowen IC | 6 | Yes | Yes | No | 13812 |
| 7. | Meridian Rd IC | Reconstruct interchange | NA | Yes | Yes | Yes - (40CFR 93.127) | 10939 |
| 8. | McMillan Rd | Locust Grove Rd - Eagle Rd | 5 | No | No | Yes | RC0240/ RD2012-100 |
| 9. | SH 16 River Crossing | Connect SH 16 from SH 44 to US 20/26 | 4 | Yes | Yes | No | 11236 |
| 10. | Ten Mile Rd | Cherry Ln - Ustick Rd | 5 | No | No | Yes | RD188/ RD2012-131 |

¹Identification No: Numeric numbers refer to projects in the TIP. Alphanumeric identification numbers refer to projects in ACHD's Five-Year Work Plan or CIP.

Table 2 shows estimated motor vehicle emissions for PM₁₀, VOC, and NO_x from the 2015 baseline scenario.

| Table 2: 2015 Estimated Emissions, Tons per Day | | | | | | |
|--|-----------------------------|---------------------------|---|--------------------------------|-------------|-----------------------|
| 2015 | PM₁₀ | | | | VOC | NO_x |
| | Unpaved Road Dust Emissions | Paved Road Dust Emissions | Tailpipe, Tire, and Brakewear Emissions | Total PM ₁₀ Emitted | | |
| Estimated Emissions | 2.65 | 21.75 | 0.72 | 25.12 | 7.20 | 15.07 |
| Budget | n/a | n/a | n/a | 42.9 | 12.6 | 29.5 |

2019 Scenario

The 2019 scenario uses 2019 population and employment forecasts with the 2019 roadway network. The 2019 roadway network includes the projects listed in Tables 1 and 3. (Note: The numbers in the "No." column are for reference only).

| Table 3: Projects Added to the 2015 Network for the 2019 Scenario | | | | | | | |
|--|-----------------------------|-------------------------------|-------|-------------------------|--------------|---------------------------------|------------------------------------|
| No. | Project | Location | Lanes | Regionally Significant? | Federal Aid? | Exempt from Regional Conformity | Identification No. ¹ |
| 11. | Broadway Bridge Replacement | Front St to University Dr | 6 | Yes | Yes | No | 11588 |
| 12. | Cloverdale Rd | Franklin Rd – Fairview Ave | 5 | No | No | Yes | RD202-14/ RD2012-30 / RC0087 |
| 13. | Cloverdale Rd | Fairview Ave – Ustick Rd | 5 | No | No | Yes | RD202-14/ RD2012-31 / RC0087 |
| 14. | Cole Rd | I-84 WB ramps – Franklin Rd | 5 | Yes | No | No | RD207-16/ RD2012-34 |
| 15. | Franklin Rd | Black Cat Rd – Ten Mile Rd | 5 | Yes | Yes | No | RC0152/ RD2012- 60/12368 |
| 16. | Pine Ave/ Executive St | Parkdale Ave – President Dr | 5 | No | No | Yes | UB212-07/ RD2012-119 |
| 17. | Ustick Rd | Linder Rd -Meridian Rd | 5 | Yes | TBD | No | RD205-05/ RD2012-139 |
| 18. | Ustick Rd | Meridian Rd – Locust Grove Rd | 5 | Yes | No | No | RD202-37/ RD2012-140 |

¹ Identification No: Numeric numbers refer to projects in the TIP. Alphanumeric identification numbers refer to projects in ACHD's Five-Year Work Plan or CIP.

Table 4 shows estimated motor vehicle emissions for PM₁₀, VOC, and NO_x from the 2019 scenario.

| Table 4: 2019 Estimated Emissions, Tons per Day | | | | | | |
|--|-----------------------------|---------------------------|-------------------------------|--------------------------------|-------------|-----------------------|
| 2019 | PM₁₀ | | | | VOC | NO_x |
| | Unpaved Road Dust Emissions | Paved Road Dust Emissions | Tailpipe, Tire, and Brakewear | Total PM ₁₀ Emitted | | |
| Estimated Emissions | 2.65 | 23.95 | 0.63 | 27.23 | 5.66 | 10.98 |
| Budget | <i>n/a</i> | <i>n/a</i> | <i>n/a</i> | 42.9 | 12.6 | 29.5 |

2025 Scenario

The 2025 scenario uses 2025 population and employment estimates with the 2025 roadway network. The 2025 roadway network includes all projects listed in Tables 1, 3, and 5. (*Note: The numbers in the "No." column are for reference only.*)

