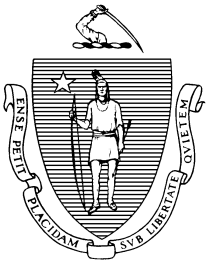

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Biennial Report: 2010-2011

Massachusetts Enhanced Emissions and Safety Test Inspection and Maintenance Program

July 31, 2012

BIENNIAL REPORT
MASSACHUSETTS ENHANCED EMISSIONS AND SAFETY TEST
INSPECTION AND MAINTENANCE PROGRAM
2010-2011

1. Introduction

This report has been prepared for the U.S. Environmental Protection Agency (U.S. EPA), in compliance with the requirements of 40 CFR 51.366 (e). The information in this report covers the reporting period of calendar years 2010 and 2011, and supplements the program information that is contained in the 2010 and 2011 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 Program (I&M) 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, and G.L. c.21A, §§2(28) and 16. Implementing regulations were initially adopted in January 1999 by the Massachusetts Department of Environmental Protection ("MassDEP") at 310 CMR 60.02, and the Registry of Motor Vehicles ("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 the Massachusetts Department of Transportation's RMV Division jointly administer the Massachusetts Vehicle Check Program. In January 2008, the Commonwealth contracted with Parsons Commercial Technology Group, Inc. 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 the 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 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 2010 and 2011.

Table 1: Summary Statistics: Massachusetts Inspection and Maintenance Program 2010 and 2011

	PROGRAM COMPONENT	2010 TOTAL	2011 TOTAL
Vehicles and Inspections	Number of vehicles in the Massachusetts fleet	4.63 million	4.65 million
	Number of unique vehicles tested for safety or for safety and emissions	4,492,134	4,490,232
	Number of unique vehicles receiving an emissions test	3,628,686	3,605,733
	Types of emissions tests: OBD	97.3%	97.4%
	Opacity	2.7%	2.6%
	Non-diesel vehicles (e.g. gasoline, natural gas, etc): • Number that received initial OBD emissions tests	3,520,698	3,497,604
	• Number that failed initial OBD emissions tests	253,416 (7.2%)	245,236 (7.0%)
	Diesel vehicles: • Number that received initial OBD emissions tests	11,786	15,840
	• Number that failed initial OBD emissions test	672 (5.7%)	1,160 (7.3%)
	• Number that received initial opacity tests	96,162	92,207
	• Number that failed initial opacity emissions test	2,745 (2.9%)	2,059 (2.2%)
	Number of Waivers issued	5	6
	Number of Economic Hardship Extensions issued	70	64
	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]	39,824	39,205
	Percent of non-diesel vehicles receiving an initial OBD test with no known outcome	1.1%	1.1%
	Number of inspection sticker motor vehicle violations issued by state and local police	63,898	74,664

[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	2010 TOTAL	2011 TOTAL
Stations and Inspectors	Inspection Stations • Number of stations inspecting vehicles throughout the period	1,586	1,601
	• Number of RMV site audits of inspection stations (most stations were audited multiple times)	8,409	8,415
	• Number of adverse RMV enforcement actions (license revoked, license suspended, warning)	464	408
	Inspectors • Number of licensed inspectors that performed at least one test during the period	6,649	6,643
	• Number of adverse RMV enforcement actions (license revoked, license suspended, warning)	410	368
	Totals penalties assessed against stations and inspectors	$433,000	$426,250
	Amount of penalties stayed (Penalties stayed as long as stations and inspectors comply with all program requirements during the period covered by the settlement)	$57,500	$275,350
	Number of covert vehicle audits	2,076[2]	1,439
	Number of covert vehicles audits that falsely passed OBD.	0	0
Equipment	Number of OBD equipment audits	2,131	4,341
	Number of OBD Equipment Audits that failed for communications or accuracy	6 0.3%)	22 (0.5%)
	Number of OBD Equipment Audits that failed for Station Maintenance items (Condition of cables and connectors)	27 (1.3%)	62 (1.4%)

[2] The unusually high number of covert vehicle audits in 2010 was due to the Network contractor successfully catching up on the 2,000 vehicle audits Massachusetts was committed to perform between October 1, 2008 and September 30, 2010.

2. Program Changes Implemented in 2010-2011

As required by EPA's regulations[3] defining biennial reporting requirements, the following summarizes the 2010 and 2011 changes made in program design, funding, personnel levels, procedures, regulations, and legal authority.

