



EVALUATION OF CONNECTICUT'S INSPECTION/MAINTENANCE PROGRAM

2020 ANNUAL REPORT

Prepared For

Connecticut Department of Energy and Environmental Protection
Connecticut Department of Motor Vehicles

Prepared By

dKC – de la Torre Klausmeier Consulting
1401 Foxtail Cove
Austin, TX 78704
(512) 447-3077

E-mail: delaklaus@aol.com

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1. Introduction

1.1. Executive Summary

As required by the Clean Air Act Amendments of 1990, the Connecticut Department of Energy and Environmental Protection (DEEP) in partnership with the Connecticut Department of Motor Vehicles (DMV) conducts periodic evaluations of its enhanced Motor Vehicle Inspection and Maintenance (I/M) Program. This report is written and submitted in fulfillment of the requirement to provide annual I/M reports per 40 CFR 51.366 to the U.S. Environmental Protection Agency (EPA). This report addresses data collected from January 1, 2020 through December 31, 2020. As evidenced by the high compliance rate, limited fraud and low waiver rate, this report demonstrates that Connecticut’s I/M program effectively achieves the expected air quality benefits.

The EPA provided a checklist, which identified the data elements to be included in this report. Required data and reports for 2019 and earlier years have been submitted to EPA. The 2020 data elements are compiled in the main body and Appendix A and B of this report and correspond to the indexing system used in EPA’s checklist. The requirements of EPA’s checklist that are not applicable due to the structure of Connecticut’s I/M program are addressed at the end of each applicable section of this report.

1.2. Major Findings

This report focuses on the current effectiveness of Connecticut’s I/M program. Key program highlights include:

- 2020 saw significant changes and delays to I/M testing programs across the country due to the effects of COVID-19. Connecticut’s program required changes to testing schedules and testing methods. As such, any significant variations in the data have been noted below:
 - In 2020, the Connecticut program performed 921,437 initial inspections as compared to 1,040,842 initial inspections in 2019. Despite the pandemic, DMV met all of EPA’s quality assurance requirements.
 - Due to COVID-19 Connecticut deferred testing requirements for motorists in 2020. Time extensions of testable vehicles were offered as per the following schedule.

Date	Action
3/20/2020	All vehicles with I/M dates that expired on March 10, 2020 through June 30, 2020 were extended 90 days
5/15/2020	All vehicles with I/M dates that expired on March 10, 2020 through June 30, 2020 were extended 180 days
6/17/2020	All vehicles with I/M dates that expired on July 1, 2020 through July 31, 2020 were extended 90 days
7/15/2020	All vehicles with I/M dates that expired on August 1, 2020 through September 31, 2020 were extended 90 days

- Details on temporary changes to Connecticut’s I/M program due to COVID-19 are provided in Section 7.2.
- Connecticut’s I/M program correctly fails non-complying vehicles and strictly enforces I/M requirements:

- Approximately 8.4% of vehicles failed their initial emissions test and 9.5% of these vehicles also failed their first retest in 2020. This is similar to failure rates in centralized, test-only programs, which EPA considers a benchmark.
- DMV and its contractor, Applus, perform extensive quality assurance checks on the program. Evaluation of these quality assurance data demonstrates that the program performs accurate inspections.
- Connecticut’s anti-fraud efforts are models for other I/M programs. Connecticut audits all stations as part of an extensive anti-fraud program. For example, Connecticut conducted 2,573 video surveillance audits and 505 covert audits during 2020. Covert and video audits address On-Board Diagnostics (OBDII), Pre-Conditioned Two Speed Idle (PCTSI) and diesel opacity inspection performance. In addition, DMV and Applus run extensive trigger reports. Less than 0.03% of the inspections in Connecticut are suspect, which is far lower than the “suspect test” rate in most other states’ I/M programs where suspect inspection rates are 0.3% or higher.
- In 2015, Connecticut implemented a new registration system – Connecticut Integrated Vehicle and Licensing System (CIVLS). CIVLS automated checking for I/M compliance makes it impossible for motorists to renew their registration via US Mail, in person or on the DMV website without first complying with I/M requirements. The DMV also checks each registration request for compliance with I/M requirements. DMV provided data on registration renewal requests mailed to the Department – 98.7% of the registration requests were in compliance with I/M requirements when mail renewals were processed. Ultimately, 100% of the vehicles renewed are in compliance with I/M requirements.

Connecticut’s ongoing analysis of inspection and enforcement data continues to demonstrate the program effectively produces air pollutant reductions. DEEP and DMV will continue to evaluate opportunities to improve the program and increase cost effective air quality benefits.

2. Program Overview

2.1. Introduction

The I/M program is an important part of Connecticut’s overall clean air strategy to ensure the state is positioned to attain and maintain the National Ambient Air Quality Standard (NAAQS) for Ozone (i.e., smog). Ozone is formed by photochemical reactions between volatile organic compounds (VOCs) and oxides of nitrogen (NOx). Connecticut’s I/M program, which dates back to 1983, has a long history of effectively reducing vehicle VOC and NOx emissions.

Connecticut’s I/M program identifies vehicles that emit pollutants that exceed standards set by EPA and require such vehicles to be repaired in a timely manner to comply with emission standards. DMV oversees the I/M program operated by a private contractor; DEEP advises DMV on I/M standards and ensures that the program achieves the air quality benefits as outlined in Connecticut’s State Implementation Plan (SIP) for Air Quality.

The emission reductions from the I/M program are an essential element of Connecticut’s clean air strategy. On June 3, 2016, having determined that both the Greater Connecticut and the New York-Northern New Jersey-Long Island (NY-NJ-CT) nonattainment areas failed to attain the 2008 ozone standards by the July 20, 2015 attainment date, EPA reclassified those areas from marginal

nonattainment to moderate nonattainment. This reclassification required the two areas to attain the 2008 standard by July 20, 2018. Neither area measured attainment as of that date and, as such, Connecticut was reclassified by EPA as serious nonattainment for 2008 standard as of September 2019. Thus, EPA changed the attainment date for the 2008 standard to July 21, 2021. Additionally, on October 1, 2015 EPA strengthened the 2015 Ozone NAAQS to 70 parts per billion (ppb) from 75 ppb. Effective August 3, 2018, the Greater Connecticut nonattainment area is classified as marginal nonattainment (attainment date August 3, 2021) and the New York-Northern New Jersey-Long Island (NY-NJ-CT) nonattainment area is classified as moderate nonattainment (attainment date August 3, 2024). Upon implementation of the tighter 2015 standard and the serious classification under the 2008 standard, Connecticut will need to achieve even greater emission reductions from motor vehicles.

As part of the next ozone attainment demonstration, DEEP will need to evaluate additional measures to reduce emissions from the transportation sector as this sector accounts for about 67% of NOx emissions in Connecticut. These strategies may include, but are not limited to: adopting the California aftermarket catalytic converter rule, promoting electric and alternative fueled vehicles by expanding the availability of electric vehicle charging stations and alternative fuel refueling stations, adopting programs that encourage the replacement of older diesel on and off road equipment with equipment that complies with the newest emission standards, and expanding the I/M program to include more medium and heavy duty trucks. Failing to effectively reduce transportation emissions to meet federal air quality standards in a timely manner may result in the need for additional control measures in the future. Therefore, the existing I/M program should be viewed against the backdrop of potential additional control programs necessary to achieve Connecticut's short term and long-term air quality goals.

In January 2020, Connecticut issued a request for proposals (RFP) for the next generation of its I/M program. After an extensive evaluation period, which included consultation from DEEP, Connecticut DMV selected Opus Inspection Inc. (Opus) as the vendor for the next I/M contract. On January 26, 2021 Connecticut DMV executed a I/M contract with Opus for a term of six years, commencing November 27, 2021. DMV also extended the current contract with Applus Technologies to November 26, 2021 to ensure program continuity. Opus is expected to provide additional program enhancements and improvements in the coming years to the program, including expansion of testing to higher weight rated vehicles.

2.2. Emissions Tests Administered

Vehicles that are between 4 and 24 years old with a gross vehicle weight of 10,000 pounds or less are inspected in Connecticut by the following procedures on a biennial basis.

Gasoline Powered Vehicles (Including CNG, Propane and Hybrid Vehicles)

Below is a brief description of the criteria used to determine if a gasoline powered vehicle passes or fails inspection.

Pass/Fail Criteria

Pre-Conditioned Two-Speed Idle (PCTSI) Inspection (vehicles > 8500 pounds gross vehicle weight):

Vehicles fail if they exceed Connecticut's cut points or emissions standards. For the PCTSI test, HC and CO emissions are evaluated. Connecticut uses EPA's recommended cut points for the PCTSI¹ tests.

