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Biennial Report: 2016-2017

Massachusetts Enhanced Emissions and Safety Test Inspection and Maintenance Program

April 29, 2019

BIENNIAL REPORT
MASSACHUSETTS ENHANCED EMISSIONS AND SAFETY TEST
INSPECTION AND MAINTENANCE PROGRAM
2016-2017

1. Introduction

The Massachusetts Department of Environmental Protection (MassDEP) has prepared this report for the U.S. Environmental Protection Agency (EPA) in compliance with the requirements of 40 CFR 51.366 (e). The information in this report covers the reporting period of calendar years 2016 and 2017, and supplements the program information that is contained in the 2016 and 2017 Annual Reports (these reports are available on the Mass Vehicle Check Program web site: *https://www.mavehiclecheck.com/motorists-resources*).

The Massachusetts Inspection and Maintenance (I&M) Program is an important tool for improving air quality in the Commonwealth. The program also ensures that Massachusetts cars are safe to drive. The program was established in M.G.L. c. 111, §§142J and 142M, c.21A, §§2(28) and 16, and c. 90, §§7A, 7V, 7W, 7X, 7Y, 7Z, 20 and 31. Implementing regulations were initially adopted in January 1999 by MassDEP at 310 CMR 60.02, and the Massachusetts Department of Transportation's Registry of Motor Vehicles Division (RMV) at 540 CMR 4.00-4.09.

The Massachusetts I&M Program is designed to balance three goals:

- *Pollution reductions* - Vehicles with high emission levels (or in unsafe operating condition) must be identified and repaired using test equipment appropriate for today's high-tech vehicles.
- *Motorist convenience* – The test must be as convenient as possible for Massachusetts motorists.
- *Fitting in with the automotive service industry* – Attractive business opportunities must be provided to the program's private sector partners: the inspection stations and repair shops that test and fix vehicles.

MassDEP and RMV (the Agencies) jointly administer the Massachusetts Vehicle Check Program. In January 2008, the Agencies contracted with Parsons Environmental & Infrastructure Group Inc. (Parsons or Contractor) to manage and implement the I&M Program. This contract ended September 30, 2017. In November 2016, the Agencies contracted with Applus Technologies (Applus or Contractor) to manage and implement the program starting on October 1, 2017. Contractor responsibilities include developing and managing the Inspection Station network; developing and implementing inspection protocols; and acquiring, providing, and maintaining inspection station workstations and data systems. The Contractor also trains inspectors and repairers and provides communications to the public, inspectors, and repairers. Emissions and safety inspections are performed through a decentralized network of public inspection stations. Inspection stations and individual inspectors are licensed by RMV. This network is supplemented by stations that are specially licensed to conduct inspections for vehicle fleets.

Since October 1, 2008, the program has employed only on-board diagnostic (OBD) testing for all vehicles required to receive an emissions test, with the exception of diesel vehicles with a Gross Vehicle Weight Rating (GVWR) greater than or equal to 10,000 pounds that are not equipped with OBD. These diesel vehicles receive an opacity test.

To help motorists whose vehicles need emissions repairs, the program includes a network of registered repair technicians who are specially trained to diagnose emissions problems and repair modern vehicles effectively. The Program provides waivers of emission standards if some repairs are completed by a registered repairer, the repair expenditures exceed program requirements, and certain other conditions are met.

For vehicles that failed the emissions test and require replacement of a major (and expensive) component(s) to pass, a one-time economic hardship exemption is available that gives the vehicle owner one year to finance repairs or replace the vehicle.

Table 1 provides statistics describing the Massachusetts Inspection and Maintenance Program "at a glance" in 2016 and 2017.

