Oregon

Vehicle Inspection Program

— Annual EPA Report —
2020 Test Year

Submitted in compliance with the Federal Code of Regulations Title 40 Chapter I Part 51 Subpart S Section 51.366 Data Analysis and Reporting

This consolidated report includes the following required annual & biennial reports:

1. **Test Data Report**
2. **Quality Assurance Report**
3. **Quality Control Report**
4. **Enforcement Report**
5. **Additional Reporting Requirements (biennial report)**

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Acknowledgments

The following individuals are acknowledged for their contributions to this report:

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  Report Review and Approval
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  Quality Assurance Report, Enforcement Report

Oregon Program Overview

Oregon operates a hybrid biennial vehicle test program. The bulk of the testing is in the centralized program performed by DEQ employees in basic, standard and "self-service"[1] lanes at Clean Air Stations. Some tests are also done by DEQ employees on auto dealership inventory on the dealership lot. Some are companies testing their own fleet of vehicles. And since 2016, Oregon uses a remotely administered OBD test method called DEQ Too™. DEQ Too Private business participants, such as repair shops, can perform their customers' DEQ tests at DEQ-authorized facilities. The method uses DEQ-approved telematics devices to perform OBD tests on 2005 and newer vehicles. Other than occurring remotely/wirelessly, a DEQ Too test is administered consistent with Oregon's other OBD test methods. All of these test methods are financially supported by DEQ's fees, which were temporarily increased during the COVID-19 pandemic, when decreased revenues sped the depletion of the program's fund balance. These fees, increased for the first time in 23 years, are expected to become permanent during the 2021 legislative session.

The Inspection Maintenance (IM) Program is divided into two regions; Portland and Medford. There are approximately 2.0 million registered vehicles within the IM boundary and 2.7 million registered vehicles outside the IM boundary. 1.3 of the 2.0 million registered vehicles within the IM boundary meet the requirements for testing. Oregon has a four year grace period for new vehicles. The Portland region tests vehicles model year 1975 and newer. Medford tests vehicles up to twenty years old.

Oregon conducted two test types during 2020. A Single Speed Idle test (curb idle) was conducted on 1975 to 1995 model years and an On-Board Diagnostic test was conducted on 1996 and newer model years. (These test methods are performed consistent with applicable Oregon Administrative Rules, including self-service and remote OBD which was approved by the Oregon Environmental Quality Commission and then submitted to EPA as part of the Ozone SIP in 2006). Oregon only charges a fee when the vehicle passes and receives a certificate of compliance. Oregon DEQ, with cooperation from Oregon DMV, uses registration denial as its enforcement mechanism. Vehicles owned and operated within the IM boundary may not be registered without an emissions certificate of compliance.

[1] While generally referred to as "self-service" lanes, these lanes may be more appropriately described as "customer assisted" lanes. The lanes are designed to enable customers to input background information, for example, but with much testing work continuing to be performed by VIP inspectors.

Preface

TITLE 40 Protection of Environment
CHAPTER I Environmental Protection Agency
PART 51 Requirements for Preparation, Adoption, and Submittal of Implementation Plans
Subpart S Inspection/Maintenance Program Requirements

Sec. 51.366 Data analysis and reporting
Data analysis and reporting are required to allow for monitoring and evaluation of the program by program management and EPA, and shall provide information regarding the types of program activities performed and their final outcomes, including summary statistics and effectiveness evaluations of the enforcement mechanism, the quality assurance system, the quality control program, and the testing element. Initial submission of the following annual reports shall commence within 18 months of initial implementation of the program as required by Sec. 51.373 of this subpart. The biennial report shall commence within 30 months of initial implementation of the program as required by Sec. 51.373 of this subpart.

Test Data Report

The program shall submit to EPA by July 1 of each year a report providing basic statistics on the testing program for January through December of the previous year, including:

(1) The Number of vehicles tested by model year and vehicle type

This information is attached as Exhibit 1. Also see Chart 1.

(2) By model year and vehicle type, the number and percentage of vehicles

(I) Failing initially, per test type
This information is attached as Exhibit 2 and Exhibit 3. Also see Chart 2 and Chart 3.

(II) Failing the first retest per test type
This information is attached as Exhibit 4 and Exhibit 5. Also see Chart 4 and Chart 5.

(III) Passing the first retest per test type
This information is attached as Exhibit 6 and Exhibit 7. Also see Chart 6 and Chart 7.

(IV) Initially failed vehicles passing the second or subsequent retest per test type
This information is attached as Exhibit 8 and Exhibit 9. Also see Chart 8 and Chart 9.

(V) Initially failed vehicles receiving a waiver
This section is not applicable to Oregon's program. Oregon does not waive any motorist from the vehicle emission test requirement based solely upon repair cost. Oregon's approach is to provide financial assistance, to those motorists who qualify, to facilitate the repair of their vehicle. All motorists operating a vehicle within the IM boundary are expected to pass a vehicle emission inspection with few exceptions. Oregon does offer a medical waiver to motorists with conditions prohibiting testing or making testing a hardship. A physician's letter explaining the hardship is required. Oregon offers a waiver (Form 9401) to motorists temporarily operating their vehicle in another state that does not have an emissions inspection program. If the aforementioned state does conduct vehicle testing, then Oregon requires the motorist to pass the test requirements of that state and provide proof of compliance.

While this section is not directly applicable to Oregon, an accounting of the waivers Oregon does offer is attached as Exhibit 29.

(VI) Vehicles with no known final outcome (regardless of reason)
This information is attached as Exhibit 10 and Exhibit 11. Also see Chart 10 and Chart 11.
Oregon interprets this request to mean those vehicles with no ultimate pass result during the calendar year of testing.

(VII)-(X) [Reserved]

(XI) Passing the on-board diagnostic check
This information is attached as Exhibit 12 and Exhibit 13. Also see Chart 12 and Chart 13.

(XII) Failing the on-board diagnostic check
This information is attached as Exhibit 14 and Exhibit 15. Also see Chart 14 and Chart 15.

(XIII) Failing the on-board diagnostic check and passing the tailpipe test (if applicable)
This section is no longer applicable to Oregon's program. Oregon conducted this type of data gathering in 1999 and 2000 prior to adopting OBD as a test methodology.

(XIV) Failing the on-board diagnostic check and failing the tailpipe test (if applicable)
This section is no longer applicable to Oregon's program. Oregon conducted this type of data gathering in 1999 and 2000 prior to adopting OBD as a test methodology.

(XV) Passing the on-board diagnostic check and failing the I/M gas cap evaporative system test (if applicable)
This section is not applicable to Oregon's program.

(XVI) Failing the on-board diagnostic check and passing the I/M gas cap evaporative system test (if applicable)
This section is not applicable to Oregon's program.

(XVII) Passing both the on-board diagnostic check and I/M gas cap evaporative system test (if applicable)
This section is not applicable to Oregon's program.

(XVIII) Failing both the on-board diagnostic check and I/M gas cap evaporative system test (if applicable)
This section is not applicable to Oregon's program.

(XIX) MIL is commanded on and no codes are stored
This information is attached as Exhibit 16 and Exhibit 17.

(XX) MIL is not commanded on and codes are stored
This information is attached as Exhibit 18 and Exhibit 19.

(XXI) MIL is commanded on and codes are stored
This information is attached as Exhibit 20 and Exhibit 21.

(XXII) MIL is not commanded on and codes are not stored
This information is attached as Exhibit 22 and Exhibit 23.

(XXIII) Readiness status indicates that the evaluation is not complete for any module supported by on-board diagnostic systems
This information is attached as Exhibit 24 and Exhibit 25. Also see Chart 16 and Chart 17.

(3) The initial test volume by model year and test station
This information is attached as Exhibit 26.

(4) The initial test failure rate by model year and test station

This information is attached as Exhibit 27.

(5) The average increase or decrease in tailpipe emission levels for HC, CO, and NOX (if applicable) after repairs by model year and vehicle type for vehicles receiving a mass emissions test

This section is no longer applicable to Oregon's program.

Quality Assurance Report

The program shall submit to EPA by July 1 of each year a report providing basic statistics on the quality assurance program for January through December of the previous year, including:

(1) The number of inspection stations and lanes

(I) Operating throughout the year

Table 1 shows an accounting of Oregon's test units.

Table 1

Station	Units
Clackamas	10
Gresham	8
Medford	4
MOBILE	1
Northeast	8
Scappoose	1
Sherwood	7
Sunset	12
DEQToo - MEDFORD	29
DEQToo - PORTLAND	295
Total Units	**375**

Each of Oregon's units is effectively a lane though some units are double positioned in a single physical lane. Oregon's Mobile station is a mobile van that travels to car dealerships to provide on-site testing. It is located in Portland. DEQ Too continues to grow as a sub-program. Hence, Oregon has 7 centralized stations, a mobile station, and 299 private stations from which Oregon motorists may choose. These private stations are called "Device-Use Businesses" or generally "Hosts" as they host a device for use by the general public. Five of Oregon's centralized stations have one or more Self-Serve OBD Test lanes. They are located at Clackamas, Gresham, Northeast, Sherwood, and Sunset. There were three vendors that sold continuously connected devices to motorists. The continuously connected motorists do not constantly broadcast OBD data to DEQ, but rather upload the data to DEQ on demand or when their test is due. However, one vendor has shared in-use or continuous OBD data with DEQ.

i) Operating for only part of the year

Oregon was required to temporarily close all of its centralized stations due to COVID-19, for approximately three months, between mid-March and mid-June. The stations extended operating hours and performed "make-up" tests, at unprecedented levels, following reopening. DEQ Too stations also remained operating as an option to customers throughout the year.

(2) The number of inspection stations and lanes operating throughout the year

(I) Receiving overt performance audits in the year

Given that Oregon primarily operates a state run centralized program, overt and covert audits beyond those which are automated within the software are not routinely conducted at our centralized facilities. The software conducts a calibration followed by a single gas audit every four hours in the basic Single-Speed Idle test and the OBD interface is checked as well. The software automatically shuts down lanes which fail these daily audits. Maintenance personnel conduct additional periodic audits as a part of their preventive maintenance procedures. The majority of Oregon's testing is now OBD-II which is not

subject to a DEQ calibration. However, an OBD communications check is performed prior to opening. This check covers CAN, ISO9141, PWM, and VPW. Maintenance personnel are also able to lockout a lane from testing if their on-site audit shows the lane is not accurate. In addition, Oregon monitors test lanes with digital surveillance cameras in order to ensure the highest level of test integrity. DEQ Too facilities with telematic units enroll under specific terms and conditions and DEQ is able to block an entire facility or an individual telematic device from posting data to the DEQ Too server. All data is monitored for rationality both during and after testing. The dynamic fraud checking includes PID Checks and known Simulator Checks. These data are given a Non-OEM OBD Data Failure, a message about the Federal Clean Air Act Prohibitions, and the record is flagged for later follow-up.

(II) Not receiving overt performance audits in the year
See bullet (I) of this section entitled "Receiving overt performance audits in the year."

(III) Receiving covert performance audits in the year
See bullet (I) of this section entitled "Receiving overt performance audits in the year."

(IV) Not receiving covert performance audits in the year
See bullet (I) of this section entitled "Receiving overt performance audits in the year."

(V) That have been shut down as a result of overt performance audits
See bullet (I) of this section entitled "Receiving overt performance audits in the year."

(3) The number of covert audits

(I) Conducted with the vehicle set to fail per test type
See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(II) Conducted with the vehicle set to fail any combination of two or more test types
See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(III) Resulting in a false pass per test type
See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(IV) Resulting in a false pass for any combination of two or more test types
See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(V-VIII) [Reserved]

(4) The number of inspectors and stations

(I) That were suspended, fired, or otherwise prohibited from testing as a result of covert audits
Since Oregon's program is largely centralized, there are no covert audits in the traditional sense of decentralized state vehicle test programs. Instead, DEQ utilizes continuous monitoring by station managers and video cameras in each testing lane.

(II) That were suspended, fired, or otherwise prohibited from testing for other causes
While the program continued to address needed personnel issues and to fill vacancies, it was not necessary to suspend, fire or otherwise prohibit testing by any inspectors for any matters pertaining to vehicle testing.

(III) That received fines
This section is not applicable to Oregon's program.

(5) The number of inspectors licensed or certified to conduct testing

The Department of Environmental Quality has 124 Fleet Certified Inspectors that must have 8 hours of training per year to maintain their certification through DEQ's program. As of December 31, 2020, the Department of Environmental Quality employed 59 Vehicle Emission Inspectors who are certified to conduct a vehicle emission test at an Oregon Clean Air Station.

(6) The number of hearings

(I) Held to consider adverse actions against inspectors and stations

There were none during 2020.

(II) Resulting in adverse actions against inspectors and stations

There were none during 2020.

(7) The total amount collected in fines from inspectors and stations by type of violation

This section is not applicable to Oregon's program.

(8) The total number of covert vehicles available for undercover audits over the year

This section is not applicable to Oregon's program.

(9) The number of covert auditors available for undercover audits

This section is not directly applicable to Oregon's program.
See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

Quality Control Report

The program shall submit to EPA by July 1 of each year a report providing basic statistics on the quality control program for January through December of the previous year, including:

(1) The number of emission testing sites and lanes in use in the program

This information is the same as that found in Table 1.

(2) The number of equipment audits by station and lane

This section is not directly applicable to Oregon's program.
See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(3) The number and percentage of stations that have failed equipment audits

This section is not directly applicable to Oregon's program.
See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(4) Number and percentage of stations and lanes shut down as a result of equipment audits

This section is not directly applicable to Oregon's program.
See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

Enforcement Report

(1) All varieties of enforcement programs shall, at a minimum, submit to EPA by July 1 of each year a report providing basic statistics on the enforcement program for January through December of the previous year, including

(I) An estimate of the number of vehicles subject to the inspection program, including the results of an analysis of the registration data base

Oregon used 2020 DMV data in order to conduct this analysis. The analysis suggests that approximately 1,307,886 vehicles were registered within Oregon's IM boundary and meet the criteria for testing. Given that Oregon operates a biennial test program, approximately 653,943 of these vehicles would be tested in 2020.[2]

(II) The percentage of motorist compliance based upon a comparison of the number of valid final tests with the number of subject vehicles

Oregon used 2020 DMV data in order to conduct this analysis. The analysis suggests that approximately 653,943 vehicles registered in the IM boundary meet the criteria for testing during 2020. Examining DEQ's 2020 test data reveals that 495,424 initial tests were conducted in 2020. This represents 76% of the 653,943 vehicles expected to be tested. This analysis is a coarse estimate given the complexities involved with determining the exact number of vehicles which should be tested. The target value of 653,943 vehicles is based upon the total number of vehicles registered within testable ZIP codes that meet Oregon's test criteria. However, Oregon's IM boundary is more complicated than a simple ZIP code bounded area. Some ZIP codes are split by the I/M boundary. The total number of vehicles with final passing test results in 2020 is 485,260. This represents 98% of the 495,424 initially tested vehicles. Some vehicles that failed in 2020 may have passed in 2021. Hence, Oregon estimates a compliance rate of between 76%[3] and 98%. *This is much lower than previous reports and is due to the COVID-19 closure impact on the ability to test with the same efficiency as in past years.*

(III) The total number of compliance documents issued to inspection stations

This information is attached as Exhibit 28.

(IV) The number of missing compliance documents

All compliance documents are accounted for at the end of each till, if there is any discrepancy or missing documents they are dealt with at that time. In the event a compliance document comes up missing, all vehicle information is reported and DEQ makes every effort to find the address and phone number of the customer to recover the missing document. There were no missing document situations during 2020.

(V) The number of time extensions and other exemptions granted to motorists

Oregon issues a form 9401: Statement of vehicle outside of Oregon. This postponement is specifically for Oregon registered vehicles that require an emission certificate for registration and are currently in a state that does not offer an emissions test. In 2020, DEQ issued 266 "9401" Exemptions. Oregon also kept on record 4 permanent medical waivers during 2020. For a full accounting of 9401 and other waivers see Exhibit 29.

(VI) The number of compliance surveys conducted, number of vehicles surveyed in each, and the compliance rates found

This section is not applicable to Oregon's program.

[2] Given the impacts of COVID-19 and a testing enforcement moratorium in place during 2020, it is expected that some testing within 2021 may actually be attributable to testing otherwise expected to occur in 2020.

[3] Oregon's Centralized Clean Air Stations were closed for roughly three months during 2020 due to the COVID-19 outbreak.

(2) Registration denial based enforcement programs shall provide the following additional information

(I) **A report of the program's efforts and actions to prevent motorists from falsely registering vehicles out of the program area or falsely changing fuel type or weight class on the vehicle registration, and the results of special studies to investigate the frequency of such activity**
The Department of Environmental Quality does not track motorists that falsely register their vehicles. All registration is completed through Oregon's Driver and Motor Vehicle Services. Oregon's Driver and Motor Vehicle Services is responsible for registration audits. The DMV does not provide the results of these audits to DEQ.

(II) **The number of registration file audits, number of registrations reviewed, and compliance rates found in such audits**
Oregon's Driver and Motor Vehicle Services is responsible for this audit. The DMV does not provide the results of these audits to DEQ. All vehicle registration is done through the Driver and Motor Vehicle Services.

(3) Computer-matching based enforcement programs shall provide the following additional information

(I) **The number and percentage of subject vehicles that were tested by the initial deadline, and by other milestones in the cycle**
Oregon does not currently have sufficient data to conduct this analysis.

(II) **A report on the program's efforts to detect and enforce against motorists falsely changing vehicle classifications to circumvent program requirements, and the frequency of this type of activity**
This type of audit falls under the purview of Oregon's Driver and Motor Vehicle Services.

(III) **The number of enforcement system audits, and the error rate found during those audits**
This type of audit falls under the purview of Oregon's Driver and Motor Vehicle Services.

(4) Sticker-based enforcement systems shall provide the following additional information

(I) **A report on the program's efforts to prevent, detect, and enforce against sticker theft and counterfeiting, and the frequency of this type of activity**
This section is not applicable to Oregon's program.

(II) **A report on the program's efforts to detect and enforce against motorists falsely changing vehicle classifications to circumvent program requirements, and the frequency of this type of activity**
This section is not applicable to Oregon's program.