OBDII Inspection: 1996 and newer MY light-duty vehicles (< 8500 pounds gross vehicle weight) and 2008 and newer medium-duty vehicles with a GVWR between 8,501 LBS to 10,000 lbs. are subject to an OBDII inspection. The emissions test system is plugged into the OBDII connector and information on the status of the vehicle's OBDII system is downloaded. Vehicles fail the OBDII inspection if they have any of the following problems:

- Malfunction Indicator Lamp (MIL²) is commanded-on;
- MIL not working (Termed Key-On Engine-Off, KOEO, failure³);
- The number of readiness monitors that are not ready exceed EPA's limit⁴:
 - 1996-2000 MY light-duty vehicles: Two monitors are allowed to be not ready.
 - 2001 and later MY light-duty vehicles: One monitor is allowed to be not ready.
- OBDII Diagnostic Link Connector (DLC) damaged; or
- Vehicle could not communicate with the Connecticut inspection system.

Note: ASM tests were terminated in 2020 because only 1996 vehicles were tested. In previous years 1995 and older light-duty vehicles received ASM tests.

Diesel Powered Vehicles

Diesel-powered vehicles with a GVWR of 10,000 lbs. or less are also tested in Connecticut's I/M program. Vehicles equipped with OBDII systems receive OBDII tests. Otherwise, the vehicle receives a test designed to identify excessive exhaust smoke opacity. EPA regulations do not require the testing and reporting of diesel-powered vehicles.

Below is a brief description of the criteria used to determine if a vehicle passes or fails inspection.

Pass/Fail Criteria

Modified Snap Acceleration (MSA) Test (2006 and older medium-duty vehicles and pre-1997 light-duty vehicles): With this test, the throttle is "snapped" (i.e., accelerator is quickly pressed and then released) and exhaust smoke opacity is measured. This test is performed with the vehicle being in "neutral". The

¹ *Two speed idle test—EPA 81, 40 CFR 85.2214*

² MIL is a term used for the light on the instrument panel, which notifies the vehicle operator of an emission-related problem. The MIL is required to display the phrase "check engine" or "service engine soon" or the ISO engine symbol. The MIL is required to illuminate when a problem has been identified that could cause emissions to exceed a specific multiple of the standards the vehicle was certified to meet.

³ The Key-On Engine-Off (KOEO) determines if the MIL bulb is working. The bulb should illuminate when the vehicle is in the ON/RUN position but not started.

⁴ OBDII systems have up to 11 diagnostic monitors, which run periodic tests on specific systems and components to ensure that they are performing within their prescribed range. OBDII systems must indicate whether the onboard diagnostic system has monitored each component. Components that have been diagnosed are termed "ready", meaning they were tested by the OBDII system.

average of three snaps is calculated, and compared to the standard recommended by the Society of Automotive Engineers (SAE).

Loaded Mode Diesel (LMD) Test (medium-duty vehicles and pre-1997 light-duty vehicles): This test was phased out early in 2020.

OBDII Inspection: 1997 and newer model year diesel vehicles with a GVWR of 8,500 lbs. or less and 2007 and newer medium-duty vehicles with a GVWR between 8,501 LBS to 10,000 lbs. are subject to OBDII inspection. The emissions test system is plugged into the OBDII connector and information on the status of the vehicle's OBDII system is downloaded. Diesel-powered vehicles will fail the OBDII inspection if they have any of the following problems:

- Malfunction Indicator Lamp (MIL) is commanded-on;
- MIL not working (Termed Key-On Engine-Off, KOEO, failure);
- The number of readiness monitors that are not ready exceed EPA's limit:
 - 1997-2000 MY light-duty vehicles: Two monitors are allowed to be not ready.
 - 2001 and later MY light-duty vehicles: One monitor is allowed to be not ready.
- OBDII Diagnostic Link Connector (DLC) damaged; or
- Vehicle could not communicate with the Connecticut inspection system.

3. Test Data Report

3.1. Vehicles Tested

40 CFR 51.366 (a)(1): The number of vehicles tested by model year and vehicle type

Tables 1 and 2 and Figure 1 present the number of passenger cars and trucks that were inspected at public and fleet stations. Overall, Connecticut has 2,904,160 registered vehicles, which are tested every two years, with a four-year exemption for new vehicles. For this test period, 987,306 vehicle inspections were performed at public stations while 965 vehicle inspections were performed at fleet inspection facilities; the total number of vehicles inspected **represents approximately thirty-four percent of the registered fleet**. In 2020, there were more vehicles tested with even model years than odd model years.

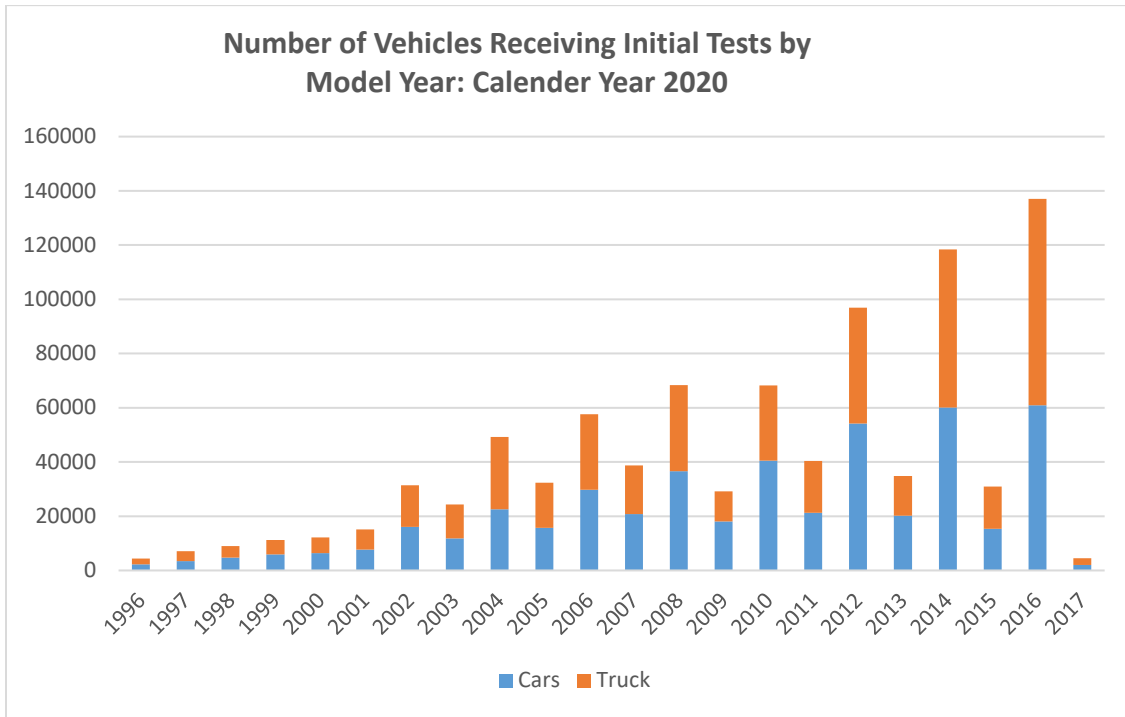
TABLE 1 - (A)(1) NUMBER OF VEHICLES TESTED BY MODEL YEAR AND VEHICLE TYPE (NETWORK TESTING)
 INCLUDES INITIAL TESTS AND RETESTS

Model Year	Passenger Car (P)	Truck (T)	Total
1996	2,564	2,390	4,954
1997	3,916	4,202	8,118
1998	5,404	4,957	10,361
1999	6,848	6,228	13,076
2000	7,667	6,779	14,446
2001	9,551	9,188	18,739
2002	18,443	17,880	36,323
2003	13,897	14,773	28,670
2004	25,243	30,185	55,428
2005	18,043	19,344	37,387
2006	32,750	30,759	63,509
2007	22,970	19,886	42,856
2008	39,164	34,047	73,211
2009	19,506	12,130	31,636
2010	42,380	29,324	71,704
2011	22,529	20,445	42,974
2012	55,959	44,483	100,442
2013	21,310	15,380	36,690
2014	61,352	59,752	121,104
2015	15,933	16,203	32,136
2016	61,744	77,198	138,942
2017	2,044	2,556	4,600
Grand Total	509,217	478,089	987,306

TABLE 2 - (A)(1) NUMBER OF VEHICLES TESTED BY MODEL YEAR AND VEHICLE TYPE (FLEET TESTING)
 INCLUDES INITIAL TESTS AND RETESTS

