

# Treasure Valley Vehicle Inspection and Maintenance Programs

## Annual Review

**State of Idaho**  
**Department of Environmental Quality**



**Prepared by**  
Idaho Department of Environmental Quality



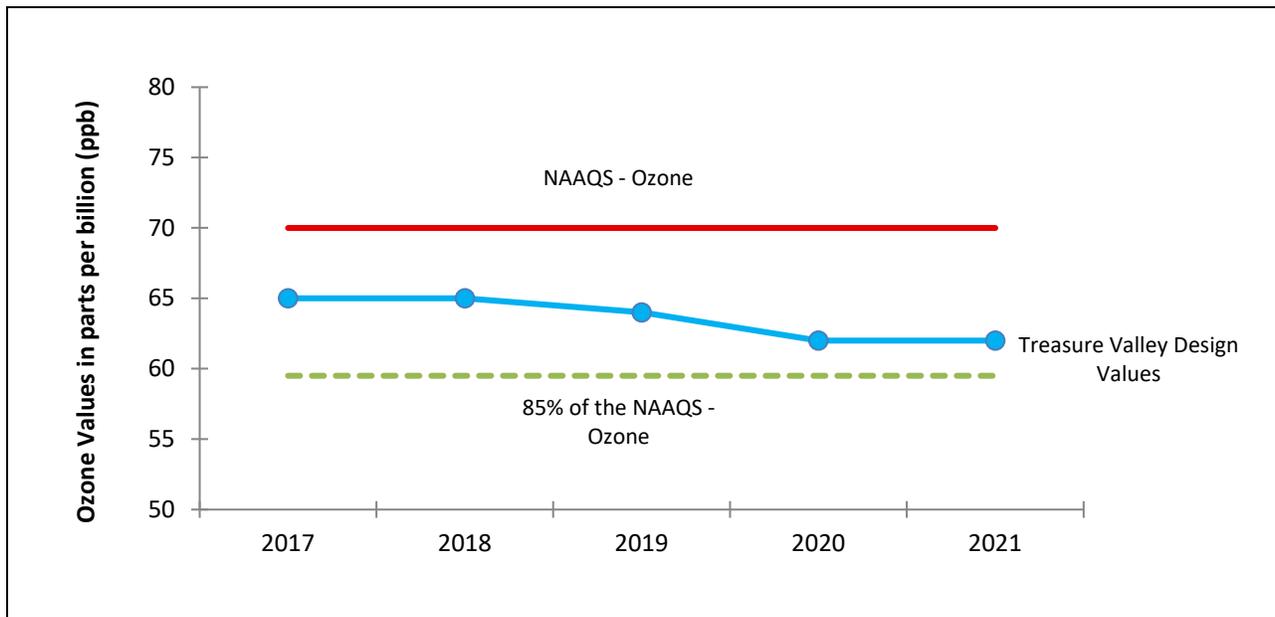
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## Summary

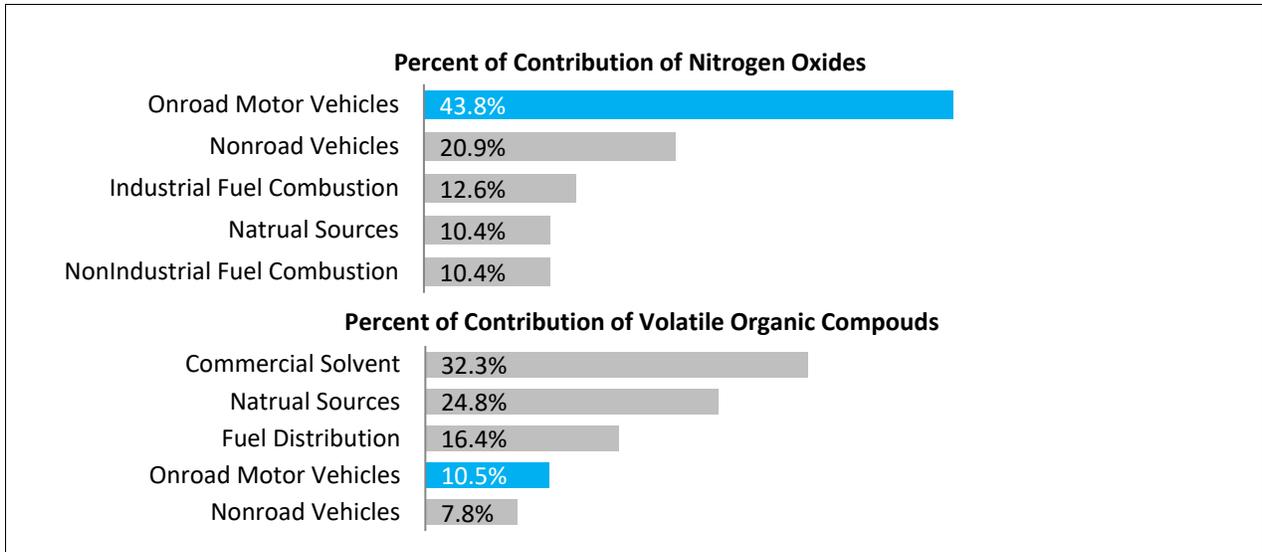
Idaho Code §39-116B(5) directs that “The department shall annually review the results of the vehicle inspection and maintenance program. The review shall include, among other things, an estimate of the emission reduction obtained from the number of vehicles that initially fail the test and then pass after maintenance.” This report summarizes the effectiveness of the Vehicle Inspection and Maintenance (I/M) program in both Ada and Canyon Counties for calendar year 2020.

