

**The State of New Jersey
Department of Environmental Protection**

**Proposed Revisions to the Enhanced Inspection and
Maintenance (I/M) Program for the State of New Jersey**

**Extension of the New Vehicle Inspection Exemption
From 4 Years to 5 Years**

**I/M Program Modeling and USEPA Performance
Standard Modeling**

SIP Revision

Appendix I

**New Jersey Legislation for Inspection and
Maintenance Program Statute Revisions**

July, 2010

**Signed into law on June 30, 2010
P.L. 2010, Chapter 29**

SENATE, No. 2090

**STATE OF NEW JERSEY
214th LEGISLATURE**

INTRODUCED JUNE 21, 2010

**Sponsored by:
Senator ANDREW R. CIESLA
District 10 (Monmouth and Ocean)**

SYNOPSIS

Extends waiver for new car inspections to five years and eliminates safety inspections for certain motor vehicles.

CURRENT VERSION OF TEXT

As introduced.

AN ACT concerning motor vehicle inspections and amending chapter 8 of Title 39 of the Revised Statutes.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. R.S.39:8-1 is amended to read as follows:

39:8-1. a. Every motor vehicle registered in this State which is used over any public road, street, or highway or any public or quasi-public property in this State, and every vehicle subject to enhanced inspection and maintenance programs pursuant to 40 C.F.R. s.51.356, except motorcycles, historic motor vehicles registered as such, collector motor vehicles designated as such pursuant to this subsection, and those vehicles over 8,500 pounds gross weight that are under the inspection jurisdiction of the commission pursuant to Titles 27 and 48 [(as amended by this legislation)] of the Revised Statutes, shall be inspected by designated inspectors or at official inspection facilities to be designated by the commission or at licensed private inspection facilities. Passenger automobiles registered in accordance with R.S.39:3-4 or R.S.39:3-27 and noncommercial trucks registered in accordance with section 2 of P.L.1968, c.439 (C.39:3-8.1) or R.S.39:3-27 inspected pursuant to this section shall only be inspected for emissions and emission-related items such as emission control equipment and on-board diagnostics. The commission shall adopt rules and regulations establishing a procedure for the designation of motor vehicles as collector motor vehicles, which designation shall include consideration by the commission of one or more of the following factors: the age of the vehicle, the number of such vehicles originally manufactured, the number of such vehicles that are currently in use, the total number of miles the vehicle has been driven, the number of miles the vehicle has been driven during the previous year or other period of time determined by the commission, and whether the vehicle has a collector classification for insurance purposes.

b. The commission shall determine the official inspection facility or private inspection facility at which a motor vehicle, depending upon its characteristics, shall be inspected. The commission, with the concurrence of the Department of Environmental Protection, may exclude by regulation from this inspection requirement any category of motor vehicle if good cause for such exclusion exists, unless the exclusion is likely to prevent this State from meeting the applicable performance standard established by the United States Environmental Protection Agency. The commission may determine that a vehicle is in compliance with the inspection requirements of this section if the vehicle has been inspected and passed under a similar inspection program of another state, district, or territory of the United States.
(cf: P.L.2009, c.331, s.4)

2. R.S.39:8-2 is amended to read as follows:

39:8-2. a. The commission may designate and appoint, subject to existing laws, competent inspectors of motor vehicles to conduct examinations, other than the periodic inspections required pursuant to subsection b. of this section, of motor vehicles required to be inspected in accordance with the provisions of this chapter. The inspectors may be delegated to enforce the provisions of the motor vehicle and traffic law.

b. (1) The commission shall adopt, pursuant to the "Administrative Procedure Act," P.L.1968, c.410 (C.52:14B-1 et seq.), rules and regulations consistent with P.L.1966, c.16 (C.26:2C-8.1 et seq.) and with the requirements of the federal Clean Air Act with respect to the type and character of the inspections to be made, the facility at which the vehicle shall be inspected, the frequency of inspections of motor vehicles and the approval or rejection of motor vehicles as a result of these inspections. These rules and regulations shall require the use of inspection tests that are designed to meet the enhanced inspection and maintenance requirements of the federal Clean Air Act and that have been proven to be feasible and effective for the inspection of large numbers of motor vehicles, except that these tests shall not include the "I/M 240" test. Nothing in this subsection shall preclude the use of the "I/M 240" test in sampling for performance evaluations only or the use of the test at the option of a private inspection facility. The rules and regulations may distinguish between vehicles based on model year, type, or other vehicle characteristics in order to facilitate inspections or to comply with the federal Clean Air Act.

(2) The Department of Environmental Protection and the commission shall investigate advanced testing technologies, including but not limited to remote sensing and onboard diagnostics, and shall, to the extent permitted by law, pursue the use of such technologies, other than the "I/M 240" test, in motor vehicle emission inspections required by the United States Environmental Protection Agency pursuant to the federal Clean Air Act. The commission shall adopt, to the extent practicable, advanced technologies to facilitate the retrieval of testing and other information concerning motor vehicles, which technologies shall include but not be limited to the use of computer bar codes and personal cards containing encoded information, such as a person's operating license, motor vehicle registration, and motor vehicle insurance, the inspection status of a motor vehicle, and mass transit fares, that can be accessed quickly by a computer.

c. Except as modified by the commission to distribute evenly the volume of inspections, all motor vehicles required by the commission, in accordance with the provisions of R.S.39:8-1, to be inspected under this chapter shall be inspected biennially, except that:

(i) after certification by the commission of the federal approval by the Environmental Protection Agency of the State waiver request, model year [2004] 2006 and newer motor vehicles shall be inspected no later than [four] five years from the last day of the month in which they were initially registered and thereafter biennially and a decal affixed thereto shall so indicate. Motor vehicles [four] five model years old or newer, purchased in a foreign jurisdiction, and to be

registered in this State, [shall receive a temporary inspection certificate of approval. Motor vehicles four model years old or newer, purchased in a foreign jurisdiction,] shall be subject to inspection not later than [four] five years from the last day of the last calendar month of the model year of the vehicle, and thereafter, inspected biennially and a decal affixed thereto shall so indicate. Whenever a used motor vehicle [four] five model years old or newer is purchased in this or any other state which has affixed thereto an unexpired decal issued pursuant to this paragraph or an unexpired New Jersey inspection certificate of approval and is initially registered by the purchaser in this State, the unexpired decal or unexpired New Jersey inspection certificate of approval displayed on the windshield shall be valid for the remaining time indicated [on the inspection certificate of approval] thereon. Upon expiration of the decal or inspection certificate of approval, such vehicle shall be subject to inspection and inspected biennially thereafter; and

(ii) classes of vehicles that require more frequent inspections, such as school buses, shall be inspected at such shorter intervals as may be established by the commission after consultation with the Department of Environmental Protection. At any time, the commission may require the owner, lessee, or operator of a motor vehicle to submit the vehicle for inspection.

d. The commission shall furnish to designated inspectors or to other persons authorized to conduct inspections [or to grant waivers] official certificates of approval[,] and rejection stickers [or waiver certificates], the form, content and use of which it shall establish. The certificates of approval[,] and rejection stickers [and waiver certificates] shall be of a type, such as a windshield sticker or license plate decal, that can be attached to the vehicle or license plate in a location that is readily visible to anyone viewing the vehicle. If a certificate of approval cannot be issued, the driver shall be provided with a written inspection report describing the reasons for rejection and, if appropriate, the repairs needed or likely to be needed to bring the vehicle into compliance with applicable standards.

e. The commission may, with the approval of the State House Commission, purchase, lease or acquire by the exercise of the power of eminent domain any property for the purpose of assisting it in carrying out the provisions of this chapter. This property may also be used by the commission for the exercise of the duties and powers conferred upon it by the other chapters of this Title.

f. For the purpose of implementing the motor vehicle inspection requirements of the federal Clean Air Act and subject to the approval of the Attorney General, the State Treasurer, prior to January 1, 1997, may:

(1) Purchase, lease or acquire by eminent domain any property for vehicle inspection purposes. Any other provision of law to the contrary notwithstanding, no further approval shall be required for transactions authorized by this paragraph, except that a proposed purchase, lease or acquisition by eminent domain shall require the approval of the Joint Budget Oversight Committee, and shall be submitted to the Joint Budget Oversight Committee, which shall review the proposed purchase, lease or acquisition by eminent domain within 15 business days; and

(2) Sell or lease, or grant an easement in, any property acquired, held or used for vehicle inspection purposes or any other suitable property held by the State that is not currently in use or dedicated to another purpose. For the purpose of this paragraph and notwithstanding any provision of R.S.52:20-1 et seq. to the contrary, the sale or lease of, or the granting of an easement in, real property owned by the State shall be subject to the approval of the State House Commission, which shall meet at the call of the Governor to act on a proposed sale or lease or grant of an easement pursuant to this paragraph. A member of the State House Commission may permit a representative to act on that member's behalf in considering and voting on a sale or lease or grant of an easement pursuant to this paragraph. Any other provision of law to the contrary notwithstanding, any moneys derived from a sale, lease or granting of an easement by the State pursuant to this paragraph shall not be expended unless approved by the Joint Budget Oversight

Committee for the purpose of purchasing, leasing or acquiring property pursuant to paragraph (1) of this subsection, except that any moneys derived therefrom and not approved for that purpose shall be appropriated to the Department of Transportation to provide for mass transit improvements.

g. The commission shall conduct roadside examinations of motor vehicles required to be inspected, using such inspection equipment and procedures, and standards established pursuant to section 1 of P.L.1966, c.16 (C.26:2C-8.1), including, but not limited to, remote sensing technology, as the commission shall deem appropriate to provide for the monitoring of motor vehicles pursuant to this subsection. At least 20,000 vehicles or 0.5 percent of the total number of motor vehicles required to be inspected under this chapter, whichever is less, shall be inspected during each inspection cycle by roadside examination teams under the supervision of the commission. The commission may require any vehicle failing a roadside examination to be inspected at an official inspection facility or a private inspection facility within a time period fixed by the commission. Failure to appear and pass inspection within the time period fixed by the commission shall result in registration suspension in addition to any other penalties provided in this Title. The commission shall conduct an aggressive roadside inspection program to ensure that all motor vehicles that are required to be inspected in this State are in compliance with State law.

h. The commission, and, when appropriate, the Department of Environmental Protection, shall conduct inspections and audits of licensed private inspection facilities, official inspection facilities and designated inspectors to ensure accurate test equipment calibration and use, and compliance with proper inspection procedures and with the provisions of P.L.1995, c.112 (C.39:8-41 et al.) and any regulations adopted pursuant thereto by the commission or by the Department of Environmental Protection. These inspections and audits shall be conducted at such times and in such manner as the commission, upon consultation with the Department of Environmental Protection, shall determine in order to provide quality assurance in the performance of the inspection and maintenance program.

i. (1) The commission shall make a charge of \$2.50 for the initial inspection for each vehicle subject to inspection, which amount shall be paid to the commission or its representative when payment of the registration fees fixed in chapter 3 of this Title is made which inspection charge shall be considered a service charge and shall be subject to the calculation of proportional revenue remitted to the commission pursuant to section 105 of P.L.2003, c.13 (C.39:2A-36); provided however, that on and after January 1, 1999, a school bus as defined pursuant to section 3 of P.L.1999, c.5 (C.39:3B-20) and having a registration period commencing on or after January 1, 1999, shall be subject to an inspection fee for each in-terminal or in-lieu-of terminal inspection in accordance with the following schedule:

School Bus Specification Inspection	\$50 per bus
School Bus Inspection	\$25 per bus
School Bus Reinspection	\$25 per bus

subject to the conditions set forth below

The specification inspection is required when a school bus is put into service in New Jersey, whether a new bus or a bus from another state. The specification inspection is conducted to ensure that the school bus meets New Jersey specification standards. The school bus inspection fees shall be charged to the operator for each in-terminal or in-lieu-of terminal inspection. School Vehicle Type I and School Vehicle Type II buses shall be inspected semiannually. Retired school buses shall be inspected annually. No school bus inspection fee shall be charged for any reinspection conducted by the commission if the reinspection is conducted on the same day as the inspection that necessitated the reinspection. If an additional trip is required by the commission's inspectors, a fee of \$25 per bus shall be charged. School bus inspection fees shall be paid to the commission or the commission's designee subject to the terms and conditions prescribed by the

commission and shall be considered service charges of the commission and not subject to the calculation of proportional revenue remitted to the commission pursuant to section 105 of P.L.2003, c.13 (C.39:2A-36). Any law or rule or regulation adopted pursuant thereto to the contrary notwithstanding, a registration fee authorized pursuant to chapter 3 of Title 39 of the Revised Statutes shall not be increased for the purpose of paying any costs associated in any manner with the establishment, implementation or operation of the motor vehicle inspection and maintenance program established pursuant to P.L.1995, c.112 (C.39:8-41 et al.).

(2) The commission shall establish by regulation a fee to cover the costs of inspecting any vehicle that is required, or has the option, under federal law to be inspected in this State but is registered in another state or is owned or leased by the federal government. In determining these costs, the commission shall include all capital and direct and indirect operating costs associated with the inspection of these vehicles including, but not limited to, the costs of the actual inspection, the creation and maintenance of the vehicle inspection record, administrative, oversight and quality assurance costs and the costs associated with reporting inspection information to the owner, the federal government and agencies of other states. All fees collected pursuant to this subsection shall be paid to the State Treasurer and deposited in the "Motor Vehicle Inspection Fund" established pursuant to subsection j. of this section.

j. There is established in the General Fund a special dedicated, non-lapsing fund to be known as the "Motor Vehicle Inspection Fund," which shall be administered by the State Treasurer. The State Treasurer shall deposit into the "Motor Vehicle Inspection Fund" \$11.50 from each motor vehicle registration fee received by the State after June 30, 1995. This fee shall be considered a service charge of the commission and shall be subject to the calculation of proportional revenue remitted to the commission pursuant to section 105 of P.L.2003, c.13 (C.39:2A-36). The Legislature shall annually appropriate from the fund an amount necessary to pay the reasonable and necessary expenses of the implementation and operation of the motor vehicle inspection program. The State Treasurer shall:

(1) Pay to a private contractor or contractors contracted to design, construct, renovate, equip, establish, maintain and operate official inspection facilities under a contract or contracts entered into with the State Treasurer pursuant to subsection a. of section 4 of P.L.1995, c.112 (C.39:8-44) from the fund the amount necessary to meet the costs agreed to under the contract or contracts; and

(2) Transfer from the fund to the commission as provided pursuant to section 105 of P.L.2003, c.13 (C.39:2A-36) and the Department of Environmental Protection the amounts necessary to finance the costs of administering and implementing all aspects of the inspection and maintenance program, and to the Office of Telecommunications and Information Systems in the Department of the Treasury the amount necessary for computer support upgrades;

Moneys remaining in the fund and any unexpended balance of appropriations from the fund at the end of each fiscal year shall be reappropriated for the purposes of the fund. Any interest earned on moneys in the fund shall be credited to the fund.

(cf: P.L.2009, c.331, s.5)

3. R.S.39:8-3 is amended to read as follows:

39:8-3. a. No certificate of approval shall be issued by an examiner, official inspection facility or private inspection facility until the motor vehicle inspected successfully passes [all emission tests] inspections for emissions and emission-related items such as emission control equipment and on-board diagnostics required by the [director] chief administrator and the mechanism, brakes and equipment of the motor vehicle inspected have been found to be in a proper and safe condition and complying with the laws of this State.

b. Notwithstanding subsection a. of this section, passenger automobiles registered in accordance with R.S.39:3-4 or R.S.39:3-27 and noncommercial trucks registered in accordance with section 2 of P.L.1968, c.439 (C.39:3-8.1) or R.S.39:3-27 that are only inspected for emissions and emission-related items such as emission control equipment and on-board diagnostics pursuant to R.S.39:8-1 and that successfully pass such inspections shall be issued a certificate of approval.

c. Notwithstanding the issuance or non-issuance of a certificate of approval, the obligation to ensure that a vehicle is in a proper and safe condition rests with the owner, operator or lessee, as appropriate, of the vehicle.

(cf: P.L.1995, c.112, s.21)

4. This act shall take effect on July 1, 2010. General implementation of section 3 of this act is to be completed no later than the 30th day following enactment.

STATEMENT

This bill amends various statutes relating to motor vehicle inspection. The bill streamlines inspections of passenger automobiles and noncommercial truck inspections by limiting inspections of such vehicles to emissions and emission-related items such as emission control equipment and on-board diagnostics and providing for the issuance of certificates of approval to passenger automobiles and noncommercial trucks that successfully pass such inspections. The bill also exempts motorcycles from the motor vehicle inspection requirements currently imposed by law.

Further, the bill extends to five years the period of time before a model year 2006 or later motor vehicle and certain used motor vehicles will be subject to inspection at an official inspection facility.

The bill also deletes references to “waivers” and “waiver certificates” because the statutory authority for the issuance of such waivers was repealed by section 11 of P.L.2009, c. 331.

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Standard Modeling**

SIP Revision

**Appendix II
History of New Jersey's I/M SIP**

July, 2010

History of New Jersey's I/M SIP

A. Basic I/M SIP

In 1974, New Jersey, under commitments made in its basic I/M SIP, implemented its basic I/M program. At that time, the State's basic I/M SIP consisted of an annual inspection program whereby all gasoline-fueled motor vehicles, unless specifically exempt through law or regulation, were subject to an idle exhaust emission test. Although several subsequent revisions were made to the State's basic I/M SIP, the core program remained unchanged. Major changes in the State's basic I/M program over time included: 1) the addition of a visual inspection for the presence of a catalytic converter, 2) the addition of an inlet restrictor test to determine whether a vehicle's fuel inlet was sufficiently narrow as to preclude use of a leaded gasoline nozzle, thereby preventing the use of leaded fuel, and 3) modification of the program network design to allow for private inspection facilities (PIFs). This third major change expanded the inspection facility network to include non-state-operated inspection facilities that could do both inspections and repairs. Although these private facilities were originally only allowed to perform re-inspections, their responsibilities were later augmented to include initial inspections as well.

B. Enhanced I/M SIP

The Clean Air Act Amendments of 1990 require the implementation of enhanced I/M programs for areas meeting one or more of the following criteria:

- 1) Designated as a serious, severe or extreme ozone non-attainment area with urbanized populations of 200,000 or more¹ ;
- 2) Designated as a carbon monoxide non-attainment area that exceeded a 12.7 ppm design value with urbanized populations of 200,000 or more²; or,
- 3) Part of a Metropolitan Statistical Area with a population of 100,000 or more in the northeast Ozone Transport Region (OTR)³ .

New Jersey met all three of these criteria for required implementation of an enhanced I/M program. As part of this requirement, Congress established performance specifications that were further elucidated by the USEPA. Specifically, the USEPA's promulgated rules and established guidance, including a performance standard and program administration features, for the implementation of enhanced I/M programs.

¹ 42 U.S.C.A. §7511a (c)(3).

² 42 U.S.C.A. §7512a(a)(6).

³ 42 U.S.C.A. §7511c(b)(1)(A).

The USEPA's final rule on Inspection/Maintenance Program Requirements was promulgated on November 5, 1992.⁴ Subsequently, on June 29, 1995, New Jersey submitted a SIP to the USEPA that described its enhanced I/M program design. This SIP described an inspection program whereby all 1968 and newer gasoline-fueled motor vehicles, unless specifically exempt through law or regulation, would be subject to a steady-state dynamometer-based exhaust emission test known as the ASM5015. In addition, all 1975 and newer vehicles would receive evaporative pressure and purge tests designed to detect any malfunctions with the vehicle's evaporative emission control system. All pre-1968 vehicles would continue to be subject to the idle exhaust emission test. New Jersey's enhanced I/M SIP also accounted for a hybrid (i.e., both centralized, test-only and decentralized, test-and-repair facilities) inspection network, similar to the one established for New Jersey's basic I/M program. This SIP stated that once the enhanced I/M program was fully implemented, all subject motor vehicles would be inspected at least once every two years (i.e., biennially).

C. Enhanced I/M SIP Revision - March 27, 1996

On March 27, 1996, New Jersey submitted a revision to its June 29, 1995 enhanced I/M SIP, modifying its enhanced I/M program design to take advantage of the additional flexibility afforded states by Congress in designing their enhanced I/M programs. Specifically, the National Highway System Designation Act of 1995, P.L. 104-59 [S.440], (NHSDA) prohibited the USEPA from automatically discounting decentralized program formats by 50 percent, as had previously been prescribed in the USEPA's final rule on I/M program requirements.⁵ Rather, the NHSDA allowed states to claim any reasonable amount of credit for their decentralized programs that they deemed appropriate, so long as 18 months from the approval of their enhanced I/M SIP the state could show six months of full implementation enhanced I/M program data substantiating their credit claim. Consistent therewith, as part of its March 27, 1996 enhanced I/M SIP revision, New Jersey claimed 80 percent credit for the decentralized portion of its enhanced I/M program. Refer to Section F. for more information on New Jersey's analyses to substantiate its 80 percent credit claim.

In addition to taking advantage of the flexibility afforded by the NHSDA, the March 27, 1996 enhanced I/M SIP revision modified the model year coverage of the ASM5015 exhaust emission test and evaporative system pressure and purge tests to the following: all 1981 and newer light-duty vehicles, other than low annual mileage and full-time four-wheel drive vehicles, would be subject to the steady-state dynamometer-based ASM5015 exhaust emission test, as well as evaporative system pressure and purge tests. Vehicles 1980 and older would continue to be subject to the basic idle exhaust emission test, as well as a gasoline cap pressure test for those vehicles with sealed gas cap systems.

⁴ 40 C.F.R. §51, 57 Fed. Reg. 52987 (November 5, 1992).

⁵ 40 C.F.R. §51.353, 57 Fed. Reg. 52990 (November 5, 1992).

Finally, as part of this March 27, 1996 revision to the State's enhanced I/M SIP, the test frequency of the State's current inspection process was slightly modified in connection with an enhanced demonstration phase. During this demonstration phase, vehicles that successfully passed a voluntary enhanced exhaust emission test would receive an inspection sticker valid for two years.