Model Year	Passenger Car (P)	Truck (T)	Total
1999	3	1	4
2000	1	2	3
2001	0	1	1
2002	2	1	3
2003	2	2	4
2004	0	1	1
2006	3	9	12
2007	5	19	24
2008	9	30	39
2009	8	10	18
2010	14	19	33
2011	29	15	44
2012	35	83	118
2013	49	10	59
2014	167	116	283
2015	26	39	65
2016	84	162	246
2017	1	7	8
Grand Total	438	527	965

FIGURE 1 – NUMBER OF INITIAL TESTS BY VEHICLE TYPE AND MODEL YEAR (NETWORK TESTS)



3.2. Test Results

40 CFR 51.366 (a)(2): By model year and vehicle type, the number and percentage of vehicles:

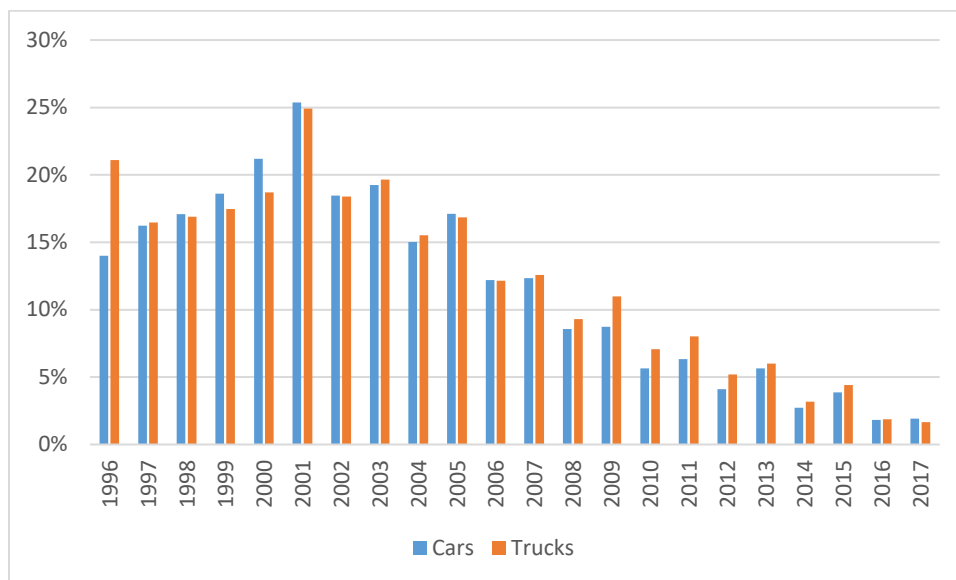
- (i) Failing initially, per test type;
- (ii) Failing the first retest per test type;
- (iii) Passing the first retest per test type
- (iv) Initially failed vehicles passing the second or subsequent retest per test type
- (v) Initially failed vehicles receiving a waiver
- (vi) Vehicles with no known final outcome (regardless of reason)

Table 3 presents the failure rate by test type and vehicle type. The failure rates in 2020 are very similar to the rates in 2019 and earlier years. As shown on Figure 2, due to more stringent pass/fail criteria for the OBD test, failure rates jump up in 2001. Appendix A presents details on failure rate trends by model year, test type, and vehicle type.

TABLE 3 - (A)(2)(i) INITIAL TEST FAIL RATE BY TEST TYPE AND MODEL YEAR (NETWORK TESTS)

Test Type	Cars			Trucks		
	Fail	Pass	% Fail	Fail	Pass	% Fail
OBD Gasoline	37,698	423,237	8.18%	35,166	384,793	8.37%
OBD Diesel	417	2,573	13.95%	1,046	3,598	22.52%
OBD Hybrid	588	11,794	4.75%	90	2,409	3.60%
PCTSI	1	11	8.33%	1,218	11,981	9.23%
MSA	3	18	14.29%	745	3,809	16.36%
LMD		1	0.00%	5	236	2.07%
Grand Total	38,707	437,634	8.13%	38,270	406,826	8.60%

FIGURE 2 - OVERALL INITIAL TEST FAIL RATE BY VEHICLE TYPE AND MODEL YEAR



Failure rates for the first retest and second and later retests are shown in Tables 4 and 5.

TABLE 4 - (A)(2)(II,III) FIRST RETEST FAIL RATE BY TEST TYPE

Test Type	Cars			Trucks		
	Fail	Pass	% Fail	Fail	Pass	% Fail
OBD Gasoline	2,755	27,117	9.22%	2,697	25,692	9.50%
OBD Diesel	12	333	3.48%	51	559	8.36%
OBD Hybrid	30	422	6.64%	6	66	8.33%
PCTSI		1	0.00%	146	786	15.67%
MSA	1	1	50.00%	129	366	26.06%
LMD				2	5	28.57%
Grand Total	2,798	27,874	9.12%	3,031	27,474	9.94%

TABLE 5 - (A)(2)(IV) SECOND AND LATER RETEST FAIL RATE BY TEST TYPE

Test Type	Cars			Trucks		
	Fail	Pass	% Fail	Fail	Pass	% Fail
OBD Gasoline	610	1,553	28.20%	533	1,643	24.49%
OBD Diesel	1	12	7.69%	2	25	7.41%
OBD Hybrid	8	20	28.57%	3	1	75.00%
PCTSI	0	0		61	100	37.89%
MSA				51	67	43.22%
LMD				0	2	0.00%
Grand Total	619	1,585	28.09%	650	1,838	26.13%

The number and percent of vehicles receiving waivers are shown on Table 6. The overall waiver rate is very low; 0.08% of the failed vehicles receive waivers.

TABLE 6 - (A)(2)(v). WAIVERS ISSUED

Model Year	Passenger Car (P)	Truck (T)	Total # of Waivers	# of Failed Vehicles	% of Failed Vehicles Receiving Waivers
1996	1	0	1	765	0.13%
1997	1	1	2	1,158	0.17%
1998	2	0	2	1,521	0.13%
1999	1	0	1	2,037	0.05%
2000	1	0	1	2,442	0.04%
2001	5	3	8	3,804	0.21%
2002	1	2	3	5,798	0.05%
2003	2	3	5	4,737	0.11%
2004	3	4	7	7,529	0.09%
2005	2	0	2	5,498	0.04%
2006	0	7	7	7,018	0.10%
2007	2	2	4	4,820	0.08%
2008	3	2	5	6,083	0.08%
2009	4	4	8	2,798	0.29%
2010	2	2	4	4,247	0.09%
2011	1	1	2	2,878	0.07%
2012	0	1	1	4,437	0.02%
2013	0	1	1	2,012	0.05%
2014	1	0	1	3,497	0.03%
2015	0	0	0	1,281	0.00%
2016	0	0	0	2536	0.00%
2017	0	0	0	81	0.00%
Total	32	33	65	76,977	0.08%

Table 7 presents the estimated percent of vehicles without a passing result. This table presents the total number of initial failing tests and passing retests. The number of passing retests include waivers. Overall, the number of vehicles that pass retests is 76% of the number of vehicles that fail initial tests. From this, Connecticut concludes that 24% of initially failing vehicles do not have a passing result or 2% of all vehicles tested do not have a passing result.

TABLE 7 - (A)(2)(VI) VEHICLES WITH NO FINAL PASS

Model Year	Cars			Light Trucks			ALL
	# Fail Initial Tests	# Pass Retests (Includes Waivers)	% of Initially Failed Vehicles with No Final Pass	# Fail Initial Tests	# Pass Retests (Includes Waivers)	% of Initially Failed Vehicles with No Final Pass	% of Initially Failed Vehicles with No Final Pass
1996	320	214	33.13%	445	215	51.69%	43.92%
1997	556	422	24.10%	602	422	29.90%	27.12%
1998	802	577	28.05%	719	544	24.34%	26.30%
1999	1,100	787	28.45%	937	688	26.57%	27.59%
2000	1,365	953	30.18%	1,077	858	20.33%	25.84%
2001	1,952	1,566	19.77%	1,852	1,461	21.11%	20.43%
2002	2,961	2,072	30.02%	2,837	2,102	25.91%	28.01%
2003	2,280	1,775	22.15%	2,457	1,928	21.53%	21.83%
2004	3,391	2,371	30.08%	4,138	3,089	25.35%	27.48%
2005	2,680	2,084	22.24%	2,818	2,306	18.17%	20.15%
2006	3,628	2,671	26.38%	3,390	2,545	24.93%	25.68%
2007	2,567	1,980	22.87%	2,253	1,765	21.66%	22.30%
2008	3,138	2,370	24.47%	2,945	2,138	27.40%	25.89%
2009	1,579	1,317	16.59%	1,219	937	23.13%	19.44%
2010	2,289	1,719	24.90%	1,958	1,475	24.67%	24.79%
2011	1,348	1,191	11.65%	1,530	1,289	15.75%	13.83%
2012	2,220	1,713	22.84%	2,217	1,690	23.77%	23.30%
2013	1,139	1,062	6.76%	873	774	11.34%	8.75%
2014	1,641	1,242	24.31%	1,856	1,403	24.41%	24.36%
2015	596	540	9.40%	685	622	9.20%	9.29%
2016	1,116	849	23.92%	1,420	1,074	24.37%	24.17%
2017	39	16	58.97%	42	20	52.38%	55.56%
ALL	38,707	29,491	23.81%	38,270	29,345	23.32%	23.57%

40 CFR 51.366 (a)(2): By model year and vehicle type, the number and percentage of vehicles:
(xi) Passing the on-board diagnostic check
(xii) Failing the on-board diagnostic check

Table 8 presents the percent of vehicles that pass or fail the on-board diagnostic (OBD) test. Due to more stringent readiness criteria starting with the 2001 model year, the failure rate jumps up that year. Testing data shows an overall OBD failure rate of 8.1% for passenger vehicles and 8.5% for trucks. These numbers are within normal failure rates, there are no outliers. Please reference Appendix A, (a) (2) (xi, xii) for specific data.

