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ECOLOGY
State of Washington

Final Cost-Benefit and Least Burdensome Alternative Analyses

*Chapter 173-422A WAC
Motor Vehicle Emissions Inspection*

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Final Cost-Benefit and Least Burdensome Alternative Analyses

Chapter 173-422A WAC Motor Vehicle Emissions Inspection

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Conclusion

Ecology determines the benefits of the adopted rule are greater than the costs and that it is the least burdensome rule of those components meeting the rules and objectives of the authorizing statute. The estimated quantifiable benefits of the rule exceed the costs by over \$9.6 million dollars over the life of the rule.

Purpose of this Analysis

The Washington State Department of Ecology (Ecology) is adopting a new rule, WAC 173-422A, to cover motor vehicle emissions inspections that will take effect in 2012. Ecology will repeal the existing rule WAC 173-422 sometime after it no longer applies. The Administrative Procedure Act (RCW 34.05.328(d) (e)) requires two types of analysis before adopting a significant legislative rule: a cost-benefit analysis and a least burdensome alternative analysis. This report provides the results of these analyses and shows the potential impacts associated with the rule.

Background

History of the rule

Washington's Motor Vehicle Emissions Inspection Program began in Seattle and its suburban areas in 1982, and then in Spokane and some suburbs in 1985. In 1993, Ecology expanded the program to include the Vancouver area, more of Spokane's suburbs, and more of the Puget Sound region. Also in 1993, diesel vehicles were added to the program. The Legislature passed a law in 1998 exempting vehicles newer than five years and vehicles older than 25 years from testing, starting in 2000.

Reason for this rule proposal

An Emission Check Program is required by federal law in areas that do not meet federal health-based air quality standards due to motor vehicle emissions. In Washington, it is in place for the urban areas of Clark, King, Pierce, Snohomish and Spokane counties. It helps reduce air pollution by identifying the most polluting vehicles, and encouraging their repair. This is important because motor vehicles are the largest source of air pollution in Washington. Motor vehicles contribute nearly 60 percent of criteria air-pollutant emissions, and 80 percent of air toxics emissions.

Air pollution levels routinely measured in Washington continue to harm public health, the environment, and the economy. Air pollution causes or contributes to premature death, cancer, asthma, and heart and lung disease. Over half of the state's population suffers from one or more medical conditions that make them very vulnerable to air pollution.

Baseline of Analysis

The baseline for this analysis is the Motor Vehicle Emission Inspection WAC 173-422 last updated in 2002. This will be used as a point of comparison to evaluate the costs and benefits of the final rule.

State law requires gasoline and diesel vehicles more than 5 years and less than 25 years old to be tested every other year. State and local government vehicles in the test areas must be tested annually. When 20 or more state vehicles are kept at one location, they must be tested even if they are not in a test area. Used cars purchased from private parties must be tested before transferring ownership to test areas unless they have been tested during the previous twelve months.

Emissions from gasoline vehicles are tested by measuring the carbon monoxide and hydrocarbons (partially burned gasoline) in the exhaust or by downloading the problems detected by the vehicle's on-board diagnostic (OBD) system. Gasoline vehicles also receive a gas-cap leak test or visual inspection.

Emissions from diesel vehicles are tested by measuring the smoke level of their exhaust.

The tests are performed at 16 test stations operated by an Ecology contractor, except for self-testing fleets. The test fee is \$15.00 and if a vehicle fails, there is no charge for the first retest, but after that, each test is another \$15.00.

Scope of Analysis

Ecology analyzed all changes to the rule not specified elsewhere in law or rule. One exception is the exemption of 2009 and newer model year vehicles from testing. Ecology did not analyze this change because it was explicitly set by the Legislature. However, Ecology did analyze the new requirement that allows private businesses to perform vehicle testing and the cost for those businesses to become testers, even though that change was also set by the Legislature. We did this because of the discretion Ecology has in setting the requirements.

The decreasing numbers of tested vehicles, due to exemption of 2009 and newer vehicles, was taken into account during the analyses of the rule changes. Ecology estimated the decrease in the number of vehicles that will require testing using data from the 2007 and 2008 reports to the Environmental Protection Agency (EPA). Table 1 shows when certain model year vehicles need to be inspected.