On May 14, 1997, the USEPA granted conditional interim approval to New Jersey's enhanced I/M SIP.⁶ This conditional interim SIP approval, which became effective on June 13, 1997, addressed both the State's original June 29, 1995 enhanced I/M SIP submittal and its subsequent March 27, 1996 SIP revision. New Jersey subsequently satisfied the conditions of this approval by rectifying the two major deficiencies in its enhanced I/M SIP identified by the USEPA (New Jersey cured the first major enhanced I/M SIP deficiency by providing final and complete test equipment specifications, test procedures and emission standards to the USEPA by January 31, 1997⁷; and cured the second major enhanced I/M SIP deficiency by providing enhanced I/M performance standard modeling to the USEPA by February 1, 1998⁸). In addition, on December 14, 1998, New Jersey cured the eight (8) de minimis deficiencies identified by the USEPA⁹, even though the satisfaction of those de minimis deficiencies had no effect on the USEPA's interim approval.¹⁰

D. Enhanced I/M SIP Revision - June 5, 1998

On June 5, 1998, New Jersey submitted a revision to its I/M SIP, clarifying the testing frequency during the transition between the basic I/M program and the full implementation of the enhanced I/M program. Although the previous SIP revisions clearly define the testing frequency of both New Jersey's basic and enhanced I/M programs, they did not definitively specify the testing frequency during the transition

⁶ 40 C.F.R. 52, 62 Fed. Reg. 26401 (May 14, 1997).

⁷ These documents were submitted as an attachment to a letter dated January 31, 1997 from Commissioner Robert C. Shinn, Jr., New Jersey Department of Environmental Protection, to Jeanne M. Fox, Regional Administrator, USEPA, Region II.

⁸ This modeling and its supporting documentation were submitted as an attachment to a letter dated January 30, 1998 from Commissioner Robert C. Shinn, Jr., New Jersey Department of Environmental Protection to William J. Muszynski, P.E., Deputy Regional Administrator, USEPA, Region II.

⁹ The State of New Jersey Department of Environmental Protection, Revision to the State Implementation Plan (SIP) for the Inspection and Maintenance (I/M) Program for the State of New Jersey, December 14, 1998.

¹⁰ 61 Fed. Reg. 56172, (October 31, 1996).

period between the two programs.

As part of the June 5, 1998 SIP revision, the State determined that during the transition period, the basic I/M program would continue to operate, but on a biennial, rather than annual, test frequency. This was done to accommodate the decreased availability of centralized inspection lanes while they were being retrofitted for enhanced testing. To make this modification to the basic I/M program's test frequency, this SIP revision quantified the emission reduction losses anticipated from this modification and provided an equivalency demonstration showing the State's plan to offset those losses in emission reduction benefit. Specifically, to compensate for the loss in VOC emission reduction benefit from modifying the basic I/M program's test frequency, New Jersey: 1) began administering fuel cap pressure tests as part of its basic I/M program in its centralized inspection facilities, and 2) began fuel cap/evaporative emission control system visual inspections as part of its basic I/M program in its decentralized inspection facilities. The loss in carbon monoxide emission reduction benefit from modifying the basic I/M program's test frequency was offset by taking credit for emission reduction benefits gained through vehicle fleet turnover which had not already been claimed by the State in its carbon monoxide SIP.¹¹ Vehicle fleet turnover results when newer vehicles with more advanced emission controls replace older, less advanced vehicles within the State vehicle population. The State submitted modeling analyses showing that both of the above strategies more than compensated for the loss in VOC and carbon monoxide emission reduction benefits from modifying the basic I/M program's test frequency. The USEPA approved the State's June 5, 1998 revision to its enhanced I/M SIP on August 26, 1998.¹²

E. Proposed Enhanced I/M SIP Revision - June 9, 2001

¹¹ The New Jersey State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Carbon Monoxide National Ambient Air Quality Standard, November 17, 1994. The State, on July 10, 1997, proposed a revision to this SIP. A hearing on this proposal took place on August 11, 1997 and the comment period closed on August 20, 1997. This SIP revision was submitted to the USEPA on August 7, 1998. To date, the USEPA has taken no action on New Jersey's submittal.

¹² 63 Fed. Reg. 45402 (August 26, 1998).

On June 9, 2001, the State proposed to revise its enhanced I/M SIP to include amendments to the NJMVC's rules governing the implementation and operation of the State's I/M program. The proposed rulemaking¹³ made the following changes to the NJMVC's I/M regulations that could impact the air quality benefits associated with the enhanced I/M program, and therefore impact the SIP:

- Provide that if leasing companies and out-of-state new motor vehicle dealerships inspect a new motor vehicle's safety and emission control devices to insure that they conform to the specifications established by the manufacturer and contained in the pre-delivery checklist, those facilities could issue a temporary inspection decal. This decal allows the motorist to present the vehicle at the exit end of any CIF and be issued a two-year inspection decal. This regulatory change gives these leasing companies and out-of-state new motor vehicle dealerships equivalent privileges to those previously given to in-state new motor vehicle dealerships;
- Exempt gasoline-fueled school buses which are subject to inspection by the NJMVC's School Bus Inspection Unit from the inspection requirements of the enhanced I/M program;
- Allow any motor vehicle that passes an on-road inspection within the two-month period prior to its regularly scheduled biennial inspection to use the on-road inspection result in lieu of the complete biennial inspection, so long as the tests performed on-road are the same tests that would be performed on the vehicle as part of the biennial inspection process;
- Exempt from dynamometer testing any motor vehicle "with a chassis height that has been modified so as to make its operation on a dynamometer either impractical or hazardous, as will be determined in the discretion of the Director [of the NJMVC]"; and,
- Change the minimum cost expenditure value needed for the issuance of a cost waiver from \$200 to \$450 as of January 1, 2002.

¹³ 33 N.J.R. 1894(a) (June 4, 2001).

A hearing on this proposed SIP revision, as well as the NJMVC's proposed rulemaking, was held on July 9, 2001. The NJMVC subsequently adopted its regulations on October 15, 2001.¹⁴

F. Enhanced I/M SIP Revision - August 31, 2001

On December 13, 2000, in compliance with its NHSDA credit claim, New Jersey submitted to the USEPA a qualitative analysis of four months of data showing the effectiveness of the decentralized portion of its enhanced I/M program relative to its centralized test-only network.¹⁵ Subsequently, on May 4, 2001, New Jersey proposed its final report for NHSDA compliance, which evaluated six full months of program implementation data (the period from July 1, 2000 through December 31, 2000) using various analysis methodologies. On August 31, 2001¹⁶, the State of New Jersey submitted to the USEPA a revision to its enhanced I/M SIP that included:

- 1) The State's final submittal for compliance with the National Highway Systems Designation Act (NHSDA); and,
- 2) A revision to New Jersey's enhanced I/M performance standard modeling.

The first part of this SIP revision included New Jersey's final NHSDA report. This report was designed to support the claim New Jersey made in its March 27, 1996 enhanced I/M SIP revision that its decentralized network (the private inspection facilities, or PIFs) is at least 80 percent as effective as its centralized network (the centralized inspection facilities, or CIFs). The NHSDA report showed that both New Jersey's centralized test-only and decentralized test-and-repair program networks are effectively identifying vehicles with unacceptably high levels of emissions, and that the State-registered Emission Repair Facilities (ERFs) are significantly reducing vehicle emissions through effective repairs. Specifically, the NHSDA analyses show overall emission reductions of 55 percent for hydrocarbons (HC), 58 percent for nitrogen oxide (NO) and 84 percent for carbon monoxide from the vehicles repaired and successfully passing re-inspections following initial inspection failures. These analyses show relatively uniform emission reductions attributable to both network types of New Jersey's enhanced I/M program, indicating that the emission reductions attributable to the PIFs are at least 80 percent of those attributed to the CIF network. In fact, the analyses show that the State was conservative in this original credit estimation.

¹⁴ 33 N.J.R. 3651(b) (October 15, 2001).

¹⁵ The State of New Jersey Department of Environmental Protection, Report on the Inspection and Maintenance (I/M) Program for the State of New Jersey, National Highway Systems Designation Act (NHSDA) Submittal, December 13, 2000.

¹⁶ Although this document was submitted to the USEPA on August 31, 2001, the date on the SIP submittal document is August 20, 2001.

The second part of the August 20, 2001 enhanced I/M SIP revision addressed the State's performance standard modeling for its enhanced I/M program. The State originally submitted its performance standard modeling to the USEPA on January 30, 1998, to satisfy a condition of the USEPA's conditional interim approval of New Jersey's enhanced I/M program SIP.¹⁷ At that time, the State had not yet implemented its enhanced I/M program, requiring the NJDEP to make certain assumptions about the program, such as the expected date for the implementation of final standards. After the State successfully implemented its enhanced I/M program, the USEPA requested that the State update its performance standard modeling to more accurately reflect the program as implemented. The August 20, 2001 revised performance standard modeling demonstrated that for an evaluation year of 2002, the State exceeded the applicable enhanced performance standard.

On September 11, 2001, the USEPA proposed to: 1) approve New Jersey's August 20, 2001 SIP revision; and, 2) give final approval to New Jersey's overall enhanced I/M SIP. Prior to this, the State's enhanced I/M SIP had interim approval from the USEPA. On January 22, 2002, the USEPA finalized its approval of New Jersey's August 20, 2001 SIP revision and gave final approval to New Jersey's overall enhanced I/M SIP.¹⁸

G. Proposed Enhanced I/M SIP Revision - December 31, 2001

On December 31, 2001, the State of New Jersey submitted a proposed revision to its enhanced I/M SIP to the USEPA.¹⁹ This proposed revision included the following:

- 1) A formal request to defer of the mandatory implementation date for inclusion of On-Board Diagnostic (OBD) inspections into the State's I/M program from January 1, 2002 to January 1, 2003;
- 2) A formal request that the State be allowed to phase-in the mandatory OBD inspection portion of its I/M program;
- 3) Submittal, for inclusion as part of the overall enhanced I/M SIP, of those proposed amendments to the Department of Environmental Protection's (NJDEP) rules which establish the necessary test procedures and standards for implementation of an enhanced I/M program for gasoline-fueled motor vehicles in New Jersey; and,
- 4) Submittal, for inclusion as part of the overall enhanced I/M SIP, of those emission-related portions of the NJMVC-proposed amendments to its rules governing school

¹⁷ 40 C.F.R. 52, 62 Fed. Reg. 26401 (May 14, 1997).

¹⁸ 67 Fed. Reg. 2811 (January 22, 2002).

