

Treasure Valley Vehicle Inspection and Maintenance Programs

Annual Review and Director Recommendation for the
2013 Idaho State Legislature



**State of Idaho
Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706**

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1 Background

In April 2008, the Idaho Legislature enacted and the governor signed into law Idaho Code §39-116B, “Vehicle Inspection and Maintenance Program.” Idaho Code §39-116B(5) provides: “The department shall annually review the results of the vehicle inspection and maintenance program. The review shall include, among other things, an estimate of the emission reduction obtained from the number of vehicles that initially fail the test and then pass after maintenance.” In addition, Idaho Code §39-116B(6), provides “beginning in 2013 the director shall review the air quality data and make recommendations to the legislature for its determination whether [the] program shall be continued, modified or terminated.

An inspection and maintenance (I/M) testing program to reduce ozone pollution caused by nitrogen oxides (NO_x) and volatile organic compounds (VOCs) from vehicle emissions in Canyon County and the city of Kuna in Ada County began June 1, 2010. An I/M testing program in Ada County has been operating since 1984 as a result of noncompliance with the federal carbon monoxide National Ambient Air Quality Standard (NAAQS) and remains in place as a required maintenance control measure.

This report constitutes the annual review required by Idaho Code §39-116B(5) and summarizes the emission reductions obtained from both I/M programs for the first full 2-year testing cycle (i.e., June 1, 2010–December 31, 2011). This report also constitutes the review required by Idaho Code §39-116B(6) and recommendations to the legislature.

2 Regulatory Justification

Idaho Code §39-116B(1) stipulates that a vehicle I/M program shall be developed when the DEQ Director determines the following two conditions are met:

- (a) An airshed, as defined by the department, within a metropolitan statistical area, as defined by the United States office of management and budget, has ambient concentration design values equal to or above eighty-five percent (85%) of a national ambient air quality standard, as defined by the United States Environmental Protection Agency, for three (3) consecutive years starting with the 2005 design value; and
- (b) The department determines air pollutants from motor vehicles constitute one (1) of the top two (2) emission sources contributing to the design value of eighty-five percent (85%).

The Treasure Valley airshed, which is within the “Boise City, ID” metropolitan statistical area defined by the US Office of Management and Budget, clearly exceeds the 85% criteria specified in Idaho Code and remains in danger of exceeding the ozone NAAQS. In addition, data show that vehicles constitute one of the top two emission sources contributing to ozone pollution in the valley. These two statutory conditions are discussed in more detail in the following sections (2.1 and 2.2).

2.1 Ambient Air Quality Standard

As required by the applicable US Environmental Protection Agency’s (EPA’s) definition, the ozone design value is calculated using the annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years. The fourth highest 8-hour ozone values for the past 3 years were: 0.073 parts per million (ppm) (2009), 0.069 ppm (2010), and 0.062 ppm (2011). Therefore, the 2011 Treasure Valley airshed design value for ozone is 0.068 ppm. Past ozone design values for the Treasure Valley airshed are 0.075 (2008), 0.071 (2009), and 0.068 ppm (2010). The

current NAAQS for ozone is 0.075 ppm, making each of these design values greater than 85% of the standard, with the 2011 design value equating to 90.7% of the NAAQS.

Although the 2012 ozone season is complete, the data are undergoing quality assurance and quality control reviews prior to submittal to EPA. Once EPA approves the 2012 data, they will be used to calculate the 2012 design value. The earliest the 2012 design value would be available is approximately May 2013, which is consistent with design value availability in years past. The 2012 design value is likely to be similar to 2011.

2.2 Vehicle Contributions

In 2010, DEQ completed an updated emissions inventory of emission sources within the Treasure Valley. DEQ updated the emissions inventory in 2010 because of its importance to the I/M programs and other pollution control strategies. This state implementation plan (SIP)-level emissions inventory, one of the most rigorous and time consuming to undertake, provides information on the sources and amounts of criteria pollutants and their precursors. Criteria pollutants are the six air pollutants (carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide) identified in the Clean Air Act of 1970 that can cause negative health effects, environmental effects, and property damage. All criteria pollutants have NAAQS that define allowable concentrations of these substances.