Table 1: Years vehicles are required to be tested

		Year License Expires							
		2012	2013	2014	2015	2016	2017	2018	2019
Vehicle Model Year	2012	2012	2013	2014	2015	2016	2017	2018	2019
	2011	2011	2012	2013	2014	2015	2016	2017	2018
	2010	2010	2011	2012	2013	2014	2015	2016	2017
	2009	2009	2010	2011	2012	2013	2014	2015	2016
	2008	2008	2009	2010	2011	2012	2013	2014	2015
	2007	2007	2008	2009	2010	2011	2012	2013	2014
	2006	2006	2007	2008	2009	2010	2011	2012	2013
	2005	2005	2006	2007	2008	2009	2010	2011	2012
	2004	2004	2005	2006	2007	2008	2009	2010	2011
	2003	2003	2004	2005	2006	2007	2008	2009	2010
	2002	2002	2003	2004	2005	2006	2007	2008	2009
	2001	2001	2002	2003	2004	2005	2006	2007	2008
	2000	2000	2001	2002	2003	2004	2005	2006	2007
	1999	1999	2000	2001	2002	2003	2004	2005	2006
	1998	1998	1999	2000	2001	2002	2003	2004	2005
	1997	1997	1998	1999	2000	2001	2002	2003	2004
	1996	1996	1997	1998	1999	2000	2001	2002	2003
	1995	1995	1996	1997	1998	1999	2000	2001	2002
	1994	1994	1995	1996	1997	1998	1999	2000	2001
	1993	1993	1994	1995	1996	1997	1998	1999	2000
1992	1992	1993	1994	1995	1996	1997	1998	1999	
1991	1991	1992	1993	1994	1995	1996	1997	1998	
1990	1990	1991	1992	1993	1994	1995	1996	1997	
1989	1989	1990	1991	1992	1993	1994	1995	1996	
1988	1988	1989	1990	1991	1992	1993	1994	1995	
1987	1987	1988	1989	1990	1991	1992	1993	1994	

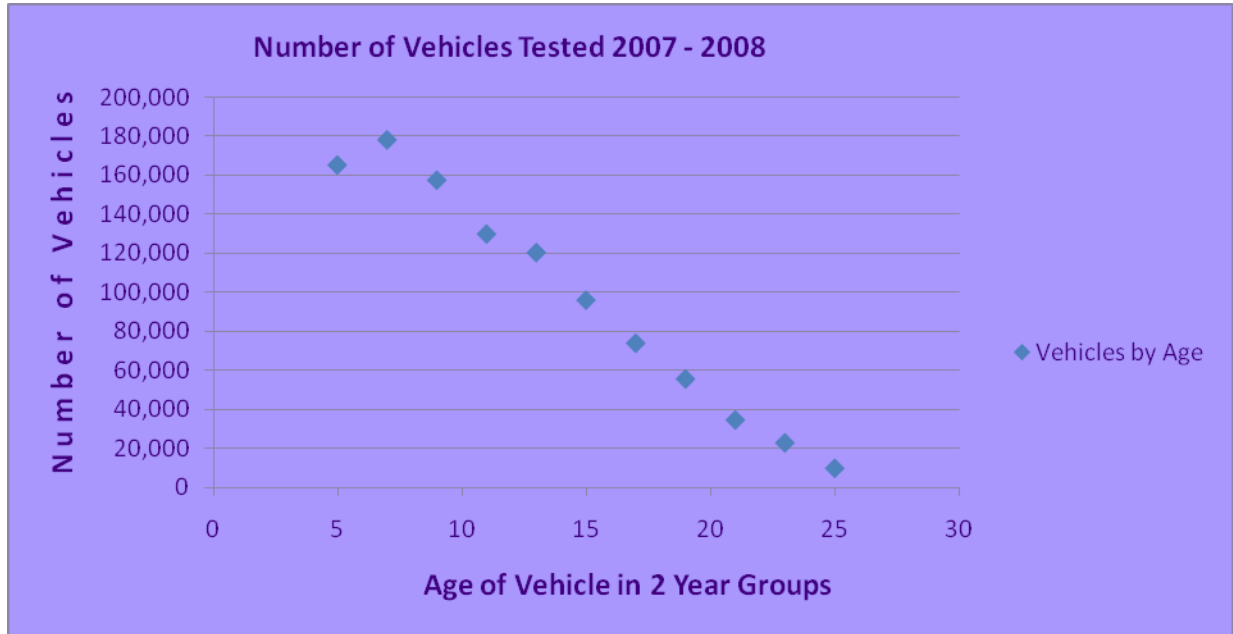
KEY

	Exempt
	Regularly Scheduled Test
	No Test Required

Figure 1 shows how many vehicles of a certain age are tested over a 2-year period using data from 2007 and 2008. We have grouped the data in years of two. For example, vehicles aged five and six are grouped as one data point, as are ages seven and eight, etc. Because vehicles are only required to be tested every other year, this way you can clearly see a snapshot of the number

of vehicles at one time that require an inspection. The most vehicles requiring an inspection are aged 7-8 and then the numbers decline steadily.

Figure 1: Number of vehicles tested 2007-2008



Using the data in Figure 1 above, Ecology estimated the declining number of total vehicles that will require testing each year from 2012 to 2019. See Table 2 below.

Table 2: Declining number of vehicles

Testing Year	Percentage of Remaining Vehicles	Number of Vehicles
2012	100%	500,000
2013	100%	1,000,000
2014	88%	880,000
2015	88%	880,000
2016	70%	700,000
2017	70%	700,000
2018	54%	544,000
2019	54%	544,000

Because State law does not authorize a Vehicle Emissions Inspection Program past 2019, Ecology estimated the costs in this analysis for the remaining 7.5 years of the program. The new rule will go into effect in July 2012, and therefore only half the vehicles tested that year will be subject to the new changes. Ecology estimates half the vehicles will be inspected in those 6 months in 2012 as for the whole year of 2013.