¹⁹ Submitted December 31, 2001 under cover letter from then NJDEP Commissioner Robert C. Shinn, Jr. to Jane M. Kenny, Regional Administrator, USEPA Region II.

bus inspections in New Jersey.²⁰

The proposed NJDEP regulatory amendments were attached as Appendix I to the December 31, 2001 proposed SIP submittal and proposed the following major modifications to N.J.A.C. 7:27-15 (Control and Prohibition of Air Pollution from Gasoline-Fueled Motor Vehicles) and N.J.A.C. 7:27B-5 (Air Test Method 5: Testing Procedures for Gasoline-Fueled Motor Vehicles):

- Modify the framework, procedures and testing schedule by which 1996 and newer model year vehicles will be subject to OBD inspections;
- Extend the end date for the current initial ASM5015 standards for all 1981 and newer light duty gasoline vehicles (LDGVs), light duty gasoline trucks 1 and 2 (LDGT1s and LDGT2s)²¹ from December 31, 2001 to December 31, 2002;
- Replace the final standards for the ASM5015 exhaust emission test for all model year 1994 and newer Tier I light-duty gasoline-fueled trucks 1 and 2 (LDGT1 and LDGT2s), currently scheduled for implementation on January 1, 2002, with new "interim" standards that will go into effect on January 1, 2003;
- Replace the final standards for the ASM5015 exhaust emission test for all pre-1996 non-Tier I LDGT1s and LDGT2s, and for all 1981 and newer light-duty gasoline-fueled vehicles (LDGVs) with the current initial ASM5015 standards for those vehicles, and change the implementation date from January 1, 2002 to January 1, 2003;
- Remove all references to the evaporative pressure and purge tests, and;
- Change the test procedure requirements for those gasoline-fueled motor vehicles registered as school buses by the NJMVC, and subject to inspection by the NJMVC's School Bus Inspection Unit.

A hearing on the proposed SIP revision, as well as both NJDEP and NJMVC's proposed rulemakings, was held on February 25, 2002. The State received significant comments on two aspects of its January 22, 2002 proposal; the implementation plan for integrating mandatory OBD inspections, and the implementation of interim standards for the ASM5015 exhaust emissions test to replace the current final standards.

In addition to considering the comments, the NJDEP also took into account other factors with regard to OBD implementation, such as the determination that implementation of the USEPA's original OBD inspection component design without "second chance"

²⁰ Please note that the NJDMV's school bus rule proposal was forwarded to the USEPA under separate cover from the original proposed SIP revision. Specifically, this proposal was forwarded on March 26, 2001 from Chris Salmi, Manager of the Bureau of Air Quality Planning in the NJDEP to Raymond Werner, Chief of the Air Programs Branch, USEPA - Region II.

²¹ To determine whether a vehicle is classified as a LDGV, LDGT1, LDGT2 or HDGV please refer to the definition section of the NJDEP's rules at N.J.A.C. 7:27-15.1.

testing would impose less of a burden on the State than implementation of a "phase-in" OBD inspection program that still required the motor vehicle to be repaired to pass an OBD inspection on re-inspection. After evaluating all of these issues, the State determined not to adopt the proposed OBD implementation plan or the interim standards for ASM5015 exhaust emission test. Although the State considered adopting the remaining changes proposed in its January 22, 2002 proposal, it determined that it would be clearer to the public if the NJDEP developed a new proposal that included the State's revised OBD implementation plan, and provided for continuation of the initial ASM standards without the implementation of final standards. As such, the NJDEP determined not to adopt its January 22, 2002 rule proposal and, on April 22, 2002²², the NJDEP submitted a SIP revision that took the following action with regard to the State's enhanced I/M program:

- 1) Withdrew the State's request to phase-in OBD inspections into New Jersey's enhanced I/M program;
- 2) Withdrew the State's submittal of the January 22, 2002 NJDEP rule proposal, and;
- 3) Submitted a final SIP revision requesting a deferral of the mandatory implementation date for inclusion of OBD inspections into the State I/M program from January 1, 2002 to January 1, 2003. This request included a commitment to modify the rule date for OBD inspection.

In the letter transmitting this SIP revision to the USEPA, the State indicated that, should the NJMVC act to adopt its latest school bus rule proposal, the NJDEP would then submit to the USEPA for their review and approval, a final SIP revision that includes that adoption, as well as the NJMVC's previous rule adoption which removed from the I/M program those gasoline-fueled vehicles registered as school buses, and thus subject to inspection by the NJMVC's school bus inspection unit, from the enhanced I/M program requirements. This second rule adoption was submitted to the USEPA as a proposed SIP revision on June 9, 2001 and the adoption appeared in the October 15, 2001 edition of the New Jersey Register.

H. Proposed Enhanced I/M SIP Revision - April 24, 2002

On April 24, 2002, the NJDEP submitted a revision to its enhanced I/M SIP that consisted of proposed amendments to the NJDEP rules governing the implementation of the enhanced I/M program in New Jersey. Specifically, the NJDEP's rule proposal made the following major changes to the State's enhanced I/M program:

²² The State of New Jersey Department of Environmental Protection, Enhanced Inspection and Maintenance (I/M) Program for the State of New Jersey, Request to Defer the Integration of On-Board Diagnostic (OBD) Inspections into the State's I/M Program, SIP Revision, April 22, 2002.

- Modified the framework, procedures and testing schedule by which model year 1996 and newer vehicles would be subject to on-board diagnostic (OBD) inspections. The proposed program modifications included changing the start date for mandatory OBD inspections (pass/fail determinations) from January 1, 2001, to June 1, 2003. The proposal set forth the testing protocols for OBD inspections on 1996 and newer vehicles;
- Eliminated the end date for the use of the "initial" emission standards for the ASM5015 exhaust emission test. This would allow for the continued use of these initial standards;
- Removed the "final" emission standards for the ASM5015 exhaust emission test²³;
- Removed all references to the evaporative pressure and purge tests while retaining the evaporative fuel cap (or gas cap) leak test; and;
- Exempted from dynamometer testing those pre-1996 light-duty vehicles that are registered as school buses and that are under the jurisdiction of the NJMVC's School Bus Inspection Unit. 1996 and newer light-duty vehicles registered as school buses would receive an OBD inspection.

A hearing on the NJDEP's new proposal, and the associated proposed SIP revision, was held on June 24, 2002 and the comment period ended on July 30, 2002. On December 15, 2003 (68 Fed. Reg. 69640), the USEPA proposed approval of this revision to New Jersey's enhanced I/M SIP. USEPA gave final approval of this revision on May 21, 2004 (69 Fed. Reg. 29234).

I. Revised Performance Standard Modeling SIP Revision - November 27, 2002

On November 27, 2002, the NJDEP submitted a revision to New Jersey's enhanced Inspection and Maintenance (I/M) program State Implementation Plan (SIP) which contained a revision to New Jersey's enhanced I/M performance standard modeling. The primary reason for this revised performance standard modeling was to satisfy the USEPA's requirements for securing their approval for the State to extend the new vehicle emission inspection exemption from one inspection cycle (i.e., 2 years) to two inspection cycles (i.e., 4 years). Governor James E. McGreevey enacted this new car emission inspection exemption on July 1, 2002, however, implementation of this exemption was contingent on USEPA approval.

In addition to the extension to the new car emission inspection exemption, New Jersey

²³ Although the NJDEP proposed the elimination of the final standards for dynamometer testing, the basis and background document for the proposal discusses the USEPA's intention to finalize a comprehensive set of revised final standards for the ASM5015 test, and the State's determination to consider including those final standards as part of its enhanced I/M program, once they are made available.

proposed several modifications to its enhanced I/M program design since the State's previous performance standard submittal on August 20, 2001. These proposed changes would impact the effectiveness of the overall I/M program. Specifically, the NJDEP proposed the following changes to its enhanced I/M regulations in the May 20, 2002 New Jersey Register (N.J.R.):

- Modified the framework, procedures and testing schedule by which model year 1996 and newer vehicles would be subject to on-board diagnostic (OBD) inspections. The proposed program modifications included changing the start date for mandatory OBD inspections (pass/fail determinations) from January 1, 2001, to June 1, 2003 and set forth the testing protocols for OBD inspections on 1996 and newer vehicles;
- Eliminated the end date for the use of the "initial" emission standards for the ASM5015 exhaust emission test to allow for the continued use of these initial standards;
- Removed the "final" emission standards for the ASM5015 exhaust emission test;
- Removed all references to the evaporative pressure and purge tests while retaining the evaporative fuel cap (or gas cap) leak test; and,
- Exempted from dynamometer testing those pre-1996 light-duty vehicles that are registered as school buses and that are under the jurisdiction of the NJDMV's School Bus Inspection Unit. 1996 and newer light-duty vehicles registered as school buses would receive an OBD inspection.

The NJDEP's November 27, 2002 revision revised the State's enhanced I/M performance standard modeling to account for the four-year new car exemption, as well as the NJDEP's May 20, 2002 proposed rule changes. This revision showed that for the evaluation years 2002, 2005 and 2007, the State's I/M program meets the low enhanced performance standard. On November 5, 2002 (67 Fed. Reg. 67345), the USEPA proposed approval of this revision to New Jersey's enhanced I/M SIP. The USEPA gave this revision final approval on February 18, 2003 (68 Fed. Reg. 7704).

J I/M Program Changes SIP Revision - December 15, 2009

On December 15, 2009 the NJDEP submitted a revision to New Jersey's enhanced I/M program SIP which contained I/M program modeling, including USEPA performance standard modeling, that demonstrated the emissions impacts due to a number of proposed program changes. Specifically, this SIP revision reflected the adopted new rules and rule amendments to the NJDEP's rules at N.J.A.C. 7:27-14, 7:27-15, 7:27B-4 and 7:27B-5 and the Motor Vehicle Commission (MVC) rules at N.J.A.C. 13:20-7, 13:20-24, 13:20-26, 13:20-28, 13:20-29, 13:20-30, 13:20-32, 13:20-33, 13:20-43, 13:20-44, 13:20-45, 13:20-46, 13:20-47, 13:20-48, and 13:21-15. The program changes included the following:

- Emission tests will no longer require the use of a dynamometer. Emission tests will include On-Board Diagnostics (OBD), gas cap, visible smoke and two-speed idle tailpipe tests. The two-speed idle test replaces both the ASM5015 and 2500 RPM tests.
- Repair cost waiver provisions are removed.
- Gas cap testing is excluded for vehicles of model year 2001 and newer because the OBD testing addresses this concern.
- Certain classes of commercial vehicles, limousines, taxis and jitneys will require annual (more frequent) inspection.
- Light duty diesel vehicles will now be subject to emission testing.

This SIP revision consisted of the NJDEP rule changes, the MVC rule changes, and an analysis showing the emissions impact of the changes to the program. This analysis evaluated the emission impacts of the enhanced I/M program changes by comparing emission factors for the existing and proposed programs. The results indicated that the changes to the enhanced I/M program do not compromise the State's efforts to meet and/or maintain National Ambient Air Quality Standards for ozone or carbon monoxide. Also, the new program meets the USEPA low enhanced performance standard.

**The State of New Jersey
Department of Environmental Protection**

**Proposed Revisions to the Enhanced Inspection and
Maintenance (I/M) Program for the State of New Jersey**

**Extension of the New Vehicle Inspection Exemption
From 4 Years to 5 Years**

**I/M Program Modeling and USEPA Performance
Standard Modeling**

SIP Revision

**Appendix III
Modeling Parameters and Assumptions**

July, 2010

Modeling Parameters and Assumptions

Table 1 outlines the main program parameters of the low enhanced performance standard model program. In addition, this table presents New Jersey's enhanced I/M program design for both the existing and new programs for evaluation year 2012. The emission factors were estimated for 2012 which is when the anticipated changes are expected to be in place. Although each state must model the performance standard using the parameters specified in Table 1, the performance standard emission factor results will vary for each state. This variation is the result of the use of state-specific inputs such as vehicle age distribution and vehicle miles traveled (VMT) mix. Other local parameters, such as fuel type, add to state variations in determining the emission factors for the USEPA's performance standard program.