(III) **The number of parking lot sticker audits conducted, the number of vehicles surveyed in each, and the noncompliance rate found during those audits**
This section is not applicable to Oregon's program.

Additional Reporting Requirements

In addition to the annual reports in paragraphs (a) through (d) of this section, programs shall submit to EPA by July 1 of every other year, biennial reports addressing:

(1) Any changes made in program design, funding, personnel levels, procedures, regulations, and legal authority, with detailed discussion and evaluation of the impact on the program of all such changes

Oregon continues to pursue a fee increase needed to maintain current staffing levels and to otherwise address program fiscal needs. The program's proposed fee increase was not approved or denied in the prior legislative session, as the session ended without addressing the request. An interim, emergency fee increase of the same amount has been in place during much of 2020, as discussed below.

The current, permanent fee increase, generally increasing fees from $21 to $25 per test in the Portland area, and ultimately to $20 in Medford, has been approved by the Environmental Quality Commission. The increase must next be ratified by the Oregon Legislature during the current legislative session scheduled to end on June 27, 2021. If the fee increase is not approved by the Oregon legislature and Environmental Quality Commission, the program will need to re-evaluate and potentially further update its design, operational approaches, personnel levels, procedures, regulations and/or legal authority.

In order to meet continued testing demands at current staffing levels, and to remain efficient and cost-effective, Oregon continues to take several steps to manage operations. Among these steps, in addition to securing the needed fee increase, Oregon continues to reconfigure and expand its self-serve lanes. For example, the program is currently completing a Self Service Lean process improvement initiative. The project has given rise to several software enhancements and newly re-designed Self Service lanes. Oregon also continues to expand and update its DEQ Too program for the motoring public. There are currently 127 host locations, 107 dealer locations, 7 fleet locations, and 2 vendors providing a continuously connected solution for their motorists. The recent fee increases, discussed above, supports the continuation of this work and important program updates. Among the priority updates are new communications about the DEQ Too program, technology upgrades, improved training and updated rules and procedures.

Oregon is also increasing its focus on anti-fraud work particularly that focused on the diesel sector. Work in this area includes updated program rules, a partnership with Oregon State policy, and modified lane testing procedures. For example, in 2020 the program returned to a practice of physically evaluating and addressing vehicles with potentially removed catalytic converters. The program has also initiated a procurement that will enable it to complete a roadside testing evaluation in multiple areas throughout the state. This work, last completed approximately 15 years ago, will provide important data regarding the effects of the program, potential fraud and the impacts of diesel-powered vehicles on Oregon roadways.

(2) Any weaknesses or problems identified in the program within the two-year reporting period, what steps have already been taken to correct those problems, the results of those steps, and any future efforts planned

DEQ's VIP faced tremendous challenges associated with COVID-19. The separately attached "*VIP 2020 Report*" discusses many of the challenges faced, as well as many key activities occurring in 2020.

Last year, the required closures of VIP stations between mid-March and mid-June created numerous, unprecedented challenges for VIP. Although stations were temporarily closed, the DEQ Too testing option remained in place, addressing many customer needs. To the extent customers elected to wait until stations reopened to test at a state-run Clean Air Station, that opportunity also remained available. As noted in the VIP 2020 report, testing was delayed for some but customers returned at unprecedented levels when stations were reopened in late June. The "make-up" testing volume, on top of already high station test volume,

required the integration of traffic plans, flaggers, press releases, and new station signage, operations and protective measures to effectively reopen the Clean Air Stations.

The temporary closures also created a potential service gap between VIP and the DMV. Certain customers could not get vehicle inspections in order to complete registrations through DMV's online services. The new authority complemented other options in place, including the continued availability of the program's DEQ Too test certificates, in addressing this potential service gap. Within approximately two weeks of receiving the new authority, the VIP developed and launched a new system for enabling customers to obtain these "COVID-19 certificates", and to test their vehicles at a later date. By the end of 2020, most customers who obtained these certificates have already returned for their test, and customers have expressed satisfaction with this additional testing option being available during the pandemic.

Acronyms Used in This Report

Acronym	Acronym Spelled Out	Additional Information
AND	Logic AND	To logically combine two or more bits such that the output is true only if all inputs are true.
Basic Test	See SSI	Basic test is another name for SSI.
DEQ	Department of Environmental Quality	Oregon's environmental agency responsible for maintaining Oregon's air, land, and water quality.
DEQ Too™	Department of Environmental Quality Testing Too	Oregon's remote OBD program which allows private businesses to perform DEQ Too testing. A business can host a device which is shared with the public, it can use a device to test its own inventory or fleet, and a continuously connected business can add DEQ Too to their existing product once that product is certified by DEQ.
DLC	Data Link Connector	The connection on the vehicle through which an outboard computer is able to communicate to the vehicle's on-board computer.
DMV	Driver and Motor Vehicle Services	Oregon's department for handling driver and motor vehicle services such as license, registration, and vehicle titling.
DTC	Diagnostic Trouble Code	OBD codes which define a vehicle system or component fault.
ECM	Engine Control Module	An ECU that receives data from and exercises control over the engine.
ECU	Electronic Control Unit	An OBD computer network node able to make and respond to data requests via other nodes on the network. These nodes also exercise control over specific vehicle systems or components.
eVIN	Electronic Vehicle Identification Number	The vehicle identification number retrieved from the on-board diagnostics system of the vehicle being tested.
IM	Inspection Maintenance	A test and repair strategy whereby polluting vehicles are identified and repaired to maintain good air quality.
MIL	Malfunction Indicator Lamp	A lamp located on a vehicle's dashboard to alert the driver of an OBD fault.
OBD	Onboard Diagnostic Test.	A computerized test Implemented on vehicles model year 1996 and newer whereby the vehicle's on-board computer transfers emission system/component status to an off-board computer.
OR	Logic OR	To logically combine two or more bits such that the output is true if any one of the inputs is true.
PCI	Purchase Card Industry	The purchase card industry has rigorous security standards for card readers/networks and will not reimburse losses to those merchants using card readers/networks which do not meet these rigorous standards.
PCM	Powertrain Control Module	A single ECU that receives data from and exercises control over both engine and transmission (powertrain).
SSI	Single Speed Idle Test or curb idle test.	An emission test implemented on vehicles model year 1975 to 1995 whereby tailpipe emissions are sampled while the vehicle is at its normal curb (low) idle.
TCM	Transmission Control Module	An ECU that receives data from and exercises control over the transmission.
VID	Vehicle Inspection Database.	A centralized data warehouse that transfers important test data to and from the lanes. The VID is located at DEQ's technical center.
VIP	Vehicle Inspection Program	Oregon's air quality subprogram with the sole responsibility of testing vehicle emission control systems.
VLT	Vehicle Lookup Table	A data table containing vehicle information which resides on the VID.

Exhibits and Charts

Exhibit 1

The number of vehicles tested by model year and vehicle type[20] (Chart 1)

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1975	33	16	31	8	88
1976	70	48	61	13	192
1977	69	53	91	32	245
1978	104	73	130	27	334
1979	105	49	65	25	244
1980	81	66	22	20	189
1981	89	67	18	21	195
1982	97	113	14	28	252
1983	117	87	28	29	261
1984	183	222	55	68	528
1985	197	204	43	64	508
1986	312	402	64	82	860
1987	258	386	47	58	749
1988	400	427	152	112	1,091
1989	363	437	144	173	1,117
1990	738	672	222	186	1,818
1991	719	638	148	97	1,602
1992	924	858	279	219	2,280
1993	839	914	239	188	2,180
1994	1,293	1,658	622	290	3,863
1995	1,371	1,251	570	331	3,523
1996	2,097	1,949	605	445	5,096
1997	2,263	2,229	681	473	5,646
1998	4,028	3,618	968	440	9,054
1999	3,675	2,816	1,398	639	8,528
2000	6,748	4,985	2,364	990	15,087
2001	6,169	3,835	2,045	733	12,782
2002	8,803	6,307	3,323	901	19,334
2003	8,183	5,043	2,730	876	16,832
2004	10,709	8,558	4,505	1,154	24,926
2005	11,826	6,059	2,785	699	21,369
2006	16,363	8,313	4,270	1,216	30,162
2007	14,450	6,430	3,330	675	24,885
2008	16,809	7,614	3,606	762	28,791
2009	11,168	2,878	1,197	317	15,560
2010	15,917	5,865	2,681	370	24,833
2011	12,911	4,731	2,944	524	21,110
2012	22,377	6,722	4,027	659	33,785
2013	20,877	5,575	3,475	543	30,470
2014	26,600	8,103	5,774	836	41,313
2015	23,638	6,886	4,294	983	35,801
2016	29,545	9,982	5,985	1,313	46,825
Total	**283,518**	**127,139**	**66,032**	**17,619**	**494,308**

Exhibit 2

By model year and vehicle type, the number of vehicles failing initially, per test type[4] (Chart 2)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	24	9	14	2					49
1976	26	25	19	3					73
1977	29	22	41	14					106
1978	40	34	52	9					135
1979	34	26	31	11					102
1980	12	24	9	4					49
1981	21	24	12	7					64
1982	23	37	4	8					72
1983	17	33	9	9					68
1984	27	60	15	22					124
1985	31	68	13	23					135
1986	54	123	31	26					234
1987	37	109	10	20					176
1988	75	99	35	35					244
1989	51	89	44	62					246
1990	100	145	52	34					331
1991	103	103	41	22					269
1992	134	105	52	37					328
1993	118	126	51	26					321
1994	135	202	146	34					517
1995	155	121	139	49					464
1996	8	1		43	125	145	59		381
1997		1		42	165	191	67		466
1998	2			53	249	182	69		555
1999				49	232	138	105		524
2000				45	456	312	134		947
2001				26	447	260	125		858
2002				20	520	387	161		1,088
2003				24	453	331	152		960
2004				13	515	404	220		1,152
2005				18	506	276	143		943
2006				21	633	352	177		1,183
2007				8	457	188	141		794
2008				2	454	162	121		739
2009				1	252	78	52		383
2010				1	249	105	49		404
2011				1	237	88	83		409
2012				4	282	83	89		458
2013					247	71	79	16	413
2014					195	65	77	17	354
2015					202	51	58	22	333
2016					155	57	50	37	299
Total	**1,256**	**1,586**	**820**	**828**	**7,031**	**3,926**	**2,211**	**92**	**17,750**

[4] Some heavy-duty OBD inspections were performed due to inspector error as heavy-duty vehicles are not required to be OBD-II compliant until 2013. Some 2013 and newer model years are among those heavy-duty OBD inspections.

Exhibit 3

By model year and vehicle type, the percentage of vehicles failing initially, per test type[5] (Chart 3)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	75.00%	64.29%	50.00%	25.00%					59.76%
1976	38.24%	62.50%	31.67%	23.08%					40.33%
1977	43.94%	43.14%	47.67%	43.75%					45.11%
1978	40.00%	50.00%	42.62%	34.62%					42.72%
1979	34.00%	54.17%	48.44%	44.00%					43.04%
1980	15.58%	37.50%	40.91%	22.22%					27.07%
1981	25.30%	36.36%	66.67%	35.00%					34.22%
1982	24.73%	34.91%	30.77%	30.77%					30.25%
1983	15.04%	39.76%	37.50%	32.14%					27.42%
1984	15.79%	29.41%	29.41%	33.85%					25.25%
1985	16.40%	36.36%	34.21%	37.10%					28.36%
1986	18.24%	32.63%	50.82%	35.14%					28.96%
1987	15.10%	29.62%	23.26%	36.36%					24.75%
1988	19.84%	24.81%	23.49%	31.82%					23.55%
1989	14.29%	22.03%	32.59%	37.58%					23.19%
1990	14.01%	22.62%	24.30%	19.10%					18.95%
1991	14.95%	16.75%	30.37%	23.16%					17.54%
1992	15.21%	12.98%	19.77%	17.29%					15.14%
1993	14.73%	14.33%	22.47%	14.13%					15.35%
1994	10.98%	12.70%	24.66%	12.10%					14.00%
1995	11.89%	10.07%	25.60%	15.56%					13.80%
1996	12.90%	100.00%	0.00%	9.95%	6.84%	8.15%	11.07%		8.22%
1997	0.00%	50.00%		9.19%	8.20%	9.43%	10.97%		9.07%
1998	2.94%			12.47%	6.81%	5.44%	7.92%		6.64%
1999				8.17%	6.89%	5.28%	8.26%		6.68%
2000				4.71%	7.29%	6.75%	6.15%		6.76%
2001				3.70%	8.11%	7.77%	6.99%		7.56%
2002				2.28%	6.62%	6.83%	5.40%		6.26%
2003				2.84%	6.13%	7.20%	6.28%		6.29%
2004				1.18%	5.26%	5.09%	5.40%		5.03%
2005				2.63%	4.68%	4.98%	5.75%		4.83%
2006				1.79%	4.18%	4.55%	4.53%		4.23%
2007				1.23%	3.40%	3.13%	4.64%		3.43%
2008				0.28%	2.90%	2.26%	3.60%		2.75%
2009				0.33%	2.40%	2.89%	4.81%		2.62%
2010				0.28%	1.67%	1.90%	1.98%		1.73%
2011				0.20%	1.95%	1.97%	3.03%		2.06%
2012				0.63%	1.34%	1.30%	2.35%		1.44%
2013				0.00%	1.26%	1.33%	2.42%	3.47%	1.44%
2014					0.78%	0.84%	1.41%	2.31%	0.91%
2015				0.00%	0.90%	0.77%	1.42%	2.47%	0.98%
2016				0.00%	0.55%	0.60%	0.88%	3.10%	0.67%
Total	15.41%	19.30%	28.37%	6.16%	2.74%	3.55%	3.80%	2.80%	3.85%

[5] This rate is a comparison of initial failures versus the sum of initial passes and failures.

Exhibit 4

By model year and vehicle type, the number of vehicles failing the first retest per test type. (Chart 4)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	10	7	8	1					26
1976	13	13	8	1					35
1977	11	8	19	7					45
1978	18	13	27	4					62
1979	14	8	11	5					38
1980	4	11	4	3					22
1981	6	9	5	2					22
1982	5	17	1	2					25
1983	6	15	6	3					30
1984	8	30	4	7					49
1985	11	22	2	7					42
1986	19	49	9	15					92
1987	15	46	8	7					76
1988	24	31	15	15					85
1989	11	37	12	24					84
1990	32	44	16	11					103
1991	32	40	17	10					99
1992	40	39	22	14					115
1993	31	39	19	7					96
1994	44	70	57	9					180
1995	62	45	56	15					178
1996	2			20	28	33	17		100
1997	1			18	24	48	16		107
1998				23	40	34	10		107
1999				13	28	27	15		83
2000				18	63	62	23		166
2001				6	63	49	21		139
2002				6	92	56	27		181
2003				8	53	44	33		138
2004				4	67	50	27		148
2005				5	75	34	29		143
2006				7	90	56	27		180
2007				1	63	29	18		111
2008				1	53	17	10		81
2009					31	12	5		48
2010					28	12	3		43
2011					29	4	8		41
2012					36	6	7		49
2013					42	10	7	6	65
2014					30	4	14		48
2015					30	7	5	5	47
2016					18	1	5	5	29
Total	**419**	**593**	**326**	**299**	**983**	**595**	**327**	**16**	**3,558**

Exhibit 5

By model year and vehicle type, the percentage of vehicles failing the first retest per test type[6] (Chart 5)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	41.67%	77.78%	57.14%	50.00%					53.06%
1976	50.00%	52.00%	42.11%	33.33%					47.95%
1977	37.93%	36.36%	46.34%	50.00%					42.45%
1978	45.00%	38.24%	51.92%	44.44%					45.93%
1979	41.18%	30.77%	35.48%	45.45%					37.25%
1980	33.33%	45.83%	44.44%	75.00%					44.90%
1981	28.57%	37.50%	41.67%	28.57%					34.38%
1982	21.74%	45.95%	25.00%	25.00%					34.72%
1983	35.29%	45.45%	66.67%	33.33%					44.12%
1984	29.63%	50.00%	26.67%	31.82%					39.52%
1985	35.48%	32.35%	15.38%	30.43%					31.11%
1986	35.19%	39.84%	29.03%	57.69%					39.32%
1987	40.54%	42.20%	80.00%	35.00%					43.18%
1988	32.00%	31.31%	42.86%	42.86%					34.84%
1989	21.57%	41.57%	27.27%	38.71%					34.15%
1990	32.00%	30.34%	30.77%	32.35%					31.12%
1991	31.07%	38.83%	41.46%	45.45%					36.80%
1992	29.85%	37.14%	42.31%	37.84%					35.06%
1993	26.27%	30.95%	37.25%	26.92%					29.91%
1994	32.59%	34.65%	39.04%	26.47%					34.82%
1995	40.00%	37.19%	40.29%	30.61%					38.36%
1996	25.00%	0.00%		46.51%	22.40%	22.76%	28.81%		26.25%
1997		0.00%		42.86%	14.55%	25.13%	23.88%		22.96%
1998	0.00%			43.40%	16.06%	18.68%	14.49%		19.28%
1999				26.53%	12.07%	19.57%	14.29%		15.84%
2000				40.00%	13.82%	19.87%	17.16%		17.53%
2001				23.08%	14.09%	18.85%	16.80%		16.20%
2002				30.00%	17.69%	14.47%	16.77%		16.64%
2003				33.33%	11.70%	13.29%	21.71%		14.38%
2004				30.77%	13.01%	12.38%	12.27%		12.85%
2005				27.78%	14.82%	12.32%	20.28%		15.16%
2006				33.33%	14.22%	15.91%	15.25%		15.22%
2007				12.50%	13.79%	15.43%	12.77%		13.98%
2008				50.00%	11.67%	10.49%	8.26%		10.96%
2009				0.00%	12.30%	15.38%	9.62%		12.53%
2010				0.00%	11.24%	11.43%	6.12%		10.64%
2011				0.00%	12.24%	4.55%	9.64%		10.02%
2012				0.00%	12.77%	7.23%	7.87%		10.70%
2013					17.00%	14.08%	8.86%	37.50%	15.74%
2014					15.38%	6.15%	18.18%	0.00%	13.56%
2015					14.85%	13.73%	8.62%	22.73%	14.11%
2016					11.61%	1.75%	10.00%	13.51%	9.70%
Total	**33.36%**	**37.39%**	**39.76%**	**36.11%**	**13.98%**	**15.16%**	**14.79%**	**17.39%**	**20.05%**

[6] This rate is a comparison of first retest failures versus total initial failures.