Comparison of the Current and Final Rules

Current rule Chapter 173-422 WAC

- Establishes the emission test procedures and standards for gasoline and diesel vehicles.
- Sets the emission-testing schedule for five to 24 year old vehicles through the year 2012.

Gasoline vehicles emission test procedures

Gasoline vehicles receive a leak check or visual inspection of their gas caps and a test of their exhaust emissions or a check of the information in the vehicles OBD system.

The preferred test for 1996 or newer model cars and light trucks (0-8500 GVWR¹) is a check of their OBD system. For the vehicle to pass, its OBD system must not detect any problems that cause the “check engine light” to come on and all other emission-related functional checks must also be complete. There are two exceptions for monitoring emissions on 1996 to 2000 model year vehicles:

- 2001 or newer model year vehicles may only have one monitor not “ready”.
- Vehicles with OBD system checking problems may be defaulted to an exhaust emission test.

The preferred test for all 1995 or older model cars and light trucks (0-8500 GVWR) is an acceleration simulation mode (ASM) exhaust emission test using a dynamometer² and while the vehicle is idling.

All 1995 or older model cars and light trucks (0-8500 GVWR) that cannot be tested on a dynamometer, and all other trucks, are tested using a Two Speed Idle (TSI) exhaust emission test. The TSI Emission Standards are less stringent for heavy-duty vehicles.

Diesel vehicles test procedures

Diesel vehicles have the smoke levels of their exhaust measured. The preferred test for cars and light trucks (0-8500 GVWR) is a Loaded test. In a diesel Loaded test, the smoke opacity is measured while the vehicle is being driven on a dynamometer at 25 mph.

The cars and light trucks that cannot be tested on a dynamometer, and all other trucks, are tested using a Snap Test. The peak opacity of the exhaust pipe(s) emissions are measured while the throttle is depressed rapidly to a wide-open position and immediately released.

¹ A gross vehicle weight rating (GVWR) is the maximum allowable total weight of a road vehicle or trailer when loaded

² A device for measuring [force](#), [moment of force](#) (torque), or [power](#).

Description of final changes

When the Washington State Legislature adopted California's new vehicle emission standards, they also directed:

- Newer vehicles would be exempt from emission testing, starting with the model year that these standards became effective in Washington.
- Businesses other than the contractor, including automotive repair businesses, would be allowed to test vehicles

Ecology also proposes to amend the rule to reduce the cost of testing. The goal is to maximize testing convenience and facilitate the repair and testing by more businesses. Several test procedures and requirements that are becoming less relevant will be discontinued. For example:

- Dynamometer testing.
- Gasoline filler caps testing and inspection.
- The requirement for listed automotive repair businesses to have an exhaust analyzer.
- Fleet test forms.

Other final rule provisions include:

- Setting the testing schedule for vehicles through the year 2019.
- Requiring all testing to be done online with the contractor's computer system.
- Requiring listed automotive repair businesses to have an OBD scan tool with full diagnostic capabilities.
- Permitting a vehicle unable to be retested to be issued a repair waiver if all the other requirements are met.
- Exempting all light-duty diesel vehicles.
- Exempting heavy-duty diesel vehicles with an engine that meets the EPA 2007 exhaust emission standards or equipped with an exhaust particle filter acceptable to Ecology. Most pre-2007 public transit buses have already been retrofitted with a particle filter.
- Standardizing the test standards for all 1995 model year and older gasoline vehicles.
- Requiring that for a vehicle to pass an OBD retest, the monitor(s) that detected a malfunction on the initial test must be ready for the retest.
- Tightening diesel snap-acceleration test standards.

Analysis of Costs and Benefits

Costs

Allowing private businesses to test vehicles

WAC 173-422A will require all testers to use Ecology approved online testing equipment.

Self-testing private fleets are currently purchasing test forms from Ecology for \$15.00 each. The test form will no longer be necessary or available from Ecology. Ecology intends for the test charges for these fleets will not exceed the previous \$15.00.

However, private repair businesses who choose to become testers will now incur new costs. Private businesses are allowed, by law, to charge whatever test fee they want, unlike the state contractor who must charge no more than \$15.00 per test. For this analysis, it does not matter what price a repair business charges because it will simply be a cost transfer from vehicle owner to vehicle tester.

Ecology based its assumptions on the number of vehicles that may be tested at a private inspection businesses on the current hybrid program in New Jersey. New Jersey's hybrid program is closest to the program Washington is creating. A hybrid program combines centralized and decentralized testing systems. A centralized system has the state or a state contractor do the tests. A decentralized system has testing done by many independently owned businesses that may do other business at the testing locations. In New Jersey there is no test fee collected at the centralized test stations. The long wait times at these stations prompted the state to subsidized private business testing. In 2007, there were 1,327 private inspection facilities in New Jersey with about 20 percent of vehicle inspections being done at these facilities.