Table 1: Performance Standard and NJ Enhanced I/M Program Designs

Program Element	Low Enhanced Performance Standard	New Jersey's Existing Enhanced I/M Program	New Jersey's New Enhanced I/M Program
Network Type	100% centralized	hybrid – 70% centralized / 30% decentralized	hybrid – 70% centralized / 30% decentralized
Credit Assumed for Decentralized Program	NA	80%	96% ²
Overall I/M Program Effectiveness	100%	94%	98.8%
Program Start Date	1983 ¹	1974	1974
Test Frequency	annual	biennial	biennial
New Vehicle Exemption	None	4 Years	5 Years ³
Emission Standards	Those specified at 40 C.F.R. Part 85, Subpart W	Two-Speed Idle Standards of 1.2% for carbon monoxide and 220ppm for HC	Two-Speed Idle Standards of 1.2% for carbon monoxide and 220ppm for HC
Model Year (MY) Coverage	1968 and later MY	all vehicles not specifically exempt	all vehicles not specifically exempt
Vehicle Type Coverage	All light-duty gasoline-fueled vehicles and trucks (up to 8,500 lbs. GVWR)	All gasoline-fueled vehicles and trucks (both light and heavy duty vehicles)	All gasoline-fueled vehicles and trucks (both light and heavy duty vehicles)

Program Element	Low Enhanced Performance Standard	New Jersey's Existing Enhanced I/M Program	New Jersey's New Enhanced I/M Program
Exhaust Emission Test	<u>Idle</u> - 1968-2050 MY	<u>OBD</u> - 1996 and later MY beginning 6/1/03 <u>Two-Speed Idle</u> – 1981-1995 MY <u>Idle</u> - pre-1981 and HDGVs	<u>OBD</u> - 1996 and later MY beginning 6/1/03 <u>Two-Speed Idle</u> – 1981-1995 MY <u>Idle</u> - pre-1981 and HDGVs
Visual Inspections	<u>Positive Crankcase Ventilation (PCV) valve</u> -- 1968 – 1971 MY inclusive <u>Exhaust Gas Recirculation (EGR) valve</u> – 1972 and newer	Visual inspection of the catalytic converter, presence of a gas cap, and fuel inlet restrictor -- 1975 and newer (beginning calendar 1985)	Visual inspection of the catalytic converter, presence of a gas cap, and fuel inlet restrictor -- 1975 and newer (beginning calendar 1985)
Evaporative System Function Checks	N/A	<u>Gas Cap Testing</u> – 1971 – 2000 MY inclusive ⁴ (beginning calendar year 1998)	<u>Gas Cap Testing</u> – 1971 – 2000 MY inclusive ⁴ (beginning calendar year 1998)
Pre- 1981 MY Stringency	20%	30%	30%
Waiver Rate	3%	0%	0%
Compliance Rate	96%	98%	98%
Evaluation Date ⁵	January 1, 2002	January 1, 2012	January 1, 2012
On-Road Testing	0.5% of the subject vehicle population or 20,000 vehicles (whichever is less)	0.5% of the subject vehicle population or 20,000 vehicles (whichever is less)	0.5% of the subject vehicle population or 20,000 vehicles (whichever is less)

¹ For programs with existing I/M programs, like New Jersey's basic I/M program.

² New Jersey conducted a study to assess the current effectiveness of its PIF network. See Appendix IV of this SIP revision for a description of this study. The study concluded that the PIF network is currently 96 percent as effective as the CIF network.

³ New Jersey's fiscal year 2011 budget is expected to reflect the increased new vehicle inspection exemption period thereby implementing the change by statute.

⁴ Only those pre-1981 vehicles that were equipped with sealed gas caps will be subject to the gas cap check. The State estimates that model year vehicles prior to 1970 were not equipped with a sealed gas cap.

⁵ For all scenarios, summer season and temperatures were used for VOC/NO_x evaluations, while winter season and temperatures were used for carbon monoxide evaluations.

The remainder of this section discusses in detail the various New Jersey program parameters used to model the existing and new enhanced I/M programs.

1. Network Type:

New Jersey's enhanced I/M program is comprised of a hybrid network of both centralized test-only facilities and decentralized test-and-repair facilities. The State has assumed a 70/30 CIF/PIF split for its enhanced I/M network (that is, 70 percent of the vehicle owners are expected to pass inspection at a centralized inspection facility and the remaining 30 percent are expected to pass inspection at a decentralized private inspection facility).

New Jersey, in accordance with the flexibility afforded states by the National Highway Systems Designation Act (NHSDA), claimed that the decentralized portion of its enhanced I/M program would be 80 percent as effective as the centralized portion of its program.¹ As part of its August 31, 2001 enhanced I/M SIP revision submittal, New Jersey demonstrated that its private inspection network is achieving this 80 percent effectiveness. In fact, this analysis showed that the State was conservative in its 80 percent estimate. Appendix II Sections C and F contain additional discussions concerning the basis for the original 80 percent effectiveness assumption.

New Jersey has recently suspected that the effectiveness of the private inspection network may have increased to a level significantly higher than 80 percent, especially now that the majority of inspections are being conducted with OBD testing which is considered to be equally effective whether it is conducted by a CIF or a PIF. Therefore, New Jersey conducted a study to assess the current effectiveness of its PIF network. Documentation of the study is provided in Appendix IV. The study concluded that the PIF network is currently 96 percent as effective as the CIF network.

To facilitate MOBILE6 modeling of the State's hybrid inspection network the NJDEP calculated an overall I/M effectiveness rate. The I/M effectiveness rate was 94 percent for the existing program ($0.70 * 100 \text{ percent} + 0.30 * 80 \text{ percent}$) and 98.8 percent for the new program ($0.70 * 100 \text{ percent} + 0.30 * 96 \text{ percent}$). These overall effectiveness rates were used as inputs to the MOBILE6 model.

2. Start Date:

The I/M program start date is defined as the date on which vehicles were first inspected using an evaporative or tailpipe exhaust emission inspection in the State. As such, for New Jersey this date is 1974 (all modeling dates are assumed to be January 1 of the given year), the date when the State implemented its basic I/M program. Although this is New Jersey's start date as outlined in the low enhanced performance standard requirements, the NJDEP considers other programmatic start dates in determining the

¹ Revision to the State Implementation Plan (SIP) for the Control of Mobile Source Ozone Air Pollution--Enhanced Inspection and Maintenance (I/M) Program, March 27, 1996, Section 3, Network Type and Program Evaluation, pages 14-15.

final emission factors associated with New Jersey's program. The State implemented its enhanced I/M program on December 13, 1999, which, for modeling purposes, is assumed to be January 1, 2000. As such, the January 1, 2000 date is assumed in modeling the enhanced portion of the State's program, while January 1, 1974 continues to be assumed for the basic (idle) portion of the State's program. Finally, the State assumed a January 1, 2004 start date for OBD implementation.

3. Test Frequency and New Vehicle Exemption Periods:

The current test frequency of New Jersey's enhanced I/M program is biennial (that is, vehicle inspections are required once every two years). Starting on January 1, 2003, New Jersey implemented a 4-year new vehicle exemption. The 4-year new vehicle exemption was modeled as a grace period with the age of vehicles first subject to mandatory I/M program requirements set to 4. The new vehicle exemption period will be increased from 4 years to 5 years for the new I/M program. New Jersey's fiscal year 2011 budget is expected to reflect the increased new vehicle inspection exemption period thereby implementing the change by statute.

4. Model Year and Vehicle Type Coverage:

Vehicles currently receive different types of emission tests, depending on the type and model year of the vehicle. Pre-1981 vehicles are given an idle exhaust emission test and model year 1981-1995 vehicles which are: classified as light-duty gasoline-fueled motor vehicles (LDGVs) or light-duty gasoline-fueled trucks 1 and 2 (LDGT1s and LDGT2s)², and not specifically exempted³ from emissions testing, are subjected to the two-speed idle (TSI) tailpipe test. All 1996 and newer vehicles receive an OBD inspection unless they are exempt from that test in which case they receive the applicable exhaust emissions test.

Gas cap testing is excluded for vehicles of model year 2001 and newer. Certain classes of commercial vehicles, limousines, taxis and jitneys receive annual (more frequent) inspection. The credit for these more frequent inspections is not modeled by MOBILE6. In addition, although it is also not modeled by MOBILE6, light duty diesel vehicles are subject to emission testing.

² To determine whether a vehicle is classified as a LDGV, LDGT1, LDGT2, or HDGV, please refer to the definition section of either of the NJDEP's rules for the implementation of the enhanced I/M program at N.J.A.C. 7:27-15.1 and N.J.A.C. 7:27B-4.1.

³ Specifically exempted vehicles are those vehicles which have been exempted from enhanced emission testing, or alternatively, from emission testing all together, through NJMVC regulations and statute. These vehicles include collector motor vehicles and historic motor vehicles.

Table 2 (in Section 5) shows a summary of each vehicle category and the applicable OBD, exhaust and/or evaporative emission tests.

5. Exhaust Emission Test Type:

The majority of gasoline-fueled motor vehicles inspected as part of the enhanced I/M program currently receive either an OBD inspection or a TSI exhaust emission test. Table 2 outlines the different vehicle categories and the applicable tests for those categories.

Table 2: Various Vehicle Categories and Applicable Emission Tests

Vehicle Category	Exhaust Emission Test	Evaporative Emission Test(s)
Pre-1981 vehicles	idle	gas cap test only ¹
1981-1995 vehicles	TSI	gas cap test only
1996-2000 vehicles	OBD	OBD and gas cap test ²
2001 and later vehicles	OBD	OBD
Collector motor vehicles ³	exempt	exempt
Historic motor vehicles	exempt	exempt
1981 and newer vehicles registered as school buses ⁴	OBD	OBD and gas cap test ²

¹ Only those pre-1981 vehicles that were equipped with sealed gas caps will be subject to the gas cap check. The State estimates that model year vehicles prior to 1970 were not equipped with a sealed gas cap.

² The OBD test includes checks for monitored failures of both the exhaust and evaporative systems. In addition to these checks, the State will also perform a traditional gas cap pressurization inspection on these vehicles.

³ The “collector motor vehicle” category, as required by the enhanced I/M legislation, is defined and discussed at P.L. 1995, Chapter 112, Section 39:8-1a., approved June 2, 1995.

⁴ All gasoline-fueled vehicles registered as school buses in the State are inspected by the NJMVC's School Bus Inspection Unit. If applicable, these vehicles receive an OBD test. School buses not amenable to an OBD test will receive the 2500 RPM tailpipe test.