Table 1: Summary Statistics: Massachusetts Inspection and Maintenance Program 2016 and 2017

	PROGRAM COMPONENT	2016 TOTAL	2017 TOTAL
Vehicles and Inspections	Number of vehicles in the Massachusetts fleet	4.96 million	5.03 million
	Number of unique vehicles tested for safety or for safety and emissions	4,772,285	4,786,557
	Number of unique vehicles receiving an initial emissions test	3,688,060	3,723,384
	Types of emissions tests: OBD	97.5%	97.5%
	Opacity	2.5%	2.5%
	Non-diesel vehicles (e.g. gasoline, natural gas, etc.): • Number that received initial OBD emissions tests	3,557,832	3,597,990
	Number that failed initial OBD emissions tests	186,477 (5.2%)	181,322 (5.0%)
	Diesel vehicles: • Number that received initial OBD emissions tests	37,497	32,822
	• Number that failed initial OBD emissions test	3,805 (10.1%)	4,028 (12.3%)
	• Number that received initial opacity tests	92,731	93,771
	• Number that failed initial opacity emissions test	1,515 (1.6%)	1,151 (1.2%)
	Number of Waivers issued	5	2
	Number of Economic Hardship Extensions issued	31	14
	No Known Outcome Number of non-diesel vehicles that failed an initial OBD test and did not pass a subsequent retest or obtain a waiver or an economic hardship extension by June 5, 2018[1]	26,792	21,565
	Percent of non-diesel vehicles receiving an initial OBD test with no known outcome	0.8%	0.6%

[1] Vehicles taken off the road have a "known outcome." Therefore, the raw numbers for no known outcome were adjusted by removing vehicles with cancelled , suspended, or expired registrations that had not been renewed by June 5, 2018.

	PROGRAM COMPONENT	2016 TOTAL	2017 TOTAL
Stations and Inspectors	Inspection Stations • Number of stations inspecting vehicles throughout the period	1,623	1,587
	• Number of RMV site audits of inspection stations (most stations were audited multiple times)	7,527	8,220
	• Number of adverse RMV enforcement actions (license revoked, license suspended, warning)	375	225
	Inspectors • Number of licensed inspectors that performed at least one test during the period	7,006	6,790
	• Number of adverse RMV enforcement actions (license revoked, license suspended, warning)	362	77
	Totals penalties assessed against stations and inspectors	$29,400	$0
	Amount of penalties stayed (Penalties stayed as long as stations and inspectors comply with all program requirements during the period covered by the settlement)	$4,400	$0
	Number of covert vehicle audits	1,562	940
	Number of covert vehicles audits that falsely passed OBD.	0	0
Equipment	Number of OBD equipment audits	5,970	3,818
	Number of OBD Equipment Audits that failed for communications or accuracy	0 (0.0%)	0 (0.0%)
	Number of OBD Equipment Audits that failed for Station Maintenance items (Condition of cables and connectors)	18 (0.3%)	15 (0.4%)

2. Program Changes Implemented in 2016-2017

As required by EPA's regulations[2] defining biennial reporting requirements, the following summarizes the 2016 and 2017 changes made in program design, funding, personnel levels, procedures, regulations, and legal authority. 2016 and 2017 were the eighth and ninth full calendar years under the current program design. The new program beginning October 1, 2017 includes several new features to aid with program oversight described in the "procedures" section below.

Program Design: No changes to program design were made in 2016 and 2017.

Funding: The program funding structure was unchanged for 2016 and 2017. The inspection fee remained $35, with the inspection stations retaining $23.50 of the fee and the remaining $11.50 deposited into the Commonwealth's Inspection and Maintenance Trust Account.

Through September 30, 2017, the Contractor's per-inspection fee continued to be $1.904 for each of the first 4.4 million "paid" inspections, and $0.70 for each additional "paid" inspection thereafter. Effective October 1, 2017, the Contractor's per-inspection fee became $1.343 for the first 4.4 million "paid" inspections, and $0.43 for each additional "paid" inspection thereafter. The Trust Account funds remaining after payments to the Contractor were available to MassDEP and RMV for program oversight and management. MassDEP was provided with funds from the Trust Account through an Inter-Agency Service Agreement with RMV, updated annually.

Funding levels from the Inspection and Maintenance Trust for the program continued to be adequate to fund program costs. In FY 2017, Parsons was paid $8.89 million, RMV's expenditures were $4.11 million, and MassDEP's expenditures were $1.9 million. MassDEP expenditures were consistent with expenditures reported in the 2014-2015 biennial report.

Personnel Levels: Staffing levels for the Massachusetts Inspection and Maintenance Program have been generally stable since the program's inception. In FY2017, RMV assigned 35 staff (full time equivalents) to the Program, and MassDEP had 8 staff assigned during the fiscal year. MassDEP staffing was consistent with staffing levels reported in the 2014-2015 biennial report.