It is impossible to know the extent to which other businesses will be interested in becoming testers. Ecology assumed since there will be no subsidy in Washington and the declining number of vehicles needing testing in the future, there will be less interest in private inspection facilities than in New Jersey. Therefore, Ecology assumed only 10 percent of the tests will be at a private testing facility. Table 3 below shows the declining number of vehicles expected to be tested by private businesses each year with the associated costs.

Table 3: Number of Vehicles Expected to be tested by Private Businesses 2012-2019

Testing Year	Percentage of Remaining Vehicles	Number of Vehicles	Cost Per Year ³	Present Value
2012	100%	50,000	\$750,000	\$750,077
2013	100%	100,000	\$1,500,000	\$1,476,239
2014	88%	88,000	\$1,319,000	\$1,277,079
2015	88%	88,000	\$1,319,000	\$1,256,720
2016	70%	70,000	\$1,052,000	\$986,142
2017	70%	70,000	\$1,052,000	\$970,421
2018	54%	54,000	\$815,000	\$740,407
2019	54%	54,000	\$815,000	\$728,603
Total Present Value				\$8,185,690

Using the average real rate on treasury bills of 1.62 percent, Ecology estimates the final rule will create a total present value of about \$8.6 million for new authorized testers over the 7.5 years.

Requiring listed repair businesses to have a diagnostic OBD scan tool

WAC 173-422A will require listed repair businesses to have an OBD scan tool with full diagnostic capabilities. WAC 173-422 only requires a scan tool; however, the new adopted rule specifies that the scan tool must have diagnostic capabilities (mode 1 through 9). Ecology believes most businesses already have this type of scan tool. To verify this, Ecology conducted a phone survey and contacted 53 of its listed businesses to ask if their scan tools already had diagnostic abilities⁴. All 53 businesses answered yes. Of the 53 businesses surveyed, 45 are small businesses with an average of eight employees and eight are large businesses with an average of 97 employees.⁵ Therefore, Ecology believes this change will not create any extra costs for the listed repair businesses or the businesses that wish to be listed.

³ Cost per year = (Number of vehicles) x (\$15.00 collected by the Contractor)

⁴ Businesses were contacted on October 7 and 14, 2009.

⁵ This is the best information currently available to Ecology. As always, we welcome new information that will further improve our analyses.

Tightening diesel test standards

This new adopted rule will tighten the diesel snap-acceleration test standards for newer and older vehicles. Table 4 shows the change in standards for high-duty diesels vehicles.

Table 4: Final Standard Changes for Vehicles over 8,500 pounds GVWR

Model Year	Previous Opacity Standard	Final Opacity Standard
1991 and older	55%	50%
1992-1996	40%	40%
1997 and newer	40%	30%

Ecology was able to run a cutpoint analysis by model year for 2008 and 2009 tests. We were able to calculate how many more vehicles would fail the final standards over these 2 years. Using the age of vehicles from this data, Ecology extrapolated how many vehicles per year will be tested under the remaining 7.5 years of the program. Ecology used the failure rate from the cutpoint analysis to estimate how many more vehicles we expect to fail the diesel snap test in future years. Tables 5 and 6 show the number of vehicles for 1991 and older models and 1997 and newer models Ecology expects to fail. They also show the cost for the vehicles' minimum repair. In addition to paying the minimum repair costs of \$150, time costs are associated for repair and retesting time. Ecology estimates 2 hours of time for repair and retesting. Ecology used a wage rate of \$31.50 per hour⁶, which is the average rate for workers in the five counties.

Table 5: Final changes on diesel-snap acceleration standards for 1991 and older vehicles

Year	Number of Vehicles Tested	Number Failing at 55% Opacity	Number Failing at 50% Opacity	Change	Costs		Present Value
					Repair Costs	Time Costs	
2012	795	54	90	36	\$5,400	\$2,300	\$7,700
2013	1,589	108	180	72	\$10,800	\$4,500	\$15,056
2014	866	59	98	39	\$5,850	\$2,500	\$8,086
2015	866	59	98	39	\$5,850	\$2,500	\$7,957
2016	0	0	0	0	\$0	\$0	\$0
2017	0	0	0	0	\$0	\$0	\$0
2018	0	0	0	0	\$0	\$0	\$0
2019	0	0	0	0	\$0	\$0	\$0
Total Present Value							\$38,799

⁶ 2009 Occupational Employment and Wage Estimates- Washington State, Metropolitan, and Balance of State Areas. Washington State Employment Security Department
http://www.workforceexplorer.com/admin/uploadedPublications/9766_Web_Databook2009.pdf

Vehicles being tested with the 55 percent opacity standard are failing at a rate of 6.5 percent. Ecology expects at least 11.3 percent to fail with the final 50 percent opacity standard. As you can see, starting in 2016, the 1991 and older vehicles will no longer need to be tested.