The NJMVC's regulations and State statute specifically exempt collector motor vehicles that would otherwise be subjected to enhanced I/M testing. To determine whether or not a vehicle qualifies as a collector motor vehicle, consult the NJMVC's definitions at N.J.A.C. 13:20-43.1. In addition, the NJMVC's regulations exempt historic motor vehicles from basic I/M emission testing. To determine whether or not a vehicle qualifies as a historic motor vehicle, consult the NJMVC's definitions at N.J.A.C. 13:20-

43.1 and N.J.S.A. 39:3-27.3. The NJDEP did not specifically account for these vehicles as part of this revised performance standard modeling for two reasons: (1) the number of vehicles in these categories was so small that their emissions were not significant enough to impact the modeling, and (2) the historic motor vehicles, by definition, fell outside the 25 model year analysis window used by the MOBILE6 model.

6. Emission Control Device Inspections:

A visual inspection to determine the presence of a catalytic converter is performed on all 1975 and newer motor vehicles. This was included in the State's revised performance standard modeling. In addition, the State assumed that all vehicles subject to the gas cap inspection also receive a visual gas cap inspection for the presence of a cap and to examine the cap for any cracks, outside damage, etc. Finally, the State included in its revised performance standard modeling fuel inlet restrictor testing for all applicable model years. The purpose of the fuel inlet restrictor test is to determine whether or not a leaded gasoline pump nozzle could fit into the vehicle's gasoline inlet, allowing for the possibility of leaded gasoline usage. Use of leaded gasoline interferes with the effectiveness of the vehicle's catalytic converter. Although the State began fuel inlet restrictor testing as part of its annual inspections in June 1990, New Jersey stopped performing inlet restrictor tests in 1994 because it was no longer possible for New Jersey motorists to obtain leaded gasoline. However, according to a USEPA guidance memorandum on highway source modeling⁴, states that have, in the past, performed fuel inlet tests for at least one full cycle (and have required catalyst replacement upon failure) may claim the SIP credit associated with this testing without future testing. Since New Jersey meets these requirements, the State took emission credit for the fuel inlet restrictor test in this revised performance standard modeling.

7. Evaporative System Function Checks:

In addition to outlining the exhaust emission tests applicable to each vehicle category, Table 2 also shows which vehicle categories are currently subject to the State's evaporative emission tests. Although OBD monitors a vehicle's evaporative system, and as such has a "self-contained" evaporative functional check, the USEPA has recommended that states needing significant hydrocarbon reductions to meet their attainment goals should supplement OBD-I/M testing with a separate gas cap test.⁵ This recommendation is based on the fact that when the USEPA compared failure rates for the evaporative portion of the OBD-I/M test to the failure rate for the stand-alone gas cap test, they found that the separate gas cap test was able to identify a substantial number of leaking gas caps that were not identified by the OBD monitors due to the

⁴ Memorandum dated September 16, 1994 from Phil Lorang, then Director of the Emission Planning and Strategies Division, USEPA to All Regional Air Directors entitled "Discontinuation of Tail Pipe Lead and Fuel Inlet Tests."

⁵ "Performing Onboard Diagnostic System Checks as Part of a Vehicle Inspection and Maintenance Program", EPA420-R-01015, June 2001.

different failure thresholds. The pressurized gas cap test is designed to insure that the gas cap seals properly and has no leaks. All gasoline-fueled motor vehicles manufactured with a sealed gas cap are subject to this pressured gas cap inspection; which the NJDEP determined is all 1971 and later vehicles. In addition, for the New Jersey program model year 2001 and newer vehicles are excluded from the separate gas cap test. This is because by model year 2001 the vehicle manufacturers had refined their OBD systems to more reliably detect evaporative system malfunctions and tighter evaporative emission tests were imposed by the USEPA.

8. Stringency:

For modeling purposes, a 30 percent emission test failure rate was assumed for pre-1981 vehicles.

9. Waiver Rate:

In accordance with 40 C.F.R. 51.360(d)(1), each state's SIP must include "a maximum waiver rate expressed as a percentage of initially failed vehicles." The purpose of this waiver rate is to estimate emission reduction benefits in a modeling analysis. In the USEPA enhanced low I/M performance standard, a 3 percent waiver rate was used.

New Jersey's enhanced I/M program does not have an option for vehicles to comply with emission standards by receiving a waiver. Waiver rates are zero for all vehicles in the New Jersey I/M program.

10. Compliance Rate:

For modeling purposes, a 98 percent compliance rate was assumed for the overall enhanced I/M program.

11. Evaluation Date:

An evaluation date of January 1, 2002 is used for the performance standard runs.⁶ An evaluation date of January 1, 2012 is used for the program evaluation runs because the anticipated changes to New Jersey's I/M program are expected to be in place by this date. Implementation of the new vehicle exemption period would likely be implemented during the calendar year 2011 inspection cycle resulting in it being fully in effect on January 1, 2012.

⁶ 40 C.F.R. §51.351(g)(13).

In addition to the parameters and assumptions discussed previously in this section, the NJDEP had to make other assumptions in order to complete its performance standard and program evaluation modeling. The following table shows what those assumptions were and what values were used to complete the modeling:

Table 3: Other Modeling Assumptions

Modeling Parameters	Value Used for Average Summer Runs (VOC and NO_x)	Value Used for Average Winter Runs (Carbon Monoxide)
Maximum Temperature (F)	82.9	41.2
Minimum Temperature (F)	66.3	26.7
Absolute Humidity (grains/pound)	85.59	20.00
Speed	MOBILE6 Defaults	MOBILE6 Defaults
Mechanic Training and Certification	yes - 100%	yes - 100%
NJ Low Emission Vehicle Program w/o ZEV Mandate	yes	yes
Gasoline RVP (psi)	6.8	15
Oxygenated Reformulated Gasoline	10% Ethanol	10% Ethanol

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SIP Revision

Appendix IV

**Documentation of the Effectiveness of New Jersey's
Private Inspection Facilities Relative to New Jersey's
Centralized Inspection Facilities**

July, 2010



**NEW JERSEY MOTOR VEHICLE INSPECTION PROGRAM
PIF EFFECTIVENESS STUDY**

Final Report

Prepared for:

**New Jersey Department of Environmental Protection
Bureau of Motor Vehicle Inspection & Maintenance
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1.0 INTRODUCTION

In its original regulations on implementing an enhanced motor vehicle inspection program, the USEPA considered inspections performed at a decentralized test-and-repair garage to be only 50% as effective as those performed at a centralized test-only facility. Under pressure from states, the USEPA allowed inspection programs to claim higher degrees of decentralized testing effectiveness in their modeling as long as the claim was backed by sound reasoning. In New Jersey's hybrid vehicle inspection network, Centralized Inspection Facilities (CIFs) are test-only facilities run by the Parsons Group as a State contractor. Private Inspection Facilities (PIFs) are comprised of privately-owned test and repair facilities licensed by the State. The New Jersey Department of Environmental Protection (the Department or DEP) proposed an effectiveness of 80% for its decentralized PIFs and has been using this factor in modeling for many years.

When enhanced inspection was implemented in New Jersey, all vehicles received a tailpipe exhaust emissions test as their primary test. A tailpipe test may be subject to considerable fraud because it is easy to probe a known clean vehicle ("clean piping"). While the Motor Vehicle Commission (MVC) aggressively pursues and prosecutes fraudulent inspection, a Sierra Research study in 2005, concluded that a significant fraction of tailpipe tests were either outright fraudulent or suspicious.

With a large percentage of the motor vehicle fleet (model year 1996 and newer) now subject to On Board Diagnostics (OBD) testing as their primary emissions test, the landscape has changed. Newer OBD vehicles (2005+) have VINs embedded in the OBD data and even older OBD vehicles have a distinct "fingerprint" of OBD data that narrows probable year/make/model/engine family. As such, fraudulently substituting a known good vehicle for the vehicle under test ("clean scanning") has become no less difficult, but far more easily detected. The MVC and DEP now have access to triggers and alerts whenever suspected fraudulent OBD testing occurs, virtually in real time.

The Department considers 80% PIF effectiveness to likely be very conservative in light of the program and technology changes described above. In May 2010, the Department therefore authorized MACTEC to assess improvements in effectiveness of the decentralized program. The purpose of this study is to determine a reasonable effectiveness fraction that may be supported by data and good technical reasoning.

The data currently available for this study includes about ten years of enhanced inspection program data, plus limited roadside testing data. We evaluated the utility and relevance of the roadside data because it is not based on random selection of vehicles subject to inspection. It was determined that the use of this data could not improve the statistical confidence of the larger dataset.

MACTEC analyzed the effectiveness of the decentralized PIF network relative to the CIF (centralized) network. The relative effectiveness of PIFs is based on data collected from PIFs and CIFs in 2009.

The final results of our evaluation are being submitted by June 30, 2010, to coincide with program planning efforts that may be affected by the study outcome.

2.0 OTHER STATES' PRACTICES

Since the decentralized portion of the New Jersey inspection program is not unlike decentralized testing in other States, MACTEC was directed to investigate relevant programs to determine if effectiveness rates in current use are similar enough to indicate a standard for industry practice.

MACTEC was able to determine that emission inspection programs in Massachusetts, Connecticut, New York, Georgia and Utah claim in their SIPs that their decentralized OBD inspections are as effective as centralized programs. None of these States use the decentralized program effectiveness prompt of the MOBILE6.2 model when modeling the emission benefits for their OBD inspections.

Although many states claim that their decentralized tailpipe inspections are 100% effective, based on the supporting data included with this report, it seems more reasonable to keep New Jersey's PIF effectiveness factor for tailpipe tests at 80%.

3.0 ANALYTICAL APPROACH

The following is a description of the analysis employed to re-calculate the PIF effectiveness for MOBILE6 modeling. It is broken down into the following categories:

- Previous program (CIF and PIF) data analysis
- Current program (CIF and PIF) data analysis
- MOBILE6.2 analysis

This analysis defines the effectiveness of the decentralized (PIF) network relative to the centralized (CIF) network. CIFs are test-only facilities run by the Parsons Group as a State contractor. PIFs are comprised of privately-owned test and repair facilities licensed by the State.

Previous Program Data Analysis Protocol

An indicator of PIF vs. CIF effectiveness is the incidence of clean scanning or clean piping. Clean piping and clean scanning refer to the practice of substituting a passing vehicle for the vehicle being tested. Clean piping occurs when an inspector probes the tailpipe of a passing vehicle instead of the vehicle being tested. Clean scanning occurs when an inspector substitutes a fault-free vehicle for the vehicle that is being inspected. Previous program data from CIFs and PIFs was analyzed to determine rates of suspected fraud in PIFs and CIFs. From this, the effectiveness of PIF inspections is calculated relative to CIF inspections. This analysis focused on data collected during the last two years of the old program. The following describes the possible indicators of fraud that we calculated.

Suspected Clean Scanning

Two parameters are calculated to determine if stations may have clean scanned a vehicle:

1. Mismatch between entered VIN and OBD VIN
2. Questionable retests – mismatch between initial test monitors supported and retest monitors supported

Mismatch between entered VIN and OBD VIN -- If the vehicle has an electronic VIN available through the vehicle's OBD II system, clean scanning cases can be identified by comparing the entered VIN with the VIN provided by vehicle's OBD II system. In order to perform this analysis, the data was manipulated to remove cases where mismatches between the OBDII VIN and the registered VIN may be in error. These manipulations are presented below:

- Records where the OBDII VIN and the registered VIN had less than 17 characters were removed.
- Records where the last digit of the OBDII VIN and the registered VIN was alpha (not numeric) were removed.