TABLE 8 - (A)(2)(XI, XII) PERCENT FAILING OBD TESTS (NETWORK TESTS) ALL FUELS

Model Year	% Fail Cars	% Fail Light Trucks	% Fail All
1996	13.98%	16.46%	15.01%
1997	16.24%	16.80%	16.50%
1998	17.07%	16.89%	16.99%
1999	18.62%	18.17%	18.42%
2000	21.20%	19.37%	20.41%
2001	25.37%	27.06%	26.13%
2002	18.46%	19.58%	18.97%
2003	19.25%	20.22%	19.71%
2004	15.03%	16.32%	15.69%
2005	17.11%	17.53%	17.31%
2006	12.19%	12.67%	12.41%
2007	12.35%	13.13%	12.70%
2008	8.57%	9.34%	8.93%
2009	8.74%	11.03%	9.61%
2010	5.65%	7.06%	6.22%
2011	6.34%	8.04%	7.14%
2012	4.10%	5.20%	4.58%
2013	5.63%	6.03%	5.80%
2014	2.73%	3.19%	2.96%
2015	3.88%	4.44%	4.16%
2016	1.83%	1.86%	1.85%
2017	1.92%	1.66%	1.77%
All	8.13%	8.50%	8.30%

40 CFR 51.366 (a)(2): By model year and vehicle type, the number and percentage of vehicles:

(xix) MIL is commanded on and no codes are stored

(xxi) MIL is commanded on and codes are stored

(xxii) MIL is not commanded on and codes are not stored

(xxiii) Readiness status indicates that the evaluation is not complete for any module supported by on-board diagnostic systems

MIL light illumination, or lack of readiness, results in an automatic failure of the I/M test. As such MIL "command on" and "not ready" status is reported. In 2020, 3.6% of the vehicles had MILs commanded-on with DTCs and 0.01% had MILs commanded on with no codes stored. In 0.11% of the tests, the test system could not communicate with the OBD system. Specific data can be found in Appendix A, (a) (2) (xix, xxi, xxii).

Overall, 5.2% of the vehicles had diagnostic monitors that were not ready on their initial test. Model year vehicles from 1996 to 2000 are allowed to have two monitors not ready; 2001 and newer models are allowed to have one monitor not ready. Due to the more stringent readiness requirement starting with 2001 model year vehicles (one monitor vs two allowed to be not ready), the percent of vehicles that are not ready increases for that model year. Specific data can be found in Appendix A, (a) (2) (xxiii).

40 CFR 51.366 (a)(3): The initial test volume by model year and test station

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

Appendix A, (a)(3&4) contains a breakdown of initial test volume and fail rate by model year and test station.

3.3. Inapplicable Requirements

The following requirements from 40 CFR 51.366 (a) regarding test data reports are not applicable to Connecticut's I/M program:

- 40 CFR 51.366 (a)(2)(xiii-xv)
- 40 CFR 51.366 (a)(2)(xvi-xviii)
- 40 CFR 51.366 (a)(2)(xx)
- 40 CFR 51.366 (a)(5)

4. Quality Assurance Report

4.1. Inspection Stations

40 CFR 51.366 (b)(1): The number of inspection stations and lanes:

- (i) Operating throughout the year
- (ii) Operating for only part of the year

Table 9 presents the number of inspection stations that operated in 2020.

TABLE 9 - (B)(1) QUALITY ASSURANCE 2020 – NUMBER OF INSPECTION STATIONS

	Beginning of Year	Left Program	Added to Program
No. of Inspection stations/lanes operating throughout 2020	219	10	9

4.2. Inspectors

40 CFR 51.366 (b)(5): The number of inspectors licensed or certified to conduct testing

Table 10 presents the number of certified test inspectors (CTIs) that were active in 2020.

TABLE 10 – (B)(5) QUALITY ASSURANCE – NUMBER OF CERTIFIED TEST INSPECTORS (CTIs)

Total CTIs Actively Testing Part of Year	411
Total CTIs Actively Testing All Year	527
Total CTIs Testing	938

4.3. Overt performance audits

40 CFR 51.366 (b)(2): The number of inspection stations and lanes operating throughout the year:

- (i) Receiving overt performance audits in the year
- (ii) Not receiving overt performance audits in the year

EPA requires that overt audits be performed twice per year per station. DMV meets these requirements through use of the Emission Test Monitoring Report (ETMR). Connecticut prepares ETMRs more frequently than required by EPA. Every two months, at least one ETMR is performed on each station. In addition, Applus also performs overt audits. Connecticut also checks more items than required by EPA, such as checking the operational status of test equipment and peripherals (e.g., cameras). Connecticut is continuing to evaluate the auditing process to build upon the program's success. Table 11 summarizes the results of overt performance audits.

TABLE 11 - (B)(2) QUALITY ASSURANCE 2020 – OVERT AUDITS -- 2020

Parameter	Left Program/Joined Program
Receiving overt performance audits in 2020	217
Not Receiving overt performance audits in 2020	1 ⁵
2020 Overt Audits - Emissions Test Monitoring Report (ETMR)	
<u>Parameter</u>	<u>2020 Value</u>
Total Overt Audits Performed	688
No. of Stations Audited	217
No. of Times Each Station Was Audited (range)	0 thru 6
No. of Stations That Had No Violations for the Entire Year	189
Total Number of Audits for which One or More Violations Were Reported	34
No. of stations at which violations were reported	28
No. of stations at which one (1) violation was reported	23
No. of stations at which two (2) violations were reported	5
<u>Motor Vehicle Agents</u>	<u>2020 Value</u>
No. of Agents That Performed Overt Audits During the Course of the Year	5
No. of Agents That Are No Longer Performing Overt Audits	2
No. of Agents That Are Currently Assigned to Perform Overt Audits	3
No. of Overt Audits per Agent (range)	94 to 247
No. of Station Issues Reported per Agent (range)	1 to 23

4.4. Digital Checks / Trigger audits / Camera / Video

Based on the results of trigger audits, Connecticut is a model for other states in how to enforce proper I/M test procedures. Connecticut actively looks for cases where inspectors may be performing improper inspections and passing vehicles that otherwise should fail. The following is a summary of how Connecticut ensures that stations perform proper inspections.

Trigger Audits

DMV and Applus run extensive trigger audits to assure that inspection stations follow proper test procedures. DMV requires Applus to maintain quality assurance measures, which they meet by conducting additional audits. Specifically, Applus performs a large number of digital audits and quality assurance reviews on a daily, weekly, and monthly basis. Many of the reports are automated by the Applus vehicle inspection database (VID), and distributed, via email, to DMV and Applus QA staff. In

⁵ One station left program before audit was performed. Another station changed names and was audited under new ownership.

addition, the reports are available on the program dashboard for review at any time, and they are available for any time frame.

Trigger audits look for anomalies in data recorded during inspection. Reporting the outcome of these audits help DMV to identify if stations are performing fraudulent or inaccurate inspections. Trigger audits focus on finding the following types of fraud:

- Clean Scanning: Performing an OBDII test on a fault-free vehicle instead of the vehicle that should be tested;
- Clean Piping: Performing a tailpipe test on a passing vehicle instead of the vehicle that should be tested.