Exhibit 6

By model year and vehicle type, the number of vehicles passing the first retest per test type. (Chart 6)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	4	1	3	1					9
1976	5	5	6	1					17
1977	4	7	9	5					25
1978	12	10	15	3					40
1979	7	9	8	3					27
1980	4	8	3	2					17
1981	11	10	2	1					24
1982	10	14	1	4					29
1983	6	11		3					20
1984	11	19	3	9					42
1985	8	24	3	8					43
1986	17	45	13	9					84
1987	12	30	3	11					56
1988	29	49	10	13					101
1989	27	33	22	17					99
1990	38	59	21	21					139
1991	41	43	15	7					106
1992	62	46	17	12					137
1993	47	43	21	12					123
1994	54	82	62	14					212
1995	52	50	52	27					181
1996	7			16	40	50	19		132
1997	4	1		17	61	55	22		160
1998	5			15	89	72	17		198
1999				24	78	44	35		181
2000				19	180	141	51	1	392
2001				17	158	83	31		289
2002				9	175	132	65		381
2003				13	173	121	51		358
2004				8	211	167	90		476
2005				10	173	100	55		338
2006				12	291	132	63		498
2007				3	165	76	45		289
2008				2	225	68	51		346
2009					105	33	21		159
2010					130	52	21		203
2011				3	116	34	32		185
2012				4	130	48	31		213
2013				1	107	32	44	7	191
2014					95	33	38	3	169
2015					93	26	27	10	156
2016					80	31	26	17	154
Total	**477**	**599**	**289**	**356**	**2,875**	**1,530**	**835**	**38**	**6,999**

Exhibit 7

By model year and vehicle type, the percentage of vehicles passing the first retest per test type[7] (Chart 7)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	16.67%	11.11%	21.43%	50.00%					18.37%
1976	19.23%	20.00%	31.58%	33.33%					23.29%
1977	13.79%	31.82%	21.95%	35.71%					23.58%
1978	30.00%	29.41%	28.85%	33.33%					29.63%
1979	20.59%	34.62%	25.81%	27.27%					26.47%
1980	33.33%	33.33%	33.33%	50.00%					34.69%
1981	52.38%	41.67%	16.67%	14.29%					37.50%
1982	43.48%	37.84%	25.00%	50.00%					40.28%
1983	35.29%	33.33%	0.00%	33.33%					29.41%
1984	40.74%	31.67%	20.00%	40.91%					33.87%
1985	25.81%	35.29%	23.08%	34.78%					31.85%
1986	31.48%	36.59%	41.94%	34.62%					35.90%
1987	32.43%	27.52%	30.00%	55.00%					31.82%
1988	38.67%	49.49%	28.57%	37.14%					41.39%
1989	52.94%	37.08%	50.00%	27.42%					40.24%
1990	38.00%	40.69%	40.38%	61.76%					41.99%
1991	39.81%	41.75%	36.59%	31.82%					39.41%
1992	46.27%	43.81%	32.69%	32.43%					41.77%
1993	39.83%	34.13%	41.18%	46.15%					38.32%
1994	40.00%	40.59%	42.47%	41.18%					41.01%
1995	33.55%	41.32%	37.41%	55.10%					39.01%
1996	87.50%	0.00%		37.21%	32.00%	34.48%	32.20%		34.65%
1997		100.00%		40.48%	36.97%	28.80%	32.84%		34.33%
1998	250.00%			28.30%	35.74%	39.56%	24.64%		35.68%
1999				48.98%	33.62%	31.88%	33.33%		34.54%
2000				42.22%	39.47%	45.19%	38.06%		41.39%
2001				65.38%	35.35%	31.92%	24.80%		33.68%
2002				45.00%	33.65%	34.11%	40.37%		35.02%
2003				54.17%	38.19%	36.56%	33.55%		37.29%
2004				61.54%	40.97%	41.34%	40.91%		41.32%
2005				55.56%	34.19%	36.23%	38.46%		35.84%
2006				57.14%	45.97%	37.50%	35.59%		42.10%
2007				37.50%	36.11%	40.43%	31.91%		36.40%
2008				100.00%	49.56%	41.98%	42.15%		46.82%
2009				0.00%	41.67%	42.31%	40.38%		41.51%
2010				0.00%	52.21%	49.52%	42.86%		50.25%
2011				300.00%	48.95%	38.64%	38.55%		45.23%
2012				100.00%	46.10%	57.83%	34.83%		46.51%
2013					43.32%	45.07%	55.70%	43.75%	46.25%
2014					48.72%	50.77%	49.35%	17.65%	47.74%
2015					46.04%	50.98%	46.55%	45.45%	46.85%
2016					51.61%	54.39%	52.00%	45.95%	51.51%
Total	**37.98%**	**37.77%**	**35.24%**	**43.00%**	**40.89%**	**38.97%**	**37.77%**	**41.30%**	**39.43%**

[7] This rate is a comparison of first retest passes versus initial failures.

Exhibit 8

By model year and vehicle type, the number of initially failed vehicles passing the second or subsequent retest per test type[8] (Chart 8)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	10	5	9	2					26
1976	12	13	14	1					40
1977	10	12	22	10					54
1978	22	19	30	5					76
1979	16	14	16	7					53
1980	7	12	7	3					29
1981	16	16	6	3					41
1982	11	25	2	6					44
1983	10	19	2	4					35
1984	15	38	7	12					72
1985	16	39	5	15					75
1986	29	77	16	21					143
1987	21	57	7	15					100
1988	44	69	22	22					157
1989	32	56	33	31					152
1990	53	82	30	25					190
1991	58	70	25	13					166
1992	87	73	29	21					210
1993	67	60	36	18					181
1994	83	134	104	20					341
1995	99	82	82	35					298
1996	8			30	57	83	31		209
1997	6	2		26	84	84	34		236
1998	11			33	118	106	28		296
1999				34	106	71	53		264
2000				25	243	190	75	1	534
2001				20	230	152	60		462
2002				14	274	214	89		591
2003				19	243	184	89		535
2004				11	303	254	130		698
2005				14	263	149	84		510
2006				15	410	206	104		735
2007				7	253	113	81		454
2008				3	303	100	81		487
2009					157	40	32		229
2010					171	72	32		275
2011				4	154	50	52		260
2012				4	189	62	59		314
2013				1	159	44	59	9	272
2014					133	48	56	6	243
2015					136	37	36	16	225
2016					108	42	35	21	206
Total	**743**	**974**	**504**	**549**	**4,094**	**2,301**	**1,300**	**53**	**10,518**

[8] Only vehicles failing during calendar year 2020 and then ultimately passing prior to January 2021 are used in this analysis.

Exhibit 9

By model year and vehicle type, the percentage of initially failed vehicles passing the second or subsequent retest per test type[9] (Chart 9)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	41.67%	55.56%	64.29%	100.00%					53.06%
1976	46.15%	52.00%	73.68%	33.33%					54.79%
1977	34.48%	54.55%	53.66%	71.43%					50.94%
1978	55.00%	55.88%	57.69%	55.56%					56.30%
1979	47.06%	53.85%	51.61%	63.64%					51.96%
1980	58.33%	50.00%	77.78%	75.00%					59.18%
1981	76.19%	66.67%	50.00%	42.86%					64.06%
1982	47.83%	67.57%	50.00%	75.00%					61.11%
1983	58.82%	57.58%	22.22%	44.44%					51.47%
1984	55.56%	63.33%	46.67%	54.55%					58.06%
1985	51.61%	57.35%	38.46%	65.22%					55.56%
1986	53.70%	62.60%	51.61%	80.77%					61.11%
1987	56.76%	52.29%	70.00%	75.00%					56.82%
1988	58.67%	69.70%	62.86%	62.86%					64.34%
1989	62.75%	62.92%	75.00%	50.00%					61.79%
1990	53.00%	56.55%	57.69%	73.53%					57.40%
1991	56.31%	67.96%	60.98%	59.09%					61.71%
1992	64.93%	69.52%	55.77%	56.76%					64.02%
1993	56.78%	47.62%	70.59%	69.23%					56.39%
1994	61.48%	66.34%	71.23%	58.82%					65.96%
1995	63.87%	67.77%	58.99%	71.43%					64.22%
1996	100.00%	0.00%		69.77%	45.60%	57.24%	52.54%		54.86%
1997		200.00%		61.90%	50.91%	43.98%	50.75%		50.64%
1998	550.00%			62.26%	47.39%	58.24%	40.58%		53.33%
1999				69.39%	45.69%	51.45%	50.48%		50.38%
2000				55.56%	53.29%	60.90%	55.97%		56.39%
2001				76.92%	51.45%	58.46%	48.00%		53.85%
2002				70.00%	52.69%	55.30%	55.28%		54.32%
2003				79.17%	53.64%	55.59%	58.55%		55.73%
2004				84.62%	58.83%	62.87%	59.09%		60.59%
2005				77.78%	51.98%	53.99%	58.74%		54.08%
2006				71.43%	64.77%	58.52%	58.76%		62.13%
2007				87.50%	55.36%	60.11%	57.45%		57.18%
2008				150.00%	66.74%	61.73%	66.94%		65.90%
2009				0.00%	62.30%	51.28%	61.54%		59.79%
2010				0.00%	68.67%	68.57%	65.31%		68.07%
2011				400.00%	64.98%	56.82%	62.65%		63.57%
2012				100.00%	67.02%	74.70%	66.29%		68.56%
2013					64.37%	61.97%	74.68%	56.25%	65.86%
2014					68.21%	73.85%	72.73%	35.29%	68.64%
2015					67.33%	72.55%	62.07%	72.73%	67.57%
2016					69.68%	73.68%	70.00%	56.76%	68.90%
Total	**59.16%**	**61.41%**	**61.46%**	**66.30%**	**58.23%**	**58.61%**	**58.80%**	**57.61%**	**59.26%**

[9] This rate is a comparison of second or subsequent retest passes versus initial failures. There are cases where the initial and subsequent retests were not the same type.

Exhibit 10

By model year and vehicle type, the number of initially failed vehicles with no known final outcome (regardless of reason)[10] (Chart 10)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	14	4	5	0					23
1976	14	12	5	2					33
1977	19	10	19	4					52
1978	18	15	22	4					59
1979	18	12	15	4					49
1980	5	12	2	1					20
1981	5	8	6	4					23
1982	12	12	2	2					28
1983	7	14	7	5					33
1984	12	22	8	10					52
1985	15	29	8	8					60
1986	25	46	15	5					91
1987	16	52	3	5					76
1988	31	30	13	13					87
1989	19	33	11	31					94
1990	47	63	22	9					141
1991	45	33	16	9					103
1992	47	32	23	16					118
1993	51	66	15	8					140
1994	52	68	42	14					176
1995	56	39	57	14					166
1996	0	1		13	68	62	28		172
1997		-1		16	81	107	33		230
1998	-9			20	131	76	41		259
1999				15	126	67	52		260
2000				20	213	122	59		413
2001				6	217	108	65		396
2002				6	246	173	72		497
2003				5	210	147	63		425
2004				2	212	150	90		454
2005				4	243	127	59		433
2006				6	223	146	73		448
2007				1	204	75	60		340
2008				-1	151	62	40		252
2009				1	95	38	20		154
2010				1	78	33	17		129
2011				-3	83	38	31		149
2012				0	93	21	30		144
2013					88	27	20	7	141
2014					62	17	21	11	111
2015					66	14	22	6	108
2016					47	15	15	16	93
Total	**513**	**612**	**316**	**279**	**2,937**	**1,625**	**911**	**39**	**7,232**

[10] Only vehicles failing during calendar year 2020 and without an ultimate pass prior to January 2021 are used in this analysis. Assumes 'known final outcome' means an ultimate pass result. There are cases where the initial and subsequent retests were not the same type.

Exhibit 11

By model year and vehicle type, the percentage of initially failed vehicles with no known final outcome (regardless of reason)[7, 11] (Chart 11)

	Idle				OBD				Total
Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	58.33%	44.44%	35.71%	0.00%					46.94%
1976	53.85%	48.00%	26.32%	66.67%					45.21%
1977	65.52%	45.45%	46.34%	28.57%					49.06%
1978	45.00%	44.12%	42.31%	44.44%					43.70%
1979	52.94%	46.15%	48.39%	36.36%					48.04%
1980	41.67%	50.00%	22.22%	25.00%					40.82%
1981	23.81%	33.33%	50.00%	57.14%					35.94%
1982	52.17%	32.43%	50.00%	25.00%					38.89%
1983	41.18%	42.42%	77.78%	55.56%					48.53%
1984	44.44%	36.67%	53.33%	45.45%					41.94%
1985	48.39%	42.65%	61.54%	34.78%					44.44%
1986	46.30%	37.40%	48.39%	19.23%					38.89%
1987	43.24%	47.71%	30.00%	25.00%					43.18%
1988	41.33%	30.30%	37.14%	37.14%					35.66%
1989	37.25%	37.08%	25.00%	50.00%					38.21%
1990	47.00%	43.45%	42.31%	26.47%					42.60%
1991	43.69%	32.04%	39.02%	40.91%					38.29%
1992	35.07%	30.48%	44.23%	43.24%					35.98%
1993	43.22%	52.38%	29.41%	30.77%					43.61%
1994	38.52%	33.66%	28.77%	41.18%					34.04%
1995	36.13%	32.23%	41.01%	28.57%					35.78%
1996	0.00%	100.00%		30.23%	54.40%	42.76%	47.46%		45.14%
1997		-100.00%		38.10%	49.09%	56.02%	49.25%		49.36%
1998	-450.00%			37.74%	52.61%	41.76%	59.42%		46.67%
1999				30.61%	54.31%	48.55%	49.52%		49.62%
2000				44.44%	46.71%	39.10%	44.03%		43.61%
2001				23.08%	48.55%	41.54%	52.00%		46.15%
2002				30.00%	47.31%	44.70%	44.72%		45.68%
2003				20.83%	46.36%	44.41%	41.45%		44.27%
2004				15.38%	41.17%	37.13%	40.91%		39.41%
2005				22.22%	48.02%	46.01%	41.26%		45.92%
2006				28.57%	35.23%	41.48%	41.24%		37.87%
2007				12.50%	44.64%	39.89%	42.55%		42.82%
2008				-50.00%	33.26%	38.27%	33.06%		34.10%
2009				100.00%	37.70%	48.72%	38.46%		40.21%
2010				100.00%	31.33%	31.43%	34.69%		31.93%
2011				-300.00%	35.02%	43.18%	37.35%		36.43%
2012				0.00%	32.98%	25.30%	33.71%		31.44%
2013					35.63%	38.03%	25.32%	43.75%	34.14%
2014					31.79%	26.15%	27.27%	64.71%	31.36%
2015					32.67%	27.45%	37.93%	27.27%	32.43%
2016					30.32%	26.32%	30.00%	43.24%	31.10%
Total	**40.84%**	**38.59%**	**38.54%**	**33.70%**	**41.77%**	**41.39%**	**41.20%**	**42.39%**	**40.74%**

[11] This rate is a comparison of ultimate non-passes versus initial failures. This includes vehicles that ultimately are OBD Not-Ready. There are cases where the initial and subsequent retests were not the same type.

Exhibit 12

By model year and vehicle type, the number passing the on-board diagnostic check[12] (Chart 12)

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	1,702	1,634	474		3,810
1997	1,847	1,835	544		4,226
1998	3,406	3,162	802		7,370
1999	3,133	2,476	1,166		6,775
2000	5,795	4,309	2,046		12,150
2001	5,068	3,086	1,664		9,818
2002	7,340	5,279	2,819		15,438
2003	6,939	4,266	2,267		13,472
2004	9,272	7,536	3,851		20,659
2005	10,310	5,269	2,345		17,924
2006	14,502	7,377	3,731		25,610
2007	12,993	5,823	2,899		21,715
2008	15,178	6,996	3,236		25,410
2009	10,263	2,622	1,030		13,915
2010	14,704	5,434	2,425		22,563
2011	11,889	4,381	2,660		18,930
2012	20,760	6,295	3,701		30,756
2013	19,422	5,257	3,192	445	28,316
2014	24,890	7,672	5,390	718	38,670
2015	22,268	6,551	4,025	869	33,713
2016	27,864	9,513	5,639	1,157	44,173
Total	**249,545**	**106,773**	**55,906**	**3,189**	**415,413**

Exhibit 13

By model year and vehicle type, the percentage passing the on-board diagnostic check[13] (Chart 13)

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	93.16%	91.85%	88.93%		92.05%
1997	91.80%	90.57%	89.03%		90.90%
1998	93.19%	94.56%	92.08%		93.65%
1999	93.11%	94.72%	91.74%		93.45%
2000	92.71%	93.25%	93.85%		93.09%
2001	91.89%	92.23%	93.01%		92.19%
2002	93.38%	93.17%	94.60%		93.53%
2003	93.87%	92.80%	93.72%		93.50%
2004	94.74%	94.91%	94.60%		94.77%
2005	95.32%	95.02%	94.25%		95.09%
2006	95.82%	95.45%	95.47%		95.66%
2007	96.60%	96.87%	95.36%		96.51%
2008	97.10%	97.74%	96.40%		97.18%
2009	97.60%	97.11%	95.19%		97.33%
2010	98.33%	98.10%	98.02%		98.25%
2011	98.05%	98.03%	96.97%		97.89%
2012	98.66%	98.70%	97.65%		98.55%
2013	98.74%	98.67%	97.58%	96.53%	98.56%
2014	99.22%	99.16%	98.59%	97.69%	99.09%
2015	99.10%	99.23%	98.58%	97.53%	99.02%
2016	99.45%	99.40%	99.12%	96.90%	99.33%
Total	**97.26%**	**96.45%**	**96.20%**	**97.20%**	**96.91%**

[12] Some heavy-duty OBD inspections were performed due to inspector error as heavy-duty vehicles are not required to be OBD-II compliant until 2013. Some early 2013 model releases may also be among those heavy-duty inspections.