Program Design: No changes to program design were made in 2010 and 2011.

Funding: The program funding structure was unchanged in 2010 and 2011. The $29 inspection fee (which was established in regulation in 1999 and covers safety as well as emissions tests) remained in place. For 2010 and 2011, 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 the RMV. From this account, Parsons Commercial Technology Group, Inc. was paid $1.74 for each of the first 4.4 million "paid" inspections, and $0.60 for each additional "paid" inspection thereafter. The remaining funds were available to MassDEP and the RMV for program oversight and management. MassDEP was provided with funds from the Trust Account through an Inter-Agency Service Agreement with the RMV, updated annually.

Funding levels from the Inspection and Maintenance Trust Fund for the program continued to be adequate to fund program costs. In FY 2011, Parsons Commercial Technology Group, Inc. was paid $7.81 million, RMV's expenditures were $5.31 million, and MassDEP's expenditures were $1.27 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 FY2011, RMV assigned 52 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 2010 and 2011, the basic OBD and opacity inspection procedures were unchanged. While inspection procedures were unchanged, procedures were implemented that changed how certain vehicles were handled during the inspection process, as described below.

- *Automatic Motorist Assistance Center (MAC) referrals for multiple readiness turnaways.* Vehicles with multiple turnaways for readiness started being referred to MACs for readiness-related assistance. This assistance is intended to get motorists out of the drive-some-more advice from inspectors to help determine if any vehicle-related issues might be preventing monitors from setting to Ready. There is no charge for this assistance. Motorists are counseled regarding drive cycles, and many vehicles are run on a dynamometer to try to set monitors to Ready. When

[3] 40 CFR § 51.366 (e)

vehicle condition issues that might affect readiness were found, motorists were given a general indication of the issues and assistance was offered for their repairers.

- *Motorist Assistance Center (MAC) referrals for vehicles receiving fraudulent emissions tests.* Vehicles that received improper emissions tests (e.g., clean screening) were referred to a MAC following their next inspection. While some emissions tests are performed improperly without the motorist's knowledge, some motorists attempt to locate inspectors or stations that will perform an improper test to avoid repairs or to mask a tampered vehicle. This procedure is intended to ensure that vehicles that have received an improper emissions test are unable to receive another.
- *Motorist Assistance Center (MAC) referrals for vehicles with noncomplying OBD systems.* Vehicles that have been identified with noncomplying OBD systems were referred to a MAC following their next inspection. The vehicles are required to be returned to a proper configuration before a reinspection is allowed.

Program Authority (Legislation and Regulations): The Program's authorizing legislation was amended slightly in 2010[4]. New emissions requirements for kit cars became effective October 1, 2008, with the transition to the OBD-only emissions testing. Some kit car owners had made purchasing decisions based on prior requirements and the legislature granted kit car owners a grace period to April 30, 2012, to allow enthusiasts who had started vehicle construction prior to imposition of new emissions requirements to finish their vehicles.

Effective November 1, 2009, the Patrick-Murray Administration eliminated the Turnpike Authority, and integrated 4,000-plus employees and over five transportation agencies into one unified organization, the Massachusetts Department of Transportation (MassDOT). The Registry of Motor Vehicles is now a division of MassDOT. This reorganization had no impact on the I&M program.

3. Program Issues Identified and Corrected

During 2010-11, MassDEP and RMV worked with the network contractor to address program issues. These included contract issues and issues with software and hardware.

- *Contract extension:* During 2011, MassDEP and RMV negotiated contract terms with Parsons Commercial Technology Group to extend the current Network contract for two years. The contract extension, covering inspections from October 1, 2013 through September 30, 2015, was signed on January 4, 2012.

- *OBD testing issues:* During 2010 and 2011, progress was made on correcting minor software bugs that:

[4] Chapter 311, Acts of 2010.

- improved model year and fuel type change tracking to help identify emission test fraud.
- corrected scan tool performance to address a small number of inspections where flashing MILs were missing monitor results due to the way the scan tool performed multiple scans during a flashing MIL event.
- corrected emission test software performance where a small portion of vehicles more than 1 year old that were getting a new vehicle scan instead of a regular OBD test if there was no previous test on record.
- corrected emission test software performance where a small number of tests did not require the catalytic converter monitor to be ready if there was a previous catalyst-related diagnostic trouble code (DTC).