Table 5: Projects Added to the 2019 Network for the 2025 Scenario

| No. | Project | Location | Lanes | Regionally Significant? | Federal Aid? ¹ | Exempt from Regional Conformity | Identification No. ² |
|-----|--------------------------------|---|-------|-------------------------|---------------------------|---------------------------------|---------------------------------|
| 19. | Black Cat Rd | Overland Rd - Franklin Rd (no widening of the overpass) | 5 | No | No | Yes | RD2012-18 |
| 20. | Black Cat Rd | Franklin Rd – Cherry Ln | 5 | No | No | Yes | RD2012-19 |
| 21. | Black Cat Rd | Cherry Ln – Ustick Rd | 5 | No | No | Yes | RD2012-20 |
| 22. | Cloverdale Rd | Overland Rd - Franklin Rd (no widening of the overpass) | 5 | No | No | Yes | RD2012-29 |
| 23. | Cloverdale Rd | Overland Rd – Victory Rd | 5 | No | No | Yes | RD2012-28 |
| 24. | Cloverdale Rd | Amity Rd – Victory Rd | 5 | No | No | Yes | RD2012-27 |
| 25. | Cloverdale Rd | Lake Hazel Rd – Amity Rd | 5 | No | No | Yes | RD2012-26 |
| 26. | Cloverdale Rd | Columbia Rd – Lake Hazel Rd | 5 | No | No | Yes | RD2012-25 |
| 27. | Eagle Rd | SH 44 to Plaza Dr (or State St depending on study) | 5 | No | No | Yes | RD2012-38 |
| 28. | Emerald St | Five Mile Rd – Curtis Rd | 5 | No | No | No | RD2012-41/42/43 |
| 29. | Executive St / Presidential | 1000 feet east of Cloverdale Rd – Five Mile Rd (3 lane couplet with Presidential) | 5 | No | No | Yes | RD2012-45 |
| 30. | Fairview Ave Access Management | Linder Rd to Orchard St | 5 | No | No | Yes | RD208-10 |
| 31. | Fairview Ave | Meridian Rd - Locust Grove Rd | 7 | Yes | No | No | RD2012-46 |
| 32. | Fairview Ave | Locust Grove Rd – Eagle Rd | 7 | Yes | No | No | RD2012-47 |
| 33. | Five Mile Rd | Victory Rd – Amity Rd | 5 | No | No | No | RD2012-54 |
| 34. | Five Mile Rd | Overland Rd - Franklin Rd (no widening of the overpass) | 5 | No | No | No | RD2012-55 |
| 35. | Hill Rd | Horseshoe Bend Rd – Seaman’s Gulch Rd | 5 | No | No | No | RD2012-63 |
| 36. | Linder Rd | US 20/26 (Chinden Blvd) – SH 44 | 7 | Yes | No | No | RD2012-85 |
| 37. | Linder Rd | McMillan Rd to US 20/26 (Chinden Blvd) east side of road only | 5 | Yes | No | No | RD2012-84 |
| 38. | Linder Rd | SH 44 – Floating Feather Rd | 5 | Yes | No | No | RD2012-86 |
| 39. | Linder Rd | Floating Feather Rd – Beacon Light Rd | 5 | Yes | No | No | RD2012-87 |
| 40. | Linder Rd | Franklin Rd – Cherry Ln | 5 | Yes | No | No | RD2012-81/RD213-16 |
| 41. | Locust Grove Rd | Amity Rd – Victory Rd | 3 | No | No | Yes | RD2012-88 |
| 42. | Locust Grove Rd | Fairview Ave – Ustick Rd | 5 | No | No | Yes | RD2012-90 |
| 43. | Locust Grove Rd | Ustick Rd - McMillan Rd | 3 | No | No | Yes | RD2012-91 |

Table 5: Projects Added to the 2019 Network for the 2025 Scenario

| No. | Project | Location | Lanes | Regionally Significant? | Federal Aid? ¹ | Exempt from Regional Conformity | Identification No. ² |
|-----|----------------|---|-------|-------------------------|---------------------------|---------------------------------|---------------------------------|
| 44. | Maple Grove Rd | Fairview Ave - McMillan Rd | 5 | No | No | Yes | RD2012-94/95 |
| 45. | Maple Grove Rd | Victory Rd to Overland Rd | 5 | No | No | Yes | RD2012-93 |
| 46. | Maple Grove Rd | Amity Rd – Victory Rd | 5 | No | No | Yes | RD2012-92 |
| 47. | McMillan Rd | Star Rd - McDermott Rd | 3 | No | No | Yes | RD2012-97 |
| 48. | McMillan Rd | McDermott Rd – Black Cat Rd | 3 | No | No | Yes | RD2012-98 |
| 49. | McMillan Rd | Black Cat Rd – Ten Mile Rd | 3 | No | No | Yes | RD2012-99 |
| 50. | Meridian Rd | Cherry Ln – Ustick Rd | 5 | No | No | Yes | RD2012-104 |
| 51. | Meridian Rd | Ustick Rd – McMillan Rd | 3 | No | No | Yes | RD2012-105 |
| 52. | SH 44 | SH 16 – Linder Rd | 4 | Yes | TBD | No | TBD |
| 53. | Star Rd | McMillan Rd – US 20/26 (Chinden Blvd) | 5 | No | No | Yes | RD2012-121 |
| 54. | Star Rd | US 20/26 (Chinden Blvd) – SH 44 | 5 | No | No | Yes | RD2012-122 |
| 55. | State St | Glenwood St – Peirce Park Ln | 7 | Yes | No | No | RD208-04/ RD2012-123 |
| 56. | State St | Peirce Park Ln – Collister Dr | 7 | Yes | No | No | RD208-05/ RD2012-124 |
| 57. | State St | Collister Dr – 36 th St | 7 | Yes | No | No | RD208-06/ RD2012-125 |
| 58. | State St | 36 th St – 27 th St | 7 | Yes | No | No | RD208-07/ RD2012-126 |
| 59. | Ten Mile Rd | Victory Rd – Overland Rd | 5 | Yes | No | No | RD2012-130 |
| 60. | Ten Mile Rd | Ustick Rd – McMillan Rd | 5 | No | No | Yes | RD2012-132 |
| 61. | Ustick Rd | Ten Mile Rd – Linder Rd | 5 | Yes | No | No | RD2012-138 |
| 62. | Ustick Rd | Cole Rd - Curtis Rd | 5 | No | No | Yes | RD2012-143 |
| 63. | Victory Rd | Meridian Rd – Locust Grove Rd | 3 | No | No | Yes | RD2012-148 |
| 64. | Victory Rd | Locust Grove Rd – Eagle Rd | 3 | No | No | Yes | RD2012-149 |
| 65. | Victory Rd | Cloverdale Rd – Five Mile Rd | 5 | No | No | Yes | RD2012-151 |
| 66. | Victory Rd | Five Mile Rd – Maple Grove Rd | 5 | No | No | Yes | RD2012-152 |

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

² Identification No: Alphanumeric identification numbers refer to projects in ACHD’s Five-Year Work Plan or CIP.

Table 6 shows estimated motor vehicle emissions for PM₁₀, VOC, and NO_x from the 2025 scenario.