## Background

In 2008, the Idaho Legislature enacted and the governor signed into law Idaho Code §39-116B, “Vehicle Inspection and Maintenance Program,” laying the groundwork for requiring vehicle emissions testing in areas of the state where air quality is compromised and motor vehicle emissions constitute one of the top two sources contributing to the pollution. Ada and Canyon Counties meet the criteria specified in the law. As the data in Figure 1 show, the design value for ozone exceeds 85% of the National Ambient Air Quality Standard (NAAQS), and vehicle emissions constitute one of the top two emissions sources contributing to ozone concentrations in the Treasure Valley (Figure 2).



**Figure 1. Ozone levels in the Treasure Valley.** Design values (ppb): 64 (2016); 65 (2017); 65 (2018); 64 (2019); 62 (2020); 62 (2021, preliminary data). Days flagged for exceptional events have been removed.



**Figure 2. Ozone precursor emissions by source.** The top five sources for nitrogen oxides (NOx) and volatile organic compounds (VOCs) in the Treasure Valley and their percentage of contribution. Vehicles are the top contributor to NOx in the Treasure Valley at 43.8% and fourth for VOCs at 10.5%.

Ada County’s vehicle emissions testing program has operated since 1984 and is managed by the Air Quality Board. In 2010, vehicle emissions testing became a requirement in Canyon County and the city of Kuna in Ada County. As of February 2015, the Idaho Department of Environmental Quality (DEQ) contracts with Applus Technologies Inc. to operate the program in Canyon County and Kuna according to Idaho Code §39-116B(3).

## Program Effectiveness

The effectiveness of an emissions testing program is described in terms of failure rates, compliance rates, and estimated emission reductions. Table 1 shows the failure, compliance, and waiver rates for calendar years 2017–2020, along with the total number of vehicles tested.

