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Biennial Report: 2012-2013

Massachusetts Enhanced Emissions and Safety Test Inspection and Maintenance Program

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BIENNIAL REPORT
MASSACHUSETTS ENHANCED EMISSIONS AND SAFETY TEST
INSPECTION AND MAINTENANCE PROGRAM
2012-2013

1. Introduction

This report has been prepared 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 2012 and 2013, and supplements the program information that is contained in the 2012 and 2013 Annual Reports (these reports are available on the Mass Vehicle Check Program web site:
http://massvehiclecheck.state.ma.us/about_publications.html).

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 the Massachusetts Department of Environmental Protection (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 Commonwealth contracted with Parsons Environmental & Infrastructure Group Inc. (Parsons or Contractor) to manage and implement the I&M Program, including 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. The contract covers vehicle inspections starting October 1, 2008.

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 that 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 2012 and 2013.

Table 1: Summary Statistics: Massachusetts Inspection and Maintenance Program 2012 and 2013

	PROGRAM COMPONENT	2012 TOTAL	2013 TOTAL
Vehicles and Inspections	Number of vehicles in the Massachusetts fleet	4.68 million	4.72 million
	Number of unique vehicles tested for safety or for safety and emissions	4,536,027	4,579,975
	Number of unique vehicles receiving an initial emissions test	3,594,837	3,598,964
	Types of emissions tests: OBD	97.4%	97.4%
	Opacity	2.6%	2.6%
	Non-diesel vehicles (e.g., gasoline, natural gas, etc.): • Number that received initial OBD emissions tests	3,482,058	3,481,900
	Number that failed initial OBD emissions tests	224,103 (6.4%)	215,348 (6.2%)
	Diesel vehicles: • Number that received initial OBD emissions tests	20,339	24,705
	• Number that failed initial OBD emissions test	1,414	1,722
		(7.0%)	(7.0%)
	• Number that received initial opacity tests	92,440	92,162
	• Number that failed initial opacity emissions test	1,670	1,561
		(1.8%)	(1.7%)
	Number of Waivers issued	4	7
	Number of Economic Hardship Extensions issued	82	59
	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 March 31 of the subsequent year[1]	38,538	29,266
	Percent of non-diesel vehicles receiving an initial OBD test with no known outcome	1.1%	0.8%
	Number of inspection sticker motor vehicle violations issued by state and local police	70,859	63,796

[1] Vehicles taken off the road have a "known outcome." Therefore, the raw numbers for no known outcome were adjusted by removing vehicles with expired registrations that had not been renewed by March 31st of the subsequent year.

	PROGRAM COMPONENT	2012 TOTAL	2013 TOTAL
Stations and Inspectors	Inspection Stations • Number of stations inspecting vehicles throughout the period	1,654	1,641
	• Number of RMV site audits of inspection stations (most stations were audited multiple times)	8,628	8,382
	• Number of adverse RMV enforcement actions (license revoked, license suspended, warning)	319	336
	Inspectors • Number of licensed inspectors that performed at least one test during the period	6,929	6,966
	• Number of adverse RMV enforcement actions (license revoked, license suspended, warning)	278	289
	Totals penalties assessed against stations and inspectors	$139,000	156,025
	Amount of penalties stayed (Penalties stayed as long as stations and inspectors comply with all program requirements during the period covered by the settlement)	91,000	86,000
	Number of covert vehicle audits	1,402	1,464
	Number of covert vehicles audits that falsely passed OBD.	0	0
Equipment	Number of OBD equipment audits	5,180	5,835
	Number of OBD Equipment Audits that failed for communications or accuracy	6 (0.1%)	5 (0.1%)
	Number of OBD Equipment Audits that failed for Station Maintenance items (Condition of cables and connectors)	41 (0.9%)	31 (0.5%)

2. Program Changes Implemented in 2012-2013

As required by EPA's regulations[2] defining biennial reporting requirements, the following summarizes the 2012 and 2013 changes made in program design, funding, personnel levels, procedures, regulations, and legal authority. 2012 and 2013 were the fourth and fifth full calendar years under the current program design. The changes and issues needing to be addressed in this mature program were relatively minor.