Table 6: 2025 Estimated Emissions, Tons per Day

| 2025 | PM ₁₀ | | | | VOC | NO _x |
|---------------------|-----------------------------|---------------------------|---|--------------------------------|-------------|-----------------|
| | Unpaved Road Dust Emissions | Paved Road Dust Emissions | Tailpipe, Tire, and Brakewear Emissions | Total PM ₁₀ Emitted | | |
| Estimated Emissions | 2.65 | 31.04 | 0.64 | 34.33 | 4.83 | 9.08 |
| Budget | n/a | n/a | n/a | 60.1 | 17.2 | 34.2 |

2035 Scenario and 2040 Scenario

The 2035 scenario uses 2035 population and employment estimates with the 2035 roadway network. The 2035 roadway network includes all projects listed in Tables 1, 3, 5, and 7. (Note: The numbers in the "No." column are for reference only). The 2040 scenario uses 2040 population and employment estimates with the 2035 roadway network since no additional roadways projects are planned for funding.

| Table 7: Projects Added to the 2025 Network for the 2035 Scenario and 2040 Scenario | | | | | | | |
|--|---------------------------------|---|-------|-------------------------|---------------------------|---------------------------------|---------------------------------|
| No. | Project | Location | Lanes | Regionally Significant? | Federal Aid? ¹ | Exempt from Regional Conformity | Identification No. ² |
| 67. | 36th St Extension 1 | Bison Dr to Cartwright Rd | 2 | No | No | Yes | RD2012-2 |
| 68. | 36 th St Extension 2 | Cartwright Rd and Bogus Basin Rd | 2 | No | No | Yes | RD2012-3 |
| 69. | Amity Rd | Black Cat Rd - Ten Mile Rd | 5 | Yes | No | No | RD2012-5 |
| 70. | Amity Rd | Ten Mile Rd - Linder Rd | 5 | No | No | Yes | RD2012-6 |
| 71. | Amity Rd | Linder Rd - Meridian Rd | 5 | No | No | Yes | RD2012-7 |
| 72. | Amity Rd | SH 69 - Locust Grove Rd | 5 | No | No | Yes | RD2012-8 |
| 73. | Amity Rd | Locust Grove Rd - Eagle Rd | 5 | No | No | Yes | RD2012-9 |
| 74. | Avalon Rd (Kuna Rd) | Linder Rd - Orchard St | 3 | No | No | Yes | RD2012-10 |
| 75. | Beacon Light Rd | SH 16 - Palmer Ln | 5 | No | No | Yes | RD2012-11 |
| 76. | Beacon Light Rd | Palmer Rd - Linder Rd | 5 | No | No | Yes | RD2012-12 |
| 77. | Beacon Light Rd | Linder Rd - Ballantyne Rd | 5 | No | No | Yes | RD2012-13 |
| 78. | Beacon Light Rd | Ballantyne Rd - Eagle Rd | 5 | No | No | Yes | RD2012-14 |
| 79. | Beacon Light Rd | Eagle Rd - SH 55 | 5 | No | No | Yes | RD2012-15 |
| 80. | Cloverdale Rd | Ustick Rd - McMillan Rd | 5 | No | No | Yes | RD2012-32 |
| 81. | Deer Flat Rd | Linder Rd - SH 69 | 5 | No | No | Yes | RD2012-35 |
| 82. | Eagle Rd | Lake Hazel Rd - Amity Rd | 5 | Yes | No | No | RD2012-36 |
| 83. | Eagle Rd | Amity Rd - Victory Rd | 5 | Yes | No | No | RD2012-37 |
| 84. | Eisenmann Rd | New Lake Hazel Rd - I-84 IC | 5 | No | No | Yes | RD2012-39 |
| 85. | Eisenmann Rd | New Lake Hazel Rd - Gowen Rd | 3 | No | No | Yes | RD2012-40 |
| 86. | Fairview Ave | Eagle Rd - Cloverdale Rd | 7 | Yes | No | No | RD2012-48 |
| 87. | Fairview Ave | Cloverdale Rd - Five Mile Rd | 7 | Yes | No | No | RD2012-49 |
| 88. | Fairview Ave | Five Mile Rd - Maple Grove Rd | 7 | Yes | No | No | RD2012-50 |
| 89. | Fairview Ave | Maple Grove Rd - Cole Rd | 7 | Yes | No | No | RD2012-51 |
| 90. | Fairview Ave | Cole Rd - Orchard St (or e/o Curtis Rd) | 7 | Yes | No | No | RD2012-52 |
| 91. | Five Mile Rd | Lake Hazel Rd - Amity Rd | 5 | No | No | Yes | RD2012-53 |
| 92. | Five Mile Rd | Ustick Rd - McMillan Rd | 5 | No | No | Yes | RD2012-58 |
| 93. | Franklin Rd | McDermott Rd - Black Cat Rd | 5 | Yes | No | No | RD2012-59 |
| 94. | Glenwood St / Cole Rd couplet | Two way couplet - Mountain View Dr | 3 | Yes | No | No | RD2012-62 |
| 95. | Lake Hazel Rd | Linder Rd - SH 69 | 5 | Yes | No | No | RD2012-67 |
| 96. | Lake Hazel Rd | SH 69 - Locust Grove Rd | 5 | Yes | No | No | RD2012-68 |
| 97. | Lake Hazel Rd | Locust Grove Rd - Eagle Rd | 5 | Yes | No | No | RD2012-69 |

Table 7: Projects Added to the 2025 Network for the 2035 Scenario and 2040 Scenario