**Table 1. Failure, compliance, and waiver rates for each program.**

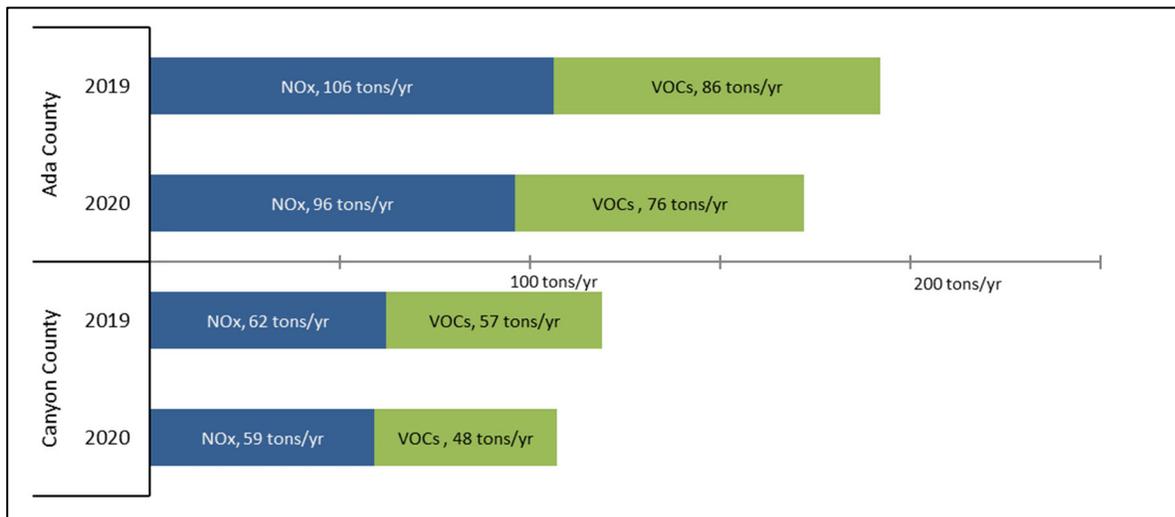
	2017		2018		2019		2020	
	Ada	Canyon	Ada	Canyon	Ada	Canyon	Ada	Canyon
Vehicles tested	135,861	52,899	142,568	52,356	146,626	58,578	143,016	51,709
Failure rate	9.4%	11.53%	8.67%	12.08%	11.60%	11.40%	10.95%	10.73%
Compliance rate	96.48%	96.53%	96.58%	96.03%	97.35%	96.36%	98.52%	96.61%
Waiver rate	0.20%	0.67%	0.19%	0.76%	0.19%	0.60%	0.14%	0.40%

The *failure rate* reflects 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 financial hardship or repair costs.

The *compliance rate* reflects the percentage of vehicles due for testing that have passed an emissions test, including after initially failing, or have received an approved waiver.

The *waiver rate* is the percentage of vehicles that obtain an approved waiver. The I/M program in Ada and Canyon Counties offers repair waivers and financial hardship waivers to assist motorists struggling with compliance. A repair waiver is available to individuals with vehicles that initially fail an emissions test, meet the minimum amount required on emissions-related repairs, and fail a follow-up emissions test after the repairs. A hardship waiver is granted to an individual who provides proof that completing the repairs would create a financial hardship.

When Idaho Code §39-116B was enacted in 2008, emissions modeling was conducted to estimate the annual ozone precursor emission reductions that would be achieved by the two-county I/M program. Several years and model versions later, DEQ continues to use modeling to evaluate the emissions in the Treasure Valley and assess the continued benefit of the two county I/M program. In 2020, the Environmental Protection Agency (EPA) released the newest version of the Motor Vehicle Emissions Simulator (MOVES). This version, MOVES3 incorporates the latest data on vehicle populations, travel activity, and emission rates. These updates improve the efficiencies of estimating the emissions from the transportation sector in the Treasure Valley as well as estimating the effectiveness of the two I/M programs. A major component of the input values for MOVES3 is the local motor vehicle database and automated traffic recording (ATR) managed by the Idaho Transportation Department (ITD). Through upgrades to their registration database, ITD has improved their reporting accuracy and these changes are reflected throughout the activity data in the modeling. Figure 3 shows the estimated emission reductions as a result the I/M programs for 2019 and 2020.