The 2010 emissions inventory confirmed the findings of DEQ's 2005 emissions inventory by demonstrating that vehicles are one of the top two pollution sources contributing to a design value greater than 85% of the NAAQS.

3 Ozone in the Treasure Valley

Historically, the Treasure Valley has been successful in reducing carbon monoxide and coarse particulate matter emissions largely due to improved efficiency of vehicle engines, an emissions testing program in Ada County targeting carbon monoxide, and local restrictions associated with open burning. More recently, rapid growth in the number of vehicles and total vehicle miles traveled have raised concern over ozone. Ozone is difficult to control due to the complexity and number of chemical agents (precursors) involved in its formation. In the Treasure Valley, the precursor pollutants NO_x and VOCs react in sunlight to form ozone. These precursors are often released as byproducts of combustion and from evaporation of fuels and solvents. These precursors also contribute to the formation of fine particulate matter (PM_{2.5}).

3.1 Ozone Levels

Ozone levels are measured during the summer (May–September) at two locations in the Treasure Valley. DEQ began monitoring Treasure Valley ozone in 2001. Figure 1 identifies the ozone design value concentrations for 2005–2011, including the preliminary value for 2012. Ozone in the Treasure Valley has declined since 2007, keeping pace as EPA has tightened the ozone standard. However, these measured values show the possibility of an ozone nonattainment designation for the Treasure Valley in the future if they are not maintained at these lower levels or if EPA lowers the ozone standard as they have proposed (Figure 1).

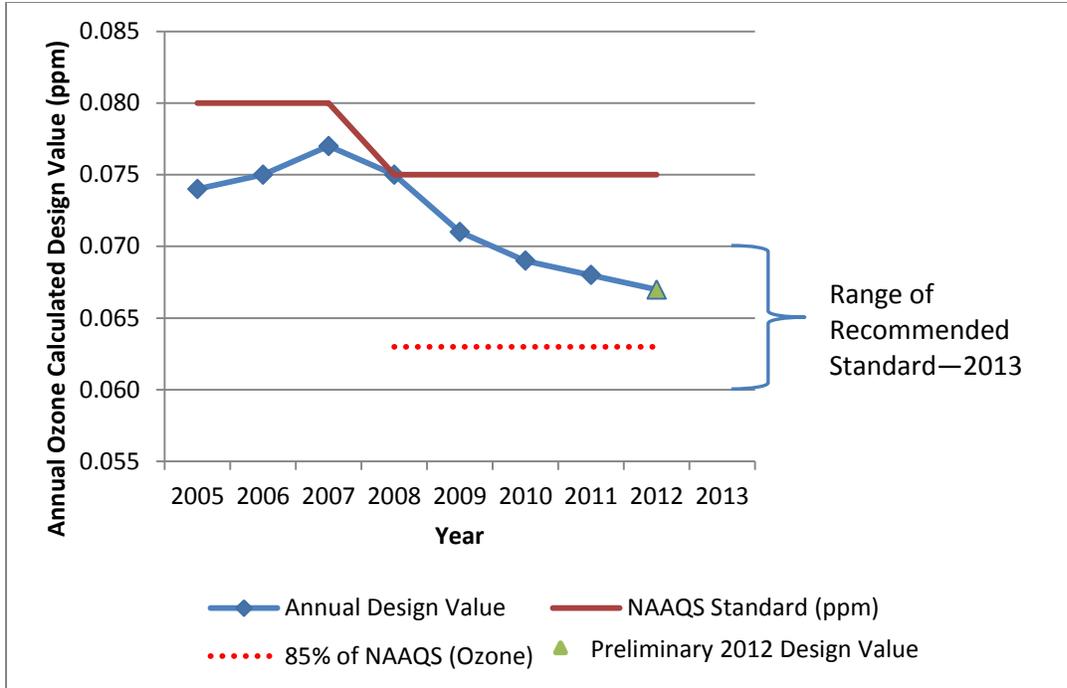


Figure 1. Ozone levels in the Treasure Valley.

Note: EPA is considering revising the 8-hour ozone National Ambient Air Quality Standard (NAAQS) within a proposed range of 0.06 to 0.07 parts per million (ppm), pending the 5-year review scheduled for 2013.