| No. | Project | Location | Lanes | Regionally Significant? | Federal Aid? ¹ | Exempt from Regional Conformity | Identification No. ² |
|------|---------------------------|--|-------|-------------------------|---------------------------|---------------------------------|---------------------------------|
| 98. | Lake Hazel Rd | Eagle Rd – Cloverdale Rd | 5 | Yes | No | No | RD2012-70 |
| 99. | Lake Hazel Rd | Cloverdale Rd – Five Mile Rd | 5 | Yes | No | No | RD2012-71 |
| 100. | Lake Hazel Rd | Five Mile Rd – Maple Grove Rd | 5 | Yes | No | No | RD2012-72 |
| 101. | Lake Hazel Rd | Maple Grove Rd – Cole Rd | 5 | Yes | No | No | RD2012-73 |
| 102. | Lake Hazel Rd Ext 1 | Cole Rd – Orchard St | 5 | Yes | No | No | RD2012-74 |
| 103. | Lake Hazel Rd Ext 2 | Orchard Ext 1 – Pleasant Valley Rd | 5 | Yes | No | No | RD2012-75 |
| 104. | Lake Hazel Rd Ext 3 | Pleasant Valley Rd – Eisenmann Rd | 5 | Yes | No | No | RD2012-76 |
| 105. | Linder Rd | Cherry Ln – Ustick Rd | 5 | Yes | No | No | RD2012-82 |
| 106. | Linder Rd | Ustick Rd – McMillan Rd | 5 | Yes | No | No | RD2012-83 |
| 107. | Linder Rd | Overland Rd - Franklin Rd (new overpass is NOT included) | 5 | Yes | TBD | No | RD2012-80 |
| 108. | Locust Grove Rd | Victory Rd – Overland Rd | 3 | No | No | Yes | RD2012-89 |
| 109. | McMillan Rd | Can Ada Rd - Star Rd | 3 | No | No | Yes | RD2012-96 |
| 110. | McMillan Rd | Cloverdale Rd - Maple Grove Rd | 5 | No | No | Yes | RD2012-101/102 |
| 111. | Meridian Rd | McMillan Rd – Chinden Blvd | 3 | No | No | Yes | RD2012-106 |
| 112. | Orchard Rd Ext 1 | Lake Hazel Rd – Orchard Ext | 5 | No | No | Yes | RD2012-107 |
| 113. | Orchard Rd Ext 2 | Pleasant Valley Rd – Orchard Ext | 5 | No | No | Yes | RD2012-108 |
| 114. | Orchard Rd Ext 3 | Orchard Ext 1 – Gowen Rd | 5 | Yes | No | No | RD2012-109 |
| 115. | Orchard Rd Ext 4 | Gowen Rd – Victory Rd | 7 | Yes | No | No | RD2012-110 |
| 116. | Overland Rd New Extension | Black Cat Rd – Ten Mile Rd | 3 | No | No | Yes | |
| 117. | Pine Ave | Meridian Rd – Locust Grove Rd | 3 | No | No | Yes | RD2012-118 |
| 118. | Ten Mile Rd | McMillan Rd – Chinden Blvd | 5 | No | No | Yes | RD2012-133 |
| 119. | Ten Mile Rd | Lake Hazel - Victory Rd | 5 | Yes | No | No | RD2012-128/129 |
| 120. | Ten Mile Rd | Columbia Rd - Lake Hazel Rd | 5 | No | No | Yes | RD2012-127 |
| 121. | US 20/26 | Locust Grove Rd – Eagle Rd | 4 | Yes | TBD | No | TBD |
| 122. | Ustick Rd | Black Cat Rd – Ten Mile Rd | 5 | Yes | No | No | RD2012-137 |
| 123. | Ustick Rd | McDermott Rd – Black Cat Rd | 5 | Yes | No | No | RD2012-136 |
| 124. | Victory Rd | McDermott Rd – Black Cat Rd | 3 | No | No | Yes | RD2012-144 |
| 125. | Victory Rd | Black Cat Rd – Ten Mile Rd | 3 | No | No | Yes | RD2012-145 |
| 126. | Victory Rd | Ten Mile Rd – Linder Rd | 3 | No | No | Yes | RD2012-146 |
| 127. | Victory Rd | Linder Rd – Meridian Rd | 3 | No | No | Yes | RD2012-147 |
| 128. | Victory Rd | Eagle Rd - Cloverdale Rd | 5 | No | No | Yes | RD2012-150 |

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

²Identification No: Alphanumeric identification numbers refer to projects in ACHD’s Five-Year Work Plan or CIP. Blanks indicate an identification number has not been assigned.

Table 8 and Table 9 show estimated motor vehicle emissions for PM₁₀, VOC, and NO_x from the 2035 scenario and 2040 scenario.

| Table 8: 2035 Estimated Emissions, Tons per Day | | | | | | |
|--|-----------------------------|---------------------------|---|--------------------------------|-------------|-----------------------|
| 2035 | PM₁₀ | | | | VOC | NO_x |
| | Unpaved Road Dust Emissions | Paved Road Dust Emissions | Tailpipe, Tire, and Brakewear Emissions | Total PM ₁₀ Emitted | | |
| Estimated Emissions | 2.65 | 41.89 | 0.80 | 45.34 | 5.11 | 9.59 |
| Budget | <i>n/a</i> | <i>n/a</i> | <i>n/a</i> | 60.1 | 17.2 | 34.2 |

| Table 9: 2040 Estimated Emissions, Tons per Day | | | | | | |
|--|-----------------------------|---------------------------|---|--------------------------------|-------------|-----------------------|
| 2040 | PM₁₀ | | | | VOC | NO_x |
| | Unpaved Road Dust Emissions | Paved Road Dust Emissions | Tailpipe, Tire, and Brakewear Emissions | Total PM ₁₀ Emitted | | |
| Estimated Emissions | 2.65 | 41.16 | 0.93 | 51.74 | 5.68 | 10.60 |
| Budget | <i>n/a</i> | <i>n/a</i> | <i>n/a</i> | 60.1 | 17.2 | 34.2 |

Carbon Monoxide Emissions

To satisfy DEQ requirements, a regional CO emissions analysis was conducted using EPA’s MOVES 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 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 (i.e., before programmed or planned projects are built). This comparison provides the CO emissions impacts to the region from the planned transportation system.

Build/No Build Scenarios

The build scenarios use transportation networks and demographic assumptions specific to the analysis year. These are the same scenarios used to estimate PM₁₀, NO_x, and VOC emissions, above. Table 1, 3, 5, and 7 provide more detailed information on the roadway projects used to develop the build scenario networks.

The no build scenarios use the 2015 (baseline) transportation network with the demographic assumptions specific to the analysis year. Table 1 provides more detailed information on the roadway projects included in the 2015 baseline transportation network.

Table 10 shows the build and no build CO emissions estimates for 2015, 2019, 2025, 2035, and 2040.

| Table 10: Build/No Build Scenario CO Emissions | | | | | |
|---|-------|-------|-------|--------|--------|
| | Year | | | | |
| | 2015 | 2019 | 2025 | 2035 | 2040 |
| Build CO Emissions (Ton/day) | 92.13 | 82.82 | 92.20 | 113.49 | 127.74 |
| No Build CO Emissions (Ton/day) | n/a | 82.82 | 92.10 | 114.44 | 129.32 |

Note: Table 10 and Figure 5 (page 28) show identical 2019 CO emissions in tons/day for both the build and no build scenarios. MOVES estimates all pollutants in tons/year, which are then converted to tons/day. Prior to being converted to tons/day, the estimated tons/year CO emissions for the 2019 no build scenario are slightly higher than for the build scenario.