Program Design: No changes to program design were made in 2012 and 2013.

Funding: The program funding structure was unchanged for most of 2012 and 2013. The $29 inspection fee (which was established in regulation in 1999 and covers safety as well as emissions tests) remained in place. For 2012 and 2013, inspection stations continued to retain $22.50 of the fee. The remaining $6.50 was deposited into the Commonwealth's Inspection and Maintenance Trust Account, which is managed by RMV. From this account, Parsons was paid $1.74 for each of the first 4.4 million "paid" inspections, and $0.60 for each additional "paid" inspection thereafter. Beginning October 1, 2013 (the start of the sixth program year) Parsons was paid $1.904 for each of the first 4.4 million "paid" inspections, and $0.70 for each additional "paid" inspection thereafter. The remaining funds 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 2013, Parsons was paid $7.86 million, RMV's expenditures were $4.25 million, and MassDEP's expenditures were $1.57 million. MassDEP expenditures reflect a decrease in costs associated with no longer contracting for the auditing of emission test equipment, a cost savings associated with the move to OBD-only testing for most vehicles.

Personnel Levels: Staffing levels for the Massachusetts Inspection and Maintenance Program have been generally stable since the program's inception. In FY2013, RMV assigned 47 staff (full time equivalents) to the Program, and MassDEP had 10 staff assigned during the fiscal year. MassDEP staffing during this fiscal year is slightly below historical levels because of a reduction in effort associated with contractor transition, moving to OBD-only emissions testing for most vehicles, and unfilled vacancies.

Procedures: During 2012 and 2013, the basic OBD and opacity inspection procedures were unchanged.

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),

[2] 40 CFR § 51.366 (e)

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 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 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 $\leq$ 14,000). The current regulations require L1 and L2 certifications.

The public comment period closed November 13, 2013. The final regulation draft is undergoing internal review at MassDEP.

3. Program Issues Identified and Corrected

During 2012 and 2013, MassDEP and RMV worked with the Contractor to address program issues.

- *Contract extensions:* During 2012 to 2013, two extensions were completed for the contract with Parsons. In January 2012, the first contract extension was signed covering inspections from October 1, 2013 through September 30, 2015. During 2012 and 2013, MassDEP and RMV negotiated contract terms with Parsons to extend the contract for an additional two years. In July 2013, a second contract extension was signed, covering inspections from October 1, 2015 through September 30, 2017.

- *OBD testing issues:* During 2012 and 2013, progress was made on correcting the following minor software bugs and testing issues.

    - Incomplete Scans: The workstation software was modified to reduce rare instances of incomplete scans and retrieving data from the incorrect control module. The modified software retries OBD communications if:
        - the Transmission Control Module (TCM) responds first instead of the Engine Control Module (ECM),
        - vehicles with multiple ECMs (e.g., sports cars with V-12 engines) respond out of order,
        - the PID parameter $1c response indicates no identifiable OBD system, or
        - the Malfunction Indicator Lamp (MIL) is on but no Diagnostic Trouble Codes (DTCs) are captured.

- 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. The number of vehicles needing an alternative OBD test was reduced to 77 in 2013, down from 131,165 in 2009. Model years, makes, and models of vehicles that received alternative tests in 2013 are presented in Attachment B of the 2013 Annual Report.