[13] This rate is a comparison of initial OBD pass versus the sum of initial OBD pass and fail.

Exhibit 14

By model year and vehicle type, the number failing the on-board diagnostic check. (Chart 14)

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	125	145	59		329
1997	165	191	67		423
1998	249	182	69		500
1999	232	138	105		475
2000	456	312	134		902
2001	447	260	125		832
2002	520	387	161		1,068
2003	453	331	152		936
2004	515	404	220		1,139
2005	506	276	143		925
2006	633	352	177		1,162
2007	457	188	141		786
2008	454	162	121		737
2009	252	78	52		382
2010	249	105	49		403
2011	237	88	83		408
2012	282	83	89		454
2013	247	71	79	16	413
2014	195	65	77	17	354
2015	202	51	58	22	333
2016	155	57	50	37	299
Total	**7,031**	**3,926**	**2,211**	**92**	**13,260**

Exhibit 15

By model year and vehicle type, the percentage failing the on-board diagnostic check[14] (Chart 15)

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	6.84%	8.15%	11.07%		7.95%
1997	8.20%	9.43%	10.97%		9.10%
1998	6.81%	5.44%	7.92%		6.35%
1999	6.89%	5.28%	8.26%		6.55%
2000	7.29%	6.75%	6.15%		6.91%
2001	8.11%	7.77%	6.99%		7.81%
2002	6.62%	6.83%	5.40%		6.47%
2003	6.13%	7.20%	6.28%		6.50%
2004	5.26%	5.09%	5.40%		5.23%
2005	4.68%	4.98%	5.75%		4.91%
2006	4.18%	4.55%	4.53%		4.34%
2007	3.40%	3.13%	4.64%		3.49%
2008	2.90%	2.26%	3.60%		2.82%
2009	2.40%	2.89%	4.81%		2.67%
2010	1.67%	1.90%	1.98%		1.75%
2011	1.95%	1.97%	3.03%		2.11%
2012	1.34%	1.30%	2.35%		1.45%
2013	1.26%	1.33%	2.42%	3.47%	1.44%
2014	0.78%	0.84%	1.41%	2.31%	0.91%
2015	0.90%	0.77%	1.42%	2.47%	0.98%
2016	0.55%	0.60%	0.88%	3.10%	0.67%
Total	**2.74%**	**3.55%**	**3.80%**	**2.80%**	**3.09%**

[14] This rate is a comparison of initial fail versus the sum of initial pass and fail. IM measured OBD failure rates are lower than actual failure rates due to the motorist feedback provided by OBD. A dashboard MIL illumination is an indicator of failure and many motorists will seek a repair to extinguish the MIL prior to visiting DEQ for their initial test. This is a major improvement over previous test methodologies as it provides the motorist a greater degree of awareness and control over their vehicle's emissions.

Exhibit 16

By model year and vehicle type, the number where MIL is commanded on and no codes are stored

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	2				2
1997					
1998					
1999		1			1
2000	1	3			4
2001	2				2
2002	3	1			4
2003	3	3	1		7
2004	1	1	1		3
2005		3			3
2006	6	3	1		10
2007	1				1
2008	2				2
2009	1	1			2
2010	1				1
2011	4				4
2012	2				2
2013					
2014	1				1
2015	1				1
2016					
Total	**31**	**16**	**3**		**50**

Exhibit 17

By model year and vehicle type, the percentage where MIL is commanded on and no codes are stored[15]

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	0.10%	0.00%	0.00%	0.00%	0.04%
1997	0.00%	0.00%	0.00%	0.00%	0.00%
1998	0.00%	0.00%	0.00%	0.00%	0.00%
1999	0.00%	0.04%	0.00%	0.00%	0.01%
2000	0.01%	0.06%	0.00%	0.00%	0.03%
2001	0.03%	0.00%	0.00%	0.00%	0.02%
2002	0.03%	0.02%	0.00%	0.00%	0.02%
2003	0.04%	0.06%	0.04%	0.00%	0.04%
2004	0.01%	0.01%	0.02%	0.00%	0.01%
2005	0.00%	0.05%	0.00%	0.00%	0.01%
2006	0.04%	0.04%	0.02%	0.00%	0.03%
2007	0.01%	0.00%	0.00%	0.00%	0.00%
2008	0.01%	0.00%	0.00%	0.00%	0.01%
2009	0.01%	0.03%	0.00%	0.00%	0.01%
2010	0.01%	0.00%	0.00%	0.00%	0.00%
2011	0.03%	0.00%	0.00%	0.00%	0.02%
2012	0.01%	0.00%	0.00%	0.00%	0.01%
2013	0.00%	0.00%	0.00%	0.00%	0.00%
2014	0.00%	0.00%	0.00%	0.00%	0.00%
2015	0.00%	0.00%	0.00%	0.00%	0.00%
2016	0.00%	0.00%	0.00%	0.00%	0.00%
Total	**0.01%**	**0.01%**	**0.00%**	**0.00%**	**0.01%**

[15] This rate is a comparison of initial MIL with no DTC versus the sum of initial pass and fail. Oregon considers a MIL command without a stored DTC an OBD failure.

Exhibit 18

By model year and vehicle type, the number where MIL is not commanded on and codes are stored

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	113	152	47		312
1997	157	211	39		407
1998	327	322	76		725
1999	286	190	92	1	569
2000	591	447	130		1,168
2001	676	313	126		1,115
2002	860	621	230		1,711
2003	710	528	181	1	1,420
2004	933	896	287		2,116
2005	920	510	227		1,657
2006	1,223	657	348		2,228
2007	922	491	257		1,670
2008	969	374	246		1,589
2009	474	153	86	1	714
2010	568	229	107		904
2011	442	167	196	1	806
2012	649	175	184	1	1,009
2013	603	140	171	16	930
2014	616	168	182	36	1,002
2015	449	122	109	28	708
2016	451	136	91	42	720
Total	**12,939**	**7,002**	**3,412**	**127**	**23,480**

Exhibit 19

By model year and vehicle type, the percentage where MIL is not commanded on and codes are stored[16]

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	5.62%	7.87%	8.12%	0.00%	6.90%
1997	7.06%	9.55%	5.90%	0.00%	7.99%
1998	8.30%	8.96%	8.03%	0.00%	8.55%
1999	7.82%	6.82%	6.76%	50.00%	7.29%
2000	8.79%	9.06%	5.57%	0.00%	8.35%
2001	10.99%	8.20%	6.23%	0.00%	9.29%
2002	9.79%	9.88%	7.03%	0.00%	9.32%
2003	8.70%	10.51%	6.73%	16.67%	8.94%
2004	8.73%	10.49%	6.48%	0.00%	8.94%
2005	7.79%	8.44%	8.26%	0.00%	8.04%
2006	7.49%	7.91%	8.22%	0.00%	7.72%
2007	6.39%	7.65%	7.77%	0.00%	6.91%
2008	5.77%	4.92%	6.84%	0.00%	5.67%
2009	4.25%	5.33%	7.20%	50.00%	4.69%
2010	3.57%	3.91%	4.00%	0.00%	3.70%
2011	3.42%	3.54%	6.67%	33.33%	3.92%
2012	2.90%	2.61%	4.57%	20.00%	3.05%
2013	2.89%	2.52%	4.93%	3.07%	3.06%
2014	2.61%	2.44%	4.24%	3.72%	2.80%
2015	1.52%	1.22%	1.82%	2.18%	1.51%
2016	0.16%	0.12%	0.15%	1.15%	0.16%
Total	**4.71%**	**5.92%**	**5.46%**	**3.48%**	**5.12%**

[16] This rate is a comparison of initial MIL not commanded with DTC versus the sum of initial pass and fail. These represent historical or pending codes and therefore Oregon does not consider a stored DTC without a MIL command an OBD failure.

Exhibit 20

By model year and vehicle type, the number where MIL is commanded on and codes are stored

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	118	139	57		314
1997	158	178	60		396
1998	239	170	66		475
1999	213	115	100		428
2000	428	261	123		812
2001	420	253	120	1	794
2002	502	378	147		1,027
2003	434	319	134		887
2004	502	388	199		1,089
2005	482	257	133		872
2006	595	339	161		1,095
2007	443	181	134		758
2008	429	150	114		693
2009	237	73	51		361
2010	232	101	47		380
2011	221	84	79	1	385
2012	268	78	81		427
2013	225	63	78	10	376
2014	172	57	73	13	315
2015	162	43	53	20	278
2016	132	50	43	27	252
Total	**6,612**	**3,677**	**2,053**	**72**	**12,414**

Exhibit 21

By model year and vehicle type, the percentage where MIL is commanded on and codes are stored[17]

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	5.86%	7.20%	9.84%	0.00%	6.94%
1997	7.11%	8.06%	9.08%	0.00%	7.77%
1998	6.07%	4.73%	6.98%	0.00%	5.60%
1999	5.82%	4.13%	7.35%	0.00%	5.48%
2000	6.37%	5.29%	5.27%	0.00%	5.80%
2001	6.83%	6.62%	5.94%	20.00%	6.62%
2002	5.71%	6.01%	4.49%	0.00%	5.60%
2003	5.32%	6.35%	4.99%	0.00%	5.59%
2004	4.70%	4.54%	4.49%	0.00%	4.60%
2005	4.08%	4.25%	4.84%	0.00%	4.23%
2006	3.64%	4.08%	3.80%	0.00%	3.79%
2007	3.07%	2.82%	4.05%	0.00%	3.14%
2008	2.56%	1.97%	3.17%	0.00%	2.47%
2009	2.13%	2.54%	4.27%	0.00%	2.37%
2010	1.46%	1.72%	1.76%	0.00%	1.55%
2011	1.71%	1.78%	2.69%	33.33%	1.87%
2012	1.20%	1.16%	2.01%	0.00%	1.29%
2013	1.08%	1.13%	2.25%	1.92%	1.24%
2014	0.65%	0.70%	1.27%	1.58%	0.76%
2015	0.69%	0.63%	1.24%	2.06%	0.78%
2016	0.45%	0.50%	0.72%	2.11%	0.54%
Total	**2.41%**	**3.11%**	**3.28%**	**1.97%**	**2.70%**

[17] This rate is a comparison of initial MIL commanded on with DTC versus the sum of initial pass and fail. This represents the majority of OBD failures. However, other failures include communication, connector, and handheld OBD scanner failures.

Exhibit 22

By model year and vehicle type, the number where MIL is not commanded on and codes are not stored

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	1,779	1,640	475	1	3,895
1997	1,908	1,820	562	1	4,291
1998	3,374	3,102	804	2	7,282
1999	3,159	2,479	1,168	1	6,807
2000	5,700	4,223	2,081	2	12,006
2001	5,055	3,253	1,775	4	10,087
2002	7,423	5,286	2,895	3	15,607
2003	7,013	4,176	2,372	5	13,566
2004	9,255	7,257	3,941	4	20,457
2005	10,404	5,276	2,389	1	18,070
2006	14,507	7,305	3,726	7	25,545
2007	13,057	5,748	2,917	2	21,724
2008	15,390	7,085	3,237	6	25,718
2009	10,440	2,646	1,058	1	14,145
2010	15,103	5,530	2,524	1	23,158
2011	12,239	4,470	2,665	1	19,375
2012	21,444	6,462	3,758	4	31,668
2013	20,037	5,361	3,222	496	29,116
2014	25,801	7,871	5,514	772	39,958
2015	23,009	6,710	4,128	921	34,768
2016	28,940	9,787	5,844	1,213	45,784
Total	**255,037**	**107,487**	**57,055**	**3,448**	**423,027**

Exhibit 23

By model year and vehicle type, the percentage where MIL is not commanded on and codes are not stored[18]

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	88.42%	84.93%	82.04%	100.00%	86.12%
1997	85.83%	82.39%	85.02%	100.00%	84.24%
1998	85.63%	86.31%	84.99%	100.00%	85.85%
1999	86.36%	89.01%	85.88%	50.00%	87.21%
2000	84.82%	85.59%	89.16%	100.00%	85.82%
2001	82.16%	85.18%	87.83%	80.00%	84.07%
2002	84.47%	84.09%	88.48%	100.00%	85.06%
2003	85.94%	83.09%	88.24%	83.33%	85.43%
2004	86.57%	84.96%	89.00%	100.00%	86.44%
2005	88.12%	87.26%	86.90%	100.00%	87.71%
2006	88.83%	87.97%	87.96%	100.00%	88.46%
2007	90.53%	89.53%	88.18%	100.00%	89.94%
2008	91.66%	93.11%	89.99%	100.00%	91.84%
2009	93.62%	92.10%	88.54%	50.00%	92.92%
2010	94.96%	94.37%	94.25%	100.00%	94.74%
2011	94.83%	94.68%	90.65%	33.33%	94.19%
2012	95.89%	96.23%	93.41%	80.00%	95.66%
2013	96.03%	96.35%	92.83%	95.02%	95.71%
2014	97.03%	97.22%	95.58%	94.03%	96.81%
2015	97.41%	97.60%	96.22%	95.05%	97.24%
2016	98.03%	98.13%	97.76%	94.62%	97.92%
Total	**92.87%**	**90.95%**	**91.25%**	**94.54%**	**92.17%**

[18] This rate is a comparison of initial no MIL command and no DTC versus the sum of initial pass and fail. This represents the majority of those vehicles passing OBD. However, some vehicles have one but not both while others were handheld tested. Handheld OBD scanner tests only have the final outcome field (OBD result) stored in the database.

Exhibit 24

By model year and vehicle type, the number where readiness status indicates that the evaluation is not complete for any module supported by on-board diagnostic systems. (Chart 16)

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	690	665	175		1,530
1997	788	786	237		1,811
1998	923	1,058	326	2	2,309
1999	862	798	501		2,161
2000	1,490	1,138	610	2	3,240
2001	1,239	913	576	1	2,729
2002	1,616	1,106	689		3,411
2003	1,439	908	766	1	3,114
2004	1,625	1,145	907		3,677
2005	1,699	1,020	544		3,263
2006	2,094	1,159	716	2	3,971
2007	1,729	657	635		3,021
2008	1,720	560	451	2	2,733
2009	1,003	220	202		1,425
2010	1,272	402	285		1,959
2011	1,235	293	329	1	1,858
2012	1,596	330	297		2,223
2013	1,675	283	254	69	2,281
2014	1,701	340	311	94	2,446
2015	1,444	252	221	108	2,025
2016	1,691	223	200	83	2,197
Total	**29,531**	**14,256**	**9,232**	**365**	**53,384**

Exhibit 25

By model year and vehicle type, the percentage where readiness status indicates that the evaluation is not complete for any module supported by on-board diagnostic systems[19] (Chart 17)

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	34.28%	34.38%	30.28%	0.00%	33.80%
1997	35.42%	35.47%	35.80%	0.00%	35.48%
1998	23.41%	29.38%	34.35%	100.00%	27.18%
1999	23.51%	28.50%	36.81%	0.00%	27.60%
2000	22.14%	22.93%	26.07%	100.00%	23.08%
2001	20.11%	23.89%	28.46%	20.00%	22.72%
2002	18.39%	17.59%	21.00%	0.00%	18.58%
2003	17.64%	18.06%	28.47%	16.67%	19.61%
2004	15.21%	13.40%	20.45%	0.00%	15.54%
2005	14.42%	16.87%	19.77%		15.86%
2006	12.84%	13.96%	16.88%	28.57%	13.76%
2007	12.00%	10.23%	19.20%	0.00%	12.51%
2008	10.25%	7.36%	12.53%	33.33%	9.76%
2009	9.01%	7.65%	16.90%	0.00%	9.37%
2010	8.00%	6.86%	10.65%	0.00%	8.02%
2011	9.58%	6.20%	11.18%	33.33%	9.04%
2012	7.14%	4.92%	7.38%	0.00%	6.72%
2013	8.04%	5.09%	7.32%	13.35%	7.50%
2014	6.40%	4.20%	5.39%	11.46%	5.93%
2015	6.12%	3.67%	5.15%	11.16%	5.67%
2016	5.74%	2.24%	3.34%	6.47%	4.70%
Total	**10.76%**	**12.06%**	**14.76%**	**10.03%**	**11.63%**

[19] This rate is a comparison of an initial test with one or more monitors not-ready (fully ready) versus the sum of initial pass, fail, and not-ready.