III. CONCLUSIONS

PM₁₀ Budget Test

The results of the PM₁₀ budget test for **draft** FY2015-2019 TIP show that the emissions impacts associated with the planned improvements to the northern Ada County transportation system (projects listed in Table 1, 3, 5, and 7) will not exceed the PM₁₀ emissions budgets established by the PM₁₀ maintenance plan (Figure 2).

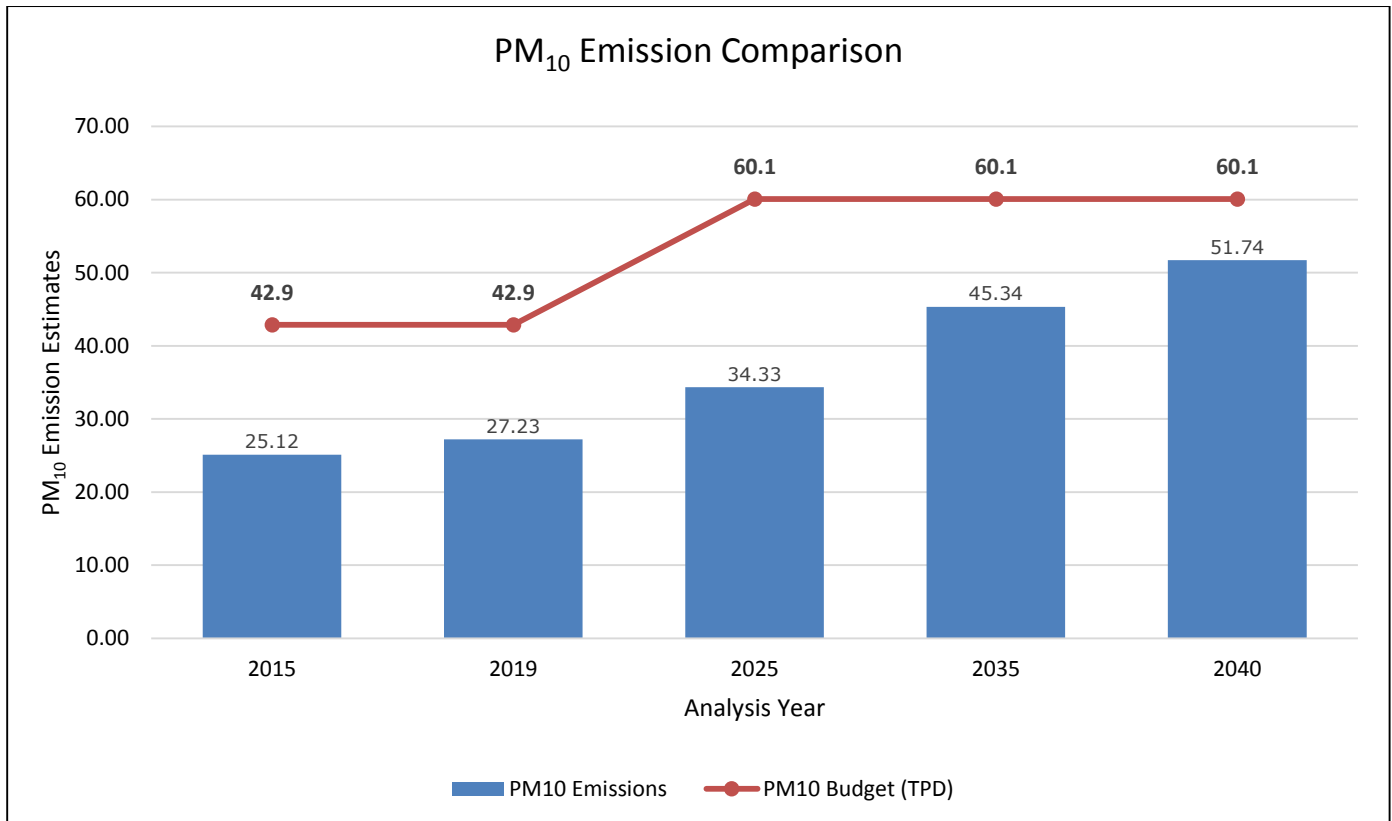


Figure 2: PM₁₀ Budget Test Results

VOC Budget Test

The results of the VOC budget test for **draft** FY2015-2019 TIP show that the emissions impacts associated with the planned improvements to the northern Ada County transportation system (projects listed in Tables 1, 3, 5, and 7) will not exceed the VOC emissions budgets established by the PM₁₀ maintenance plan (Figure 3).