- Mismatches are based on the last 4 digits of the OBD VIN and the registered VIN.

The percent of tests with VIN mismatches equals the following:

(# of valid mismatches between OBD VIN/entered VIN)/(# of records with valid OBD VINs)

Questionable Retests – Mismatch Between Initial Test Monitors Supported and Retest Monitors Supported --

The readiness monitors supported by the vehicle's OBDII system provide a rough signature for the vehicle. The following analysis was conducted on OBDII inspection data to identify cases where readiness monitors supported on an initial failing test do not match readiness monitors supported on passing retests:

1. Using data from the last two years, test records for the initial failing test were identified (termed *Fail Initial OBD*)
2. Records for vehicles that pass retests were identified (termed *Pass OBD Retest*).
3. Data records for the *Fail Initial OBD* and *Pass OBD Retest* groups were linked via VIN.
4. Records where the monitor profile changes were identified. Did not count cases where readiness status changes from ready to not ready or vice versa.

The percent of suspect retests equals the following:

(# of monitor mismatches)/(# OBD retests)

Suspected Clean Piping

Two parameters were calculated to determine if a station may have clean piped a vehicle:

1. Overall tailpipe failure rate
2. Questionable retests – less than ½ hour between initial failing test and passing retest.

Failure rate analysis – Initial test failure rates for the tailpipe test were calculated by model year and network (CIF vs. PIF). Then, using the statewide distribution of model years for the tailpipe test, normalized failure rates for tailpipe tests were calculated for CIFs and PIFs. Rates for CIFs were compared to rates for PIFs. The relative failure rate is calculated as follows:

(Normalized PIF failure rate)/(Normalized CIF failure rate)

Questionable Retests – Less than ½ Hour between Initial Failing Tailpipe Test and Passing Retest

A short time (less than ½ hour) between an initial failing test and a passing retest could indicate that the vehicle was clean-piped on the retest. The following procedure was used to identify vehicles that passed a retest less than ½ hour after they failed:

1. Using data from the last two years, test records for the initial failing test were identified (termed *Fail Initial Tailpipe*)
2. Records for vehicles that pass retests were identified (termed *Pass Tailpipe Retest*).
3. Data records for the *Fail Initial Tailpipe* and *Pass Tailpipe Retest* groups were linked via VIN.
4. Time between passing retests and failed initial test was calculated.
5. Records where passing retests occurred less than 1/2 hour after the failing test were identified.

The percent of suspect retests equals the following:

$(\# \text{ of passing retests performed less than } 1/2 \text{ hour after failing test}) / (\# \text{ of tailpipe retests})$

4.0 ANALYTICAL RESULTS

This section provides comparative information on failure rates for OBD and tailpipe tests and then addresses the results from the clean piping and clean scanning analysis.

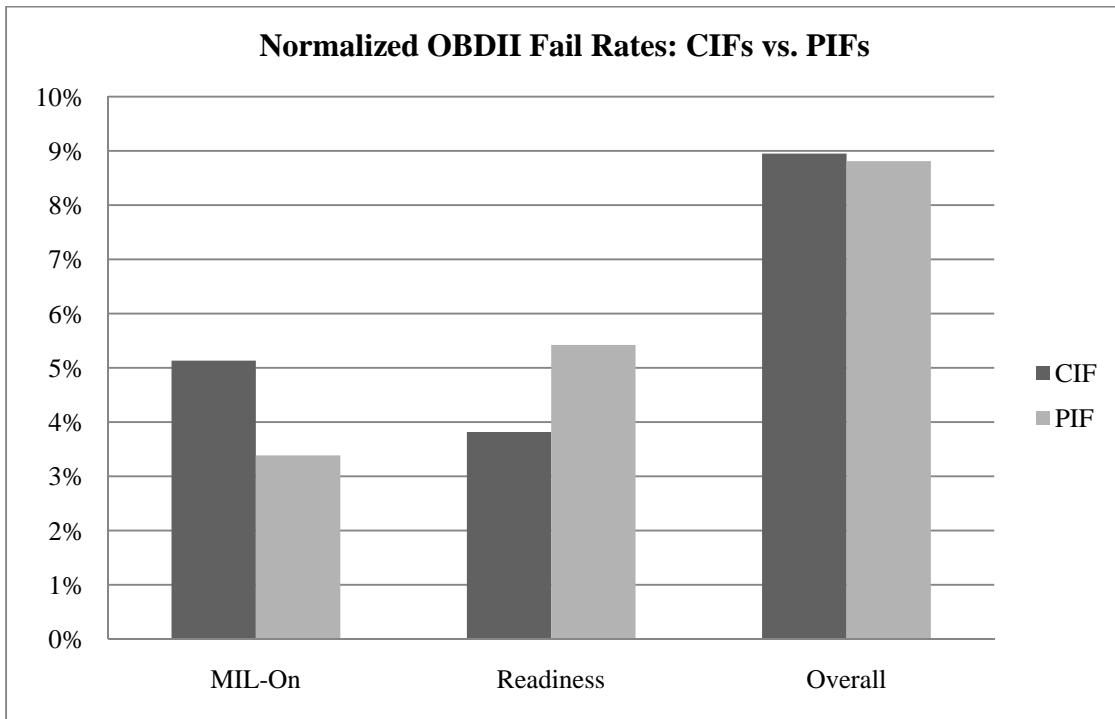
4.1 Failure Rates for OBD Tests

Table 1 and Figure 1 compare OBD failure rates for CIFs with those for PIFs. The normalized fail rate for the PIFs is 98.5% of the fail rate for CIFs. As shown on Figure 1, PIFs have a higher normalized fail rate for readiness, while CIFs have a higher normalized fail rate for MIL-Commanded On. This makes sense, considering that PIFs are much more likely than CIFs to attempt to correct a MIL situation before inspecting the vehicle. This practice would lower MIL-on rates while raising not ready rates.

Table 1 – OBD Fail Rate: CIFs vs. PIFs

Model Year	Weighting	Fail Rate	
		PIF	CIF
1996	3%	14%	21%
1997	8%	14%	16%
1998	5%	14%	16%
1999	9%	11%	12%
2000	8%	11%	11%
2001	11%	14%	13%
2002	9%	10%	9%
2003	14%	7%	6%
2004	8%	6%	4%
2005	12%	4%	3%
2006	8%	3%	2%
2007	2%	2%	1%
2008	1%	0%	1%
2009	1%	0%	1%
Normalized Fail Rate		8.8%	8.9%

Figure 1- Readiness and MIL-On Fail Rate: CIFs vs. PIFs



4.2 Failure Rates for Tailpipe Tests

Table 2 compares tailpipe failure rates for CIFs with those for PIFs. The normalized fail rate for the PIFs is 55% of the fail rate for CIFs. The lower normalized fail rate in PIFs can be partially explained by the common practice of repairing vehicles before their initial inspections.

Table 2 – Tailpipe Fail Rate: CIFs vs. PIFs

Model Year	Weighting	Tailpipe Failure Rate	
		PIFs	CIFs
Pre-81	1.85%	12.0%	1.9%
1981	0.19%	13.2%	0.2%
1982	0.25%	14.2%	0.3%
1983	0.37%	12.4%	0.4%
1984	0.75%	12.5%	0.8%
1985	1.10%	10.9%	1.1%
1986	1.91%	12.0%	1.9%
1987	2.52%	10.4%	2.5%
1988	3.44%	9.1%	3.4%
1989	3.99%	9.0%	4.0%
1990	5.38%	9.3%	5.4%
1991	5.72%	9.6%	5.7%
1992	8.41%	10.4%	8.4%
1993	10.74%	8.6%	10.7%
1994	15.24%	8.0%	15.2%
1995	18.62%	6.2%	18.6%
1996	0.73%	5.1%	0.7%
1997	1.10%	4.1%	1.1%
1998	1.15%	3.1%	1.2%
1999	1.27%	3.2%	1.3%
2000	1.57%	1.9%	1.6%
2001	1.66%	0.9%	1.7%
2002	1.63%	1.0%	1.6%
2003	1.93%	0.6%	1.9%
2004	2.68%	0.2%	2.7%
2005	3.05%	0.2%	3.0%
2006	1.32%	0.3%	1.3%
2007	0.69%	0.4%	0.7%
2008	0.53%	0.3%	0.5%
2009	0.15%	0.5%	0.2%
2010	0.02%	0.0%	0.0%
Normalized Fail Rate		7.2%	13.1%

4.3 Clean Scanning / Clean Piping Analysis

An indicator of PIF vs. CIF effectiveness is the incidence of clean scanning or clean piping. Clean piping and clean scanning refer to the practice of substituting a passing vehicle for the vehicle being tested. Clean piping occurs when an inspector probes the tailpipe of a passing vehicle instead of the vehicle being tested. Clean scanning occurs when an inspector substitutes a fault-free vehicle for the vehicle that is being inspected. Previous program data from CIFs and PIFs were analyzed to determine rates of suspected fraud in PIFs and CIFs. From this, the effectiveness of PIF inspections was calculated relative to CIF inspections. This analysis focused on data collected during the last year of the old program.

Suspected Clean Scanning in OBD Inspections

Two parameters were calculated to determine if stations may have clean scanned a vehicle:

1. Mismatch between entered VIN and OBD VIN
2. Questionable retests – mismatch between initial test monitors supported and retest monitors supported

Mismatch between entered VIN and OBD VIN -- If the vehicle has an electronic VIN available through the vehicle’s OBD system, clean scanning cases can be identified by comparing entered VIN with the VIN provided by vehicle’s OBD system. In order to perform this analysis, the data were manipulated to remove cases where mismatches between the OBD VIN and registered VIN may be in error. These manipulations are presented below:

- Records where the OBD VIN and registered VIN had less than 17 characters were removed.
- Records where the last digits of the OBD VIN and registered VIN were alpha (not numeric) were removed.
- Mismatches were then manually reviewed to identify additional cases where the OBD VIN was invalid.

Table 3 presents the number and percent of OBD VIN mismatches by network type. PIFs had a higher mismatch rate than CIFs, but the overall rate was low for both networks.

Table 3 – OBD VIN Mismatches: CIFs vs. PIFs

Network	# of Valid OBD VINs	# of Valid Mismatches	% with Valid Mismatch	% Matching
CIF	318,488	559	0.18%	99.82%
PIF	27,278	207	0.76%	99.24%

The correct inspection rate at PIFs is 99.4% of the correct inspection rate at CIFs, based on OBD VIN.

Questionable Retests – Mismatch Between Initial Test Monitors Supported and Retest Monitors Supported -- The readiness monitors supported by the vehicle’s OBD system provide a rough signature

for the vehicle. The following analysis was conducted on OBD inspection data to identify cases where readiness monitors supported on an initial failing test do not match readiness monitors supported on passing retests:

1. Using data from the last year, test records for the initial failing test were identified (termed *Fail Initial OBD*)
2. Records for vehicles that pass retests were identified (termed *Pass OBD Retest*).
3. Data records for the *Fail Initial OBD* and *Pass OBD Retest* groups were linked via VIN.
4. Records where the monitor profile changes were identified.