3.2 Federal Ozone Standard

The federal Clean Air Act requires EPA to review existing NAAQS at 5-year intervals and, if appropriate, revise the NAAQS. The last revision of the NAAQS 8-hour ozone standard occurred in 2008, when the standard was tightened from 0.080 ppm to 0.075 ppm. The next review deadline for the 8-hour ozone standard is 2013. The Clean Air Scientific Advisory Committee has recommended to EPA a new ozone standard somewhere between 0.060 and 0.070 ppm.

After EPA reviews the 8-hour ozone NAAQS, a revision of the standard to a more stringent level is likely. With a current design value of 0.068 ppm for the Treasure Valley airshed, even a modestly more stringent 8-hour NAAQS in the range being considered by EPA (0.060 to 0.070 ppm) would put the Treasure Valley area at risk for nonattainment.

3.3 Vehicle Miles Traveled

The quantity of ozone precursor emissions depends on the average vehicle emission rates and the vehicle miles traveled (VMT) each year, among other things. The emission reduction estimates reported in this document are based on VMT levels shown in Table 1. The estimates made in 2008 were made using 2006 data while the estimates made in 2012 were made using 2011 data. Modeling results indicated that vehicle miles traveled increased 17% in Ada County and 18% in Canyon County over the last 5 years (Table 1).

Table 1. Total annual vehicle miles traveled (VMT).

County	2008 VMT Estimate (billion miles)	2012 VMT Estimate (billion miles)
Ada	2.57	3.00
Canyon	1.23	1.45

4 Program Effectiveness

The effectiveness of an emissions testing program can be described in terms of its failure rates and estimated emission reductions.

4.1 Failure Rates

Failure rates reflect the percentage of tested vehicles that fail the initial test and are required to either obtain repairs and pass a retest or obtain a waiver due to hardship or repair costs. For the first 2-year testing cycle, the Ada County program tested 255,780 vehicles while the Canyon County program tested 90,298 vehicles. The Canyon County failure rates are typical of a new program, while the Ada County rates are typical of a mature program that has resulted in a fleet with fewer high-emission vehicles (Table 2).

Table 2. Failure rates for 2-year testing cycle.

Test Type	Ada County (%)	Canyon County (%)
Two-speed idle	8.4	13.52
On-board diagnostic II	4.1	9.65
Snap-acceleration (diesel)	4.1	2.74

4.2 Emission Reductions

When Idaho Code §39-116B was enacted in 2008, ozone precursor emission reduction estimates for NO_x and VOCs were developed for Ada and Canyon Counties based on the 2006 travel demand modeling and mobile emissions modeling using the MOBILE6.2 model as required by EPA and as configured for transportation conformity purposes.¹ EPA’s “national default” information, which reflects vehicle type and vehicle age distributions nationwide, was used in the MOBILE6.2 modeling.

Emission reductions for the Ada and Canyon County testing programs were again estimated in 2012 using EPA’s recently released MOVES2010a (MOVES) model.² Like MOBILE6.2, MOVES uses detailed travel demand model results, but instead of national default information, uses local inputs on vehicle types and ages, and local I/M program statistics for compliance and waiver rates (Table 3). The compliance and waiver rate information allows the MOVES model to account for those vehicles that do not obtain a passing test. The rates shown in Table 3 for Ada and Canyon Counties are typical of rates reported in other I/M programs throughout the United

¹ Community Planning Association of Southwest Idaho (COMPASS), *COMPASS Staff’s Emission Testing Benefit Analysis – as of January 11, 2008, Supplemental* (Boise, ID: COMPASS, 2008).

² U.S. Environmental Protection Agency, *Motor Vehicle Emission Simulator (MOVES): User Guide for MOVES2010a* (Washington, DC: U.S. Environmental Protection Agency, 2010), EPA-420-B-10-036.

States. The 2012 modeling is based on Community Planning Association of Southwest Idaho’s (COMPASS) travel demand modeling for 2008 updated to reflect 2010 traffic levels.

Table 3. Compliance and waiver rates based on the first 2-year testing cycle.