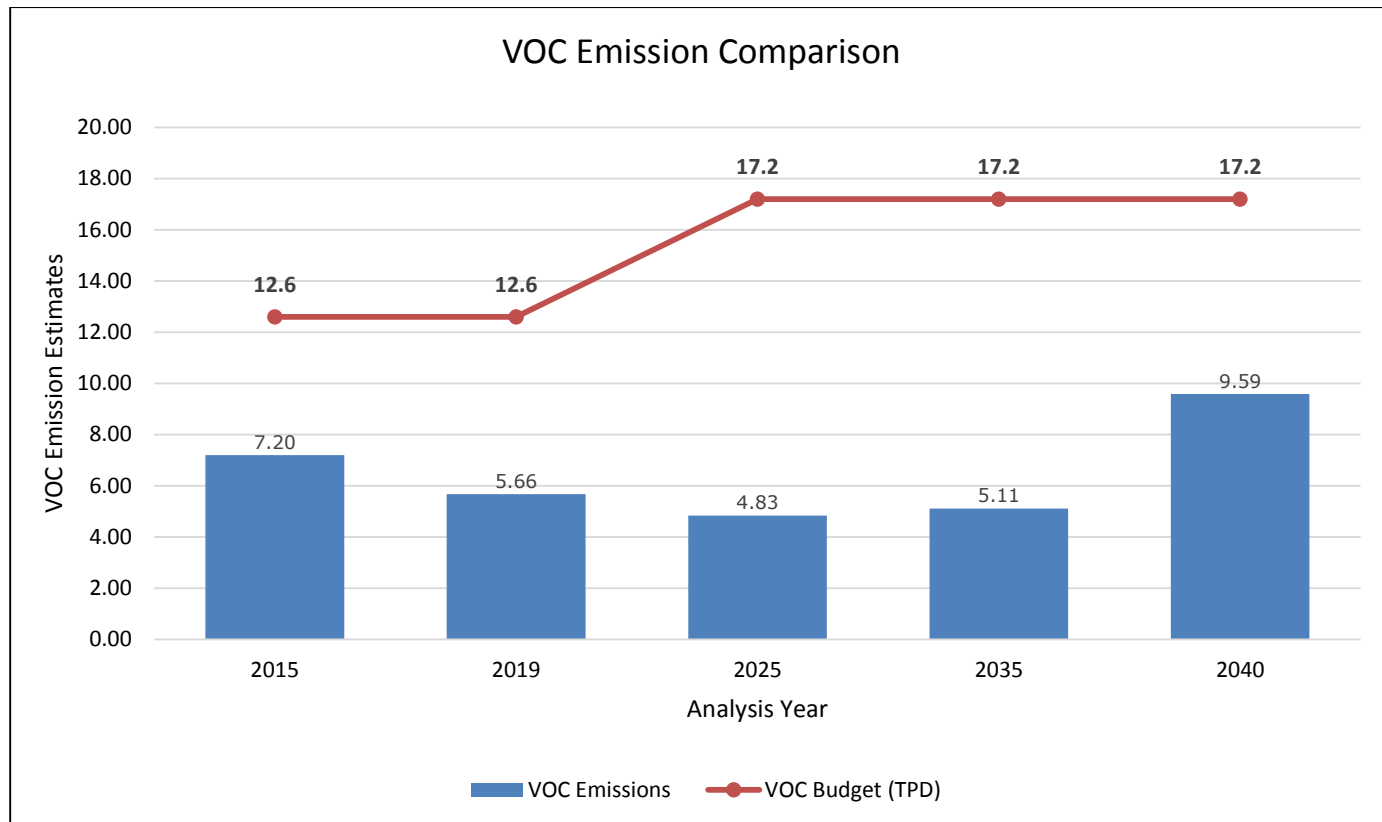


Figure 3: VOC Budget Test Results

NO_x Budget Test

The results of the NO_x budget test for **draft** FY2015-2019 TIP show that the emissions impacts associated with the planned improvements to the northern Ada County transportation system (projects listed in Tables 1, 3, 5, and 7) will not exceed the NO_x emissions budgets established by the PM₁₀ maintenance plan (Figure 4).

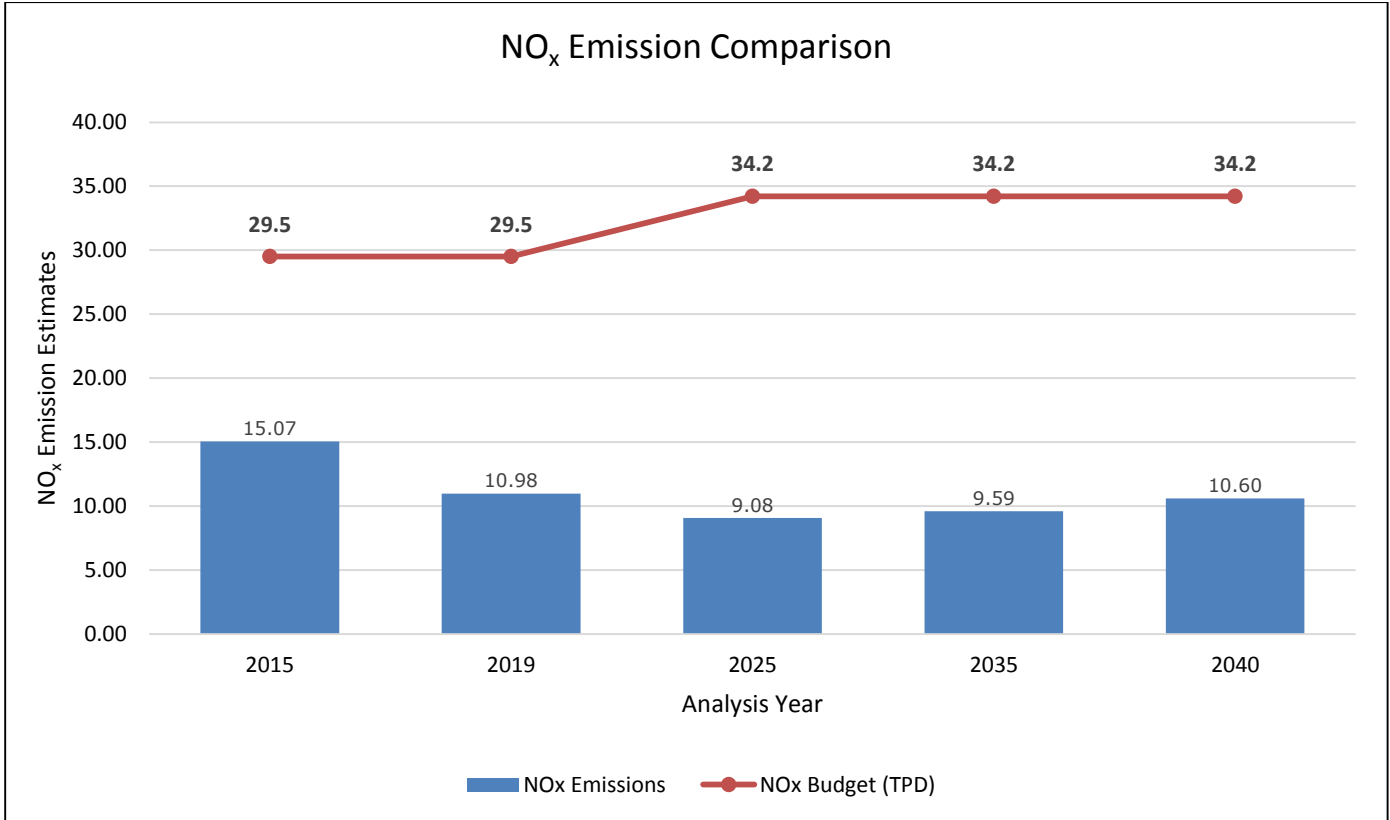


Figure 4: NO_x Budget Test Results

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 with the CO limited maintenance plan, but rather to facilitate good air quality planning in northern Ada County.