Table 6: Final changes on diesel-snap acceleration standards for 1997 and newer vehicles

Year	Number of Vehicles Tested	Number Failing at 40	Number Failing at 30	Change	Costs		Present Value
					Repair Costs	Time Costs	
2012	13,694	362	798	436	\$65,400	\$27,400	\$92,800
2013	27,387	725	1,596	871	\$130,650	\$54,900	\$182,592
2014	31,377	830	1,829	998	\$149,700	\$62,900	\$205,876
2015	31,377	830	1,829	998	\$149,700	\$62,900	\$202,594
2016	27,000	714	1,573	859	\$128,850	\$54,100	\$171,560
2017	27,000	714	1,573	859	\$128,850	\$54,100	\$168,825
2018	22,256	589	1,297	708	\$106,200	\$44,600	\$136,939
2019	22,256	589	1,297	708	\$106,200	\$44,600	\$134,756
Total Present Value							\$1,295,940

The 1997 and newer diesel vehicles being tested now with the 40 percent opacity standard are failing at a rate of 2.7 percent. Ecology expects these vehicles to have at least a 5.8 percent failure rate with the final 30 percent opacity standard. The combined present value cost for this final change annualized over 7.5 years is \$1,344,739.

Cost summary

Table 7 summarizes the expected costs associated with the final rule changes.

Table 7: Cost of final changes to 172-422A WAC

Final Change	Cost
New Authorized Testers	\$8,185,690
Requiring an OBD Scan Tool	\$0
Diesel Snap-Accelerations Test	\$1,344,739
Total	\$9,530,429

Benefits

Quantitative benefits

Stop dynamometer testing and standardize test standards for older gasoline vehicles

The new adopted rule eliminates dynamometer testing of Light Duty Gasoline Vehicles (LDGV) and standardizes the test standards for all 1995 and older gasoline vehicles. Currently LDGVs that are not given an OBD test are being tested, if possible, using the acceleration simulation mode (ASM) 2525 test on a dynamometer. Vehicles that cannot be driven on the dynamometer

are given a TSI test. While the ASM test is more effective at identifying vehicles that would benefit the most from emission repairs, the declining number of vehicles that would be given the ASM test does not appear to justify a continuing investment in dynamometers.

Based on data from the 2007 and 2008 data reports to EPA there are about 120,000 gasoline vehicles being tested annually that are ages 17-25. In 2012, vehicles made in 1995 will be 17 years old. Table 8 shows the number of LDGV each year that Ecology estimates will benefit from the standardized testing in the remaining 7.5 years of the program. The estimate for 2012 is for the last 6 months of the year the new rule will be in effect.

Table 8: Estimated number of 1995 and older LDGVs tested each year

Year	2012	2013	2014	2015	2016	2017	2018	2019
Vehicles	60,288	110,128	66,501	59,640	32,755	28,098	11,063	8,386

Currently, about 94 percent of 1995 and older LDGVs are being tested using the ASM 2525 test with 11 percent failing. The other 6 percent are being tested using the TSI test with 6.3 percent failing. Ecology is adopting to standardize the TSI standards for all 1995 and older LDGVs to equal the current Heavy Duty Gasoline Vehicles (HDGV) standards. Currently these HDGV ages 17-25 are failing the TSI test at 10.6 percent. It is likely that HDGVs will continue to fail the TSI test at least at this higher rate. However, the LDGVs are likely to fail the TSI test at a lower rate compared to the HDGVs. Based on the current difference in the LDGV fail rates for the ASM 2525 tests and the TSI tests, about 4.5 percent less LDGVs are expected to fail their test. The owners of these vehicles will be able to avoid the minimum \$150 in repair expenses along with the time cost for repairs and retesting. Ecology used a wage rate of \$31.50 an hour and an estimated time savings of 2 hours. Table 9 shows the number of vehicles that would now pass and the cost savings for their owners.

Table 9: Vehicles and cost savings of final changes to LDGV

Year	Vehicles Now Passing	Cost Savings Per Year (# of Vehicles x \$150)	Time Savings	Present Value Cost Savings Per year
2012	2,737	\$410,550	\$172,400	\$582,950
2013	5,000	\$750,000	\$315,000	\$1,048,022
2014	3,019	\$452,850	\$190,200	\$622,711
2015	2,708	\$406,200	\$170,600	\$549,652
2016	1,487	\$223,050	\$93,700	\$297,030
2017	1,276	\$191,400	\$80,400	\$250,815
2018	502	\$75,300	\$31,600	\$97,074
2019	381	\$57,150	\$24,000	\$72,516
Total	17,109	\$2,566,350	\$1,077,900	\$3,520,750

The cost savings for no longer requiring dynamometer testing and standardizing the standards on 1995 and older gasoline vehicles has a total present value of \$3.5 million.