These reports are generated frequently to identify stations performing improper inspections. Connecticut promptly investigates all significant cases of possible inspection fraud. Following is a list of some of the trigger reports:

- OBDII Testing Triggers:
 - PID/PCM Mismatch;
 - Monitor Mismatch;
 - All OBDII Monitors Unsupported;
 - A/C Monitor Ready or Not Ready;
 - OBDII Short Time Test, less than 30 minutes;
 - OBDII VIN Mismatch;
- ASM/PCTSI Triggers:
 - ASM Short Time Test, less than 30 minutes;
 - Looser ASM Cut Points;
 - Vehicles with GVWR greater than 8,500 pounds;
- Other Triggers:
 - VIN Entry Type;
 - Inspector ID Entry;
 - Offline Percentage;
 - RPM Bypass;
 - No Saturday/Holiday Testing; and
 - Missing Video/Test Image.

Applus' VID also generates the following automated alerts:

- Weather (temperature, humidity, pressure);
- EDBMS Offline;
- CDAS Offline;
- Test Center Not Testing; and
- Failed/Expired Calibrations Report.

A new quality assurance process was put in place to identify any station that either performs the minimum number of calibrations or fails to contact Applus for service when one of the calibrations fails. Each day, Applus performs a Failed/Expired Calibration Report to ensure that the entire network is in compliance with calibrations. Any test center with failed calibrations, no open service tickets, or with expired calibrations is immediately locked out to prevent use of the analyzer. This process was put in place to discourage test centers from waiting until a motorist arrives to complete the remaining calibration (PCTSI and opacity tests).

Special Triggers for Diesel Opacity Tests

No vehicles were tested with the LMD test so evaluation for triggers for diesel opacity tests are no longer necessary.

Camera Audits

There are three video cameras connected to the emissions analyzer. If anyone of them fail or are unplugged, the emissions analyzer will set a lockout to prevent the use of the workstation. In addition, the Applus VID will generate a non-compliance report for any emissions test transmitted with a missing test and video file. However, during the normal operations at the test centers, cameras may become misaligned or obstructed. Using the program dashboard, Applus and DMV perform camera audits of all three cameras, at each test center. Each camera is turned on to ensure it operates as it should, the viewing angle is verified with no obstructions and a test video is recorded. If an issue is identified that requires an onsite visit at the test center, a service ticket is generated and dispatched to the Applus field service. In 2020, Applus performed 1,890 test center camera audits. DMV audits the cameras when it performs a video audit. In 2020, 44 service tickets were opened to address alignment/refocusing issues.

Fraudulent Test Rate

A key parameter that's recorded during an OBD test is the OBD VIN – the vehicle identification number (VIN) that's part of the OBD test record. The percent of tests in Connecticut where the OBD VIN did not match the DMV VIN for the vehicle under test was calculated to be 0.03%. This mismatch could be due to clean scanning (substituting a problem free vehicle for the vehicle under test), changing the vehicle's onboard computer, or a data entry error in the DMV VIN. Connecticut has historically had low VIN mismatch rates and no individual stations in Connecticut had high OBD VIN mismatch rates.

Not all vehicles provide OBD VINs as part of the test record, so mismatches between expected and recorded communication protocol were also analyzed. OBD systems can use one of seven protocols; tests where the recorded protocol mismatches expected protocol are considered suspect. Only 0.03% of the tests (91 tests⁶) are suspect in Connecticut. No stations had high protocol mismatch rates.

This analysis indicates that inspection fraud is not a serious problem in Connecticut.

4.5. Covert audit process overview

EPA requires that covert audits be performed at least once per year per station. The requirements and frequency for covert audits are detailed in 40 CFR 51.363(a)(4) and include remote visual observation of inspector performance, site visits using covert vehicles, and documentation of the audits. DMV performs video surveillance audits on a periodic and random basis. It's easier to perform video audits

⁶ These fraudulent test statistics are based on an analysis dKC performed on the 2020 dataset. Evaluation of Connecticut's Inspection/Maintenance Program
2020 Annual Report

clandestinely, since the inspector usually does not know an audit is being performed. During 2020, DMV performed 505 covert audits and 2,573 video surveillance audits.

Warnings are routinely issued for false passes if DMV finds that the CTI did not intentionally or negligently falsely pass a vehicle. Suspensions are usually associated with violations found from trigger reports and data audits. Most false passes are for minor procedural errors, such as failing to perform the visual MIL check correctly. Unless the station repeats these errors, they are issued warnings rather than being suspended.

As stated in the Applus contract, and in the Applus Station Agreement, a CTI is suspended (pending an investigation) when it is determined that the false pass was the result of “Intentionally improperly passing a failing vehicle.” Most errors identified by covert and video surveillance audits were determined to be unintentional and due to poor attention to detail. However, a second occurrence of an unintentional error, such as missing or incorrectly answering the MIL question, results in an automatic suspension.

4.6. Covert audit results

40 CFR 51.366 (b)(8): The total number of covert vehicles available for undercover audits over the year;
(b)(9): The number of covert auditors available for undercover audits.

40 CFR 51.366 (b)(2): The number of inspection stations and lanes operating throughout the year:
(iii) Receiving covert performance audits in the year;
(iv) Not receiving covert performance audits in the year;

40 CFR 51.366 (b)(3): The number of covert audits:
(i) Conducted with the vehicle set to fail per test type
(ii) Conducted with the vehicle set to fail any combination of two or more test types
(iii) Resulting in a false pass per test type
(iv) Resulting in a false pass for any combination of two or more test types

Table 12 summarizes the results of covert performance. Table 13 presents the results of video audits. Video audits identify a lot more test discrepancies than covert audits.

Appendix B page (b)(3) contains a list of covert audits performed on each station.

TABLE 12 - (B)(2)(III, IV) & (3,8,9) QUALITY ASSURANCE – COVERT AUDITS – 2020

No of Inspection stations/lanes operating throughout 2020: (219 stations)*	OBD and PCTSI****	OBD Tests	ASM Tests	TSI Tests	LMD Tests	MSA Tests
Stations receiving Covert Audits (214)	408	210	n/a for 2020	198	5	45
Not Receiving Covert Audits (5)*	12 stations	7 stations	n/a for 2020	10 stations	2 stations	
Conducted with vehicle set to fail***	257	40	n/a for 2020	217	-	-
Conducted with vehicle set to fail any combination of two or more types	n/a	n/a	n/a for 2020	n/a	n/a	n/a
Resulting in a False Pass	11	10	n/a for 2020	1	0	0
Resulting in a False Pass for any combination of two or more test types	n/a	n/a	n/a for 2020	n/a	n/a	n/a
Total number of Covert vehicles available for undercover audits in 2020	5	-	n/a for 2020	-	-	
Total number of Covert auditors available for undercover audits in 2020	6	-	n/a for 2020	-	-	
* (5) Stations had left program and had (0) coverts audited. Additionally (7) other stations did not have one type of covert completed, for total of (12) stations						
**(47) of the recorded Covert visits did not result in generating a Pass/Fail test result for the vehicle presented.						
*** (3) vehicles set to fail for emissions test, they were used in a total (257) tests. (aborts and turn aways not counted as a test, due to no official Pass/Fail test record was created.)						
**** (408) count is the total of "Pass" and "Fail" <u>tests</u> recorded for the covert vehicles in 2020, excluding diesel tests (50 diesel)						

TABLE 13 - 2020 VIDEO SURVEILLANCE RESULTS

# of Video Audits	Passing audit	Failing Audit
2573	2217	356

4.7. Inspector and Station Disciplinary Actions

40 CFR 51.366 (b) (4): The number of inspectors and stations:
(i) That were suspended, fired, or otherwise prohibited from testing as a result of covert audits
(ii) That were suspended, fired, or otherwise prohibited from testing for other causes

40 CFR 51.366 (b) (2): The number of inspection stations and lanes operating throughout the year
(v) That have been shut down as a result of overt performance audits

Table 14 presents the number of suspensions that resulted from covert audits. “Other” reasons for station suspensions include:

- Failing to meet calibration requirements,
- Insurance/DMV license issues
- Failing to comply with compliance assessments (payment)
- Administrative issues such as failure to settle financial responsibilities, and unable to reach the responsible station representative

“Other” reasons for inspector suspensions include:

- Failing to comply with compliance assessments (payment)
- DMV request/Inspector investigation

Table 15 presents the number of suspensions that resulted from overt audits.