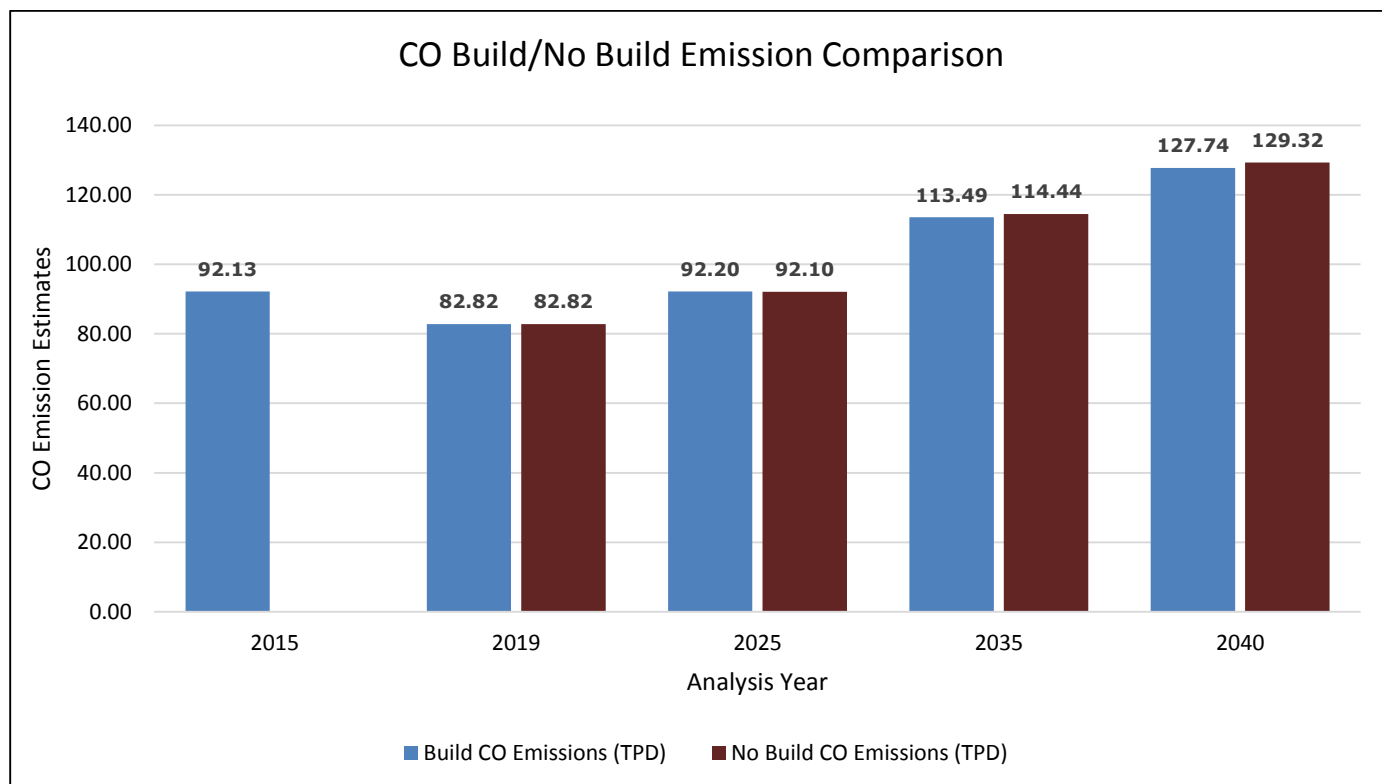
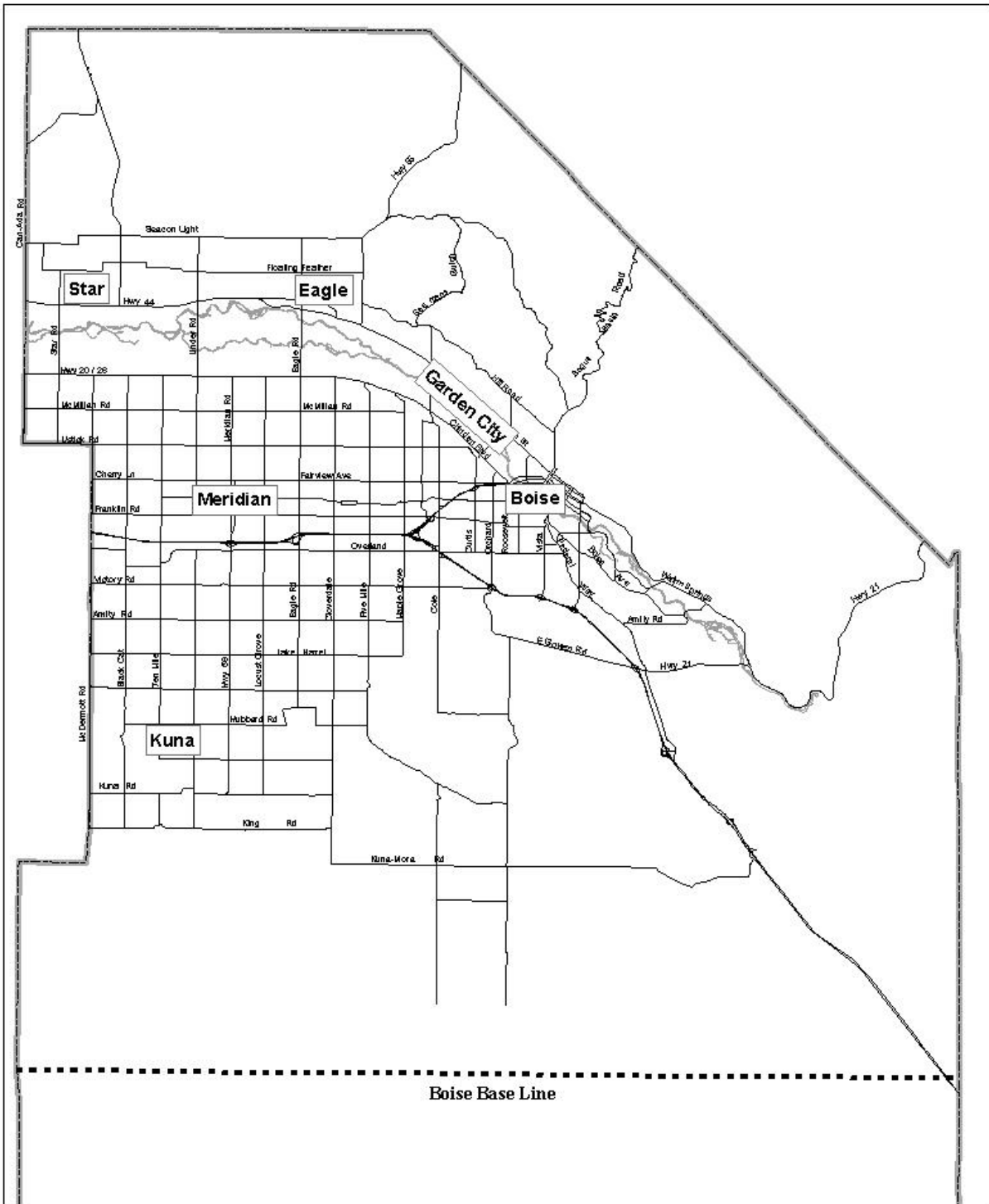