Procedures: While the basic OBD and opacity inspection procedures were largely unchanged during 2016 and 2017, there were some program-related changes associated with inspections conducted under the new contract that started October 1, 2017.

Cameras: The use of cameras for monitoring inspection quality is now required. At the start of each inspection, a digital image of the inspector is captured to verify inspector identity. Also, the following four images of the vehicle are required: 1) front of the vehicle, 2) rear of the vehicle, 3) vehicle identification number (VIN) tag, and 4) odometer reading. These images help verify the vehicle being inspected and its mileage.

Three cameras installed in each inspection bay are required to capture still images at various times during the inspection and to record a video of the entire inspection. All images and video

[2] 40 CFR § 51.366 (e)

are automatically uploaded to the Vehicle Inspection Database and become part of the inspection record.

OBD Scan Tool Audits: OBD scan tool audits continued to be performed by RMV field staff in 2016 and 2017, through September 30, 2017. All inspection stations were required to purchase new workstation equipment provided by Applus Technologies for performing inspections beginning October 1, 2017. The new equipment includes a California Bureau of Automotive Repair (BAR) certified Data Acquisition Device (DAD) for performing OBD scans. The new scan tool includes a more comprehensive daily self-check than the previous scan tool, making the audits no longer necessary. As a result, RMV field staff discontinued performing OBD scan tool audits starting October 1, 2017.

Diesel OBD Readiness Exemptions: In 2015 inspection procedures were changed in response to readiness issues related to diesel-powered vehicles with advanced emissions controls. These changes are related to the issues that lead to the development of EPA's "Best Practices for Addressing OBD Readiness in IM Testing of Diesel Vehicles Under 14,000 lbs. Gross Vehicle Weight Rating." Because the IM Program does not have software that would allow the implementation of the recommended best practices, MassDEP continued to exclude the following difficult-to-set readiness monitors from readiness determinations for these vehicles through September 30, 2017:

Model Years	Make/Model	Until mid-April 2015	After Mid-April 2015
2010-2014	All Audi/VW Diesels	NOx After-treatment	None
2010-2012	Sprinter 2500/3500	None	NMHC Cat
2013-2016	Sprinter 2500/3500	None	Exh. Gas Sensor
2010-2012	Dodge/Ram Cummins	NOx After-treatment	NOx After-treatment
2013-2016	Dodge/Ram Cummins	NOx After-treatment	PM Filter
2014-2016	Fiat 3L V6 Diesels*	None	NMHC Cat

* used in Ram 1500 pickups and Jeep Grand Cherokees

Note – While these exclusions were not continued automatically beyond October 1, 2017, because the software functionality was not fully developed, those vehicles that experienced readiness issues were provided relief manually on a case-by-case basis. The automatic exclusions were reinstated in early 2018.

Program Authority (Legislation and Regulations): The Agencies amended the program's implementing regulations (MassDEP at 310 CMR 60.02, and RMV at 540 CMR 4.00-4.09) to incorporate changes in September 2008, and the updated program started operation on October 1, 2008. A revision to the Massachusetts State Implementation Plan (SIP), reflecting the changes to

MassDEP and RMV regulations, was submitted to EPA in June 2009, with a minor revision in November, 2009. The regulatory changes received EPA approval effective March 26, 2013.

In September 2013, MassDEP proposed three minor changes to 310 CMR 60.02 that would:

1. Remove the out-of-date sections of the regulations that specify requirements that were only in place before the redesigned program started on October 1, 2008;
2. Modify the Kit Car requirements to implement the emissions inspection requirements of Chapter 311 of the Acts of 2010, an Act Relative to the Registration and Inspection of Street Rods and Custom Vehicles, effective April 30, 2011 and allow increased flexibility in how Kit Car emissions requirements are met; and
3. Modify the requirements for registered repairers to allow repairers with L1 and A9 certifications to repair light and medium duty diesel vehicles (GVWR ≤ 14,000). The current regulations require L1 and L2 certifications.

The public comment period closed November 13, 2013, and the proposed changes became final in July, 2016.