Also during 2011, a testing issue was identified with model year 2010 and newer Ram medium-duty diesel vehicles, which are equipped with a Cummins diesel engine. These vehicles exhibited high readiness failure rates and difficulty meeting readiness criteria upon retest. Chrysler Corporation and Cummins requested temporary relief from readiness requirements pending an investigation of the cause of the readiness issues and identification of a resolution. MassDEP granted a one-year relief period in response to the request. During this time, vehicles exhibiting readiness issues have received supplemental testing at MACs and been excused from readiness. Vehicles failing with the malfunction indicator lamp (MIL) commanded on have received warranty repairs.

The issue centers around the amount of travel required for the OBD system to evaluate add-on controls for diesel engines, particularly diesel particulate filters and NOx aftertreatment, and to a lesser extent the catalyst. Because these control systems operate substantially differently than controls typically used in nondiesel engines, it appears that the readiness criteria for nondiesel engines may not be appropriate for diesels with these add-on controls.

This issue will continue to be examined through a diesel readiness workgroup convened by EPA in July 2012. Other diesels with similar readiness problems will also receive relief until appropriate procedures are identified and system software revised to incorporate the amended procedures.

- Equipment Upgrades:
  - ***Opacity Meter 15 meter cable replacement:*** The opacity meter cable provided with the diesel test workstations was only 10 meters long, where the cable used in the legacy program was 15 meters long. This posed a problem for stations with test bays configured for the longer cable because the 10 meter cable could not reach the tailpipe for some vehicles without repositioning the workstation. The contractor replaced all 10 meter cables with 15 meter cables.
  - ***OBD Durability Modification: The workstation OBD scan tool consists of a 25 ft USB cable with repeater attached to the workstation PC, an OBD***

interface box, and a 3 ft cable with DLC. To improve durability several improvements were made.

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 ODB 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.

- ***Venturi Bloc Adaptors:*** The opacity meter uses a gasket-type part, called the venturi block adaptor, where the sample probe connects to the sample system. MassDEP discovered that these parts were working their way loose because their adhesive had failed. Where the devices had become loose, there was no longer a sealed sample pathway. The contractor and the equipment vendor developed a revised part and instituted a replacement program to correct this issue.

- *Sticker printing, distribution and accounting*: In 2010 and 2011, Massachusetts continued to experience problems with sticker quality control, sticker inventory management, and the automated accounting for stickers. Several steps were taken to address the problems:
  - In May 2010 the sticker vendor was replaced.
  - In 2011, Parsons, in consultation with the Agencies, developed a detailed sticker management plan covering all aspects of sticker production and quality control. The plan also included details on usability testing, the security of the sticker inventory, and sticker distribution. The plan, Inspection Sticker Quality Assurance Plan, was approved June 8, 2011.
  - During 2010 and 2011 the contractor attempted to address software issues preventing automated sticker inventory accounting. Improvements to Parsons' sticker reports allow them to better manage all aspects of the sticker inventory on a day-to-day basis. While not all issues had been resolved by the end of 2011, they should be resolved in 2012.

- *Motorist Assistance Center destroyed by Tornado:* On June 1, 2011, the West Springfield Motorist Assistance Center (MAC) was destroyed by a tornado. A new, relocated, West Springfield MAC was fully operational on September 1, 2011. In the interim, the staff from the West Springfield MAC worked from home using mobile dispatching and met motorists at locations convenient for the motorists.

In addition, we note that Massachusetts did not start a state-wide registration enforcement program in 2010-11 Responsibility for enforcement against motorists who fail to get their vehicles inspected or fail to pass their inspection is shared by the 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, the RMV's registration enforcement program had not been implemented by the end of 2011.

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, the Agency's aging information technology infrastructure cannot support a registration enforcement program while also meeting the data requirements of the other federal programs that the Agency works under (which are increasing at unparalleled levels). The 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. The replacement is expected to provide significantly more efficient data processing, which would allow the Agency to move forward with the development and implementation of a successful registration enforcement program.

The RMV continues to be committed to the registration enforcement requirement and is anxious to see it implemented. At the same time, the Agency observes that Massachusetts enjoys a compliance rate that exceeds 90% in database surveys and 95% in actual parking lot surveys, which is similar to the rates found in many other states.

4. 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 (which includes the program operations between October 1, 1999 and December 31, 2000) – 2011 can be found at the program's web site: http://massvehiclecheck.state.ma.us

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