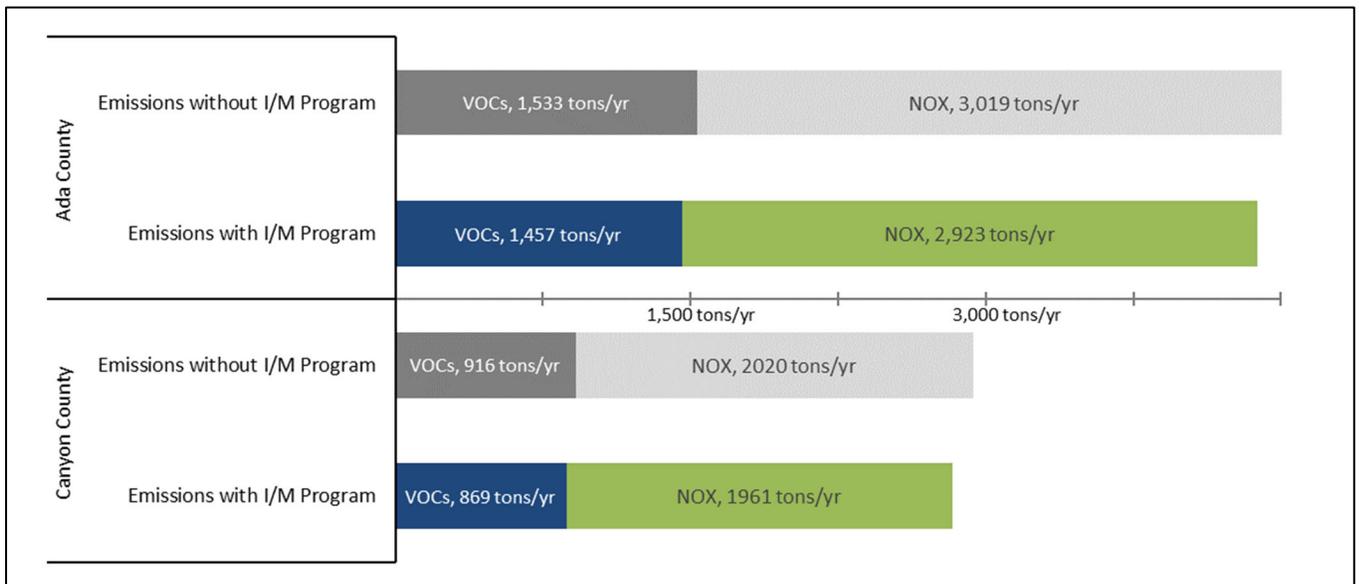
**Figure 3. Estimated emission reductions due to the Vehicle I/M programs.**

## Program Review

Based on the failure rates identified in Table 1, one in every ten vehicles continue to fail the initial emissions test (emission reductions are determined by modeling the vehicle emissions of those failing vehicles that are repaired and then obtain a passing test). Figure 3 shows the estimated emission reductions from repairing noncompliant vehicles for the previous two years, both using MOVES3. This figure looks different than in years past, as a comparison of

results between years using different model versions is not advisable since they are not directly comparable. MOVES3 is a significant improvement over its previous version, MOVES2014b, with many changes to fuel formulation characteristics and light-duty vehicle emission rates based on empirical studies of tens of thousands of vehicles in real-world scenarios and millions of emission test results.

Modeling results continue to show that by requiring properly maintained and repaired vehicles, the I/M program reduces NOx and VOC emissions, which are the primary pollutants that make up ozone (Figure 4). MOVES modeling does not account for emissions reductions from certain classes of vehicles tested within the I/M programs, including light-heavy-duty trucks and diesel vehicles. Additionally, studies have shown a significant number of vehicle owners have pre-inspection repairs performed prior to an initial test, reductions from these repaired vehicles cannot be captured in the modeling.



**Figure 3. Comparing emissions with and without I/M program.**

While the design value for ozone has declined over the three previous years, the preliminary design value of 62 ppb for 2020 is the same as 2019, which are above the trigger level of 85% of the NAAQS as cited in Idaho Code §39-116B (Figure 2). The design values assume the best-case scenarios with days flagged for exceptional events (e.g. wildfires) removed. In addition to reducing ozone, an I/M program helps to reduce wintertime fine particulate matter (PM2.5) levels. Based on 2018–2020 data, the Treasure Valley PM2.5 design value is 24 µg/m<sup>3</sup>, which is 69% of the current NAAQS. Wintertime PM2.5 is largely the result of NOx combining with ammonia to form ammonium nitrate, referred to as a secondary aerosol. It is also worth noting that EPA is currently considering lower national ambient standards for both ozone and PM2.5. DEQ will continue to assess the air quality levels in the Treasure Valley compared to the NAAQS, evaluate contribution of vehicles, and the effectiveness of an I/M program. In addition, next year as required by Idaho Code Section 39-116B (6), DEQ is to make a recommendation to the legislature whether to continue, modify, or terminate the program.

As part of the ongoing air quality public awareness and outreach program, seasonal public service announcements (PSAs) continue to be broadcasted in the Treasure Valley. Additionally, the program uses billboards and regional transit bus signs to disseminate information. The PSAs, signage, and DEQ's newly developed AIR Idaho mobile application offer daily AQI information and actions the public can take to improve air quality, these actions include specific motor vehicle maintenance suggestions (e.g. attending to a vehicle's check engine light, complying with emissions testing).