Table 4 presents the number and percent of monitor mismatches during retests by network type. Like OBD VIN mismatches, PIFs had a higher retest monitor mismatch rate than CIFs, but the overall rate was low for both networks.

Table 4 – Retest Monitor Mismatches: CIFs vs. PIFs

Network	# Re-Inspections	# with Monitor Mismatches	% with Monitor Mismatches	% without Monitor Mismatches
CIF	24,995	68	0.27%	99.73%
PIF	19,460	103	0.53%	99.47%

The correct re-inspection rate at PIFs is 99.7% of the correct re-inspection rate at CIFs, based on the percentage of retests with readiness monitor mismatches.

Triggers Implemented with New Program

The trigger incidence statistics reported above are based on data from 2009 where the State investigated mismatches in the following:

- OBD VIN
- PID Count/PCM Module ID

Using the expanded OBD data collected by new equipment in the PIFs, the State has implemented the following triggers, in addition to OBD VIN and PID Count/PCM Module ID mismatches:

- Communication Protocol mismatches
- Monitors supported mismatches
- Review of expanded PCM Module ID
- Review of CAL ID and CVN
- Extended data review:
 - Time since diagnostic trouble codes were cleared.
 - Distance traveled with MIL on.

The new triggers will further reduce the already low rates of fraudulent tests.

Suspected Clean Piping in Tailpipe Inspections

Due to time constraints for this task we were only able to analyze one parameter to determine if a station may have clean piped a vehicle: ***Questionable Retests – Less than ½ Hour between Initial Failing Tailpipe Test and Passing Retest***

The following procedure was used to identify vehicles that passed a retest less than ½ hour after they failed the initial test:

1. Using data from the last two years, test records for the initial failing test were identified (termed *Fail Initial Tailpipe*)
2. Records for vehicles that passed retests were identified (termed *Pass Tailpipe Retest*).
3. Data records for the *Fail Initial Tailpipe* and *Pass Tailpipe Retest* groups were linked via VIN.
4. The time between passing retests and failed initial test was calculated.
5. Records where passing retests occurred less than ½ hour after the failing test were identified.

A short time (less than ½ hour) between an initial failing test and a passing retest could indicate that the vehicle was clean-piped on the retest. However, in many cases tailpipe failures can be repaired in less than ½ hour. For example, a simple tune-up to correct high hydrocarbon emissions can conceivably be performed on some vehicles in less than ½ hour. Therefore, the percentage of tests identified by this trigger represents the upper limit of fraudulent tests.

Table 5 presents the number and percent of tailpipe retests that occurred less than ½ hour after the initial failing test. Even if there were no fraudulent retests, the percentage of passing retests within ½ hour of the initial failing test would be expected to be much lower in CIFs than in PIFs. As shown in Table 5, a higher percentage of passing retests occur within ½ hour of the initial failing test in PIFs than in CIFs. Overall, based on this trigger, the non-suspect re-inspection rate at PIFs is 78% of the rate at CIFs.

Table 5 – Passing Reinspections That Occur Within ½ Hour of Initial Failing Tests: CIFs vs. PIFs

Network	# Re-Inspections	# Within 1/2 Hour	Suspect Re-Inspection Rate	Non-Suspect Re-Inspection Rate
CIF	19,791	1,212	6%	94%
PIF	53,578	14,360	27%	73%

5.0 RECOMMENDATIONS

The recommendations presented in this section relate first to the PIF effectiveness factors for OBD and tailpipe inspections and then for the overall network.

5.1 Proposed Discount Factors

Recommendations on PIF effectiveness for OBD inspections and for tailpipe inspections are provided below.

PIF Effectiveness for OBD Inspections

MACTEC recommends that the State use a 100% effectiveness factor for OBD tests at PIFs, instead of the 80% factor that is currently used. Our justification for increasing the effectiveness of OBD inspections at PIFs is:

- Fail rates for OBD inspections in PIFs are nearly identical to those in CIFs.
- Based on an analysis of triggers for OBD tests performed in 2009, over 99% of inspections in PIFs have no indications of fraud.
- New Jersey has implemented several additional OBD triggers in the new program, which will further reduce the incidence of fraud.

PIF Effectiveness for Tailpipe Inspections

MACTEC recommends that the State continue to use an 80% effectiveness factor for tailpipe emissions tests at PIFs. The data analyzed in this task do not justify a higher or lower effectiveness factor. The fail rate in PIFs is 55% of the fail rate in CIFs, which can be partially explained by the common practice of repairing vehicles in PIFs before their initial inspections. The rate of non-suspect tests in PIFs is 78% of the rate in CIFs, based on the percentage of passing retests that occur within ½ hour of the initial failing tests. Considering that the percentage of tests identified by this trigger represents the upper limit of fraudulent tests, the current PIF effectiveness factor of 80% is a conservative estimate. Further study would likely result in a higher PIF effectiveness factor.

5.2 Overall Network Effectiveness

Table 6 and Figure 2 show estimates of the overall network effectiveness based on the following data and assumptions:

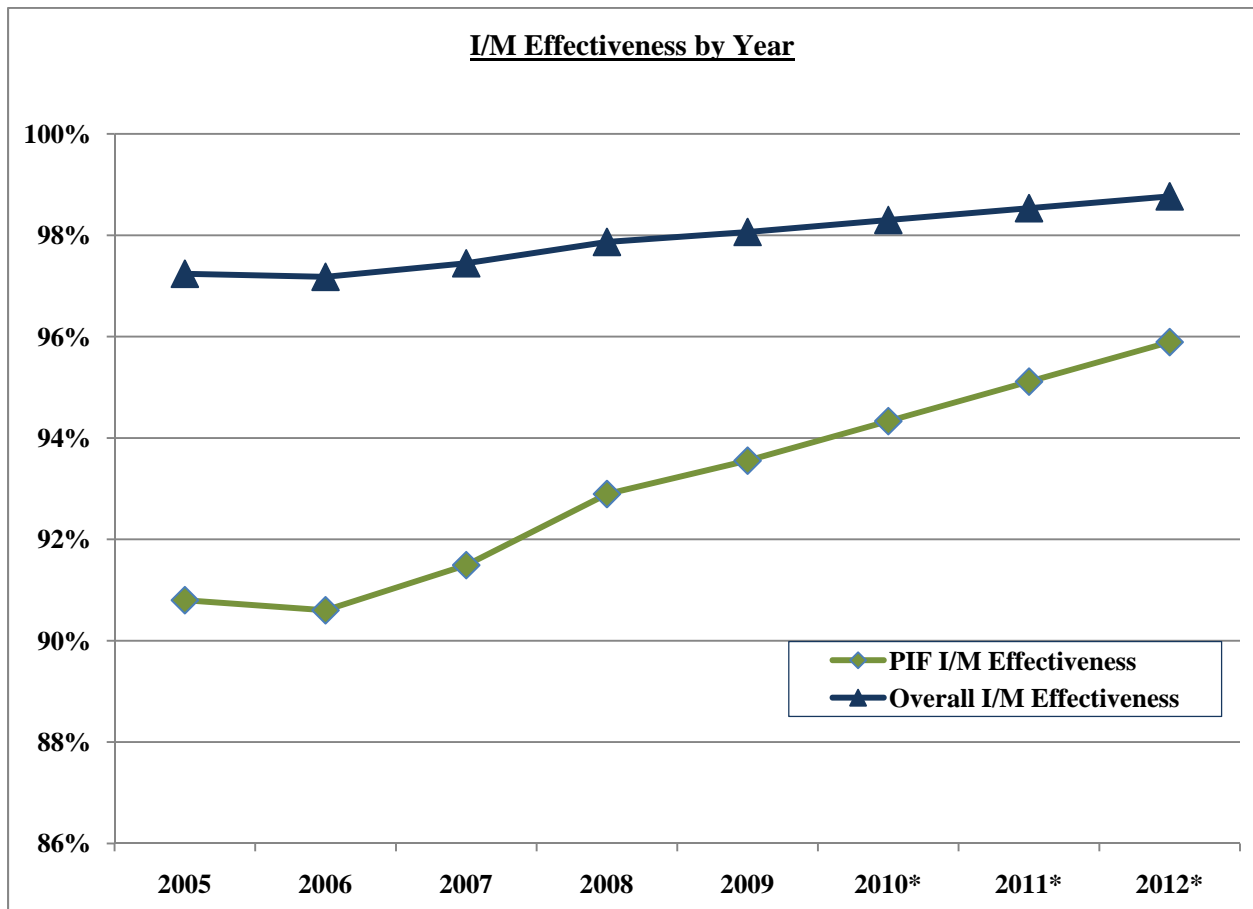
- PIF effectiveness is as follows:
 - OBD tests: 100%
 - Tailpipe tests: 80%

- 30% of the vehicles are tested in PIFs. Based on historical data, the percent tested in PIFs is more like 20%, so this assumption results in a conservative, i.e., low, effectiveness factor for the overall network.

Table 6 – Estimates of the I/M Program Effectiveness of the Network

Year	PIF Testing OBD %	PIF Testing TP %	PIF I/M Effectiveness	CIF I/M Effectiveness	MOBILE6.2 I/M Effectiveness
2005	54.0%	46.0%	90.8%	100%	97.2%
2006	53.0%	47.0%	90.6%	100%	97.2%
2007	57.5%	42.5%	91.5%	100%	97.4%
2008	64.5%	35.5%	92.9%	100%	97.9%
2009	67.8%	32.2%	93.6%	100%	98.1%
2010*	71.7%	28.3%	94.3%	100%	98.3%
2011*	75.6%	24.4%	95.1%	100%	98.5%
2012*	79.5%	20.5%	95.9%	100%	98.8%

Figure 2 – Projected I/M Program Effectiveness



**The State of New Jersey
Department of Environmental Protection**

**Proposed Revisions to the Enhanced Inspection and
Maintenance (I/M) Program for the State of New Jersey**

**Extension of the New Vehicle Inspection Exemption
From 4 Years to 5 Years**

**I/M Program Modeling and USEPA Performance
Standard Modeling**

SIP Revision

Appendix VI

**Calculation Spreadsheet for 2012 Modeling of the New
Jersey Existing I/M Program, New Jersey's New I/M
Program and USEPA I/M Performance Standard**

July, 2010

Appendix II
 Calculation Spreadsheet for 2013 Modeling of the NJ Existing I/M Program, NJ Proposed I/M Program and USEPA I/M
 Performance Standard

New Jersey 2012 Evaluation Year --- MOBILE6 Results			
Pollutant	New Jersey Existing Program	New Jersey New Program	(NJ Existing Program) (NJ New Program)
VOC	0.379	0.379	0.000
NOx	0.800	0.8	0.000
CO	10.347	10.35	-0.003
Pollutant	USEPA Low Performance Standard (LPS)	USEPA LPS Range Limit (LPS +0.02)	(USEPA LPS Range Limit) - (NJ New Program)
VOC	0.923	0.943	0.564
NOx	2.396	2.416	1.616
CO	21.854	21.874	11.524