TABLE 14 - (B)(4)(i & ii) QUALITY ASSURANCE – COVERT AUDITS -- SUSPENSIONS

Parameter	Stations	Inspectors
Suspended as a result of covert audits	0	0
Suspended as a result of video audits	0	1
Suspended for other reasons	196	7

TABLE 15 - (B)(2) QUALITY ASSURANCE – OVERT AUDITS -- SUSPENSIONS

Parameter	#
Receiving overt performance audits in 2020	217
Not Receiving overt performance audits in 2020	1
That have been shut down as a result of overt performance audits	0

4.8. Hearings

40 CFR 51.366 (b) (6): The number of hearings:
(i) Held to consider adverse actions against inspectors and stations
(ii) Resulting in adverse actions against inspectors and stations

When necessary, Applus administers hearings to resolve disputes regarding actions against inspection stations. In 2020, no hearings were held due to revision of the Compliance Action Plan in 2017. The 2017 revision added language to help resolve disputes where there was no sufficient explanation or substantive evidence, such as claims of “human error”, “can’t afford to pay”, “sorry”, “never do it again”

and simply stating “I dispute this.” Monetary assessments are based on substantive evidence, which Applus provides with the inspector’s and test center’s letters. This has helped to reduce the frivolous disputes. All rejected disputes are advised that they may seek external binding arbitration, at her or his expense.

4.9. Fines collected

40 CFR 51.366 (b)(4)(iii): The number of inspectors and stations... that received fines;

40 CFR 51.366 (b)(7): The total amount collected in fines from inspectors and stations by type of violation

Table 16 presents a summary of compliance actions that were assessed against inspectors and stations in 2020.

TABLE 16 - (b)(4), (7) COMPLIANCE ACTION ASSESSED AGAINST TESTING INSPECTOR OR STATIONS IN 2020

Inspector Violations	Occurrences	Assessment Amount
Performing an improper inspection (failed verification of the MIL light, wrong GVWR resulting in the wrong test, converter/RPM verification, dual exhaust, etc.)	58	\$8,300
Failure to enter correct test or repair data (wrong VIN entries, or other vehicle information or wrong vehicle tested)	37	\$6,125
Improperly or intentionally passing a failing Vehicle (ghost testing)	1	\$500
Total	96	\$14,925
Station Violations	Occurrences	Assessment Amount
Failure to comply with DMV direction regarding Test Center Standards (Calibration issues, failed to calibrate, modifying expiration dates, parking signs, viewing monitor, etc.)	12	\$4,700
Improper refusal to perform an inspection	10	\$1,600
Sale and/or marketing of non-emissions related product or service	3	\$375
Creating a false test record (ghost testing)	1	\$500
Failure to maintain service during mandatory operating hours (identified via covert audit)	1	\$125
Total	27	\$7,300

4.10. Inapplicable Requirements

The following requirements from 40 CFR 51.366 (b) regarding data analysis and reporting are not applicable to Connecticut’s I/M program:

- 40 CFR 51.366 (b)(3)(ii)
- 40 CFR 51.366 (b)(3)(iv)
- 40 CFR 51.366 (b)(4)(iii)
- 40 CFR 51.366 (b)(6)
- 40 CFR 51.366 (b)(7)

5. Quality Control Report

5.1. Equipment Audits

40 CFR 51.366 (c): The program shall submit to EPA by July 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;
- (2) The number of equipment audits by station and lane;
- (3) The number and percentage of stations that have failed equipment audits; and
- (4) Number and percentage of stations and lanes shut down as a result of equipment audits.

Equipment Audits Performed by Connecticut DMV

EPA requires that equipment audits be performed twice per year per station. DMV meets these requirements through the QA Audits. In addition, Applus also performs equipment audits. Connecticut checks more equipment items than required by EPA. While an audit may require a station to discontinue tailpipe testing, it can continue OBDII testing. Therefore, no stations were totally shut down due to a failed gas equipment audit. Results are presented in Table 17. In 2011, 67% of the stations failed equipment (gas) audits, while in 2020 this percentage dropped to 18%. The drop is likely due to the roll out of new, more reliable emission test benches in 2012. Appendix B, page “(c)(1,2,3,4)” contains results of equipment audits of each inspection station.

TABLE 17 – (C)(1,2,3,4) RESULTS OF EQUIPMENT AUDITS*

Parameter	2020 Result
No. of Inspection stations/lanes operating throughout 2020	219
Total Equipment Audits**	428
Total Stations that Failed Equipment Audit ***	78
Percentage of stations that failed an equipment (gas) audit	18.22%
Number of stations totally shut down as a result of a failed equipment (gas) audit	0
Percentage of stations shut down as a result of failed equipment (gas) audit	0.00%

* Every time an analyzer gas bench is changed, it is audited and is counted as an initial audit

** Initial gas audits only, not reinspections of failed audits

*** Failures of initial gas audits only

Final Technical Guidance (EPA 420-B-04-011, July 2004) provides that high-volume stations are required to be audited monthly. High volume stations are those that perform 4,000 or more emissions tests per year. The Connecticut Vehicle Inspection Program, by Federal guidance, does not have any emissions testing stations that perform the number of emissions tests necessary to be classified as high volume.

Equipment Audits Performed by Applus

DMV’s contractor, Applus, performs comprehensive overt and equipment audits biennially, at each facility that participates in the inspection program. These unannounced audits include:

- The visual inspection and physical condition of the testing equipment;
- Equipment integrity checks using traceable/certified audit equipment; and

- Observation of the proficiency of at least one inspector.

The contractor's auditor evaluates the physical condition, functionality, and inventory of all the required emissions components and any ancillary safety items (restraining straps, wheel chocks, dynamometer tie down hooks, etc.). The emissions analyzer must pass calibrations (leak check, gas bench, dynamometer, gas cap, OBDII, and opacity, if equipped).

In addition, there are several system components that are audited using National Institute of Standards and Technology (NIST) certified and traceable audit equipment:

- Gas Bench(s) Audit – NIST traceable audit gas
- Weather Station Audit - Certified temperature/humidity/pressure probes
- Opacity Audit - Reference filters (20%, 35%, 50%, and 75%)
- OBDII System Audit – EASE OBDII Verification Tester

In accordance with the Quality Assurance and Quality Control Plan, the contractor's auditor uses a pre-printed checklist to inventory and record the physical condition of the test equipment. All non-conforming items are addressed immediately; the auditor's van is equipped to replace missing station inventory at the time of the audit. If an issue is identified that cannot be addressed by the auditor, he or she will create a service ticket for Applus field service.

6. Enforcement Report

6.1. Overview of I/M Enforcement in Connecticut

The Connecticut Integrated Vehicle and Licensing System (CIVLS), which has been in use since August 2015, checks for emissions compliance during every registration renewal transaction. This means that if the renewal is attempted by mail, website, or in person, the transaction cannot go forward unless the vehicle is in compliance with the emissions program. Compliance is confirmed during every renewal transaction via a real time data transfer from DMV CIVLS to the Applus Electronic Database system (EDBMS). Details of web, mail-in, and over the counter actions are presented below:

Mail in renewals: When a mail-in renewal is denied because of an emissions compliance issue, the registration fees are put into an escrow account. The motorist is mailed a letter stating that the payment has been received, but the transaction cannot be processed until the vehicle is emissions compliant. Once the vehicle has an emissions test and is in compliance, the funds are automatically taken out of escrow and the registration is renewed.

Web renewals: If the vehicle is not in compliance when a renewal is attempted online, the transaction is stopped and the motorist receives a screen message stating the vehicle is not emissions compliant.

In-Person renewals: Renewals are not allowed if, during the automatic compliance check, the status of the vehicle is that it is "not in emissions compliance." Registration renewal is rejected and the customer is instructed to return after the vehicle is in compliance.

Before implementation of CIVLS the DMV examiner physically reviewed electronic records or paperwork provided by the motorist to confirm compliance.

6.2. Vehicles subject to inspection

40 CFR 51.366(d)(1)(i): An estimate of the number of vehicles subject to the inspection program, including the results of an analysis of the registration data base

Based on an analysis by DMV on the registration database, 1,225,284 vehicles were subject to I/M tests in 2020. This number includes vehicles that may no longer be operating in Connecticut.

6.3. Overall compliance with testing requirements

40 CFR 51.366 (d)(1)(ii): The percentage of motorist compliance based upon a comparison of the number of valid final tests with the number of subject vehicles

Percent of Vehicles Receiving Notifications That Were Tested

Table 18 presents the number of vehicles that received test notifications and the number of vehicles that were tested. Overall, 81% of the vehicles that received notifications were tested in 2020. This means that 19% of the vehicles subject to testing are no longer registered in Connecticut or are operating with expired registrations, since a vehicle must pass inspection (or receive a waiver) before it can be registered in the state. This parameter (81%) is different than the program compliance rate which is based on outcomes of vehicles that have been tested.