Discontinue gas cap checks

The new adopted rule eliminates gas-cap leak tests. After 2012, most LDGVs will receive an OBD test that may detect a leaking gas cap. In 2006 - 2008, on average 6,000 vehicles per year failed the gas cap test but passed the OBD test and were still required to purchase a new gas cap. Before the 2000 model year vehicles, the OBD test was often not as effective in detecting leaking gas caps as testing the caps was. Eliminating the gas cap test is expected to result in a minimum increase in evaporative emissions. A gas cap can cost \$5.00 - \$21.00⁷ with an average of \$13.00. Therefore, Ecology assumes the first two years will each have an average of a \$13.00 savings for at least these 6,000 vehicles. Ecology also assumes a cost savings of 2 hours for repairs and retesting at an average wage rate of \$31.50 per hour. Table 10 shows the decline in vehicles and using a 1.62 percent rate the total present value savings of \$2.5 million.

Table 10: Savings for no longer requiring gas cap check

Testing Year	Percentage of Remaining Vehicles	Number of Vehicles	Savings on Cap	Time Savings	Present Value
2012	100%	3,000	\$39,000	\$189,000	\$228,000
2013	100%	6,000	\$78,000	\$378,000	\$448,731
2014	83%	5,340	\$69,420	\$336,420	\$393,004
2015	83%	5,340	\$69,420	\$336,420	\$386,738
2016	65%	4,260	\$55,380	\$268,380	\$303,603
2017	65%	4,260	\$55,380	\$268,380	\$298,763
2018	49%	3,300	\$42,900	\$207,900	\$227,747
2019	49%	3,300	\$42,900	\$207,900	\$224,116
Total Present Value					\$2,510,702

Allowing private businesses to test vehicles

Allowing private businesses to test vehicles is a convenience and assumed time-savings for vehicle owners. Ecology assumes vehicle owners who decide to get their vehicle tested by a private business, instead of a state contractor, will do so because it will be closer to their home or work, or because they can get an emissions test while their vehicle is being serviced for something else. Ecology assumes it currently takes about one hour to drive to the testing station, get tested, and drive home. We also assume vehicle owners who choose to use a private business will cut this time in half to 30 minutes and therefore save 30 minutes of time.

Using the average of the overall wages in the five counties where emission testing is required, Ecology estimates a time-savings of \$31.50 per hour. Table 11 shows the number of vehicles each year Ecology expects to be tested using a private business and the value of the time saved.

⁷ Autozone.com

Table 11: Savings for using a private business for emissions inspections

Testing Year	Percentage of Remaining Vehicles	Number of Vehicles	Savings Per Year (millions) ⁸	Present Value (millions)
2012	100%	50,000	\$788,000	\$787,581
2013	100%	100,000	\$1,575,000	\$1,550,051
2014	88%	88,000	\$1,386,000	\$1,342,300
2015	88%	88,000	\$1,386,000	\$1,320,901
2016	70%	70,000	\$1,103,000	\$1,033,967
2017	70%	70,000	\$1,103,000	\$1,017,484
2018	54%	54,000	\$850,000	\$772,403
2019	54%	54,000	\$850,000	\$760,089
Total Present Value				\$8,584,776

Using the 1.62 percent real rate on treasury bills, Ecology estimates the final rule creates a total present value cost savings of \$8.6 million for vehicle owners over 7.5 years.

Discontinue testing of light-duty diesel vehicles

The new adopted rule eliminates test light-duty diesel vehicles. There are so few of these vehicles and the preferred dynamometer test for these vehicles will no longer be available. In addition, EPA does not recognize the benefit of testing these vehicles. There are about 6,000 light duty diesel vehicles in the testing areas; Ecology assumes about 3,000 would have been tested annually.⁹ Table 12 shows the decrease in the number of vehicles over time as 2009 and newer models are exempted. The 1.62 percent treasury bills rate is used. Each vehicle will have a savings of the \$15 charged for the test and an hour of cost savings for not having to get the test. The wage rate used is \$31.50 per hour.

Table 12: Savings for exempting light-duty diesel vehicles

Testing Year	Percentage of Remaining Vehicles	Number of Vehicles	Cost Savings		Present Value
			Savings for Test	Time Savings	
2012	100%	1,500	\$22,500	\$47,300	\$69,800
2013	100%	3,000	\$45,000	\$94,500	\$137,276
2014	89%	2,670	\$40,050	\$84,100	\$120,223
2015	89%	2,670	\$40,050	\$84,100	\$118,307
2016	71%	2,130	\$31,950	\$67,100	\$92,883
2017	71%	2,130	\$31,950	\$67,100	\$91,403
2018	55%	1,650	\$24,750	\$52,000	\$69,695
2019	55%	1,650	\$24,750	\$52,000	\$68,584

⁸ Cost per year = (Number of vehicles) x (\$31.50/hour) x (.5 hours)

⁹ In 2012 only vehicles tested after July when the new rule goes into effect will be exempt; therefore Ecology estimates half the total number of vehicles for 2012.