Exhibit 26

The initial test volume by model year and test station[20]

Year	Clackamas	Gresham	Medford	Northeast	Scappoose	Sherwood	Sunset	Mobile	DEQ Too - Portland	DEQ Too - Medford	Total
1975	22	15		23	4	13	11				88
1976	47	36		39	5	32	33				192
1977	77	45		55	3	30	35				245
1978	105	73		57	6	38	55				334
1979	72	38		46	4	27	57				244
1980	52	25		47	2	26	37				189
1981	59	22		54	2	22	36				195
1982	63	42		61	6	34	46				252
1983	65	38		63	8	33	54				261
1984	133	88		109	11	74	113				528
1985	144	88		105	7	79	85				508
1986	239	144	1	160	17	130	169				860
1987	186	118		174	12	115	144				749
1988	289	176	1	235	18	159	213				1,091
1989	302	201	2	245	24	123	220				1,117
1990	481	321	1	339	24	254	398				1,818
1991	394	299	4	327	19	238	321				1,602
1992	616	449	2	409	44	322	438				2,280
1993	597	410	1	391	35	299	447				2,180
1994	1,025	773	2	634	58	554	816		1		3,863
1995	867	723	1	635	54	492	749	2			3,523
1996	1,271	1,007	8	826	62	739	1,179	4			5,096
1997	1,391	1,071	12	937	64	814	1,353	4			5,646
1998	2,182	1,730	40	1,530	108	1,351	2,102	11			9,054
1999	2,071	1,614	83	1,381	99	1,289	1,980	11			8,528
2000	3,167	2,540	1,838	2,114	147	2,125	3,138	15	2	1	15,087
2001	2,726	2,076	1,764	1,861	89	1,648	2,574	19	18	7	12,782
2002	4,073	3,115	2,372	2,725	185	2,783	4,000	23	49	9	19,334
2003	3,436	2,799	2,138	2,433	132	2,297	3,471	36	79	11	16,832
2004	5,241	3,824	2,948	3,346	224	3,635	5,436	39	201	32	24,926
2005	3,908	3,117	2,318	2,807	144	2,606	4,097	43	2,142	187	21,369
2006	5,521	4,255	2,947	3,729	229	3,870	5,824	54	3,420	313	30,162
2007	4,441	3,629	2,392	3,229	177	3,106	4,617	79	2,921	294	24,885
2008	5,123	3,756	2,506	3,536	194	3,954	5,596	82	3,711	333	28,791
2009	2,532	2,107	1,422	2,096	101	1,948	2,823	61	2,255	215	15,560
2010	4,168	2,974	2,022	3,188	154	3,412	4,840	99	3,634	342	24,833
2011	3,369	2,487	1,889	2,575	117	2,770	3,958	111	3,460	374	21,110
2012	5,540	3,718	2,628	4,078	215	4,665	6,656	190	5,520	575	33,785
2013	4,670	3,288	2,393	3,631	180	4,097	5,567	292	5,629	723	30,470
2014	6,505	4,396	3,175	4,453	271	5,688	7,795	440	7,666	924	41,313
2015	5,203	3,650	2,562	3,953	231	4,705	6,396	516	7,594	991	35,801
2016	6,755	4,701	3,297	4,637	269	6,303	8,397	775	10,540	1,151	46,825
Total	**89,128**	**65,978**	**40,769**	**63,273**	**3,755**	**66,899**	**96,276**	**2,906**	**58,842**	**6,482**	**494,308**

[20] Oregon's Medford station only tests the first 20 model years. Oregon's Mobile unit only performs the OBD test which is applicable to 1996 and newer vehicles. DEQ Too requires OBD eVIN support which was required on all 2005 and newer model years.

Exhibit 27

The initial test failure rate by model year and test station[21]

Year	Clackamas	Gresham	Medford	Northeast	Scappoose	Sherwood	Sunset	Mobile - 1	DEQ Too - Portland	DEQ Too - Medford	Total
1975	70.00%	50.00%		60.00%	100.00%	30.77%	72.73%				59.76%
1976	51.11%	48.48%		25.00%	40.00%	46.67%	28.13%				40.33%
1977	43.06%	45.24%		37.04%	33.33%	53.33%	55.88%				45.11%
1978	43.56%	41.18%		46.15%	33.33%	47.37%	37.25%				42.72%
1979	45.71%	52.63%		32.61%	50.00%	37.04%	44.23%				43.04%
1980	29.41%	36.36%		18.18%	0.00%	23.08%	33.33%				27.07%
1981	35.71%	19.05%		35.85%	0.00%	38.10%	38.24%				34.22%
1982	33.90%	27.50%		32.20%	20.00%	30.30%	26.19%				30.25%
1983	32.79%	34.29%		21.31%	37.50%	16.67%	28.30%				27.42%
1984	22.58%	26.25%		27.45%	40.00%	24.66%	24.51%				25.25%
1985	29.50%	31.65%		20.20%	28.57%	27.40%	34.18%				28.36%
1986	31.56%	31.58%		26.53%	29.41%	22.58%	30.25%				28.96%
1987	24.86%	28.18%		20.25%	20.00%	19.09%	32.12%				24.75%
1988	23.16%	20.36%	0.00%	23.42%	47.06%	16.23%	30.54%				23.55%
1989	26.06%	18.46%	0.00%	19.66%	20.00%	19.83%	30.24%				23.19%
1990	17.79%	20.97%	0.00%	15.85%	26.09%	15.42%	22.98%				18.90%
1991	17.20%	16.37%	0.00%	14.65%	11.11%	19.30%	21.15%				17.54%
1992	14.80%	14.05%	100.00%	14.65%	9.76%	12.50%	19.42%				15.14%
1993	13.84%	16.71%	0.00%	13.26%	23.53%	14.69%	17.84%				15.35%
1994	11.73%	14.54%	0.00%	14.61%	12.50%	14.61%	15.54%				14.00%
1995	12.04%	15.15%	0.00%	11.72%	9.62%	14.99%	15.79%				13.80%
1996	8.38%	10.07%	0.00%	7.47%	9.43%	8.43%	6.88%	0.00%			8.22%
1997	9.76%	10.54%	22.22%	8.13%	11.54%	8.82%	7.82%	0.00%			9.07%
1998	6.68%	8.27%	4.00%	6.19%	4.08%	5.49%	6.55%	0.00%			6.64%
1999	5.63%	8.73%	14.81%	6.51%	9.09%	6.60%	5.98%	0.00%			6.68%
2000	5.45%	8.10%	7.59%	7.81%	6.62%	5.81%	6.54%	0.00%	0.00%	0.00%	6.76%
2001	7.49%	9.36%	7.33%	8.13%	8.86%	5.52%	7.25%	0.00%	18.75%	0.00%	7.56%
2002	5.32%	7.48%	6.66%	7.40%	4.27%	5.55%	5.89%	0.00%	6.98%	11.11%	6.26%
2003	5.84%	7.53%	5.84%	7.28%	4.10%	6.14%	5.60%	0.00%	5.00%	22.22%	6.29%
2004	4.37%	5.99%	5.88%	5.02%	6.90%	5.11%	4.51%	0.00%	4.00%	3.57%	5.03%
2005	5.10%	5.76%	4.70%	5.61%	6.72%	3.57%	5.07%	0.00%	3.24%	4.14%	4.83%
2006	3.93%	5.28%	4.40%	5.02%	5.74%	3.96%	4.17%	1.85%	2.96%	2.45%	4.23%
2007	3.20%	4.28%	2.98%	3.86%	5.52%	3.74%	3.25%	0.00%	2.83%	0.39%	3.43%
2008	2.83%	3.84%	2.89%	3.05%	3.24%	2.65%	2.53%	0.00%	1.68%	2.31%	2.75%
2009	2.52%	3.40%	3.02%	2.81%	1.10%	2.77%	2.45%	0.00%	1.89%	1.59%	2.62%
2010	2.03%	2.10%	2.03%	1.76%	3.40%	1.89%	1.78%	0.00%	0.82%	0.00%	1.73%
2011	2.51%	2.99%	2.24%	2.16%	3.57%	1.42%	2.27%	0.90%	1.21%	0.31%	2.06%
2012	1.34%	1.78%	2.10%	1.51%	1.01%	1.54%	1.32%	0.00%	1.11%	1.00%	1.44%
2013	1.58%	1.69%	1.85%	1.78%	1.75%	1.30%	1.25%	0.00%	1.11%	1.63%	1.44%
2014	1.01%	0.92%	0.86%	1.22%	1.16%	0.91%	0.86%	0.00%	0.72%	1.09%	0.91%
2015	0.89%	1.51%	1.02%	1.12%	1.35%	1.29%	0.98%	0.19%	0.56%	0.87%	0.98%
2016	0.59%	0.98%	0.76%	0.68%	0.00%	0.67%	0.73%	0.13%	0.56%	0.74%	0.67%
Total	**4.35%**	**5.35%**	**3.46%**	**4.64%**	**5.56%**	**3.66%**	**3.97%**	**0.14%**	**1.23%**	**1.20%**	**3.85%**

[21] The Mobile test station is a van that travels to car dealers to test used vehicles for sale. These vehicles are prepped for resale and therefore have a lower failure rate than public vehicles arriving at the other test stations. DEQ Too station tests are only permitted on OBD vehicles that report an eVIN (generally 2005 and newer).

Exhibit 28

The total number of compliance documents issued to inspection stations

Month/ Station	Clackamas 940	Gresham 941	Medford 949	Northeast 943	Scappoose 937	Sherwood 945	Sunset 939	Mobile 932	Tech Center 936	**Total**
January	10,000	3,000	5,000	6,000	-	6,000	13,000	-	2,000	**45,000**
February	10,000	7,000	-	9,000	-	8,000	11,000	-	-	**45,000**
March	5,000	5,000	-	6,000	-	4,000	6,000	-	-	**26,000**
April	-	-	-	-	-	-	-	-	-	**-**
May	-	-	-	-	-	-	-	-	-	**-**
June	10,000	-	-	-	-	14,000	8,000	-	-	**32,000**
July	5,000	15,000	12,000	8,000	-	3,000	8,000	-	-	**51,000**
August	10,000	6,000	10,000	8,000	-	-	14,000	-	-	**48,000**
September	8,000	7,000	-	6,000	1,000	8,000	11,000	-	-	**41,000**
October	10,000	9,000	4,000	9,000	-	12,000	16,000	2,000	-	**62,000**
November	4,000	3,000	4,000	7,000	1,000	7,000	6,000	-	-	**32,000**
December	13,000	12,000	-	8,000	-	1,000	8,000	-	-	**42,000**
Totals	**85,000**	**67,000**	**35,000**	**67,000**	**2,000**	**63,000**	**101,000**	**2,000**	**2,000**	**424,000**

Exhibit 29

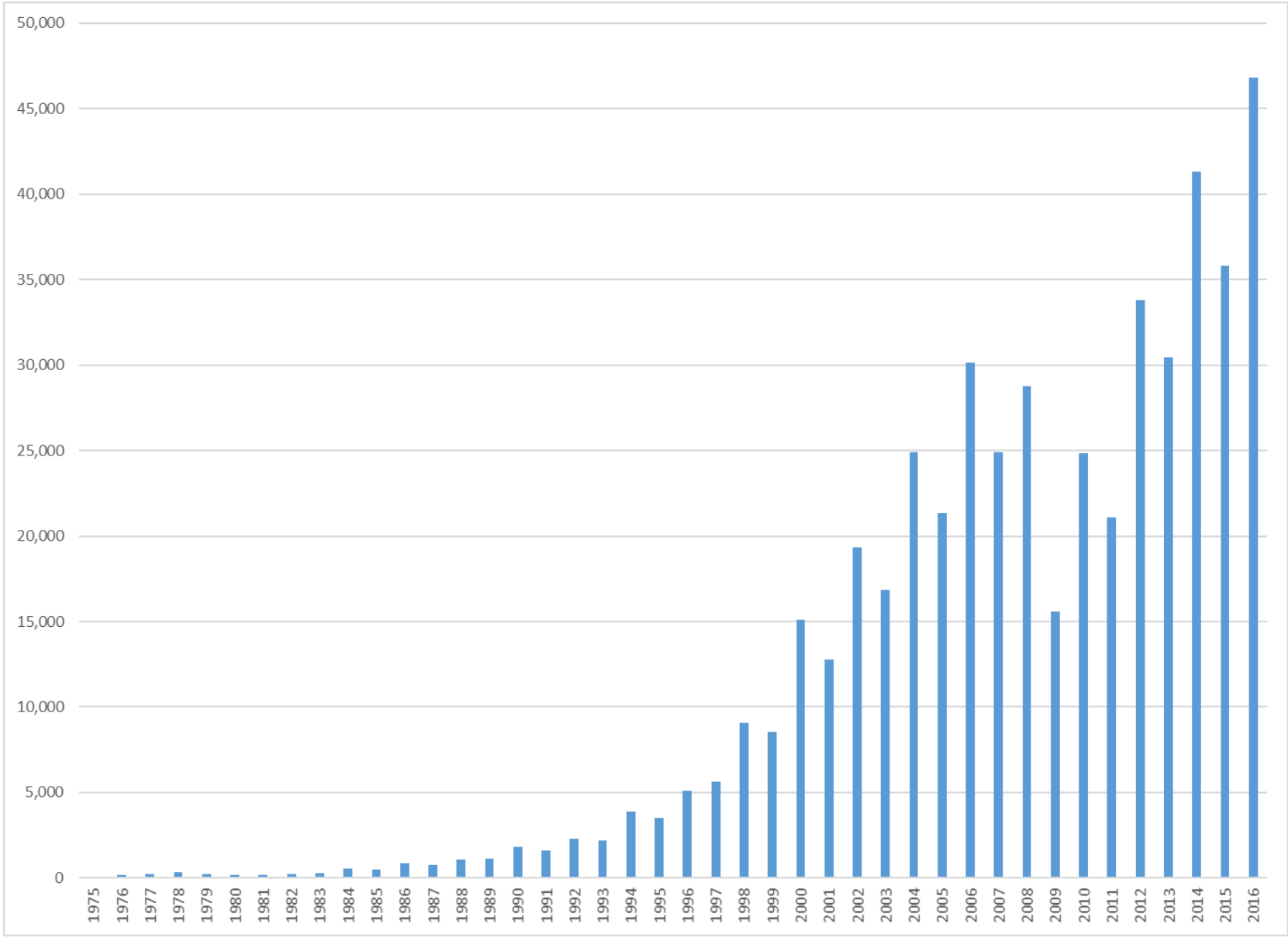
Vehicles receiving a waiver[22]

Month/ Waiver	9401 Issued	Permanent Medical	**Total**
Previously		4	4
January	47		47
February	46		46
March	26		26
April	9		9
May	13		13
June	13		13
July	8		8
August	21		21
September	11		11
October	19		19
November	23		23
December	30		30
Total	**266**	**4**	**270**

[22] For an explanation of the waivers Oregon offers, see Test Data Report (2)(V).

Chart 1

The number of vehicles tested by model year[23] (Exhibit 1)



[23] Due to Oregon's biennial test program, more odd-numbered model years are tested in odd-numbered test years and more even-numbered model years are tested in even-numbered test years. This is a direct result of the year of initial vehicle purchase and registration.

Chart 2

The number of vehicles failing initially by model year (Exhibit 2)

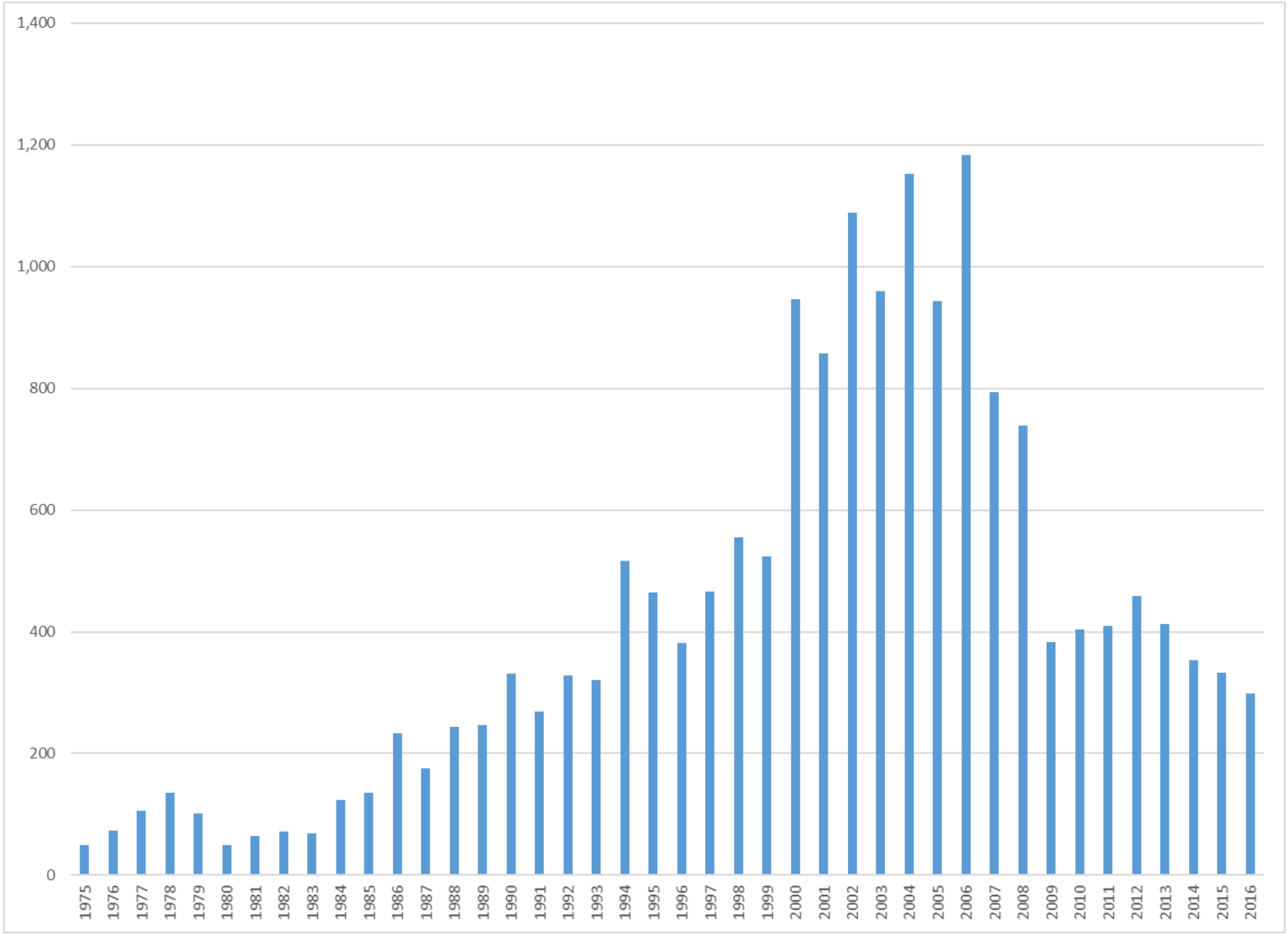


Chart 3

The percentage of vehicles failing initially by model year[5] (Exhibit 3)

