Office of the Inspector General

Commonwealth of Massachusetts

Gregory W. Sullivan
Inspector General

Vehicle Emissions Test Results Under the Massachusetts Motor Vehicle Inspection Program

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Vehicle Emissions Test Results Under the Massachusetts Motor Vehicle Inspection Program

In late 2002, the Office of the Inspector General received information that called into question the accuracy of 2002 vehicle emissions test results produced by the Massachusetts enhanced motor vehicle Inspection and Maintenance Program (I/M Program). This information suggested that when automobiles on which emissions tests had been performed in 2000 were retested in 2002, the 2002 test results showed an unexplained reduction in the measurements of polluting gas levels produced by the vehicles. The information provided to the Office also indicated that when vehicles tested at Massachusetts inspection stations were retested at Rhode Island inspection stations, the Rhode Island test results indicated substantially higher pollution levels than those reported by the Massachusetts tests.[1]

The Office conducted a series of independent tests to determine the credibility of the information. Three Office vehicles that had been tested in Massachusetts in 2000 were retested in 2002. The Office also tested a privately owned vehicle in Massachusetts, Rhode Island, and New York. To control for external factors, the vehicle tests were conducted in adjoining test bays at the same stations on the same days, within thirty minutes of each other, whenever possible.

The preliminary results of the 2002 emissions tests on the three Office vehicles indicated average reductions of 57.9 percent in carbon monoxide pollution levels and 37.2 percent in nitrous oxide pollution levels in comparison with the 2000 test results for the same vehicles. The 2002 emissions tests conducted on the private vehicle also produced varying results. The Massachusetts emission tests reported nitrous oxide pollution levels that were 56 percent lower than those reported by the Rhode Island tests and 19 percent lower than those reported by the New York tests. In addition, the Massachusetts emission tests reported carbon monoxide pollution levels that were 36

[1] The testing programs administered by Massachusetts and Rhode Island test for the same polluting gases using the same two types of testing machines. Both states have retained the same contractor to administer their testing programs.

percent lower than the levels reported by the Rhode Island tests but 16.9 percent higher than those reported by the New York tests.

The Inspector General wrote to Kevin Sullivan, then-Secretary of Administration and Finance, in November 2002 and to Christine Todd Whitman, U.S. Environmental Protection Agency (EPA) Administrator, in December 2002, summarizing the preliminary results of the Office's review. In his letter to Secretary Sullivan, the Inspector General expressed support for a quality assurance/reliability audit of the Massachusetts I/M program. The Inspector General's letter to EPA Administrator Whitman requested that the EPA review the calculation and reporting of the gaseous and particulate exhaust test procedures used in the Massachusetts I/M program. Full copies of both letters are attached.

The Commonwealth of Massachusetts
Office of the Inspector General

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November 25, 2002

Mr. Kevin Sullivan, Secretary
Office of Administration and Finance
State House, Room 373
Boston, Massachusetts 02133

Dear Secretary Sullivan:

In response to our discussions, I am writing to provide you with preliminary results of the review performed by this Office pertaining to the Massachusetts enhanced motor vehicle inspection and maintenance (I/M) program. I hope this information is responsive to your request.

Background

In 1990, the federal Clean Air Act (CAA) was amended requiring that states meet new air quality standards and criteria, otherwise known as National Ambient Air Quality Standards (NAAQS) for several categories of air pollutants. In 1996, the federal Environmental Protection Agency found that certain sections of Massachusetts were in non-compliance with these criteria, exceeding ozone and carbon monoxide standards by high margins. Carbon Monoxide is an odorless, colorless, and poisonous gas which creates health issues for those who suffer from cardiovascular disease. Ozone is a chemical that affects public health in many ways including causing eye irritation, lung problems, and aggravating existing respiratory conditions. Ground level ozone, or smog, is formed when nitrogen oxides (NOx) react with volatile organic compounds during hot summer months. NOx is a product of emissions from motor vehicles and power plants. Consequently, Massachusetts was required to reduce the amount of emissions of nitrous oxide (a major component in the creation of smog) and carbon monoxide from both fixed polluters (such as power plants) and mobile polluters (such as cars) by at least nine (9) percent by the end of 1999.[1]

In response, Massachusetts launched an aggressive series of programs including the I/M program. Beginning on October 1, 1999, Massachusetts commenced its I/M program to clean the air and avoid serious sanctions required under the CAA. These sanctions can include loss of federal highway dollars and fines on fixed polluters.

[1] As of Feb. 2002, certain sections of Massachusetts remained in non-attainment status for ozone and carbon monoxide.

The I/M program, developed by the Massachusetts Department of Environmental Protection (DEP), monitors emissions from automobiles, trucks and buses. DEP contracts for administration of the I/M program with a private company, Agbar Technologies (Agbar). Agbar oversees the operation of testing bays in approximately 1,200 automotive garages throughout the state.

Findings

This Office found troubling discrepancies between emissions test results performed in 2000 and 2002 on the same vehicles. Specifically, this Office had emissions tests performed on three vehicles in order to provide a comparison of vehicle test results for the same vehicles in 2000 and 2002. These tests showed that in 2002 the vehicles' emission levels for nitrous oxide were, on average, inexplicably lower by 37 percent than tests performed in 2000. The tests also showed that in 2002, the vehicles' emissions levels for carbon monoxide were, on average, lower by 58 percent than tests performed in 2000. This information is troubling in light of the fact that the vehicles tested by this Office had not undergone repairs or relevant preventative maintenance measures during the interim period. Please see the attached chart.