Total Present Value	\$768,171
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Ecology estimates this final change will create a savings of \$768,000.

Exempt 2007-2008 model year high-duty diesel vehicles

The new adopted rule exempts high-duty diesel vehicles with an engine that was certified by its manufacturer as meeting the EPA 2007 exhaust emission standards. This exemption will only benefit 2007 and 2008 diesel vehicles because the 2009 and newer models will already be exempt by law. Based on a snapshot of the current number of diesel vehicles in the five counties¹⁰, Ecology was able to extrapolate how many diesel vehicles there will be in each year from 2012-2019. Table 13 shows the number of 2007 and 2008 vehicles each year that will be exempt. Table 13 also shows the cost savings based on avoiding the \$15 charge for a test and the time saved by not having to get the vehicles tested. Ecology assumes it will save 1 hour of time at a labor cost of \$31.50 an hour.

Table 13: Savings for exempted 2007-2008 diesel vehicles

Testing Year	Number of Vehicles	Cost Savings		Present Value
		Savings for Test	Time Savings	
2012	4,100	\$61,500	\$128,900	\$190,400
2013	8,200	\$123,000	\$257,800	\$374,729
2014	5,800	\$87,000	\$184,200	\$262,622
2015	5,800	\$87,000	\$184,200	\$258,435
2016	6,400	\$96,000	\$200,500	\$278,040
2017	6,400	\$96,000	\$200,500	\$273,608
2018	6,100	\$91,500	\$192,900	\$258,258
2019	6,100	\$91,500	\$192,900	\$254,141
Total Present Value				\$2,150,235

Ecology estimates this final change will save \$2.2 million.

Removing the requirement for listed repair businesses to have an exhaust analyzer.

The new adopted rule removes the requirement for listed repair businesses to have an exhaust analyzer. Ecology believes that because of the declining number of vehicles failing an exhaust emission test, repair businesses should no longer be required to have an exhaust analyzer. Ecology surveyed repair businesses to estimate the cost savings for not requiring an exhaust analyzer. Ecology contacted 50 small businesses and 10 large businesses. We got an overall response rate of 77 percent with responses from 41 small businesses and 5 large businesses. Three of the small businesses reported they could not answer any of the questions and those responses were thrown out, leaving 38 small businesses with data. The small businesses averaged eight employees and the large businesses average 135.

An exhaust analyzer can cost thousands of dollars and most repair businesses invested in these analyzers many years ago. On average, small business reported that their previous exhaust analyzer or their expectation of how long their current analyzer will last is 12 years; large

¹⁰ Washington State Department of Licensing January 5, 2010

businesses estimated 14 years. A few businesses even said they expected to use their analyzer forever since they are currently using it so infrequently and would not want to buy a new one. Therefore, Ecology estimated the cost savings for avoiding maintenance and calibration gas costs. Small businesses report a combined average of \$320 per year and large businesses estimated \$375 per year. There are currently about 620 small repair businesses and 60 large businesses. Table 14 shows the cost savings for eliminating the requirement to have an exhaust analyzer.

Table 14: Savings for no longer requiring listed repair businesses to have exhaust analyzers

	Small	Large
Number of Businesses	620	60
Annual Cost of Maintenance and Calibration Gas	\$320	\$375
Total Annual Cost Savings	\$198,400	\$22,500
Total Present Value (PV) Cost Savings	\$1,402,208	\$159,021
Total Small and Large PV Cost Savings	\$1,561,229	

Ecology estimates the cost savings for eliminating the requirement for listed repair businesses to have an exhaust analyzer has a present value savings of \$1.6 million over the 7.5 remaining years of the program. Please note this savings does not include the cost of actually buying an analyzer, only its yearly maintenance costs. Not only does this new adopted rule create a benefit for currently listed repair businesses, but eliminating this requirement makes it easier for a new repair business to become listed by Ecology. This should provide more options for the owners of vehicles that fail an emission test and need repairs. See Appendix A for the text of the survey.

Qualitative benefits

Quantitative estimates of the cost and benefits of all the final rule language were not possible. The following is a discussion of several program changes intended to help achieve the best balance of public convenience, testing and repair costs, testing accuracy and emission reduction.

Discontinue dynamometer testing

While dynamometer testing is more effective at identifying high emission vehicles than the no load TSI test, the new adopted rule eliminates the use of a dynamometer during exhaust emission testing because of the declining number of vehicles that would receive a dynamometer test. This will reduce the cost of testing for current testers contracted with the state and make entry into the industry easier for a new private business because it eliminates the costs of purchasing and maintaining a dynamometer. Ecology estimates a dynamometer can cost around \$20,000 not including installation costs into the ground or the loss of this space for other purposes. Ecology also estimates that on average maintaining a dynamometer can cost thousands of dollars a year.