- *Equipment Upgrades:* The OBD testing equipment was modified to increase durability and various workstation components were updated that were no longer available from the manufacturer.
  - OBD Durability Modification: The workstation OBD scan tool consists of a 25 ft Universal Serial Bus (USB) cable with repeater attached to the workstation Personal Computer (PC), an OBD interface box, and a 3 ft cable with Diagnostic Link Connector (DLC). To improve durability several improvements were made, with the majority of the workstations being modified in 2012.
    1. The 25 ft USB cable has been replaced with a heavy-duty cable with larger strain reliefs and better protection of the repeater.
    2. The USB port on the OBD interface box was prone to breakage due to high stress on the connection between the USB cable and OBD interface. The contractor designed a plastic shroud to secure the cable strain relief to the OBD interface, eliminating the stress on the USB port.
    3. The contractor replaced the 3 ft DLC cable from the OBD interface with a heavier duty cable with larger strain reliefs.
  - Other Workstation Equipment Upgrades: The workstation PC, printer, barcode scanner, and remote control models originally provided in 2008 had been discontinued in 2012 and 2013 and required us to find replacement models. The replacements generally meet or exceed the performance of the equipment originally provided.

- *Increased Data Mining for Station and Motorist Enforcement:* During 2012 and 2013, the Program had an increased focus on data mining to identify targets for enforcement activities.
  - Fraudulent Inspection Practices: During this period, MassDEP transitioned from only reviewing stations that had multiple potential violations in a given month to reviewing all potential violations for the entire network during the month.
  - Vehicles with Possible Tampering: During this period, MassDEP increased the data mining for vehicles that appeared tampered based on their OBD

results. These vehicles are flagged so that they automatically fail their next regular inspection and receive a referral to a Motorist Assistance Center for further investigation. If the Motorist Assistance Center determines the vehicle has been tampered, the motorist is required to return the vehicle to stock condition before it is allowed to be re-inspected.

- *Station Licensing Process:* In March 2013, problems with the method of allotting licenses to new inspection stations were identified. From March 2013 though August 2013, no station license changes were implemented and no new licenses were issued. This freeze on licenses had little or no impact on motorists or test quality, but was inconvenient for existing stations that were relocating.
- *Vehicle Maintenance Initiative Improvements:* In 2012 and 2012, the Program implemented improvements to the Vehicle Maintenance Initiative (VMI) for prospective and current Registered Emissions Repair Technicians. The improvements included:
    - a revised web-based application for repairers to enter emissions-related repair data;
    - calculation of a 5-star emissions repair success rating;
    - inclusion of the 5-star rating with the repair facility information returned by the web site's repair facility locator;
    - a revised on-line course designed to teach automotive repair professionals what they need to know to become Massachusetts Registered Emissions Repair Technicians, including a proficiency exam (the "Mass Module" course);
    - the development and implementation of a new 28-hour course, on OBD diagnostics and repair, which is required for all newly registered repairers; and
    - additional classes on a variety of OBD topics that existing registered repairers can use to meet their requirement to take 4 hours of OBD-related courses per year.

- *Sticker printing, distribution and accounting*: In 2012 and 2013, sticker quality control, sticker inventory management, and the automated accounting for stickers improved compared to the past. However, some problems remained. Several steps were taken to address the problems:
    - A web-based application was released in early 2013 that RMV field investigators could use to record their collection of full books of unused stickers from the prior year.
    - During 2012, the database did not contain correct or complete data for full books of unused stickers collected by RMV from July 2010 to February 6, 2012, and for partial books of unused stickers collected from July 2010 to March 26, 2012. On November 18, 2012, the missing data were inserted, and subsequent sticker collection data appear to be complete.

- The Agencies and the Contractor have further refined the business rules for dealing with unusual missing, stolen or damaged stickers and sticker books. Starting in 2014, the Contractor will use a sticker tracking spreadsheet to document any sticker anomalies that are not adequately explained in the database.

In addition, Massachusetts did not start a state-wide registration enforcement program in 2012 and 2013. 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 2013.

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. During 2013, RMV staff worked closely with the ALARS contractor to define the business rules for the modernized database, including the business rules 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 that exceeds 90% in database surveys and 97% 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 2000 through 2013 can be found at the program's web site: *http://massvehiclecheck.state.ma.us/about_publications.html*.

- Biennial Reports to the U.S. Environmental Protection Agency describing the program in 2000-01-02, 2002-03, 2004-05, 2006-07, 2008-09 and 2010-11 can also be found at the same web site.