TABLE 18 - (D)(1)(II) ESTIMATED % OF VEHICLES SUBJECT TO I/M THAT WERE TESTED

Parameter	2020 Value
# of Notification Letters	1,225,284
# of Vehicles Tested	988,271
% of Notifications that were tested	81%

Percent of Failed Vehicles That Ultimately Pass

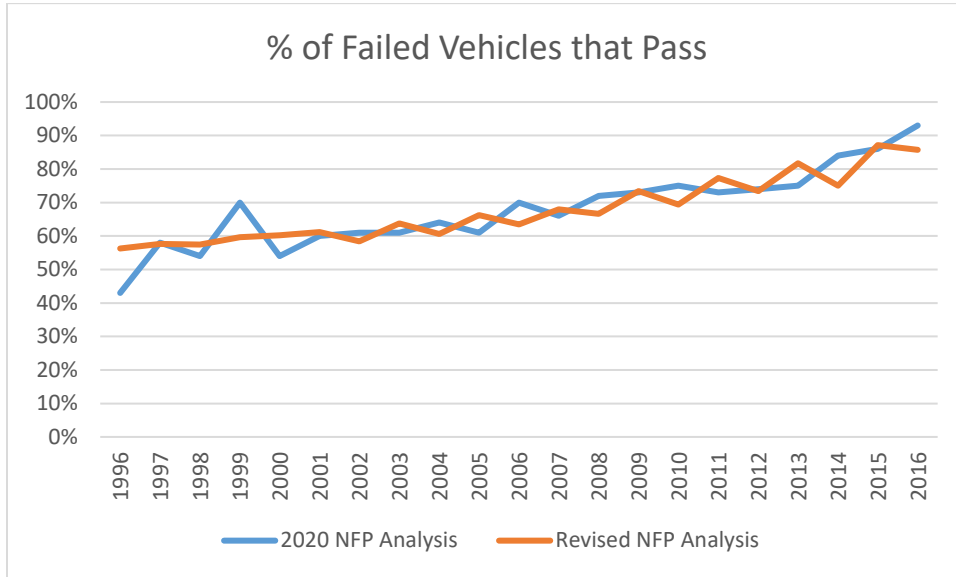
To estimate whether vehicles that failed their emissions test ultimately pass, this report analyzed the outcome of vehicles that failed their I/M test in 2020. EPA refers to vehicles that fail and never pass as no final pass or NFP. As Connecticut has done in previous reports per EPA recommendations, these results are calculated as the percentage of vehicles that initially failed and do not receive a final pass. Subject vehicles that failed the I/M test in January 2020 were tracked through December 31, 2020 to determine their final outcome. 32% of the failures during this period had not yet received a passing result or waiver. Results are shown in Table 19. Table 7 (presented in Section 3) indicates that the number of vehicles that do not pass after initially failing equals 24% of the number that initially fail. Table 7 more accurately reflects the “no final pass” rate since it does not have a time constraint.

In May 2020, EPA released revised guidance on how to calculate the percent NFP. EPA wants states to track vehicles that fail in a given year through that year and the first 4 months of the next year. EPA will not require this analysis until the 2022 report is due. To investigate the impact on the percent NFP, dKC calculated the percent NFP for vehicles that failed in 2019 based on vehicles that passed in 2019 and the first 4 months of 2020. This analysis resulted in a percent NFP rate of 34% vs 32% calculated above. As shown on Figure 3, results by model year are very similar.

TABLE 19 - VEHICLES TESTED JANUARY 2020 WITH NO FINAL PASSING RESULT

Model Year	Initial Fail	Final Retest Pass	% No Final Pass
1996	58	25	43%
1997	150	87	58%
1998	158	86	54%
1999	257	180	70%
2000	269	145	54%
2001	444	265	60%
2002	375	229	61%
2003	464	282	61%
2004	703	451	64%
2005	589	359	61%
2006	636	445	70%
2007	523	345	66%
2008	522	374	72%
2009	308	224	73%
2010	375	280	75%
2011	326	239	73%
2012	273	201	74%
2013	261	196	75%
2014	244	204	84%
2015	188	161	86%
2016	302	280	93%
Grand Total	7425	5058	68%

FIGURE 3 – PERCENT OF FAILED VEHICLES THAT PASS



Waivers Issued

Another aspect related to enforcement is the number of waivers issued. Program effectiveness is inversely proportional to the waiver rate. As Table 6 in Section 3 showed, only 0.08% of the vehicles that failed received waivers, indicating that the waiver program is not being abused. Connecticut’s I/M SIP committed to a waiver rate of 1% or less.

6.4. Registration File Audits and Compliance with Deadlines

40 CFR 51.366 (d)(2)(ii): The number of registration file audits, number of registrations reviewed, and compliance rates found in such audits.

Connecticut’s SIP commits the State to achieve a 96% compliance rate for the vehicles subject to I/M requirements. Registration audits indicate that over 98% of the vehicles being registered comply with I/M requirements.

Registration Audits

Connecticut audits each registration for I/M compliance. Table 20 presents the number of registration applications that were mailed to DMV that were denied for failure to meet the requirement of the I/M program. In 2020, 523,836 renewal applications were sent to DMV and 6,785 were denied due to I/M compliance status. The result is a 98.7% compliance rate for vehicles that are being registered. These compliance rates are similar to those reported in previous years’ reports. Ultimately, 100% of the vehicles registered comply with I/M requirements.

TABLE 20 - (D)(2)(II) REGISTRATION AUDITS -- 2020

Registrations Checked	Denied Registration Renewal Count	Percent of Mail In Registrations that Comply
523,836	6,785	98.70%

6.5. Motorist Time extensions

40 CFR 51.366 (d)(1)(v): The number of time extensions and other exemptions granted to motorists

Table 21 presents the number of time extensions and late fee assessments in 2020. Table 22 presents a breakdown of tests relative to testing deadlines.

TABLE 21 - (D)(1)(V) TIME EXTENSIONS AND LATE FEES

Parameter	Annual Total
Time Extension and Other Exemptions	1,773
# of Late Fees Assessed	53,016
Late Fees (\$)	\$1,060,320

TABLE 22 - (D)(3)(I). # AND % OF SUBJECT VEHICLES THAT WERE TESTED BY THE INITIAL DEADLINE*

Deadline	# of Vehicles	% of Vehicles
On Due date	14,911	1.83%
Tested Early	615,232	75.61%
1-30 days late	51,308	6.31%
31-60 days late	22,332	2.74%
61-90 days late	10,476	1.29%
91-120 days late	5,915	0.73%
> 120 days late	93,532	11.49%

* Figures based on 'Noticed' vehicles/tested and passed volume of 813,706

6.6. Station Compliance Documents

40 CFR 51.366 (d) (1) (iii): The total number of compliance documents issued to inspection stations
(iv) The number of missing compliance documents

The Compliance Action Plan (CAP) was updated and issued to all active inspection stations in 2020.

6.7. False registrations

40 CFR 51.366 (d)(2) Registration denial based enforcement programs shall provide the following additional information:
(i): Registration denial based enforcement programs shall provide 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
(ii): The number of registration file audits, number of registrations reviewed, and compliance rates found in such audits

Preventing Circumvention of Connecticut's, I/M Requirement

EPA requires states to implement measures that prevent motorists from avoiding I/M requirements by falsely registering vehicles out of the program area, or falsely changing fuel type or weight class on the vehicle registration. EPA also requires states to report on results of special studies to investigate the frequency of such activity. As shown below, it's very difficult for vehicle owners to circumvent Connecticut's I/M requirements.

- **Circumventing I/M Tests in Connecticut** – Circumventing I/M tests in Connecticut is nearly impossible. First, Connecticut implements the I/M program on a statewide basis. Second, Connecticut tests all fuel types, including hybrids, so motorists cannot avoid inspection by changing fuel type, unless the fuel type of the vehicle is inadvertently categorized as “electric”. It may also be possible to avoid inspection by registering the vehicle with a GVWR greater than 10,000 lbs. The majority of vehicles registered with an incorrect GVWR are those where the vehicle owner registers the vehicle at a lower weight to avoid the added registration expense and would not be emission eligible (>10,000 lbs.) with their corrected weight.
- **Detection and enforcement against motorists that falsely change vehicle classifications to circumvent program requirements** – Historically, 99% of the vehicles subject to emissions testing in Connecticut are in the Passenger, Commercial or Combination classifications. Incidents of motorists falsely modifying a vehicle's registration classification to an emissions exempt class are rare, most likely because of the added expense, documentation and inspection requirements.
- **Vehicles registered in Connecticut that are operated out-of-state** – DMV does not allow blanket extensions for vehicles registered in Connecticut that are operated out-of-state. Vehicles that are out-of-state at the time they are due for their emissions testing are allowed to apply for an extension. Applicants need to provide evidence that the vehicle is physically not present in Connecticut. This is done by means of a VIN verification form (CT form #AE-81) being completed by a law enforcement authority in the state where the vehicle is physically located. This completed VIN verification form along with a written request by the motorist is submitted to our office for processing for the appropriate time extension. Additionally, DMV accepts passing emission test results from states that operate an I/M program using the same pass/fail criteria.