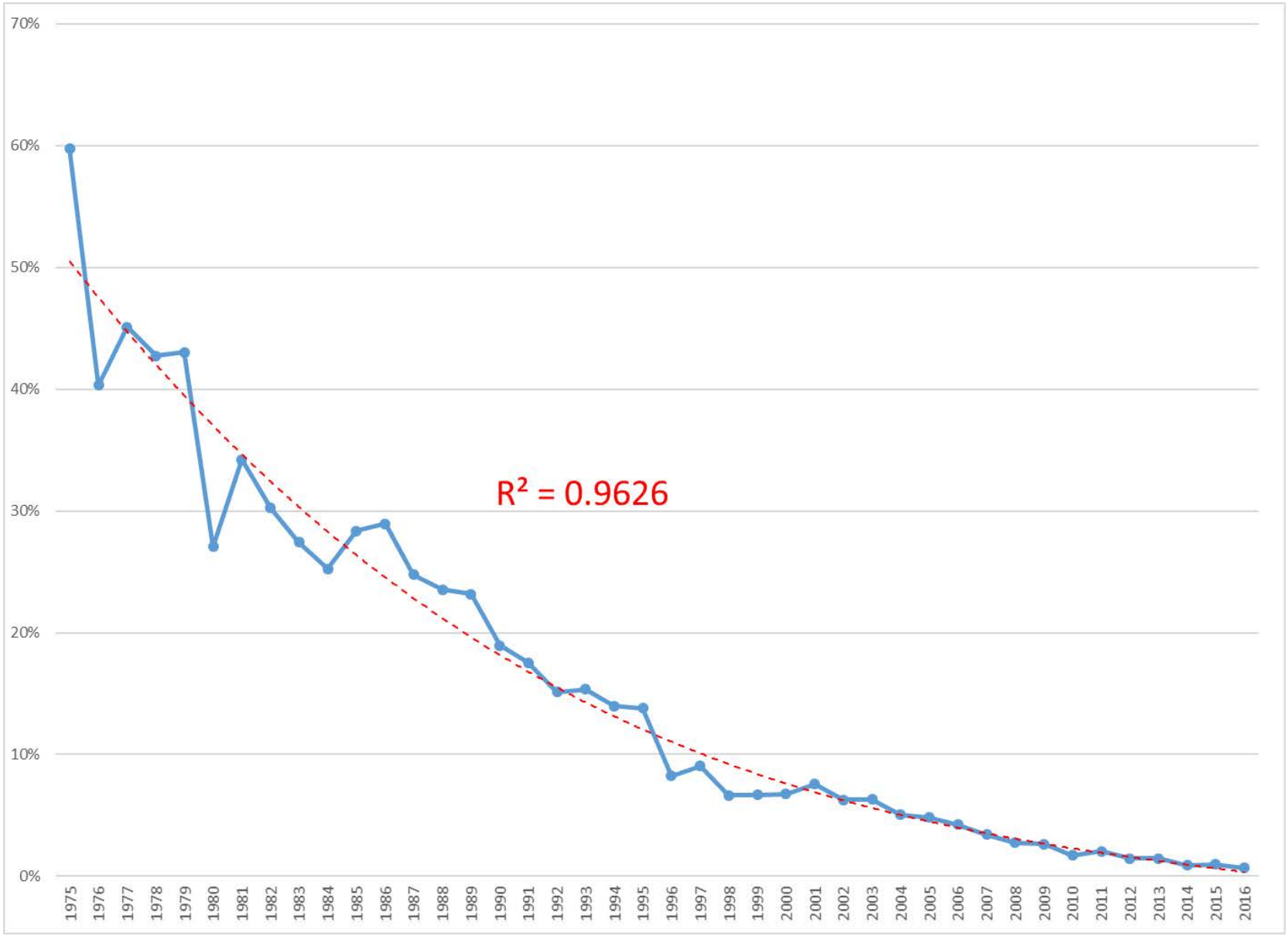


Chart 4

The number of vehicles failing the first retest by model year (Exhibit 4)

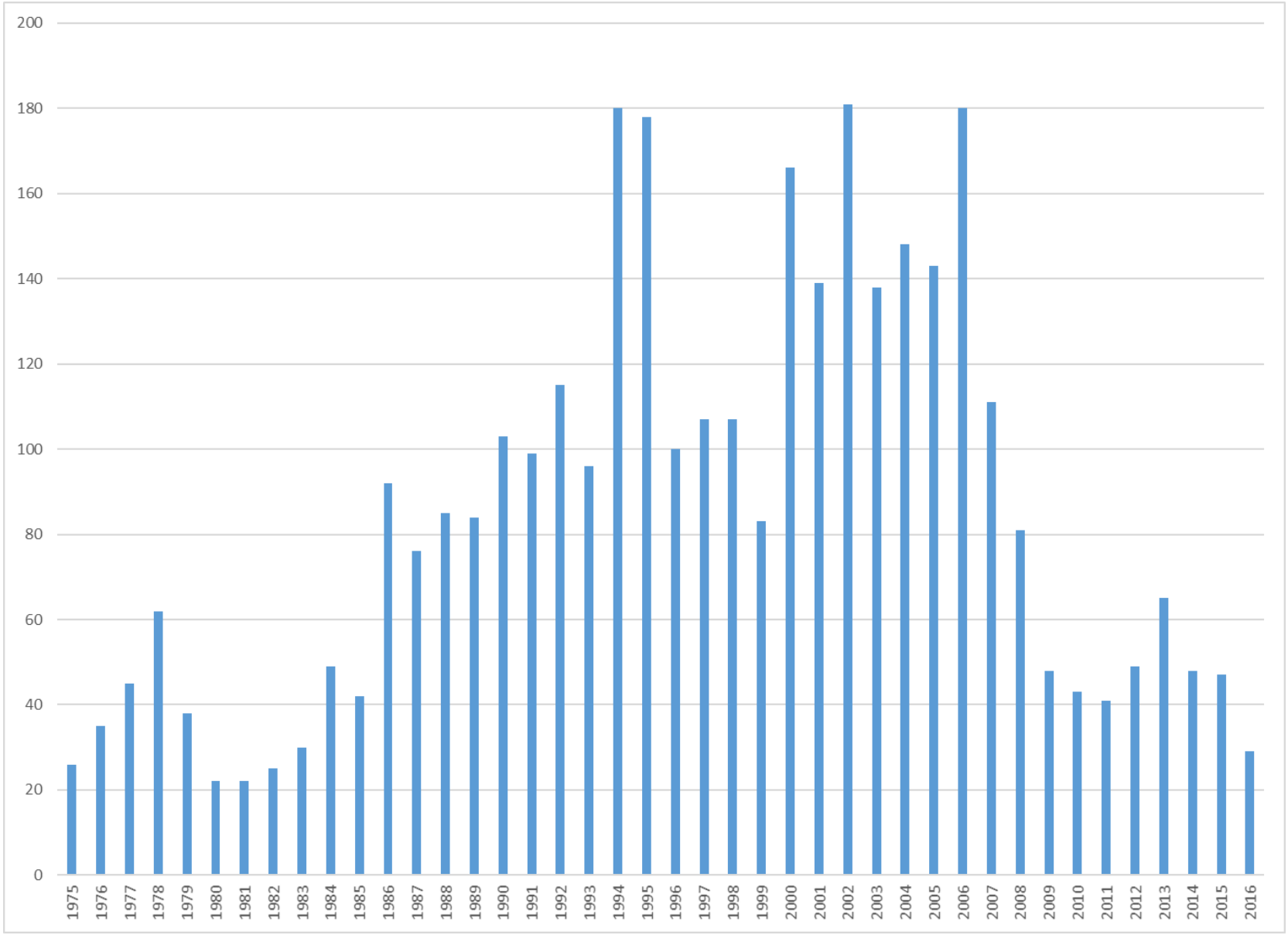


Chart 5

The percentage of vehicles failing the first retest by model year[6] (Exhibit 5)

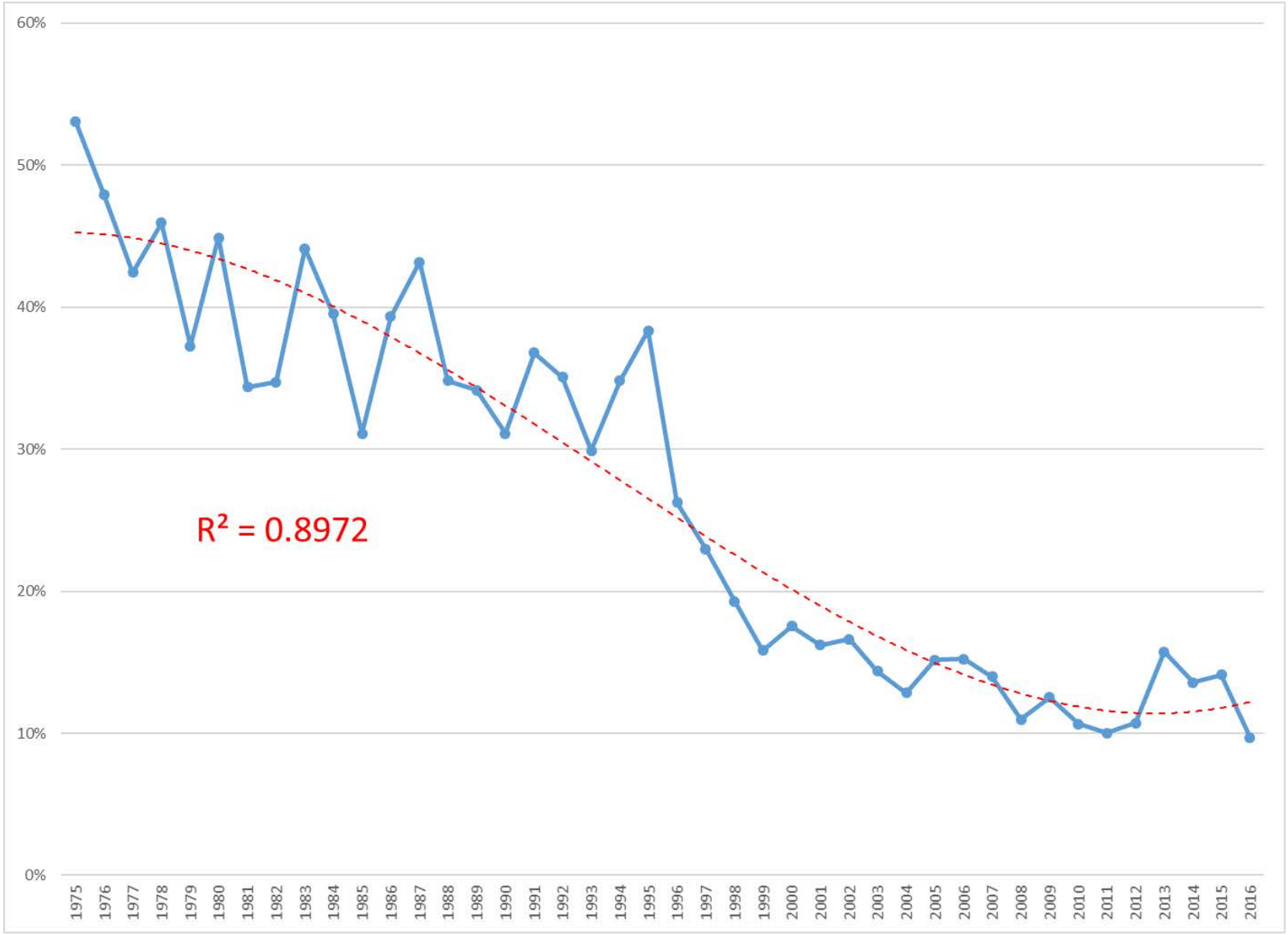


Chart 6

The number of vehicles passing the first retest by model year (Exhibit 6)

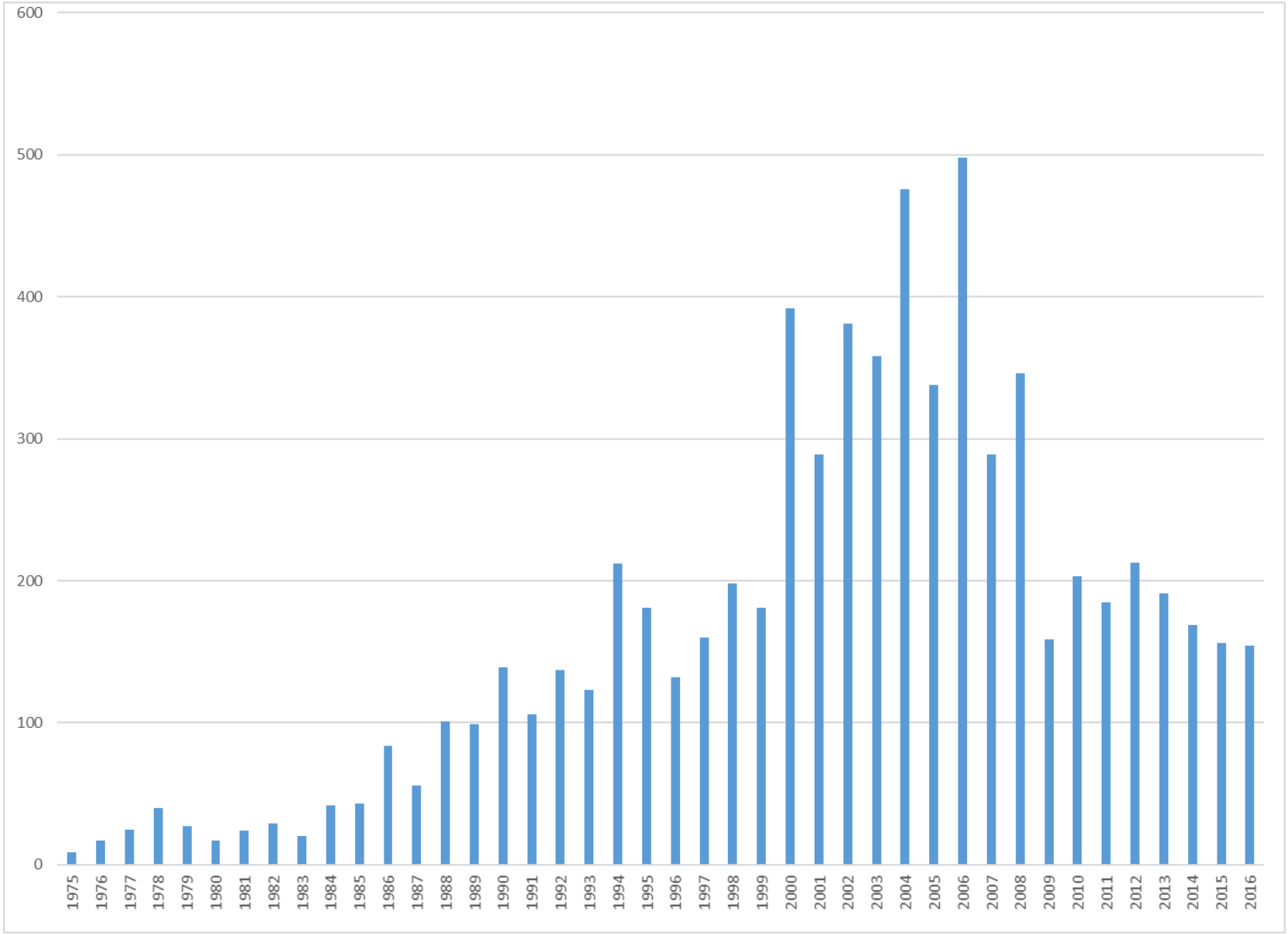


Chart 7

The percentage of vehicles passing the first retest by model year[7] (Exhibit 7)

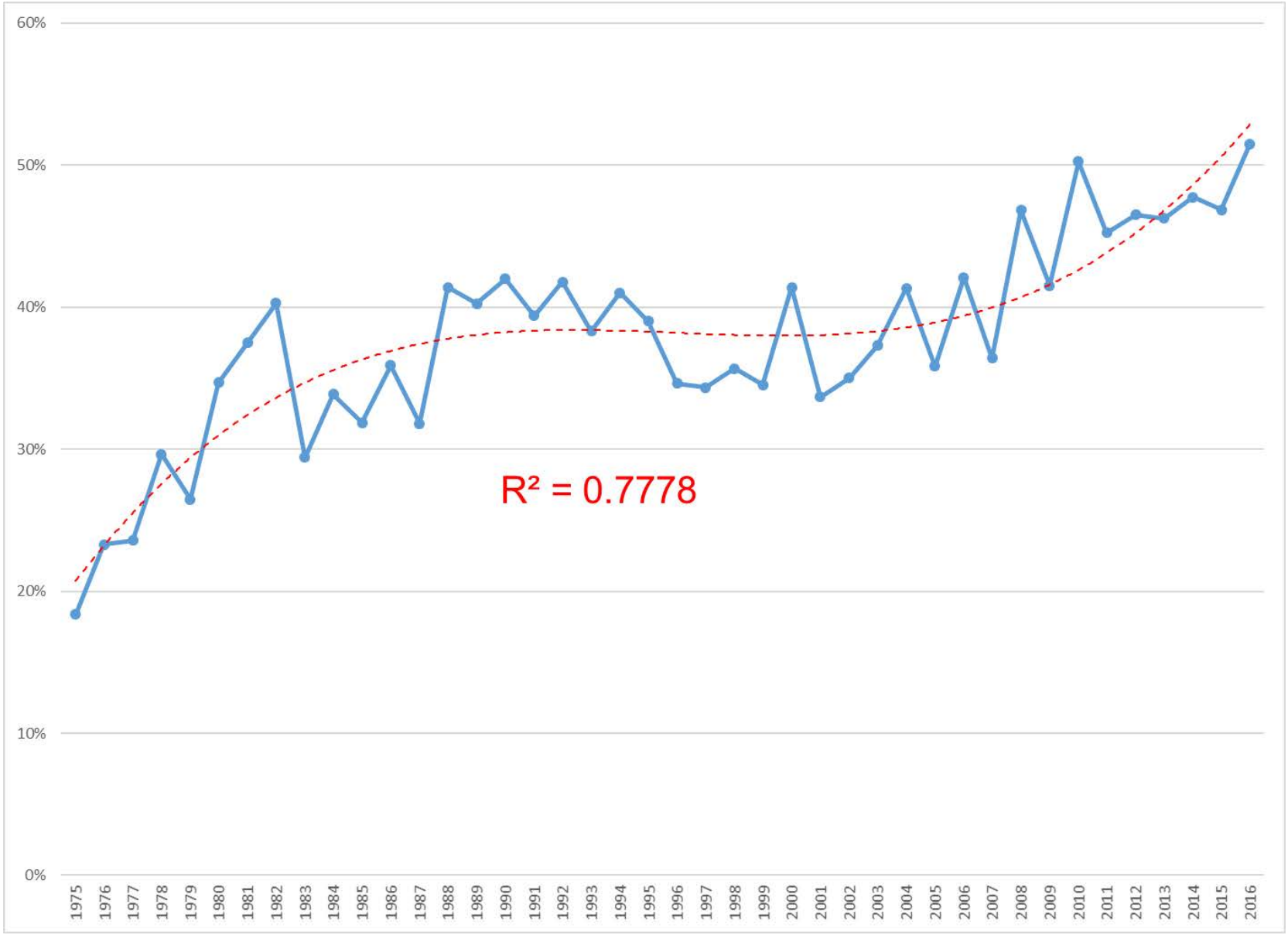


Chart 8

The number of initially failed vehicles passing the second or subsequent retest by model year[8] (Exhibit 8)