	Ada County	Canyon County
Compliance rate	98.5%	96.6%
Waiver rate	0.78%	0.33%

The 2008 and 2012 vehicle emission reduction estimates are summarized in Table 4. Estimated Ada County emission reductions modeled in 2012 are 21% greater than the emission reductions estimated by COMPASS in 2008. Canyon County emission reduction estimates are 53% greater than 2008 due to a greater average per-vehicle emission reduction, as expected for this older vehicle fleet traveling more total miles than estimated in 2008.

Table 4. Ozone precursor modeled annual reductions.

Ozone Precursor	2008 Emission Reductions		2012 Emission Reductions	
	Ada County	Canyon County	Ada County	Canyon County
Volatile organic compounds (tons/year)	293	138	353	226
Nitrogen oxides (tons/year)	275	114	333	160
Total reductions (tons/year)	568	252	686	386

5 Program Changes

In 2012, DEQ initiated rule changes that would allow emissions testing locations to perform repairs on vehicles they test (IDAPA 58.01.01.518.04) and allow DEQ to issue extensions for active duty military members and vehicle owners temporarily located outside a testing area who cannot easily return to an area for testing (IDAPA 58.01.01.527). These temporary rules must still be approved by the Idaho Legislature in the 2013 session.

6 Conclusion and Recommendations

According to Idaho House Bill 586, “This legislation [§39-116B] provides authority to the Department of Environmental Quality to establish a vehicle emission testing and maintenance program to control air pollution emissions from vehicles in air-sheds that are approaching non-attainment with applicable air quality standards and rules.”

The Treasure Valley continues to meet both of the conditions specified in Idaho Code §39-116B: the ozone design value is greater than 85% of the 8-hour ozone NAAQS and vehicles remain one of the top two contributors to the design value. The I/M program has been an effective method for reducing ozone precursor emissions and achieving greater emissions reductions than originally estimated in 2008.

In addition, should EPA tighten the ozone NAAQS somewhere between 0.060 and 0.070 ppm, the Treasure Valley I/M programs would become even more important in helping the airshed maintain its ozone attainment status. Designation of the Treasure Valley as a nonattainment area

would have several important health, economic, and regulatory implications. First, because EPA is required under the Clean Air Act to establish the NAAQS at levels that will protect public health, a nonattainment designation is an official statement that our air quality is unhealthy. A nonattainment designation also triggers a number of additional legal requirements for state and local agencies and businesses:

- **Additional requirements for planning and analysis**—The required SIP process is expensive and time consuming. Permanent and enforceable control measures would be required to bring the area back into compliance. This process and new requirements would continue for 20 years after the area has shown attainment with the violated standard.
- **New emission standards for existing facilities**—Existing sources of air pollution may be required to install expensive emissions control equipment to meet more stringent standards.
- **More stringent permitting requirements**—For major new facilities or modifications to existing facilities, facilities would be required to install expensive emissions control equipment and businesses would have to find pollutant offsets to their emissions before construction of a new facility or expansion of an existing facility would be permitted.

An airshed designated nonattainment results in new, costly requirements. These requirements divert business and agency resources from economic growth activities and collaborative air quality improvement measures. They also result in new requirements for the regulated public, such as even more stringent vehicle emission testing requirements.

The Treasure Valley vehicle emission testing programs are achieving greater emission reductions than estimated in 2008 when the Idaho Legislature passed Idaho Code §39-116B. While ozone levels have improved and the Treasure Valley area remains in attainment for ozone, ambient air quality monitoring shows that the ozone design value is at nearly 91% of the federal ozone NAAQS, which is significantly greater than the 85% trigger for the statute's applicability. Additionally, it is likely the EPA will tighten the ozone NAAQS in the near future, making attainment of the ozone NAAQS more difficult. All of these findings confirm the evaluation and determination by the Treasure Valley Air Quality Council that the two-county testing program is one of the most effective measures available to reduce ozone precursors such as NO_x and VOCs in the Treasure Valley.

It is therefore the recommendation of the DEQ Director that the emissions testing programs in Ada and Canyon Counties be continued subject to modifications made through negotiated rulemaking as adopted by the DEQ Board and approved by the Idaho Legislature which maintain the effectiveness of the program while decreasing the regulatory burdens of the program.