As noted above in Section 6.4, Connecticut reviews every registration application for evidence that the motorist complies with inspection requirements. In 2020, 523,826 renewal applications were sent to DMV and 6,785 were denied due to I/M compliance status. This means that 98.7% of the registration requests complied with I/M requirements when mail renewals were processed. These compliance rates are similar to those reported in previous year's reports.

6.8. Inapplicable Requirements

The following requirements from 40 CFR 51.366 (d) regarding enforcement reports are not applicable to Connecticut's I/M program:

- 40 CFR 51.366 (d)(1)(vi)
- 40 CFR 51.366 (d)(3)

- 40 CFR 51.366 (d)(4)

7. Program Changes in 2020

On January 16, 2020, the State of Connecticut DMV in partnership with DEEP tendered a Request for Proposals (RFP) seeking to contract with an experienced and qualified vendor to provide, implement and manage the Connecticut Vehicle Inspection Program (CTVIP). The deadline for contractors to submit a written response was March 11, 2020. As a result of this procurement, DMV entered into a contract with Opus Inspection.

The following changes and improvements were implemented in 2020:

7.1. Test Type Changes: ASM testing expired, Dynamometers no longer used in the program,

On January 1, 2020, ASM testing expired when model year 1995 vehicles became exempt from testing. At this same time, medium-duty vehicles became subject to new emissions testing requirements replacing the Loaded Mode Diesel (LMD) opacity test with the On-Board Diagnostics Second Generation (OBD II) or Modified Snap Acceleration (MSA) opacity test. The following medium-duty vehicles with a GVWR between 8,501 LBS to 10,000 lbs. became subject to the more comprehensive OBD II test:

- 2007 or newer diesel-powered vehicles; and
- 2008 or newer non-diesel vehicles (Gasoline, Compressed Natural Gas (CNG), Liquid Propane Gas (LPG), Ethanol and Methanol).

These changes eliminated the need for dynamometers in the program. To facilitate the transition of these changes, testing software and training material were upgraded. Notices were sent to all test facilities in 2020. Applus Technologies Inc. removed dynamometers from test facilities. Test facilities had the option to retain their dynamometer and obtain ownership at no cost. Additionally, posters and program literature notifying the public were made available at all test facilities. An example poster is shown below:

Medium-Duty Vehicles Subject to New Emissions Testing Requirements

Some medium-duty vehicles (trucks, vans, larger SUVs) with the Gross Vehicle Weight Rating (GVWR) between 8,501 LBS to 10,000 LBS will be subject to new testing requirements based on the model year and fuel type.

On-Board Diagnostic (OBD) Test

Beginning in 2020, vehicles with the GVWR between 8,501 LBS to 10,000 LBS will be subjected to the enhanced OBD test. These vehicles include:

- 2007 or newer Diesel-powered vehicles
- 2008 or newer Non-Diesel vehicles (Gasoline, Compressed Natural Gas (CNG), Liquid Propane Gas (LPG), Ethanol and Methanol)

The OBD system in your vehicle continuously monitors the electronic sensors and emissions control systems, including the catalytic converter, while the vehicle is being driven to ensure they are working as designed. When a potential problem is detected, a dashboard warning light called a malfunction indicator light (MIL) illuminates to alert the driver of a problem.



An OBD emission test provides a more comprehensive picture of a vehicle's emissions status because it evaluates emissions control systems during everyday driving conditions, whereas a tailpipe test measures emissions only at a particular moment in time.

Medium-duty vehicles with the GVWR between 8,501 LBS to 10,000 LBS (2007 or newer Diesel-powered and 2008 or newer Non-Diesel vehicles) are equipped with an OBD system and can receive the more comprehensive OBD emissions test.

Older Medium-Duty Vehicles with the GVWR between 8,501 LBS to 10,000 LBS

2006 and older diesel-powered vehicles will continue to receive a test that utilizes an opacity meter, which measures the smoke density emitted from the vehicle's tailpipe.

2007 and older non-diesel vehicles will continue to receive a test that measures tailpipe emissions.

Where do I find the GVWR?

The GVWR weight rating is listed on the manufacturer's vehicle identification label, usually located on the drivers' door jam or on the drivers' door itself.

If you need assistance finding your GVWR or have any questions related to the Connecticut emissions program please call the motorist hotline at 1-888-828-8399.



1-888-828-8399
www.ctemissions.com



7.2. COVID-19 Response

Connecticut's I/M program adapted to operating during the COVID-19 pandemic. Although time extensions were issued, the I/M program remained operational throughout the entire year.

- State and Federal safety and social distancing guidelines were followed by all stakeholders such as the DMV, contractor, test facilities, testing inspectors and the public.
- DMV office seating was rearranged to allow for 6 feet between each workstation. Some DMV personnel worked from home to allow for this.
- No late fee collection.
- More frequent testing inspector training and re-certification classes. Class size was limited to 5 students.
- Stations were restricted to test by appointment only.
- Contractor provided guidance reminders to test facilities on work safety and testing during the pandemic.
- Time extensions of testable vehicles due to COVID-19 offered as per the following schedule.

Date	Action
3/20/2020	All vehicles with I/M dates that expired on March 10, 2020 through June 30, 2020 were extended 90 days
5/15/2020	All vehicles with I/M dates that expired on March 10, 2020 through June 30, 2020 were extended 180 days
6/17/2020	All vehicles with I/M dates that expired on July 1, 2020 through July 31, 2020 were extended 90 days
7/15/2020	All vehicles with I/M dates that expired on August 1, 2020 through September 31, 2020 were extended 90 days

8. EPA Comments

The following addresses EPA's comments in a letter dated May 15, 2021 on Connecticut's 2019-2020 Biennial I/M Program Evaluation Report:

- 1) EPA encourages states to improve I/M program performance by reducing the number of vehicles with no known final outcome. On Table (a)(2)(vi) of the 2016-2017 biennial report's Appendix B, Connecticut illustrates that over 23% of initially failed vehicles have no known final outcome. EPA continues to be concerned with I/M programs where the percentage of initially failed vehicles with no known final outcome exceeds the national average. Historically, the national average of initially failed vehicles with no known final outcome was about 12%. However, as EPA continues its analysis of I/M programs nationwide, it is likely that the national average is about 18%.

EPA recommends that states with I/M programs consider developing a Vehicle Identification Number (VIN)-based database for vehicles that fail an I/M test and do not receive a final

pass. This data may already exist and would just need to be filtered from the inspection database appropriately. EPA has suggested Connecticut explore sharing this data with other states. Potential reciprocity agreements allowing the sharing of such data among states may further reduce the number of vehicles with no known outcome.

- a. **Response:** Connecticut lacks the resources to identify vehicles that are registered out-of-state due to emissions non-compliance. Connecticut looks forward to EPA's leadership in developing partnerships with other jurisdictions to improve the program by addressing regional I/M non-compliance.
- 2) EPA wants to make Connecticut aware of EPA's annual reporting guidance released in 2020.⁷ While EPA will not apply this guidance for this year, EPA will review reports submitted in July 2022 to ensure conformance with this guidance.
- a. **Response:** Connecticut is aware of the EPA guidance and has reviewed this report with those requirements in consideration. Connecticut anticipates that the majority of these requirements will be met in this report and will work with CT DMV and the emissions contractor to ensure the report submitted in July 2022 will meet all requirements.

⁷ <https://www.epa.gov/state-and-local-transportation/vehicle-emissions-inspection-and-maintenance-im-policy-guidance-and>
Evaluation of Connecticut's Inspection/Maintenance Program
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9. Conclusions

Following are the key conclusions from this annual review of Connecticut's I/M program:

- Connecticut's I/M program correctly fails non-complying vehicles and strictly enforces I/M requirements:
 - Approximately 8.4% of vehicles failed their initial emissions test and 9.5% of these vehicles also failed their first retest in 2020. This is similar to failure rates in 2019.
 - DMV and Applus perform extensive quality assurance checks on the program. Evaluation of these quality assurance data demonstrates that the program performs accurate inspections.
 - Connecticut's anti-fraud efforts are models for other I/M programs. Connecticut conducted audits at all stations as part of an extensive anti-fraud program. For example, Connecticut conducted 2,573 video surveillance audits and 505 covert audits during 2020. Covert audits addressed On-Board Diagnostics (OBDII), Acceleration Simulation Mode (ASM) and Pre-Conditioned Two Speed Idle (PCTSI) inspection performance. In addition, DMV and Applus run extensive trigger reports.
- As noted in Section 7, in 2020 Connecticut tendered a procurement for new I/M contract.