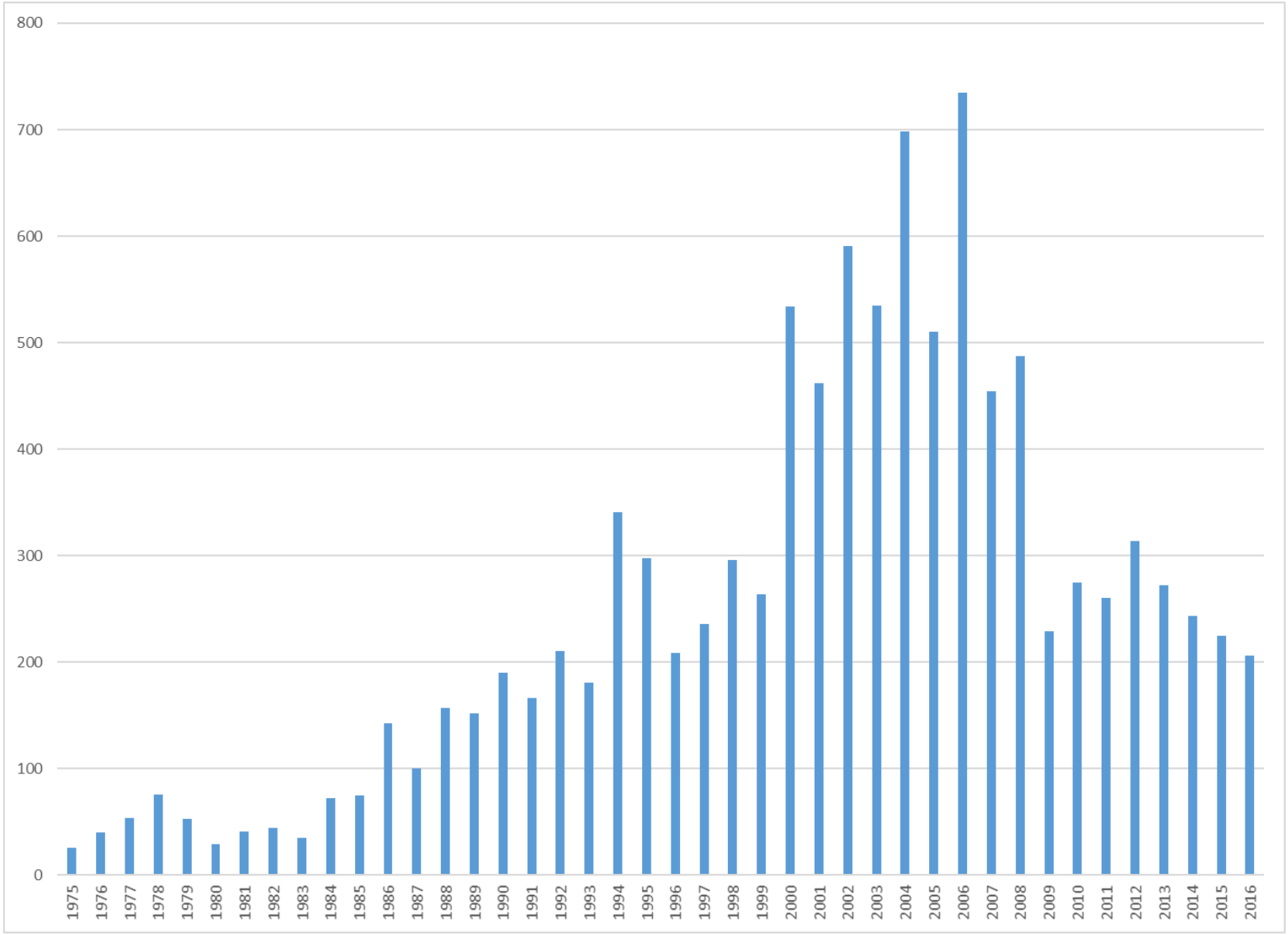


Chart 9

The percentage of initially failed vehicles passing the second or subsequent retest by model year[8, 9] (Exhibit 9)

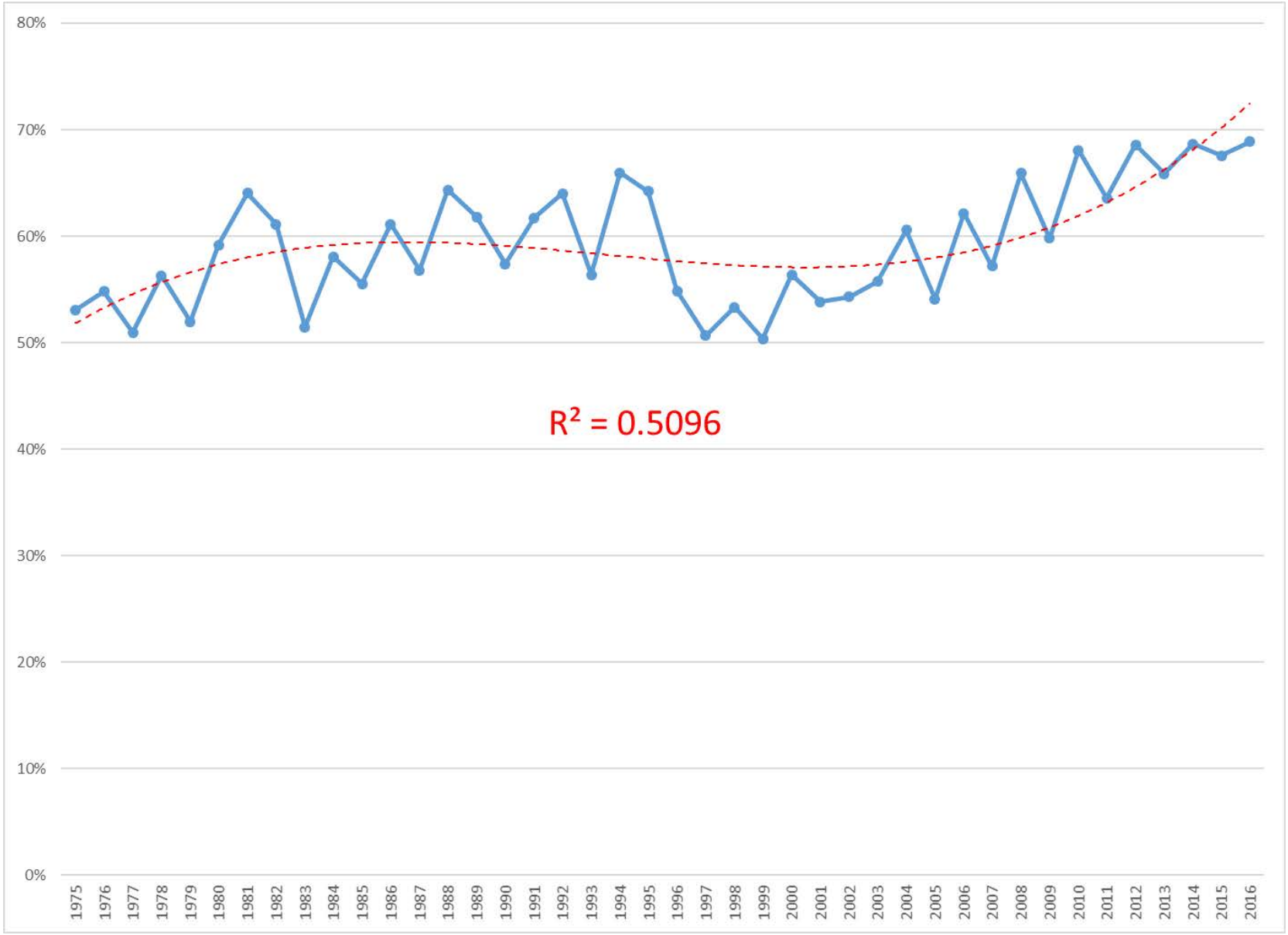


Chart 10

The number of initially failed vehicles with no known final outcome (regardless of reason) by model year[10] (Exhibit 10)

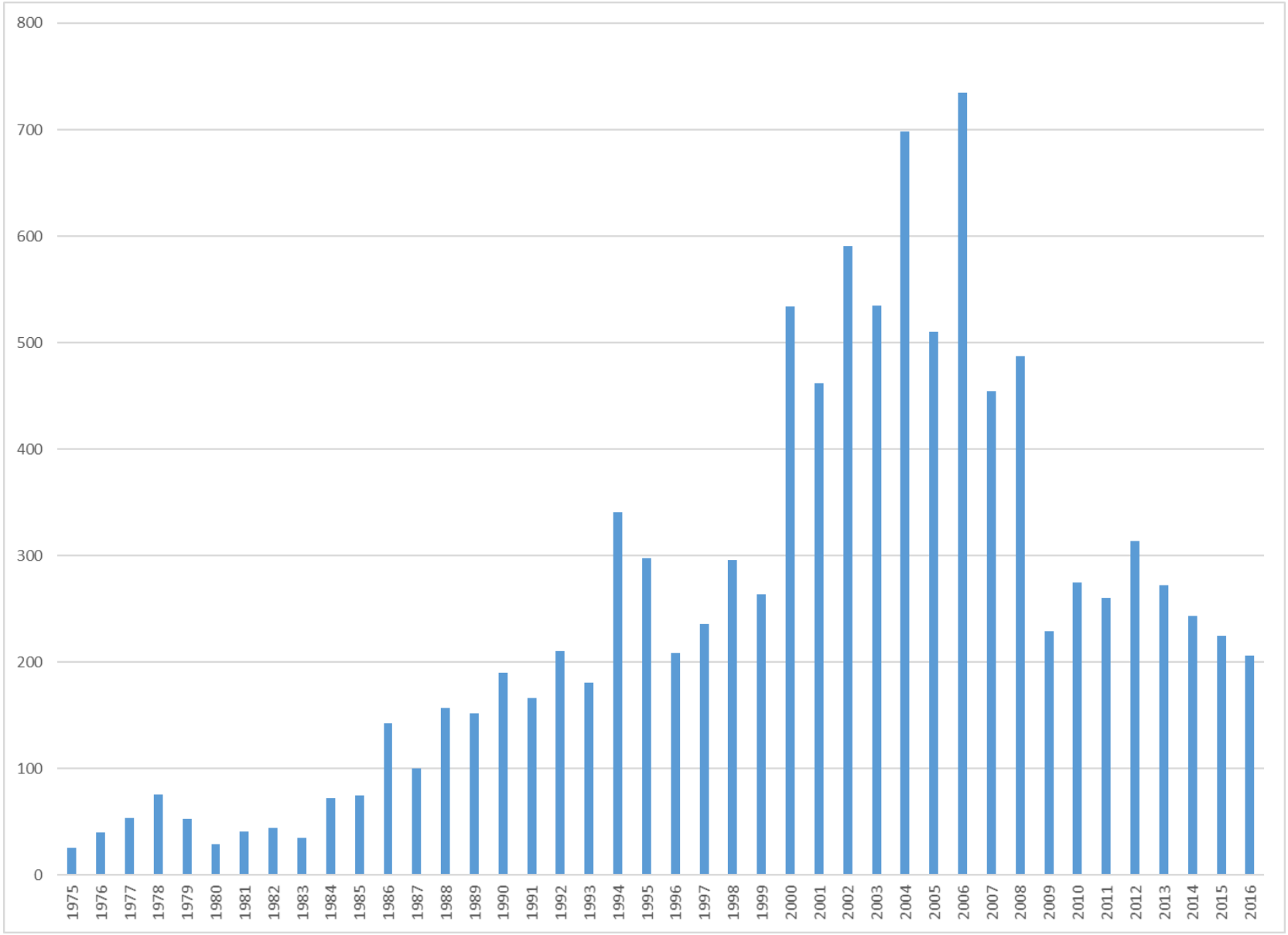


Chart 11

The percentage of initially failed vehicles with no known final outcome (regardless of reason) by model year[10, 11] (Exhibit 11)

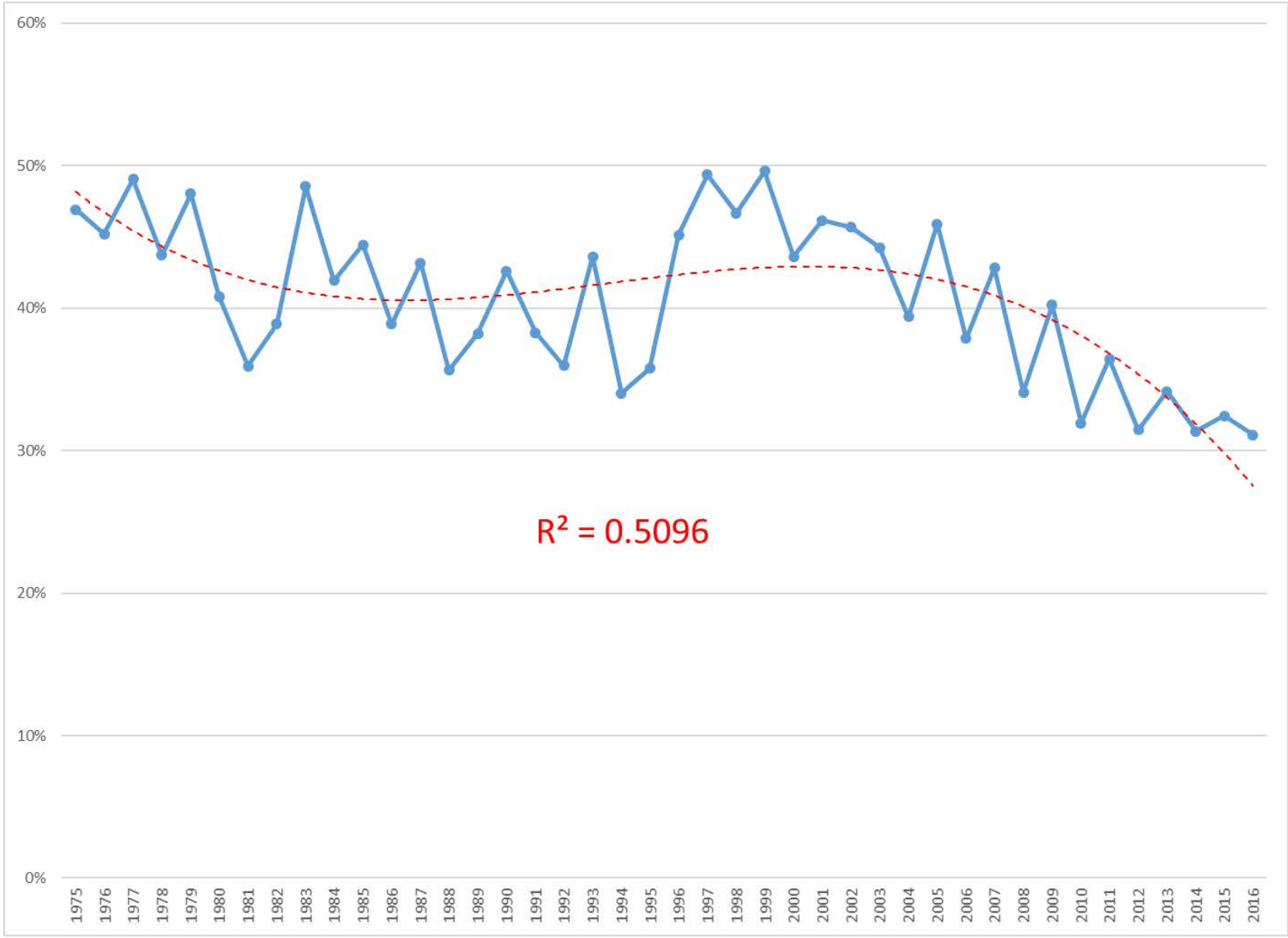


Chart 12

The number passing the on-board diagnostic check by model year (Exhibit 12)