Allow repair waivers for vehicles unable to be retested

The new adopted rule allows vehicles that are unable to be retested to be issued a waiver if all other requirements are met. This is a timesaving measure primarily for the owners of vehicles who fail an OBD test. A vehicle considered to be “ready” can be given an OBD test even if one or two monitors are “not ready”. This is to balance the need for an effective test while not overburdening vehicle owners.

If a vehicle is “not ready” for an OBD test, the driver is instructed that additional driving is necessary. The additional driving will give the OBD system a chance to run through its monitoring. This can be a problem for the driver because the amount of driving that is necessary for all monitoring to occur varies significantly. It can vary between vehicles, how the vehicle is operated, and even on the ambient temperatures while the vehicle is being driven. When the vehicle is retested, there may not have been enough time after the repairs for the OBD monitors to have completed their checks. Therefore, the vehicle cannot yet receive a passing test, but it is likely to have already met the other requirements for obtaining a waiver.

Require OBD monitors that initially reported a problem to be “ready” during a retest

The new adopted rule requires that monitor(s) that reported a problem in an initial OBD test must be “ready” to report to pass a retest. This will increase the emission reduction achieved by OBD testing by discouraging code clearing to fraudulently obtain a passing OBD test. Code clearing is erasing the diagnostic information stored in the vehicle OBD system just before an OBD test. This can be done by using a common diagnostic tool or by disconnecting the vehicle’s battery

Code clearing is not always a deliberate attempt to obtain a passing OBD test. It is a common practice for fault codes to be cleared after a vehicle has received repairs, or after an initial malfunction detection to confirm the monitoring results before repairs. Battery replacement or accidental draining can also cause codes to be cleared.

Exempt diesel vehicles equipped with an exhaust particle filter

The new adopted rule exempts diesel vehicles or vehicles equipped with an exhaust particle filter acceptable to Ecology. This exemption will primarily benefit public transit systems.

Cost savings summary

Table 15 summarizes the expected cost savings of the new adopted rule.

Table 15: Cost savings of final 172-422A WAC

Final Change	Cost Savings
Eliminating Dynamometers and standardizing 1995 and older test standards	\$3,520,750
No Gas Cap Check	\$2,510,702
Convenience of Using a Private Testing Business	\$8,584,776
Exempting Light Duty Diesel Vehicles	\$768,171
Exempting 2007-2008 High Duty Diesel Vehicles	\$2,150,235
Eliminating Exhaust analyzers	\$1,561,229
Total Cost Savings	\$19,095,863

Conclusion

Table 16 summarizes the costs and benefits of the new adopted rule WAC 173-422A, Motor Vehicle Emission Inspection. Ecology concludes the benefits of the rule outweigh the costs by at least \$9.6 million, which does not include the qualitative benefits addressed above.

Table 16: Costs and benefits of final Chapter 173-422A WAC

COSTS	
New authorized testers	\$8,185,690
Requiring an OBD scan tool	\$0
Diesel Snap-Acceleration Test	\$1,344,739
Total Costs	\$9,530,429
BENEFITS	
Eliminating Dynamometers and Standardizing 1995+ Standards	\$3,520,750
No Gas Cap Check	\$2,510,702
Convenience of Using a Private Testing Business	\$8,584,776
Exempting Light Duty Diesel Vehicles	\$768,171
Exempting 2007 and 2008 High Duty Diesel Vehicles	\$2,150,235
Eliminating Exhaust Analyzers	\$1,561,229
Total Benefits	\$19,095,863
TOTAL NET BENEFITS	\$9,565,434

Least Burdensome Analysis

RCW 34.05.328(1)(e) required Ecology to “determine, after considering alternative versions of the rule and the analysis under (b),(c), and (d) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection.

Ecology believes this is the least burdensome alternative to the rule and that the new adopted rule will make testing easier for businesses and vehicle owners without significantly increasing health or environmental risks. The final changes described in the Benefits section of this analysis create a cost savings of over \$18 million. A more burdensome alternative would have been to not make all of these changes or to have only made some of them. The final changes include:

- Standardizing the test procedures and standards for 1995 and older gasoline vehicles.
- Discontinuing gas cap tests.
- Allowing testing by other businesses than the State contractor.
- Exempting from testing light-duty diesel vehicles.
- Exempting from testing 2007 and 2008 high-duty diesel vehicles.
- Not requiring listed repair businesses to have an exhaust analyzer.
- Allowing a waiver for vehicles that cannot be retested.

Appendix

Appendix A

Exhaust analyzer survey

Changes are coming to the Vehicle Emission Testing Program starting in July 2012.

Because of the declining number of vehicles being given an exhaust test at the test stations, Ecology is considering eliminating any requirement for authorized emission repair businesses to have an exhaust analyzer. We are conducting this survey to estimate the cost savings for not having one.

1. How long ago did you purchase your current exhaust analyzer? _____
2. How long did your previous exhaust analyzer last? Or how long do you expect your current exhaust analyzer to last? _____
3. How much do you spend per year on maintenance to your exhaust analyzer? _____
4. How much do you spend per year on calibration gas for your exhaust analyzer? _____