In order to provide comparative data of 2002 emissions test in different states, this Office tested emissions from the same vehicle in MA, RI and NY. Again, the emissions test results raised concerns about the accuracy of the I/M program. The average of three MA emissions tests for nitrous oxide were 56 percent less than the average on the same three vehicles tested in RI, and 19 percent less than the results of one vehicle tested twice in NY. Similarly, the average of three emissions tests for carbon monoxide performed on the same vehicle in MA were 36 percent less than the average of emissions tests performed on the same three vehicles in RI, and 16.9 percent greater that the average of two emissions test performed in NY on the same vehicle. Please see the attached chart.

Conclusion

In conclusion, this Office hopes that this information is helpful to you in your consideration of whether to implement a quality assurance/reliability audit of the Massachusetts I/M program. Based on this preliminary research, this Office would be in support of your proposal.

Sincerely,

Gregory W. Sullivan

Gregory W. Sullivan
Inspector General

Emissions Tests, Massachusetts v. Rhode Island v. New York
November 19-November 23, 2002

Nitrous Oxide (NOx) - major contributor to smog production

	Grams per mile	Notes:
Massachusetts	**2.85** [1]	**Mass. failure threshold is 3.0 for vehicle tested**
Rhode Island	**5.78** [2]	**Mass. NOx test results 56% less than RI**
New York	**3.52** [3]	**Mass. NOx test results 19% less than NY**

Carbon Monoxide (CO) - an odorless, colorless, and poisonous gas which creates health issues for those who suffer from cardiovascular disease

	Grams per mile	Notes:
Massachusetts	**4.67** [4]	**Mass. failure threshold is 60.0 for vehicle tested**
Rhode Island	**7.33** [5]	**Mass. CO test results 36% less than RI**
New York	**4.00** [6]	**Mass. CO test results 16.9% greater than NY**

1- Average of three tests done on the same vehicle between November 19 and 20 at three Massachusetts inspection stations

2- Average of three tests done on the same vehicle between November 19, 20, and 21 at three Rhode Island inspection stations

3- Average of two tests done on the same vehicle on November 23, 2002 at two New York Inspection stations

4- Average of three tests done on the same vehicle between November 19 and 20 at three Massachusetts inspection stations

5- Average of three tests done on the same vehicle between November 19, 20, and 21 at three Rhode Island inspection stations

6- Average of two tests done on the same vehicle on November 23, 2002 at two New York inspection stations

Comparison of three I.G. autos tested in 2000 v. 2002
at Massachusetts inspection stations

	Grams Per Mile	Notes:
Nitrous Oxide		
2000 Test	**1.48** [7]	
2002 Test	**0.93** [8]	**Mass. NOx dropped 37.2% since 2000**
Carbon Monoxide		**Notes:**
2000 Test	**9.18** [9]	
2002 Test	**3.86** [10]	**Mass. CO dropped 57.9% since 2000**

7 & 9- Average of three tests conducted between July 19, 2000 and August 18, 2000 on same three vehicles

8 & 10 - Average of seven tests conducted between October 3 and October 10, 2002 on same three vehicles

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December 4, 2002

Ms. Christine T. Whitman, Secretary
Environmental Protection Agency
1101A USEPA Headquarters
Ariel Rios Building
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Dear Ms. Whitman:

I am writing to request that the Environmental Protection Agency (EPA) review the calculation and reporting of the gaseous and particulate exhaust test procedures used in the MA enhanced motor vehicle inspection and maintenance (I/M) program. The I/M program developed by the MA Department of Environmental Protection (DEP) monitors emissions from motor vehicles. This Office conducted a review and found apparent problems with the accuracy of test results in MA.

This Office compared the MA test results in the year 2002 with test results from the same vehicles in RI and NY. This Office also compared the MA test results on vehicles taken in 2002 with test results on the same vehicles tested in 2000. The Inspector General's review found troubling discrepancies between emissions test results performed in 2000 and 2002 on the same vehicles.

Specifically, this Office had emissions tests performed on three vehicles in order to provide a comparison of vehicle test results for the same vehicles in 2000 and 2002. These tests showed that in 2002, the vehicles' emission levels for nitrous oxide were, on average, inexplicably lower by 37 percent than test performed in 2000. The tests also showed that in 2002, the vehicles' emissions levels for carbon monoxide were, on average, lower by 58 percent than tests performed in 2000. This information is troubling in light of the fact that the vehicles tested by this Office had not undergone repairs or relevant preventative maintenance measures during the interim period. Please see the attached chart.

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test results raised concerns about the accuracy of the I/M program. The average of three MA emissions tests for nitrous oxide were 56 percent less than the average on the same three vehicles tested in RI and 19 percent less than the results of one vehicle tested twice in NY. Similarly, the average of three emissions tests for carbon monoxide performed on the same vehicle in MA were 36 percent less than the average of emissions tests performed on the same three vehicles in RI, and 16.9 percent greater than the average of two emissions tests performed on the same vehicle in NY. Please see the attached chart.

The Office of the Inspector General has concluded that there may be as many as 50,000 vehicles on the road in MA that may have passed the emissions test and received an inspection sticker based on inaccurate test results. On December 3, 2002, the MA Secretary of Administration and Finance requested that DEP conduct a quality assurance audit to ensure the integrity of the I/M program. Until the Commonwealth learns the results of an EPA review and the DEP's independent audit, no final conclusions about the I/M program can be drawn. As such, this Office is seeking the assistance of your Office to verify equipment calibration methodology. We would be pleased to provide additional information. Please feel free to contact me or Richard Finocchio of my staff.

Sincerely,

Gregory W. Sullivan

Gregory W. Sullivan
Inspector General

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