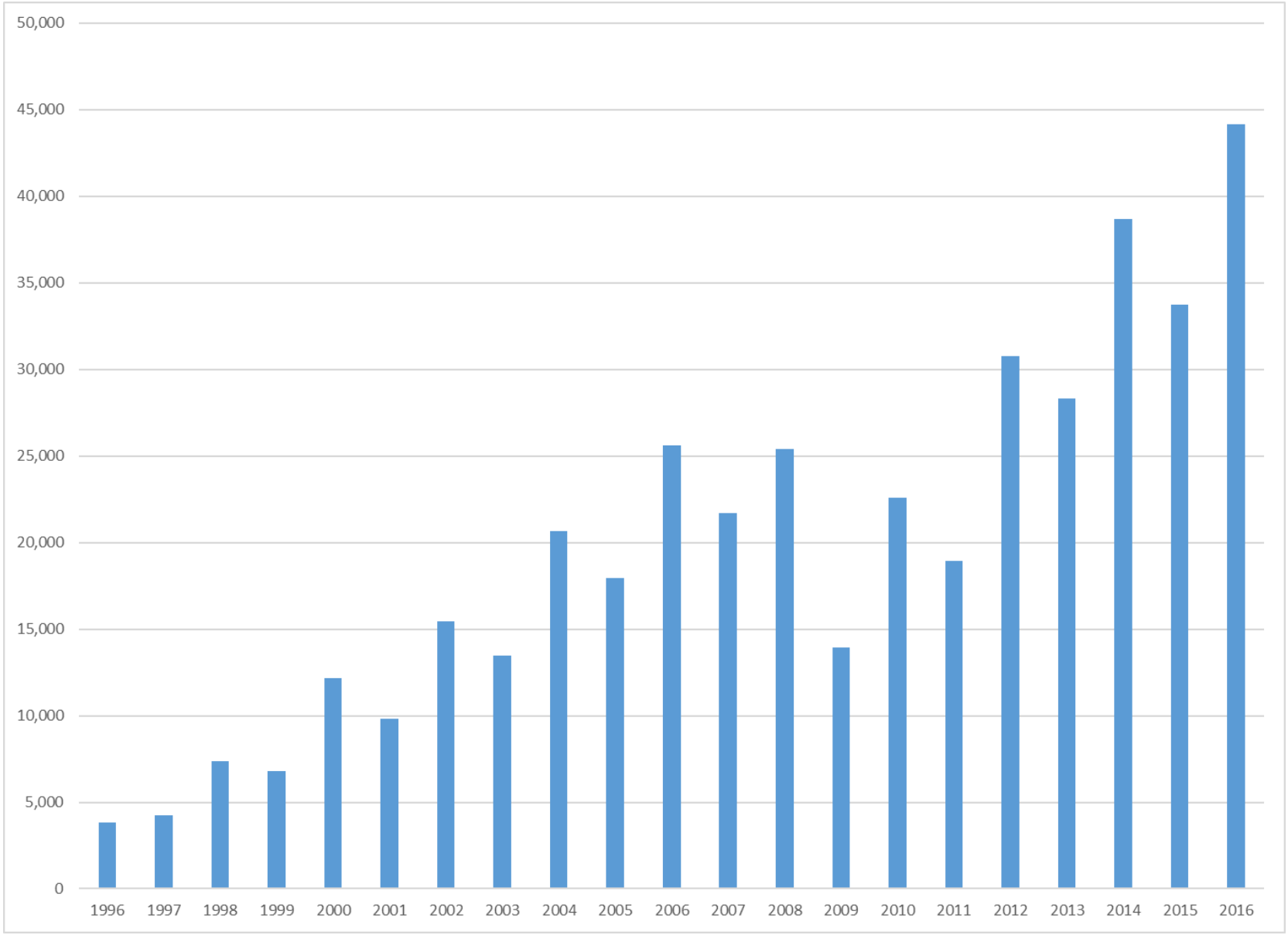


Chart 13

The percentage passing the on-board diagnostic check by model year[10] (Exhibit 13)

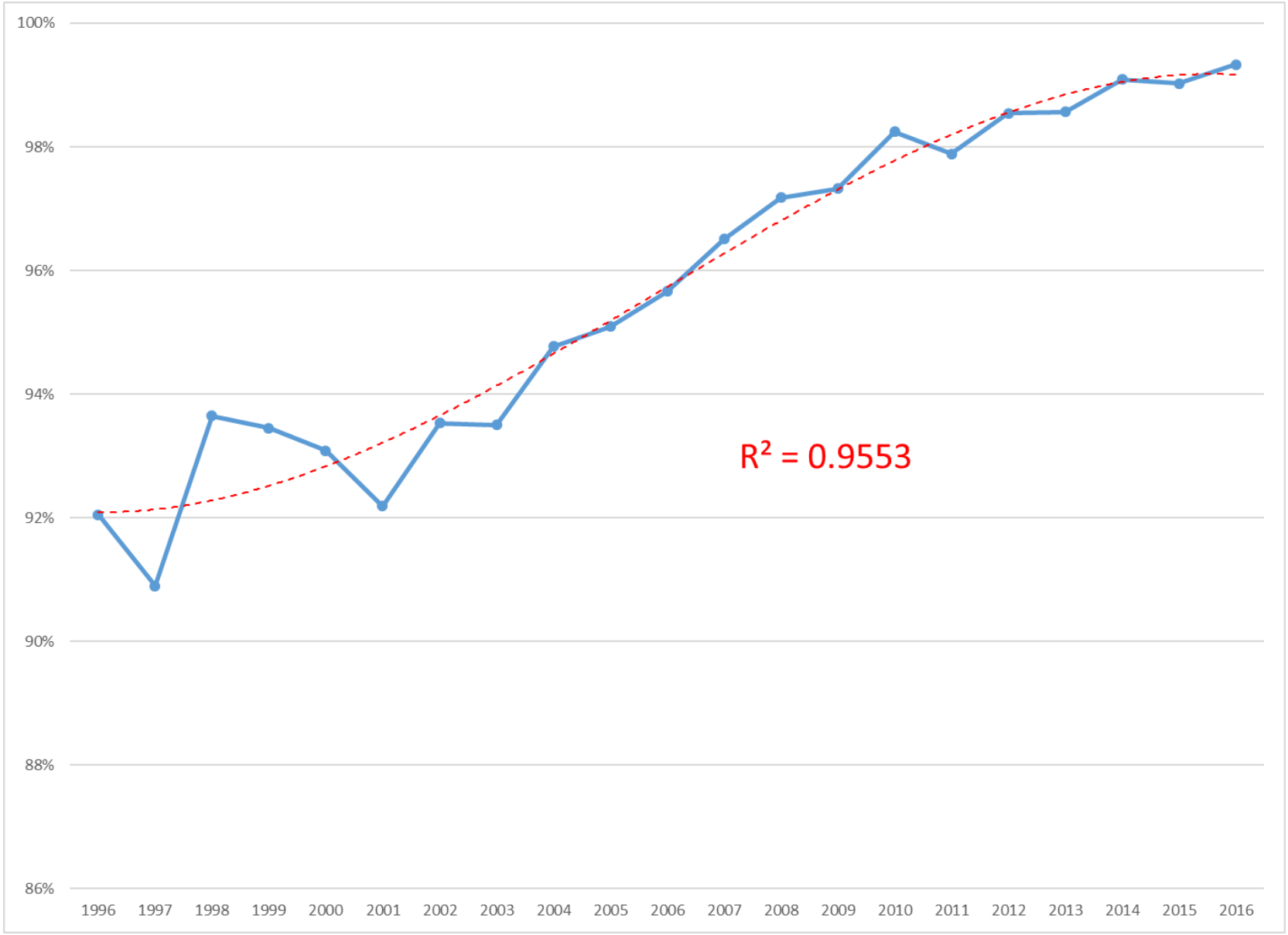


Chart 14

The number failing the on-board diagnostic check by model year (Exhibit 14)

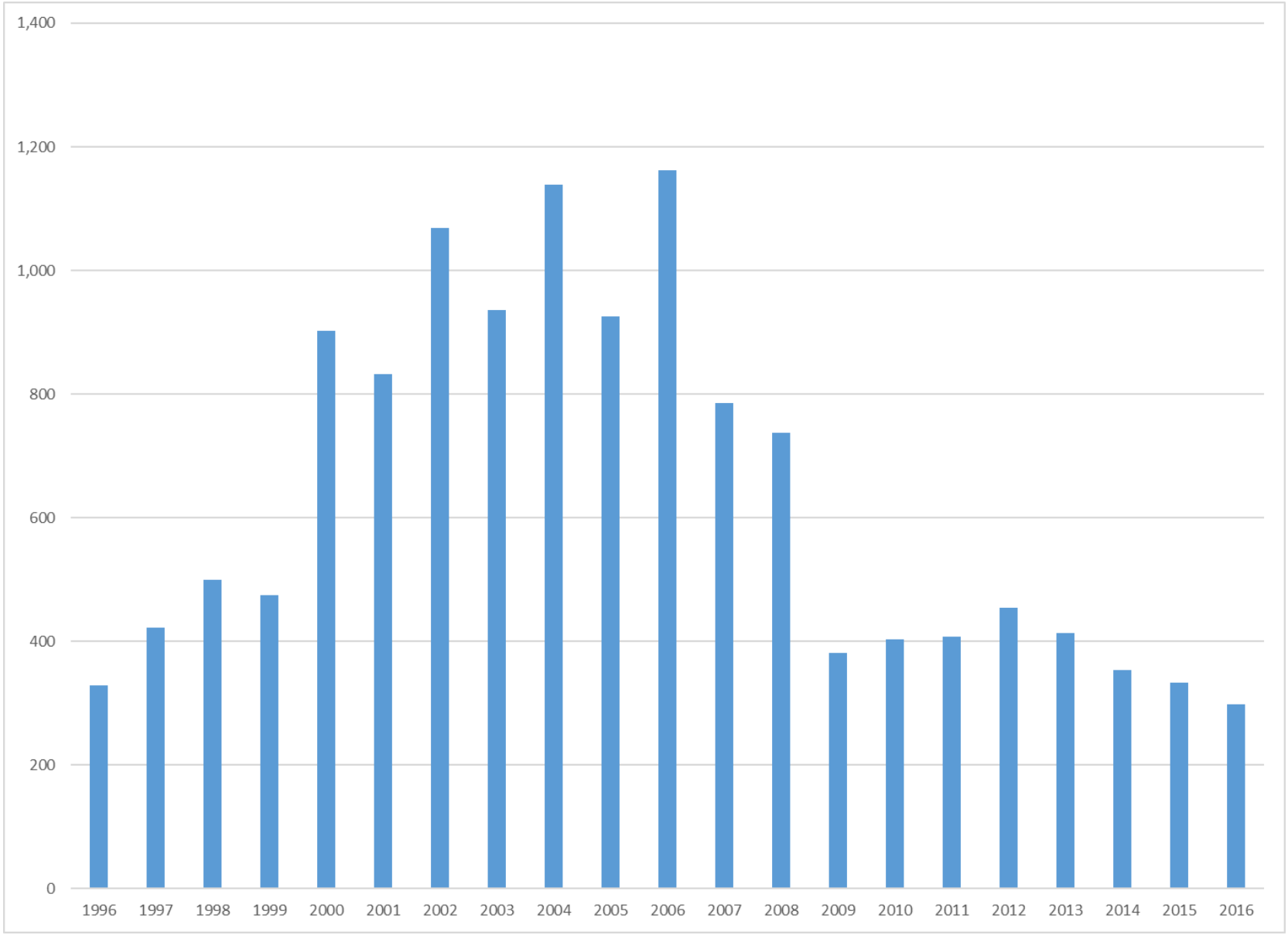


Chart 15

The percentage failing the on-board diagnostic check by model year[11] (Exhibit 15)

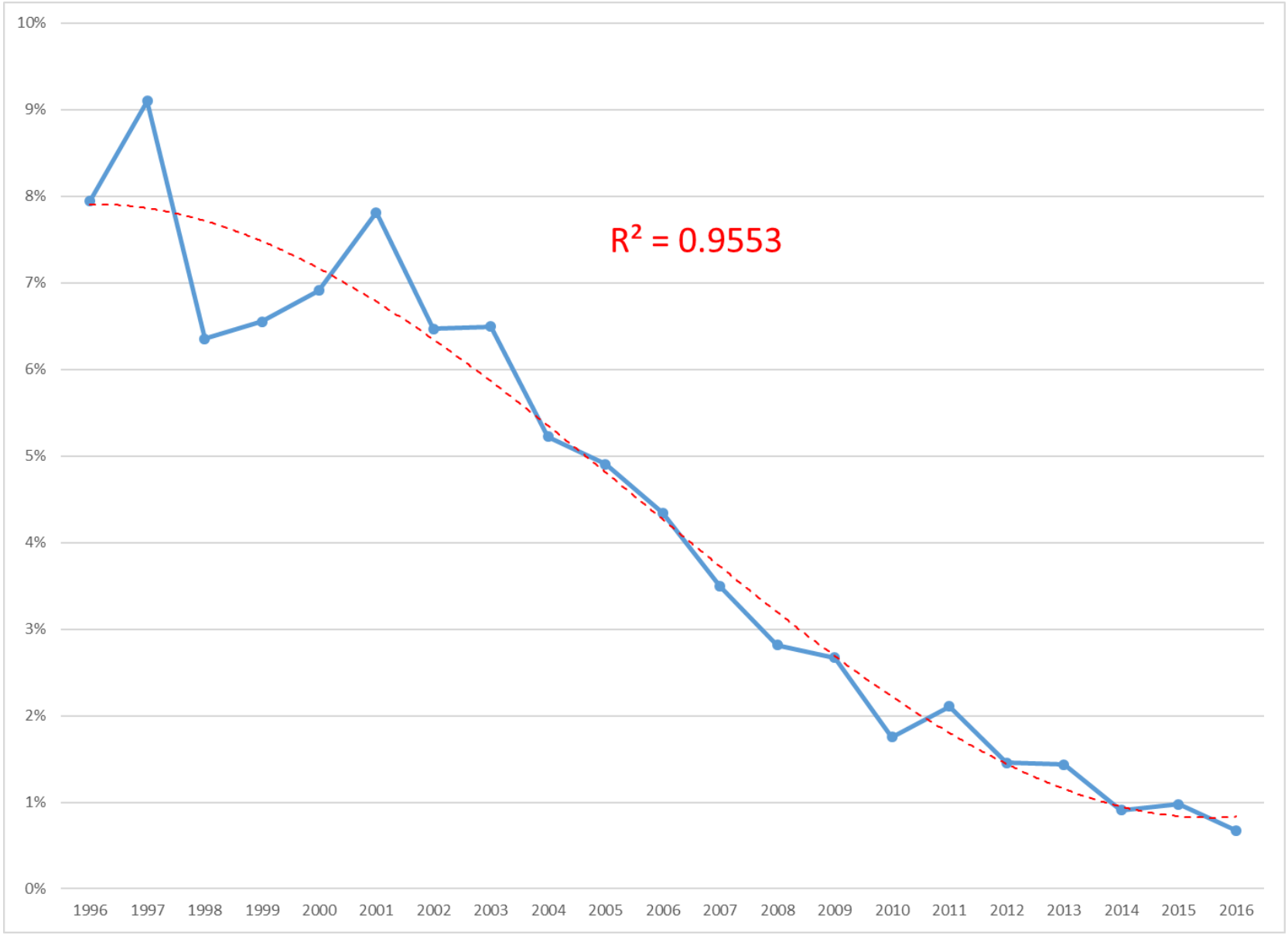


Chart 16

The number where readiness status indicates that the evaluation is not complete (Exhibit 24)

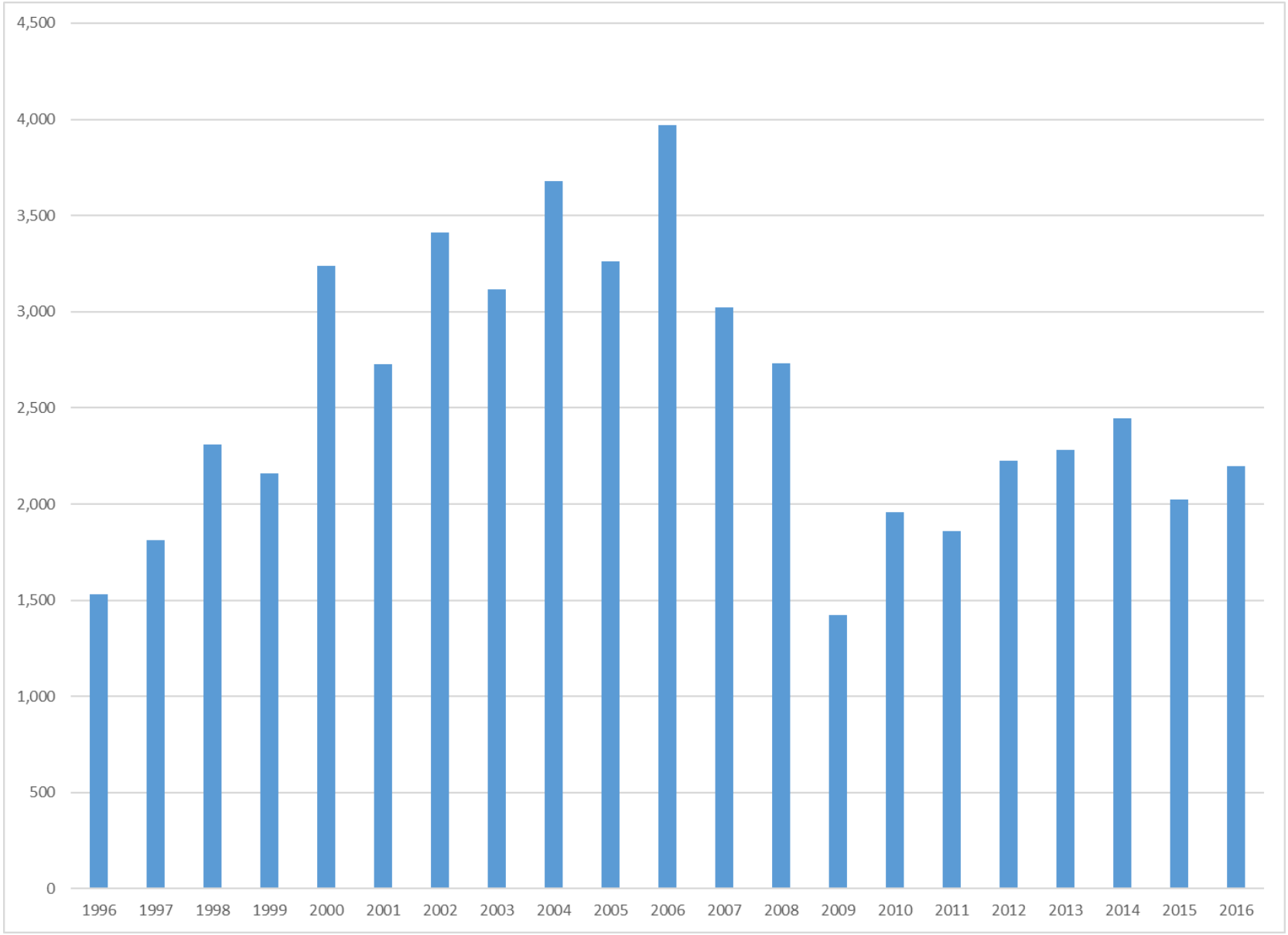


Chart 17

The percentage where readiness status indicates that the evaluation is not complete[16] (Exhibit 25)