3. Program Issues Identified and Corrected

During 2016 and 2017, MassDEP and RMV worked with the Contractor to address program issues.

- *Database and Workstation Software Revisions:* During 2016, the Agencies worked with Parsons to implement the following revisions to database and workstation software:
    - improve/upgrade sticker tracking functions;
    - begin capturing calibration identification (CAL ID) and calibration verification number (CVN) during the OBD scan to help identify the vehicle being inspected and potential tampering;
    - begin capturing the following additional OBD parameters:
        - Distance traveled with MIL on
        - Warm-ups since DTCs (Diagnostic Trouble Codes) cleared
        - Distance since DTCs cleared
        - Engine run time with MIL (Malfunction Indicator Light) on
        - Engine run time since DTCs cleared
        - Permanent DTCs
    - revise Vehicle Inspection Report for diesel-fueled vehicles to include diesel OBD monitors' names;
    - improve OBD communication procedures for vehicles with multiple ECMs (Engine Control Modules);
    - implement automatic motorist assistance center (MAC) referral for vehicles with the non-compliant OBD systems and other inspection anomalies.

Problems with OBD Inspections for Specific Vehicle Makes and Models: Massachusetts continues to monitor the OBD inspection data to identify specific vehicle makes and models that have problems with their OBD inspections. The problems are investigated to determine whether the vehicle or the test equipment was the cause. Problems with the test equipment are resolved via updates to hardware and/or software. In 2016 Massachusetts identified problems communicating with some model year 2016 to 2018 Jaguar and Land Rover models. These vehicles were given alternative OBD tests for the remainder of the program through September 30, 2017. Beginning October 1, 2017 the new BAR certified DAD did not have problems communicating with any vehicles tested in the program. As a result, there were no alternative OBD tests performed since October 1, 2017.

Model years, makes, and models of vehicles that received alternative tests are presented in Attachment B of the 2017 Annual Report.

In addition, Massachusetts did not start a state-wide registration enforcement program in 2016 and 2017. Responsibility for enforcement against motorists who fail to get their vehicles inspected or fail to pass their inspection is shared by RMV, and local and state police. Since the program's inception, RMV's enforcement efforts have focused primarily on ensuring that inspectors and inspection stations properly administer the test, while local and state police have issued citations to motorists found to be driving vehicles without proper inspection stickers.

While state and local police continue to issue tickets for vehicles they find on the road without proper inspection stickers, RMV's registration enforcement program had not been implemented by the end of 2017.

RMV recognizes the need to have a registration enforcement program to enhance its efforts to ensure that motorists comply with the requirements of the Massachusetts I&M Program. However, in today's era of unprecedented state resource limitations, RMV's aging information technology infrastructure cannot support a registration enforcement program while also meeting the data requirements of the other federal programs that RMV works under (which are increasing at unparalleled levels). RMV is continually exploring more cost-effective ways to get this job done in a proficient manner, and is working to replace its primary database (Automated License and Registration System (ALARS)). The replacement is expected to provide significantly more efficient data processing, which would allow RMV to move forward with the development and implementation of a successful registration enforcement program.

The contract to modernize ALARS was awarded on March 7, 2013, at which time RMV staff began working closely with the ALARS contractor to define the business rules for the modernized database called ATLAS, including the business rules for implementing registration enforcement. The module for driver's and inspector's licenses was updated and migrated to the new ATLAS system in March 2018. The module for vehicle registrations is scheduled to be updated and migrated in September 2019. Once this is completed, the tools will be in place for implementing registration enforcement.

RMV continues to be committed to the registration enforcement requirement and is anxious to see it implemented. At the same time, RMV observes that Massachusetts enjoys a compliance

rate of approximately 90% in database surveys and 94% in actual parking lot surveys, which is similar to the rates found in many other states.

Reports Referenced

- Annual Reports to the U.S. Environmental Protection Agency describing the implementation of the Massachusetts Enhanced Emissions and Safety Test Program for 2009 through 2016 can be found at the program's web site:

  https://www.mavehiclecheck.com/motorists-resources

- Biennial Reports to the U.S. Environmental Protection Agency describing the program in 2008-09, 2010-11, 2012-13, and 2014-15 can also be found at the same web site.