Figure 5: CO Build/No Build Comparison

The comparisons show that the CO emissions for the build scenario are slightly higher than the no build scenario in 2025, and slightly lower in 2035 and 2040. As noted earlier, the CO emissions are the same for the 2019 build and no build scenarios. MOVES estimates all pollutants in tons/year, which are then converted to tons/day. Prior to being converted to tons/day, the estimated tons/year CO emissions for the 2019 no build scenario are slightly higher than for the build scenario. The higher estimate for the build scenario in 2025 is due to a reduction in roadway congestion, which increased network speeds forecasted by the regional travel demand model. Carbon monoxide emissions factors are very sensitive to speed. Since the 2025 build scenario emission estimates are higher than the no build, the build scenario is compared to the 1990 CO emissions as allowed by the conformity rule under 40CFR93.113(c)(ii). The 1990 on-road mobile source emissions are 58,777.3 tons per year (161.03 tons per day). Clearly, the 2025 CO emission estimate of 92.2 tons per day is below the 1990 CO emissions.

APPENDICES

Appendix A: Northern Ada County PM₁₀ and CO Maintenance Area



Legal Description for Northern Ada County PM₁₀ and CO Maintenance Area

The legal description of the area boundaries is as follows:

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

Northern Boundary

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

Western Boundary

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

Southern Boundary

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

Eastern Boundary

- Thence north to the point of beginning.

Appendix B: Approved Regional Emission Assumptions

Source type population and fleet age distribution:

DEQ decoded individual Idaho Department of Motor Vehicles registration records of vehicles registered in the Treasure Valley using the Polk vehicle identification number (VIN) decoding system. The decoded VINs provide information regarding the vehicle make, model, age, and fuel types. This information was then used to develop the MOVES input.

Inspection Maintenance Program – June 1, 2010 - future

Ada County:

- 1) Two speed test (idle and 2500 RPM) for pre 1996 vehicles only.
- 2) Exhaust on-board diagnostics (OBD) check for 1996 and newer vehicles.
- 3) Evaporative system OBD check for 1996 and newer vehicles.
- 4) Compliance rate = 98.0%.
- 5) Waiver rate = 1.0%
- 6) Four-year grace period for new vehicles
- 7) Biennial testing – effective January 1, 2010.

Canyon County:

- 1) Two speed test (idle and 2500 RPM) for pre 1996 vehicles only.
- 2) Evaporative gas cap check for 1996 and newer vehicles.
- 3) Exhaust OBD check for 1996 and newer vehicles.
- 4) Evaporative system OBD check for 1996 and newer vehicles.
- 5) Compliance rate = 98.0%.
- 6) Waiver rate = 1.0%
- 7) Five-year grace period for new vehicles
- 8) Biennial testing – effective January 1, 2010.

Meteorology

The meteorology input compiles the average hourly temperature and relative humidity data for each county. Base- and future-year inventories were modeled using average hourly temperature and relative humidity data by county for each month from a representative weather station for each county. Ada County is represented by the National Weather Service station at the Boise Air Terminal and Canyon County is represented by the data set from the Caldwell Industrial Airport.

Fuel-Related Inputs

Alternative Vehicle Fuels and Technology (AVFT): Ada and Canyon Counties were modeled using a custom AVFT input file derived from VIN-decoded registration data. The same AVFT input was used for base and future years.

Fuel Supply: National default fuel supply inputs were used for all source types except transit buses. A large portion of the transit bus fleet in the Treasure Valley operates on compressed natural gas (CNG). For this reason, CNG fuels were included in base- and future-year modeling.

Fuel Formulation: With the exception of 10% ethanol in gasoline (E10), MOVES national default fuel formulations were used as base-year inputs for each county. These default values were judged to be reasonable based on local knowledge, except for the E10 market share. The base-year E10 market share was updated with information provided by fuel suppliers.

Average Speed Distribution

The average speed distribution allocates the different source types (vehicles) for each roadway type to 16 speed bins ranging from 0 to >75 miles per hour. Average speed distributions were developed from the regional travel demand model average daily estimates or forecasts for each roadway segment and hourly traffic count statistics developed from detailed automatic traffic recorder (ATR) traffic count data provided by Idaho Transportation Department (ITD).

The hourly ATR-based traffic count profiles for each roadway type were used to estimate hourly volume on each segment and the modified Bureau of Public Roadways volume/capacity curve was used to develop the average speed distribution database for each hour.

$$\text{Hourly Vehicle Speed} = \text{Free Flow Speed} * \left(1 + A * \left(\frac{\text{Volume}}{\text{Capacity}} \right)^B \right)$$

Where A and B are local coefficients used in the regional travel demand model as provided by COMPASS.

Base- and future-year average speed distributions were developed for all four MOVES road types using travel demand model base and future-year outputs developed by COMPASS for the Treasure Valley and detailed ATR data provided by ITD.

Note: Treasure Valley refers to Ada and Canyon Counties.